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A REVISION OF THE SERPHIDAE (HYMENOPTERA)

by

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TABLE OF CONTENTS

| | | | |
|--|-----|--|--|
| Introduction | 1 | | |
| Acknowledgements | 2 | | |
| Nomenclature | 3 | | |
| Family size and distribution | 4 | | |
| Biology | 6 | | |
| Hosts attacked | 6 | | |
| Abdominal morphology | 7 | | |
| Family SERPHIDAE | 8 | | |
| Subfamily VANHORNINAE | 9 | | |
| Genus Vanhornia | 10 | | |
| 1. leileri | 10 | | |
| 2. eucnemidarum | 11 | | |
| Genus Heloriserphus | 11 | | |
| 1. castor | 13 | | |
| 2. pollux | 13 | | |
| Subfamily ACANTHOSERPHINAE | 14 | | |
| Genus Acanthoserphus | 15 | | |
| 1. bidens | 15 | | |
| 2. albicoxa | 16 | | |
| Genus Austrocodrus | 17 | | |
| 1. patagonicus | 17 | | |
| Genus Austroserphus | 18 | | |
| 1. albofasciatus | 18 | | |
| Subfamily SERPHINAE | 19 | | |
| (Tribe DISOGMINI) | 20 | | |
| Genus Disogmus | 21 | | |
| 1. obsoletus | 23 | | |
| 2. costatus | 23 | | |
| 3. areolator | 24 | | |
| 4. basalis | 28 | | |
| (Tribe CRYPTOSERPHINAE) | 29 | | |
| Genus Oxyserphus | 32 | | |
| 1. pediculatus | 36 | | |
| 2. maculipennis | 36 | | |
| 3. splendidus | 37 | | |
| 4. rugatus | 38 | | |
| 5. doddi | 39 | | |
| 6. nitidus | 39 | | |
| 7. hipponecrus | 40 | | |
| 8. turneri | 41 | | |
| 9. corvinus | 41 | | |
| 10. caudatus | 42 | | |
| 11. baini | 42 | | |
| 12. xanthura | 43 | | |
| 13. syagrii | 44 | | |
| 14. leiopleurum | 44 | | |
| 15. calcaratus | 45 | | |
| 16. brevicaulis | 45 | | |
| 17. capitatus | 46 | | |
| 18. unisulcus | 46 | | |
| 19. sulcatus | 47 | | |
| 20. nigriscutum | 47 | | |
| Genus Fustiserphus | 48 | | |
| 1. longiceps | 50 | | |
| 2. compressus | 50 | | |
| 3. intrudens | 51 | | |
| 4. unidentatus | 52 | | |
| 4a. u. unidentatus | 53 | | |
| 4b. u. rufipes | 54 | | |
| 5. niger | 54 | | |
| 6. reticulatus | 55 | | |
| 6a. r. reticulatus | 55 | | |
| 6b. r. grossus | 56 | | |
| Genus Sminthoserphus | 56 | | |
| 1. defricatus | 57 | | |
| 2. sparsus | 58 | | |
| 3. alvarengai | 58 | | |
| 4. piceipes | 59 | | |
| 5. pallipes | 59 | | |
| Genus Afroserphus | 60 | | |
| 1. bicornis | 61 | | |
| Genus Nothoserphus | 61 | | |
| 1. boops | 63 | | |
| 2. scymni | 64 | | |
| 3. afissae | 65 | | |
| 4. aequalis | 66 | | |
| 5. debilis | 66 | | |
| 6. epilachnae | 67 | | |
| 7. mirabilis | 68 | | |
| Genus Tretoserphus | 69 | | |
| 1. laricis | 70 | | |
| 2. perkinsi | 73 | | |
| 3. nudicauda | 74 | | |
| 4. foveolatus | 75 | | |
| Genus Cryptoserphus | 76 | | |
| 1. longitarsis | 79 | | |
| 2. flavipes | 81 | | |
| 3. pauciruga | 84 | | |
| 4. latidens | 84 | | |
| 5. fortis | 85 | | |
| 6. occidentalis | 86 | | |
| 7. medius | 87 | | |
| 8. dilatatus | 88 | | |
| 9. hirtipennis | 89 | | |
| 10. adustus | 90 | | |
| 11. aculeator | 91 | | |
| 12. quintanus | 93 | | |
| 13. rostratus | 94 | | |
| Genus Mischoserphus | 95 | | |
| 1. lachrymans | 98 | | |
| 2. alternans | 99 | | |
| 3. arcuator | 100 | | |
| 4. obesus | 101 | | |

| | | | | | |
|-------------------------------|-------------------------|--------------------------------|--------------------------------|------------------------|-----|
| 5. | alaskensis | 102 | 11. | glabratus | 157 |
| 6. | abbreviatus | 102 | 12. | chittii | 158 |
| 7. | obscurus | 103 | 13. | longipes | 159 |
| 8. | australiae | 104 | 14. | viator | 160 |
| 9. | samurai | 104 | 15. | pallipes | 165 |
| 10. | genatus | 105 | 16. | disjunctus | 167 |
| 11. | acomus | 105 | 17. | punctatus | 167 |
| 12. | comatus | 106 | 18. | partipes | 168 |
| 13. | coxalis | 106 | Genus Serphus | 169 | |
| 14. | trichopleurum | 107 | (Brachypterus Group) | 171 | |
| 15. | pileatus | 108 | 1. | brachypterus | 172 |
| 16. | crassicornis | 108 | 2. | caudatus | 176 |
| 17. | pictus | 109 | (Gravidator Group) | 177 | |
| 18. | calvus | 109 | 3. | pallidus | 177 |
| 19. | appendicis | 110 | 4. | gravidator | 179 |
| 20. | petiolatus | 111 | 5. | maurus | 184 |
| Genus Pschornia | 111 | 6. | terminalis | 184 | |
| 1. | minora | 112 | 7. | bistriatus | 188 |
| 2. | striata | 113 | Genus Parthenocodrus | 191 | |
| 3. | megaloura | 113 | 1. | elongatus | 192 |
| Genus Hormoserphus | 114 | 2. | laevicollis | 193 | |
| 1. | clypeatus | 115 | Genus Paracodrus | 193 | |
| 2. | segregatus | 115 | 1. | apterogynus | 194 |
| Genus Brachyserphus | 116 | Genus Phaneroserphus | 196 | | |
| 1. | lucens | 118 | 1. | calcar | 198 |
| 2. | leptura | 119 | 2. | cristatus | 201 |
| 3. | barberi | 120 | 3. | longistigma | 201 |
| 4. | rugatus | 120 | 4. | punctibasis | 202 |
| 5. | obliquus | 121 | 5. | brevistigma | 202 |
| 6. | hawaiiensis | 121 | Genus Exallonyx | 203 | |
| 7. | curticornis | 122 | (Subgenus Eocodrus) | 204 | |
| 8. | abruptus | 122 | 1. | brevicornis | 205 |
| 9. | teres | 125 | 2. | ruficeps | 207 |
| 10. | parvulus | 125 | 3. | longicornis | 207 |
| 11. | laeviceps | 127 | 4. | certus | 209 |
| Genus Serphonostus | 128 | 5. | striatus | 210 | |
| 1. | nigerrimus | 129 | (Subgenus Exallonyx) | 210 | |
| Genus Apoglypha | 129 | (Ater Group) | 213 | | |
| 1. | nitens | 130 | 1. | sparsus | 216 |
| 2. | radiata | 131 | 2. | quadriceps | 217 |
| 3. | janthinae | 131 | 3. | styracura | 219 |
| (Tribe SERPHINI) | 132 | 4. | ater | 220 | |
| Genus Codrus | 134 | 5. | texanus | 223 | |
| 1. | unistria | 135 | 6. | boreus | 225 |
| 2. | philippinus | 136 | 7. | nevadensis | 226 |
| 3. | pivicornis | 137 | 8. | artoculus | 228 |
| 4. | striatus | 138 | 9. | simplicior | 229 |
| 5. | ciliatus | 139 | (Formicarius Group) | 230 | |
| 6. | nebriae | 139 | 1. | placidus | 243 |
| 7. | niger | 140 | 2. | fusicornis | 244 |
| Genus Phaenoserphus | 143 | 3. | leiopleurum | 246 | |
| 1. | gregori | 146 | 4. | diminuens | 246 |
| 2. | genualis | 147 | 5. | multidens | 247 |
| 3. | leptopygus | 149 | 6. | pleuralis | 248 |
| 4. | nigripes | 149 | 7. | equidens | 250 |
| 5. | borealis | 150 | 8. | bisulcus | 251 |
| 6. | trieces | 152 | 9. | californicus | 253 |
| 7. | granulatus | 152 | 10. | decumbeus | 255 |
| 8. | fuscipes | 153 | 11. | declivus | 256 |
| 9. | melliventris | 155 | 12. | angusticeps | 257 |
| 10. | lineatus | 156 | 13. | ashmeadi | 259 |

| | | | |
|------------------------------|-----|------------------------------|-----|
| 14. seticornis | 260 | 9. liratus | 317 |
| 15. crenaticornis | 261 | 10. leptopus | 317 |
| 16. femoratus | 263 | 11. enomus | 318 |
| 17. piliventris | 265 | 12. durus | 318 |
| 18. asper | 265 | 13. triglyptus | 319 |
| 19. pallidicornis | 266 | 14. angustoralis | 320 |
| 20. daschi | 268 | 15. binodus | 320 |
| 21. arizonicus | 269 | 16. lipus | 321 |
| 22. obscuratus | 270 | 17. pentaglyptus | 322 |
| 23. frater | 270 | 18. leptonyx | 322 |
| 24. oaxacae | 271 | 19. variolae | 323 |
| 25. vietus | 271 | 20. substriatus | 323 |
| 26. formicarius | 272 | (Atripes Group) | 324 |
| 27. microcerus | 273 | 1. japonicus | 328 |
| 28. trifoveatus | 275 | 2. orientalis | 329 |
| 29. ligatus | 278 | 3. nathani | 330 |
| 30. crassulus | 280 | 4. nikkoensis | 330 |
| 31. polysulcus | 282 | 5. atripes | 331 |
| 32. visayanus | 283 | 6. levibasis | 332 |
| 33. luzonicus | 283 | 7. lissopleuris | 333 |
| 34. latilabris | 284 | 8. masoni | 334 |
| 35. phaemerus | 284 | 9. arctus | 335 |
| 36. claripes | 285 | 10. planocaulis | 336 |
| 37. angulatus | 285 | 11. applanatus | 336 |
| 38. seabrai | 286 | 12. antillarum | 337 |
| 39. brutus | 287 | 13. atrellus | 337 |
| 40. leptocorsa | 287 | 14. brunescens | 338 |
| 41. subteres | 288 | 15. culmeus | 339 |
| 42. brevimala | 289 | 16. parcus | 339 |
| 43. subserratus | 290 | 17. oculatus | 340 |
| 44. trichomus | 292 | 18. melanomerus | 340 |
| 45. confusus | 293 | 19. trachodes | 341 |
| 46. nixoni | 294 | 20. datae | 342 |
| 47. minor | 295 | (Evanescens Group) | 342 |
| 48. alticola | 297 | 1. flavicinctus | 344 |
| 49. parvus | 299 | 2. evanescens | 345 |
| 50. kenyensis | 299 | 3. semitropis | 346 |
| 51. siccatu | 300 | 4. capnodes | 346 |
| 52. monotrema | 300 | 5. mydobi | 347 |
| 53. pissinus | 301 | 6. intensus | 347 |
| 54. chiuae | 301 | 7. trialbus | 348 |
| 55. peñai | 302 | 8. castaneipes | 349 |
| 56. leptocerus | 303 | 9. parameces | 349 |
| 57. cervicatus | 303 | 10. vescus | 350 |
| 58. reflexus | 304 | 11. deflexus | 350 |
| 59. rhadinus | 305 | 12. columnaris | 351 |
| 60. nodosus | 305 | 13. antennalis | 351 |
| 61. rudis | 306 | 14. stenostoma | 352 |
| (Cingulatus Group) | 306 | 15. burhytis | 352 |
| 1. seyrigi | 307 | 16. collaris | 353 |
| 2. cingulatus | 307 | 17. ochropus | 354 |
| 3. mindorensis | 308 | (Obsoletus Group) | 354 |
| (Leptonyx Group) | 308 | 1. pallidistigma | 356 |
| 1. amplipennis | 311 | 2. crenicornis | 359 |
| 2. lophotos | 312 | 3. recavus | 361 |
| 3. pustula | 313 | 4. achilus | 361 |
| 4. specularis | 313 | 5. obsoletus | 362 |
| 5. carbunculus | 314 | 6. grandis | 364 |
| 6. truncatus | 315 | (Dictyotus Group) | 365 |
| 7. thymobasis | 316 | 1. nimius | 367 |
| 8. calvescens | 316 | 2. camelinus | 368 |

| | | | |
|----------------------------|-----|------------------------------|-----|
| 3. soror | 368 | (Capillatus Group). | 376 |
| 4. torquatus | 369 | 1. jubatus | 377 |
| 5. clinatus | 369 | 2. capillatus | 378 |
| 6. melanoptera | 370 | (Wasmanni Group). | 378 |
| 7. dictyotus | 370 | 1. wasmanni | 379 |
| 8. cracens | 371 | 2. ringens | 380 |
| 9. dilatus | 371 | 3. anceps | 381 |
| 10. ejuvidus | 372 | Nomina dubia | 381 |
| 11. coracinus | 372 | Fossil Serphidae | 383 |
| (Unisulcus Group). | 373 | Nomina nuda | 384 |
| 1. unisulcus | 374 | List of figures | 385 |
| 2. albicornis | 375 | Figures | 386 |
| 3. pallibasis | 375 | Index to hosts | 531 |
| 4. fuscipalpis | 376 | Index to Serphidae | 533 |
| 5. flavotinctus | 376 | | |

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INTRODUCTION

The Serphidae is a relatively small group of parasitic Hymenoptera that is one of the families included in the "Serphoidea" or "Proctotrupoidea". Frequently the family has gone under the name Proctotrupidae or Proctotrypidae. Recognition characters of the family are given on page 8.

The object of this paper is to revise the species already described, to assemble the biological information about them that is published, and to describe the new species represented in the collections that are conveniently available. The survey of the literature and the nomenclatural work is as complete and precise as we could make it, but we have not borrowed extensively from museums to describe all of the new species that can be found, nor exhaustively to record the distribution data on pin labels. The user will find treatment of the Nearctic and the European species reasonably complete, but only a minor portion of the species from the rest of the world are included. A moderate representation of the Neotropical species is described from the Townes and Ottawa collections. The Ethiopian species and those from the Indo-Australian area are described mostly from specimens in the Townes Collection. There do not seem to be many Ethiopian species, but the Indo-Australian area has a rich and varied serphid fauna. That part of the world invites more collecting. Several small lots from Japan have been studied, and one lot from Nepal. No collections have been seen from central and eastern Asia.

We have not dealt with the fossil species because the specimens are not easily available. The fossil species are, however, catalogued and arranged alphabetically at the end of the revision. Neither have we attempted to evaluate the relations of certain fossil genera that are sometimes placed in the Serphidae, again because of lack of specimens.

The literature on serphids is voluminous, but it is more repetitious than instructive. We have been careful to record all of the literature, but much of it is useless or unreliable because of incorrect or questionable identifications, or taxonomic descriptions that do not actually define the species. Incorrect nomenclature is often present and troublesome. There was a marked improvement in the precision of the literature on European species after 1938, with the publication of a revision of the British serphids by Nixon (1938. *Trans. Roy. Ent. Soc. London* 87: 431-466), but even after this paper there remained incorrect nomenclature in Europe, and more than one European species has habitually

been mixed under the names *Serphus gravidator*, *Cryptoserphus aculeator*, *Exallonyx microcerus*, *E. ligatus*, *E. confusus*, and *E. gracilis*. The more useful literature on the family, besides Nixon's revision of the British species, is a treatment of the species of Switzerland by Pschorn-Walcher (1971. *Fauna Helvetica* vol. 4, 63 pages), a key to the Russian species by Kozlov (1978. *Hymenoptera of the European part of USSR* 3: 543-548), and a monograph of the world species by Kieffer (1914. *Das Tierreich* 42: 1-57). Kieffer's work is mostly a compilation, but useful because of its completeness. For identifications it is unreliable. There were rudimentary revisions of the Nearctic species by Ashmead (1893), and by Brues (1919). They are not recommended.

ACKNOWLEDGMENTS

This study was started at Carleton University in Ottawa and finished at the American Entomological Institute in Ann Arbor, Michigan. Prof. Henry Howden arranged for our stay at Carleton University, and Carleton helped finance the research costs. The scanning electron photographs were taken at Carleton University by Mr. Lewis Ling. Draft typing of the manuscript was by Mrs. Betty Thomas at Carleton and Mrs. Janet Rupp at Lexington Park, Maryland. Final typing for photo-offset reproduction was by Mrs. Rupp. Our own collection of Serphidae, which was the main basis of the study, owes much of its value to the generous help of several collectors: Mr. George F. Townes, Dr. Denis Owen, Dr. Jennifer Owen, Mr. Luis Peña-G., and Col. Moacir Alvarenga.

Dr. Lubomir Masner has been helpful in telling us about the literature, location of types, and discussing taxonomic problems. The collection at Ottawa, which was built largely through his efforts, contains a very important portion of the specimens studied. Dr. Masner's help has been exceptionally competent and generous, and it compensated in part for the fact that we were newcomers to the Serphidae.

In the preparation of the manuscript, Dr. Marjorie Townes did most of the bibliographic work. Dr. Henry Townes did most of the work with specimens. Those parts of the publication that validate new generic or specific names are by Henry Townes, and the correct author citation for new names is "Townes" rather than "Townes and Townes".

The descriptions of one new genus (*Heloriserphus*) and three new species (*Heloriserphus castor*, *H. pollux*, and *Acanthoserphus bidens*) were authored by Dr. L. Masner.

The seven collections listed below were studied, and also a few specimens from the collections in Honolulu (*Nothoserphus*), London (*Disogmus*), Los Angeles, Stockholm, and Auckland (*Oxyserphus* and *Exallonyx*).

- Cambridge. Museum of Comparative Zoology, Harvard University, Cambridge, Mass., USA. Curator (former curator): Mrs. Janice Scott White.
- Davis. University of California at Davis, Davis., Calif., USA. Curator: Prof. R. M. Bohart.
- East Lansing. Department of Entomology, Michigan State University, East Lansing, Mich., USA. Curator: Prof. Roland Fischer.
- Ottawa. Biosystematics Research Institute, Research Branch, Ottawa, Ont., Canada. Curator: Dr. Lubomir Masner.
- St. Paul. Department of Entomology, University of Minnesota, St. Paul, Minn., USA. Curator: Mr. Philip J. Clausen.
- Townes. Collection of Henry and Marjorie Townes, 5950 Warren Rd., Ann Arbor, Mich., USA.
- Washington. National Museum of Natural History, Smithsonian Institution, Washington, D. C., USA. This collection contains the former Stelfox collection from Ireland and the Priesner collection from Austria. Curator (former curator): Mr. C. F. W. Muesebeck.

A special effort was made to study the types. These are widely scattered. Some are lost or destroyed. The Kieffer types were a difficulty because it was not known at first where they were located. Persons who helped with the types, either by sending them on loan, acting as host when their museums were visited, giving advice where types might be found, sending notes on types, or searching for types for us are as follows: Ferdinando Bin (Piacenza), Josephine Cardale and Ian Naumann (Canberra), Roy Danielsson (Lund), Paul Dessart (Brussels), F. N. Dingemans-Bakels (Maastricht), Willem N. Ellis (Amsterdam), Nigel Fergusson (London), Max Fischer (Vienna), Delfa Guiglia (Genoa), K. -J. Hedqvist (Stockholm), Wolter Hellén (Helsinki), Yoshihiro Hirashima (Fukuoka), M. Kak (Wrocław), Simone Kelner-Pillault (Paris), E. Kierych (Warsaw), E. Königsmann (East Berlin), B. -O. Landin (Lund), Pavel Lauterer (Brno), John H. Ling (Adelaide), Lubomir Masner (Ottawa), Carl Muesebeck (Washington), A. Neboiss (Melbourne), Gilbert Nixon (London), Joachim Oehlke (Eberswalde), James P. O'Connor (Dublin), C. E. O'Riordan (Dublin), J. Papp (Budapest), J. M. Perron (Sainte Foy), Børge Petersen (Copenhagen), Hubert Pschorn-Walcher (Delémont), Henk Vlug (Wageningen), Henrik W. Waldén (Göteborg), Chihisa Watanabe (Sapporo), G. Weidemann (Bremen), Janice Scott White (Cambridge), Thomas Zavortink (San Francisco), and Robert Zwart (Wageningen). This list of names indicates the amount of cooperation that was needed for the nomenclatural work, and how generously it was given. To all of the above we express our appreciation.

NOMENCLATURE

Most of the types known to be in existence were studied by us in 1975, except for the Haliday types (in Dublin). Mr. Gilbert Nixon studied these types and reported on them in 1938. He did not entirely

clarify the type of *Proctotrupes aculeator* Haliday. Dr. James P. O'Connor sent us notes on this type, based on a key and comparison specimens that were sent to him. No trace of the Nees types could be found and they are reputed to be destroyed. Vollenhoven figured some of the Nees types in his "Pinacographia", which helps with their interpretation but the figures are too small to give decisive characters. Nixon treated the Nees species according to Haliday as the first revisor. This precedent is followed except in the case of *Codrus ater* Nees, which is obviously a *Cryptoserphus* according to the host Nees gives and according to Vollenhoven's figure in "Pinacographia". Haliday (and Nixon) interpreted *ater* Nees incorrectly as an *Exallonyx*. The name is anyway preoccupied. It has been necessary to revise the application of the names *Codrus niger* Panzer and *Codrus pallipes* Jurine. The types of both names are lost but their original figures show conclusively that the usual application of the names is incorrect. *Codrus niger* is the genotype of *Codrus* and since *niger* has usually been misidentified as an *Exallonyx* the name *Codrus* has been incorrectly applied to *Exallonyx*. The application of the name *Codrus* is corrected in the present revision.

Some of the Kieffer types are not to be found and are presumably destroyed. In some of the cases we have identified the names from Kieffer's descriptions. Six names were not identified. These are: *Disogmus integer* Kieffer (Italy), *Disogmus nigricornis* Kieffer (France and Switzerland?), *Exallonyx leviventris* Kieffer (Italy), *Exallonyx ligatus luteipes* Kieffer (Italy), *Exallonyx ligatus subnervosus* Kieffer (Europe), and *Exallonyx microstylus* Kieffer (Switzerland).

The family Serphidae is often called Proctotrupidae (or Proctotrypidae). By standard rules of nomenclature the correct name is Serphidae. The generic name *Proctotrupes* Latreille, 1796 is a synonym of *Serphus* Schrank, 1780. There was a move in 1935 by the International Commission on Zoological Nomenclature to suppress the name *Serphus* so that *Proctotrupes* would be used instead. That attempt was never carried out, even though a subsequent secretary of the Commission published in 1946 that it was. There is no validity in statements sometimes made that *Proctotrupes* is a *nomen conservandum*. This is discussed further on page 170, under the generic name *Serphus*.

FAMILY SIZE AND DISTRIBUTION

This revision records 310 species. Probably the actual world fauna comprises approximately 1,200 species, distributed among the genera as in the following table. The genus *Exallonyx* includes more than half of the species in the family.

List of known species per genus and estimated total species

| <u>Genus</u> | <u>Known species</u> | <u>Estimated total species</u> |
|----------------|----------------------|--------------------------------|
| Vanhornia | 2 | 2 |
| Heloriserphus | 2 | 4 |
| Acanthoserphus | 2 | 4 |
| Austrocodrus | 1 | 1 |
| Austroserphus | 1 | 1 |
| Disogmus | 4 | 8 |
| Oxyserphus | 20 | 150 |
| Fustiserphus | 6 | 12 |
| Sminthoserphus | 5 | 15 |
| Afroserphus | 1 | 5 |
| Nothoserphus | 7 | 15 |
| Tretoserphus | 4 | 8 |
| Cryptoserphus | 13 | 25 |
| Mischoserphus | 20 | 50 |
| Pschornia | 3 | 6 |
| Hormoserphus | 2 | 6 |
| Brachyserphus | 11 | 30 |
| Serphonostus | 1 | 1 |
| Apoglypha | 3 | 10 |
| Codrus | 7 | 15 |
| Phaenoserphus | 18 | 40 |
| Serphus | 7 | 10 |
| Parthenocodrus | 2 | 4 |
| Paracodrus | 1 | 1 |
| Phaneroserphus | 5 | 12 |
| Exallonyx | 162 | 750 |
| New genera | 0 | 15 |
| <hr/> | | |
| Totals | 310 | 1,200 |

Geographic distribution of the genera

- Worldwide: Cryptoserphus, Mischoserphus, and Exallonyx.
- Holarctic: Vanhornia, Disogmus, Tretoserphus, Pschornia, Hormoserphus, Brachyserphus (also Hawaii), Phaenoserphus (also India), Serphus, and Phaneroserphus.
- Palaearctic: Parthenocodrus and Paracodrus.
- Palaearctic and Oriental: Nothoserphus and Codrus (also New Guinea).

| | |
|-------------------------|---|
| Australian: | <u>Acanthoserphus</u> , <u>Oxyserphus</u> , <u>Serphonostus</u> , and <u>Apoglypha</u> . |
| Australian & Neotropic: | <u>Fustiserphus</u> (also one Nearctic subspecies). |
| Neotropic: | <u>Heloriserphus</u> , <u>Austrocodrus</u> , and <u>Sminthoserphus</u> . |
| Ethiopian: | <u>Afroserphus</u> . |

BIOLOGY

The Serphidae are internal parasites of larvae of Coleoptera, except that *Cryptoserphus* and probably some related genera parasitize Fungivoridae. *Phaneroserphus* has been reared from a centipede. Oviposition is into the larvae, with a quick thrust. Host larvae seem at first unaffected by the parasites. Later they become retarded in development, sluggish, then quiescent before emergence of the parasites. There is one, several, or many parasite larvae per host. They live internally until mature, then emerge from the ventral side of the host, usually at intersegmental membranes. Immediately on emergence they molt to the pupal stage. Eastham (1929. Parasitology 21: 10-11) records that in *Phaenoserphus viator* there are four larval instars, plus a prepupal instar just after emergence of the fourth larval instar and before the molt to the pupal stage.

Emergence from the host is not complete, leaving the tail of the larva or pupa still embedded in the host remains. The parasite pupae are always positioned venter to venter with the host and head inclined forward. There is no cocoon.

HOSTS ATTACKED

Many of the published host records are unreliable because either the host or the parasite was probably misidentified. Records indicate that the hosts are usually beetle larvae and that each genus of Serphidae usually attacks one or a few families. The families known to be attacked are in the table below.

List of hosts typical of the genera

| <u>Genus</u> | <u>Host family</u> |
|----------------|---|
| Vanhornia | Eucnemidae |
| Oxyserphus | Curculionidae, Anthribidae |
| Nothoserphus | Coccinellidae |
| Cryptoserphus | Fungivoridae |
| Pschornia | Cleridae |
| Brachyserphus | Erotylidae, Melandryidae, Nitidulidae, and Phalacridae |
| Apoglypha | Erotylidae |
| Codrus | Carabidae |
| Phaenoserphus | Carabidae |
| Serphus | Carabidae |
| Parthenocodrus | Elateridae |
| Paracodrus | Elateridae |
| Phanoserphus | Lithobiidae and Staphylinidae |
| Exallonyx | Staphylinidae |

ABDOMINAL MORPHOLOGY

The serphid abdomen has a large syntergite that comprises most of the length. This has three pairs of vestigial spiracles, three pairs of thyridia, and three hair bands. Evidently it is composed of three tergites fused together. Between the syntergite and propodeum is a sub-cylindric stalk, without a spiracle and without a suture separating the tergal from the sternal portion. The stalk is heavily sculptured. It may be long, of median length, or so short as to be virtually absent. The base of the syntergite is attached to the stalk by a stiff hinge. Ventrally the stalk is continuous with a long synsternite that reaches to the apex of the syntergite. The stalk is interpreted as the first abdominal segment (after the propodeum); the syntergite as tergites 2-4. The synsternite (continuous with the stalk) is sternites 1-4.

Following the syntergite are tergites 5-8. Tergite 9 is fused with tergite 8 in females and somewhat separate in males. It bears a pair of button-like cerci. Following the synsternite are sternites 5-7 in males and sternites 5 and 6 in females.

The ovipositor sheaths originate from tergite 8. Inside the sheaths is a weakly sclerotized 3-valved ovipositor (a pair of dorsal valves fused together and 2 separate ventral valves), plus a ventral soft strap-like piece that is interpreted as a median apical elongation of sternite 6 which has become enclosed between the ovipositor sheaths. This apical part of sternite 6 is sclerotized and outside and beneath the ovipositor sheaths in *Austroserphus*. *Austroserphus* is believed to show the primitive condition.

The ovipositor sheaths are rigid except that in *Vanhornia* they are

very slender and flexible. The ovipositor operates by projecting beyond the tip of its sheath. It is never separated from the sheath as it is in the Ichneumonoidea.

Family SERPHIDAE

Front wing 1.6 to 7.4 mm. long. One species is apterous and two species sometimes short-winged. Body usually weakly compressed, the sides of abdomen not carinate. Antenna always with 13 segments, arising from center of front aspect of head. Antenna not elbowed nor clavate. Mandible with one apical tooth, two teeth, or rarely with several teeth. Maxillary palpus with 4 segments. Labial palpus with 3 segments. Trochanters single. Middle and hind tibiae with two apical spurs. Front wing with costa, subcosta, and radius strong, other veins sometimes strong but usually represented by weak furrows, stigma usually large, radial cell usually very short, and second recurrent vein always absent. Hind wing lacking cells that are closed by definite veins, usually the only distinct vein being next to front margin. Abdominal sternites 1-4 and tergites 2-4 fused together to form a synsternite and syntergite. Base of abdomen consisting of a solid stalk composed of sternite 1 and tergite 1, the stalk sometimes so short as to be essentially absent. Ovipositor sheath rigid (except in *Vanhornia*), exerted, and nearly always decurved. Ovipositor issuing from tip of sheaths.

Head and body black, rarely partly ferruginous. Wings hyaline to black, not patterned except in *Oxyserphus maculipennis* and *Serphonostus nigerrimus*. Sometimes there is a dark spot next to the stigma, and often in *Nothoserphus* the median part of the front wing is infusate.

The Serphidae occur worldwide. Most species are in damp habitats. This revision includes 310 species. The existing species are estimated to number 1,200.

Key to the subfamilies of Serphidae

- 1. First recurrent vein either absent or joining medius far basad of postnervulus (nearer to nervulus than to postnervulus). Notaulus usually short or absent, if present seldom reaching middle of mesoscutum (in some species of *Disogmus*, in *Serphonostus*, and usually in *Nothoserphus* the notaulus reaching past center of mesoscutum; sometimes in *Serphus* the notaulus represented by a long weak impression). Mesopleurum with a median transverse groove except in *Apoglypha*. 3. *Serphinae* (p. 19)
- First recurrent vein present and joining medius opposite or a little basad of postnervulus. Notaulus long and distinct, reaching past center of mesoscutum. Mesopleurum with a median impression or broad transverse trough, usually without a distinct transverse groove. 2

2. Apex of scape without a projection. Mandible strong or very strong. First cubital and first discoidal cells separated by basal section of subdiscoideus. Nervellus strongly inclivous. Syntergite covered with moderately dense hairs. 1. *Vanhorniinae* (p. 9)
- Apex of scape with a spine-like projection on upper side. Mandible small and weak. First cubital and first discoidal cells confluent or faintly separated, the basal section of discoideus lacking or faint. Nervellus weakly inclivous. Syntergite with sparse hairs. 2. *Acanthoserphinae* (p. 14)

1. Subfamily VANHORNIIINAE

Figures 1 (side view); 25 and 26 (front wings)

Mandible very stout and wide with 3 downward directed teeth, or moderately slender with two teeth that are directed mesad, in this case the hind tooth a little shorter than front tooth. Maxillary palpus of moderate length. Apex of scape truncate, without a projection. Pronotum with a moderately strong epomia or none, without an anterodorsal tooth. Notalus deep, reaching almost to hind edge of mesoscutum. Transverse furrow in front of scutellum foveate. Mesopleurum with a median impression, without a narrow transverse groove. Dorsal face of propodeum with a median carina, the carina sometimes obscured by coarse reticulation. Tarsal claws simple or pectinate. Wing veins of front wing complete but sometimes weak. Base of cubitus present, the first cubital and first discal cells distinct. First recurrent vein joining discoideus opposite postnervulus. Hind wing with a distinct nervulus that is strongly inclivous. Abdomen with a short stalk or none. Syntergite and synsternite completely covered with moderately dense hairs. Ovipositor sheath very long, slender, and turned forward or short and pointed backward (and a little upwards).

Two genera are known, *Vanhornia* from Sweden and eastern North America and *Heloriserphus* from Chile. *Vanhornia* is a parasite of larvae of Eucnemidae.

The two genera assigned to this subfamily have little in common except for venation. They are only distantly related.

Key to the genera of Vanhorniinae

1. Mandible very short and broad, with 3 triangular teeth that are pointed downward rather than mesad. Veins of front wing all strong and pigmented. Ovipositor elongate, turned forward to lie in a groove on midline of synsternite. Sweden and Eastern North America. 1. *Vanhornia* (p. 10)
- Mandible narrow, with 2 normal teeth (directed mesad). Veins of front wing mostly faint and unpigmented. Ovipositor short, directed backward. Chile. 2. *Heloriserphus* (p. 11)

1. Genus VANHORNIA

Figures 1 (side view); 25 (front wing)

Vanhornia Crawford, 1909. Proc. Ent. Soc. Washington 11: 63.Type: *Vanhornia eucnemidarum* Crawford. Monobasic.

Front wing 3.2 to 4.2 mm. long. Temple moderately wide or very wide. Occipital carina obsolete above near midline, elsewhere present, joining hind articulation of mandible. Mandible extremely wide, with 3 triangular teeth that project downward rather than mesad, not meeting the opposing mandible on midline. Pronotum without an epomia, the scrobe coarsely punctate. Notaulus sharp, foveolate, reaching almost to hind edge of mesoscutum. Hind edge of mesoscutum with a transverse flexion groove. Scutellum weakly convex, the groove in front of scutellum occupied by 5 large foveae. Mesopleurum mostly concave, without a transverse groove. Venation as figured. Abdomen without a stalk. Base of syntergite and of synsternite both with a heavy transverse ridge followed by long wrinkles. Synsternite of female with a median longitudinal furrow for receiving ovipositor, with sparse longitudinal wrinkles on each side of median furrow. Syntergite of female followed by a scoop-shaped tergite that caps apex of abdomen and deflects ovipositor forward along under side of abdomen. Female without visible sternites beyond the synsternite. Ovipositor sheaths as long as abdomen, slender, hairless, and flexible.

This genus contains one species that is widespread in the deciduous forest area of eastern North America and another recently described from Sweden. Both species parasitize larvae of Eucnemidae.

Key to the species of Vanhornia

1. Syntergite with longitudinal wrinkling on basal 0.8.

Temple 0.75 as long as eye. Sweden.

1. leileri Hedqvist (p. 10)

Syntergite with longitudinal wrinkling on basal 0.3. Temple 1.4 as long as eye. Eastern North America.

2. eucnemidarum Crawford (p. 11)1. Vanhornia leileri Hedqvist

**Vanhornia leileri* Hedqvist, 1976. Ent. Scandinavica 7: 315. ♂, ♀. des., fig. Type: ♀, reared from *Hypocoelus cariniceps*, Sweden: Tullgarn in Södermanland (Hedqvist). Type not seen.

Front wing 3.2 to 3.5 mm long. Temple strongly convex, in female 0.75 as long as eye. Syntergite with longitudinal wrinkling on basal 0.8.

Black. Antenna brown. Legs and tegula yellowish brown. Strong wing veins blackish.

Specimens: Known only from the types: ♂, ♀, reared from *Hypocoelus cariniceps* (Eucnemidae), Tullgarn, Södermanland Prov., Sweden, Jul. 25, 1971, T.-E. Leiler (Hedqvist).

2. *Vanhornia eucnemidarum* Crawford

Figures 1 (side view); 25 (front wing)

**Vanhornia eucnemidarum* Crawford, 1909. Proc. Ent. Soc. Washington 11: 63. ♀. des., fig. Type: ♀, from cells of eucnemid larva, USA: Silver Springs in Maryland (Washington). Examined in 1947. USA: Plummers Is. in Maryland; Lynnhaven in Virginia.

Vanhornia eucnemidarum Champlain, 1922. Psyche 29: 100. USA: Hummelstown in Pennsylvania. Host: *Isorhipis ruficornis*.

Vanhornia eucnemidarum Brues, 1927. Psyche 34: 80. des. USA: Petersham in Massachusetts. Host: *Isorhipis ruficornis* [incorrectly as "*flavicornis*"].

Vanhornia eucnemidarum Bradley, 1928. Mem. Cornell Univ. Agr. Exp. Sta. 101: 962. USA: Ithaca in New York.

Male: Unknown.

Female: Front wing 3.6 to 4.2 mm. long. Temple almost flat, 1.4 as long as eye. Syntergite with longitudinal wrinkling on basal 0.3.

Black. Mandible with a median area of dark brown. Scape, pedicel, palpi, tegula, legs, and ovipositor sheath brownish fulvous. Wings faintly infusate, the stigma and strong veins blackish.

Specimens: 19♀ from Georgia (Forsyth); Kentucky (Golden Pond); Michigan (Ann Arbor); New York (Ithaca); North Carolina (Highlands); Ontario (Aylmer West and Cumberland); Quebec (Rondeau Provincial Park); South Carolina (Cleveland); and Tennessee (Natchez Trace State Park at Lexington). Collection dates are from June 21 to July 31, except for the dates May 18 to 30 at Forsyth, Ga. and June 1 to 15 at Natchez Trace State Park at Lexington, Tenn.

Dr. P. P. Babiy told us of watching *Vanhornia* apparently ovipositing at Ithaca, N. Y. Females were seen crawling along hardwood logs that were without bark. Occasionally they would pause over a crack, unhinge the ovipositor into the crack and pass the ovipositor along the crack.

This species occurs in deciduous forests of eastern North America, in the Transition and Upper Austral Zones. It has been reared from *Isorhipis ruficornis*. See the references by Champlain and by Brues.

HELORISERPHUS Masner, new genus

Figures 2 (side view); 26 (front wing)

Female. Whole body remarkably pilose, hairs rather dense and appressed. Head subrectangular, broadly transverse, almost twice as wide as long; frons between antennae bluntly humped; eyes large, glabrous; ocelli in a low triangle; POL greater than OOL; temples behind eyes well developed, rather wide for the family; occipital carina not

quite distinct; malar carina or groove absent; clypeus moderately excavate, truncate at apex; mandibles strong, deeply bidentate; palpi rather short, formula 4-3; antenna 13-segmented, inserted at about middle of face; scape short, unarmed, cup-like, housing very short pedicel; following segments (A3-A13) elongate, moderately filiform.

Mesosoma short and relatively wide, as high as wide across tegulae; anterolateral corners of prothorax blunt, unarmed; notauli non-crenulate, very deep, converging but not quite confluent posteriorly, terminating in front of scutellar pit; scutellar pit transverse, deep, with distinct keels at bottom; scutellum rounded posteriorly; metanotum unarmed but with moderate bulge at meson; propodeum unarmed, trapezoidal; metapleura with only a small smooth field; venation of fore wing considerably reduced, C and Sc present, stigma very large, approximately as long as radial cell, R₁ short, R₂ long; other veins absent except for a small sclerotized speck representing the junction of M and basalis; hind wing with only short stem of C basally; legs normal, tibial spur formula 1-2-2, mid- and hind spurs slender, situated rather wide apart, equal in length; claws simple or pectinate (with 2 additional teeth).

Metasoma remarkably campanulate-ovate, not compressed from sides and not downcurved at apex; petiole fused with synsternite, short, about as long as wide, not concealed under front margin of syntergite; syntergite strikingly hairy, its lateral sides relatively short for the family, thus revealing considerable part of synsternite; anterior margin of syntergite simple, without carinae or grooves; only 3 small tergites after syntergite and 1 sternite (hypopygium) after synsternite; lateral parts of those 3 tergites very short leaving the whole hypopygium uncovered; ovipositor sheaths (valves) very short, straight, not downcurved, ovipositor short, protruding straight from sheaths, enhancing hereby the non-curved profile of metasoma; cerci not developed.

Type species: *Heloriserphus castor* Masner, new species.

Heloriserphus is really unique among all genera of Proctotrupidae. The short robust body together with peculiar metasomatic characters, the shape of stigma in fore wing, all recall characteristics of the family Heloridae. Unlike all other Proctotrupidae *Heloriserphus* has a campanulate, not compressed metasoma. The ovipositor is not downcurved but protrudes straight as an extension of the longitudinal axis of metasoma, a situation encountered in families Austroniidae and Diapriidae. Also the segmentation of the metasoma, its largely uncovered ventral part, shape of hypopygium and the pilosity all recall the characteristics of the above two families. I therefore do not concur with Dr. Townes' classification of *Heloriserphus* in Vanhorniinae. In my opinion this peculiar Chilean genus represents a distinct subfamily of its own and should be placed at the beginning of the Proctotrupidae (Serphidae). From an evolutionary point *Heloriserphus* appears to me as an isolated pillar narrowing the wide gap between Proctotrupidae and Vanhorniidae on one side and the Heloridae-Austroniidae and Diapriidae on the other side.

Key to species of Heloriserphus

1. Claws simple; stigma larger, slightly longer than radial cell measured along front margin; propodeum anteromedially with only small smooth field; antenna stouter and shorter, A4 only 2.7 times as long as wide. . . . 1. castor, new species (p. 13)
- Claws pectinate, with 2 additional teeth; stigma smaller, slightly shorter than radial cell measured along front margin; propodeum anteromedially with large smooth area; antenna longer and more slender, A4 fully 3.4 times as long as wide.
 2. pollux, new species (p. 13)

1. Heloriserphus castor Masner, new species

Female (Holotype in CNC, Ottawa No. 15000, well preserved); Chile, Arauco, Pichinahuel, Cordillera Nahuelbuta, 1100-1400 m., January 10-20, 1959, L. E. Peña.

Fore wing 3.3 mm. long. Black; fore tibiae reddish-brown, fore and mid-tarsi and palpi reddish yellow, tips of mandibles red; wings almost clear.

Head densely hairy, smooth and shining, with dense minute setigerous punctures; shallow sulcus running from anterior ocellus down to frontal hump; POL greater than OOL (23: 19); antennal segments in relative proportions (length: width) 15: 15; 3: 9; 26: 11; 27: 11; 25: 11; 25: 11; 23: 11; 20: 11; 20: 11; 20: 11; 26: 11; mesoscutum with denser punctation anteriorly than posteriorly; petiole rugosopunctate, as long as wide; syntergite and synsternite from front to back gradually more and more punctured; following segments more densely punctured, with submicroscopic punctation in between the larger setigerous punctures.

Paratype: 1♀ (CNC No. 15000, well preserved); Chile, Arauco, Caramavida, January 11, 1954, L. E. Peña.

Male: Unknown.

Biology: Unknown.

Heloriserphus pollux Masner, new species

Female (Holotype in MCZ, Cambridge, well preserved); Chile, Talca, Altos de Vilches, 1200 m., October 18-25, 1964, C. C. Porter.

Differing from the preceding species by characters mentioned in the key; furthermore by scutellum which is markedly shorter than that of *castor*, slightly longer petiole and more slender radial cell; the two teeth on claws are blunt apically.

Male: Unknown.

Biology: Unknown.

2. Subfamily ACANTHOSERPHINAE

Figures 3 and 4 (side views); 27 and 28 (front wings)

Mandible vestigial, weak and without a distinct apical tooth, not meeting opposing mandible. Maxillary palpus elongate. Apex of scape with a stout, projecting, pointed spine or scale on upper side. Pronotum with an antero-lateral dorsally projecting tooth or spine, or with a very strong epomia that angles mesad at upper end. Notaulus deep, reaching almost to hind edge of mesoscutum. Transverse groove in front of scutellum simple or foveate. Mesopleurum with a median transverse impression that may appear like a wide trough or a relatively narrow trough or groove. Propodeum without a median carina. Tarsal claws simple. Veins of front wing complete and strong or moderately strong, but base of cubitus missing so that first cubital and first discal cells are confluent. First recurrent vein joining discoideus opposite postnervulus or a little basad. Hind wing narrow with a distinctly pigmented nervellus that is almost vertical. Abdomen with or without a distinct stalk. Hairs on syntergite very sparse. Ovipositor sheath 0.25 to 1.5 as long as hind tibia, hairless.

Three genera, represented by a total of four species, are known. They occur in the Australian Region and in southern South America. There are no data about their biology or hosts.

Key to the genera of Acanthoserphinae

1. Abdomen without a distinct stalk. Groove in front of scutellum not foveate. Postscutellum with a long dorsally-directed spine.
Australia and New Guinea. 1. Acanthoserphus (p. 15)
- Abdomen with a stalk that is at least as long as wide. Groove in front of scutellum foveate. Postscutellum without a spine. . . 2
2. Frons smooth above antennal sockets (except for a short carina between the sockets). Anterolateral part of pronotum with a dorsally-projecting tooth. First recurrent vein joining discoideus a short distance basad of postnervulus. Stalk of abdomen of male 1.2 as long as wide. Southern South America.
 2. Austrocodrus (p. 17)
- Frons with a transverse rugose shelf above antennal sockets.
Anterolateral part of pronotum with a strong angulate ridge but without a tooth. First recurrent vein joining discoideus opposite postnervulus. Stalk of abdomen of male 3.8 as long as wide.
Australia and Tasmania. 3. Austroserphus (p. 18)

1. Genus ACANTHOSERPHUS

Figures 3 (side view); 27 (front wing)

Acanthoserphus Dodd, 1915. Trans. Roy. Soc. South Australia 39: 384.Type: *Acanthoserphus albicoxa* Dodd. Original designation.

Front wing 3.1 to 3.7 mm. long. Front of head with a high short carina between antennal sockets, joining a short transverse shelf-like ridge just above antennal sockets. Pronotum with a stout, dorsally-projecting, anterolateral spine on each side. Groove in front of scutellum deep, not foveate. Postscutellum with a finger-like projecting spine at center. First recurrent vein joining discoideus opposite postnervulus. Cubitus and subdiscoideus weaker than in the genera *Austrocodrus* and *Austroserphus*. Stalk of abdomen very short, essentially absent. Female synsternite ending in a long triangular point, the female synsternite being the last visible sternite except when abdomen is extended. Apical segments of female abdomen long and protractile. Ovipositor sheath 0.25 to 0.39 as long as hind tibia, smooth and hairless, decurved, and slightly tapered to a blunt apex.

Two species are known, one from Australia and one from New Guinea.

Key to the species of Acanthoserphus

1. Upper side of scape ending in a large projecting spine-like scale that has two points, a large inner point and a smaller outer point. Notaulus moderately deep, shallow anteriorly. Palpi blackish. Front coxa fuscous. New Guinea.
 1. bidens Masner, new species (p. 15)
- Upper side of scape ending in a large triangular point. Notaulus very deep, deep anteriorly. Palpi white. Front coxa white. Eastern Australia. 2. albicoxa Dodd (p. 16)

1. Acanthoserphus bidens Masner, new species

Figures 3 (side view); 27 (front wing)

Female (Holotype in CNC, Ottawa No. 14099, well preserved); New Guinea, Papua, Mt. Suckling 350 m., July 1972, Malaise trap (T. L. Fenner).

Head and mesosoma ebony black, tegula light brown; scape and pedicel bright yellow, antennal segments 3-7 and 11-13 dark brown, entire segment 9, apical half of segment 8 and all but extreme tip of segment 10 snowy white; front coxa dark brown, middle and hind coxae and trochanters dirty white with apices darker; all femora, tibiae, and tarsi chestnut brown; metasoma chestnut brown, membranous tail

lighter; wings considerably infuscate with all veins dark.

Fore wing 3.3 mm. long; head slightly transverse (6: 10), smooth and shining; process between antennae prominent, truncate at apex; malar carina sharp and percurrent; tentorial pits very deep; POL less than OOL (13: 20); antennal segments in relative proportions (length: width) 30: 15; 8: 9; 42: 8; 40: 7; 40: 7; 41: 9; 31: 9; 29: 9; 23: 9; 23: 10; 20: 12; 20: 12; 34: 13.

Mesoscutum smooth and shining, with a shallow but distinct sulcus anteromedially; notauli generally shallow almost obsolete anteriorly, strongly converging posteriorly, almost confluent in front of scutellum; scutellar pit deep, transverse, not crenulate at bottom; scutellum with minute sharp projections anterolaterally; propleura smooth and shining except for a chain of crenulae originating below anterolateral spines and extending back towards spiracles; mesopleurum smooth, with deep curved sulcus dorsomedially and a broad shallow depression in lower half; metapleurum with smooth central disc; metanotal projection finger-like, blunt apically; propodeum smooth and shining anteriorly, reticulate-rugose in posterior 2/3; spiracles very prominent.

Petiole completely concealed dorsally by syntergite; the latter smooth and shining, virtually without sculpture anteriorly; following segments extruded tail-like, forming a long downcurved tail; ovipositor sheaths gently curved, smooth and glabrous.

Male: Unknown.

Biology: Unknown.

Discussion: Apart from the characters mentioned in the key this new species differs strikingly from the other only species, *A. albicoxa* Dodd by generally melanic coloring. The presence of *Acanthoserphus* outside the Australian mainland is noteworthy to justify the description of the above new species.

Note by Townes: There is a male in the Townes Collection, believed to be this species. It differs from the above description in having the notaulus shallow anteriorly and obsolescent behind middle of mesoscutum. Scape brown. Pedicel tan. Flagellum entirely black. Middle and hind coxae dark brown. Trochanters pale brown, a little darker basally. Femora, tibiae, and tarsi dark brown. Abdomen blackish. The lateral point on the apical scale of the scape is weak, obtuse, and inconspicuous. This specimen is from Baiyer River 1, 100 m., Papua, New Guinea, Feb. 6 to 25, 1979, J. Sedlacek.

2. Acanthoserphus albicoxa Dodd

**Acanthoserphus albicoxa* Dodd, 1915. Trans. Roy. Soc. South Australia 39: 385. ♂, ♀. des. Type: sex not stated, Australia: Kuranda, 1,200 ft., in Queensland (Adelaide). Paratype ♀ (in Cambridge) examined in 1975.

Acanthoserphus albicoxa Riek, 1955. Australian Jour. Zool. 3: 109. ♂, ♀. des.

Front wing 3.1 to 3.2 mm. long. Apex of scape with a long triangular point on upper side. Groove paralleling upper margin of pronotum

deep, not foveate. Notaulus very deep throughout. Upper face of propodeum almost smooth. Ovipositor sheath 0.25 as long as hind tibia.

Dark brown. Mouth parts, tegula, coxae, and trochanters white or pale stramineous. Flagellar segment 9, and 10 except at apex white. Scape, pedicel, femora, and front and middle tibiae pale fulvous. Male with hind corner of pronotum, mesopleurum below tegula, and most of mesoscutum fulvous brown. Front and middle tarsi light brown. Hind tibia and tarsus dark brown. Wings with a brown tinge, the veins brown. Apical abdominal segments and ovipositor sheath brownish fulvous.

Specimens: ♀ (paratype, lacking head), Kuranda, Queensland, Australia, A. P. Dodd (Cambridge). ♂, Lake Barrine, Atherton Plat, 2, 300 ft., Queensland, Australia, Apr. 19, 1932, Darlington (Cambridge).

Dodd reports that the types (♂, 2♀) were collected on a decaying log in jungle.

2. Genus AUSTROCODRUS

Austrocodrus Ogloblin, 1960. Actas y trabajos del primer Congreso Sudamericano de Zoología 1959, La Plata 3: 119.

Type: *Austroserphus (Austrocodrus) patagonicus* Ogloblin. Original designation.

Front wing about 3.7 mm. long. Frons and face smooth except for a vertical carina between antennal sockets. Pronotum with a strong anterolateral dorsally-projecting tooth on each side. Groove in front of scutellum with 5 foveae. Postscutellum without a spine. Venation, as illustrated by Ogloblin, 1960, very similar to that of *Acanthoserphus*. First recurrent vein joining discoideus a short distance in front of postnervulus. Stalk of abdomen of male 1.2 as long as wide. Female unknown.

A single species is known, from southern South America. We have not seen specimens but abstract portions of the original publication for the generic and specific descriptions.

Austrocodrus patagonicus Ogloblin

**Austroserphus (Austrocodrus) patagonicus* Ogloblin, 1960. Actas y trabajos del primer Congreso Sudamericano de Zoología 1959. 3: 120. ♂. des., figs. Type: ♂, Argentina: Estación Forestal de Pucará above Lago Lacar in Neuquén (La Plata). Type not seen. Description and figures adequate.

Male type: Front wing 3.7 mm. long. Structural features as described under the genus. Further details of structure may be found in the original description.

Black. Palpi, distal part of labrum, 0.67 of the front and middle coxae, and 0.33 of the hind coxa white. Front and middle tibiae fulvous,

rest of legs (except coxae), tegula, and wing veins reddish brown. Hind tarsus black. Apex of scape, pedicel, base of first flagellar segment, and stigma pale brown.

Female: Unknown.

Specimens: Known only from the type, a male from Estación Forestal de Pucará, above Lake Lucar, Neuquén, Argentina, Mar. 15, 1955, A. Ogloblin (Ogloblin collection, now in La Plata museum).

3. Genus AUSTROSERPHUS

Figures 4 (side view); 28 (front wing)

Austroserphus Dodd, 1933. Proc. Linnean Soc. New South Wales 58: 275.

Type: *Austroserphus albofasciatus* Dodd. Original designation.

Front wing 5.3 to 5.8 mm. long. Head with a high strong carina between antennal sockets that joins a short transverse rugulose shelf just above antennal sockets. Pronotum with a very strong epomia that dorsally turns mesad to form a transverse carina across top of pronotum, without an anterolateral tooth or spine. Groove in front of scutellum with 5-9 foveae. Postscutellum without a median spine. First recurrent vein joining discoideus opposite postnervulus. Stalk of abdomen about 3.8 as long as wide in male, about 1.0 as long as wide in female. Last sternite of female (just distad of synsternite) ending in a long, slender, trough-shaped process that subtends the ovipositor and reaches almost to its apex. Ovipositor sheath about 1.5 as long as hind tibia, slender, smooth, and weakly tapered.

One species is known. It occurs in Tasmania and southeastern Australia.

Austroserphus albofasciatus Dodd

Figures 4 (side view); 28 (front wing)

**Austroserphus albofasciatus* Dodd, 1933. Proc. Linnean Soc. New South Wales 58: 276.

♂, ♀. des., fig. Type: sex?, Australia: Beech Forest in Victoria (F. E. Willson Coll.). Australia: Millgrove. Type not seen. Description adequate.

Austroserphus albofasciatus Riek, 1955. Australian Jour. Zool. 3: 108. ♂, ♀. des., figs. Australia: Millgrove in Victoria; Mt. Wellington in Tasmania.

Front wing 5.3 to 5.8 mm. long. Structure as figured and as described under the generic heading.

Black. Segments 7 and 8 or at least segment 8 of flagellum, palpi, subbasal 0.3 of tibiae, and segments 3 and 4 of tarsi white. Front and middle tibiae and tarsi light brown to blackish brown, except where described as white. Wings weakly infuscate, the stigma and veins black. Ovipositor sheath and apical process on last sternite of female light brown.

Specimens: 28♂, 17♀ from Australia (Barrington Tops in N. S. W., Mt. Buffalo at 1,600 m. in Vict., Mt. Dandenong at 200 m. in Vict., and Warburton in Vict.) and Tasmania (Geeveston, Hellyer Gorge at 300 m., King William Range, Roseberry, Strahan, Strathgordan, Waldheim at 800 m., and Waratah). Collection dates are from December 31 to March 17. One of these specimens is in Washington, the rest are in the Townes Collection.

3. Subfamily SERPHINAE

Figures 5-24 (side views); 29-48 (front wings)

Mandible strong, often falcate, with a single apical tooth or sometimes also with a small second tooth on upper margin, or the mandible vestigial in some genera of Cryptoserphini. Maxillary palpus short to moderately long. Apex of scape truncate. Pronotum with or without an epomia, sometimes with a dorsolateral tubercle or angulate carina. Notaulus usually absent or short, in *Serphonostus* and in some species of *Disogmus* and *Nothoserphus* long and reaching past center of mesoscutum or sometimes the mesoscutum with a long weak impression in the position of notaulus. Transverse groove in front of scutellum not foveate except in *Afroserphus* and sometimes in *Nothoserphus*. Dorsal face of propodeum with a median carina, or in *Parthenocodrus* with a median groove. Tarsal claws simple, or in *Exallonyx* and *Afroserphus* with teeth. Front wing with costa, subcosta, stigma, and radial vein strong, intercubitus sometimes moderately strong to faint; the rest of the veins represented by weak furrows that are sometimes pigmented. Radial cell moderately short to very short. Base of cubitus present, the first cubital and first discal cells distinct but first discal cell sometimes confluent with second discal cell. First recurrent vein joining discoideus far basad of postnervulus, nearer to nervulus than to postnervulus (except in those cases where the portion of first recurrent next to discoideus is lacking). Nervellus represented by a weak groove. Abdomen with or without a stalk. Syntergite usually with sparse hairs. Ovipositor sheath rigid, moderately slender to very stout, 0.25 to 1.5 as long as hind tibia, nearly always decurved at tip.

The Serphinae includes the great majority of the serphid genera and species. It has a worldwide distribution. Hosts are beetle larvae, except that *Cryptoserphus* and probably some of its related genera parasitize Fungivoridae. One species was once reared from a centipede (*Lithobius*).

Key to the tribes of Serphinae

1. Radius originating from apical 0.3 of stigma. Radial cell moderately short. Intercubitus distinct and almost complete. Notaulus present, often reaching beyond center of mesoscutum. Lower half of lateral aspect of syntergite without hairs. Occipital carina

present only on upper part of head. . . . 1. Disogmini (p. 20)
Radius originating from near midlength of stigma, except in some cases where radius is very short, in which cases it may originate farther distad. Radial cell moderately short to very short. Intercubitus usually indistinct or incomplete. Notaulus present or absent, reaching beyond center of mesoscutum only in some species of *Nothoserphus*, and in the genus *Serphonostus*. Lower half of lateral aspect of syntergite usually with some hairs. Occipital carina usually extending to lower half of head. . . . 2

2. Notaulus often present, usually short and sometimes represented by an anterolateral pit. Abdomen usually without a stalk. Mandible often with two teeth. Metapleurum usually with a large smooth unsculptured area. Front wing about 2.5 as long as wide. First and second discal cells separated. Dorsal face of propodeum long to sometimes very short. . . . 2. Cryptoserphini (p. 29)
Notaulus absent or represented by a shallow impression, not a distinct groove. Abdomen with a stalk, except in *Paracodrus*. Mandible usually with one tooth (or with two teeth in *Parthenocodrus*). Metapleurum usually with less than its front 0.35 unsculptured. Front wing about 3.0 as long as wide (or wings sometimes absent or reduced). First and second discal cells confluent, except sometimes in *Codrus*. Dorsal face of propodeum of moderate length to long. 3. Serphini (p. 132)

1. Tribe DISOGMINI

Figures 5 (side view); 29 (front wing)

Occipital carina present only on upper part of head, above the foramen magnum. Mandible stout, with one tooth. Tyloids present as flanges or narrow ridges on several of flagellar segments 3-7. Pronotum with a strong vertical epomia which dorsally margins a prominent tubercle. Notaulus present, shorter than tegula to quite long, often extending to near hind edge of mesoscutum. Metapleurum completely rugulose. Propodeum moderately long, with a high median carina, rugose except that upper face is usually smoother. Tarsal claws simple. Front wing about 2.5 as long as wide. Stigma relatively small, about 2.7 as long as deep, the radius originating from its apical 0.3. Radial cell along costa about 0.85 as long as stigma. Intercubitus pigmented and long, almost reaching cubitus. First and second discal cells separated. Stalk of abdomen about 1.2 as long as wide. Syntergite broad, not compressed, with a very few hairs dorsally and none at all below midheight of its lateral aspect. Apical segments of female abdomen protractile. Ovipositor sheath 0.75 to 0.90 as long as hind tibia, cylindrical, evenly decurved and gradually tapered to apex, the apex narrowly rounded. Hairs on ovipositor sheath sparse along shaft, a little denser and longer on tip.

This tribe includes only *Disogmus*, a small genus of Holarctic dis-

tribution. Specimens are usually scarce. Their taxonomy is difficult and about 20% of the specimens studied could not be determined with certainty. Specimens have been reared from rotting logs and have been collected while running along logs. The host is unknown.

Genus DISOGMUS

Figures 5 (side view); 29 (front wing)

Disogmus Foerster, 1856. Hymenopterologische Studien 2: 99.

Type: *Proctotrupes areolator* Haliday. Designated by Ashmead, 1893.

Front wing 2.0 to 3.3 mm. long. Body moderately slender. Clypeus moderately small, strongly convex, its apex truncate. Apical margin of clypeus sharp, reflexed. Cheek usually with a groove from eye to mandible. Occipital carina present on upper part of head, absent below upper edge of foramen magnum. Mandible moderately stout, with a single apical tooth. Flagellum moderately slender, the male flagellum with tyloids. Notaulus varying from about 0.5 as long as tegula to quite long and reaching beyond center of mesoscutum. Lateral aspect of collar relatively smooth to rugose. Upper front part of pronotum with a strong angular tubercle that is surmounted by a sharp carina. Scrobe of pronotum smooth. Front edge of mesopleurum with a broad continuous band of sparse hairs. Horizontal groove across mesopleurum complete and strong. Mesopleural suture foveolate its entire length. Metapleurum rugose, with a small but distinct carina from its upper front part to anterolateral edge of propodeum. Longer spur of hind tibia reaching to basal 0.3± of hind basitarsus. Stigma small. Radial vein arising from apical 0.3 of stigma, its vertical part about 3.0 as long as wide. Radial cell moderately long, the side next to costa about 2.8 as long as depth of stigma. Costal vein extending hardly at all beyond end of radius. Abdomen with a stalk that is about 1.2 as long as high. Base of syntergite usually with 6 to 11 longitudinal grooves (often without a distinct median groove). Ventrolateral quarter of side aspect of syntergite entirely hairless. Ovipositor sheath 0.75 to 0.90 as long as hind tibia, smooth, slender, evenly curved, gradually tapered to a rounded apex, with some erect hairs that are denser near apex.

This is a Holarctic genus. The species are relatively few and specimens are scarce in collections.

Keys to the species of Disogmus

Males

- | | |
|---|---|
| 1. Tyloids on flagellar segments 3-6. | 2 |
| Tyloids on flagellar segments 4-6 or 4-7. | 3 |

2. Tyloids in the form of a longitudinal ridge that is about 0.8 as long as the segment. Flagellar segments 3 and 4 each about 1.65 as long as wide. Notaulus only 0.7-1.5 as long as tegula. Northern Nearctic Region. 1. obsoletus Brues (p. 23)
- Tyloids in the form of an ascending claw. Flagellar segments 3 and 4 each about 2.2 as long as wide. Notaulus usually reaching (or at least traceable) to behind center of mesoscutum, or sometimes very short. Europe. 4. basalis Thomson (p. 28)
3. Notaulus short, 1.0 to 1.5 as long as tegula. Tyloids on flagellar segments 4-7. Longitudinal grooves at base of syntergite faint or weak and short, the group on each side separated by a wide smooth space between. Northern Nearctic Region.
2. costatus, new species (p. 23)
- Notaulus long, reaching past center of mesoscutum. Tyloids on flagellar segments 4-6. Longitudinal grooves at base of syntergite moderately long and strong, the group of grooves on each side adjacent or with a narrow smooth space between. Holarctic Region. 3. areolator Haliday (p. 24)

Females

1. Notaulus only 0.5 to 1.5 as long as tegula, not reaching center of mesoscutum (not even as a trace). 2
- Notaulus long, extending past center of mesoscutum, at least as a very shallow impression. 3
2. Mesopleurum without a distinct carina-like fold above its horizontal groove. Base of syntergite with a group of 3 or 4 distinct but short longitudinal grooves on each side. Third flagellar segment about 1.65 as long as wide. Northern Nearctic Region.
1. obsoletus Brues (p. 23)
- Mesopleurum with a carina-like fold above the front part of its horizontal groove that is about 0.5 as long as the length of mesopleurum. Base of syntergite with a few faint longitudinal wrinkles on each side. Third flagellar segment about 1.95 as long as wide. Northern Nearctic Region. . . 2. costatus, new species (p. 23)
3. Females of the Holarctic *areolator* Haliday (p. 24) and of the European *basalis* Thomson (p. 28) key to here. Specific distinctions between the two have not been found. Nearctic specimens are assumed to be all *areolator*, and European specimens that have the thorax (especially the mesoscutum) more or less reddish brown or fulvous might also be considered to be *areolator*. European specimens with the thorax entirely black may be either *areolator* or *basalis*.

1. Disogmus obsoletus Brues

**Disogmus obsoletus* Brues, 1905. Bul. Wisconsin Nat. Hist. Soc. 3: 186. ♀. des.

Type: ♀, USA: Morris Cove in Connecticut (Washington). Examined in 1975.

Cryptoserphus obsoletus Kieffer, 1914. Das Tierreich 42: 41. ♀. key, des. USA: Connecticut.

Disogmus obsoletus Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 573. des. USA: Morris Cove in Connecticut.

**Cryptoserphus bruesi* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. New name.

Cryptoserphus bruesi Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♀. type data.

Front wing 2.3 to 2.6 mm. long. Flagellar segments exceptionally short, the third segment about 1.65 as long as wide in both sexes. Tyloids on flagellar segments 3-6, the tyloids in the form of a high ridge that is about 0.8 as long as the segments, the basal end of ridge tapered and apical end abrupt, with a small apical tooth. Side of collar mostly rugulose. Mesopleurum below tegula not distinctly wrinkled. Front half of horizontal groove of mesopleurum without a carina along its upper edge. Base of syntergite with 4 or 5 very fine longitudinal grooves on each side, the grooves reaching about 0.35 the distance to first thyridia and separated on midline by a wide smooth area.

Blackish brown. Antenna brown or dark brown, darker brown or blackish apically. Mouth parts brown. Tegula light brown to dark brown. Legs light brown to medium brown, the hind coxa usually darker than the rest of legs. Wings tinged with brown. Stigma and strong veins dark brown. Weak veins pale brown. Ovipositor sheath dark brown.

Specimens: ♂, Stone Mt. Park, 3,800±ft., B. C., July 18, 1973, H. and M. Townes (Townes). 2♂, King Salmon, Naknek River, Alaska, July 9 and 20, 1952, W. R. M. Mason (Ottawa). ♀, Gagnon Road, 6 miles west of Terrace, B. C., June 8, 1960, J. G. Chillcott (Ottawa). ♂, Saginaw Co., Mich., May 24, 1960, R. R. Dreisbach (East Lansing). ♂, ♀, South Branch, Newfoundland, July 8-15, 1974 and July 1974, G. Heinrich (Ottawa). ♀, Cumberland, Ont., June 27, 1975, L. Ling (Townes). ♀, Point Pelee, Ont., June 13, 1968, W. R. M. Mason (Ottawa). ♂, Dayville, Oreg., Apr. 29, 1976, H. and M. Townes (Townes). ♀, mile 43 on Peel Pt. Road, 3,500 ft., North Fork Crossing, Yukon Territory, July 4, 1962, P. J. Skitsko (Ottawa). ♂, North Fork Pass, Ogilvie Mts., Yukon Territory, July 7, 1962, P. J. Skitsko (Ottawa).

This species occurs in the Hudsonian and Canadian zones of the Nearctic Region.

2. Disogmus costatus, new species

Front wing 2.6 to 2.9 mm. long. Third segment of flagellum about 2.3 as long as wide in male, about 1.95 as long as wide in female.

Tyloids present on flagellar segments 4-7, in the form of a high ridge that is about 0.6 as long as the segments, the basal end of the ridge tapered and apical end abrupt or with a short point. Side of collar rugulose. Notaulus sharp but only about as long as tegula, the mesoscutum evenly convex except for the short notaulus. Mesopleurum below tegula with some fine horizontal wrinkling. Front $0.5 \pm$ of horizontal groove of mesopleurum with a distinct ridge along its upper edge. Base of syntergite with 2 or 3 weak longitudinal grooves on each side of midline, the grooves well separated by a median smooth area and reaching only about 0.3 the distance to first thyridia.

Blackish brown. Palpi, antenna, tegula, legs, and ovipositor sheath brown. Most of abdomen and usually the collar dark brown. Wings with a brown tinge. Stigma and strong veins dark brown. Weak veins light brown.

Type: ♂, near Stanley, Ida., Aug. 5, 1978, H. and M. Townes (Townes).

Paratypes: ♀, Isabel Pass, 2,900 ft., mile 206 on the Richardson Highway, Alaska, July 17, 1962, P. J. Skitsko (Ottawa). ♂, Eisenhower Lookout, 4,600 ft., Banff, Alta., July 25, 1962, W. R. M. Mason (Ottawa). ♂, Cowichan Lake, B. C., July 6, 1964, J. A. Chapman (Ottawa). ♂, Honeymoon Bay, Cowichan Lake, B. C., June 6, 1955, G. E. Shewell (Ottawa). ♀, Diamond Head Trail, 3,200 ft., Squamish, B. C., Aug. 30, 1953, W. R. M. Mason (Ottawa). 4♀, near Stanley, Ida., Aug. 2, 5, and 7, 1978, H. and M. Townes (Townes). ♀, Normandale, Ont., May 18, 1962, S. M. Clark (Ottawa). ♂, Mt. Hood, 5,400 ft., Oreg., July 18, 1978, H. and M. Townes (Townes). ♀, Old Chelsea, Que., June 16, 1970 (Ottawa). ♀, Mt. Rogers, 5,300 ft., Smith Co., Va., June 1, 1962, J. R. Vockerth (Ottawa). ♀, Mt. Rainier, Wash., Aug. 25, 1921, A. L. Melander (Cambridge). ♂, Mt. Rainier, 2,900 ft., Wash., Aug. 14, 1940, H. and M. Townes (Townes).

This is a Nearctic species, occurring in the Canadian and Hudsonian zones.

3. Disogmus areolator Haliday

Proctotrupes areolator Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.

Proctotrupes Epphippium Curtis, 1837. Guide . . . British insects . . . ed. 2, column 128. listed from Britain. *Nomen nudum*.

**Proctotrupes areolator* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 13. ♂, ♀. des., biol. Lectotype: ♀ (designated by Nixon, 1938), England or Ireland (Dublin). Type examination reported by Nixon, 1938.

Proctotrupes areolator Curtis, 1839. British entomology . . . XVI: text for fig. 744. ♀. key, syn., des., fig.

Bethylus (Proctotrupes) areolator Blanchard, 1849. In Cuvier: Regne animal . . . les insectes ed. 3 Insect. Atlas 2: pl. 115, fig. 4. ♀.

**Disogmus discrepator* Foerster, 1856. Hymenopterologische Studien 2: 100. ♂. des. in key. Type: ♂, Germany (lost, not found in Vienna in 1975). Pschorn-Walcher reported on examination of type in 1971.

- **Disogmus aequator* Foerster, 1856. Hymenopterologische Studien 2: 100. ♂. des in key. Type: ♂, Germany (Vienna). Examined in 1975.
- Disogmus areolator* Foerster, 1856. Hymenopterologische Studien 2: 100. ♂. key.
- **Proctotrupes elegans* Thomson, 1857. Öfvers. Svenska Ventsk. Akad. Förh. 14: 414. ♀. des. Type: ♀ (lacking head, wings, and front half of thorax), Sweden: Ringsjö in Skåne (Lund). Examined in 1975.
- **Proctotrupes nigripennis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 415. ♂. des. Type: ♂, Sweden: Stockholm (Stockholm). Examined in 1975.
- Proctotrupes Areolator* Vollenhoven, 1876. Pinacographia, p. 30, 31, pl. 19, fig. 3. ♀. fig.
- Disogmus areolator* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: pl. XIII, fig. 6. ♀. fig.
- Proctotrypes nigripennis* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 466. syn.
- **Disogmus canadensis* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 193. ♀. des. Type: ♀, Canada: Ottawa (Ottawa). Examined in 1975. New synonym.
- **Disogmus diversicornis* Kieffer, 1906. Berlin. Ent. Ztschr. 50: 271. ♂. key, des. Types: ♂, USA: San Mateo in California (lost). Description seems sufficient for identification. New synonym.
- **Disogmus glabratus* Kieffer, 1906. Berlin. Ent. Ztschr. 50: 273. ♂. key, des. Type: ♂ (lacking flagella beyond segment 3), USA: San Mateo in California (San Francisco). Examined in 1975. New synonym.
- **Disogmus Carinatus* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 282. ♂. des. in key. Type: ♂, France: Ferté-Milon (Paris). Examined in 1975. New synonym.
- Disogmus Areolator* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 283, 286. ♀. Haliday des. repeated in key, fig. England. Ireland.
- Disogmus Elegans* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 384. ♀. Thomson des. repeated in key. Sweden: Skåne.
- Disogmus Discrepator* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 285. key.
- Disogmus Aequator* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 286. key.
- Disogmus Nigripennis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 286. ♂. Thomson des. repeated in key. Sweden: Stockholm.
- Disogmus areolator* Lameere, 1907. Manuel de la faune de Belgique. 3. Insectes supérieurs . . . p. 260. syn., des. Belgium.
- Disogmus areolator* Kieffer, 1909. Genera Insectorum 95: 11. fig. 2.
- Disogmus carinatus* Kieffer, 1914. Das Tierreich 42: 18. ♂. key, des. France: Ferté-Milon.
- Disogmus areolator areolator* Kieffer, 1914. Das Tierreich 42: 18. ♂, ♀. key, des., fig. England & Ireland, in the autumn.
- **Disogmus areolator ephippium* Kieffer, 1914. Das Tierreich 42: 19. ♂, ♀. des. Types: ♂, ♀, England (Dublin). Examination of types reported by Nixon, 1938.
- Disogmus elegans* Kieffer, 1914. Das Tierreich 42: 19. ♀. key, des. Sweden: Skåne.
- Disogmus nigripennis* Kieffer, 1914. Das Tierreich 42: 20. ♂. key, des. Sweden: Stockholm.
- Disogmus discrepator* Kieffer, 1914. Das Tierreich 42: 20. ♂. key, des. Probably Germany.
- Disogmus aequator* Kieffer, 1914. Das Tierreich 42: 20. ♂. key, des. Probably Germany.
- Disogmus diversicornis* Kieffer, 1914. Das Tierreich 42: 21. ♂. key, des. USA: San Mateo in California.
- Disogmus glabratus* Kieffer, 1914. Das Tierreich 42: 21. ♂. key, des. USA: San Mateo in California.
- Disogmus canadensis* Kieffer, 1914. Das Tierreich 42: 22. ♀. key, des. Canada: Ottawa.

Disogmus areolator Morley, 1922. Entomologist 55: 3. ♂, ♀. key, biol. England: 5 localities.

Disogmus areolator Morley, 1929. Trans. Suffolk Nat. Soc. 1: 40. England: Suffolk County.

**Disogmus torvus* Whittaker, 1930. Proc. Ent. Soc. Washington 32: 68. ♂, ♀. des. Lectotype: ♀ (designated by Masner, 1965), Canada: Chilliwack in British Columbia (London). Examined in 1975. New synonym.

Disogmus carinatus Holzapfel, 1932. Rev. Suisse Zool. 39: 35. Switzerland: Bern.

Disogmus areolator Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 448. ♀. key, syn., des., lectotype designation. England: Gloucester West. Ireland: 3 localities. Scotland: Breadalbane Mts. in Perthshire.

Disogmus nigripennis Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 448, 449. keys, des., figs., biol. England: S. E. London. Ireland: 5 localities. Scotland: Inverness.

Disogmus areolator Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Gretna.

Disogmus nigripennis Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.

Disogmus nigripennis Hellén, 1941. Notulae Ent. 21: 40. ♂. key, des. England. Finland: 2 localities. Sweden.

Disogmus nigripennis? Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 3 localities.

Disogmus carinatus Tomšik, 1944. Ent. Listy 7: 55. ♂. Czechoslovakia: Brno-Rej in Moravia.

Disogmus carinatus Masner, 1957. Klíč Zvířeny ČSR 2: 299. key. Czechoslovakia.

Cryptoserphus areolator Meyer, 1961. Bombus 2: 93. West Germany: 4 localities.

Disogmus nigripennis Meyer, 1961. Verh. Ver. naturw. Heimatforsch. Hamburg 35: 68. fig., biol. West Germany: Hohwacht in East Holstein.

Disogmus nigripennis Pschorn-Walcher, 1964. Insecta Matsumurana 27: 1. Europe. Japan.

Disogmus torvus Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7. ♀. lectotype designated.

Disogmus nigripennis Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441. Czechoslovakia: East Bohemia. Switzerland.

Disogmus nigripennis Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 533, 534. ♂. syn., des. Ireland: Newcastle district in Co. Down.

Disogmus areolator Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 533, 534. ♂, ♀. syn. des. Ireland: 2 counties.

Disogmus areolator Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 33, 34, 35. ♂, ♀. key, syn., des., figs., biol. Germany. Great Britain. Northern Japan. Sweden. Switzerland: 3 localities.

Disogmus areolator Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 118. ♂, ♀. Germany. Switzerland.

Disogmus carinatus Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.

Disogmus carinatus Teodorescu, 1973. Soc. Ști. Biol. Republ. Socialist. România Comunicări Zool. p. 47. ♀. des. Rumania: Sinaia in Prahova district.

Disogmus nigripennis Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t.3: Pereponchatokrylye 2: 546. ♂, ♀. key. Western Europe.

Front wing 2.2 to 2.7 mm. long. Third flagellar segment about 2.1 as long as wide in both sexes. Tyloids on flagellar segments 4-6, the tyloids in the form of a high ridge that is about 0.6 as long as the segments, the ridge tapered at base and at apex ending at an acute tooth. Side of collar smooth or weakly rugulose. Notaulus reaching past center of mesoscutum, usually shallow or sometimes faint or strong but always traceable to past center of mesoscutum. Mesopleurum

below tegula smooth or sometimes with some fine horizontal wrinkles. Front half of horizontal groove of mesopleurum without a carina along its upper edge. Base of syntergite with 5 or 6 longitudinal grooves on each side, the grooves reaching 0.3 to 0.8 the distance to first thyridia and usually separated at midline by a narrow smooth area.

Black or blackish brown. Antenna brown, darker apically, sometimes blackish brown and sometimes stramineous brown with apical part darker. Mouth parts, tegula, and legs pale fulvous brown to medium brown, sometimes dark brown. Thorax of female often more or less light reddish brown on mesoscutum, collar, propleurum, and along sutures, sometimes with mesoscutum fulvous. Wings with a faint tinge of brown. Stigma and strong veins dark brown. Weak veins pale brown. Ovipositor sheath brown.

I am not able to distinguish the females of this species from those of the European *D. basalis*. This means that the association of the names *areolator* and *elegans*, (whose types are females) with the present species (characterized by the male tyloids) could be incorrect. The distinctions between *areolator* and *basalis* used by Nixon (1938) and by Pschorn-Walcher (1971) do not seem to work for the specimens at hand.

Nearctic males differ from European males in having the tyloids, on the average, a little shorter and with a profile that is straight or weakly convex. In European males the profile of the tyloids is straight or weakly concave.

European specimens: 16♂, 12♀ from England (Leicester and Oxford); East Germany (Eschwege); Ireland (Ballyhubbock in County Wicklow, Barris in County Carlow, Deerpark at Powerscourt in County Wicklow, Drung in County Cavan, Duran in County Wicklow, Enniskerry in County Wicklow, Lawers, Malahide in County Dublin, Pink Point in County Kilkenny, and Rye Water in County Kildare); and Sweden (Ljungby and Nuolja at Abisko in Lappland). Six of the Irish specimens (Enniskerry) were reared from a log by A. W. Stelfox.

Nearctic specimens: 18♂, 11♀ from Alaska (Mt. Fairplay at 3,600 ft. at mile 32 on the Taylor Highway); British Columbia (Atlin and Robson); Colorado (Doolittle Ranch at 9,800 ft. on Mt. Evans and west slope of Loveland Pass at 9,850 ft.); Northwest Territories (Fort McPherson); Ontario (Cumberland and Point Pelee); South Carolina (Greenville); Wyoming (University of Wyoming Camp at 9,600 ft. in the Medicine Bow Range); and Yukon Territory (Rampart House).

Collection dates are from mid May through August; also May 8 at Robson, B. C. and September 20, 23, and 30 in Counties Wicklow and Dublin in Ireland.

This species is widespread in the northern half of the Holarctic Region. Nixon, 1938, reports its being bred from a log.

4. *Disogmus basalis* Thomson

- **Proctotrupes basalis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 416. ♂. des. Lectotype: ♂ (labeled by Townes, 1975 and hereby designated), Lappland (Lund). Examined in 1975. Sweden: Skåne.
- Proctotrupes basalis* Vollenhoven, 1876. Pinacographia, p. 30. pl. 18, fig. 9. ♂. syn., fig.
- Proctotrypes basalis* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.
- Disogmus Basalis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 278. ♂. Thomson des. repeated in key. Lappland. Southern Scandinavia.
- **Disogmus Carinatus* var. *Fuscitarsis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 282. ♂. des. Type: ♂, "France: Berisal" (Paris). Examined in 1975. New synonym.
- Disogmus basalis* Kieffer, 1914. Das Tierreich 42: 17. ♂. key, des. Lappland. Southern Scandinavia.
- Disogmus fuscitarsis* Kieffer, 1914. Das Tierreich 42: 18. ♂. key, des. "France: Berisal".
- Disogmus basalis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 449, 450, 462. ♂, ♀. keys, des., figs. England: 3 localities. Ireland: 2 localities.
- Disogmus basalis* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Disogmus basalis* Hellén, 1941. Notulae Ent. 21: 40. ♂, ♀. key, des. England. Finland: 3 localities. Sweden. USSR: Kola Peninsula.
- Disogmus basalis* Perkins, 1942. Entomologist 75: 194. ♂. Sweden.
- Disogmus basalis* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 27. ♂, ♀. ecology. West Germany: 2 localities.
- Disogmus basalis* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441. Switzerland.
- Disogmus basalis* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 533, 534. ♂, ♀. syn., des. Ireland: near Collinstown House in Co. Kildare.
- Disogmus basalis* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 33, 34. ♂, ♀. key, des., figs., biol. Germany. Great Britain. Northern Italy. Scandinavia. Switzerland: 2 localities.
- Disogmus basalis* Kozlov, 1971. Vses. ent. obshch. 54: 8. USSR: Lithuania.
- Disogmus basalis* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 118. ♂. Italy. Switzerland.
- Disogmus basalis* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 545, 546. ♂, ♀. key, figs. USSR: Lithuania.

Male: Front wing 2.8 to 3.0 mm. long. Third flagellar segment about 2.2 as long as wide. Tyloids on flagellar segments 3-6, each in the form of a subtriangular claw that is about 0.25 as long at base as the segments are long. Side of collar almost smooth. Notaulus reaching past middle of mesoscutum, sharp to shallow or sometimes so weak as to be very indistinct. Mesopleurum below tegula not wrinkled. Front part of horizontal groove of mesopleurum without a ridge along its upper edge. Base of syntergite with 4 or 5 longitudinal grooves on each side of middle, the grooves reaching 0.35 to 0.6 the distance to first thyridia.

Black. Palpi, tegula, coxae, trochanters, and femora dark brown. Tibiae, basal part of tarsi, and apices of femora brown. Wings faintly infuscate. Stigma and strong veins dark brown. Weak veins tinged with brown.

Female: Not distinguished from female of *D. areolator* except that in *D. areolator* females the thorax is often partly reddish brown or fulvous. Distinctions for the female of *basalis* as given by Nixon (1938) and by Pschorn-Walcher (1971) have not proved useable.

Specimens: ♂, Devil's Glen, County Wicklow, Ireland, June 18, 1950, A. W. Stelfox (Washington). ♂, Kenmore, "MP", Ireland, April 11, 1952, A. W. Stelfox (Washington). ♂, Trawalua, County Sligo, Ireland, July 8, 1936, A. W. Stelfox (Washington). ♂, Messaure, Sweden, July 6, 1972, Karl Müller (Townes).

This species is known only from Europe. It has been bred in Ireland from a log, and Nixon in England collected a series of both sexes running over a *Prunus* log infested with *Lycoria* (Lycoriidae).

2. Tribe CRYPTOSERPHINI

Figures 6-17 (side views); 30-42 (front wings)

Occipital carina complete or incomplete, sometimes present only on upper part of head. Mandible often moderately stout to weak or vestigial, either simple or with a small preapical tooth on upper edge. Sometimes the mandible reduced to a small ovate flap. Tyloids present or absent, when present ovate and usually small and low, or sometimes in the form of a long ridge. Pronotum often with an epomia that may be stout and end dorsally on an angulation or tubercle. Metapleurum nearly always with a large smooth unsculptured area. Dorsal face of propodeum very short to moderately long, often smooth except for a median carina. Tarsal claws simple or in *Afroserphus* with two or three slender teeth at midlength. Front wing about 2.5 as long as wide. Stigma moderately deep to very deep and short, giving rise to radius near its center except in some cases where the radial cell is exceptionally short the radius arises farther distad. Intercubitus weak and short, usually unpigmented. Radial cell varying from very short to 2.2 as long (measured along costa) as depth of stigma. First and second discoidal cells separated. Discoidella usually arising from below front end of nervellus. Abdomen usually without a stalk but stalk sometimes present and up to 2.0 as long as wide. Syntergite weakly compressed, with few hairs. Apical segments of female abdomen often protractile. Ovipositor sheath short to long, slender to stout, often essentially hairless or with sparse hairs but sometimes with moderately dense hairs.

This tribe is worldwide, and is represented by 13 genera. The hosts of most genera are beetle larvae; at least one parasitizes Fungivoridae.

Key to the genera of Cryptoserphini

1. Radius descending vertically from lower corner of stigma, then turned at an acute angle obliquely toward costa. 2
- Radius curved obliquely or almost vertically toward costa directly from lower corner or lower part of stigma, without first a short vertical descent from stigma. 9

2. Groove across middle of mesopleurum incomplete, reaching only about 0.7 the distance from front edge of mesopleurum toward mesopleural suture. Propodeum long, its apex usually far behind middle of hind coxa, never in front of basal 0.4 of hind coxa. Upper front part of smooth area of metapleurum without a ridge extending to upper lateral margin of propodeum. Upper front part of pronotum an evenly rounded swelling. Ovipositor sheath covered with erect hairs, its apex blunt and rounded. Australian, Neotropic, and Nearctic regions. . . . 2. Fustiserphus (p. 48)
- Groove across middle of mesopleurum complete, reaching the mesopleural suture. Propodeum short to moderately long, its apex not behind middle of hind coxa. Upper front part of smooth area of metapleurum with a ridge extending to upper lateral margin of metapleurum (except in the genus *Cryptoserphus*). 3
3. Radial cell short, the side next to costa 0.3 to 0.9 as long as depth of stigma. Vertical basal part of radial vein very thick and short, not longer than it is thick. 4
- Radial cell moderately long, the side next to costa 0.6 to 2.0 as long as depth of stigma. Vertical basal part of radius about 2.0 as long as it is thick. 7
4. Upper face of propodeum moderately long, at least 1.2 as long as width of scutellum. Occipital carina absent from lower 0.4± of head. Ovipositor sheath 0.45 to 1.45 as long as hind tibia, with few hairs or none. 5
- Upper face of propodeum very short, about 0.3 as long as width of scutellum, the propodeum in profile consequently sloping downward from very close to its front end. Occipital carina complete, or absent from lower 0.3± of head. Ovipositor sheath up to 0.4 as long as hind tibia. 6
5. Upper front part of pronotum with a tubercle that is usually margined on hind edge by a short vertical carina. Ovipositor sheath moderately wide, a little widened beyond middle, its tip a little tapered and rounded at apex. Australian and Oriental regions.
1. Oxyserphus (p. 32)
- Upper front part of pronotum without a distinct tubercle and without a vertical carina. Ovipositor sheath narrow, gradually tapered to apex. Neotropic Region. 3. Sminthoserphus (p. 56)
6. Cheek without a strong vertical ridge. Temple moderately long, strongly convex. Mandible long. Notaulus absent but represented by a punctato-rugose area. Scutellum large, rugose, its apex broad and sides and hind end descending vertically. Tarsal claws each with 2 or 3 slender teeth medially. Ethiopian Region.
4. Afroserphus (p. 60)

Cheek with a strong vertical ridge and temple extremely short. Mandible very short. Notaulus present. Scutellum evenly convex, with sparse small punctures. Tarsal claws simple. Palearctic and Oriental regions. . . . 5. Nothoserphus (p. 61)

7. Longer spur of hind tibia ending between the middle and the apical 0.2 of hind basitarsus. Upper front part of smooth area on metapleurum not connected by a carina to upper edge of propodeum, or sometimes connected by a weak or incomplete carina. Mesopleural suture not foveate, or its upper half weakly foveate in *C. fortis*. Worldwide. 7. Cryptoserphus (p. 76)

Longer spur of hind tibia ending near or before middle of hind basitarsus. Upper front part of smooth area on metapleurum connected by a fine short carina to upper edge of propodeum. Mesopleural suture sometimes foveate. 8

8. Mandible with two teeth. Mesopleural suture foveate its entire length. Costal vein continued beyond apex of radial cell not at all, or by less than 0.3 the length of costal edge of radial cell. Ovipositor sheath 0.6 to 1.0 as long as hind tibia. Holarctic Region. 6. Tretoserphus (p. 69)

Mandible with one tooth, the mandible short, wide, and thin. Mesopleural suture foveate only above the horizontal groove or not foveate. Costal vein continued beyond apex of radial cell by a distance equal to 0.4 to 1.9 the costal length of radial cell. Ovipositor sheath 0.9 to 1.8 as long as hind tibia. Worldwide. 8. Mischoserphus (p. 95)

9. Notaulus reaching almost to hind edge of mesoscutum. Groove across middle of mesopleurum strongly arched and shallow. Tasmania. 12. Serphonostus (p. 128)

Notaulus short or almost absent, less than 0.3 as long as mesoscutum. Groove across middle of mesopleurum weakly arched, or in *Apoglypha* absent. 10

10. Mesopleurum without a horizontal groove across its middle. Radial cell in the form of a narrow slit that does not reach costa. Mesopleurum partly striate. Australia and Tasmania. 13. Apoglypha (p. 129)

Mesopleurum with a horizontal groove across its middle. Radial cell reaching costa, its length along costa 0.3 to 2.0 as long as the stigma is deep. Mesopleurum usually not striate. 11

11. Notaulus absent or represented by a small shallow pit at margin of mesoscutum. Scrobe of pronotum and lower 0.5 to 0.7 of metapleurum with fine horizontal wrinkles. Thorax compressed, clypeus wide, and flagellum short. Holarctic Region. 9. Pschornia (p. 111)

Notaulus about 0.7 as long as tegula. Scrobe of pronotum smooth or with short oblique wrinkles. Metapleurum variously sculptured but without fine horizontal wrinkles. 12

12. *Epomia* not continued dorsad to cross tip of the tubercle on upper front part of pronotum. Scrobe of pronotum with coarse wrinkles. Lower 0.7± of metapleurum with coarse reticulate wrinkling.

10. Hormoserphus (p. 114)

Epomia continued dorsad to cross top of the tubercle on upper front part of pronotum as a sharp carina. Scrobe of pronotum smooth or with some oblique or transverse wrinkles. Lower 0.3± of metapleurum often with horizontal wrinkling, the rest smooth. Holarctic, Oriental, and Neotropic Regions.

11. Brachyserphus (p. 116)

1. Genus OXYSERPHUS

Figures 6 (side view); 30 (front wing)

Oxyserphus Masner, 1961. Parc National de l'Upemba - Mission G. F. De Witte fasc. 60 (4): 41.

Type: *Proctotrupes maculipennis* Cameron. Original designation.

Front wing 1.8 to 7.4 mm. long. Body stout to moderately slender. Clypeus wide, weakly convex, its apex broadly truncate, with a sub-apical carina closely paralleling true apical margin. Apex of clypeus thin and sharp. Cheek short to moderately long, with a groove from eye to mandible. Occipital carina present dorsally and dorsolaterally, often also laterally, absent near oral carina. Mandible stout or moderately stout, usually with a preapical tooth on upper edge. Flagellum moderately stout to moderately slender, without distinct tyloids. Notaulus distinct, 0.6 to 1.2 as long as tegula. Pronotal collar smooth or more or less rugulose or wrinkled, usually with a group of fine parallel wrinkles on its upper part that extend into pronotal scrobe, sometimes with a carina on lateral aspect. Pronotal scrobe smooth or its upper part with fine horizontal to strongly oblique wrinkles, sometimes with extensive coarse wrinkles. Upper anterolateral part of pronotum with a low (or sometimes prominent) tubercle that is usually emphasized by being bordered posteriorly by a low, short subvertical carina. Front edge of mesopleurum with or without a band of hairs. Groove across mesopleurum complete. Mesopleural suture foveolate only above the horizontal groove to completely foveolate. Metapleurum sculptured on its lower 0.25 or more and usually on its hind 0.2 to 0.5 (or rarely almost entirely sculptured), the upper front part of smooth area of metapleurum connected by a carina to lateral part of upper edge of propodeum. Long spur of hind tibia ending between middle and basal 0.3 of hind basitarsus. Stigma moderate sized to deep. Radius originating in vicinity of midlength of stigma, its vertical part usually

very short, 0.3 to 1.5 as long as wide. Radial cell short or moderately short, the side next to costa 0.5 to 0.7 as long as depth of stigma. Costal vein extending hardly at all beyond radial cell or gradually evanescent so that its length is not determinable. Abdomen without a stalk or with a stalk that is up to 2.0 as long as wide. Base of syntergite with 1 to 13 longitudinal grooves. Ovipositor sheath 1.0 to 1.45 as long as hind tibia, wide, hairless or almost hairless, often weakly widened beyond the middle, its apical half usually more strongly curved than basal half, its tip a little tapered and apex rounded.

This is a large genus of the Australian Region, with a smaller number of species in the Oriental Region.

Hosts are Curculionidae and Anthribidae, as shown by the known hosts of *Oxyserphus maculipennis* and *O. syagrii* and the following host records from specimens of still undescribed species reared in New Zealand and preserved in Auckland: *Scolopterus aequus*, *Oreocharis* sp., *Incentia nubila*, and *Protolobus obscurus* (all Curculionidae), and *Anthribus* sp. (Anthribidae).

Key to the species of Oxyserphus

1. Abdomen with a stalk that is 2.0 as long as high. Metapleurum rugoso-punctate, only the upper front corner smoother. Body moderately slender. New Zealand.
 1. pediculatus, new species (p. 36)
Abdomen without a stalk, or with a stalk less than 0.3 as long as high. Metapleurum with upper front 0.15 to 0.7 of its surface smooth, the rest strongly sculptured. Body stout. 2
2. Front wing yellow with apex and a subapical band fuscous. Median carina of propodeum elevated as a crescentic crest. Front wing 6.4 to 7.4 mm. long. New Zealand.
 2. maculipennis Cameron (p. 36)
Front wing hyaline, not marked with fuscous. Median carina of propodeum not elevated. Front wing 1.8 to 5.6 mm. long. 3
3. Lower corner of pronotum with a large area of hairs. Mesopleurum below the horizontal groove covered with hairs. Australia.
 3. splendidus Riek (p. 37)
Lower corner of pronotum without hairs. Mesopleurum below the horizontal groove with a large median dorsal area that lacks hairs. 4
4. Front margin of mesopleurum with a band of hairs between subtegular area and its horizontal groove. Vertical portion of the radial vein very short and wide, about 0.4 as long as wide. 5
Front margin of mesopleurum with a hairless area between the hair patch on subtegular area and its horizontal groove. Vertical portion of radial vein moderately short to very short, 1.0 to 0.4 as long as wide. 9

5. Mesopleurum with only its upper front 0.2 smooth. 6
 Mesopleurum with 0.4 to 0.7 of its surface smooth. 7
6. Coxae fulvous. Side of pronotum with weak oblique wrinkling.
 Metapleurum punctato-rugose, the rugae horizontal. Australia.
 4. rugatus, new species (p. 38)
 Coxae black. Side of pronotum with strong oblique wrinkling.
 Metapleurum punctate, with a faint tendency toward oblique
 rugae. Australia. 5. doddi Riek (p. 39)
7. Lower hind edge of smooth part of metapleurum not sharp, invaded
 by large crowded punctures. Australia. 6. nitidus Dodd (p. 39)
 Lower hind edge of smooth part of metapleurum sharp, bounded by
 a curved wrinkle. 8
8. Pronotum at midheight with a group of about 3 oblique grooves.
 Apex of ovipositor sheath broadly rounded. Australia. 7. hipponecrus, new species (p. 40)
 Pronotum at midheight with a radiating fan of about 6 grooves.
 Apex of ovipositor sheath tapered to a rounded point. Tasmania.
 8. turneri Dodd (p. 41)
9. Upper front 0.25 of metapleurum smooth, the rest sculptured.
 Radius joining lower corner of stigma broadly, without a distinct
 vertical portion. Mandible with a preapical tooth that is 0.6 as
 long as lower tooth. Femora entirely black. Tasmania. 9. corvinus, new species (p. 41)
 Upper front 0.5 to 0.7 of metapleurum smooth, the rest sculptured.
 Radius joining lower corner of stigma by a short vertical portion.
 Mandible without a preapical tooth on upper edge or with a very
 small tooth. 10
10. Base of syntergite with 3 or more longitudinal grooves on each side
 of median groove. 11
 Base of syntergite without distinct longitudinal grooves on each side
 of midline but usually with a broad impression laterally and
 another next to median groove, between these two impressions a
 raised area or broad ridge. 14
11. Pronotum with a group of 3 short horizontal grooves at its midheight,
 in front of sulcus. Upper face of propodeum entirely smooth.
 Ovipositor sheath 1.7 as long as hind tibia. Australia. 10. caudatus, new species (p. 42)
 Pronotum without horizontal grooves at its midheight in front of
 sulcus, but sometimes with subvertical grooves in front of sulcus
 or horizontal grooves within the sulcus. Upper face of propodeum
 with only its basal 0.3 to 0.8 smooth. Ovipositor sheath 0.8 to
 1.7 as long as hind tibia. 12

12. Abdomen without a stalk. Pronotum with fine subvertical wrinkling in front of sulcus. Hind coxa dark brown, paler at apex. New Zealand. 11. baini, new species (p. 42)
 Abdomen with a very short stalk (0.25 as long as high). Pronotum without subvertical wrinkling in front of sulcus. Hind coxa brownish fulvous, usually darker at extreme base. 13
13. Lateral grooves at base of syntergite about 0.7 as long as median groove. Pronotum often more or less fulvous brown. Tasmania. 12. xanthura, new species (p. 43)
 Lateral grooves at base of syntergite about 0.25 as long as median groove. Pronotum black. Australia. . 13. syagrii Riek (p. 44)
14. Pronotum without horizontal grooves near midheight in front of sulcus. 15
 Pronotum with one or several horizontal grooves near midheight in front of sulcus. 16
15. Coxae dark brown. Angulation of radius swollen, without a distinct spur that projects downward and basad. Stigma dark brown. Australia. 14. leiopleurum, new species (p. 44)
 Coxae pale fulvous. Angulation of radius with a short spur projecting downward and basad. Stigma pale brown. Australia. 15. calcaratus, new species (p. 45)
16. Vertical part of radius 0.4 as long as wide. Ovipositor sheath 1.7 as long as hind tibia. New Guinea. 16. brevicaulis, new species (p. 45)
 Vertical part of radius 1.0 as long as wide. Ovipositor sheath 0.8 to 1.15 as long as hind tibia. 17
17. Hind coxa dark brown. 18
 Hind coxa fulvous. 19
18. Metapleurum sculptured on hind 0.5, the rest smooth. Swelling of pronotum in front of sulcus crossed by about 4 small grooves. Australia. 17. capitatus, new species (p. 46)
 Metapleurum sculptured on lower hind 0.2, the rest smooth. Swelling of pronotum in front of sulcus crossed by one deep groove. New Guinea. . . . 18. unisulcus, new species (p. 46)
19. Ovipositor sheath 1.05 as long as hind tibia. Thorax black. Australia. 19. sulcatus Riek (p. 47)
 Ovipositor sheath 1.15 as long as hind tibia. Thorax brown. Australia. 20. nigriscutum Dodd (p. 47)

1. Oxyserphus pediculatus, new speciesFigure 49 (σ metapleurum and propodeum)

Male type: Front wing 3.3 mm. long. Body moderately slender. Cheek short, with a groove from eye to mandible. Occipital carina subcomplete, its lower end directed toward hind condyle of mandible but evanescent. Mandible stout, apparently with a single tooth but upper edge not visible. Flagellum slender, the second segment 2.7 as long as wide and penultimate segment 2.8 as long as wide. Lateral aspect of collar with a longitudinal carina. Upper part of pronotal scrobe mat and with fine wrinkling paralleling direction of scrobe. Front edge of mesopleurum with a narrow band of hairs that is interrupted just above transverse groove of mesopleurum. Mesopleural suture with large foveae its entire length. Metapleurum partly coarsely punctate and partly reticulate, anterodorsally with a very small almost smooth area. Upper face of propodeum with fine wrinkling, not polished, its median carina moderately strong. Hind femur 4.8 as long as deep. Vertical portion of radius 1.2 as long as wide. Radial cell of moderate length, the side next to costa 0.55 as long as stigma. Abdomen with a stalk that is 2.0 as long as high, the stalk strongly mat, laterally and ventrally with long parallel grooves. Base of syntergite with a median groove reaching 0.6 the distance to thyridial interspace, with 6 shorter grooves on each side of median groove.

Head black. Clypeus, labrum, and mandible light brown. Palpi stramineous. Scape and pedicel stramineous, the apical 0.3 of scape brown. Flagellum brown. Thorax blackish, the propleurum stramineous, pronotum light brown with scrobe dark brown, mesoscutum light brown with dark brown marginally and next to notauli and hind part, scutellum brown, and mesosternum light brown. Tegula light brown. Legs stramineous. Wings with a tinge of light brown, the stigma and strong veins medium brown. Abdominal petiole black, the rest of abdomen reddish brown with dorsal part of syntergite blackish.

Female: Unknown.

Type: σ , Forest Research Institute, Rotorua, New Zealand, Dec. 25-29, 1970, John Bain (Townes).

2. Oxyserphus maculipennis CameronFigure 50 (σ metapleurum and propodeum)

**Proctotrupes maculipennis* Cameron, 1888. Mem. & Proc. Manchester Lit. & Phil. Soc. (4) 1: 175. [σ]. des. Type: σ , New Zealand: Greymouth (London).

Examined in 1975.

Serphus maculipennis Kieffer, 1909. Genera Insectorum 95: 5. syn.

Serphus maculipennis Kieffer, 1914. Das Tierreich 42: 15. [σ]. key, des. New Zealand: Greymouth.

Proctotrypes maculipennis Tillyard, 1926. Insects of Australia & New Zealand, p. 282. σ . des., fig.

Oxyserphus maculipennis Masner, 1961. Parc National de l'Upemba - Mission G. F. De Witte fasc. 60 (4): 40, 41. ♂. syn., des., fig.

Oxyserphus maculipennis Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 8. ♂. type data.

Front wing 6.4 to 7.4 mm. long. Body moderately stout. Clypeus about 3.8 as wide as long. Side of pronotum with a weakly arched carina along collar, without other carinae or wrinkling. Upper anterolateral part of pronotum forming a rounded swelling. Front margin of mesopleurum without hairs from some distance below tegula to the transverse groove. Mesopleural suture foveate throughout. Lower 0.2 and hind 0.3 of metapleurum rugose, the rest smooth. Upper face of propodeum smooth, with a heavy median carina that is elevated as a low crescent. Propodeal spiracle prominent, surmounted by a polished rounded protuberance that projects laterad. Ovipositor sheath 0.90 as long as hind tibia, polished, evenly curved, parallel-sided except a little deeper at base than elsewhere, the tip a little tapered and apex rounded.

Head and body ferruginous or more or less fuscous or blackish, sometimes almost entirely blackish. Scape and pedicel ferruginous to fuscous. Flagellum black. Mouth parts, tegula, and legs ferruginous to reddish brown, the coxae, trochanters, and femora often dark brown or blackish. Wings yellow, the apical 0.18± of front and hind wings and a broad band at stigma infuscate, the band at stigma and apical infuscation of front wing usually connected along hind margin of wing. Ovipositor sheath ferruginous.

Specimens: ♂, reared from *Anagotus helmsi* in *Nothofagus menziesii*, Mt. Arthur, 3,000 ft., New Zealand, collected Nov. 11, 1969, emerged Dec. 1, 1969, B. M. May (Auckland). ♂, 2♀, reared from larvae of *Anagotus helmsi* in *Nothofagus menziesii*, Golden Downs, New Zealand, Nov. 8, 1968, W. A. Holloway (Auckland). ♀, Dashwood Creek, 1,600 ft., Wilmot Pass, New Zealand, Jan. 25, 1970, J. S. Dugdale (Auckland). 2♂, Lake Paringa, S. Westland, New Zealand, June 10-12, 1960, J. I. Townsend and P. R. Kettle (Auckland). ♀, Otira, New Zealand, Mar. 1919, J. W. Campbell (Auckland).

This large, brightly colored species is known only from New Zealand.

3. Oxyserphus splendidus Riek, new combination

**Proctotrupes splendidus* Riek, 1955. Australian Jour. Zool. 3: 114. ♀. des., fig.

Type: ♀, Australia: Bendora in Australian Capital Territory (Canberra). Examined in 1977.

Male: Unknown.

Female type: Front wing 5.6 mm. long. Body moderately elongate. Mandible stout, its upper edge not visible. Second flagellar segment 4.2 as long as wide. Penultimate flagellar segment 2.6 as long as wide.

Flagellum weakly enlarged apically. Side of pronotum with 5 weak horizontal grooves in the scrobe. Lower corner of pronotum with a large area of hairs (hairless in the other species). Front edge of mesopleurum broadly hairy from its upper corner to the horizontal groove. Mesopleurum below its horizontal groove completely covered with moderately dense hairs (in other species with a large hairless area next to horizontal groove). Mesopleural suture with 12 foveae, 4 of them below the horizontal groove. Metapleurum with upper front 0.15 smooth, the rest strongly rugose. Propodeum coarsely rugose, its dorsal surface weakly rugulose and with small punctures. Hind femur 4.9 as long as deep. Vertical portion of radius 0.3 as long as wide, from the vertical portion the radius curved distad without an angulation. Base of syntergite with a long median groove, otherwise without grooves or impressions. Ovipositor sheath 1.45 as long as hind tibia, moderately deep, its apex tapered to a narrowly rounded point.

Black. Palpi and trochanters dark reddish brown. Tegula and legs beyond trochanters ferruginous, their tarsi brownish apically. Wings faintly infusate, the stigma and strong veins blackish. Tergites beyond the syntergite fusco-ferruginous to light ferruginous.

Specimen: ♀ (type), Bendora, A. C. T., Australia, Mar. 31, 1951, E. F. Riek (Canberra).

4. Oxyserphus rugatus, new species

Figures 51 (♀ metapleurum and propodeum); 382 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.7 mm. long. Body stout. Mandible stout, with a single tooth. Flagellum faintly thicker apicad, its second segment 2.3 as long as wide and penultimate segment 1.6 as long as wide. Pronotum with 5 short coarse horizontal grooves within its scrobe, the lowermost of these continued forward in a sinuate course and crossing the collar. Front margin of mesopleurum with a continuous band of hairs from tegula to its transverse groove. Metapleurum and propodeum as in figure 51. Hind femur 4.0 as long as deep. Vertical section of radial vein 0.4 as long as wide. Base of syntergite with a median groove reaching 0.6 to interthyridial space, next to its basal carina weakly foveate but without additional longitudinal grooves, on each side of median groove and sublaterally with a large depression. Thyridium 2.8 as wide as long. Ovipositor sheath 1.23 as long as hind tibia, shaped as in figure 382.

Black. Mouth parts brown. Tegula and legs fulvous, the tarsi brownish apically. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♀, Strahan, Tasmania, Mar. 14 to 26 (Townes).

5. Oxyserphus doddi Riek, new combination

**Proctotrupes doddi* Riek, 1955. Australian Jour. Zool. 3: 113. ♀. des., fig. Type: ♀, Australia: Barrington Tops in New South Wales (Canberra). Examined in 1977.

Male: Unknown.

Female type: Front wing 3.3 mm. long. Body of moderate proportions. Mandible stout, its upper edge not visible. Flagellum of uniform diameter, its second segment 2.8 as long as wide and penultimate segment 2.0 as long as wide. Pronotum with 8 closely spaced oblique grooves that extend from pronotal sulcus to and over the collar. Front edge of mesopleurum with a few sparse hairs between the hair patch at its upper corner and the hair patch at front end of the horizontal groove. Mesopleural suture with 13 foveae, 4 of them below the horizontal groove. Upper front 0.2 of metapleurum smooth, the rest coarsely reticulately wrinkled. Propodeum coarsely reticulately wrinkled, the basal 0.3 of upper aspect mostly smooth. Hind femur 6.0 as long as deep. Vertical portion of radius 0.3 as long as wide. Base of syntergite with a median groove reaching 0.5 the distance to space between thyridia, on each side of median groove with two short deep depressions. Ovipositor sheath 0.95 as long as hind tibia, similar in shape to that of *O. nitidus* (fig. 383).

Black. Palpi and trochanters blackish brown. Tegula and legs beyond trochanters fulvoferruginous, the femora dark brown at base and tarsi brown. Wings subhyaline, the stigma and strong veins blackish brown. Weak veins tinged with brown. Apical telescoped tergites light brown.

Specimen: ♀ (type), Barrington Tops, N. S. W., Australia, Feb. 5, 1931, A. P. Dodd (Canberra).

6. Oxyserphus nitidus Dodd

Figures 52 (♀ metapleurum and propodeum); 383 (ovipositor sheath)

**Cryptoserphus nitidus* Dodd, 1915. Trans. Roy. Soc. South Australia 39: 388. ♂. des. Type: ♂ (lacking head and front wings), Australia: Cairns district in Queensland (Adelaide). Examined in 1977.

Cryptoserphus nitidus Riek, 1955. Australian Jour. Zool. 3: 116. ♂. des., fig. Australia: Cairns district.

Front wing 2.4 to 2.8 mm. long. Body stout. Mandible stout, with a very small preapical tooth on upper edge. Flagellum of the only male specimen (the type) not available for measurements. Flagellum of female enlarged apicad, its second segment 2.5 as long as wide and penultimate segment 1.4 as long as wide. Pronotum with 3 or 4 coarse horizontal short grooves running forward from scrobe, one of the grooves

notching the collar. Front margin of mesopleurum with a continuous band of hairs from tegula to the horizontal groove. Mesopleural suture with moderate sized foveae above the horizontal groove, the suture weak and only faintly foveate below the groove. Metapleurum and propodeum as in figure 52. Hind femur 3.8 as long as deep. Vertical portion of radius 0.4 as long as wide. Base of syntergite with a median groove reaching 0.7 to thyridial interspace, with a depression on each side of median groove and another depression sublaterally. Thyridium 1.8 as wide as long. Ovipositor sheath 1.4 as long as tibia, shaped as in figure 383.

Black. Mouth parts, scape, pedicel, tegula, and legs fulvous, the tarsi brownish apically. Wings subhyaline, the stigma and strong veins dark brown.

Specimens: ♂ (type), Cairns district, Queensland, Australia (Adelaide). ♀, Mt. Dandenong, 300 m., Vict., Australia, Feb. 13-19 (Townes). 2♀, Dead Horse Gap, 1,650 m., Snowy Mts., N. S. W., Australia, Feb. 2 (Townes).

7. Oxyserphus hipponecrus, new species

Figures 53 (♀ metapleurum and propodeum); 384 (ovipositor sheath)

Front wing 2.2 to 2.3 mm. long. Body stout. Mandible stout, with a small preapical tooth on upper margin. Flagellum of male the same diameter toward apex. Flagellum of female weakly thickened toward apex. Second flagellar segment 1.9 as long as wide in male, 1.75 as long as wide in female. Penultimate flagellar segment 2.0 as long as wide in male, 1.6 as long as wide in female. Pronotum with 3 or 4 short grooves extending from the scrobe forward, the grooves almost horizontal and weakly divergent caudad, anteriorly narrowly notching the collar. Front margin of mesopleurum with a continuous band of hairs from tegula to the horizontal groove. Mesopleural suture with moderately small foveae above the horizontal groove, the suture weak and faintly foveate below the horizontal groove. Metapleurum and propodeum as in figure 53. Hind femur 3.7 as long as deep. Vertical section of radial vein 0.5 as long as wide. Base of syntergite with a median groove reaching 0.7 to interthyridial space, with a strong impression on each side of median groove and another sublaterally. Thyridium 2.5 as wide as long. Ovipositor sheath 1.19 as long as hind tibia, shaped as in figure 384.

Black. Male with mouth parts, tegula, and legs fulvous, the coxae fuscous basally, hind tarsus infuscate, and front and middle tarsi infuscate apically. Female with front and middle legs beyond coxae, and hind tibia brown. Female hind trochanter, femur, and tarsus blackish brown, the hind femur brown at apex. Wings subhyaline, the stigma and strong veins blackish brown.

Type: ♀, Dead Horse Gap, 1,650 m., Snowy Mts., N. S. W., Australia, February 2 (Townes). Figures 53 and 384 are from the type.

Paratypes: ♀, same data as type (Townes). ♂, Taralga, N. S. W., Australia, January (Townes). As noted in the description, this male is colored somewhat differently than the females. The male was collected at a lower altitude.

8. Oxyserphus turneri Dodd

Figures 54 (♀ metapleurum and propodeum); 385 (ovipositor sheath)

- **Proctotrupes turneri* Dodd, 1920. Trans. Ent. Soc. London 1919: 363. ♂, ♀. des.
Type: ♀, Australia: Mt. Wellington at 2,300 ft. in Tasmania (London). Examined in 1977.
- Proctotrupes turneri* Riek, 1955. Australian Jour. Zool. 3: 111. ♂, ♀. des.
Australia: Lucindale in South Australia.
- Crytoserphus turneri* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7.
♀. type data.

Male: Unknown.

Female: Front wing about 3.3 mm. long. Clypeus about 3.5 as wide as long. Side of pronotum with a carina paralleling lower half of front margin, the upper end of carina diverging from edge of pronotum then stopping without continuing as an epomia. Side of pronotum with 6 wrinkles extending forward from its sulcus and convergent forward. Front margin of mesopleurum with a broad continuous band of hairs from tegula to the horizontal groove. Mesopleural suture foveate above the horizontal groove, only faintly foveate below. Metapleurum and propodeum similar to those of *O. hipponecrus* (figure 53). Base of syntergite with a median longitudinal groove and on each side two broad groove-like impressions. Thyridium 1.9 as wide as long. Ovipositor sheath about 1.05 as long as hind tibia, shaped as in figure 385.

Black. Labrum dark brown. Tegula and legs fulvous brown, the tarsi light brown, middle coxa brown, and hind coxa blackish brown. Wings hyaline, the stigma and strong veins dark brown.

Specimens: 3♀ (including the type), Mt. Wellington, 2,300 ft., Tasmania, Mar. 22, 1913, Mar. 25-26, 1913, and Apr. 2-6 (type), 1913, R. E. Turner (London). Figures 54 and 385 are from the type.

9. Oxyserphus corvinus, new species

Figure 55 (♂ metapleurum and propodeum)

Male type: Front wing 2.3 mm. long. Body moderately slender. Mandible moderately slender, with two teeth, the upper tooth 0.6 as long as lower tooth. Second flagellar segment 2.2 as long as wide. Penultimate flagellar segment 1.7 as long as wide. Flagellum weakly enlarged toward apex. Side of pronotum quite smooth. Front edge of mesopleurum with a patch of hairs below tegula and a very small patch of hairs above horizontal groove, hairless between these two patches. Meso-

pleural suture foveate above the horizontal suture and with 1.5 foveae just below the horizontal suture. Metapleurum and propodeum as in figure 55. Hind femur 5.0 as long as deep. Vertical part of radial vein 0.3 as long as wide. Base of syntergite with a median longitudinal groove reaching 0.5 to thyridial interspace, on each side of median groove a trough-like impression and a similar impression sublaterally.

Black. Apical 0.4 of mandible brown. Tegula and legs black, the apex of femora dark brown. Wings subhyaline, the stigma and strong veins black.

Type: ♂, Mt. Barrow, 1,200 m., Tasmania, Jan.10 to 26 (Townes).

10. Oxyserphus caudatus, new species

Figures 56 (♀ metapleurum and propodeum); 386 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.1 mm. long. Body moderately proportioned. Mandible moderately stout, its apex not visible. Flagellum enlarged at apex, its last segment 2.0 the diameter of its second segment. Second segment of flagellum 3.6 as long as wide, the penultimate segment 1.4 as long as wide. Pronotum with 3 short subparallel grooves running forward from the sulcus and notching the collar. Front margin of mesopleurum with a patch of hairs below tegula, otherwise hairless. Mesopleural suture with moderately large foveae above the horizontal groove, below the groove faintly foveate. Metapleurum and propodeum as in figure 56. Hind femur 5.7 as long as deep. Vertical part of radial vein 1.3 as long as wide. Base of syntergite with a median groove reaching 0.75 to interthyridial space, on each side of median groove with about 7 fine grooves that are about 0.5 as long as median groove. Ovipositor sheath 1.7 as long as hind tibia, shaped as in figure 386.

Black. Scape, mouth parts, tegula, and legs pale brownish fulvous, the tarsi dark brown. Thorax next to tegula dark brown rather than black. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♀, Mt. Buffalo, Vict., Australia, Feb. 7 (Townes).

11. Oxyserphus baini, new species

Figures 57 (♀ metapleurum and propodeum); 387 (ovipositor sheath)

Front wing 2.0 to 2.4 mm. long. Clypeus about 3.2 as wide as long. Side of pronotum with a carina paralleling lower half of front margin, the carina continued straight dorsad as an epomia and evanescent on a prominence on upper anterolateral edge of pronotum. Pronotum with a little fine wrinkling along epomia, elsewhere smooth. Front margin of mesopleurum without hairs from a little below tegula to a little above the horizontal groove. Mesopleural suture foveolate above mesopleural transverse groove but not below. Lower hind half of metapleurum

sharply rugulose, the rest smooth. Upper face of propodeum with a pair of areas that are finely wrinkled, the two areas separated by a carina. Base of syntergite with 9 to 13 longitudinal grooves. Ovipositor sheath 1.25 as long as hind tibia, curved, polished, weakly widened to near apex (as in figure 387).

Black. Palpi fulvous. Mandible and legs of male brownish fulvous, the coxae and hind femur brown to blackish brown. Mandible, tegula, and legs of female fulvous, the hind coxa mostly brown. Tegula of male dark brown. Thorax of female reddish brown around edges of pronotum and next to middle coxa. Wings hyaline, the strong veins and stigma dark brown. Ovipositor sheath dark brown.

Type: ♀, Forestry Research Institute, Rotorua, New Zealand, Oct. 1-2, 1970, John Bain (Townes).

Paratypes: 2♂, same locality and collector as type, Sept. 21-25 and Dec. 30-31, 1970 (Townes).

The species name is in honor of Mr. John Bain.

12. Oxyserphus xanthura, new species

Figures 58 (♀ metapleurum and propodeum); 388 (ovipositor sheath)

Front wing 2.9 to 4.0 mm. long. Body moderately proportioned. Mandible stout, with two teeth, the upper tooth 0.3 as long as lower tooth. Second flagellar segment of male 2.3 as long as wide, of female 2.6 as long as wide. Penultimate flagellar segment 1.75 as long as wide in male, 1.5 as long as wide in female. Flagellum moderately enlarged toward apex, the penultimate segment 1.3 as wide as second segment. Side of pronotum smooth in male, in female with weak coarse short transverse wrinkles in scrobe. Front edge of mesopleurum with a patch of hairs below tegula and a small patch above the horizontal groove, hairless between these two patches. Mesopleural suture with medium sized foveae throughout. Metapleurum and propodeum as in figure 58. Hind femur 4.25 as long as deep in male, 5.1 as long as deep in female. Vertical part of radius 1.4 as long as wide. Base of syntergite with median longitudinal groove reaching 0.7 to thyridial interspace, on each side of median groove with about 4 grooves that are 0.7± as long as median groove. Ovipositor sheath 0.83 as long as hind tibia, shaped as in figure 388.

Black. Scape, mouth parts, tegula, and legs pale brownish fulvous, the tarsi dark brown, the scape often more or less infusate and sometimes entirely black. Pronotum varying from fulvous brown to dark brown to black. Female with apical 0.45 of syntergite and all of following tergites reddish fulvous.

Type: ♀, Geeveston, Tasmania, Feb. 7-27 (Townes).

Paratypes: 68♂ from Tasmania (Geeveston, Hartz Mts. at 900 m., Hellyer Gorge at 300 m., King William Range, Roseberry, Strahan, and Togari). Collection dates are from January 7 to April 2. Paratypes are in the Townes and Ottawa collections.

13. Oxyserphus syagrii Riek

Figures 59 (♀ metapleurum and propodeum, from a faded photograph);
389 (ovipositor sheath).

**Proctotrubes syagrii* Riek, 1955. Proc. Linnean Soc. New South Wales 80: 147. ♂, ♀. des. Type: ♀, Australia: Helensburgh in New South Wales (New South Wales Dept. of Agriculture). Paratypes examined in 1977. Australia: 3 localities in New South Wales. Host: *Syagrius fulvitaris*.

Front wing 3.2 to 3.3 mm. Structurally similar to *O. xanthura*, from which it differs in having the side of pronotum smooth in female as well as in male and the paramedian grooves at base of syntergite very short, only 0.25 as long as median groove. Ovipositor sheath 0.90 as long as hind tibia, shaped as in figure 389. The photograph used for figure 59 is badly faded but is reproduced as better than nothing.

Black. Scape, pedicel, mouth parts, tegula, and legs light fulvous, the tarsi slightly brownish. Flagellum fulvous basally, especially in female. Wings subhyaline, the stigma and strong veins dark brown. Female with lower part of syntergite and the tergites behind syntergite brownish rather than blackish.

Specimens: ♂, ♀ (paratypes), reared from *Syagrius fulvitaris*, Coaldale and Coalcliff, N. S. W., Australia, Jan. 23, 1929 and Nov. 12, 1929, L. Gallard (Canberra).

14. Oxyserphus leiopleurum, new species

Figure 60 (♂ metapleurum and propodeum)

Male type: Front wing 1.9 mm. long. Body of moderate proportions. Mandible moderately stout, with a small tooth on upper edge a distance before apex. Second flagellar segment 2.2 as long as wide. Penultimate segment of flagellum 1.7 as long as wide. Side of pronotum quite smooth. Front edge of mesopleurum with a patch of hairs below tegula and a small patch above horizontal groove, hairless between these two patches. Mesopleurum foveate above the horizontal groove but not below. Metapleurum and propodeum as in figure 60. Hind femur 4.2 as long as deep. Vertical part of radial vein 1.0 as long as wide, swollen at bend but without a distinct spur. Base of syntergite with a median groove reaching 0.7 to thyridial interspace, on each side of median groove a longitudinal impression and sublaterally a second, similar impression.

Black. Subapical part of mandible brown. Tegula black. Front coxa brown, middle coxa dark brown, and hind coxa blackish. Legs beyond coxae brownish fulvous, their tarsi brown. Wings subhyaline, the stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, Mt. Bogong, 1,700 m., Vict., Australia, Feb. 14 (Townes).

15. Oxyserphus calcaratus, new species

Figures 61 (♀ metapleurum and propodeum); 390 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 1.9 mm. long. Flagellum enlarged at apex, its penultimate segment 1.65 as wide as second segment, the last segment 1.3 as wide as penultimate. Second segment of flagellum 3.3 as long as wide. Angulation of radial vein with a short acute spur that projects baso-caudad. Ovipositor sheath 1.25 as long as hind tibia, shaped as in figure 390. Structure otherwise as described for *O. leiopleurum*.

Head, abdomen, and ovipositor sheath blackish. Mandible and clypeus light brown. Palpi stramineous. Scape and pedicel pale brown. Flagellum dark brown. Thorax brownish fulvous, the prepectus, center of mesoscutum, metathorax, and propodeum dark brown. Legs and tegula stramineous. Wings tinged with stramineous, the stigma and strong veins pale brown.

Type: ♀, Mt. Glorious, Queensland, Australia, January 25 (Townes).

16. Oxyserphus brevicaulis, new species

Figures 62 (♀ metapleurum and propodeum); 391 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.2 mm. long. Body moderately proportioned. Mandible apparently with one tooth but upper edge hidden; possibly with a small tooth on upper edge. Palpi unusually slender. Second flagellar segment 2.2 as long as wide. Flagellum of uniform thickness to apex. Scrobe of pronotum at middle with three coarse horizontal grooves that converge forward and cross swelling at front of pronotum as a single groove. Front edge of mesopleurum with a patch of hairs at upper edge and a smaller patch just above horizontal groove, none between. Mesopleural suture with foveae from upper to lower end. Metapleurum and propodeum as in figure 62. Hind femur 4.2 as long as deep. Vertical portion of radial vein 0.4 as long as wide. Base of syntergite with median groove reaching 0.6 to thyridial interspace, with a shallow longitudinal trough sublaterally and another next to median groove. Ovipositor sheath 1.7 as long as hind tibia, shown in figure 391. The ovipositor figure is from a slightly oblique view that makes it appear narrower than it actually is.

Black. Labrum, mandible, and tegula brown. Palpi stramineous. Legs pale fulvous, the hind tarsus and hind tibial spurs brown. Wings hyaline, the stigma and strong veins blackish. Ovipositor sheath black.

Type: ♀, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes).

17. Oxyserphus capitatus, new species

Figures 63 (♀ metapleurum and propodeum); 392 (ovipositor sheath)

Front wing 1.9 to 2.1 mm. long. Body moderately proportioned. Clypeus smooth. Mandible moderately stout, with a long apical tooth and a very small tooth on upper edge far before apex. Flagellum of male faintly enlarged apically. Flagellum of female strongly enlarged at apex, its penultimate segment 1.55 as wide as second segment. Second segment of flagellum 2.7 as long as wide in male, 3.2 as long as wide in female. Penultimate segment of flagellum 2.1 as long as wide in male, 1.53 as long as wide in female. Side of pronotum with about 5 fine horizontal grooves that run forward from sulcus to cross collar. Mesopleural suture foveate above horizontal groove, with 2 foveae just below horizontal groove. Metapleurum and propodeum as in figure 63. Vertical part of radius 1.2 as long as wide. Base of syntergite with a median groove reaching 0.7 to thyridial interspace, on each side of median groove with a trough-like impression and a second similar impression sublaterally. Ovipositor sheath 1.0 as long as hind tibia, shaped as in figure 392.

Black. Palpi, labrum, tegula, and legs light brown to medium brown, the tarsi dark brown. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♀, Dead Horse Gap, 1,650 m., Snowy Mts., N. S. W., Australia, Feb. 2 (Townes). Figures 63 and 392 are from the type.

Paratypes: ♀, same data as type (Townes). ♂, Tom Groggin, 1,000 m., N. S. W., Australia, Feb. 2 (Townes).

18. Oxyserphus unisulcus, new species

Figures 64 (♀ metapleurum and propodeum); 393 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.0 to 2.3 mm. long. Body moderately stout. Mandible apparently with one tooth but with upper edge hidden; there is probably a small second tooth on upper edge. Second flagellar segment 2.1 as long as wide. Flagellum enlarged apically, the penultimate segment 1.15 as wide as second and last segment 1.25 as wide as penultimate segment. Side of pronotum with close weak horizontal wrinkles at center of scrobe, these convergent forward into a single deep groove that crosses swelling in front of scrobe. Front edge of mesopleurum with hairs at upper corner and no hairs between upper corner and the horizontal groove. Mesopleural suture with 6 foveae above the horizontal groove, with no foveae (type) or 2 foveae (paratype) below the groove. Metapleurum and propodeum as in figure 64. Hind femur 4.9

as long as deep. Vertical part of radial vein 1.2 as long as wide. Base of syntergite with a median groove reaching 0.8 to thyridial interspace, flattened and weakly impressed on each side of median groove and with a short weak groove sublaterally. Ovipositor sheath 0.85 as long as hind tibia, shaped as in figure 393.

Black. Labrum brown or blackish. Mandible, palpi, and scape brown. Tegula dark brown. Coxae brown, the hind coxa dark brown. Trochanters stramineous. Legs beyond trochanters in type light brown with middle and hind femora medium brown; in paratype light fulvous. Wings subhyaline, the stigma and strong veins dark brown. Ovipositor sheath blackish.

Type: ♀, Mt. Kainde, 1,900 m., Papua, New Guinea, Feb. 13 to Mar. 12, 1979, J. Sedlacek (Townes). Figures 64 and 393 are from the type.

Paratypes: 2♀, Baiyer River, 1,100 m., Papua, New Guinea, Feb. 25 to Mar. 9, 1979, J. Sedlacek (Townes).

19. Oxyserphus sulcatus Riek, new combination

**Cryptoserphus sulcatus* Riek, 1955. Australian Jour. Zool. 3: 116. ♀. des. Type: ♀, Australia: Marysville in Victoria (Canberra). Examined in 1977.

Male: Unknown.

Female type: Front wing 2.2 mm. long. Structurally similar to *O. capitatus* but the ovipositor a little longer, 1.15 as long as hind tibia, and not quite as stout. The type specimen lacks the flagella, so no comparison of the flagellum is possible.

Black. Scape, pedicel, mouth parts, tegula, and legs fulvous, the tarsi tinged with brown. Wings subhyaline. Stigma and strong veins brown.

Specimen: ♀ (type), Marysville, Victoria, Australia, Feb. 28, 1932, A. P. Dodd (Canberra).

20. Oxyserphus nigriscutum Dodd

**Cryptoserphus nigriscutum* Dodd, 1915. Trans. Roy. Soc. South Australia 39: 388. ♀. des. Type: ♀ (lacking antennae and wings), Australia: Cairns district in Queensland (Adelaide). Examined in 1977.

Cryptoserphus nigriscutum Riek, 1955. Australian Jour. Zool. 3: 115. ♀. des. Australia: Belgrave in Victoria; Macpherson Range at 2,600 ft. in Queensland.

Male: Unknown.

Female type: Wing length 1.8 mm. (estimated). Structurally similar to *O. capitatus*, but with ovipositor 1.2 as long as hind tibia and not as stout as that of *capitatus*. The type specimen is partially embedded in balsam on a point so that the face, mandible, and base of

syntergite are only partially observable. The type has the antennae and wings mounted on a slide (which was not studied).

Head and abdomen blackish. Thorax brown. Mouth parts, tegula, and legs fulvous. Wings subhyaline. Stigma and strong veins dark brown.

Specimen: ♀ (type, lacking antennae and wings), Cairns district, 1,500 ft., Australia, Sept. 18, 1913, A. P. Dodd (Adelaide).

2. FUSTISERPHUS, new genus

Figures 7 (side view); 31 (front wing)

Front wing 2.2 to 4.1 mm. long. Body moderately stout, more or less compressed. Clypeus weakly to moderately convex, its apex with a moderately wide truncation. Apical margin of clypeus simple, blunt to moderately sharp. Cheek with or without a groove from eye to mandible. Occipital carina present dorsally and dorsolaterally, absent laterally and below. Mandible moderately stout, with a subapical tooth on upper edge. Flagellum slender or moderately slender, without distinct tyloids. Notaulus present or absent, when present about as long as tegula. Collar of pronotum and scrobe smooth to rugulose and/or finely wrinkled. Front dorsolateral part of pronotum with an evenly convex swelling, without a tubercle or carina. Front of mesopleurum with a marginal band of hairs that is complete or interrupted. Horizontal groove on mesopleurum incomplete, reaching only $0.7 \pm$ the distance toward mesopleural suture. Mesopleural suture present or absent, sometimes partly or completely foveate. Metapleurum anteromedially with a hairless polished area that is bordered by a depression with dense hairs, the posterior part of metapleurum sculptured. Upper front part of metapleurum without a carina running dorsad to lateral upper edge of propodeum. Propodeum exceptionally long, its apex somewhere between basal 0.4 and apex of hind coxa. Longer spur of hind tibia reaching from basal 0.3 to apical 0.2 of hind basitarsus. Stigma moderately short and deep. Radial vein arising from midlength of stigma, its vertical part varying from 1.2 as long as wide to very short or obliterated. Radial cell short to moderately long, its costal side 0.6 to 1.5 as long as depth of stigma. Costal vein extending hardly at all beyond apex of radial cell. Abdomen usually without a stalk, in one species with a stalk that is 0.4 as long as deep. Base of syntergite with up to 5 longitudinal grooves, sometimes without grooves. Ovipositor sheath 0.6 to 1.2 as long as hind tibia, covered with erect hairs, evenly curved, not narrowed apically but a little expanded, its apex rounded or in one species the ovipositor is tapered to a somewhat pointed apex with the apical part more strongly curved.

Genotype: *Fustiserphus reticulatus*, new species.

The generic name is from the Latin *fustis* (club), plus *Serphus*, referring to the club-shaped ovipositor sheath.

This genus contains several species in the Australian and Neotropic

regions, and one in the United States.

Key to the species and subspecies of *Fustiserphus*

1. Notaulus present, at least as an impression or a weak trace. Cheek with a vertical groove from eye to mandible. Metapleurum smooth and hairless except around margins. 2
 Notaulus absent. Cheek without a vertical groove. Metapleurum with hind 0.3 or more sculptured. 3
2. Head and body fulvous. Thorax moderately compressed, about 2.7 as long as wide. Notaulus distinct. Longer spur of hind tibia about 0.8 as long as hind basitarsus. New Zealand.
 1. *longiceps*, new species (p. 50)
 Head and body black. Thorax strongly compressed, about 3.4 as long as wide. Notaulus faint. Longer spur of hind tibia about 0.3 as long as hind basitarsus. Ecuador.
 2. *compressus*, new species (p. 50)
3. Abdomen with a stalk that is about 0.4 as long as high. Scrobe of pronotum mat and often also with fine wrinkling. Scape and pedicel usually fulvous. New Zealand.
 3. *intrudens* Smith (p. 51)
 Abdomen without a stalk. Scrobe of pronotum polished, smooth or with some wrinkling. Scape and pedicel ferruginous or black. 4
4. Mesopleurum with horizontal wrinkles in front of speculum. Upper half of lateral aspect of collar with fine wrinkling. 5
 Mesopleurum smooth in front of speculum. Upper half of lateral aspect of collar smooth. 6
5. Hind femur reddish brown to black. Tip of ovipositor sheath not tapered. Chile and Ecuador.
 4a. *unidentatus unidentatus* Kieffer (p. 53)
 Hind femur ferruginous. Tip of ovipositor sheath faintly tapered. Chile.
 4b. *unidentatus rufipes*, new subspecies (p. 54)
6. Vertex moderately convex. Propodeum finely reticulate, with a strong median carina. Costa Rica and Colombia.
 5. *niger*, new species (p. 54)
 Vertex flat or weakly concave. Propodeum coarsely reticulate, without a median carina or with a weak median carina. 7
7. Coxae and scape ferruginous. United States.
 6a. *reticulatus reticulatus*, new subspecies (p. 55)
 Coxae and scape black. Argentina.
 6b. *reticulatus grossus*, new subspecies (p. 56)

1. Fustiserphus longiceps, new speciesFigure 65 (σ metapleurum and propodeum)

Front wing 3.1 to 3.7 mm. long. Temple about 0.74 as long as eye. Vertex in profile faintly convex. Cheek about 1.3 as long as basal width of mandible, with a vertical groove. Occipital carina present across top of head and to a little below center, absent ventrad. Clypeus unusually long, very weakly convex. Thorax about 2.7 as long as wide. Notaulus sharp, curved, about as long as tegula. Side of pronotum polished and smooth, the upper half of side aspect of collar with a longitudinal carina. Swelling on upper front part of lateral aspect of pronotum with a weak ridge or carina on its upper and lateral margins (this ridge or carina lacking in other species of the genus). Mesopleurum polished, smooth, hairless except beneath tegula and except for about 5 hairs on its lower half. Metapleurum polished, smooth and hairless except for a marginal band of fine dense hairs and some wrinkling next to hind coxa. Side and apical 0.5 of propodeum coarsely reticulate, the basal 0.5 of upper side of propodeum smooth and polished except for a median longitudinal carina. Apex of propodeum near basal 0.4 of hind coxa. Costal side of radial cell about 0.6 as long as depth of stigma. Longer spur of hind tibia about 0.8 as long as hind basitarsus. Lower profile of sternite 1 with a 70° triangular projection in male, with a long projection with rounded lower edge in female (this specialization lacking in other species of the genus). Ovipositor sheath 0.5 as long as hind tibia.

Fulvous. Pedicel fulvous to fuscous. Flagellum fuscous, often fulvescent basally, in female with a white band that covers 1.4 segments. Tegula, front margin of pronotum, hind margin of mesoscutum and metanotum, lower margin of metapleurum, and special margin of propodeum reddish brown to dark brown. Apices of coxae and legs beyond coxae more or less brown (especially the hind legs), the basal 0.2 of tibiae whitish. Wings subhyaline, the front wing with a brown area behind stigma and a smaller brown area at juncture of basal and median veins. Stigma and main veins blackish. Ovipositor sheath fulvous.

Type: σ , Ngongotaha, Rotorua, New Zealand, Dec. 20-21, 1970, John Bain (Townes).

Paratypes: 4 σ , Forestry Research Institute, Rotorua, New Zealand, Dec. 14-15, and 30-31, 1970, and Mar. 13-15, 1971, John Bain (Townes). \varnothing , Wiltons Bush, New Zealand, Feb. 5, 1923, G. V. Hudson (Cambridge).

2. Fustiserphus compressus, new speciesFigures 66 (\varnothing metapleurum and propodeum); 394 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.8 mm. long. Temple 1.0 as long as eye.

Vertex short, its profile moderately convex. Cheek 0.8 as long as basal width of mandible, with a vertical groove. Occipital carina present above, absent laterally and below. Clypeus difficult to observe because covered with glue but apparently only weakly convex. Labrum large. Thorax strongly compressed, 3.4 as long as wide. Notaulus faint, curved, about as long as the tegula. Side aspect of pronotum smooth and polished, without wrinkles or carinae. Mesopleurum smooth and polished, with hairs near its upper edge, elsewhere bare. Metapleurum smooth, polished, and hairless except for a narrow margin of dense fine hairs and a narrow edge of wrinkling posteriorly. Propodeum irregularly reticulate, the upper side of its basal 0.4 smooth except for a median carina. Apex of propodeum near midlength of hind coxa. Costal side of radial cell 1.2 as long as depth of stigma. Longer spur of hind tibia 0.3 as long as hind basitarsus. Ovipositor sheath 0.6 as long as hind tibia, decurved apically, tapered gradually from base to an apical point (fig. 394).

Black. Mandible, trochanters, apices of femora, front tibia, and front tarsus brownish fulvous. Middle and hind tibiae and tarsi dark brown. Tegula blackish. Wings hyaline, the stigma and main veins black.

This species differs from other species of *Fustiserphus* in the somewhat longer median horizontal groove on the mesopleurum, short tibial spurs, and tapered ovipositor sheath. Its generic assignment is uncertain.

Type: ♀, east of Papallacta, 2,900 m., Ecuador, Jan. 14-17, 1971, Luis Peña (Townes).

3. *Fustiserphus intrudens* Smith

Figures 67 (♀ metapleurum and propodeum); 395 (ovipositor sheath)

- **Proctotrubes intrudens* Smith, 1878. Trans. Ent. Soc. London 1878: 5. "♀" = ♂, and [♀] var. Type: ♂, New Zealand: Canterbury District (London). Examined in 1975.
- Proctotrubes intrudens* Hutton, 1881. Catalogues of the New Zealand Diptera, Orthoptera, Hymenoptera . . . , p. 130. copy of original description.
- **Proctotrypes obliquus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 338. ♂. key, des. Type: ♂, USA: Texas (Washington). Examined in 1975. Type locality incorrect; should be New Zealand. New synonym.
- Proctotrypes intrudens* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn.
- Phaenoserphus intrudens* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Phaenoserphus obliquus* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Phaenoserphus obliquus* Kieffer, 1914. Das Tierreich 42: 33. ♂. key, des. "USA: Texas".
- Phaenoserphus intrudens* Kieffer, 1914. Das Tierreich 42: 36. ♀. key, des. New Zealand: Canterbury Province.
- Phaenoserphus obliquus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. "Canada: Ontario. USA: Maryland; Texas".
- Proctotrubes intrudens* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 9. ♂. type data.
- Phaenoserphus obliquus* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♂. type data.

Front wing 2.6 to 3.4 mm. long. Temple about 0.25 as long as eye. Profile of vertex very weakly convex. Cheek about 2.5 as long as basal width of mandible, without a vertical groove. Occipital carina present above, absent laterally and below. Clypeus moderately convex. Thorax about 2.6 as long as wide. Notaulus absent. Lateral aspect of pronotum faintly to strongly mat, smoother near hind corner and below, its scrobe usually with fine weak oblique wrinkles. Mesopleurum with fine weak rugulosity on upper front part and with fine weak wrinkles near middle coxa, elsewhere smooth. Speculum and median part of lower 0.4 of mesopleurum hairless. Front 0.55± of metapleurum smooth, polished, and hairless, the rest punctato-rugulose. Propodeum mat and with small reticulations, without a median carina. Apex of propodeum near apical 0.3 of hind coxa. Longer spur of hind tibia about 0.57 as long as hind basitarsus. Costal side of radial cell about 0.8 as long as depth of stigma. Abdomen with a short stalk that is about 0.4 as long as high (abdomen without a stalk in the other species of *Oxyserphus*). Ovipositor sheath about 0.68 as long as hind tibia, evenly curved, somewhat widened apically and rounded at apex (fig. 395).

Black. Scape and pedicel fulvous or sometimes brown or black. Legs fulvous, the basal 0.3 of hind coxa usually brownish, in males the legs sometimes mostly brown or fuscous. Apex of hind tibia usually dusky. Tegula fulvous to blackish. Wings hyaline, the stigma and strong veins pale brown. Female with apical 0.3± of syntergite and all of following tergites fulvous: Ovipositor sheath reddish brown.

Specimens: 46♂, 29♀ from the following localities in New Zealand: Aniseed Valley, Aniwaniwa, Atawhai at Nelson, Canaan, Dun Mt. at 3,000 ft., D'Urville Island, Fletcher Creek, Flora River, Governor's Bay, Haumoana at Hawkes Bay, Kelly's Creek Camp Ground near Otira, Little Barrier Island (at Te Titoki Point, Thumb Track, Turnero Stream, and Waipawa Stream bed), Mt. Robert, Red Hills at Wairau (3,600 ft.), Rotorua, Saddle Hill (3,000 ft.) at Nelson, South Borland River at 760 m., Stephens Island, and Stewart Island (at Mason Bay, Rakeahua River, and Table Hill). Collection dates range from October 31 (at Nelson) to March 20 (at Rotorua) and March 23 at Wairau in the Red Hills. Most collections are from November to mid March. The majority of the specimens were collected by sweeping grass and other vegetation and in Malaise Traps.

A specimen in Washington is labeled as found in a shipment of apples from Tasmania. The type of synonymous name *obliquus* is labeled "Texas" and Muesebeck and Walkley (1951) recorded the species from Canada and USA. These locality records are presumed to be incorrect.

This species is widespread in New Zealand, and judging by collections it is the commonest serphid in that country.

4. Fustiserphus unidentatus Kieffer

Front wing 2.2 to 3.7 mm. long. Temple about 0.75 as long as eye.

Profile of vertex moderately convex. Cheek about 1.25 as long as basal width of mandible, without a vertical groove. Occipital carina present above, absent laterally and below. Clypeus strongly convex. Thorax about 2.7 as long as wide. Notaulus absent. Side of pronotum weakly mat on upper 0.3±, the rest polished. Upper 0.5± of collar with fine wrinkling that is usually a little oblique to the axis of collar, sometimes the wrinkling invading scrobe of pronotum. Mesopleurum with horizontal wrinkles in front of speculum and oblique wrinkles next to middle coxa, with fine hairs on upper front corner and lower 0.4 (except for central part of lower 0.4). Metapleurum with front 0.6± smooth, polished, and hairless except for an oblique impression above the middle and a narrow band of fine hairs on front and lower margins. Hind 0.4± of metapleurum rugulosopunctate. Propodeum with moderately small reticulations, without a median carina. Apex of propodeum near apex of hind coxa. Longer spur of hind tibia about 0.54 as long as hind basitarsus. Costal side of radial cell about 0.8 as long as depth of stigma. Ovipositor sheath 0.9 to 1.2 as long as hind tibia, evenly curved, its apex rounded.

Black. Palpi stramineous. Apical segments of female abdomen dark brown. Wings hyaline, the stigma and strong veins black. Coloration of legs and ovipositor sheath variable, according to the subspecies.

Two subspecies are recognizable. Both occur in Chile. The typical subspecies ranges northward to Ecuador.

4a. Fustiserphus unidentatus unidentatus Kieffer

Figures 68 (♀ metapleurum and propodeum); 396 (ovipositor sheath)

- **Proctotrypes unidentatus* Kieffer, 1904. Rev. Chilena Hist. Nat. 8: 145. ♂, ♀. des. Types: ♂, ♀, Chile: Concepción (lost). Description adequate for identification.
Cryptoserphus unidentatus Kieffer, 1909. Genera Insectorum 95: 7. syn.
Cryptoserphus unidentatus Kieffer, 1914. Das Tierreich 42: 42. ♂, ♀. key, des. Chile: Concepción.

Ovipositor sheath about 1.15 as long as hind tibia, its tip slightly widened.

Black. Tegular brown. Legs black. Front leg beyond trochanter fulvous, its femur fuscous basally. Middle and hind femora dark brown or reddish brown to black, their apical 0.1 paler. Middle and hind tibiae and tarsi light reddish brown to blackish. Ovipositor sheath light reddish brown to blackish, usually darker at tip (fig. 396).

Specimens from Chile: 4♂, Butamalal, Arauco, Jan. 21 and 31, 1954, Luis Peña (Ottawa). ♂, Chovellén, Maule, Dec. 5, 1953, Luis Peña (Ottawa). ♂, ♀, Concepción, Nov. 12-14 and 12-15, 1970, T. Cekalović (Townes). ♀, El Canelo, Santiago, Oct. 28-29, 1964, Luis Peña (Ottawa). 4♂, 2♀, El Coigo, Oct. to Nov., 1959, Luis Peña (Ottawa). 3♂, 4♀, Fundo Malcho, Linares, Oct., Nov., Dec., Feb.,

and Mar., 1956-1958, Luis Peña (Ottawa). 5♂, Fundo Malcho, Cordillera Parral, Oct. and Nov. 1956, and Mar. 1958, Luis Peña (Ottawa). ♂, Icalma, Malleco, Dec. 31, 1958, Luis Peña (Ottawa). 2♂, Las Cabras Cordillera, Feb. 8-15, 1959, Luis Peña (Ottawa). 4♂, Las Cabras, Chillán Vulcán, Ñuble, Feb. 8-15, 1959, Luis Peña (Ottawa). ♂, Las Trancas, Ñuble, Feb. 15-18, 1959, Luis Peña (Ottawa). 4♂, 11♀, Las Cruces, Cordillera Parral, Oct. 1958, Luis Peña (Ottawa). 2♂, Los Maitenes, 1200 m., Oct. 16 and 19, 1954, Luis Peña (Ottawa). 10♂, 5♀, Pichinahuel, Cordillera Nahuelbuta, Jan. 1-10 and 20-28, 1959 and Oct. 1, 1959, Luis Peña (Ottawa). ♀, Recinto, Ñuble, Nov. 22, 1952, Luis Peña (Ottawa). 4♀, Rio Mañihuales, 21 kilometers east of Puerto Aisén, Jan. 26-28, 1961, Luis Peña (Townes). ♂, Villarrica, 20 kilometers north of Villarrica Lake, Cautín, Jan. 28-, 29, 1965, Luis Peña (Ottawa).

Specimens from Ecuador: ♀, Pimo (north of Cañar), 3200 m., Dec. 10-12, 1970, Luis Peña (Townes).

This subspecies is known from Chile and Ecuador.

4b. Fustiserphus unidentatus rufipes, new subspecies

Ovipositor sheath about 0.9 as long as hind tibia, its tip faintly tapered.

Tegula, trochanters, femora, and tibiae fulvous. Front tarsus light brown, middle tarsus brown, and hind tarsus dark brown.

Type: ♀, Dalcahue, Chiloé Island, Chile, Jan. 17 to Feb. 14, 1962, Luis Peña (Townes).

Paratypes: ♀, same data as type (Townes). ♀, Puerto Cisnes, Aisén, Chile, Feb. 1961, Luis Peña (Townes).

5. Fustiserphus niger, new species

Male: Unknown.

Female: Front wing 3.2 to 3.6 mm. long. Temple about 0.68 as long as eye. Profile of vertex moderately convex. Cheek about 1.7 as long as basal width of mandible, without a vertical groove. Occipital carina present above, absent laterally and ventrally. Clypeus strongly convex. Thorax about 2.7 as long as wide. Notaulus absent. Side of pronotum smooth and polished, without wrinkling or carinae. Mesopleurum smooth and polished, with hairs in an anterodorsal area and on most of lower 0.4. Metapleurum smooth and polished with hind part rugulose, with hairs posteriorly and near front and lower margins. Propodeum reticulately wrinkled, with a strong median carina, the basal 0.35 of its upper side smooth except for the median carina. Apex of propodeum at apex of hind coxa. Longer spur of hind tibia 0.4 as long as hind basitarsus. Costal side of radial cell 1.05 as long as depth of stigma. Ovipositor sheath about 1.08 as long as hind tibia, evenly curved, weakly widened toward tip, its apex rounded.

Black. Palpi blackish brown. Tegula fulvous. Apices of femora pale brown. Front tibia and front and middle tarsi dark brown. Wings hyaline, the stigma and strong veins medium brown.

Type: ♀, in montane rain forest, Cartago at 2640 m. (9° 40' N, 83° 50' W), Cerro Las Vueltas, Costa Rica, May 18-20, 1973, J. Helava (Ottawa).

Paratype: ♀, Tunja, Colombia, May 30, 1946, E. A. Chapin (Washington).

6. *Fustiserphus reticulatus*, new species

Male: Unknown.

Female: Front wing 3.5 to 4.1 mm. long. Temple about 0.5 as long as eye. Profile of vertex flat or weakly concave. Cheek about 2.0 as long as basal width of mandible, without a vertical groove. Occipital carina strong above, absent laterally and ventrally. Clypeus strongly convex. Thorax about 2.5 as long as wide. Notaulus absent. Side of pronotum smooth and polished, without wrinkles or carinae. Mesopleurum smooth and polished, with hairs on its upper front part and on most of lower 0.4. Metapleurum smooth and polished, with very coarse wrinkles next to hind coxa, and along upper and lower edges, with a band of hairs around the edges that is wider ventrally and caudally. Propodeum with strong, coarse, reticulate wrinkling, and a weak median carina, without smooth areas. Apex of propodeum at apex of hind coxa. Longer spur of hind tibia about 0.6 as long as hind basitarsus. Costal side of radial cell about 1.15 as long as depth of stigma. Ovipositor sheath about 0.72 as long as hind tibia, evenly curved, its tip weakly widened and apex rounded.

Coloration variable, according to the subspecies.

This species ranges from the United States to Argentina. Two subspecies are recognized.

6a. *Fustiserphus reticulatus reticulatus*, new subspecies

Figure 397 (ovipositor sheath)

Wrinkling on propodeum and metapleurum a little less coarse than in the subspecies *grossus*.

Black. Scape, pedicel, mouth parts, legs, and ovipositor sheath ferruginous, the ovipositor sheath often infusate apically. Wings hyaline, the stigma and strong veins black.

Type: ♀, Portal, Ariz., U. S. A., Sept. 1, 1974, H. and M. Townes (Townes).

Paratypes: ♀, Gull Lake Biological Station, Kalamazoo Co., Mich., U. S. A., Aug. 25, 1969, R. L. Fischer (East Lansing). 2♀, reared from *Evetria buoliana*, Monument, Colo., Aug. 23, 1916, G. G. Hedgcock (Washington).

This subspecies is known from the United States in Michigan, Colorado, and Arizona.

6b. Fustiserphus reticulatus grossus, new subspecies

Figure 69 (♀ metapleurum and propodeum)

Wrinkling on propodeum and metapleurum a little stronger and coarser than in the subspecies *reticulatus*.

Black. Palpi, front and middle tibiae, and front and middle tarsi ferruginous. Tegula blackish. Front femur dark ferruginous, fuscous basally. Apex of middle femur with a ferruginous tinge. Wings hyaline, the stigma and strong veins black. Ovipositor sheath blackish brown.

Type: ♀, Jujuy, Argentina, Jan. 15, 1966, H. and M. Townes (Townes).

3. SMINTHOSERPUS, new genus

Figures 8 (side view); 32 (front wing)

Front wing 2.4 to 3.3 mm. long. Body stout. Clypeus moderately wide, transversely wrinkled, weakly convex, the median 0.5 of its apex truncate or weakly concave. Apical margin of clypeus thin and sharp. Cheek with a deep groove from eye to mandible. Occipital carina present above and laterally, evanescent below. Mandible short and stout, with a small preapical tooth on upper edge. Flagellum moderately slender, in male sometimes with tyloids. Notaulus about as long as tegula. Upper part of collar and of pronotal scrobe weakly rugulose. Upper antero-lateral part of pronotum with a rounded swelling, not a distinct tubercle. Front edge of mesopleurum with a complete band of hairs. Horizontal groove across mesopleurum complete. Mesopleural suture foveate throughout. Metapleurum with anterodorsal $0.4\pm$ nearly smooth, the rest strongly punctato-reticulate. Upper front part of smooth part of metapleurum with a carina extending dorsad to upper margin of propodeum. Longer spur of hind tibia reaching to basal $0.45\pm$ of hind basitarsus. Stigma moderately deep. Radius originating near apical 0.4 of stigma, its vertical part about 0.7 as long as wide. Radial cell short, its costal side 0.3 to 0.7 as long as depth of stigma. Costal vein ending just beyond apex of radial cell. Abdomen without a stalk. Base of syntergite with 11 to 15 longitudinal grooves. Ovipositor sheath 0.45 to 0.88 as long as hind tibia, slender, terete, hairless, weakly curved, and gradually tapered to apex.

Genotype: *Sminthoserphus alvarengai*, new species.

The generic name is from *σμίθθος* (mouse) plus *Serphus*, referring to the mouse-like appearance of the body and the ovipositor.

This is a Neotropical genus. Five species are known.

Key to the species of Sminthoserphus

1. Apical part of syntergite without setiferous punctures or with very few small punctures (less than 40). 2
 Apical part of syntergite with numerous moderate sized setiferous punctures (about 250). 3
2. Apical part of syntergite and the following tergite without punctures. Radial cell narrowed posteriorly to a point. Coxae fulvous. Mexico. 1. defrictus, new species (p. 57)
 Apical part of syntergite with about 25 small sparse punctures. Tergite following the syntergite with about 20 medium sized punctures on its dorsal basal part. Radial cell of equal length throughout, its hind side truncate. Coxae dark brown, paler apically. Southeastern Brazil. 2. sparsus, new species (p. 58)
3. Mesopleurum between speculum and pronotal spiracle smooth, not wrinkled or rarely with 2 short wrinkles. Vestiges of median and intercubital veins colored brown. Legs bright ferruginous to ferruginous brown. Southern Brazil. 3. alvarengai, new species (p. 58)
 Mesopleurum between speculum and pronotal spiracle with two or three long horizontal wrinkles. Vestiges of median and intercubital veins hyaline. 4
4. Coxae and scape blackish. Sculptured part of metapleurum punctatose. Chile. 4. piceipes, new species (p. 59)
 Coxae and scape fulvous. Sculptured part of metapleurum with several strong parallel wrinkles. Chile. 5. pallipes, new species (p. 59)

1. Sminthoserphus defrictus, new species

Male type: Front wing 3.0 mm. long. Flagellum without tyloids. Hairs along upper edge of pronotal scrobe confined to upper 0.12 of pronotum. Scrobe of pronotum smooth. Mesopleurum between speculum and pronotal spiracle almost smooth, with a single weak wrinkle. Postero-ventral half of metapleurum sharply punctato-reticulate. Costal side of radial cell 0.36 as long as depth of stigma, the radial cell narrowing from front edge toward the rear, its hind end pointed. Apical half of syntergite and all of the following tergite hairless and impunctate.

Black. Palpi brown. Scape fulvous basally, fuscous apically. Tegula and legs fulvous, the tarsi light brown. Wings hyaline, the stigma and strong veins dark brown. Weak veins not pigmented.

Female: Unknown.

Type: ♂, El Salto, 9,000 ft., Durango, Mexico, July 1, 1964,

W. R. M. Mason (Ottawa).

2. Sminthoserphus sparsus, new species

Male: Unknown.

Female: Front wing 2.9 to 3.3 mm. long. Hairs along upper edge of pronotal scrobe confined to upper 0.20 of pronotum. Scrobe of pronotum smooth. Mesopleurum between speculum and pronotal spiracle with 2 or 3 strong horizontal wrinkles. Lower hind 0.65 of metapleurum sharply punctato-reticulate, the upper front part of the sculptured area usually with about 2 horizontal wrinkles. Costal side of radial cell about 0.33 as long as depth of stigma, the cell of uniform length to its hind side, the hind side truncate. Apical 0.4 of syntergite with a very few (about 20) very small setiferous punctures. Tergite following the syntergite with a dorsal patch of medium sized punctures that are separated by about 3 times their diameter. Ovipositor sheath about 0.65 as long as hind tibia.

Black. Palpi, scape, pedicel, tegula, and legs beyond coxae light brownish fulvous, the hind tarsus fuscous and hind tibia infuscate apically. Basal segments of flagellum more or less fulvous. Coxae blackish brown, stained with fulvous apically. Wings with a faint tinge of brown. Stigma blackish. Strong veins dark brown. Weak veins tinged with dark brown.

Type: ♀, S. J. Barreiro, Serra da Bocaina, 1,650 m., Brazil, Nov. 1968, Alvarenga and Seabra (Townes).

Paratypes: 3♀, same data as type (Townes).

3. Sminthoserphus alvarengai, new species

Male: Unknown.

Female: Front wing 2.9 to 3.7 mm. long. Hairs along upper margin of pronotal scrobe restricted to upper 0.25 of pronotum. Pronotal scrobe smooth. Mesopleurum between speculum and pronotal spiracle smooth or sometimes with two short weak wrinkles. Lower hind 0.7 of metapleurum strongly punctato-reticulate. Costal edge of radial cell about 0.5 as long as depth of stigma, somewhat narrowed posteriorly, its hind side narrowly truncate. Apical 0.3 of syntergite and dorsal part of the following tergite with areas of moderately large punctures that are separated by about 3 times their diameter. Ovipositor sheath about 0.45 to 0.75 as long as hind tibia (0.45 as long in the type).

Black. Palpi, scape, pedicel, tegula, and legs entirely fulvous or sometimes darker as follows: Scape, pedicel, and coxae varying from clear fulvous to brown; hind tarsus and more or less of hind tibia reddish brown. Basal segments of the flagellum more or less fulvous. Wings with a faint tinge of brown. Stigma blackish. Strong veins dark brown. Weak veins tinged with dark brown.

Type: ♀, S. J. Barreiro, Serra da Bocaina, 1,650 m., Brazil, Nov.

1969, Alvarenga and Seabra (Townes).

Paratypes: 2♀, same locality and collectors as type, November 1968 (Townes). ♀, same locality and collectors as type but altitude 1,600 m., Nov. 4-7, 1967 (Townes).

This is a species of southern Brazil. It is named in honor of Col. Moacir Alvarenga.

4. Sminthoserphus piceipes, new species

Front wing 2.8 to 3.0 mm. long. Male flagellum with tyloids on segments 3-11, the tyloids broadly elliptic, a little raised and convex. Tyloids on segments 3 and 11 small, those on segments 4-10 about 0.4 as long as the segments. Hairs along upper margin of pronotal scrobe restricted to upper 0.27 of pronotum. Pronotal scrobe rugulose in male, a little rugulose or smooth in female. Mesopleurum between speculum and pronotal spiracle with 3 strong horizontal wrinkles. Lower hind 0.7 of metapleurum strongly punctato-reticulate. Costal edge of radial cell about 0.7 as long as depth of stigma. Radial cell narrowed posteriorly, its hind side very narrowly truncate. Apical 0.3 of syntergite and dorsal part of following tergite with areas of moderately large punctures that are separated by about 2 to 4 times their diameter. Ovipositor sheath about 0.88 as long as hind tibia.

Black. Tegula ferruginous. Palpi and legs blackish brown. Wings hyaline, the stigma and strong veins black or dark brown. Weak veins unpigmented.

Type: ♀, Dalcahue, Chiloé Island, Chile, Jan. 17 to Feb. 14, 1962, Luis Peña (Townes).

Paratypes: 2♂, 1♀, Pichinahuel (one of the three specimens labeled "11-1,400 m."), Arauco, Chile, Jan. 20 to 28, 1959 and Nov. 14, 1956, Luis Peña (Ottawa). ♂, Caramávida, Arauco, Chile, Oct. 1-6, 1954, Luis Peña (Ottawa). ♂, Fundo Malcho, Cordillera Parral, Chile, Jan. 1958, Luis Peña (Ottawa). ♀, 15 kilometers west of Victoria, 200 m., Malleco, Chile, Dec. 28 to 31, 1976, J. Peck (Ottawa).

5. Sminthoserphus pallipes, new species

Front wing 2.9 to 3.0 mm. long. Male flagellum with tyloids on segments 2-11, the tyloids broadly elliptic, convex, and polished. Tyloids on segments 2, 3, and 11 very small, those on segments 4-10 larger, about 0.3 as long as the segments. Hairs along upper margin of pronotal scrobe restricted to upper 0.2 of pronotum. Scrobe of pronotum faintly rippled. Lower hind 0.6 of metapleurum with several strong but irregular wrinkles that are almost horizontal, rugulose between and below the wrinkles. Costal edge of radial cell 0.7 as long as depth of stigma. Radial cell narrowed posteriorly, the hind end narrowly truncate. Apical 0.3 of syntergite and upper part of following tergite with areas of moderately large punctures that are separated by 2 to 4

times their diameter. Ovipositor sheath 0.83 as long as hind tibia.

Black. Scape, pedicel, palpi, tegula, and legs yellowish fulvous to brownish fulvous, the hind tarsus light brown. Flagellum brown. Wings hyaline. Stigma and strong veins light to dark brown. Weak veins not pigmented.

Type: ♀, Rio Mañihuales, 20 kilometers east of Puerto Aisén, Chile, Jan. 26 to 28, 1961, Luis Peña (Townes).

Paratype: ♂, El Coigo, Curicó, Chile, Jan. 1961, J. Foerster (Ottawa).

4. Genus AFROSERPHUS

Figures 9 (side view); 33 (front wing)

Afroserphus Masner, 1961. Parc National de l'Upemba-Mission G. F. De Witte fasc. 60 (4): 37.

Type: *Afroserphus bicornis* Masner. Original designation.

Front wing about 3.2 mm. long. Body stout. Head wide. Frons with a swelling on each side, the swelling sometimes in the form of a short triangular horn. Clypeus very wide and short, its apex broadly truncate with margin reflexed. Cheek very short, with a groove from eye to mandible. Temple strongly convex. Occipital carina absent from lower 0.3± of head. Mandible elongate, with a single point. Maxillary palpus short. Flagellum without tyloids. Notaulus absent. Mesoscutum with an anterolateral punctato-rugose area in the position of notaulus. Collar in the form of a high ridge. Anterodorsal part of lateral aspect of pronotum obliquely wrinkled. Upper part of lateral aspect of pronotum strongly convex. Hair area on front edge of mesopleurum interrupted. Horizontal groove across mesopleurum complete, its front part shallow and a little down-slanted. Mesopleural suture foveate. Transverse furrow in front of scutellum with a pair of short longitudinal carinae. Scutellum large, rugose, its apex broad and rear end and sides descending vertically. Metapleurum coarsely rugose, with small smooth areas anteriorly. Longer spur of middle tibia curved and more than half as long as middle basitarsus, the longer spur of hind tibia relatively shorter. Tarsal claws with 2 or 3 slender parallel teeth near middle. Stigma subcircular. Vertical part of radius about 0.3 as long as wide. Costal side of radial cell about 0.4 as long as depth of stigma. Costa ending at apex of radius. Abdomen without a distinct stalk. Base of syntergite without longitudinal grooves. Ovipositor sheath short, broad, with relatively sparse hairs, its apex narrowly rounded.

This is an Ethiopian genus, with one described species. A second species is at hand, represented by a female (without hind legs) from Entebbe, Uganda. This specimen is in Ottawa.

Afroserphus bicornis Masner

**Afroserphus bicornis* Masner, 1961. Parc National de l'Upemba-Mission
G. F. De Witte fasc. 60 (4) : 39. ♂. des., figs. Type: ♂, Zaire: Lusinga in
Upemba Natl. Park at 1,760 m. (Tervuren). Type not seen.

Copy of original description: "Male: Black, shining; antennae dull yellow-brown, darkened toward apex; legs dirty-yellow, hind femur brown, coxae black; fore wing rather clear, slightly infuscated behind stigma.

"Head with two types of sculpture: upper part of frons and vertex smooth and shining, only with scattered punctures; the whole portion of face (including the horns) and that of clypeus and labrum roughly and irregularly reticulated throughout. Frons (between horns) only with a feeble trace of a keel. Antennae thread-like in shape; scape moderately elongated, pedicel transverse; no anellus present; all funicular joints distinctly elongated, the 3rd and apical one the longest; the surface of joints shows a dense granulose sculpture throughout in combination with intensive pilosity. No special patches of sculpture (like in some European genera), nor lateral sclerotized keels on joints present.

"Thorax intensively pilose, especially aside and on propodeum. Anterior part of propleurae with deep longitudinal striae; the posterior part (around the spiraculæ) finely punctured; lower part smooth, highly shining. Mesopleurae smooth and shining throughout. Metapleurae intensively pilose, so that the sculpture is not visible. Propodeum irregularly reticulated.

"Spur of tibia II very long, being nearly as long as metatarsus (20:25), remarkably curved. Spur of tibia III not so long and not so curved (!). Claw bearing at base two small hyaline teeth, situated close to each other, so that the claw itself looks semipectinated (Fig. 1).

"Length 6.2 mm.

"Holotype: 1♂, partially destroyed (deposited in Coll. Inst. Parcs Nat. du Congo et du Ruanda-Urindi, Bruxelles).

"Female: Unknown."

The type is from Lusinga in Upemba National Park, 1,760 m., Zaire.

5. Genus NOTHOSERPHUS

Figures 10 (side view); 34 (front wing)

Nothoserphus Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 263.

Type: *Nothoserphus mirabilis* Brues. Original designation.

Thomsonina Hellén, 1941. Notulae Ent. 21: 40. New synonym.

Type: *Proctotrupes boops* Thomson. Original designation.

Watanabeia Masner, 1958. Beitr. z. Ent. 8: 477. New synonym.

Type: *Disogmus afissae* Watanabe. Original designation.

Front wing 1.7 to 4.5 mm. long. Body stout. Head very short, transverse. Clypeus of moderate size, smooth, evenly convex, its apex

weakly convex and narrowly reflexed. Cheek with a strong vertical ridge, concave behind the ridge. Temple extremely short. Occiput flat or concave. Occipital carina complete, its upper part close to foramen magnum. Mandible very small, difficult to see. Flagellum with 11 segments (as in all other Serphidae), moderately long, in male with elliptic or linear tyloids. Notaulus moderately short to long and deep. Collar with a vertical carina. Anterolateral part of pronotum with a large swollen elevation. Front part of mesopleurum covered with hairs. Horizontal groove across mesopleurum broad, sometimes not distinct on front half of mesopleurum. Mesopleural suture foveate. Metapleurum with an anterodorsal smooth area that covers 0.2 to 0.4 of its surface. Dorsal face of propodeum very short, about 0.3 as long as width of scutellum, the propodeum in profile with a long downward slope that begins close to the base. Longer spur of hind tibia ending between basal 0.25 and basal 0.4 of hind basitarsus. Stigma deep and short. Vertical part of radius 1.3 to 0.4 as long as wide. Costal side of radial cell 0.25 to 0.65 as long as depth of stigma. Costa ending at or just beyond apex of radius. Abdomen with a stalk that is 0.3 to 1.1 as long as wide. Base of syntergite with a long median groove and sometimes short lateral grooves. Ovipositor sheath up to 0.4 as long as hind tibia, sometimes short enough to be retracted.

This genus occurs in the Oriental and Palearctic regions. It parasitizes larvae of Coccinellidae (Scymninae and Epilachninae). Seven species are known.

Key to the species of Nothoserphus

1. Notaulus short, about as long as tegula. Metapleurum with a smooth area that covers about 0.35 of its surface. Boops Group. 2
 Notaulus long, reaching past center of mesoscutum. Metapleurum without a smooth area or with a smooth area that covers less than 0.2 of its surface. 3
2. Trochanters and femora infuscate. Male tyloids (on flagellar segments 3-7) about 0.65 as long as the segments. Ovipositor sheath a little longer than in *N. scymni*. Northern Europe.
 1. boops Thomson (p. 63)
 Trochanters and femora yellowish. Male tyloids (on flagellar segments 3-7) about 0.35 as long as the segments. Ovipositor sheath a little shorter than in *N. boops*. Japan.
 2. scymni Ashmead (p. 64)
3. Top of head with a pair of erect blade-like processes. Side of pronotum coarsely rugose in and above the sulcus. Hind ends of notaulus separated by a narrow, wedge-shaped ridge. Mirabilis Group. Oriental Region. 7. mirabilis Brues (p. 68)
 Top of head without a pair of erect blade-like processes. Side of pronotum smooth or almost smooth in and above the sulcus. Hind ends of notauli separated by about the length of tegula. Afissae Group. 4

4. Lower half of side of pronotum with horizontal wrinkles. Median part of propodeum distinctly impressed. Front wing about 4.5 mm. long. Japan. 3. afissae Watanabe (p. 65)
Lower half of side of pronotum almost smooth. Median part of propodeum not impressed. Front wing 3.1 to 3.3 mm. long. . . 5
5. Groove in front of scutellum without longitudinal ridges (except at sides). Tergite following the syntergite with fine punctures only. Nepal. 4. aequalis, new species (p. 66)
Groove in front of scutellum with two strong submedian longitudinal ridges. Tergite following the syntergite with both fine punctures and coarser punctures. 6
6. Groove along anterolateral edge of mesoscutum (between notaulus and tegula) very shallow, indistinctly foveate near tegula. Larger punctures on the tergite following syntergite relatively small, separated by about 4.0 their diameter. Scape and pedicel blackish. Nepal and Taiwan. 5. debilis, new species (p. 66)
Groove along anterolateral edge of mesoscutum moderately deep, with about 5 large foveae. Larger punctures on the tergite following syntergite moderately large, separated by about 2.0 their diameter. Scape and pedicel light fulvous. China, Vietnam, and Java. . . 6. epilachnae Pschorn-Walcher (p. 67)

Boops Group

Front wing 1.7 to 2.4 mm. long. Top of head without projections. Tyloids on male flagellar segments 3-7, elliptic, convex. Notaulus about as long as tegula. Median lobe of mesoscutum without an impression next to notaulus. Prescutellar groove without longitudinal ridges. Upper front swelling of side of pronotum margined by a vertical carina, the side of pronotum smooth behind this swelling and in the sulcus. Upper front 0.35 of metapleurum smooth, the rest coarsely rugose. Ovipositor sheath about 0.4 as long as hind tibia.

Two species are known, one in Europe and one in Japan. Both parasitize coccinellids of the genus *Scymnus*.

1. Nothoserphus boops Thomson

**Proctotrupes boops* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 417. ♀. des. Lectotype: ♀ (labeled by Townes 1975 and hereby designated), Sweden: Stockholm (Stockholm). Examined in 1975. Sweden: Westergötland.

Proctotrypes boops Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn. *Serphus* (*Phaenoserphus*) *Boops* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 303. ♀. Thomson des. repeated in key. Sweden: Stockholm; Westergötland.

Phaenoserphus boops Kieffer, 1914. Das Tierreich 42: 26. ♀. key, des. Sweden: Stockholm; Westergötland.

- Thomsonina boops* Hellén, 1941. Notulae Ent. 21: 40. ♂, ♀. des. Finland. Sweden.
Thomsonina boops Pschorn-Walcher, 1958. Beitr. z. Ent. 8: 726, 727. ♂, ♀. key, syn., des., figs. Finland: Nystad. Sweden: Orebö.
Thomsonina boops Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 60. syn.
Thomsonina boops Eidmann, 1958. Ent. Tidskr. 79: 234. ♂, ♀. biol. Sweden: Visingsö. Host: *Scymnus nigrinus*.
Thomsonina boops Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 24, 26. key, figs.
Thomsonina boops Kozlov, 1971. Vses. ent. obshch. Trudy 54: 9. fig.
Thomsonina boops Kozlov, 1978. Opredelitel' nasekomykh evropeiskoy chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 546. ♀. des., figs. Finland. Sweden.

Tyloids each about 0.65 as long as the flagellar segments bearing them. Flagellar segments a little shorter than in *N. scymni*. Ovipositor sheath a little longer than in *N. scymni*.

Black. Scape blackish brown to black. Pedicel brownish to black. First flagellar segment light brown, the following flagellar segments progressively darker, or sometimes flagellum entirely blackish. Palpi brown or fuscous. Coxae blackish. Trochanters and femora fuscous. Front and middle tibiae and tarsi yellowish to brown. Hind tibia and tarsus brown to fuscous. Wings hyaline, the stigma and strong veins dark brown.

Specimen: ♂, Vallentuna, Uppsala, Sweden, July 15, 1974, K.-J. Hedqvist (Stockholm).

This species is known from Sweden and Finland. It has been reared from *Scymnus nigrinus* (Coccinellidae).

2. Nothoserphus scymni Ashmead

Figure 70 (♂ top of thorax)

- **Proctotrypes scymni* Ashmead, 1904. Jour. New York Ent. Soc. 12: 67. ♂, ♀. des. Type: ♀, Japan (Washington). Examined in 1975. Japan: Gifu. Hosts: *Scymnus dorcatomoides*; *Scymnus* larva.
Phaenoserphus scymni Kieffer, 1909. Genera Insectorum 95: 6. syn.
Phaenoserphus ? *scymni* Kieffer, 1914. Das Tierreich 42: 30. ♂, ♀. key, des.
Phaenoserphus ? *scymni* Watanabe, 1949. Insecta Matsumurana 17: 25. syn.
 "Undetermined serphid" Bernard, 1951. In Grassé: Traité de zoologie 10: 964. figs. of egg & larva. Japan. Host: *Scymnus* sp.
Thomsonina scymni Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 60. syn.
Thomsonina scymni Pschorn-Walcher, 1958. Beitr. z. Ent. 8: 725, 726, 727. ♂, ♀. key, syn., des., figs. Japan: Kanasawa.
Thomsonina scymni Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 7. ♀. type data.
Thomsonia (!) *scymni* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 9. fig.

Front wing 1.7 to 2.4 mm. long. Tyloids about 0.35 as long as the segments bearing them. Flagellar segments a little longer than in *N. boops*. Ovipositor sheath about 0.40 as long as hind tibia.

Black. Palpi, scape, pedicel, and legs beyond coxae yellow. Flagellum yellowish brown basally, darkening toward apex to dark brown. Tegula pale brown. Coxae medium brown. Wings hyaline, the stigma and strong veins brown.

Specimens: 2♀ (paratypes), Japan, A. Koebele (Washington). 3♂, Tokyo, Japan (Cambridge). 5♂, 16♀, reared from a scymnine, Japan, Koebele (Honolulu).

This species is known only from Japan. It has been reared from *Scymnus dorcatomoides*.

Afissae Group

Front wing 3.1 to 4.5 mm. long. Top of head without projections. Tyloids on male flagellar segments 5-7 or 4-8, each like a keel extending from base of the segment to a small tooth near apex (male of only *afissae* known). Notauli reaching to past center of mesoscutum, their hind ends separated by about the length of tegula. Median lobe of mesoscutum without an impression next to front part of notaulus. Prescutellar groove with or without a pair of longitudinal ridges. Upper front swelling of side of pronotum with a sharply rounded edge, behind the swelling smooth or almost so. Scrobe of pronotum smooth or more or less wrinkled. Metapleurum entirely coarsely rugose or a small upper front corner smoother. Ovipositor sheath very short, often concealed.

Four species are known, occurring in Japan and the Oriental Region. They parasitize phytophagous coccinellids of the genus *Epilachna*.

3. Nothoserphus afissae Watanabe

- **Disogmus afissae* Watanabe, 1954. Mushi 26: 5. ♂, ♀. des., figs. Type: ♀, Japan: Sapporo on Hokkaido (Sapporo). Type not seen. Host: *Epilachna admirabilis*. Species redescribed from paratypes by Pschorn-Walcher, 1958.
- Disogmus afissae* Watanabe, 1954. Kontyû 22: 28. ♂, ♀. des. Japan: near Tokyo. Hosts: *Epilachna admirabilis*; *Epilachna vigintioctopunctata*.
- Watanabeia afissae* Masner, 1958. Beitr. z. Ent. 8: 477. ♂, ♀. des., figs.
- Watanabeia afissae* Pschorn-Walcher, 1958. Beitr. z. Ent. 8: 726, 727, 728. ♂, ♀. key, des., figs. Japan: Hokkaido. Host: *Epilachna admirabilis*.
- Watanabeia afissae* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 60. Host: Coccinellidae larvae.
- Watanabeia afissae* Pschorn-Walcher, 1964. Insecta Matsumurana 27 (1): 3. Japan: Ongata near Tokyo, Sapporo in Hokkaido. Hosts: *Epilachna admirabilis*; *Epilachna vigintioctopunctata*.

Front wing about 4.5 mm. long. Tyloids on male flagellar segments 5-7, each like a keel extending from base of the segment to a small tooth near apex. Lower half of side of pronotum longitudinally wrinkled. Prescutellar groove with a pair of longitudinal ridges.

Median part of propodeum impressed.

Black. Palpi fulvous. Antenna fulvous on basal half, then darkened toward apex. Legs fulvous, their coxae fuscous. Wings subhyaline, the front wing with a brown cloud behind stigma. Stigma and strong veins dark brown.

Specimens: None at hand. Key and description from information given by Watanabe, 1954, and Pschorn-Walcher, 1958.

This species is known only from Japan. The specimens in the type series were reared from *Epilachna admirabilis* and *E. virgintioctopuncta*, phytophagous coccinellids.

4. Nothoserphus aequalis, new species

Figure 71 (♀ top of thorax)

Male: Unknown.

Female: Front wing 3.2 to 3.3 mm. long. Lower half of side of pronotum mostly smooth. Prescutellar groove smooth, without longitudinal ridges except at sides (the submedian ridges present in other species moved to sides where they are confluent with the carinae at sides). Median part of propodeum flattened but not impressed. Tergite following the syntergite with small punctures, without large punctures.

Black. Scape, pedicel, palpi, and legs beyond coxae fulvous yellow, the hind tarsus light brown. Flagellum fulvous yellow at base, darkening to dark brown near middle and beyond. Tegula black. Coxae blackish. Wings subhyaline, the front wing with a fuscous cloud in radial cell and behind stigma. Stigma, subcosta, and radius dark brown. Costa and costella yellowish. Weak veins tinged with brown.

Type: ♀, Godavari, 5,000 ft., Katmandu, Nepal, Aug. 7-13, 1967 (Ottawa).

Paratype: ♀, same locality as type, Aug. 13-17, 1967 (Ottawa).

5. Nothoserphus debilis, new species

Figure 72 (♀ top of thorax)

Front wing 3.2 to 3.6 mm. long. Tyloids present on flagellar segments 4-8, each like a keel extending from near base of its segment to beyond the middle, rising distad and with distal end vertically truncate. Lower half of side of pronotum smooth. Upper edge of pronotum paralleled just behind epomia by a weak carina that is separated from the upper edge by a narrow shallow impression. Anterolateral margin of mesoscutum (between notaulus and tegula) with a shallow groove that is not distinctly foveate. Prescutellar groove with a pair of longitudinal carinae and on midline one or two faint additional carinae. Median part of propodeum not impressed. Reticulate sculpture of metapleurum and propodeum finer and weaker than in *N. epilachnae*. Tergite following the syntergite with very small, moderately close punctures and larger

(but still small) punctures which are separated by about 4.0 their diameter.

Black. Legs beyond coxae brownish fulvous. Tegula fuscous.

Wings hyaline with a small dark brown area over base of radial vein. Stigma and strong veins blackish.

Type: ♂, Fenkihi, 1, 370 m., Chiayi Hsein, Taiwan, Apr. 10 to 12, 1965, C. M. Yoshimoto and B. D. Perkins (Honolulu).

Paratype: ♀, Bokathunde, 2, 100 m., 20 kilometers north of Trisuli, Nepal, Nov. 13 to 17, 1965, L. W. Quate (Honolulu).

6. Nothoserphus epilachnae Pschorn-Walcher

**Watanabeia epilachnae* Pschorn-Walcher, 1958. Beitr. z. Ent. 8: 725, 727, 728. ♀. key, des., figs. Type: ♀, Java: Lembang (Washington). Examined in 1975. China: K'unming. Hosts: *Epilachna admirabilis*; *Epilachna vigintioctopunctata*.

Watanabeia epilachnae Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 60. Hosts: Coccinellidae larvae.

Watanabeia epilachnae Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 7. ♀. type data.

Watanabeia epilachnae Kozlov, 1971. Vses. ent. obshch. Trudy 54: 9. fig.

Male: Unknown.

Female: Front wing about 3.1 mm. long. Lower half of side of pronotum mostly smooth. Upper edge of pronotum paralleled by a carina that is separated from the upper edge by a broad irregular groove. Anterolateral margin of mesoscutum (between notaulus and tegula) with a broad groove that contains about 5 foveae. Prescutellar groove with a pair of longitudinal carinae. Median part of propodeum not impressed. Tergite following the syntergite with very small, moderately close punctures and on its upper half also with large punctures that are separated by about 2.0 their diameter.

Black. Scape, pedicel, and first flagellar segment light fulvous (the rest of flagellum missing). Tegula black. Coxae blackish. Trochanters yellow. Legs beyond trochanters light fulvous, last segment of front and middle tarsi and all of hind tarsus brown. Wings subhyaline, the front wing with a fuscous cloud in radial cell and below stigma. Stigma and strong veins dark brown, except that costa and costella are yellowish. Weak veins with a faint tinge of brown.

Specimens: Redescribed from the ♀ type and ♀ paratype, and a new specimen as follows: ♀, Fyan, 1, 200 m., Vietnam, July 11 to Aug. 9, 1961, N. R. Spencer (Honolulu).

This species is known only from Java, Vietnam, and southern China. It has been reared from two species of *Epilachna*, a genus of phytophagous coccinellids.

Mirabilis Group

Front wing 2.3 to 2.9 mm. long. Top of head with a pair of high, blade-like projections between the hind ocelli. Male flagellar segments 1-4 without tyloids, the males at hand lacking flagellum beyond segment 4. Notauli reaching to behind center of mesoscutum, their hind ends separated by a narrowly wedge-shaped ridge. Median lobe of mesoscutum with a foveate groove next to front part of notaulus. Prescutellar groove with two longitudinal ridges. Upper front swelling of side of pronotum bordered by a vertical carina. Side of pronotum behind the upper front swelling coarsely punctato-rugose. Scrobe of pronotum with short, coarse, irregular wrinkles. Metapleurum coarsely reticulately rugose. Ovipositor sheath about 0.22 as long as hind tibia.

One species, from the Oriental Region, is known. It has been reared from a coccinellid larva feeding on aphids.

7. Nothoserphus mirabilis Brues

Figure 73 (♀ top of thorax)

**Nothoserphus mirabilis* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 263. ♂. des.

Type: ♂, Taiwan: Taihorin (Cambridge). Paratype examined in 1975.

Nothoserphus mirabilis Masner, 1958. Beitr. z. Ent. 8: 479. ♂. figs.

Notoserphus (!) mirabilis Pschorn-Walcher, 1958. Beitr. z. Ent. 8: 725, 727, 729. ♂. des., figs. Java: Blitar, Taiwan: Taihorin. Host: Coccinellidae larva.

Nothoserphus mirabilis Masner, 1966. Psyche 72: 297. ♂. type data.

Front wing 1.7 to 2.4 mm. long. Structure as described under the species group.

Black. Scape, pedicel, maxillary palpus, and legs beyond coxae yellowish fulvous, the last segment of front and middle tarsi and all of hind tarsus brown. Flagellum yellowish fulvous basally, darkening to brown near middle and dark brown beyond middle. Tegula and coxae brown. Wings subhyaline on basal 0.35 and apical 0.15, the rest weakly infusate, darkest near and below stigma. Stigma, radius, and subcosta dark brown. Costa and costella pale brown.

Specimens: ♂ (paratype), Taihorin, Taiwan, H. Sauter, 1911 (Cambridge). ♀, reared from larva of Coccinellidae, Blitar, Java, July 1913, K. W. Dammerman (Washington). ♀, near Birganj, 450 ft., Lothar, Nepal, Sept. 13-14, 1967 (Ottawa). ♀, reared from coccinellid larva feeding on aphids (other data illegible), Sept. 1964 (Washington).

This species is widespread in the Oriental region. It parasitizes coccinellid larvae.

6. TRETOSERPUS, new genus

Figures 11 (side view); 35 (front wing)

Front wing 2.1 to 3.7 mm. long. Body of moderate proportions. Clypeus moderately wide, moderately convex, its apex broadly truncate. Apical margin of clypeus double, with an inner and an outer sharp edge, separated by a groove. Cheek short, with a strong groove from eye to mandible. Occipital carina complete or almost so, when complete the lower end joining oral carina. Mandible long, moderately stout, with two teeth of which the upper tooth is about 0.35 as long as lower tooth. Flagellum moderately long to moderately short, in male with elliptic tyloids. Notaulus 0.3 to 1.3 as long as tegula. Upper anterolateral part of pronotum with a strong tubercle, the tubercle not surmounted by a carina. Collar and scrobe of pronotum smooth or the upper part sometimes rugulose or finely punctato-rugose. Hair band on front edge of mesopleurum complete or interrupted. Horizontal groove across mesopleurum deep and complete. Mesopleural suture foveolate from top to bottom. Metapleurum with an anterodorsal smooth area that covers about 0.4 its area, the smooth area subdivided into unequal parts by a fine moderately oblique groove. Upper front part of smooth area of metapleurum connected with lateral upper margin of propodeum by a fine carina. Longer spur of hind tibia ending near basal 0.4 of hind basitarsus. Stigma moderately deep. Radius originating near apical 0.45 of stigma, its vertical part about 2.5 as long as wide. Costal side of radial cell about 1.2 as long as depth of stigma. Costa ending just beyond apex of radius. Abdomen without a stalk. Base of syntergite with about 17 longitudinal grooves. Ovipositor sheath 0.5 to 1.1 as long as hind tibia, with sparse erect or divergent hairs, or almost bare.

Genotype: *Proctotrupes laricis* Haliday.

The generic name is from $\tau\rho\eta\tau\acute{o}s$ (perforated), plus *Serphus*, alluding to the foveolate mesopleural suture.

Four species are known. They occur in northern or arctic habitats, two species in the Palearctic Region and the other two species with a Holarctic distribution.

Key to the species of Tretoserphus

1. Coxae blackish brown. Pronotal tubercle very high, subconical. Ovipositor sheath about 0.6 as long as hind tibia, its surface almost smooth. Holarctic Region. 1. *laricis* Haliday (p. 70)
- Coxae fulvous to medium brown. Pronotal tubercle low to moderately high, approximately hemispherical. Ovipositor sheath 0.8 to 1.1 as long as hind tibia, its surface distinctly sculptured. 2

2. Males 3
 Females 5
3. First thyridium about 8.0 as wide as long. England and Sweden.
 2. perkinsi Nixon (p. 73)
 First thyridium about 4.0 as wide as long. 4
4. Groove dividing the smooth area on metapleurum into an upper
 smaller part and larger lower part nearly always complete.
 Pronotal tubercle moderately high, in dorsal view the tubercle
 projecting outward from the outline of dorsal part of pronotum.
 Holarctic region. 3. nudicauda, new species (p. 74)
 Groove dividing the smooth area on metapleurum into an upper
 smaller part and larger lower part incomplete or obsolete.
 Pronotal tubercle low, in dorsal view the tubercle not projecting
 distinctly outward from the outline of dorsal part of pronotum.
 Sweden. 4. foveolatus Möller (p. 75)
5. Hairs on ovipositor sheath conspicuous, suberect and about 0.8
 as long as depth of the sheath. Anteroventral part of side aspect
 of pronotum punctato-rugulose. Sweden.
 4. foveolatus Möller (p. 75)
 Hairs on ovipositor sheath inconspicuous, not more than about 0.2
 as long as depth of the sheath. Antroventral part of side aspect
 of pronotum mostly smooth. 6
6. Groove dividing the smooth area on metapleurum into an upper
 small part and a lower larger part very faint and shallow.
 First thyridium about 8.0 as wide as long. Tip of ovipositor
 sheath in side view with a broadly rounded apex, in dorsal
 view only faintly flared near apex. England and Sweden.
 2. perkinsi Nixon (p. 73)
 Groove dividing the smooth area on metapleurum into an upper small
 part and a lower larger part distinct and sharp. First thyridium
 about 4.0 as wide as long. Tip of ovipositor sheath in side view
 tapered to a narrowly rounded apex, in dorsal view distinctly
 flared near apex. Holarctic Region.
 3. nudicauda, new species (p. 74)

1. Tretoserphus laricis Haliday

Figure 398 (ovipositor sheath)

Proctotrupes Laricis Curtis, 1837. Guide . . . British insects ed. 2, column 128.
 listed from Britain. *Nomen nudum*.

**Proctotrupes laricis* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 14. ♂, ♀.
 des., biol. Types: ♂, ♀, England (Dublin). Examination of types reported by Nixon,
 1938.

- Proctotrupes Laricis* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key, biol.
- Proctotrupes laricis* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Haarlem.
- Proctotrypes laricis* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn. *Serphus (Cryptoserphus) Laricis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 322. ♂, ♀. des. in key, fig. England. France: Maisons-Laffite. Scotland.
- **Serphus (Cryptoserphus) Nigricauda* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 324. ♀. des. in key. Type: ♀, France: Clamart (Paris). Examined in 1975. New synonym.
- Cryptoserphus laricis* Kieffer, 1909. Genera Insectorum 95: 11. fig. 1.
- Cryptoserphus laricis* Kieffer, 1914. Das Tierreich 42: 39. ♂, ♀. key, des., fig. England. France. Scotland.
- Cryptoserphus nigricauda* Kieffer, 1914. Das Tierreich 42: 40. ♀. key, des. France.
- **Cryptoserphus melanderi* Brues, 1919. Jour. New York Ent. Soc. 27: 8. ♂. des., figs. Type: ♂, USA: Pullman in Washington (Cambridge). Examined in 1975. New synonym.
- Proctotrypes laricis* Morley, 1922. Entomologist 55: 59, 82. ♂, ♀. key. England: 3 localities. Ireland: Killarney. Scotland.
- Cryptoserphus laricis* Pax & Maschke, 1935. Beiträge zur Biologie des Glatzer Schneeberges (Breslau) 1: 12, 61. Poland: Wolmsdorf cave [southwest of Klodzko (= Glatz)].
- Cryptoserphus nigricauda* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. ♀. Belgium: Embourg.
- Cryptoserphus laricis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 463, 464. ♂, ♀. key, des., fig. England: 9 localities. Ireland: 9 localities. Scotland: Aviemore in Inverness.
- Cryptoserphus laricis* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Cryptoserphus laricis* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- Cryptoserphus laricis* Hellén, 1941. Notulae Ent. 21: 41. ♂, ♀. key. England. Finland: 2 localities. France. Sweden.
- Cryptoserphus laricis* Nixon, 1942. Entomologist 75: 195. ♂. key.
- Cryptoserphus laricis* Tomášik, 1944. Ent. Listy 7: 53. ♀. Czechoslovakia: Moravia.
- Cryptoserphus laricis* Watanabe, 1949. Insecta Matsumurana 17: 24, 26. ♂, ♀. des., figs. Europe. Japan.
- Cryptoserphus laricis* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.
- Cryptoserphus laricis* Meyer, 1961. Bombus 2: 93. West Germany: Kiel-Hasseldieksdamm.
- Cryptoserphus laricis* Weidemann, 1962. Faun Mitt. aus Norddeutschland 2: 27. ♂, ♀. ecology. West Germany: 4 localities.
- Cryptoserphus laricis* Bazavan-Teodorescu, 1963. București U. Ann., ser. Ști. Nat. Biol. 12: 117. ♀. des., fig. Rumania: one locality.
- Cryptoserphus laricis* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 1. Europe. Japan.
- Cryptoserphus laricis* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441 et seq. ecology. Austria (to 2,000 m.). Carpathian Mts. Switzerland (sub-alpine region). USSR: Kola Peninsula.
- Cryptoserphus melanderi* Masner, 1966. Psyche 72: 297. ♂. type data.
- Cryptoserphus laricis* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 539. ♂, ♀. biol. Ireland: Tollymore Park in Co. Down.
- Cryptoserphus laricis* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. ♀. fig.
- Cryptoserphus laricis* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 28, 32. ♂, ♀. key, des., fig., biol. Central Europe. France. Germany. Northern Japan. Scandinavia. Switzerland. Northern USSR.

Cryptoserphus laricis Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl.

Bayerischen Ent. 21: 117. ♂, ♀. Austria. Germany. Switzerland.

Cryptoserphus laricis Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.

Cryptoserphus laricis Kozlov, 1978. Opređelitel' nasekomykh evropeiskoĭ chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 546. ♀. key, figs. USSR: Murmanskaya oblast.

Front wing 2.1 to 3.7 mm. long. Penultimate segment of flagellum about 2.9 as long as wide in male, about 1.8 as long as wide in female. Male tyloids occurring on flagellar segments 2-11 (or sometimes fewer segments), each tyloid elliptic and about 0.15 as long as a segment. Upper half of side view of collar with a longitudinal carina, otherwise smooth or sometimes wrinkled or rugulose. Pronotal tubercle like a low blunt cone, conspicuously projecting. Notaulus about 1.2 as long as tegula. Hair band on front edge of mesopleurum complete or interrupted. Groove dividing the smooth area on metapleurum into a small upper and larger lower part very shallow, sometimes incomplete. Anterobasal quarter of lateral view of syntergite with about 8 hairs. Ovipositor sheath about 0.60 as long as hind tibia, convex, polished, and with a few very small punctures, without evident hairs, gradually tapered to the broadly rounded apex (fig. 398).

Black. Mouth parts and tegula brown. Coxae blackish brown. Legs beyond coxae ferruginous to dark brown, their tarsi somewhat darker brown than the rest. Stigma and strong veins dark brown. Ovipositor sheath blackish brown.

Nearctic specimens: 15♂, 14♀ from Alaska (Mt. McKinley at 2,500 ft., Paxson Lodge at Gulkana, Tsaina River, and Unalakleet); Alberta (Bad Hills in the Maligne Range at 7,000 to 8,400 ft. in Jasper National Park, and Banff); British Columbia (Cultus Lake, Queen Charlotte Islands, Point Grey in Vancouver, Robson, and Stone Mt. Park at 3,800± ft.); California (Lily Pond at Alpine Lake in Marin Co.); Colorado (west side of Loveland Pass at 9,850 ft.); Idaho (Lake Waha); Maryland (Plummers Island and Takoma Park); Newfoundland (Hebron in Labrador and Portland Creek); Northwest Territories (Bathurst Inlet of Baychimo Harbor, Masik River on Banks Island, and Yellowknife); Ontario (Innisville); Quebec (Chimo, Indian House, Mt. Jacques Cartier at 3,000 ft., and Payne Bay); and Washington (Summerland Trail on Mt. Rainier). A female among these specimens is labeled "*Boletus*", without further comment.

Palaearctic specimens: 29♂, 28♀ from England (East Dartmoor, Leicester, and Oxford); Ireland (Boher-na-breena in Co. Dublin, Clara in Co. Wicklow, Georges Br. in Co. Wicklow, Glenasmole in Co. Dublin, Glencullen in Co. Wicklow, L. Dan in Co. Wicklow, Leixlip in Co. Kildare, Powerscourt Deerpark in Co. Wicklow, Roheen in Co. Dublin, Rockbrook in Co. Wicklow, Shakill in Co. Dublin, The Slade of Saggart in Co. Dublin, Spratton in Northants, and Woodtown in Co. Dublin); Japan (Mt. Arakura at 1,300 m. in Nagano); and Sweden (Åhus in Skaraborg and Messaure).

Collection dates are mostly spring and fall, and into early winter,

with dates of June, July, and August in arctic and subarctic areas. Representative early and late dates of capture are: January 22 in Marin Co., Calif., USA; March 17 at Plummers Is., Md., USA; April 14 at Leixlip, Co. Kildare, Ireland; April 15 at East Dartmoor, England; April 30 at Leicester, England; May 24 at Robson, B. C.; October 9 at Messaure, Sweden; November 7 at Takoma Park, Md., USA; November 17 at The Slade of Saggart, Co. Dublin, Ireland; and December 3 at Boher-na-breena, Co. Dublin, Ireland.

This species is widespread in the Holarctic Region, and is common in arctic and subarctic habitats. It is adult in the spring and fall, or in more northern localities in the summer months.

2. Tretoserphus perkinsi Nixon

Figure 399 (ovipositor sheath)

**Cryptoserphus perkinsi* Nixon, 1942. Entomologist 75: 195, 196. ♂, ♀. key, des., figs. Type: ♀, England: Weybridge in Surrey (London). Examined in 1975.

Cryptoserphus perkinsi Stelfox, 1944. Ent. Monthly Mag. (4) 80: 72. ♀. Ireland: Finner in East Donegal.

Cryptoserphus perkinsi Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 59. North & central Europe.

Cryptoserphus foveolatus Hedqvist, 1963. Ent. Tidskr. 84: 62. syn. (in part).

Cryptoserphus perkinsi Pschorn-Walcher, 1964. Insecta Matsumurana 27: 2. Europe. Japan.

Cryptoserphus perkinsi Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7. ♀. type data.

Cryptoserphus perkinsi Kozlov, 1972. Insects of Mongolia 1: 648. ♀. Mongolia: 1 locality.

Front wing 3.0 to 3.3 mm. long. Penultimate segment of flagellum about 2.9 as long as wide in male, about 2.5 as long as wide in female. Male tyloids on flagellar segments 1-10, about 0.2 as long as a segments. Upper half of lateral view of collar with a longitudinal carina, otherwise almost smooth. Pronotal tubercle hemispheric, in dorsal view distinctly projecting. Notaulus about 0.8 as long as tegula. Hair band on front edge of mesopleurum interrupted. Groove dividing the smooth area on metapleurum into a small upper part and larger lower part shallow and indistinct. Anterobasal quarter of lateral view of syntergite with about 50 hairs. First thyridium about 8.0 as wide as long. Ovipositor sheath 0.98 as long as hind tibia, its dorsal profile weakly convex with a stronger convexity near apex, its apex broadly rounded, the general surface with small sparse setiferous punctures, the setae hardly visible (fig. 399).

Black. Mouth parts, scape, pedicel, tegula, and legs fulvous or fulvous brown. Anteroventral part of pronotum and apical tergites tinged with brown. Stigma and strong veins brown. Ovipositor sheath light brown.

Specimens: ♂ (paratype) and ♀ (type), Weybridge, Surrey, England, Oct. 27, 1940, G. E. J. Nixon (London). ♂, Abisko, 400 m., Lappland,

Sweden, Aug. 2, 1960, W. R. M. Mason (Ottawa). ♀, Åhus, Skaraborg, Sweden, Oct. 14, 1970, K. -J. Hedqvist (Stockholm). Figure 399 is from the type.

This species is known from England and Sweden.

3. Tretoserphus nudicauda, new species

Figure 400 (ovipositor sheath)

Front wing 2.5 to 3.4 mm. long. Penultimate segment of flagellum about 3.2 as long as wide in male, about 2.7 as long as wide in female. Male tyloids on flagellar segments 1-11, each tyloid elliptic and about 0.2 as long as a segment. Upper half of lateral view of collar with a longitudinal carina, otherwise smooth or almost smooth. Pronotal tubercle hemispheric, in dorsal view distinctly projecting. Notaulus about 0.55 as long as tegula, variable in length. Hair band on front edge of mesopleurum interrupted or sometimes complete. Groove dividing the smooth area on metapleurum into a small upper part and larger lower part usually sharp and complete. Anterobasal quarter of lateral view of syntergite with about 30 hairs. First thyridium about 4.0 as wide as long. Ovipositor sheath about 1.0 as long as hind tibia, its dorsal profile weakly convex with its apex dorsoventrally somewhat flattened so that its tip tapers to a narrowly rounded apex, its surface with scattered small setiferous punctures or grooves, its setae aparse and about 0.2 as long as depth of ovipositor sheath (fig. 400).

Black. Mouth parts, tegula, and legs fulvous or fulvous brown, the tarsi usually brown and hind coxa often brown. Scape, pedicel, anteroventral part of pronotum, and hind corner of pronotum dark brown. Stigma and strong veins brown. Ovipositor sheath pale brown to brown, usually darkened apically.

Type: ♀, Stone Mt. Park, 3,800± ft., B. C., Aug. 24, 1973, H. and M. Townes (Townes).

Nearctic paratypes: ♂, 6♀, same locality and collectors as type, Aug. 22, 23, and 24, 1973 (Townes). ♂, ♀, Deering, Alaska, Aug. 24 to 27, 1968, J. Matthews (Ottawa). 2♂, Mt. McKinley, 1,600 ft. and 2,500 ft., Alaska, Aug. 10 and 15, 1954, David Townes (Townes). ♀, Paxson Lodge, Gulkana, Alaska, Aug. 4, 1951, W. R. M. Mason (Ottawa). ♀, milepost 48.5, Slana Road, Alaska, Aug. 28, 1948, G. L. Morris (Ottawa). ♂, ♀, Robson, B. C., Aug. 6 to 21, 1947, and Sept. 21 to 30, 1948, H. R. Foxlee (Ottawa). ♂, ♀, Bathurst Inlet, Baychimo Harbor, Northwest Territories, Aug. 16, 1966, G. E. Shewell (Ottawa). 2♂, Dawson, Yukon, Aug. 1, 1973, H. and M. Townes (Townes).

European paratypes: 2♀, Messaure, Sweden, Sept. and Sept. 12, 1971, Karl Müller (Townes).

4. Tretoserphus foveolatus Möller

Figure 401 (ovipositor sheath)

- **Proctotrupes foveolatus* Möller, 1882. Ent. Tidskr. 3: 181. ♂, ♀. des. Lectotype: ♂ (designated by Hedqvist, 1963), Sweden: "Kempinge" in Skåne (Göteborg). Examined in 1975, but since male specimens are difficult to determine its identity is somewhat uncertain. The paratype ♀ is lost.
- Proctotrupes foveolatus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 464. syn.
- Phaenoserphus foveolatus* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Phaenoserphus foveolatus* Kieffer, 1914. Das Tierreich 42: 28. ♂, ♀. key, des. Scandinavia.
- Cryptoserphus foveolatus* Hedqvist, 1963. Ent. Tidskr. 84: 62. ♂. syn. (in part). lectotype designated.
- Cryptoserphus foveolatus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441 et seq. Czechoslovakia. Finland.
- Cryptoserphus foveolatus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 29, 30. ♂, ♀. key, des., fig., biol. Austria. Czechoslovakia. England. France. Northern Japan. Scandinavia.
- Cryptoserphus foveolatus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 17. ♂. Germany: Flintsbach am Inn in Oberbay[ern].

Front wing 2.7 to 3.0 mm. long. Penultimate segment of flagellum about 2.7 as long as wide in male, about 1.6 as long as wide in female. Male tyloids usually on flagellar segments 1-10, elliptic, variable in size but usually about 0.3 as long as a segment. Upper half of lateral view of collar with a longitudinal carina and in female finely rugoso-punctate, in male mostly smooth. Pronotal tubercle low hemispheric, in dorsal view not distinctly projecting. Notaulus about 0.8 as long as tegula. Hair band on front edge of mesopleurum complete or with a narrow interruption. Groove dividing the smooth area on metapleurum into a small upper and larger lower part weak and usually incomplete. Anterobasal quarter of lateral view of syntergite with about 30 hairs. First thyridium about 4.0 as wide as long. Ovipositor sheath about 0.90 as long as hind tibia, moderately convex, its surface with setiferous punctures, its hairs numerous but widely spaced, about 0.8 as long as depth of ovipositor sheath and divergent from sheath at about 80° (fig. 401).

Black. Mouth parts, tegula, and legs brownish fulvous, the tarsi brown apically and middle and hind coxae often medium brown. Scape, pedicel, cheek near mandible, and broad pronotal collar brown. Flagellum dark brown. Stigma and strong veins brown.

Specimens: 4♂, 14♀, Messaure, Sweden, Aug. 4, 11, 18, and 29, and Sept. 7, 15, 25, and 26, 1971 and 1972, Karl Müller (Townes).

7. Genus CRYPTOSERPUS

Figures 12 (side view); 36 (front wing)

Cryptoserphus Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 288.

Type: (*Cryptoserphus longicalcar* Kieffer) = *flavipes* Provancher. Designated by Kieffer, 1908.

Front wing 2.0 to 4.1 mm. long. Body slender. Clypeus narrow to wide, its apex truncate, the apical edge thin but not sharp, with a narrow reflexion. Cheek with or without a groove from eye to mandible. Occipital carina complete, joining oral carina below. Mandible moderately long and stout to short and weak, with or without a small subapical tooth on upper edge. Flagellum slender, without distinct tyloids. Notaulus usually present and about 0.8 as long as width of tegula, sometimes absent. Pronotal scrobe and lateral aspect of collar smooth. Anterior dorsolateral part of pronotum with a prominent tubercle that is not surmounted by a carina. Front margin of mesopleurum with a hair band that may be interrupted. Horizontal groove across mesopleurum complete. Mesopleural suture not foveolate except in *C. fortis*. Metapleurum with a large smooth impunctate area, without a carina (or with a low weak carina) between its anterodorsal part and lateral part of dorsal edge of propodeum (such a carina present in all other genera of the tribe except *Oxyserphus*). Longer spur of hind tibia reaching from middle to apical 0.2 of hind basitarsus. Stigma of moderate depth. Radius originating near apical 0.45 of stigma, the vertical part of radius about 2.0 as long as wide. Costal side of cell about 1.75 as long as depth of stigma. Costa ending at or just beyond apex of radius. Abdomen without a stalk. Base of syntergite with 5 to 9 longitudinal grooves. Ovipositor sheath 0.6 to 1.1 as long as hind tibia, with very sparse hairs or none.

This genus seems to have a worldwide distribution. Thirteen species are known.

Key to the species of Cryptoserphus

1. Clypeus 0.69 to 0.99 as wide as face. Mandible moderately long, moderately strong with a well sclerotized apical point and a small or very small preapical tooth on upper edge. Hair band on front edge of mesopleurum complete. Flavipes Group. 2
- Clypeus about 0.60 as wide as face. Mandible short and weak, its apical point broad and weak, without a preapical tooth. Hair band on front edge of mesopleurum sometimes interrupted. 5

2. Opening of propodeal spiracle ovate, about 2.0 as long as wide.
 Clypeus about 2.8 as wide as long. Upper part of pronotal collar yellow with a small median brown or black area. Holarctic Region. 1. *longitarsis* Thomson (p. 79)
 Opening of propodeal spiracle sublinear, about 3.1 as long as wide.
 Clypeus 3.2 to 3.8 as wide as long. Upper part of pronotal collar black, or brown with a median black area. 3
3. Portion of propodeum immediately behind propodeal spiracle coarsely and strongly reticulately rugose, as is the apical $0.6\pm$ of propodeum. Clypeus 3.3 as wide as long. Holarctic Region.
 2. *flavipes* Provancher (p. 81)
 Portion of propodeum immediately behind propodeal spiracle with a weakly wrinkled or almost smooth space that is 2.0 to 2.5 as large as the spiracular protuberance of propodeum. Clypeus 3.3 to 3.8 as wide as long. 4
4. Clypeus 3.3 as wide as long. Mandible with a long slender pointed apex, its dorsal subapical tooth minute. Subapical segment of flagellum 2.7 as long as wide in male, 2.2 as long as wide in female. Arizona and Mexico.
 3. *pauciruga*, new species (p. 84)
 Clypeus 3.8 as wide as long. Mandible moderately stout, its dorsal subapical tooth moderately large. Subapical segment of flagellum 3.0 as long as wide in male, 2.8 as long as wide in female.
 Mexico. 4. *latidens*, new species (p. 84)
5. Base of syntergite broad, with 4 or 5 (or rarely 3) short longitudinal grooves on each side of central groove. Dorsal smooth areas on propodeum each about 1.25 as long as wide. 6
 Base of syntergite of moderate width, with 2 or 3 (or rarely 4) short to long longitudinal grooves on each side of central groove.
 Dorsal smooth areas on propodeum each 1.4 to 2.0 as long as wide. 7
6. Upper half of mesopleural suture with about 5 small foveae. Ovipositor sheath evenly tapered from base to apex. Northeastern Nearctic Region. 5. *fortis*, new species (p. 85)
 Upper half of mesopleural suture not foveate. Ovipositor sheath of uniform width except at base and apex. Nearctic Region.
 6. *occidentalis* Brues (p. 86)
7. Median longitudinal groove at base of syntergite short, reaching 0.2 to 0.3 the distance to the first pair of thyridia. Hair band on front edge of mesopleurum nearly always with a wide interruption. Punctures on the tergite of male following the syntergite moderately small, separated by about 0.5 their diameter. 8

- Median longitudinal groove at base of syntergite long, reaching about 0.5 the distance to the first pair of thyridia. Hair band on front edge of mesopleurum nearly always complete. Male with punctures on the tergite following syntergite very small, separated by about 2.0 their diameter. 9
8. Paired smooth areas on upper face of propodeum each about 1.4 as long as wide, with sparse hairs that near middle of the smooth areas are about 0.8 as far apart at base as the hairs are long. Apex of ovipositor sheath without a lateral swelling, the combined sheaths in dorsal view faintly tapered at tip to a blunt rounded apex. Holarctic Region. 7. medius, new species (p. 87)
- Paired smooth areas on upper face of propodeum each about 1.7 as long as wide, with moderately spaced long hairs that near middle of the smooth areas are about 0.4 as far apart at base as the hairs are long. Apex of ovipositor sheath with a small lateral swelling, the combined sheaths in dorsal view faintly widened at tip, with a subtruncate apex. Holarctic Region. 8. dilatatus, new species (p. 88)
9. Notaulus present, at least as a small impression on margin of mesoscutum. Base of syntergite with 5 to 7 longitudinal grooves. 10
- Notaulus completely lacking. Base of syntergite with 5 longitudinal grooves. 12
10. Femora dark brown, pale at ends. Front 0.3 of syntergite with 0 to 12 hairs on lower half. Base of syntergite with 5-7 longitudinal grooves, these of about equal length. New Guinea. 10. adustus, new species (p. 90)
- Femora fulvous. Front 0.3 of syntergite with about 50 hairs on lower half. Base of syntergite with 7-9 longitudinal grooves, the groove second from median groove about 0.5 as long as groove next to median groove. 11
11. Hairs on front part of front wing unusually long, the hairs on costa about 0.8 as long as width of costal cell. Notaulus very short or vestigial. Philippines. 9. hirtipennis, new species (p. 89)
- Hairs on front part of front wing of normal length, the hairs on costa about 0.5 as long as width of costal cell. Notaulus 0.5 to 1.0 as long as width of tegula. Holarctic Region and mountains of the Oriental Region. 11. aculeator Haliday (p. 91)
12. Clypeus about 2.3 as wide as long. Cheek about 2.0 as long as diameter of scape. Smooth part of metapleurum bounded below by a horizontal wrinkle on its hind 0.4. Ecuador. 12. quintanus, new species (p. 93)

Clypeus about 1.65 as wide as long. Cheek about 2.3 as long as diameter of scape. Smooth part of metapleurum not bounded below by a horizontal wrinkle. Ecuador.

13. rostratus, new species (p. 94)

Flavipes Group

Cheek with an impression at lower corner of eye but without a complete groove from eye to mandible. Clypeus 2.7 to 3.9 as wide as long, 0.69 to 0.99 as wide as face. Mandible long, moderately strong, with an elongate apical point and on upper edge a small or minute subapical tooth. Notaulus 0.5 to 1.0 as long as width of tegula. Mesopleurum with an uninterrupted hair band next to hind edge of pronotum. Longer spur of hind tibia reaching to apical $0.25\pm$ of hind basitarsus. Base of syntergite with 7 longitudinal grooves. Ovipositor sheath 0.6 to 0.9 as long as hind tibia, somewhat compressed, weakly curved with its apical 0.3 more strongly curved, its apical 0.25 weakly tapered to the rounded apex. Each half of ovipositor sheath with about 4 widely spaced almost erect hairs that are about as long as depth of ovipositor sheath.

Four species of this group are known, two in the Holarctic Region and two in the southern Nearctic Region (Arizona and Mexico). There is no distinct difference in ovipositor sheath between the four species.

1. Cryptoserphus longitarsis Thomson

- **Proctotrupes longitarsis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 415. ♀. des. Type: ♀, Lappland (Stockholm). Examined in 1975.
- Proctotrupes longitarsus* (!) Vollenhoven, 1876. Pinacographia, p. 30, pl. 18, fig. 8. ♀. syn., figs. of type.
- Proctotrypes longitarsis* Dalla Torre, 1898. Catalogo hymenopterorum . . . 95: 466. syn.
- Serphus* (*Cryptoserphus*) *Longitarsis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 320. ♀. des. in key. Algeria. France: Cannes. Lappland.
- Cryptoserphus longitarsis* Kieffer, 1914. Das Tierreich 42: 39. ♂, ♀. key, des. Algeria. France: Cannes. Lappland.
- Proctotrypes longitarsis* Morley, 1922. Entomologist 55: 59, 83. key. England: 4 localities.
- Cryptoserphus longitarsis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 463. ♀. key, des. England: 2 localities.
- Cryptoserphus longitarsis* Murray, 1940. Ent. Monthly Mag. 76: 130. ♀. des., biol. England: Todhills Moss in Cumberland.
- Cryptoserphus aculeator* Hellén, 1941. Notulae Ent. 21: 41. ♂, ♀. key, des. Finland: 11 localities. Sweden. USSR: Kola Peninsula. (in part).
- Cryptoserphus longitarsis* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 5 localities.
- Cryptoserphus longitarsis* Nixon, 1942. Entomologist 75: 195, 196. ♂, ♀. key, syn., des. Austria. Sweden.
- **Cryptoserphus longicalcar castaneus* Tomšík, 1944. Ent. Listy 7: 52. ♀. des. Lectotype: ♀ (labeled by Townes, 1975 and hereby designated), Czechoslovakia: Gross-Ubsín (Brno). Examined in 1975. Czechoslovakia: 4 localities. New synonym.

- Cryptoserphus longitarsis* Pschorn-Walcher, 1964. *Insecta Matsumurana* 27: 2. Europe. Japan.
- Cryptoserphus longitarsis* Weidemann, 1965. *Ztschr. f. Morph. u. Ökol. der Tiere* 55: 441 *et seq.* Switzerland.
- Cryptoserphus longitarsis* Stelfox, 1966. *Proc. Roy. Irish Acad.* 64 (B): 538. ♂, ♀. des., biol. Ireland: 2 counties.
- Cryptoserphus longitarsis* Teodorescu, 1967. *Studii si cercetări de Biologie (ser. Zool.)* 19: 372. ♀. des. Rumania: Povalina (reg. Banat).
- Cryptoserphus longitarsis* Pschorn-Walcher, 1971. *Insecta Helvetica* 4. Hymenoptera, p. 29, 30, 32. ♂, ♀. key, des., figs., biol. Austria. England. Germany. Japan. Sweden. Switzerland.
- Cryptoserphus longitarsis* Pschorn-Walcher & Haeselbarth, 1972. *Nachrichtenbl. Bayerischen Ent.* 21: 117. Many localities in different types of woodland in Alps.

Front wing 2.0 to 2.8 mm. long. Clypeus about 2.8 as wide as long and about 0.70 as wide as face. Mandible moderately long, with a small preapical tooth on upper side. Subapical segment of flagellum about 2.5 as long as wide in male, about 1.9 as long as wide in female. Upper part of pronotal collar a little smoother and wider than in the related species. Notaulus about 0.8 as long as width of tegula. Paired dorsal smooth areas on propodeum each about 1.2 as long as wide. Propodeal reticulation moderately dense, filling the space directly behind propodeal spiracle. Opening of propodeal spiracle about 2.0 as long as wide.

Black. Mouth parts, scape, pedicel, tegula, and legs fulvous, the fifth tarsal segments fulvous brown. Flagellum more or less fulvous at base. Upper part of pronotal collar yellow, with a median brown spot. Stigma and strong veins blackish brown. Apical part of abdomen dark brown. Ovipositor sheath medium brown to dark brown.

Nearctic specimens: 9♂, 23♀ from Alberta (Elkwater Lake in Cypress Hills Provincial Park); Alaska (Tangle Lakes and Thompson Pass); British Columbia (Lake La Hache, Robson, and Stone Mt. Park at 3,800± ft.); California (Crescent City and Putah Canyon in Yolo Co.); Idaho (Lowman at 4,000 ft. and near Stanley); Maine (Mt. Desert); Newfoundland (Portland Creek and South Branch); Oregon (Mt. Hood at 3,500 ft. and 5,400 ft. and Ochoco Creek); Washington (Mt. Rainier at 2,700 ft. and Swank Creek near Blewett Pass); and Wyoming (Yellowstone Park).

European specimens: 14♂, 19♀ from Austria (near Linz, Marchtrenk, Pitten, Sarleinsbach, Scheffau in Tirol at 800 m., Schillenberg, and Tirol at 900 m.); Ireland (Athdown in Co. Wicklow, Drinabilly in Co. Down, and "Pine Hill" at Mourne in Co. Down); and Sweden (Åhus in Skaraborg, Ekerö in Uppsala, and Messaure).

Dates of collection are mostly in July and Aug.; those in other months are: April 30 in Putah Canyon, Yolo Co., Calif., USA; June 28 at Swank Creek near Blewett Pass, Wash., USA; June 28 at Pitten, Austria; Sept. at Messaure, Sweden; Sept. 13 and 19 near Linz, Austria; and Sept. 16 and Oct. 18 at Sarleinsbach, Austria.

This species is widespread in the northern part of the Holarctic

Region. It is adult in mid and late summer to early fall.

2. *Cryptoserphus flavipes* Provancher

Figure 402 (ovipositor sheath)

- **Proctotrupes flavipes* (as *P. pallipes* on p. 263) Provancher, 1881. Nat. Canad. 12: 264. (Faune, p. 561, 562). ♀. key, des. Type: ♀, Canada: Quebec (Sainte Foy). Examined in 1975.
- Proctotrupes flavipes* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 338. ♀. key, syn., des. Canada: Ottawa. (in part).
- Proctotrupes flavipes* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♂, ♀. Canada: Ottawa in Ontario; Cap Rouge and Hull in Quebec. (in part).
- **Serphus (Cryptoserphus) Longicalcar* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 317. ♀. des. in key, fig. Lectotype: ♀ (designated by Kelner-Pillault, 1958), France: Bitche (Paris). Examined in 1975. Italy: frontier Alps. Oviposits in *Lactarius*. New synonym.
- **Serphus (Cryptoserphus) Longitarsis* v. *Ruficauda* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 320. ♀. des. in key. Type: ♀, France: Mesnil-le-Roy (Paris). Examined in 1975. New synonym.
- **Serphus (Cryptoserphus) Brevimanus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 323. ♂, ♀. des. in key. Lectotype: ♂ (lacking head, labeled by Townes, 1975 and hereby designated), England: "Govilon" (Budapest). Examined in 1975. England: 2 localities. New synonym.
- Phaenoserphus flavipes* Kieffer, 1909. Genera Insectorum 95: 6. syn. (in part).
- Cryptoserphus longicalcar* Kieffer, 1909. Genera Insectorum 95: 11. fig.
- Phaenoserphus flavipes* Kieffer, 1914. Das Tierreich 42: 33. ♀. key, des. Canada: Ottawa. (in part).
- Cryptoserphus longicalcar* Kieffer, 1914. Das Tierreich 42: 4, 38. ♀. key, des., fig., biol. France: Bitche. Italy: frontier Alps. Oviposits in *Lactarius* species infested by Diptera larvae.
- Cryptoserphus ruficauda* Kieffer, 1914. Das Tierreich 42: 39. ♀. key, des. France: Mesnil-le-Roy.
- Cryptoserphus brevimanus* Kieffer, 1914. Das Tierreich 42: 40. ♂, ♀. key, des. England: Isle of Wight.
- Serphus flavipes* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. key, des.
- Cryptoserphus flavipes* Brues, 1919. Jour. New York Ent. Soc. 27: 6. pl. 1, fig. 5. syn., figs. USA: Black Rock Mt. in Georgia; Woods Hole in Massachusetts.
- Proctotrupes brevimanus* Morley, 1922. Entomologist 55: 59, 82. ♂, ♀. key. England: 3 localities. Ireland: Killarney. Wales: near Abergavenny.
- Proctotrupes brevimanus* Morley, 1929. Trans. Suffolk Nat. Soc. 1: 40. England: Suffolk Co.
- **Cryptoserphus cumaeus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 462. ♀. key, des., fig. Type: ♀, Ireland: Trawallua in Sligo Co. (London). Examined in 1975. Ireland: 2 localities. New synonym.
- Cryptoserphus brevimanus* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- **Cryptoserphus cumaeus fungorum* Szelényi, 1940. Arb. über Morph. u. Taxonom. Ent. 7: 234. ♂, ♀. des. Lectotype: ♀ (labeled by Townes, 1975 and hereby designated), reared from *Fungivora fungorum*, West Germany: Steglitz (Eberswalde). Examined in 1975. New synonym.
- Cryptoserphus brevimanus* Hellén, 1941. Notulae Ent. 21: 41. ♀. key, des. Finland: 1 locality.
- Cryptoserphus cumaeus* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 5 localities.

- Cryptoserphus cumaeus* Nixon, 1942. Entomologist 75: 195, 196. ♂, ♀. key, syn., des., figs. Austria. Sweden.
- Cryptoserphus longicalcar longicalcar* Tomštk, 1944. Ent. Listy 7: 52. ♂, ♀. des. Czechoslovakia: 7 localities in Moravia and Bohemia.
- Serphus (Cryptoserphus) longicalcar* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. ♀. lectotype designated.
- Cryptoserphus cumaeus* Meyer, 1961. Bombus 2: 93. West Germany: Hamburg.
- Cryptoserphus cumaeus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 2. Europe. Japan.
- Cryptoserphus cumaeus* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7. ♀. type data.
- Cryptoserphus cumaeus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441. Swedish Lappland. Switzerland. Yugoslavia: Istria.
- Cryptoserphus cumaeus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 538. ♂, ♀. Ireland: 2 counties.
- Cryptoserphus flavipes* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog. 2, suppl. 2: 286. Canada: New Brunswick. USA: North Carolina.
- Cryptoserphus cumaeus* Masner, 1968. Acta Ent. Bohemoslov. 65: 465. ♂, ♀. Czechoslovakia: 2 localities. Host: *Fungivora fungorum*.
- Cryptoserphus flavipes* Masner, 1969. Nat. Canad. 96: 780. ♀. type data.
- Cryptoserphus cumaeus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 29, 30, 32. ♂, ♀. key, des., figs., biol. Austria. Germany. Ireland. Italy. Northern Japan. Switzerland: 4 localities.
- Cryptoserphus cumaeus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 117. ♂, ♀. Austria. Germany. Switzerland.
- Cryptoserphus longicalcar* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.
- Cryptoserphus brevimanus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoï chasti SSSR. t. 3: Pereponchatokrylye 2: 546. key. England.

Front wing 2.7 to 3.5 mm. long. Clypeus about 3.3 as wide as long, about 0.82 as wide as face. Mandible with a moderately long apex, its dorsal subapical tooth small or very small. Subapical segment of flagellum about 2.7 as long as wide in male, about 2.3 as long as wide in female. Notaulus about 0.8 as long as width of tegula. Paired dorsal smooth areas on propodeum each about 1.2 as long as wide. Propodeal reticulation strong and moderately dense, filling the space directly behind propodeal spiracle. Opening of propodeal spiracle about 3.0 as long as wide. Ovipositor sheath as in figure 402.

Black. Mouth parts, scape, pedicel, tegula, and legs fulvous, the tarsi brown apically. Male with hind coxa often more or less infuscate, hind tibia sometimes infuscate apically, and hind tarsus sometimes fuscous. Flagellum usually fulvous at base. Upper part of pronotal collar light brown to black, when brown with a black area at center. Stigma and strong veins blackish brown. Apical part of female abdomen often brownish. Ovipositor sheath light brown to blackish.

Nearctic specimens: 100♂, 215♀ from Alaska (Anchorage, Big Delta, Deering, King Salmon on the Naknek River, Matanuska, Mt. McKinley at 2,500 ft., Naknek, Paxson, Tangle Lakes, Tsaina River, and Unalakleet); Alberta (Elkwater Lake, Johnston Canyon near Banff at 4,700 ft., Jumping Pound Creek 20 miles west of Calgary, McMurray, and Slave Lake); British Columbia (Atlin, Diamond Head Trail near Squamish at 3,200 ft., Hixon, Kleanza Creek 14 miles east of Terrace, Lac La Hache, Mt. Thornhill near Terrace, Nass River

near Alyanah at 500 ft., Racing River at 2,400 ft., Robson, Spring Creek near Terrace, Stone Mt. Park at 3,800± ft., and Terrace); California (Crescent City); Colorado (Echo Lake and Fall River Pass at 11,600 ft.); Connecticut (Colebrook in Litchfield Co.); Georgia (Black Rock Mt. in Rabun Co. at 3,500 ft., Pine Mt. in Rabun Co. at 1,400 ft., Rabun Bald at 4,200 ft., and Warwoman Creek in Rabun Co. at 1,500 ft.); Idaho (Priest Lake); Labrador (Hebron); Manitoba (Churchill); Maryland (Chevy Chase and Hagerstown); Massachusetts (Humarock, Petersham, and Woods Hole); Michigan (Ann Arbor, Benzie Co., Branch in Lake Co., Cheboygan Co., Crystal Falls, Iron River, and 5 miles north of Newaygo); New Brunswick (St. John); New Hampshire (alpine area of Mt. Washington at 4,700 ft. and at 5,500 ft.); New Jersey (High Point State Park and Moorestown); New York (Canajoharie, Farmingdale, Hancock, Ithaca, Keene Valley in Essex Co. at 1,200 ft., Oneonta at 1,900 ft., Oswego, and Poughkeepsie); Newfoundland (Portland Creek and South Branch); North Carolina (Crabtree Meadows in Yancey Co., Highlands at 4,100 ft. and at 3,800 ft., Little Bear Pen Mt., Pisgah Mt. from near foot to the peak, and Skittle Creek at Highlands); Nova Scotia (Baddeck on Cape Breton Island); Ontario (Chatterton, Constance Bay, One Sided Lake, Ottawa, Palmer Rapids, and Rondeau Provincial Park); Oregon (Mt. Hood at 3,500 ft.); Pennsylvania (North East and Spring Brook); Quebec (Cap Rouge, Hull, Indian House, King Mt. at 1,150 ft., Mistassini, Old Chelsea, Mt. Albert at 1,500 ft., Park Reserve in Kamouraska Co. at 950 ft., and Ridge Road in Gatineau Park); Rhode Island (Westerly); Saskatchewan (Hudson Bay and Otosquen); South Carolina (Cleveland and Greenville); Tennessee (Indian Gap in Great Smoky Mountains National Park at 5,200 ft.); Virginia (Big Meadows in Shenandoah National Park, Galax, Mountain Lake at 3,800 ft., and Skyline Drive); Washington (Big Four, Everett, Mt. Rainier at 2,700 to 4,700 ft., Pullman, and Upper Gallatin Canyon); and Yukon Territory (Dawson and Whitehorse).

European specimens: 11♂, 53♀ from Austria (near Linz, Pulgarn, Sarleinsbach, and Scheffau in Tirol at 800 m.); Czechoslovakia (Kytín in Bohemia); Ireland (Drinabilly in Co. Down and Co. Kerry); Sweden (Åhus in Skaraborg, Hällnäs in Västerbotten, Harparbol in Uppsala, Ljungby, and Messaure); and West Germany (Bruchhausen and Siebengebirge).

Collection dates are mostly from June 1 to September 12. Those outside of this range are: May 14 at Cleveland, S. C., USA; May 18 and 23 in the Great Smoky Mountains National Park, Tenn., USA; May 18 to 26 at Robson, B. C., Canada; May 20 to 25 at Black Rock Mt., 3,500 ft., Rabun Co., Ga., USA; May 21 at Cleveland, S. C., USA; May 26 at Mountain Lake, 3,800 ft., Va., USA; May 28 at Messaure, Sweden; May 30 near Linz, Austria; Sept. 13 and 19 at Old Chelsea, Que., Canada; Sept. 15 at Hudson Bay, Sask., Canada; Sept. 15, 22, and 26 and Oct. 9 at Messaure, Sweden; Sept. 16 at Sarleinsbach, Austria; Sept. 18 at Greenville, S. C., USA; Sept. 22 near Linz, Austria; Sept. 25 from near Ottawa, Ont., Canada; Oct. 13 at Highlands, N. C., USA;

Oct. 19 at Siebengebirge, West Germany; Oct. 30 at Chevy Chase, Md., USA; and Dec. 12 at Ridge Road, Gatineau Park, Que., Canada.

There is one bred series in the lot: 4♂, 8♀, from *Armillaria mellea*, collected Sept. 30, 1912, adults obtained Oct. 30, 1912, Chevy Chase, Md., USA, C. H. Popinoe. Kieffer, 1908 and 1914, reports oviposition into *Lactarius*. Szelényi, 1940 and Masner, 1968 report *Fungivora fungorum* as a host.

This is a common species of the Holarctic Region. Adults occur throughout the warmer part of the season.

3. Cryptoserphus pauciruga, new species

Front wing 2.6 to 3.2 mm. long. Clypeus about 3.3 as wide as long and about 0.86 as wide as face. Mandible with a long slender pointed apex, its dorsal subapical tooth minute. Subapical segment of flagellum 2.7 as long as wide in male, about 2.2 as long as wide in female. Notaulus about 0.8 as long as width of tegula. Paired dorsal smooth areas on propodeum each about 1.4 as long as wide. Propodeal reticulation sparse, the propodeum behind spiracle with a weakly wrinkled or almost smooth area that is about 2.5 as large as the spiracular swelling of propodeum. Opening of propodeal spiracle about 3.2 as long as wide.

Black. Scape, pedicel, mouth parts, tegula, and legs fulvous, the tarsi brownish fulvous. Base of flagellum fulvous brown. Stigma and strong veins dark brown. Ovipositor sheath dark brown to black.

Type: ♀, Portal, Ariz., U. S. A., Aug. 13, 1974, H. and M. Townes (Townes).

Paratypes: ♂, 4♀, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 30 and Aug. 2, 1964, W. R. M. Mason (Ottawa). ♀, 10 miles west of El Salto, 9,000 ft., Durango, Mexico, July 19, 1964, J. E. H. Martin (Ottawa). ♀, 15 miles west of El Palmito, 5,000 ft., Sinaloa, Mexico, July 30, 1964, W. R. M. Mason (Ottawa).

This species occurs in the mountains of Mexico and southern Arizona.

4. Cryptoserphus latidens, new species

Front wing 2.5 to 3.3 mm. long. Clypeus about 3.8 as wide as long and about 0.90 as wide as face. Mandible stout. Subapical segment of flagellum 3.0 as long as wide in male, about 2.8 as long as wide in female. Notaulus about 0.5 as long as width of tegula. Paired dorsal smooth areas on propodeum each about 1.3 as long as wide. Propodeal reticulation sparse, the propodeum behind spiracle with a weakly wrinkled or almost smooth area that is about 2.0 as large as the spiracular swelling of propodeum. Opening of propodeal spiracle about 3.3 as long as wide.

Black. Scape, pedicel, mouth parts, tegula, and legs fulvous, the

tarsi largely brownish. Stigma and strong veins dark brown. Apical 0.25± of syntergite of female and all of following tergites of female brown. Ovipositor sheath blackish.

Type: ♀, 10 miles west of El Salto, 9,000 ft., Durango, Mexico, Aug. 11, 1964, J. E. H. Martin (Ottawa).

Paratypes: 5♀, same locality as type, June 16, 28, and 30 and July 8 and 11, 1964, J. E. H. Martin and W. R. M. Mason (Ottawa). ♀, 14 miles southwest of El Salto, 8,000 ft., Durango, Mexico, June 30, 1964, W. R. M. Mason (Ottawa). ♀, 3 miles east of El Salto, 8,400 ft., Durango, Mexico, June 21, 1964, W. R. M. Mason (Ottawa). ♀, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 4, 1964, W. R. M. Mason (Ottawa). ♀, 9 miles west of La Ciudad, 8,800 ft., Durango, Mexico, July 12, 1972, B. and C. Dasch (Dasch). 2♀, west side of Cortes Pass, 9,500 ft., and 11,000 ft., Mexico, Mexico, Aug. 13, 1964, J. G. Chilcott (Ottawa). ♂, 5 kilometers west of El Salto, 8,800 ft., Durango, Mexico, June 12, 1972, B. and C. Dasch (Dasch). ♂, 10 miles east of Toluca, 8,900 ft., Mexico, Mexico, July 31, 1964, J. G. Chilcott (Ottawa).

This species occurs in the higher mountains of Mexico.

Aculeator Group

Cheek with a vertical impression below lower corner of eye or sometimes with a complete groove from eye to mandible. Clypeus about 0.6 as wide as face, 1.6 to 2.3 as wide as long. Mandible short, thin, its apex broad, rounded or with a single small point. Notaulus present, vestigial, or absent. Hair band on front edge of mesopleurum interrupted or not. Longer spur of hind tibia ending between middle and the apical 0.3 of hind basitarsus. Base of syntergite with 5 to 11 longitudinal grooves. Ovipositor sheath 0.7 to 1.1 as long as hind tibia, without long hairs except in *C. aculeator* (which has the long hairs arising at about 80° and not so erect as in the Flavipes Group).

Nine species are known, three of them Holarctic or Holarctic and Oriental, two Nearctic, one in the Philippines, one in New Guinea, and two in Ecuador.

5. Cryptoserphus fortis, new species

Figure 403 (ovipositor sheath)

Male: Unknown.

Female: Front wing 3.4 to 3.5 mm. long. Penultimate segment of female flagellum about 2.0 as long as wide. Notaulus about 0.8 as long as width of tegula. Hair band on front of mesopleurum with a wide interruption. Mesopleural suture with about 5 small foveae on its upper half and 3 larger foveae on its lower half (no other species of *Cryptoserphus* has this suture distinctly foveate). Lower edge of smooth area of metapleurum with a curved horizontal wrinkle on its

hind 0.5±. Dorsal paired smooth areas on propodeum each about 1.25 as long as wide, their hairs sparse, those near the middle of the areas separated at base by about 1.0 the length of the hairs. Punctures on apical 0.25 of syntergite very small. Base of syntergite wide, with 9 to 11 very short longitudinal grooves, the median groove reaching about 0.3 the distance to first pair of thryidia. Ovipositor sheath about 0.9 as long as hind tibia, terete and hairless, its apical 0.5 a little more strongly decurved than its basal 0.5, with a weak even taper toward the apex, the apex narrow and rounded (fig. 403). Tip of paired ovipositor sheaths in dorsal view with a slight taper to the rounded apex.

Black. Mouth parts, scape, pedicel, tegula, and legs light fulvous, the hind tarsus light brown. Flagellum light fulvous brown at base, soon darkening to medium brown then to dark brown near middle and beyond.

Type: ♀, King Mt., 1,150 ft., Old Chelsea, Que., July 30, 1959, S. M. Clark (Ottawa). Figure 403 is from the type.

Paratypes: ♀, Aylmer West, Que., Malaise trap, July 20 to 24, 1972 (Ottawa). ♀, Mt. Desert, Me., July 30, 1922, W. L. McAtee (Washington).

6. Cryptoserphus occidentalis Brues

Figures 75 (♀ metapleurum and propodeum); 404 (ovipositor sheath)

**Cryptoserphus occidentalis* Brues, 1919. Jour. New York Ent. Soc. 27: 7, pl. 1, fig. 7. ♀. des., figs. Type: ♀, USA: Chatcolet Lake in Idaho (Cambridge).

Examined in 1975. USA: Tacoma in Washington.

Cryptoserphus occidentalis Masner, 1966. Psyche 72: 297. ♀. type data.

Front wing 2.4 to 3.3 mm. long. Penultimate segment of female flagellum about 2.3 as long as wide. Notaulus about 0.6 as long as width of tegula. Hair band on front of mesopleurum with an interruption, or sometimes continuous in females and rarely continuous in males. Dorsal paired smooth areas on propodeum each about 1.25 as long as wide, their hairs sparse, those near middle of the areas separated at base by about 0.7 the length of the hairs. Base of syntergite wide, with 4 (or rarely 3) very short longitudinal grooves on each side of middle, the median groove reaching only about 0.25 the distance to first pair of thryidia. Punctures on apical 0.25 of male syntergite very small, separated by about 2.0 their diameter; punctures on following tergite of male also small, separated by about 1.0 their diameter. Ovipositor sheath about 0.9 as long as hind tibia, for most of its length almost straight and not tapered, without distinct hairs, its apical 0.2± more curved and in profile weakly tapered to a rounded tip (fig. 404). Tip of paired ovipositor sheaths in dorsal view weakly tapered to a blunt rounded apex.

Black. Mouth parts, scape, pedicel, tegula, and legs pale fulvous, the hind coxa often brown basally and hind tarsus usually pale brown.

Flagellum blackish brown, paler toward base, next to pedicel brownish fulvous. Ovipositor sheath brown.

Specimens: 4♂, 24♀ from Alaska (Paxson); British Columbia (Metlakatla, Robson, and Terrace); California (Crescent City); Idaho (Idaho City, Lake Waha, Moscow Mt., and Priest Lake); New Hampshire (Mt. Munroe at 5,000 to 5,200 ft.); Ontario (Ottawa); Oregon (Mt. Hood at 3,500 ft., Saddleback Mt. in Lincoln Co., Seaside, Selma, and Tahkenitch Lake); Quebec (Gatineau Park, Hull, Old Chelsea, and Parke Reserve in Kamouraska Co. at 950 ft.); Washington (Tacoma and White River on Mt. Rainier); and Yukon Territory (Gravel Lake 58 miles east of Dawson at 2,050 ft.). Specimens are in the collections of Ottawa, Cambridge, and Washington. Collection dates are distributed from May 11 to September 21-30.

This is a Nearctic species, of the Canadian and Hudsonian Zones. It is commonest in the West.

7. *Cryptoserphus medius*, new species

Figure 405 (ovipositor sheath)

Front wing 2.4 to 3.0 mm. long. Penultimate segment of female antenna about 2.2 as long as wide. Notaulus about 0.8 as long as width of tegula. Hair band on front margin of mesopleurum with a wide interruption. Lower margin of smooth area of metapleurum with a horizontal wrinkle on its hind 0.45±. Dorsal smooth areas of propodeum each about 1.4 as long as wide, their hairs sparse and relatively short, the hair bases near the middle of the areas separated by about 0.8 the length of the hairs. Base of syntergite of moderate width, with 3 (or sometimes 2) longitudinal grooves on each side of midline, the grooves of moderate length. Median longitudinal groove of syntergite reaching about 0.25 the distance to basal pair of thyridia. Punctures on apical 0.25 of male syntergite separated by about 0.7 their diameter; punctures on the following tergite separated by about 0.5 their diameter. Ovipositor sheath about 0.85 as long as hind tibia, rather strongly decurved, without evident hairs, its apical 0.25± somewhat tapered, the apex without a lateral swelling (fig. 405). Dorsal aspect of the combined ovipositor sheath only faintly tapered at tip and with apex broadly rounded.

Black. Mouth parts, scape, pedicel, tegula, and legs light fulvous, the hind coxa brownish basally. Flagellum brownish fulvous at base, darkened beyond base. Collar brown. Ovipositor sheath dark brown.

Type: ♀, Stone Mt. Park, 3,800± ft., B. C., July 17, 1973, H. and M. Townes (Townes).

Nearctic paratypes: 32♂, 59♀ from Alaska (near Anchorage, Isabel Pass near mile 206 on the Richardson Highway at 2,900 ft., King Salmon on the Naknek River, Matanuska, Naknek, Paxson, Thompson Pass, Tsaina River, and Umiat); British Columbia (Kaslo, Kleanza Creek 14 miles east of Terrace, Lac la Hache, Milnor, Mt.

Thornhill at Terrace, Racing River at 2,400 ft., Robson, Stone Mt. Park at 3,500 and at 4,500 ft., Takakkaw Falls, and Terrace); Colorado (Gould); New Hampshire (Mt. Washington at 4,700 ft.); New York (Ithaca); North Carolina (Highlands and Mt. Mitchell at 3,800 ft.); Ontario (Mer Bleue, Rondeau Provincial Park, and Trenton); Quebec (La Trappe, Old Chelsea, and Parke Reserve in Kamouraska Co. at 950 ft.); Washington (Everett and Mt. Rainier at 2,700 ft.); and Yukon Territory (14 miles east of Dawson at 1,300 ft., Norman Wells, North Fork Crossing in the Ogilvie Mts. at 3,500 ft., and Teslin).

Palaearctic paratypes: 2♂, 13♀ from West Germany (Mainz); Japan (Kinasa in Nagano at 400 m.); and Sweden (Messaure).

Paratypes are in the collections of Ottawa, Townes, Washington, and Cambridge.

Collection dates are mostly from June to September. Those outside of this range are April 27, May 18-26, and May 23-31 at Robson, B. C.; May 4 at Mainz, Germany; Oct. 4 at Messaure, Sweden; Oct. 6 at Matanuska, Alaska; and "Oct." in Rondeau Provincial Park, Ont.

This species is widespread in the northern part of the Holarctic Region. In the Nearctic Region it is in the Canadian, Hudsonian, and Arctic zones.

8. Cryptoserphus dilatus, new species

Figure 406 (ovipositor sheath)

Front wing 2.3 to 3.3 mm. long. Penultimate segment of female antenna about 2.6 as long as wide. Notaulus about 0.8 as long as width of tegula. Hair band on front margin of mesopleurum with a wide interruption. Lower margin of smooth area of metapleurum with a horizontal wrinkle on its hind 0.3±. Dorsal smooth areas of propodeum each about 1.7 as long as wide, with long hairs that are dense at hind edge of the areas, much sparser toward front end, the hairs near center of smooth areas about 0.4 as far apart at base as the hairs are long. Base of syntergite of moderate width, with 3 long longitudinal grooves on each side of midline, the median 3 grooves of equal length and reaching about 0.5 the distance to first pair of thyridia. Punctures on apical 0.25 of male syntergite separated by about 0.7 their diameter; punctures on the following tergite of male separated by about 0.5 their diameter. Ovipositor sheath about 0.9 as long as hind tibia, without evident hairs, almost straight with apical 0.25± decurved, its tip in profile strongly tapered to a narrowly rounded apex (fig. 406). Dorsal aspect of combined ovipositor sheaths a little expanded at apex, with the end almost truncate.

Black. Mouth parts, tegula, and legs pale fulvous or brownish fulvous, the tarsi and usually the basal 0.4± of hind coxa light brown. Scape, pedicel, and base of flagellum brownish fulvous to brown. Ovipositor sheath brown, the apical 0.25± dark brown.

Type: ♀, Tsaina River, Alaska, Aug. 17, 1973, H. and M. Townes

(Townes).

Nearctic paratypes: 31♂, 101♀ from Alaska (Deering, King Salmon on the Naknek River, Matanuska, Mt. McKinley at 2,000 ft., Naknek, Paxson, Tsaina River at 2,400 ft., Valdez, and Willow Road at mile 32.3); British Columbia (Cowichan Lake, Cultus Lake, Hixon, Kitsumkalum Lake 20 miles north of Terrace, Kleanza Creek 14 miles east of Terrace, Lac la Hache, Mission City, Point Grey in Vancouver, Robson, Terrace, 33 miles west of Terrace, and Mt. Thornhill near Terrace); California (Crescent City); Colorado (Silverton at 9,800 ft.); Georgia (Rabun Bald); Maine (Bar Harbor); Michigan (Iron River); Minnesota (Big Fork); Newfoundland (Portland Creek and South Branch); New York (Haggards in St. Lawrence Co., Ithaca, and Whiteface Mt. at 4,600 to 4,872 ft.); North Carolina (Highlands at 3,800 ft. and Pisgah Mt.); Ontario (Cumberland, near Marmora, and Stittsville); Oregon (Corvallis); Quebec (Lac Chicobi and Parke Reserve in Kamouraska Co. at 950 ft.); South Carolina (Cleveland); Washington (Ashford, Castle Rock, Ilwaco, Longatee, Olympia, Sequim, and Shelton); and Yukon Territory (Rancheria Swift River).

European paratypes: 4♂, 6♀ from Ireland (Powerscourt Deer Park in County Wicklow, Glenasmole in County Dublin, Slade Brook in County Dublin, The Slade of Saggart in County Dublin, and Tollymore Park in Co. Dublin); Italy (Cansiglio in Belluno and Franzenfeste at 1,000 m.); and Sweden (Vallentuna in Uppsala).

Dates of collection are mostly from June to September. Those outside of this range are: May 9 at Cleveland, S. C., USA; May 21 at Stittsville, Ont., Canada; May 26 at The Slade of Saggart, County Dublin, Ireland; May 27 at Powerscourt Deer Park, County Wicklow, Ireland; May 29 at Crescent City, Calif., USA; May 31 at Terrace, B. C., Canada; Oct. 1 at Vallentuna, Uppsala, Sweden; Oct. 2 and 5 at Matanuska, Alaska, USA; and Oct. 20 and Nov. 22 at The Slade of Saggart, County Dublin, Ireland.

This species is widespread in the northern part of the Holarctic Region. It is adult throughout the warmer part of the season.

9. Cryptoserphus hirtipennis, new species

Figure 407 (ovipositor sheath)

Front wing 2.1 to 3.0 mm. long. Penultimate segment of female antenna 2.25 as long as wide. Notaulus very short or represented by a small dimple on margin of mesoscutum. Hair band on front margin of mesopleurum complete or sometimes with a narrow interruption. Lower margin of smooth area of metapleurum with or without a weak horizontal wrinkle on its hind 0.2±. Dorsal smooth areas of propodeum each about 1.9 as long as wide, with sparse very long hairs, the hairs near middle of the areas separated at base by about 0.6 the length of the hairs. Hairs on front part of front wing unusually long, those on costa about 0.8 as long as width of costal cell. (In other species of *Crypto-*

serphus the hairs on costa are about 0.5 as long as width of costal cell.). Base of syntergite moderately slender, with 7 moderately long longitudinal grooves at base, the 3 median grooves reaching about 0.5 the distance to first pair of thyridia. Punctures on apical 0.25 of male syntergite and on male tergite following the syntergite very small, separated by about 4 times their diameter. Ovipositor sheath 0.70 as long as hind tibia, in profile tapered to a point, in dorsal view the apex moderately wide and broadly rounded (fig. 407). The ovipositor sheath in the one female available has a few short hairs at the base, but there are hair sockets (without apparent hairs) near middle and apex of the sheath which indicate that longer hairs perhaps were originally present.

Black. Mouth parts, scape, pedicel, tegula, and legs stramineous or pale fulvous, the hind coxa brown basally, front and middle tarsi brown apically, apical 0.12± of hind tibia infuscate, and hind tarsus fuscous. Base of flagellum tinged with pale fulvous.

Type: ♀, Mt. Canlaon, 7,000 ft., Negros Oriental, Philippines, May 5, 1953, H., M., and D. Townes (Townes).

Paratypes: 5♂, same data as type (Townes). 3♂, in *Quercus* forest, Mt. Data, 7,800 ft., Philippines, Dec. 30 and 31, 1952, H., M., and D. Townes (Townes).

10. Cryptoserphus adustus, new species

Front wing 2.7 to 3.0 mm. long. Structurally similar to *C. aculeator* except as follows: Body a little more slender. Notaulus about 0.5 as long as width of tegula. Hair band on front margin of mesopleurum usually interrupted. Hairs on costa about 0.7 as long as costal cell. First thyridium averaging smaller. Syntergite with 5 or sometimes 7 longitudinal grooves at base, these of about equal length. Front 0.3 of syntergite with 0 to 12 hairs on its lower half.

Black. Palpi pale brown. Mandible, scape, pedicel, and trochanters light fulvous. Tegula and front coxa light brown. Middle coxa brown. Hind coxa dark brown. All coxae paler apically. Femora brown, the hind femur darkest. All femora pale at ends. Tibiae pale brown to dark brown, paler at base. Front and middle tarsi light brown. Hind tarsus dark brown. Wings subhyaline. Stigma and strong veins light brown.

Type: ♀, Mt. Kainde, 2,300 m., Papua, New Guinea, Feb. 13 to Mar. 12, 1979, J. Sedlacek (Townes).

Paratypes: 4♂, 12♀, from Mt. Kainde at 2,300 m., Mt. Wilhelm at 2,550 m., Mt. Giluwe at 2,800 m., Tari Gap near Mt. Hagen, and Jimimi Valley to Baiyer River at 1,750 m., all in Papua, New Guinea, dated between Dec. 19, 1978 and Feb. 14, 1979, J. Sedlacek (Townes).

11. Cryptoserphus aculeator Haliday

Figures 76 (♀ metapleurum and propodeum); 408 (ovipositor sheath)

- Proctotrupes aculeator* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.
- **Codrus ater* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 359. ♂, ♀. des. biol. Types: ♂, ♀. Germany: Sickershausen (destroyed). In *Boletus* infested with *Fungivora* larvae. Name preoccupied by Gravenhorst, 1807. Vollenhoven figured a type and stated that this is probably the same as *aculeator*. His interpretation of *ater* is followed.
- **Proctotrupes aculeator* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 14, 15. ♂, ♀. des., biol. Lectotype: ♀ (labeled as type by Nixon, present designation), locality? (Dublin). England. Finland. Ireland. Type examination reported by Nixon, 1938. J. P. O'Connor sent notes that type has several long hairs on ovipositor sheath and a long median groove on syntergite.
- Proctotrupes aculeator* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes aculeator* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Haarlem.
- Proctotrupes ater* Vollenhoven, 1876. Pinacographia, p. 31, pl. 19, fig. 4. syn., des., fig. Host: *Sceptonia nigra*. Figure of an original type.
- Proctotrypes aculeator* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 462. syn.
- Proctotrypes ater* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 462. syn. (in part).
- Exallonyx ater* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. syn.
- **Serphus (Cryptoserphus) Perrisi* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 318. ♀. des. in key. Type: ♀, France: Mont-de-Marsan (lost). The type was searched for in Paris in 1975 by H. Townes and in the Perris collection in Montpellier by Dr. Jean-Paul Aeschlimann in 1976. In the Perris collection there are no specimens determined as *perrisi* and no specimens are present which fit the description. The description's most distinctive statement is that the base of the front and hind coxae are brown. The hind coxa is regularly brown basally in *Cryptoserphus aculeator*, *C. medius*, and *C. dilatus*. None of these has the front coxa brown at base (except possibly in stained specimens). The most likely identification of *perrisi* is as a synonym of *aculeator*, and by first revisor's privilege, *perrisi* is treated this way. New synonym.
- Serphus (Cryptoserphus) Aculeator* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 319. ♂, ♀. des. in key. England: Isle of Wight. Finland. France: Maison-Lafitte. Ireland. Sweden.
- Serphus (Cryptoserphus) Ater* Kieffer, 1907 & 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 274, 325. des. "doubtful species". Host: *Creophilus maxillosus*.
- Cryptoserphus perrisi* Kieffer, 1914. Das Tierreich 42: 38. ♀. key, des. France: Mont-de-Marsan.
- Cryptoserphus aculeator* Kieffer, 1914. Das Tierreich 42: 39. ♂, ♀. key, des. England. France. Germany. Hungary. Sweden. Host: *Sceptonia nigra*.
- Cryptoserphus? ater* Kieffer, 1914. Das Tierreich 42: 41. ♂, ♀. des., biol. Germany. From fungi, especially *Boletus*, infested by Fungivoridae larvae.
- Proctotrypes aculeator* Morley, 1922. Entomologist 55: 59, 83. ♂, ♀. key, biol. England: 9 localities. Scotland.
- Cryptoserphus aculeator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 461, 462, 463. ♂, ♀. keys, des., figs. England: 4 localities. Ireland: 8 localities. Wales: 1 locality.
- Cryptoserphus aculeator* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Gretna.

- Cryptoserphus aculeator* Kerrich, 1940. Notulae Ent. 19: 101. USSR: Salmi.
- Cryptoserphus aculeator* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- Cryptoserphus aculeator* Hellén, 1941. Notulae Ent. 21: 41. ♂, ♀. key, des. Finland: 11 localities. Sweden. USSR: Kola Peninsula. (in part).
- Cryptoserphus aculeator* Perkins, 1942. Entomologist 75: 194. Sweden: 8 localities.
- Cryptoserphus aculeator* Nixon, 1942. Entomologist 75: 196. ♂. key, fig.
- Cryptoserphus aculeator* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.
- Cryptoserphus aculeator* Meyer, 1961. Ver. naturw. Heimatforsch. Hamburg 35: 69. ♂, ♀. West Germany: Hohwacht in East Holstein.
- Cryptoserphus aculeator* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 28, 33. ♀. ecology. West Germany: 6 localities.
- Cryptoserphus aculeator* Meyer, 1963. Bombus 2: 143. ♀. West Germany: Satrup [in Schleswig-Holstein].
- Cryptoserphus aculeator* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 2. Europe. Japan. USSR: Kuril Is.
- Cryptoserphus aculeator* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 441 et seq. ecology. Austria. Italy: Calabria. Switzerland.
- Cryptoserphus aculeator* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 537. biol. Ireland: 10 counties.
- Cryptoserphus aculeator* Masner, 1968. Acta Ent. Bohemoslov 65: 465. ♂, ♀. Czechoslovakia: 2 localities. Hosts: *Exechia contaminata* in *Lactarius "plumbeus"*; *Fungivora ruficollis*.
- **Cryptoserphus deshii* (as *deshi* on figure) Drake, 1969. Proc. Hawaiian Ent. Soc. 20: 327. ♀. des., figs. Type: ♀, Japan: Mount Omoga in Ehima Prefecture on Shikoku Is. (Fukuoka). Examined in 1975. New synonym.
- Cryptoserphus aculeator* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 30, 32. ♂, ♀. key, des., fig., biol. Middle Europe. Great Britain. Southern Italy. Japan. Scandinavia into Lappland. Switzerland: 4 localities.
- Cryptoserphus aculeator* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 117. Austria. Germany. Italy.
- Cryptoserphus aculeator* Kozlov, 1972. Insects of Mongolia 1: 648. ♀. Mongolia: 1 locality.
- Cryptoserphus aculeator* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.
- Codrus ater*? Dessart, 1975. Pub. Natuurhist. Genootsch. Limburg 24: 9. syn. (in part). type data for *Exallonyx crassicornis* Kieffer.
- Cryptoserphus aculeator* Teodorescu and Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 166. ♀. Rumania: Suceava.
- Cryptoserphus aculeator* Kozlov, 1978. Opređelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 546. ♀. key, figs. USSR: northwest Moldaviya.

Front wing 2.5 to 3.8 mm. long. Penultimate segment of female antenna about 3.0 as long as wide. Notaulus about 0.8 as long as width of tegula. Hair band on front of mesopleurum continuous, sometimes in males and rarely in females with an interruption. Lower margin of smooth area of metapleurum with a horizontal wrinkle on its hind 0.2±, sometimes the wrinkle indistinct or lacking. Dorsal smooth areas on propodeum each about 1.8 as long as wide, with sparse long hairs, the hairs near middle of the areas separated at base by about 0.6 the length of the hairs. Hairs on costa about 0.5 as long as width of costal cell. Base of syntergite of moderate width with 7 (or rarely 8 or 9) long longitudinal grooves, the 3 median grooves reaching about 0.5 the distance to first pair of thyridia, the groove second from median groove

about 0.5 as long as groove next to median groove. Punctures on apical 0.25 of male syntergite separated by about 2.0 their diameter; punctures on male tergite following the syntergite separated by about 2.0 their diameter. Ovipositor sheath about 0.80 as long as hind tibia, weakly compressed, its apical 0.3 decurved and tapered to a narrowly rounded apex (fig. 408). Hairs on ovipositor sheath about 1.0 as long as depth of the sheath and diverging from sheath at about 80° (not quite so nearly erect as in the *Flavipes* Group). There is one long hair near the tip of the sheath, one near middle, and one or two near base. Sometimes there are additional very short hairs.

Black. Scape, pedicel, mouth parts, tegula, and legs pale fulvous, with the following exceptions: Scape and pedicel sometimes brown. Hind coxa usually brown (especially in male), with apex paler. Apices of front and middle tarsi brown. Apical 0.1± of hind tibia usually fuscous. Hind tarsus fuscous. Flagellum usually more or less fulvous at base.

European specimens: 41♂, 53♀ from Austria (Seebenstein, Sarleinsbach, and Vienna); England (Bagley Woods near Oxford, Heathfield in Devon, Haytor in Devon at 1,300 ft., Leicester, and New Forest); Ireland (Angoh Lake "B. Br." in County Cavan, B'scorney in County Dublin, Carrilead in County Carlow, Clara in County Wicklow, Donard Lo in County Down, Glencullin in County Wicklow, Glending in County Kildare, Golden Hill in County Dublin, Killin "MP", Knockmaroon in County Dublin, Old Head in County Westmeath, Pink Point in County Kilkenny, The Slade of Saggart in County Dublin, Tollymore Park in County Down, Trawallua in County Sligo, and Tullaghan in County Leitrim); Italy (Unserfrau near Mont Alto in Trentino at 1,500 m.); Spain (San Sebastian); Sweden (Ljungby, Messaure, Riksgrünsen in Lappland at 500 m., and Skane); and West Germany (Bonn, Schliersee in Bavaria at 700 to 1,100 m., and Siebengebirge). Collection dates are distributed from May 8 to December 20, with most of the captures from June to October.

Oriental specimens: 7♂, 2♀ from Java (Tjibodas on Mt. Gede at 8,000 ft.); Nepal (Pulchauki in Katmandu at 6,600 and at 7,300 ft.); and Philippines (near Basiwag in Abra, Baroring River at 7,000 ft. on Mt. Apo, Dapitan, Mt. Data at 7,800 ft., Mt. Polis at 5,500 ft., and Mt. Santo Tomás at 6,500 ft.).

This species is widespread in Europe and occurs in mountainous habitats in the Oriental Region. It has been reported as a parasite of various fungivorid larvae by Nees, 1834, by Vollenhoven, 1876, and by Masner, 1968. Kieffer's 1907 and 1908 record of *Creophilus maxillosus* as a host seems an error due to nomenclatural confusion.

12. *Cryptoserphus quintanus*, new species

Figures 77 (♀ metapleurum and propodeum); 409 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.7 mm. long. Clypeus 0.62 as wide as face, 2.3 as wide as long. Cheek 2.0 as long as diameter of scape, with a small impression at lower corner of eye. Penultimate segment of flagellum 2.75 as long as wide. Notaulus completely lacking. Hair band on front edge of mesopleurum broad and continuous. Smooth area of metapleurum bounded below by a horizontal wrinkle on its hind 0.4. Dorsal smooth areas on propodeum 1.9 as long as wide, with sparse long hairs, the bases of hairs near middle of the areas separated by about 0.7 the length of the hairs. Longer spur of hind tibia reaching to apical 0.34 of hind basitarsus. Base of syntergite of moderate width, with 5 long longitudinal grooves, the 3 median grooves reaching 0.5 the distance to first pair of thyridia. Punctures on apical 0.25 of syntergite very small, separated by about 4.0 their diameter. Ovipositor sheath 0.70 as long as hind tibia, without evident hairs, almost evenly curved, its tip very little tapered (fig. 409).

Black. Scape and pedicel blackish brown. Mouth parts, tegula, trochanters, and front and middle coxae stramineous. Femora and tibiae pale brownish fulvous, slightly darker on upper part, the apical 0.12 of hind tibia fuscous. Hind coxa dark brown, gradually becoming paler towards its pale brown apex. Front and middle tarsi brown. Hind tarsus fuscous. Stigma light brown. Strong veins medium brown. Apical part of abdomen brown. Ovipositor sheath dark brown.

Type: ♀, Cerro Tinajillas, 3,200 m., Ecuador, Mar. 18-21, 1966, Luis Peña (Townes).

13. Cryptoserphus rostratus, new species

Figures 78 (♀ metapleurum and propodeum); 410 (ovipositor sheath)

Front wing 3.3 to 4.1 mm. long. Clypeus 0.62 as wide as face, 1.65 as wide as long. (Clypeus about 2.3 as wide as long in other species of the Aculeator Group.) Cheek 2.3 as long as width of scape, without a distinct impression at lower corner of eye (cheek shorter in other species of the genus). Penultimate segment of female flagellum 2.2 as long as wide. Notaulus completely lacking. Hair band on front edge of mesopleurum broad and continuous. Smooth area of metapleurum not bounded below by a wrinkle. Dorsal smooth areas of propodeum each about 1.9 as long as wide, with long sparse hairs, the bases of hairs near middle of the areas separated by about 0.6 the length of the hairs. Longer spur of hind tibia reaching to middle of hind basitarsus (reaching to apical 0.33± of hind basitarsus in other species of the group). Base of syntergite of moderate width, with 5 long longitudinal grooves, the 3 median grooves reaching about 0.5 the distance to first pair of thyridia. Punctures on apical 0.25 of syntergite and on the following tergite very small, separated by about 3.0 their diameter. Ovipositor sheath 0.97 as long as hind tibia, without evident hairs, mostly parallel-sided, its apical 0.25 a little tapered and more strongly curved than the rest, the apex rounded (fig. 410).

Black. Scape and pedicel black or dark brown. Mouth parts, tegula, coxae, trochanters, and femora pale fulvous, the apical 0.3 of hind femur brownish (especially dorsad). Front and middle tibiae light brown, paler basad. Hind tibia light brown, increasingly infuscate from middle toward apex, the apex black. Front and middle tarsi brown. Hind tarsus black. Stigma and strong veins blackish brown. Apex of abdomen brown. Ovipositor sheath blackish brown.

Type: ♀, Cerro Tinajillas, 3,200 m., Ecuador, Mar. 18-21, 1965, Luis Peña (Townes).

Paratypes: 2♂, same data as type (Townes).

8. MISCHOSERPHUS, new genus

Figures 13 (side view); 37 (front wing)

Front wing 2.2 to 3.6 mm. long. Body moderately slender. Clypeus small, moderately strongly convex, smooth, its apex truncate or weakly convex, its apical margin sharp and narrowly reflexed. Cheek with or without a groove from eye to mandible. Occipital carina usually complete with its lower end joining oral carina, sometimes the occipital carina incomplete below or only its dorsal part present. Mandible short, wide, and thin, its apex blunt or with a single point. Flagellum slender, without distinct tyloids. Notaulus about 0.8 as long as tegula. Collar and scrobe of pronotum smooth. Front dorsolateral part of pronotum with a prominent rounded tubercle. Front edge of mesopleurum with hairs just below tegula but no hairs from below this group to (or almost to) the horizontal groove. Horizontal groove of mesopleurum complete. Mesopleural suture sometimes foveolate above the horizontal groove but not below. Metapleurum with a large smooth hairless area, the upper front part of smooth area connected by a carina to lateral upper margin of propodeum. Longer spur of hind tibia ending near middle of hind basitarsus. Stigma small. Radius originating near mid-length of stigma, its vertical part about 2.5 as long as wide. Costal side of radial cell about 2.2 as long as depth of stigma. Costal vein continued beyond end of radius by a distance equal to 0.4 to 1.9 the length of radial cell. Abdomen without a stalk or sometimes with a stalk that is as much as 1.0 as long as high. Base of syntergite stout, with about 9 short longitudinal grooves. Ovipositor sheath 0.9 to 1.8 as long as hind tibia, slender, terete, hairless, weakly curved, and gradually tapered to apex.

Genotype: *Cryptoserphus arcuator* Stelfox.

The generic name is from $\mu\sigma\chi\omicron\varsigma$ (stalk), plus *Serphus*, referring to the stalk-like extension of the costa beyond the radial cell.

This genus is worldwide. Twenty species are known. There are no host records, but it can be presumed that they are parasites of Fungivoridae in fleshy fungi.

Key to the species of Mischoserphus

1. Portion of costal vein beyond radial cell 0.4 to 0.7 as long as costal length of radial cell. Abdomen without a stalk except in *M. acomus* (New Guinea). 2
 Portion of costal vein beyond radial cell 1.0 to 1.9 as long as costal length of radial cell. Abdomen usually with a stalk. Species of Australian Region. 17
2. Lower hairy margin of mesopleurum separated from smooth part of metapleurum by a horizontal wrinkle. 3
 Lower hairy margin of mesopleurum not separated from smooth part of metapleurum by a wrinkle. Species of South American and New Guinea. 12
3. Upper half of mesopleural suture distinctly foveolate. 4
 Upper half of mesopleural suture not distinctly foveolate, sometimes the suture obliterated. 7
4. Cheek with a strong complete groove from eye to mandible. Ovipositor sheath about 1.0 as long as hind tibia. Holarctic Region. 1. lacrymans, new species (p. 98)
 Cheek without a groove between eye and mandible or with a shallow incomplete groove. Ovipositor sheath 0.9 to 1.8 as long as hind tibia. 5
5. Hind coxa blackish brown. Smooth area on metapleurum without a wrinkle bounding its hind edge. New Guinea. 2. alternans, new species (p. 99)
 Hind coxa fulvous. Smooth area on metapleurum with a wrinkle bounding its hind edge. 6
6. Main wrinkle limiting the hind edge of smooth area on metapleurum sloped backward toward base of hind coxa. Smooth part of metapleurum about 0.7 as long as metapleurum. Ovipositor sheath 0.9 to 1.4 as long as hind tibia. Holarctic Region. 3. arcuator, Stelfox (p. 100)
 Main wrinkle limiting the hind edge of smooth area on metapleurum subvertical. Smooth part of metapleurum about 0.5 as long as metapleurum. Ovipositor sheath about 1.7 as long as hind tibia. Nearctic Region. 4. obesus, new species (p. 101)
7. Wrinkle along lower edge of smooth part of metapleurum continuous to lower front corner of metapleurum. Lower front quarter of syntergite with about 40 hairs. Alaska and northern British Columbia. 5. alaskensis, new species (p. 102)
 Wrinkle along lower edge of smooth part of metapleurum evanescent before reaching lower front corner of metapleurum. Lower front corner of syntergite with 6 to 25 hairs. 8

8. Median 3 grooves on syntergite reaching 0.3 to 0.4 the distance to first thyridia. Cheek with a weak groove from eye to mandible. Ovipositor sheath 1.1 as long as hind tibia. Philippines. 6. abbreviatus, new species (p. 102)
Median 3 grooves on syntergite reaching 0.5 to 0.8 the distance to first thyridia. 9
9. Hind coxa dark brown, paler apically. Ecuador.
7. obscurus, new species (p. 103)
Hind coxa entirely fulvous. 10
10. Smooth area of metapleurum with its hind 0.25 invaded by rugulosity. Median grooves on base of syntergite reaching 0.8 the distance to first thyridia. Australia. . . 8. australiae Kieffer (p. 104)
Smooth area of metapleurum not invaded posteriorly by rugulosity. Median grooves on base of syntergite reaching 0.5 the distance to first thyridia. 11
11. Ovipositor sheath about 1.40 as long as hind tibia. Japan.
9. samurai Pschorn-Walcher (p. 104)
Ovipositor sheath about 1.54 as long as hind tibia. Philippines.
10. genatus, new species (p. 105)
12. Abdomen with a stalk that is 0.6 as long as high. Mesoscutum almost hairless. New Guinea.
11. acomus, new species (p. 105)
Abdomen without a stalk. Mesoscutum with moderately dense hairs to almost hairless. 13
13. Hind half of mesoscutum with moderately dense hairs on part or all of its surface, the hair sockets separated by about 0.5 the length of the hairs. Ecuador and Mexico.
12. comatus, new species (p. 106)
Hind half of mesoscutum hairless except along sides. 14
14. Occipital carina complete or almost complete, reaching ventrad to or nearly to oral carina. 15
Occipital carina present only on upper part of head, above occipital foramen. Apical transverse carina of propodeum very high. 16
15. Hairy area in front of middle coxa (on mesopleurum) about 0.3 as large as the profile area of middle coxa. Hind coxa dark brown, its apical 0.3 fulvous. Paraguay.
13. coxalis, new species (p. 106)
Hairy area in front of middle coxa (on mesopleurum) about 0.8 as large as the profile area of middle coxa. Hind coxa fulvous. Ecuador. 14. trichopleurum, new species (p. 107)

16. Penultimate segment of flagellum 2.7 as long as wide. Occipital carina transverse. Ovipositor tip a little more slender.
Mexico. 15. pileatus, new species (p. 108)
- Penultimate segment of flagellum 1.4 as long as wide. Occipital carina gently arched. Ovipositor tip a little less slender.
Mexico. 16. crassicornis, new species (p. 108)
17. Abdomen without a stalk, the front end of syntergite at the basal constriction of abdomen. Mesoscutum usually reddish brown with 3 broad black stripes. Tasmania.
17. pictus, new species (p. 109)
- Abdomen with a short stalk. Mesoscutum entirely black. . . . 18
18. Mesoscutum almost hairless, with a total of about 20 hairs. New Guinea. 18. calvus, new species (p. 109)
- Mesoscutum with moderately dense hairs. 19
19. Stalk of abdomen about 0.3 as long as high. Smooth part of metapleurum with a horizontal wrinkle along its lower edge. Portion of costal vein beyond radial cell about 1.9 as long as radial cell. New Caledonia.
19. appendicis, new species (p. 110)
- Stalk of abdomen about 0.8 as long as high. Smooth part of metapleurum without a horizontal wrinkle along its lower edge. Portion of costal vein beyond radial cell about 1.0 as long as radial cell. New Guinea. . 20. petiolatus, new species (p. 111)

1. Mischoserphus lacrymans, new species

Figures 79 (♀ metapleurum and propodeum); 411 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.7 to 3.2 mm. long. Body of moderate proportions. Temple about 0.6 as long as eye. Cheek about 2.6 as long as diameter of pedicel, with a sharp continuous groove from eye to mandible, its lower edge projecting below base of mandible as a narrow flange. Occipital carina complete, not weak below. Penultimate segment of flagellum about 1.8 as long as wide. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture foveolate. Lower hind corner of mesopleurum with a group of about 10 hairs. Metapleural sculpture as in figure 79, the smooth area short with its hind edge invaded by some wrinkles and punctures. Dorsal smooth areas of propodeum each about 1.0 as long as wide. Apical carina of propodeum weak and irregular. Abdomen without a stalk. Costa extending beyond radial cell by 0.4 length of radial cell on costa. Anteroventral quarter of syntergite with about 50 hairs. Ovipositor as in figure 411, about 1.0 as long as hind tibia.

Black. Antenna blackish brown. Mouth parts light fulvous, the

maxillary palpus often infuscate apically. Tegula and legs fulvous, segment 5 of front and middle tarsi and all of hind tarsus brownish. Coxae sometimes brown. Wings hyaline. Stigma and strong veins dark brown. Ovipositor sheath dark brown.

Type: ♀, Messaure, Sweden, Sept. 26, 1971, Karl Müller (Townes). Figures 79 and 411 are from the type.

Paratypes: 3♀, same locality and collector as type, Sept. 7, Oct. 9, and "Sept.", 1971 (Townes). ♀, Isabel Pass, 2,900 ft., mile 206 on the Richardson Highway, Alaska, July 18, 1962, P. J. Skitsko (Ottawa). ♀, Portland Creek, Newfoundland, Aug. 1-14, 1973, Gerd Heinrich (Ottawa).

2. *Mischoserphus alternans*, new species

Figures 74 (♀ metapleurum and propodeum); 412 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.7 to 2.8 mm. long. Body moderately stout. Temple 2.1 as long as eye. Cheek 2.5 as long as diameter of scape, with a faint groove from eye to mandible, its lower edge projecting a little below base of mandible as a narrow flange. Occipital carina complete, not weak below. Penultimate segment of flagellum 2.0 as long as wide. Mesoscutum with moderately dense hairs. Upper 0.5 of mesopleural suture with small, shallow foveae. Lower hind corner of mesopleurum with a group of about 30 hairs. Metapleurum as in figure 74. Propodeal wrinkling moderately strong. Dorsal smooth areas of propodeum each as long as wide. Costa extending beyond radial cell by 0.7 length of radial cell on costa. Abdomen without a stalk. Anteroven-tral quarter of syntergite with about 40 hairs. Ovipositor sheath 1.2 as long as hind tibia, shaped as in figure 412.

Black. Mouth parts, scape, and pedicel pale brown. Tegula brown. Front coxa brown. Middle and hind coxae blackish brown. All coxae paler at apex. Front and middle legs beyond coxae and hind trochanter pale brown. Hind femur brown, its apical 0.12± and basal 0.4± pale brown. Hind tibia dark brown, pale brown basad. Hind tarsus with first segment light brown and the rest stramineous. Wings hyaline, the stigma and strong veins blackish brown. Ovipositor sheath light brown, blackish near base.

Type: ♀, Kassam Pass, 1,300 m., Papua, New Guinea, Jan. 10 to 23, 1979, J. Sedlacek (Townes). Figures 74 and 412 are from the type.

Paratype: ♀, Baiyer River, 1,100 m., Papua, New Guinea, Jan. 25 to Feb. 6, 1979, J. Sedlacek (Townes).

3. Mischoserphus arcuator Stelfox

Figures 91 (♀ metapleurum and propodeum); 413 (ovipositor sheath)

- **Cryptoserphus arcuator* Stelfox, 1950. Ent. Monthly Mag., 86: 314. ♀. des., figs., biol. Type: ♀, Ireland: Blessington in Co. Wicklow (Washington). Examined in 1975.
- Cryptoserphus arcuator* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 538. ♀. des., biol. Ireland: Tollymore Park in Co. Down.
- Cryptoserphus arcuator* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♀. type data.
- **Cryptoserphus ione* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 8. ♀. key, des. Type: ♀, USSR: Suputinskiy National Forest, Primorskiy Kray (Leningrad). Examined in 1978. New synonym.

Front wing 2.3 to 3.1 mm. long. Body of moderate proportions. Temple about 0.6 as long as eye. Cheek about 2.6 as long as diameter of scape, with or without a faint incomplete groove between eye and mandible, its lower edge projecting as a narrow flange below base of mandible. Occipital carina complete, its lower end not weak. Penultimate segment of flagellum about 2.4 as long as wide in male, about 2.0 as long as wide in female. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture distinctly foveolate. Lower hind corner of mesopleurum with a group of about 10 hairs next to middle coxa. Metapleural sculpture as in figure 91. Paired dorsal smooth areas of propodeum each about as long as wide. Apical transverse carina of propodeum weak, arched across midline or obtusely angled. Costa extending beyond radial cell by 0.7 length of radial cell on costa. Abdomen without a stalk. Lower front quarter of syntergite with about 40 hairs. Ovipositor sheath as in figure 413, 0.9 to 1.4 as long as hind tibia.

Black. Antenna brown basally (pale brown to dark brown). Mouth parts stramineous. Pronotal collar light brown to blackish brown. Tegula and legs fulvous, the fifth tarsal segments brown, basal 0.6± of hind basitarsus often light brown, and hind tibia often brownish toward apex. Wings hyaline. Stigma and strong veins light brown to dark brown. Ovipositor sheath medium brown, darker at base.

Specimens: ♂, 4♀, Messaure, Sweden, July 13 and 25 and Sept. 7 and 22, 1971 and 1972, Karl Müller (Townes). ♀, Torneträsk, Sweden, Aug. 5, 1960, W. R. M. Mason (Ottawa). ♂, Kamikochi, Japan, July 24, 1954, H., M., D., and J. Townes (Townes). ♀, Matanuska, Alaska, Sept. 3, 1945, J. C. Chamberlin (Washington). ♂, McMurray, Alta., Aug. 10, 1953, G. E. Ball (Ottawa). ♂, Abbotsford, B. C., June 27, 1953, W. R. M. Mason (Ottawa). ♂, Hatzic Lake, B. C., July 16, 1953, W. R. M. Mason (Ottawa). ♀, Kleanza Creek, 14 miles east of Terrace, B. C., June 30, 1960, J. G. Chilcott (Ottawa). ♀, Mission City, B. C., June 8, 1953, W. R. M. Mason (Ottawa). ♀, Robson, B. C., June 6-30, 1949, H. R. Foxlee (Ottawa). ♀, Terrace, B. C., Aug. 6, 1960, C. H. Mann (Ottawa). ♀, Chippewa Co., Mich., June 25, 1960, R. R. Dreisbach (East Lansing). ♀, Delta Co., Mich.,

Aug. 8, 1958, R. R. Driesbach (East Lansing). ♀, Ottawa, Ont., Aug. 16, 1947, O. Peck (Ottawa). ♂, Ottawa, Ont., Sept. 20, 1958, J. H. Vockeroth (Ottawa). ♀, Corvallis, Oreg., July 16, 1978, H. and M. Townes (Townes). 2♀, Lac Chicobi, Que., Aug. 17, 1971, A. Sauv  (Ottawa). ♂, ♀, Old Chelsea, Que., Sept. 20 and Oct. 3, 1955, J. R. Vockeroth (Ottawa). ♂, ♀, Parke Reserve, 950 ft., Kamouraska Co., Que., Aug. 9 and 23, 1957, W. R. M. Mason (Ottawa). ♀, Otonosquen, Sask., Sept. 12, 1959, J. R. Vockeroth (Ottawa).

This species occurs in the northern part of the Holarctic Region.

4. *Mischoserphus obesus*, new species

Figures 80 (♀ metapleurum and propodeum); 414 (ovipositor sheath)

Front wing 2.5 to 3.2 mm. long. Body stout. Temple about 0.7 as long as eye. Cheek about 2.3 as long as diameter of scape, with or without a shallow incomplete groove from eye to mandible, its lower edge projecting beyond base of mandible as a crescentic flange. Occipital carina complete, not weak below. Penultimate segment of flagellum about 2.0 as long as wide in male, about 1.9 as long as wide in female. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture foveolate. Lower hind corner of mesopleurum with a group of about 10 hairs in front of middle coxa. Metapleural sculpture as in figure 80. Propodeal wrinkling coarse and strong. Paired dorsal smooth areas of propodeum about 1.0 as long as wide. Apical transverse carina of propodeum evenly arched, strong but irregular. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 40 hairs. Ovipositor sheath as in figure 414, about 1.7 as long as hind tibia.

Black or blackish brown, the front and hind parts of pronotum and the mesosternum often brown. Antenna stramineous basally, darkening to dark brown toward apex. Mouth parts, tegula, and legs stramineous, the fifth tarsal segments brown. Wings hyaline. Stigma and strong veins light brown. Ovipositor sheath light brown.

Type: ♀, Canajoharie, N. Y., Aug. 13, 1934, H. Townes (Townes).

Paratypes: ♂, ♀, McMurray, Alta., Jul. 30 and Aug. 10, 1953, G. E. Ball (Ottawa). ♂, Jumping Pound Creek, 20 miles west of Calgary, Alta., Jul. 3, 1962, W. R. M. Mason (Ottawa). ♂, west slope of Loveland Pass, 9,850 ft., Colo., Jul. 28, 1961, B. H. Poole (Ottawa). ♀, Max Lake, Turtle Mt. Forest Reserve, Man., Jul. 30, 1958, J. G. Chilcott (Ottawa). ♀, Delta Co., Mich., July 2, 1955, R. R. Driesbach (East Lansing). 2♀, Lake Co., Minn., Aug. 5, 1939, H. T. Peters (St. Paul). ♀, Aylmer West, Ont., Aug. 8 to 14, 1972 (Ottawa). ♀, One Sided Lake, Ont., Jul. 13, 1960, S. M. Clark (Ottawa). ♀, Cleveland, S. C., June 9, 1961, G. F. Townes (Townes). ♂, Greenville, S. C., June 4, 1955, L. & G. Townes (Townes). ♀, Knoxville, Tenn., May 21, 1957, J. R. Vockeroth (Ottawa).

This species is transcontinental in the Canadian and Transition zones of North America.

5. Mischoserphus alaskensis, new species

Figures 81 (♀ metapleurum and propodeum); 415 (ovipositor sheath)

Front wing 2.8 to 2.9 mm. long. Body of normal proportions. Temple about 0.9 as long as eye. Cheek about 2.3 as long as diameter of scape, with a moderately deep groove from eye to mandible, its lower margin projecting below base of mandible as a crescentic flange. Occipital carina complete, its lower end not weak. Penultimate segment of flagellum about 2.1 as long as wide in male, about 1.8 as long as wide in female. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture shallow, with a few dimples that suggest foveolation. Lower hind corner of mesopleurum with a group of about 10 hairs in front of middle coxa. Metapleural sculpture as in figure 81. Propodeal wrinkling moderately coarse, the paired dorsal smooth areas each about as long as wide. Apical transverse carina of propodeum weak and irregular, obtusely angled forward at center. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 40 hairs. Ovipositor sheath as in figure 415, 1.4 as long as hind tibia.

Black. Pedicel and base of flagellum dark brown. Mouth parts, tegula, and legs fulvous, the fifth tarsal segments brown. Wings hyaline. Stigma and strong veins dark brown. Ovipositor sheath blackish brown.

Type: ♀, Tsaina River, Alaska, Aug. 16, 1973, H. and M. Townes (Townes).

Paratype: ♂, Stone Mt. Park, 3,800 ft., B. C., July 16, 1973, H. and M. Townes (Townes).

6. Mischoserphus abbreviatus, new species

Figures 82 (♀ metapleurum and propodeum); 416 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.8 mm. long. Body moderately stout. Temple 0.77 as long as eye. Cheek 2.8 as long as diameter of scape, with a weak groove between eye and mandible, the hind part of its lower edge projecting below base of mandible as a flange in the shape of a low triangle. Occipital carina complete, not weak below. Penultimate segment of flagellum 2.0 as long as wide. Hairs on mesoscutum of moderate density. Upper 0.5 of mesopleural suture shallow, with some dimples that suggest foveolation. Lower hind corner of mesopleurum with about 25 hairs in front of middle coxa. Metapleural sculpture as in figure 82. Propodeal wrinkling moderately coarse and strong. Dorsal smooth areas on propodeum each about 1.1 as long as wide. Apical

transverse carina of propodeum moderately strong but irregular, weakly angled forward at center. Costa extending beyond radial cell by 0.7 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 25 hairs. Ovipositor sheath as in figure 416, 1.1 as long as hind tibia.

Black. Scape, pedicel, mouth parts, tegula, and legs light fulvous, the fifth tarsal segments brown. Flagellum dark brown near base, the rest blackish. Wings hyaline. Stigma and strong veins dark brown. Ovipositor sheath medium brown, its basal 0.3 darker.

Type: ♀, in *Quercus* forest at 7,800 ft., Mt. Data, Philippines, Dec. 31, 1952, H., M., and D. Townes (Townes).

Paratype: ♂, Mt. Data, 7,800 ft., Philippines, Jan. 1, 1953, Townes family (Townes).

7. *Mischoserphus obscurus*, new species

Figures 83 (♀ metapleurum and propodeum); 417 (ovipositor sheath)

Front wing 2.7 to 3.2 mm. long. Body moderately slender. Temple 0.9 as long as eye. Cheek about 2.8 as long as diameter of scape, with a narrow shallow groove from eye to mandible, its lower hind margin projecting below base of mandible as a high crescentic flange. Occipital carina complete, not weak below. Penultimate segment of flagellum about 2.3 as long as wide in male, 2.0 as long as wide in female. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture simple, very shallow. Lower hind corner of mesopleurum with a group of about 20 hairs in front of middle coxa. Metapleural sculpture as in figure 83. Propodeal wrinkling moderately strong. Dorsal smooth areas on propodeum each about 1.25 as long as wide. Apical transverse carina of propodeum high, almost straight. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 10 hairs. Ovipositor sheath as in figure 417, 1.27 as long as hind tibia.

Black. Mouth parts dark brown. Tegula light brown to blackish brown. Legs medium brown to dark brown, the hind coxa and fifth tarsal segments blackish. Wings hyaline. Stigma and strong veins medium brown to dark brown. Ovipositor sheath blackish brown.

Type: ♀, Volcán Chiles, 3,000 to 3,500 m., Ecuador, June 26-27, 1965, Luis Peña (Townes).

Paratypes: ♂, same data as type (Townes). ♂, Cerro Tinajillas, 3,100 m., Azuay, Ecuador, Mar. 18-21, 1965, Luis Peña (Ottawa).

8. Mischoserphus australiae Kieffer

Figure 84 (♂ metapleurum and propodeum)

- **Proctotrypes Australiae* Kieffer, 1907. Berlin. Ent. Ztschr. 51: 266. ♂. des. Type: ♂, South West Australia: Guildford (Berlin). Examined in 1975.
Serphus australiae Kieffer, 1909. Genera Insectorum 95: 4. syn.
Serphus australiae Kieffer, 1911. Die Fauna Südwest-Australiae 3 (7): 209. ♂. des. South West Australia: Guildford on Swan River.
Phaenoserphus australiae Kieffer, 1914. Das Tierreich 42: 35. ♂. key, des. South West Australia: Guildford.
Phaenoserphus australiae Riek, 1955. Australian Jour. Zool. 3: 115. listed.

Male: Front wing 2.1 mm. long. Body moderately slender. Temple 0.75 as long as eye. Cheek 1.35 as long as diameter of scape, without a groove, the lower hind part projecting below base of mandible as a very short triangle. Occipital carina complete, not weak below. Penultimate segment of flagellum 3.6 as long as wide. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture faintly impressed, not foveate. Lower hind corner of mesopleurum with about 12 hairs in front of middle coxa. Metapleural sculpture as in figure 84. Propodeal wrinkling strong. Dorsal smooth areas on propodeum each 1.75 as long as wide. Abdomen without a stalk. Anterobasal quarter of syntergite with about 8 hairs.

Black. Scape, pedicel, first flagellar segment, mouth parts, and tegula brown. Legs fulvous, the hind tarsus and last segment of front and middle tarsus brown. Wings hyaline. Stigma and strong veins blackish brown.

Female: Unknown.

Specimen: Redescribed from the type, a male from Guildford, South West Australia, May 19 (Berlin).

9. Mischoserphus samurai Pschorn-Walcher, new combination

Figure 85 (♀ metapleurum and propodeum)

- **Cryptoserphus samurai* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 2. ♂, ♀. des., fig. Type: ♀, Japan: Sapporo (Sapporo). Examined in 1976. Japan: 3 localities.
Cryptoserphus samurai Kozlov, 1971. Vses. ent. obshch. Trudy 54: 10. key.

Front wing 2.5 to 3.9 mm. long. Cheek without a groove from eye to mandible or with a shallow incomplete groove. Upper half of mesopleural suture often with some shallow indistinct foveae. Median 3 grooves on syntergite reaching about 0.66 the distance to first thyridia. Ovipositor sheath 1.38 to 1.42 as long as hind tibia. Structure otherwise as in *M. genatus*.

Color as in *M. genatus* and *M. abbreviatus*.

Specimens: ♀ (type), Sapporo, Hokkaido, Japan, Oct. 21, 1959, Takagi (Sapporo). ♂, ♀ (paratypes), Hikosan, Kyushu, Japan, May 20 and 21, 1959, K. Kamijo (Weidemann Collection).

10. Mischoserphus genatus, new species

Male: Unknown.

Female type: Front wing 3.4 mm. long. Cheek without a groove from eye to mandible. Apical transverse carina of propodeum moderately strong, forming a 120° angle at midline. Median 3 grooves on syntergite reaching about 0.5 the distance to first thyridia. Ovipositor sheath 1.54 as long as hind tibia. Structure otherwise as in *M. abbreviatus* and *M. samurai*.

Color as in *M. abbreviatus*.

Type: ♀, Liro Lake, 8,000 ft., Mt. Apo, Mindanao, Philippines, Sept. 19, C. F. Clagg (Cambridge).

11. Mischoserphus acomus, new species

Figures 92 (♀ metapleurum and propodeum); 418 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.3 mm. long. Body moderately proportioned. Temple 0.78 as long as eye. Cheek 2.5 as long as diameter of scape, with a moderately deep groove from eye to mandible, its lower edge projecting below base of mandible as a crescentic flange. Occipital carina complete, not weak below. Penultimate segment of flagellum 2.6 as long as wide. Mesoscutum almost hairless. Upper margin of pronotum with only about 4 hairs. Upper 0.5 of mesopleural suture simple, moderately deep. Lower hind corner of mesopleurum with a group of about 25 hairs. Metapleural sculpture as in figure 92. Propodeal wrinkling moderately strong. Dorsal smooth areas of propodeum each 1.5 as long as wide. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen with a stalk that is 0.8 as long as high. Anteroventral quarter of syntergite with about 12 hairs. Ovipositor sheath as in figure 418, 1.4 as long as hind tibia.

Black. Mouth parts brown. Scape and pedicel dark brown. Tegula brown. Coxae blackish brown, narrowly paler at apex. Trochanters stramineous. Femora brown with basal 0.4± and apical 0.15± stramineous. Front and middle tibiae and tarsi stramineous. Hind tibia stramineous, brown apically. Hind tarsus dark brown. Wings hyaline, the stigma and strong veins blackish brown. Ovipositor sheath blackish, toward apex brown.

Type: ♀, Tomba Pass, 2,000 m., Papua, New Guinea, Jan. 22, 1979, J. Sedlacek (Townes).

12. Mischoserphus comatus, new species

Figures 93 (♀ metapleurum and propodeum); 419 (ovipositor sheath)

Front wing 2.7 to 2.9 mm. long. Body proportions normal. Temple about 0.68 as long as eye. Cheek about 3.0 as long as diameter of scape, with an incomplete weak trace of a groove between eye and mandible, the hind part of its lower edge projecting below base of mandible as a wide crescentic flange. Occipital carina complete, not weak below. Penultimate segment of flagellum in female about 1.67 as long as wide. Mesoscutal hairs moderately dense. Upper 0.5 of mesopleural suture only faintly impressed, not foveolate. Lower hind corner of mesopleurum with about 12 hairs in front of middle coxa. Metapleural sculpture as in figure 93. Propodeal wrinkling moderately strong. Dorsal smooth areas on propodeum each about 1.3 as long as wide. Apical transverse carina of propodeum of moderate strength, moderately arched. Costa extending beyond radial cell by 0.7 length of radial cell on costa. Abdomen without a stalk. Anterobasal quarter of syntergite with 6 to 25 hairs. Ovipositor sheath as in figure 419, about 1.1 as long as hind tibia.

Black. Scape and pedicel brown. Mouth parts, tegula, and legs fulvous, the fifth segments of front and middle tarsi and all of hind tarsus fuscous. Hind tibia fuscous, fulvous toward base. Wings hyaline. Stigma and strong veins blackish brown. Basal half of ovipositor sheath blackish brown, the apical half medium brown.

Specimens from Mexico have the mesoscutal hairs a little denser than in specimens from Panama and Ecuador, and have about 20 hairs on the anteroventral quarter of the syntergite. Specimens from Panama and Ecuador have about 8 hairs on the anteroventral quarter of the syntergite.

Type: ♀, east of Papallacta, 2,900 m., Ecuador, Jan. 14-17, 1971, Luis Peña (Townes). Figures 93 and 419 are from the type.

Paratypes: ♂, ♀, same data as type (Townes). ♀, El Palmito, 6,000 ft., Sinaloa, Mexico, Aug. 29, 1964, W. R. M. Mason (Ottawa). ♀, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 31, 1964, W. R. M. Mason (Ottawa). ♀, Cerro Campana at 850 m., 8° 40'N, 19° 50'W, Panama, J. Helava (Ottawa).

13. Mischoserphus coxalis, new species

Figure 86 (♂ metapleurum and propodeum)

Male type: Front wing 2.7 mm. long. Body of moderate proportions. Temple 0.50 as long as eye. Cheek 2.0 as long as diameter of scape, without a groove from eye to mandible, the hind part of its lower edge projecting below base of mandible as a high triangular flange. Occipital carina complete, its lower end not weak. Penultimate segment of flagellum 2.6 as long as wide. Mesoscutum with hairs on front half (the hair sockets separated by about the length of the hairs) and hairless

on hind half except for a few hairs near lateral margins. Upper 0.5 of mesopleural suture very shallow, not foveolate. Lower hind corner of mesopleurum with a group of about 10 hairs in front of middle coxa. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 22 hairs.

Black. Scape and pedicel dark brown. Mouth parts, tegula, front and middle coxae, all trochanters, and front and middle femora fulvous. Hind coxa dark brown, its apical 0.2 fulvous. Hind femur fulvous, its upper half brownish except near base. Tibiae and tarsi brown, the basal 0.2± of hind tibia pale brown. Wings hyaline. Stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, Puerto Stroessner, Paraguay, Dec. 18, 1971, Luis Peña (Ottawa).

14. *Mischoserphus trichopleurum*, new species

Figure 94 (♂ metapleurum and propodeum)

Male type: Front wing 3.6 mm. long. Body moderately slender. Temple 0.80 as long as eye. Cheek 2.0 as long as diameter of scape, without a groove between eye and mandible, the hind part of its lower edge projecting below base of mandible as a high crescentic flange. Occipital carina complete, its lower end weak. Penultimate segment of flagellum 2.5 as long as wide. Mesoscutum without hairs except for a few anteriorly and laterally. Upper 0.5 of mesopleural suture shallow, not foveolate. Lower hind corner of mesopleurum with a large patch of hairs in front of middle coxa, the hair patch 0.8 as large as profile of middle coxa. Metapleurum sculpture as in figure 94. Propodeal wrinkling sparse, mostly longitudinal rather than reticulate. Dorsal smooth areas of propodeum each 1.5 as long as wide. Costa extending beyond radial cell by 0.6 length of radial cell on costa. Abdomen without a stalk. Anteroventral quarter of syntergite with about 28 hairs.

Black. Scape and pedicel brown. Anteroventral part of pronotum light brown. Mouth parts, tegula, coxae, trochanters, and tibiae fulvous, the hind tibia with apical half infuscate. Front and middle tarsi brown. Hind tarsus fuscous. Wings hyaline. Stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, east of Papallacta, 2,900 m., Ecuador, Jan. 14-17, 1971, Luis Peña (Townes).

15. Mischoserphus pileatus, new species

Figures 87 (♀ metapleurum and propodeum); 420 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.9 mm. long. Body moderately proportioned. Temple 0.85 as long as eye. Cheek 2.9 as long as diameter of scape, without a groove from eye to mandible, the hind part of its lower edge projecting below base of mandible as a narrow crescentic flange. Occipital carina present only across top of occiput, straight, not downcurved on sides. Penultimate segment of antenna 2.7 as long as wide. Mesoscutum with a few very sparse hairs on front half and on lateral edges of hind half, the rest hairless. Upper 0.5 of mesopleural suture obliterated. Lower hind corner of mesopleurum with a group of about 20 hairs in front of middle coxa. Metapleural sculpture as in figure 87. Propodeal wrinkling reduced to weak rugulosity and a long wrinkle on side. Dorsal smooth areas on propodeum each 1.5 as long as wide. Apical transverse carina of propodeum strong and high, weakly arched with an obtuse angular peak at center. Costa extending beyond radial cell by 0.5 length of radial cell on costa. Abdomen without a stalk. Anterobasal quarter of syntergite with about 10 hairs. Ovipositor sheath as in figure 420, 1.07 as long as hind tibia.

Black. Scape, pedicel, mouth parts, tegula, and legs light fulvous, the fifth tarsal segments and apical 0.15 of hind tibia brown. Collar of pronotum brown. Flagellum pale brown basally, darkening to blackish brown toward apex. Wings hyaline. Stigma and strong veins brown. Ovipositor sheath brown, the basal 0.25 blackish brown.

Type: ♀, Zontehuitz, 9,500 ft., Chiapas, Mexico, June 27, 1969, W. R. M. Mason (Ottawa).

16. Mischoserphus crassicornis, new species

Figures 88 (♀ metapleurum and propodeum); 421 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.0 mm. long. Occipital carina present only across top of occiput, weakly arched with sides a little downcurved. Penultimate segment of antenna 1.4 as long as wide. Ovipositor sheath as in figure 421, 1.3 as long as hind tibia. Structure otherwise as in *C. pileatus*.

Black. Scape, pedicel, and lower front corner of pronotum brown. Base of flagellum dark brown. Mouth parts, tegula, and legs fulvous brown, the apical 0.1 of hind tibia, hind tarsus, and fifth segments of front and middle tarsi brown. Wings hyaline. Stigma and strong veins dark brown. Ovipositor sheath blackish brown.

Type: ♀, Zontehuitz, 9,500 ft., Chiapas, Mexico, June 27, 1969, W. R. M. Mason (Ottawa).

17. *Mischoserphus pictus*, new species

Figures 95 (♀ metapleurum and propodeum); 422 (ovipositor sheath)

Front wing 2.2 to 3.4 mm. long. Body moderately slender. Temple 0.50 as long as eye in male, 0.78 as long in female. Cheek 3.0 as long as diameter of scape, with a shallow groove from eye to mandible, the hind part of its lower edge projecting a little below base of mandible. Occipital carina complete, moderately high and weakly reflexed. Penultimate flagellar segment of male 2.7 as long as wide, of female 2.3 as long as wide. Mesoscutum with moderately dense hairs that are evenly distributed. Mesopleural suture complete, not foveate. Lower hind corner of mesopleurum with a group of about 30 closely spaced hairs in front of middle coxa. Metapleural sculpture as in figure 95. Propodeal wrinkling moderately coarse. Dorsal smooth areas of propodeum 1.3 as long as wide. Costal vein extending beyond radial cell by 0.5 length of radial cell on costa. Apical transverse carina of propodeum weak, angulate at middle. Abdomen without a stalk. Anterobasal quarter of syntergite with about 8 hairs. Ovipositor sheath as in figure 422, 1.3 as long as hind tibia.

Black. Scape, pedicel, and clypeus brown. Mouth parts and tegula stramineous. Pronotum, mesosternum, and lower half of mesopleurum reddish brown with more or less extensive fuscous areas, the median part of pronotum usually fuscous, median part of mesosternum usually fuscous, and upper part of lower half of mesopleurum usually fuscous. Mesoscutum reddish brown with 3 broad blackish stripes. Scutellum reddish brown on side. Rarely the scape, pedicel, clypeus, and thorax are entirely black. Legs light brownish fulvous, the front coxa and trochanter paler, front and middle tarsi brownish apically, hind coxa more or less brown toward base, and hind tarsus dark brown. Wings subhyaline, their strong veins dark brown. Apical tergites of abdomen of female light brown.

Type: ♀, Weldborough, Tasmania, Feb. 9 to Mar. 2 (Townes).
Figures 95 and 422 are from the type.

Paratypes: 5♂, 18♀ from Tasmania (Catamaran, Mt. Barrow at 1,100 m., Geeveston, Hellyer Gorge at 300 m., King William Range, Roseberry, Strahan, Togari, and Weldborough), various dates from January 7 to April 2 (Townes).

18. *Michoserphus calvus*, new species

Figures 96 (♀ metapleurum and propodeum); 423 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.8 to 3.3 mm. long. Body of moderate proportions. Temple 0.78 as long as eye. Cheek 2.3 as long as diameter of scape, without a groove from eye to mandible, its lower edge projecting a little below base of mandible as a narrow crescentic flange.

Occipital carina complete, not weak below. Penultimate segment of flagellum 3.1 as long as wide. Mesoscutum almost hairless. Upper margin of pronotum hairless. Upper 0.5 of mesopleural suture simple, shallow. Lower hind corner of mesopleurum with a group of about 12 hairs. Metapleural sculpture as in figure 96. Propodeal wrinkling moderately strong. Dorsal smooth areas of propodeum each 1.2 as long as wide. Costa extending beyond radial cell by 1.5 length of radial cell on costa. Abdomen with a stalk that is 1.0 as long as high. Anteroventral quarter of syntergite with 0 to 4 hairs. Ovipositor sheath as in figure 423, 0.61 as long as hind tibia.

Black. Mouth parts, scape, pedicel, and tegula brown. Front and middle coxae dark brown. Hind coxa blackish brown. Trochanters pale brown. Legs beyond trochanters light brown to dark brown, the hind leg darker than front and middle legs. Wings faintly infusate. Stigma and strong veins black. Ovipositor sheath black, brown toward apex.

Type: ♀, Baiyer River, 1,100 m., Papua, New Guinea, Jan. 25 to Feb. 6, 1979, J. Sedlacek (Townes). Figures 96 and 423 are from the type.

Paratypes: ♀, Mt. Giluwe, 2,800 m., Papua, New Guinea, Jan. 3 to Feb. 8, 1979, J. Sedlacek (Townes). ♀, Mt. Kaïnde, 2,300 m., Papua, New Guinea, Dec. 19, 1978 to Jan. 18, 1979, J. Sedlacek (Townes).

19. Mischoserphus appendicis, new species

Figures 89 (♀ metapleurum and propodeum); 424 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.2 mm. long. Body slender. Temple 0.83 as long as eye. Cheek 3.0 as long as diameter of scape, without a groove from eye to mandible, its lower edge not projecting conspicuously below base of mandible. Occipital carina complete, its lower end not weak. Penultimate segment of antenna 2.7 as long as wide. Mesoscutal hairs moderately sparse, evenly distributed. Mesopleural suture very shallow, not foveolate. Lower hind corner of mesopleurum with a group of about 20 hairs in front of middle coxa. Metapleural sculpture as in figure 89. Propodeal wrinkling not strong. Dorsal smooth areas on propodeum each about 1.3 as long as wide. Apical transverse carina of propodeum weak and not distinct. Costal vein extending beyond radial cell by 1.9 the length of radial cell on costa. Abdomen with a very short stalk that is about 0.3 as long as high. Anteroventral quarter of syntergite with about 10 hairs. Ovipositor sheath as in figure 424, 1.1 as long as hind tibia.

Black. Scape, pedicel, and collar of pronotum brown. Mouth parts, tegula, front and middle coxae, and trochanters stramineous. Hind coxa brownish fulvous. Femora and tibiae pale fulvous. Tarsi brown. Stigma and strong veins dark brown.

Type: ♀, Mt. Koghis, 800 m., New Caledonia, Sept. 1-6, 1972.

J. F. McAlpine (Ottawa).

20. *Mischoserphus petiolatus*, new species

Figures 90 (♀ metapleurum and propodeum); 425 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.7 mm. long. Body proportions normal. Temple 0.5 as long as eye. Cheek 2.6 as long as diameter of scape, without a groove from eye to mandible, its lower edge projecting conspicuously below base of mandible as a narrow flange. Occipital carina complete, not weak below. Penultimate segment of antenna 2.2 as long as wide. Mesoscutum hairless in front of scutellum, elsewhere with moderately sparse hairs whose sockets are separated by about 0.8 the length of the hairs. Upper 0.5 of mesopleural suture faint. Lower hind corner of mesopleurum with about 20 hairs in front of middle coxa. Sculpture of metapleurum as in figure 90. Propodeal wrinkling obsolescent. Dorsal smooth areas on propodeum each 1.4 as long as wide. Apical transverse carina of propodeum moderately strong, shaped like a Gothic arch. Costal vein extending beyond radial cell by 1.0 the length of radial cell on costa. Abdomen with a stalk that is 0.8 as long as high. Anteroventral quarter of syntergite with about 6 hairs. Ovipositor sheath as in figure 425, 1.45 as long as hind tibia.

Black. Scape, pedicel, mouth parts, trochanters, front femur, and front and middle tibiae and tarsi stramineous. Tegula brown. Coxae brown, the hind coxa darkest. Middle femur brown and hind femur dark brown, both with basal 0.35 and apical 0.15 stramineous. Hind tibia fuscous, stramineous basad. Hind tarsus brown. Wings hyaline. Stigma and strong veins brown. Ovipositor sheath brown, its basal 0.45 blackish brown.

Type: ♀, Wau, Papua, New Guinea, Oct. 1969, P. Shanahan (Townes).

9. *PSCHORNIA*, new genus

Figures 14 (side view); 38 (front wing)

Front wing 1.6 to 2.6 mm. long. Body stout, compressed. Clypeus very short and wide, weakly convex, its apex broadly truncate or weakly convex. Apical edge of clypeus double, with sharp inner and outer edges separated by a groove. Cheek moderately short, with a groove from eye to mandible. Occipital carina subcomplete, its lower end curving mesad above base of mandible, not quite reaching base of mandible or oral carina. Mandible long, narrow, with a single tooth. Flagellum short. Notaulus absent or represented by a small dimple at edge of mesoscutum. Front edge of lateral aspect of collar with longitudinal wrinkling. Median part of pronotum often with long, parallel, horizontal wrinkles. Upper anterolateral part of pronotum with a

rounded swelling, not a tubercle. Front margin of mesopleurum with or without a continuous hair band. Horizontal groove of mesopleurum complete. Mesopleural suture foveolate above the transverse groove, intercepted by fine parallel wrinkles or also foveolate below. Metapleurum mostly hairless but partly or mostly covered with parallel horizontal wrinkles, more or less of its upper front part smooth, anterodorsally with a short carina that reaches lateral part of upper edge of propodeum. Longer spur of hind tibia reaching about to middle of hind basitarsus. Stigma deep. Radial vein originating near apical 0.45 of stigma, the vertical part of radius obliterated. Costal side of radial cell about 0.42 as long as depth of stigma. Costal vein ending just beyond radial cell. Abdomen without a stalk. Base of syntergite with about 13 small short grooves. Ovipositor sheath stout, with a moderate number of hairs, the hairs along its lower edge erect.

Genotype: *Pschornia striata*, new species.

The name is to honor Dr. Hubert Pschorn-Walcher, an eminent author on the Serphidae.

Three species are known, two in Europe and one in Canada.

Key to the species of Pschornia

1. Scrobe of pronotum smooth. Metapleurum with lower 0.3± wrinkled. Notaulus absent. Europe. 1. minora, new species (p. 112)
 Scrobe of pronotum crossed by oblique wrinkles. Metapleurum with lower 0.5 to 0.8 wrinkled. Notaulus represented by a small pit at margin of mesoscutum. 2
2. Lower 0.8 of metapleurum covered with horizontal wrinkles. Ovipositor sheath about 0.81 as long as hind tibia, convex. Quebec. 2. striata, new species (p. 113)
 Lower 0.5 of metapleurum covered with horizontal wrinkles. Ovipositor sheath about 1.64 as long as hind tibia, the lower 0.6± of sheath mat and concave. Sweden. 3. megaloura, new species (p. 113)

1. Pschornia minora, new species

Figures 99 (♀ side of thorax); 426 (ovipositor sheath)

- Exallonyx buccatus* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland. Misdet. of *buccatus* Thomson.
- Brachyserphus buccatus* Hellén, 1941. Notulae Ent. 21: 42. ♀. key. Finland: 2 localities. Sweden. Misdet. of *buccatus* Thomson.
- Brachyserphus buccatus* Palm, 1957. Ent. Tidskr. 77: 156. ♂, ♀. biol. Host: *Thanasimus* sp. Misdet. of *buccatus* Thomson.
- Cryptocodrus buccatus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 60. Northern Europe. Host: *Thanasimus* sp. Misdet. of *buccatus* Thomson.
- Brachyserphus buccatus* Jansson, 1960. Opuscula Ent. 25: 83. ♂, ♀. Sweden. Host: *Thanasimus* larva. Misdet. of *buccatus* Thomson.
- Cryptocodrus buccatus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 25, 26. key, figs. Misdet. of *buccatus* Thomson.

Cryptocodrus buccatus Kozlov, 1978. Opređelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 546. des. Finland. Sweden. Misdet. of *buccatus* Thomson.

Front wing 1.6 to 1.7 mm. long. Very similar to *P. striata*, from which it differs in being smaller and with weaker thoracic sculpture. Notaulus absent. Side of pronotum smooth, with a few fine, weak parallel wrinkles at its upper front corner. Metapleurum with fine parallel wrinkling on its lower 0.35 and on its front edge. Ovipositor sheath as in figure 426. The thorax of the type has been exploded by verdigris, hence the appearance of figure 99.

This species has been incorrectly determined in European literature as *buccatus* Thomson (= *Parthenocodrus elongatus* Haliday). The errors originated from a specimen in Stockholm that was placed under the label *buccatus* Thomson. This specimen is not a type of *buccatus* as it does not agree with the description and is from Kinnekulle, not one of the type localities for *buccatus*. It is now made the type of *minor*.

Type: ♀, "K. K." (= Kinnekulle in Västergötland), Sweden, Coll. Boheman (Stockholm).

Paratype: ♂, reared from larva of *Thanasimus*, May 29, 1956, Jh. Palm (Stockholm). Palm, 1957, describes the rearing of this specimen and something of its biology.

2. *Pschornia striata*, new species

Figures 100 (♀ side of thorax); 427 (ovipositor sheath)

Front wing 1.9 to 2.0 mm. long. Infra-median 0.4 of side of pronotum covered with horizontal wrinkles (oblique to the direction of the scrobe). Subtegular area with horizontal wrinkles. Notaulus represented by a small pit at margin of mesoscutum. Metapleurum covered with horizontal wrinkles except for a small anterobasal corner. Ovipositor sheath 0.81 as long as hind tibia, decurved, convex (fig. 427).

Black. Mandible and antenna brown or black. Palpi stramineous or fuscous. Tegula brown. Coxae dark brown. Trochanters, femora, and hind tibia brown or blackish brown. Tarsi and front and middle tibiae light brown. Wings hyaline. Stigma and strong veins brown.

Type: ♀, reared from *Fomes fomentarius*, Gatineau Park, Que., June 17, 1966, W. G. Matthewman (Ottawa).

Paratype: ♂, same data as type (Ottawa).

3. *Pschornia megaloura*, new species

Figures 101 (♀ side of thorax); 428 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.6 mm. long. Infra-median 0.25 of side of pronotum covered with horizontal and slightly oblique wrinkles. Notaulus represented by a small pit at margin of mesoscutum. Subtegular area with weak fine wrinkling. Lower 0.5± of metapleurum with horizontal wrinkles, the rest mostly smooth. Ovipositor sheath 1.64 as long as

hind tibia, the lower 0.6± of sheath mat and weakly concave (fig. 428).

Black. Antenna dark brown. Palpi and legs beyond coxae fulvous. Coxae dark brown. Wings hyaline. Stigma and radius dark brown. Costa and subcosta stramineous. Tip of ovipositor sheath and lower 0.5 of its basal half light reddish brown.

Type: ♀, Messaure, Sweden, July 13, 1972, Karl Müller (Townes).

10. HORMOSERPHTUS, new genus

Figures 15 (side view); 39 (front wing)

Front wing 2.6 to 3.6 mm. long. Body moderately stout. Clypeus wide, weakly convex, its apex with a moderately wide truncation. Apical margin of clypeus sharp, sometimes with a second sharp margin internal to the front apical margin. Cheek with a deep groove from eye to mandible. Occipital carina complete or the lower ends absent, the lower ends (when present) reaching hind condyle of mandible. Mandible moderately stout, with a single apical tooth. Flagellum of moderate length, without tyloids. Notaulus strong, about 1.3 as long as tegula. Dorsolateral part of collar usually with some wrinkling. Upper 0.7± of pronotal scrobe with short, coarse, mostly transverse wrinkles. Upper anterolateral part of pronotum with a large rounded tubercle, in *H. transgressus* the upper face of tubercle with wrinkling and a marginal carina. Front margin of mesopleurum with or without a narrow band of sparse hairs. Horizontal groove on mesopleurum complete and strong. Mesopleural suture foveate, the foveae large. Anterodorsal 0.4± of metapleurum smooth, the rest coarsely punctato-rugose. Upper side of smooth area of metapleurum joined by a carina with lateral upper margin of propodeum. Longer spur of hind tibia reaching from basal 0.45 to apical 0.37 of hind basitarsus. Stigma very deep. Radius originating from apical 0.4 of stigma, its vertical part obliterated. Radial cell short, its costal side about 0.35 as long as depth of stigma. Costal vein ending at apex of radius. Abdomen without a stalk. Base of syntergite with a median groove, laterad of which are 2 or 3 impressed areas. Ovipositor sheath about 0.6 as long as hind tibia, rather stout with apical part strongly decurved, with short erect hairs and tapered to a pointed apex.

Genotype: *Proctotrypes clypeatus* Ashmead

The generic name is from ὄρμος (necklace), plus *Serphus*, referring to the row of foveae behind the collar.

Two species are known, one from Nepal and one from northeastern North America.

Key to the species of Hormoserphus

1. Coxae ferruginous. Upper face of propodeum with a pair of moderately smooth areas that contain weaker rugosity than the rest of propodeum. Division between upper smooth part of metapleurum and lower sculptured part of metapleurum irregular and not sharp. North America (Minnesota, New York, and Ontario) 1. clypeatus Ashmead (p. 115)
- Coxae black. Upper face of propodeum with a pair of smooth areas that are not at all rugulose. Division between upper smooth part of metapleurum and lower sculptured part at a sharp line. Nepal. 2. segregatus, new species (p. 115)

1. Hormoserphus clypeatus Ashmead

Figures 15 (side view); 39 (front wing); 429 (ovipositor sheath)

**Proctotrypes clypeatus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 339. ♀. key, des., biol. Type: ♀, USA: Ithaca in New York (Washington). Examined in 1975. Reared from a tree fungus.

Phaenoserphus clypeatus Kieffer, 1909. Genera Insectorum 95: 5. syn.

Cryptoserphus clypeatus Kieffer, 1914. Das Tierreich 42: 42. ♀. key, des. USA: New York.

Serphus clypeatus Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. ♀. key, des. •

Cryptoserphus clypeatus Brues, 1919. Jour. New York Ent. Soc. 27: 6. syn.

Cryptoserphus clypeatus Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♀. type data.

Front wing 2.6 to 3.1 mm. long. Apical margin of clypeus double, with a sharp front and a sharp hind margin separated by a groove. Lower hind 0.7± of metapleurum coarsely punctato-rugose, the division between sculptured and smooth part of metapleurum irregular. Propodeum strongly reticulate, the basal part of its upper face relatively smooth, with weak reticulate wrinkling. Longer spur of hind tibia reaching about to middle of hind basitarsus. Ovipositor sheath about 0.60 as long as hind tibia, as in figure 429.

Black. Mouth parts, scape, pedicel, tegula, and legs fulvous or fulvoferruginous. Flagellum fulvous basally. Wings hyaline, the stigma dark brown and strong veins medium brown. Intercubitus pale brown.

Specimens: ♀, Ottawa, Ont., Nov. 7, 1938, O. Peck (Ottawa). ♂, no data, from Harrington Collection (Ottawa). ♂, Toronto, Ont., July 17, 1901, Evans (Ottawa). ♀, Eaglesnest, Minn., July 28, 1961, W. V. Balduf (Washington).

This species occurs in the northeastern part of the Nearctic region.

2. Hormoserphus segregatus, new species

Male type: Front wing 3.6 mm. long. Apical margin of clypeus mostly single, double at sides. Lower hind 0.6 of metapleurum rugose, the division between sculptured and smooth part of metapleurum a

straight line. Propodeum strongly reticulate, the basal part of its upper surface comprising a pair of smooth surfaces separated by a median carina. Longer spur of hind tibia reaching to apical 0.37 of hind basitarsus.

Black. Pedicel brown. Tegula black. Front and middle femora light brown, fuscous basally. Hind femur blackish brown, paler apically. Tibiae and tarsi light brown. Wings hyaline. Stigma black. Strong veins dark brown. Intercubitus brown.

Female: Unknown.

Type: ♂, Godavari, 6,000 ft., Katmandu, Nepal, July 1967 (Ottawa).

11. Genus BRACHYSERPUS

Figure 40 (front wing)

Brachyserphus Hellén, 1941. Notulae Ent. 21: 42.

Type: *Codrus parvulus* Nees. Original designation.

Front wing 1.6 to 3.3 mm. long. Body stout, somewhat compressed. Clypeus moderately wide, weakly convex, its apex broadly truncate or weakly convex, the apical margin narrow but not sharp. Cheek short, with or without a groove from eye to mandible. Occipital carina complete or its lower end evanescent, when present the lower end reaching hind condyle of mandible. Mandible long, with a single point. Flagellum short, without distinct tyloids. Notaulus about 20° from the transverse (more nearly transverse than in other genera), about as long as tegula. Pronotum with a very stout, large anterolateral tubercle on its upper edge, the tubercle margined by a vertical carina that is continuous ventrad with the epomia. Side of pronotum smooth or with some horizontal or oblique wrinkling. Front edge of mesopleurum with a continuous moderately wide band of hairs. Horizontal groove on mesopleurum complete. Mesopleural suture foveolate. Metapleurum smooth and hairless except for its upper and front margins, lower 0.25± and hind 0.25±. Anterodorsal part of smooth area of metapleurum connected by a carina with upper lateral margin of propodeum. Longer spur of hind tibia reaching to basal 0.4± of hind basitarsus. Stigma very deep. Radius arising from near midlength of stigma. Vertical portion of radius obliterated. Costal edge of radial cell about 0.3 as long as depth of radius. Costa terminating at end of radius. Abdomen without a stalk. Base of syntergite with a median groove and a pair of impressions on each side. Ovipositor sheath 0.4 to 1.0 as long as hind tibia, stout, tapered to a decurved tip, covered with sparse erect, suberect, or reflexed hairs, the hairs on its lower margin erect or reflexed.

This is a northern hemisphere genus. Ten species are known. The differences between the species are minor and variable, and it is not always evident whether differing populations represent species or subspecies. Since some of the best characters are in the ovipositor sheath males are more difficult to distinguish than females and sometimes cannot be determined at all.

Key to the species of *Brachyserphus* (females)

(Males of *Brachyserphus* are difficult to key, though many of them can be determined on the basis of minor sculptural differences, range, and by association with females).

1. Apex of ovipositor sheath weakly decurved and rounded with its lower apical corner angular (fig. 430). Sculpture of propodeum moderately weak to moderately strong. Nearctic Region.
 1. *lucens* Provancher (p. 118)
Apex of ovipositor sheath decurved and ending in a point. Sculpture of propodeum strong or moderately strong. 2
2. Ovipositor sheath about 1.0 as long as hind tibia. Southern part of Nearctic Region. 2. *leptura*, new species (p. 119)
Ovipositor sheath 0.45 to 0.8 as long as hind tibia. 3
3. Hairs on lower edge of ovipositor sheath about 0.5 as long as depth of ovipositor sheath. Horizontal wrinkle along lower 0.25 of metapleurum emphasized by a groove along its upper edge. Southeastern Nearctic Region.
 3. *barberi*, new species (p. 120)
Hairs on lower edge of ovipositor sheath about 0.25 as long as depth of ovipositor sheath. Horizontal wrinkle along lower 0.25 of metapleurum (when distinct) with or without a groove along its upper edge. 4
4. Median or subdorsal part of pronotal scrobe with wrinkles, the wrinkles sometimes very weak. 5
Median and subdorsal part of pronotal scrobe entirely smooth. 7
5. Upper end of pronotal sulcus with vertical wrinkles. Metapleurum with 0.7 of its area covered with coarse rugae. Western Nearctic Region. 4. *rugatus*, new species (p. 120)
Upper end of pronotal sulcus without vertical wrinkles. Metapleurum with less than 0.4 of its area covered with sculpture. 6
6. Ovipositor sheath about 0.78 as long as hind tibia. Side of pronotum behind the dorsolateral tubercle without wrinkles or with only weak wrinkles. Wrinkles in pronotal scrobe horizontal in relation to body axis but strongly oblique in relation to pronotal scrobe. Western Nearctic Region. 5. *obliquus*, new species (p. 121)
Ovipositor sheath about 0.53 as long as hind tibia. Side of pronotum behind the dorsolateral tubercle with horizontal wrinkles. Wrinkles in pronotal scrobe about 40° from the horizontal. Hawaii. 6. *hawaiiensis* Ashmead (p. 121)
7. Second segment of flagellum about 1.6 as long as wide. Tegula blackish. Middle and hind coxae blackish. Peru.
 7. *curticornis*, new species (p. 122)

Second segment of flagellum about 2.0 as long as wide. Tegula fulvous to blackish. 8

8. Hairs on dorsal paired smooth areas of propodeum very sparse, about 12 hairs on each of the areas. Metapleurum with a horizontal wrinkle at its lower 0.25, the wrinkle emphasized by a groove along its upper side. Reticulate wrinkling of propodeum very coarse and deep. Canada to Brazil.

8. abruptus Say (p. 122)

Hairs on dorsal paired smooth areas of propodeum not especially sparse, about 20 or more hairs on each of the areas. Metapleurum usually with a horizontal wrinkle at its lower 0.25 but usually without a groove along upper side of wrinkle. Reticulate wrinkling of propodeum shallower. 9

9. Side of pronotum behind the dorsolateral carina weakly convex, without wrinkles. Tegula blackish. Ecuador and Colombia.

9. teres, new species (p. 125)

Side of pronotum behind the dorsolateral tubercle almost flat, often with faint horizontal wrinkling and usually with a horizontal wrinkle originating at upper edge of the tubercle. Tegula fulvous to brown or blackish. 10

10. Ovipositor sheath about the same depth just beyond the middle as it is at base. Holarctic Region. 10. parvulus Nees (p. 125)

Ovipositor sheath about 1.15 as deep just beyond the middle as at base. Sweden. 11. laeviceps Thomson (p. 127)

1. Brachyserphus lucens Provancher

Figure 430 (ovipositor sheath)

**Megaspilus lucens* Provancher, 1883. Nat. Canad. 14: 33. (Faune 4: 808). "♀" = ♂.

Type: ♂, Canada: Cap Rouge in Quebec (Sainte Foy). Examined in 1975.

Proctotrypes flavipes Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 338. ♀. key, syn., des. Canada: Ottawa. (in part).

Proctotrypes flavipes Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♂, ♀.

Canada: Ottawa in Ontario; Cap Rouge and Hull in Quebec. (in part).

Phaenoserphus flavipes Kieffer, 1909. Genera Insectorum 95: 6. syn. (in part).

Cryptoserphus flavipes Kieffer, 1914. Das Tierreich 42: 33. ♀. key, des. Canada: Ottawa. (in part).

Cryptoserphus abruptus Masner, 1969. Nat. Canad. 96: 779. ♂. syn. (in part), type data for *lucens*.

Front wing 1.6 to 2.4 mm. long. Second flagellar segment 2.35 as long as wide. Side of pronotum smooth behind the dorsolateral tubercle or with one or a few horizontal wrinkles. Scrobe of pronotum smooth. Lower 0.2 of metapleurum impressed, hairy, and sculptured, the upper edge of impressed area angulate or carinate, when carinate without a groove along upper edge of carina. Propodeal sculpture moderately weak to moderately strong, weaker on the average than in other species of the genus. Hairs on the 2 dorsal smooth areas of propodeum moderately dense, about 40 hairs on each area. Ovipositor sheath about 0.67 as

long as hind tibia, the hairs on its lower edge about 0.25 as long as depth of ovipositor sheath (fig. 430). Apex of ovipositor sheath rounded with lower apical corner angulate.

Dark brown. Mouth parts, tegula, and legs fulvous to light brown, the coxae sometimes dark brown.

Specimens: 5♂, 60♀ from Colorado; District of Columbia (Washington); Michigan (Ann Arbor and Midland Co.); Minnesota (Olmsted Co.); Maryland (Takoma Park); New York (Ithaca and New York City); North Carolina (Cedar Mt.); Nova Scotia (Truro); Ontario (Bancroft, Bradford, Brighton, Dunnville, Grand Bend, Point Pelee, and Ottawa); Quebec (Aylmer); and Saskatchewan (Dundurn and Strongfield). Collection dates are from August 3 to October 8, showing that this is a late-season species.

This species occurs in the Alleghanian Fauna of North America. It is adult in the fall and late summer.

2. Brachyserphus leptura, new species

Figure 431 (ovipositor sheath)

Front wing 2.6 to 3.3 mm. long. Second flagellar segment about 2.35 as long as wide. Side of pronotum behind its dorsolateral tubercle with a weak horizontal wrinkle behind upper edge of the tubercle, otherwise smooth or with very fine horizontal wrinkles. Scrobe of pronotum smooth. Lower 0.2 of metapleurum impressed, hairy, and sculptured, the upper edge of impressed area marked by a horizontal wrinkle but with no distinct groove along upper side of the horizontal wrinkle. Propodeal sculpture moderately strong. Hairs on the 2 dorsal smooth areas of propodeum moderately dense, about 40 hairs on each area. Ovipositor sheath about 1.0 as long as hind tibia, the hairs on its lower edge about 0.27 as long as depth of the sheath (fig. 431). Tip of ovipositor sheath rather weakly decurved and with a moderately sharp apex.

Dark brown to blackish, the mandible and a few basal segments of antenna sometimes light brown. Tegula dark brown. Legs pale brown to moderately dark brown, the coxae darker than the rest. Trochanters, apical 0.2 of femora, and basal 0.25 of tibiae often paler than the rest of the legs.

Type: ♀, Takoma Park, Md., U. S. A., Sept. 24, 1944, H. & M. Townes (Townes).

Paratypes: 2♀, "Sci Lodge", Colo., Aug. 24, 1950 (Washington). ♀, on desk in National Museum of Natural History, Washington, D. C., Sept. 19, 1971 (Washington). ♀, Bowie, Md., June 24, 1945, H. & M. Townes (Townes). ♀, Michigan, C. F. Baker (Washington). ♀, Williams-ville, Mo., July 16, 1969, E. C. Becker (Ottawa); ♀, Marmora, Ont., Aug. 15, 1952, J. F. McAlpine (Ottawa). ♀, Milford, Pa., Sept. 13, 1955, R. Angle (East Lansing). ♀, Greenville, S. C., Apr. 23, 1952, G. & L. Townes (Townes). ♂, 3♀, Pachuca, 1,700 ft., Hidalgo, Mexico, July 29, 1954, J. G. Chilcott (Ottawa).

This species occurs in eastern North America, and southward to Mexico.

3. Brachyserphus barberi, new species

Figure 432 (ovipositor sheath)

Front wing 1.7 to 2.5 mm. long. Second flagellar segment about 2.35 as long as wide. Side of pronotum behind dorsolateral tubercle with weak or faint horizontal wrinkling or almost smooth. Pronotal sulcus smooth or its upper end with weak oblique wrinkles. Lower 0.25 of metapleurum irregularly punctatorugose, the upper part of this area with an irregular horizontal wrinkle above which is an irregular groove that emphasizes the wrinkle. Propodeal sculpture strong. Dorsal paired smooth areas on propodeum with about 35 hairs on each area. Ovipositor sheath about 0.62 as long as hind tibia, moderately thick, the hairs on its lower edge about 0.5 as long as the depth of sheath (fig. 432). Tip of ovipositor sheath decurved, quickly tapered to a point.

Blackish brown. Antenna light brown basally, darkening to medium brown near middle and dark brown apically. Mouth parts, tegula, and legs light fulvous, the coxae brown.

Type: ♀, reared from *Rhipidandrus* or *Mycetophagus* in *Irpex lacteus*, Anahuac, Tex., Nov., 1918, H. S. Barber (Washington).

Paratypes: 2♂, 9♀, same data as type (Washington). ♀, reared from *Irpex lacteus*, Anahuac, Tex., Oct. 30, 1918 (Washington). ♀, 2 miles west of Paint Branch, Beltsville, Md., Jul. 30, 1922, H. S. Barber (Washington). ♀, Williamsville, Mo., Jul. 16, 1969, E. C. Becker (Ottawa).

This species occurs in southeastern U. S. A. The name is in honor of Mr. H. S. Barber.

4. Brachyserphus rugatus, new species

Figures 102 (♀ metapleurum and propodeum); 433 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.0 mm. long. Second flagellar segment 2.2 as long as wide. Side of pronotum smooth except at upper end of scrobe, the upper end of scrobe crossed by 3 strong vertical wrinkles. Propodeum strongly reticulate except on the paired dorsal smooth areas, the smooth areas each with about 5 hairs (fig. 102). Ovipositor sheath 0.68 as long as hind tibia, unusually narrow and smooth, shaped as in figure 433.

Black. Mouth parts, scape, pedicel, and tegula dark brown. Legs brownish fulvous, the front tibia and tarsus a little paler and hind tarsus brown. Wings hyaline, the stigma and strong veins dark brown.

Type: ♀, near Stanley, Ida., Aug. 8, 1978, H. and M. Townes (Townes).

Paratype: ♀, Corvallis, Oreg., Oct. 10, 1980, H. Townes (Townes).

5. *Brachyserphus obliquus*, new species

Figures 105 (♀ pronotum); 434 (ovipositor sheath)

Front wing 2.0 to 2.6 mm. long. Second flagellar segment about 2.35 as long as wide. Side of pronotum behind the dorsolateral tubercle with faint, somewhat oblique wrinkling or almost smooth, always with an almost horizontal wrinkle extending backward from upper edge of the tubercle. Median and upper part of pronotal sulcus crossed by strongly oblique wrinkles, the wrinkles sometimes faint. Lower 0.2 of metapleurum impressed, hairy, and sculptured, the upper edge of impressed area bordered by an irregular ridge. Propodeal sculpture strong. Paired dorsal smooth areas of propodeum with about 35 hairs on each. Ovipositor sheath moderately stout, about 0.78 as long as hind tibia, the hairs on its lower edge about 0.25 as long as depth of the sheath (fig. 434), its tip decurved, rapidly tapered to a pointed apex.

Blackish brown. Mouth parts and base of antenna brown. Tegula and coxae dark brown. Legs beyond coxae light brown.

Type: ♀, Diamond Head Trail at 3,200 ft., Squamish, B. C., Aug. 30, 1953, W. R. M. Mason (Ottawa).

Paratypes: ♂, 13♀, same locality and collector as type, 3,200 and 3,300 ft., Aug. 6, 9, 14, 16, 18, 19, and 30, 1953 (Ottawa). ♀, Whitehorse, Yukon, Aug. 7, 1948, W. R. M. Mason (Ottawa). ♀, Robson, B. C., Aug. 18, 1949, H. R. Foxlee (Ottawa). ♀, Moscow Mt., Ida., Aug. 10, A. L. Melander (Cambridge). ♀, Georgetown, 6,000 ft., Mont., July 29, A. L. Melander (Cambridge).

This species occurs in western North America, in mountainous areas from Montana to southern Yukon Territory. It is adult in August and late July.

6. *Brachyserphus hawaiiensis* Ashmead

Figures 106 (♀ pronotum); 435 (ovipositor sheath)

**Proctotrypes hawaiiensis* Ashmead, 1901. Fauna Hawaiiensis . . . 1: 294. ♀. des.

Lectotype: ♀ (designated by Masner, 1965), USA: Kona at 2,000-3,000 ft. in Hawaii (London). Examined in 1975. USA: 5 localities in Hawaii.

Phaenoserphus hawaiiensis Kieffer, 1909. Genera Insectorum 95: 6. syn.

Serphus? *hawaiiensis* Kieffer, 1914. Das Tierreich 42: 16. ♀. key, des. USA: Maui in Hawaii at 700-2,700 m.

Cryptoserphus hawaiiensis Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7. ♀. lectotype designated.

Male: Unknown.

Female: Front wing 1.7 to 2.2 mm. long. Second flagellar segment about 2.35 as long as wide. Side of pronotum behind the dorsolateral tubercle with horizontal wrinkling (fig. 106). Upper or upper and median part of pronotal scrobe crossed by wrinkles that are about 45° from the horizontal. Lower 0.2 of metapleurum impressed, hairy, and sculptured. Propodeal sculpture moderately weak. Dorsal pair of smooth areas of propodeum with about 45 hairs on each area. Ovipositor

sheath about 0.53 as long as hind tibia, its tip decurved and tapered to a point, the hairs on its lower edge about 0.25 as long as depth of the sheath (fig. 435).

Blackish. Antenna pale brown basally, darkening to dark brown toward apex. Mouth parts pale brown. Tegula dark brown. Coxae light brown. Legs beyond coxae light fulvous.

Specimens: ♀ (paratype), Haleakala, 8,000 ft., Maui, Hawaii, Apr. 1894, Perkins (Washington). ♀, one mile north of Manuko Park, 1,500 ft., Hawaii, Mar. 2, 1961, D. F. Hardwick (Ottawa). 2♀, two miles south of Papa, 1,500 ft., Hawaii, Mar. 3, 1961, D. F. Hardwick (Ottawa). ♀, Kilauea, 4,000 ft., Hawaii, May 4, W. M. Wheeler (Cambridge). ♀, on calla lily flower, volcano, 3,500 ft., Hawaii, Jan. 12, 1944 (Washington).

This species is known only from Hawaii.

7. Brachyserphus curticornis, new species

Male: Unknown.

Female type: Front wing 2.7 mm. long. Second flagellar segment 1.6 as long as wide. Area behind dorsolateral tubercle of pronotum almost flat, not wrinkled but bounded dorsally by a weak wrinkle. Scrobe of pronotum smooth. Lower 0.25 of metapleurum impressed, sculptured and hairy, the impressed area bounded dorsally by a weak ridge, the upper edge of ridge paralleled by a shallow groove. Propodeal reticulation moderately strong. Dorsal pair of smooth areas on propodeum with about 30 hairs in each area. Syntergite with a subapical row of hairs, the hair bases separated by about 1.1 the length of the hairs (other species of *Brachyserphus* often have such a subapical hair row on the syntergite but in these the hairs are sparser). Ovipositor sheath stout, 0.48 as long as hind tibia, apically decurved and tapered to a sharp point, the hairs on its lower edge about 0.3 as long as depth of the sheath (similar to ovipositor sheath of *abruptus*).

Black, including basal part of antenna. Mouth parts dark brown. Tegula and coxae blackish brown. Trochanters, femora, and front and middle tibiae fulvous brown, the trochanters and femora somewhat infuscate. Hind tibia dark brown basally, the rest fuscous. Tarsi fuscous.

Type: ♀, Machu Picchu, Peru, Dec. 1, 1965, H. and M. Townes (Townes).

8. Brachyserphus abruptus Say

Figures 103 (♀ metapleurum and propodeum); 436 (ovipositor sheath)

**Proctotrupes abruptus* Say, 1836. Boston Jour. Nat. Hist. 1: 278 (Leconte Ed. 2: 725). ♀. des. Type: ♀, USA: Indiana (destroyed). Earliest revisors were Provancher, 1881 (Nat. Canad. 12: 263) and Ashmead, 1893. Provancher applied the name to an *Exallonyx* which does not fit Say's description. Ashmead applied it to the present species, which is most likely the correct species.

- Proctotrypes abruptus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 339. ♀. key, des.
USA: Jacksonville in Florida; Indiana; Virginia.
- **Proctotrypes Belfragei* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 340. ♀. key, des.
Type: ♀, USA: Texas (Washington). Examined in 1975. New synonym.
- Proctotrypes obsoletus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 340. ♀. key, des.
USA: District of Columbia; Indiana. Host: *Stelidota strigosa*. Misdet. of *obsoletus* Say.
- Proctotrypes abruptus* Harrington, 1899. Trans. Roy. Soc. Canada 2 (5): 194. ♂, ♀.
Canada: Kettle Island in Ottawa in Ontario; Quebec.
- Proctotrypes obsoletus* Harrington, 1899. Trans. Roy. Soc. Canada 2 (5): 194. ♂, ♀?
Canada: Ottawa; ?Masset on Q[ueen] C[harlotte] I[slands]. Misdet. of *obsoletus* Say.
- Phaenoserphus abruptus* Kieffer, 1909. Genera Insectorum 95: 5. syn.
- Phaenoserphus Belfragei* Kieffer, 1909. Genera Insectorum 95: 5. syn.
- Proctotrypes abruptus* Viereck, 1910. Ann. Rpt. New Jersey State Mus. 1909: 652.
USA: New Jersey.
- Phaenoserphus abruptus* Kieffer, 1914. Das Tierreich 42: 32. ♀. key, des.
USA: Florida; Indiana; Virginia.
- Phaenoserphus belfragei* Kieffer, 1914. Das Tierreich 42: 32. ♀. key, des.
USA: Texas.
- Phaenoserphus obsoletus* Kieffer, 1914. Das Tierreich 42: 33. ♀. key, des.
USA: "Columbia"; Indiana. Misdet. of *obsoletus* Say.
- Serphus abruptus* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575.
♀. key, des.
- Serphus obsoletus* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575.
key, des. Host: *Stelidota strigosa*. Misdet. of *obsoletus* Say.
- Serphus obsoletus* Washburn, 1918. 17th Rpt. State Ent. Minnesota p. 197.
Host: *Stelidota strigosa*. Misdet. of *obsoletus* Say.
- Cryptoserphus abruptus* Brues, 1919. Jour. New York Ent. Soc. 27: 6, 7, Pl. 1,
fig. 6. syn., des., figs.
- Cryptoserphus obsoletus* Brues, 1919. Jour. New York Ent. Soc. 27: 6, 7. syn.
Misdet. of *obsoletus* Say.
- Cryptoserphus belfragei* Brues, 1919. Jour. New York Ent. Soc. 27: 6. syn.
- Proctotrubes abruptus* Brimley, 1938. The Insects of North Carolina. North
Carolina Dept. Agr., p. 417. USA: Raleigh in North Carolina.
- Cryptoserphus abruptus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr.
Monog. 2: 665. Canada: Ontario; Quebec. USA: Florida; Indiana; Michigan;
New York; Tennessee; Virginia.
- Cryptoserphus obsoletus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr.
Monog. 2: 665. Canada: Ontario. USA: District of Columbia; Indiana; Virginia.
Misdet. of *obsoletus* Say.
- Cryptoserphus abruptus* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog.
2, suppl. 2: 286. USA: Maryland; New Hampshire; New Jersey; South Carolina;
West Virginia.
- Cryptoserphus obsoletus* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog.
2, suppl. 2: 286. USA: Florida. Host: *Stelidota strigosa*. Misdet. of *obsoletus*
Say.
- Cryptoserphus belfragei* Masner & Muesebeck, 1968. U. S. Nat. Mus. Bul. 270: 5.
♀. type data listed.
- Cryptoserphus abruptus* Masner, 1969. Nat. Canad. 96: 779. ♂. syn. (in part).
type data of *lucens* listed.

Front wing 1.7 to 3.2 mm. long. Second flagellar segment about 2.0 as long as wide. Side of pronotum behind the anterolateral tubercle usually with faint to distinct horizontal wrinkling, at least with a weak horizontal wrinkle extending backward from upper edge of the tubercle. Upper end of pronotal sulcus usually with a little weak wrinkling. Lower 0.25 of metapleurum sculptured, hairy, and impressed, the upper edge of impressed area bordered by a horizontal wrinkle, the wrinkle emphasized by a groove along its upper edge. Propodeal sculpture very

strong and coarse, the posterodorsal corner of propodeum usually with a triangular area bordered by a strong ridge or wrinkle. Dorsal pair of smooth areas of propodeum with only a few hairs, about 12 hairs in each area. Ovipositor sheath stout, about 0.50 as long as hind tibia, its tip decurved and tapered to a sharp point, the hairs on its lower edge about 0.25 as long as depth of the sheath (fig. 436).

Blackish brown or black. Antenna light brown basally, darkening to blackish apically. Mouth parts brown to blackish. Tegula fulvous, reddish brown, or sometimes blackish brown. Legs fulvous or fulvo-ferruginous, usually with hind coxa more or less infusate and sometimes all coxae more or less brown or infusate. Hind tarsus usually darkened.

Nearctic specimens: 242♂, 223♀ from Arkansas (Fayetteville and Shores Lake Camp in Lake Co.); California (Atwood in Orange Co. and Placenta); Connecticut (Canaan and Wallingford); District of Columbia (Washington); Florida (Alachua Co., Homestead, Jacksonville, and Mount Pleasant); Georgia (Forsyth, Lavender in Floyd Co., one mile north of Pine Mt. at 3,000 ft., and Warwoman Creek); Illinois (Center-ville, Champaign, and near Urbana); Kansas (Lawrence); Louisiana (11 miles southwest of Alexandria); Maryland (Bethesda, Bowie, Cabin John, Laurel, Plummers Is., and Takoma Park); Massachusetts (Cambridge, Holliston, and Humarock); Michigan (Allegan Co., Ann Arbor, Bay Co., George Reserve in Livingston Co., Gull Lake Biological Station in Kalamazoo Co., Midland Co., and Wolf Lake Fish Hatchery in Van Buren Co.); New Hampshire (Durham); New Jersey (Moorestown, Princeton, and Windsor); New York (Babylon, Ithaca, Oswego, and Sea Cliff on Long Island); North Carolina (11 miles east of Cashiers, Highlands at 3,800 ft., and Southern Pines); Oklahoma (Ottawa Co.); Ontario (Aylmer West, Beamsville, Cumberland, Ingersoll, Ottawa, Point Pelee, and Rondeau Provincial Park); Pennsylvania (Harrisburg and Philadelphia); Quebec (Lac Brule); South Carolina (Aiken, Anderson, Clemson, Cleveland, Columbia, Greenville, Mountain Rest in Oconee Co. at 1,500 ft., and River Falls in Greenville Co.); Tennessee (Camp Mack Morris in Benton Co., Chapin Sanctuary at East Ridge, Clarksville, Indian Gap at 5,000 ft. in Great Smoky Mountains National Park, near Model in Stewart Co., and Nashville); Virginia (Alde, Arlington, Falls Church, Glencarlyn, Great Falls, and Rosslyn); and West Virginia (Mason Co.).

Neotropical specimens: ♂, Santa Engracia, Tamaulipas, Mexico, O. C. Plummer (Washington). ♂, 15 miles west of El Palmito, 6,000 ft., Sinaloa, Mexico, Aug. 12, 1964, W. R. M. Mason (Ottawa). ♀, 14 kilometers north of Ureña, Costa Rica, June 20 to 23, 1974, Julian Donahue (Los Angeles). ♀, Serra do Caraca, S. Barbara, Minas Gerais, Brazil, Jan. 1970, F. M. Oliveira (Townes). ♀, S. J. Barreiro, 1,650 m., Serra do Bocaina, Brazil, Nov. 1968, Alvarenga and Seabra (Townes).

Collecting dates in the Nearctic Region are evenly distributed from mid spring to mid fall. Four collections indicate association with buildings, especially with stored wheat: one collection from a window, one from wheat in a bin, one from surface of stored wheat, and one in flour mill.

This species occurs in the Nearctic Region as far northward as the southern boundary of the Canadian Zone and southward through warmer

and tropical areas to southern Brazil. Ashmead, 1893, reported its being reared from *Stelidota strigosa* (Nitidulidae) and the host record has been repeated by later authors.

9. *Brachyserphus teres*, new species

Figure 437 (ovipositor sheath)

Front wing 2.2 to 2.8 mm. long. Second flagellar segment about 2.0 as long as wide. Side of pronotum behind the dorsolateral tubercle smooth and unwrinkled, somewhat convex. Scrobe of pronotum smooth. Lower 0.2 of metapleurum impressed, smooth, and hairy, the upper edge of impressed area bordered by a ridge or wrinkle. Propodeal sculpture moderately strong. Dorsal pair of smooth areas on propodeum each with about 25 hairs. Ovipositor sheath stout, about 0.54 as long as hind tibia, its tip decurved and tapered to a point, the hairs on its lower edge about 0.25 as long as depth of the sheath (fig. 437).

Black, including the entire antenna. Mouth parts and tegula dark brown or black. Coxae dark brown to blackish. Trochanters, femora, and tibiae fulvous brown with weak to strong infuscation. Tarsi brown to blackish.

Type: ♀, Ascáubi to Pita, 2,600 m., Ecuador, Jan. 16, 1971, Luis Peña (Townes).

Paratypes: ♂, Latacunga, 2,800 m., Ecuador, Dec. 11, 1970, Luis Peña (Townes). ♂, Quito to Santo Domingo, 2,800 m., Ecuador, Dec. 20, 1970, Luis Peña (Townes). ♂, San Otavalo, 3,300 m., Ecuador, Jan. 8-9, 1971, Luis Peña (Townes). 2♀, La Picota, 2,640 m., near Bogotá, Colombia, Luis M. Murillo and H. O. Mesa (Washington).

10. *Brachyserphus parvulus* Nees

Figures 104 (metapleurum and propodeum); 438 (ovipositor sheath)

**Codrus parvulus* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 360. ♂, ♀. des. Types: ♂, ♀, Germany: Sickershausen (destroyed). In *Suillus granulatus* infested with *Fungivora* larvae. Interpretation of the species according to Haliday, 1839, as first revisor.

Proctotrupes parvulus Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 14, 15. ♂, ♀. des., biol. ♀♀ gregarious in *Boletus*. England. Finland.

Proctotrupes parvulus Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.

Proctotrupes parvulus Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Leiden and Utrecht.

Proctotrypes parvulus Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 467. syn.

Proctotrypes parvulus Elliott & Morley, 1907. Trans. Ent. Soc. London 1907: 39. ♂, ♀. England: Ipswich. From *Boletus* on old elm.

Serphus (Cryptoserphus) Parvulus Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 315. ♂, ♀. des. in key. England. Finland. Germany. Sweden.

- Cryptoserphus parvulus* Kieffer, 1914. Das Tierreich 42: 37. ♂, ♀. key, des., biol. England. Germany. Sweden. Oviposits in *Boletus* infested by Fungivoridae.
- Proctotrypes parvulus* Morley, 1922. Entomologist 55: 59, 108. ♂, ♀. key, biol. England: 4 localities. Host: *Diphylus lunatus* in *Sphacria concentrica*; *Orchesia micans*.
- Cryptoserphus parvulus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 462, 463, 464. keys, des., figs., biol. England: 6 localities. Ireland: 1 locality. From bracket fungus on ash, containing *Orchesia micans*.
- Cryptoserphus parvulus* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- Brachyserphus parvulus* Hellén, 1941. Notulae Ent. 21: 42. ♀. key, syn., des. Finland: 4 localities (in part).
- Cryptoserphus parvulus* Murray, 1941. Ent. Monthly Mag. 77: 56. ♂. des., biol. Scotland: Dumfriesshire.
- Cryptoserphus parvulus* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: Ringsjö.
- Cryptoserphus parvulus* Leclercq, 1952. Lambillionea 52: 71. Belgium: Seraing.
- Cryptoserphus parvulus* Osborne, 1955. Ent. Monthly Mag. 91: 47. Scotland: South Queensferry. Host: *Meligethes aeneus*.
- Cryptoserphus parvulus* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.
- Brachyserphus parvulus* Masner, 1957. Acta Fauna Ent. Mus. Natl. Pragae 2: 86. ♂, ♀. Czechoslovakia: 4 localities in Bohemia; 1 locality in Moravia; 1 locality in Slovakia.
- Brachyserphus parvulus* Masner, 1957. Klíč Zvířeny ČSR 2: 299. key, syn. Czechoslovakia.
- Brachyserphus parvulus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 59. Hosts: larvae of *Triplax* & *Meligethes*; fungus beetles.
- Brachyserphus parvulus* Szabó, 1959. Rovartani Közlemények, Folia Entomologica Hungarica (n. s.) 12: 195. ♀. Hungary: Borovec.
- Cryptoserphus parvulus* Osborne, 1960. Parasitology 50: 91, 105. des., figs., biol. Host: *Meligethes aeneus*.
- Cryptoserphus parvulus* Jourdeuil, 1961. Franc. Inst. Natl. Rech. Agron. Ann., Series C. Ann. des Épiphyt. 11: 462, 464, 468, 469, 566-568, 574-576. ecology. Host: *Meligethes aeneus*; *Meligethes*.
- Brachyserphus parvulus* Meyer, 1961. Bombus 2: 93. West Germany: Nindorfa Walde/Krs. Harburg.
- Brachyserphus parvulus* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 28, 33. ♀. ecology. West Germany: 3 localities.
- Brachyserphus parvulus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 3. Europe. Japan. USSR: Sakhalin. Hosts: *Triplax* sp.; *Phalacrus corruscus*; *Meligethes* sp.; other fungivorous beetles.
- Brachyserphus parvulus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. Austria. France. Switzerland. West Germany: 2 localities.
- Cryptoserphus parvulus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 539. ♀. Ireland: 3 counties.
- Cryptoserphus parvulus* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog. 2, suppl. 2: 286. syn.
- Brachyserphus parvulus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 29, 31. ♀. des., figs., biol. Belgium. Middle Europe. France. Great Britain. Northern Japan. Scandinavia up to Lappland. Switzerland. Hosts: *Triplax* sp.; Melandryidae?; & Phalacridae?
- Brachyserphus parvulus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 117. ♂, ♀. Austria. Germany. Switzerland. Hosts: *Meligethes*; beetle larvae.
- Brachyserphus parvulus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 546. ♀. key, figs. USSR: northwest Yaroslavskaia oblast.

Front wing, 1.9 to 2.8 mm. long. Second flagellar segment about 2.0 as long as wide. Side of pronotum behind its anterolateral tubercle smooth or almost smooth except for a weak wrinkle extending backward from upper edge of the tubercle. Scrobe of pronotum smooth. Lower 0.25 of metapleurum impressed, sculptured, and hairy, the upper edge of impressed area bordered by a weak ridge or wrinkle, this ridge or wrinkle nearly always without a groove along its upper edge. Propodeal sculpture moderately strong. Dorsal pair of smooth areas on propodeum each with about 30 hairs. Ovipositor sheath stout, about 0.55 as long as hind tibia, its apex decurved and tapered to a point, the hairs on its lower edge about 0.25 as long as depth of ovipositor sheath (fig. 438).

Blackish brown or black. Antenna sometimes brown near base. Mouth parts medium brown to blackish. Tegula fulvous to blackish. Coxae dark brown to black. Legs beyond coxae fulvous to brown, the trochanters and femora sometimes partly infusate. Tarsi sometimes infusate.

Nearctic specimens: 3♂, 17♀ from Alaska (Tsaina River); British Columbia (Cowichan Lake and Hixon); Manitoba (Cedar Lake in Riding Mountain National Park); Maryland (Cabin John); Michigan (Luzerne in Oscoda Co.); New Brunswick (St. John); New Hampshire (Durham); Ontario (Island Falls and Timagami); Quebec (Laniel); and Yukon Territory (13 miles east of Dawson at 1,300 ft.).

European specimens: 4♂, 27♀ from England (Bagley Woods near Oxford and Leicester); Ireland (Glenasmole in Co. Dublin, Kilkea Park in Co. Kildare, Tollymore Park in Co. Down, and Verschoyle's Hill in Co. Dublin); and Sweden (Åhus in Skaraborg, Bräsaro in Skaraborg, Hallands Väderö in Skaraborg, Lycksele, Messaure, Ravlunde in Skaraborg, Skåne, Skärälid, and Vittshövde in Skaraborg).

Collection dates are in August and September except for the following: June 30 near Dawson, Yukon Territory; June 28 and 30 and July 4 and 6 at Messaure, Sweden; July 4 at Laniel, Quebec; July 9 at Luzerne, Michigan; "July" and Oct. 15 and 22 at Leicester, England; and Oct. 8 at Vittshövde, Skaraborg, Sweden.

This species is widespread in the northern parts of the Holarctic Region. In North America it occurs in the Canadian and Hudsonian Zones.

This species has been reared from various small beetle larvae in fungi; also from *Meligethes* larvae (Nitidulidae) infesting the flowers of Cruciferae. Osborne, 1960, describes its parasitism on *Meligethes* and figures the egg, first larval instar, and last larval instar.

11. *Brachyserphus laeviceps* Thomson

Figure 439 (ovipositor sheath)

**Proctotrupes laeviceps* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 416. ♂, ♀. des. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), Sweden: Stockholm (Stockholm). Examined in 1975. Sweden: 4 additional localities.

- Proctotrypes leviceps* (!) Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn.
- Serphus (Cryptoserphus) Leviceps* (!) Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 314. ♂, ♀. Thomson des. repeated in key. Sweden.
- Cryptoserphus laeviceps* Kieffer, 1914. Das Tierreich 42: 37. ♂, ♀. key, des. Sweden.
- Cryptoserphus laeviceps* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 465. ♀. des.
- Brachyserphus parvulus* Hellén, 1941. Notulae Ent. 21: 42. ♀. key, syn., des. Finland: 4 localities. (in part).
- Brachyserphus laeviceps* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 59. syn.
- Brachyserphus laeviceps* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 29, 31. ♀. des., fig.
- Brachyserphus laeviceps* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. ♀. figs.
- Brachyserphus laeviceps* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 546. ♀. key, figs. USSR: Yaroslavskaya oblast.

Front wing about 2.8 mm. long. Similar to *B. parvulus* in structure and color, differing only in that the ovipositor sheath is about 0.75 as long as hind tibia and somewhat deeper near and beyond the middle than it is at the base (1.15 as deep just beyond the middle as at base). See figure 439.

Specimens: Known only from the types, from Sweden. The figure of the ovipositor sheath is from one of the paratypes.

12. SERPHONOSTUS, new genus

Figures 16 (side view); 41 (front wing)

Front wing 2.4 to 2.6 mm. long. Body moderately proportioned. Clypeus moderately small, wide, weakly convex, its apex transverse, the apical margin double because of a low overhanging ridge. Frons with a high median tubercle that is transverse and with an indentation on its upper side. Cheek with a groove from eye to mandible. Occipital carina present only above the foramen magnum, moderately arched. Mandible stout, with a single apical tooth. Flagellum moderately short, in male with faintly convex elliptic tyloids on segments 4 to 8. Notaulus long and deep, the two notauli meeting just in front of hind margin of mesoscutum. Pronotum with hairs on collar and on upper 0.3, the rest hairless. Upper part of pronotal scrobe with some long strong wrinkles. Anterolateral shoulder of pronotum prominent, its upper part with a transverse carina. Horizontal groove on mesopleurum complete but shallow, strongly arched. Mesopleural suture with deep foveae throughout its length. Metapleurum with an anterodorsal hairless polished area, the rest coarsely sculptured. Upper front part of metapleurum without a carina running dorsad to lateral upper edge of propodeum. Propodeum moderately long, completely rugoso-punctate, without distinct median or transverse carinae. Longer spur of hind tibia reaching 0.38 the length of hind basitarsus. Stigma 0.44 as long as deep. Radial vein arising tangentially from hind edge of stigma and gently curved toward costa. Radial cell moderately long, its costal side 0.66 as long as depth of

stigma. Costal vein ending just beyond apex of radial cell. Abdomen without stalk, the tergites beyond syntergite usually retracted but in female capable of great extension. Base of syntergite with median groove that reaches 0.45 to thyridial interspace, on each side with 5 or 6 longitudinal grooves the same length as median groove. Ovipositor sheath slender, decurved, of uniform depth, with rounded tip, its surface with a moderate number of erect hairs. The ovipositor sheath is capable of complete retraction within tip of abdomen.

Genotype: *Disogmus nigerrimus* Dodd.

The generic name is from *Serphus* plus $\nu\delta\sigma\tau\omicron\varsigma$ (return), alluding to the retractable ovipositor sheath.

This genus contains a single species, in Tasmania.

Serphonostus nigerrimus Dodd

Figures 16 (side view); 41 (front wing)

**Disogmus nigerrimus* Dodd, 1915. Trans. Roy. Soc. South Australia 39: 386. ♀. des.

Type: ♀, Australia: Hobart in Tasmania (Adelaide). Examined in 1977.

Disogmus nigerrimus Riek, 1955. Australian Jour. Zool. 3: 110. ♀. des.

Front wing 2.4 to 2.6 mm. long. Structure as described and figured under the generic heading.

Black. Palpi brown. Tegula black. Front tibia dark brown. Front and middle tarsi brown. Front wing hyaline, the stigma and strong veins of front wing dark brown. Nervulus and adjacent wing membrane, lower half of basal vein and adjacent wing membrane, and basal 0.7 of medius and adjacent wing membrane brown. Front wing with a large fuscous area from the level of base of stigma almost to apex but fading out apically. Hind wing and its veins hyaline. Ovipositor sheath and tergites of female beyond the syntergite brown, the tergites of female beyond syntergite usually telescoped within syntergite.

Specimens: ♂, Geeveston, Tasmania, Feb. 7-27 (Townes). ♀, Gordan, Tasmania, Jan. 19 to Feb. 8 (Townes). ♀, Mt. Barrow, 700 m., Tasmania, February (Townes).

13. APOGLYPHA, new genus

Figures 17 (side view); 42 (front wing)

Front wing 2.2 to 3.0 mm. long. Clypeus short and moderately wide, weakly convex, its apex broadly, weakly convex. Apical margin of clypeus sharp, reflexed. Cheek short, with a groove from eye to mandible. Occipital carina complete, meeting oral carina far above base of mandible. Mandible stout, with a single apical tooth. Flagellum of moderate length, the male flagellum without tyloids. Notaulus completely absent. Lateral aspect of pronotum with a median horizontal groove that is mat at the bottom, the groove often paralleled above and below by fine wrinkling. Upper front part of pronotum with a smooth weak swelling. Mesopleurum without a median horizontal groove, with sharp radiating striae

above and in front of speculum, with moderately sparse hairs on its lower 0.35, elsewhere hairless. Mesopleural suture shallow, foveolate. Metapleurum finely wrinkled and/or mat on its hind and lower part, the rest smooth and polished except for an oblique groove near its upper edge, the anterodorsal part of its smooth area connected by a short fine carina to anterolateral edge of propodeum. Propodeum sloping, its profile weakly convex, its sculpture relatively weak. Longer spur of hind tibia reaching to basal $0.4 \pm$ of hind basitarsus. Stigma large, subcircular, about as deep as long. Radial cell a very narrow open area on distal edge of stigma that seems almost a part of stigma, the front edge of radial cell not reaching stigma and greatest length of radial cell about 0.08 the depth of stigma. Costal vein not extending beyond stigma. Abdomen without a stalk. Base of syntergite either smooth or with short indistinct longitudinal grooves. Ventrolateral quarter of side of syntergite without hairs. Apical segments of female abdomen long and extensible. Ovipositor sheath 0.31 to 0.78 as long as hind tibia, moderately deep and evenly curved, with sparse erect hairs.

Genotype: *Apoglypha radiata*, new species.

The generic name is from $\alpha\pi\omicron$ - (deprived of), plus $\gamma\lambda\upsilon\phi\eta$ (carving), referring to the lack of a horizontal groove across the mesopleurum.

This is an Australian genus. Four species are known. Three are treated below, the fourth being an undescribed species listed at the end of the genus.

Key to the species of *Apoglypha*

1. Speculum with horizontal striae on its median part.
 Mesoscutum with a small marginal area of rugosity near front, on each side. Ovipositor sheath 0.31 as long as hind tibia.
 Australia. 1. *nitens* Dodd (p. 130)
 Speculum smooth on its median part, sometimes with horizontal grooves on its upper 0.35. Mesoscutum without a marginal area of rugosity near front, on each side. Ovipositor sheath 0.7 to 0.8 as long as hind tibia. 2
2. Lower hind corner of mesopleurum with about 6 short parallel grooves, in front of middle coxa. Base of syntergite with short longitudinal grooves at each lateral corner. Tasmania.
 2. *radiata*, new species (p. 131)
 Lower hind corner of mesopleurum without grooves. Base of syntergite without grooves at each lateral corner. Australia.
 3. *janthinae* Dodd (p. 131)

1. *Apoglypha nitens* Dodd

**Proctotrypes nitens* Dodd, 1920. Trans. Ent. Soc. London 1919: 364. σ , ρ . des.

Type: ρ , S. W. Australia: Yallingup (London). Examined in 1978.

Proctotrypes nitens Riek, 1955. Australian Jour. Zool. 3: 112. σ , ρ . des.

Cryptoserphus nitens Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 7.
 ρ . syn., type data.

Front wing 2.3 to 3.0 mm. long. Pronotum with about 3 wrinkles next to upper edge of its horizontal groove. Mesoscutum with a small marginal area of rugulosity near front, on each side. Median part of speculum with horizontal wrinkles. Lower front part of mesopleurum with fine oblique wrinkling. Oblique groove on upper part of metapleurum wide and rugose. Base of syntergite without longitudinal grooves. Ovipositor sheath 0.31 as long as hind tibia, evenly curved, faintly deeper near apex, its apex rounded.

Black. Scape, pedicel, and mouth parts light brown. Tegula dark brown. Legs brown or dark brown, the hind coxa blackish. Wings hyaline, with a large brown area below and a little basad of stigma. Stigma and strong veins dark brown. Weak veins indicated by light brown streaks. Ovipositor sheath blackish.

Specimens: ♂ (paratype) and ♀ (type), Yallingup, S. W. Australia, Nov. 1913, R. E. Turner (London).

2. Apoglypha radiata, new species

Figures 97 (♀ side of thorax); 440 (ovipositor sheath)

Front wing 2.6 mm. long. Pronotum with two wrinkles paralleling upper edge of its horizontal groove. Mesoscutum without marginal rugulose areas anteriorly on each side. Speculum smooth. Lower front part of mesopleurum smooth. Lower hind part of mesopleurum with about 6 short parallel grooves next to middle coxa. Oblique groove on upper part of metapleurum not wide, almost simple. Base of syntergite with a long median groove and at each lateral corner some fine short grooves. Ovipositor sheath as in figure 440, 0.78 as long as hind tibia.

Black. Palpi fuscous. Tegula blackish. Trochanters, apices of coxae, and apices of femora light brown. Front tibia and tarsus light brown. Middle tibia and tarsus medium brown. Hind tibia light brown toward base. Wings subhyaline. Stigma and strong veins dark brown. Weak veins unpigmented. Ovipositor sheath dark brown.

Type: ♀, Bronte Park, Tasmania, Jan. 2 to 8 (Townes).

3. Apoglypha janthinae Dodd

Figures 98 (♀ side of thorax); 441 (ovipositor sheath)

**Proctotrypes janthinae* Dodd, 1915. Trans. Roy. Soc. South Australia 39: 387. ♀. des. Type: ♀, Australia: Melbourne in Victoria (Melbourne). Host: *Thallis janthina*. Examined in 1977.

Proctotrupes janthinae Riek, 1955. Australian Jour. Zool. 3: 111. ♀. des.

Front wing about 2.2 mm. long. Pronotum without distinct wrinkles next to upper edge of its horizontal groove. Mesoscutum without marginal rugulose areas anteriorly on each side. Speculum with horizontal grooves on its upper 0.35, elsewhere smooth. Lower front part and lower hind part of mesopleurum smooth. Oblique groove on upper part of metapleurum not wide, simple. Base of syntergite with a long broad

median groove, without longitudinal grooves at each lateral corner. Ovipositor sheath as in figure 441, 0.75 as long as hind tibia.

Black. Mouth parts and tegula blackish brown. Apices of coxae pale brown. Trochanters and femora blackish brown. Tibiae and tarsi dark brown. Wings hyaline. Stigma and strong veins dark brown. Weak veins unpigmented. Ovipositor sheath blackish.

Specimens: Redescribed from the type, a ♀ from Melbourne, Australia that was reared from *Thallis janthina* (Erotylidae). Dodd in 1920 recorded a ♂ and ♀ of *janthinae* from Mt. Wellington in Tasmania. These specimens have been examined. They represent a fourth (undescribed) species of *Apoglypha*.

4. *Apoglypha* sp.

Proctotrupes janthinae Dodd, 1920. Trans. Ent. Soc. London 1919: 364. ♂, ♀. des. Australia: Mt. Wellington in Tasmania. Misdet. of *janthinae* Dodd.

Tribe SERPHINI

Figure 18-24 (side views); 43-48 (front wings)

Occipital carina complete, or lacking only near oral carina. Mandible falcate, with a single tooth or in *Parthenocodrus* also with a second tooth. Tyloids present or absent. Epomia absent or short and indistinct, the pronotum usually with a carina along collar that turns toward pronotal scrobe but does not cross it. Upper anterolateral part of pronotum without a tubercle or prominent swelling. Notaulus short, indistinct, lacking, or sometimes indicated by a long weak impression. Metapleurum completely sculptured or smooth on its upper front 0.7 or less. Dorsal face of propodeum of moderate length to long. Tarsal claws simple except in *Exallonyx*. Front wing about 2.5 as long as wide (or the wings sometimes reduced or absent). Stigma moderately deep, giving rise to radius near its midlength. Intercubitus short but usually pigmented. Radial cell short to very short. First and second discoidal cells usually confluent. Abdomen with a stalk that is 0.4 to 3.5 as long as wide or in *Paracodrus* without a distinct stalk. Syntergite cylindrical or weakly to moderately compressed, usually with few hairs but sometimes the hairs on lower half moderately dense. Apical segments of female abdomen not protractile. Ovipositor sheath short to long, nearly always decurved, its surface with moderately sparse to moderately dense hairs.

This tribe contains 7 genera. Six of the genera are Holarctic or Palearctic, in some cases with intrusions into the Oriental Region. The seventh (*Exallonyx*) is worldwide and contains more than half of the species of the family. Hosts are beetle larvae, especially Staphylinidae, Carabidae, and Elateridae. There is one rearing record from a centipede (*Lithobius*).

Key to the genera of Serphini

1. Front and middle tarsal claws each with a long black divergent tooth near base. Lateral aspect of pronotum with hairs on upper part of collar and along upper edge, usually without hairs elsewhere. Worldwide. 7. Exallonyx (p. 203)
- Front and middle tarsal claws simple. Lateral aspect of pronotum usually with hairs generally distributed but very often with a median hairless area. Mostly in the Northern Hemisphere. . . 2
2. Dorsal and posterodorsal faces of propodeum entirely smooth or with a very few punctures. Abdomen without a distinct stalk. Maxillary palpus with three segments. Female wingless; male fully winged. Europe. 5. Paracodrus (p. 193)
- Dorsal and posterodorsal faces of propodeum largely or entirely covered with reticulate wrinkling, the dorsal face usually with a median groove or carina. Abdomen with a stalk. Maxillary palpus with 4 segments. Female rarely wingless; male fully winged. 3
3. Mandible with two apical teeth, the upper tooth shorter. Upper face of propodeum with a shallow median longitudinal groove. Palearctic Region. 4. Parthenocodrus (p. 191)
- Mandible with one apical tooth. Upper face of propodeum with a median longitudinal carina, or the carina sometimes obliterated by coarse reticulate sculpture. 4
4. Head with a strong median vertical carina between antennal sockets. Lower half of lateral aspect of sytergite without hairs. Longer spur of male hind tibia about 0.65 as long as hind basitarsus, curved. Holarctic Region. 6. Phaneroserphus (p. 196)
- Head without a strong vertical carina between antennal sockets. Lower half of lateral aspect of sytergite with numerous hairs. Longer spur of male hind tibia 0.3 to 0.75 as long as hind basitarsus. 5
5. Lower part of frons with a median rounded bulge. Nervulus approximately opposite basal vein or distad by as much as 0.45 its length. Longer spur of hind tibia about 0.65 as long as hind basitarsus in male, about 0.5 as long in female. Male clasper ending in a decurved needle-like point. Palearctic and Oriental Regions. 1. Codrus (p. 134)
- Lower part of frons without a median bulge. Nervulus distad of basal vein by about 0.5 to 0.8 its length. Longer spur of hind tibia about 0.3 to 0.6 as long as hind basitarsus in male, about 0.3 to 0.45 as long in female. Male clasper ending in a triangular lobe or point. 6

6. Ovipositor sheath 0.25 to 0.68 as long as hind tibia. Side of pronotum nearly always smooth. Stalk of abdomen 0.45 to 1.55 as long as wide. Syntergite entirely black except in *P. melliventris* and *P. partipes*. Holarctic Region, and *P. partipes* also in India. 2. Phaenoserphus (p. 143)
- Ovipositor sheath 0.6 to 1.5 as long as hind tibia. Side of pronotum with more or less wrinkling. Stalk of abdomen about 0.4 as long as wide. Syntergite nearly always red or partly red. Holarctic Region. 3. Serphus (p. 169)

1. Genus CODRUS

Figures 18 (side view); 43 (front wing)

Codrus Panzer, 1805. Faunae insectorum Germaniae . . . heft 85, no. 9.
Type: *Codrus niger* Panzer. Designated by Morrice and Durant, 1915.

Front wing 3.0 to 5.8 mm. long. Lower part of frons with a median rounded swelling. Area between antennal sockets raised as a blunt ridge. Mandible with a single tooth. Side of pronotum smooth, covered with hairs or with a median hairless area. Propodeum reticulately wrinkled, with a long median carina, its upper face usually with a smooth area on each side of median carina. Longer spur of hind tibia about 0.6 to 0.7 as long as hind basitarsus in male, about 0.5 as long in female. Tarsal claws simple. Costal side of radial cell 0.3 to 0.8 as long as depth of stigma. First and second discoidal cells separated. Nervulus opposite basal vein or distad by as much as 0.45 its length. Stalk of abdomen 1.0 to 2.2 as long as wide. Lower half of lateral aspect of syntergite covered with moderately dense hairs. Male clasper ending in a decurved, long needle-like point. Ovipositor sheath polished and punctate, about 0.30 as long as hind tibia, evenly decurved and tapered to a point.

Since 1950, the name *Codrus* has often been applied incorrectly to the genus *Exallonyx*, because of an error in the identification of *Codrus niger* (the genotype of *Codrus*). The present genus is the true *Codrus*.

This genus occurs in the Palearctic Region and the mountains of the Oriental and Australian regions. Seven species are known. Three of the species have been reared from Carabidae.

Key to the species of Codrus

1. Radius meeting costal vein at about 32°. Stigma medium brown to blackish brown. Genal carina meeting oral carina a little above its curve laterad to base of mandible. Hairs on eye short, a little shorter than diameter of last segment of maxillary palpus. 2
- Radius meeting costal vein at about 42°. Stigma dark brown. Genal carina meeting oral carina at the center of its curve laterad to base of mandible. Hairs on eye long or moderately long, a little longer or much longer than diameter of last segment of maxillary palpus. 5

2. Side of pronotum with a large median hairless area. Base of syntergite with a long median groove, sometimes also with short weak lateral grooves. Stigma blackish brown. New Guinea.
1. unistria, new species (p. 135)
- Side of pronotum covered uniformly with hairs. Base of syntergite with lateral grooves as well as a median groove. Stigma medium brown. 3
3. Metapleurum with a smooth hairless area on its upper front 0.2. Male flagellum with raised conspicuous tyloids on segments 2-4. Philippines. 2. philippinus, new species (p. 136)
- Metapleurum without a smooth hairless area. Male flagellum without tyloids in C. picicornis, the male of C. striatus unknown. 4
4. Scrobe of pronotum smooth. Stalk of abdomen about 1.4 as long as deep. Europe. 3. picicornis Foerster (p. 137)
- Scrobe of pronotum with transverse striae. Stalk of abdomen 2.2 as long as deep. Nepal. . 4. striatus, new species (p. 138)
5. Hairs on eye about 2.5 as long as width of last segment of maxillary palpus. Stalk of abdomen about 1.35 as long as deep in male, about about 2.1 as long as deep in female, in female its upper side mat on basal 0.7±, the rest polished. Japan.
5. ciliatus, new species (p. 139)
- Hairs on eye about 1.2 as long as width of last segment of maxillary palpus. Stalk of abdomen 1.0 to 2.0 as long as deep, in female its upper side punctate and/or wrinkled throughout. .6
6. Stalk of abdomen about 1.45 as long as deep in male, about 1.9 as long as deep in female. Scape black or dark brown in both sexes. Hind tibia dark brown. Japan.
6. nebrae Watanabe (p. 139)
- Stalk of abdomen about 1.1 as long as deep. Scape medium brown to yellowish brown in male, yellow in female. Hind tibia yellow. Palearctic Region. 7. niger Panzer (p. 140)

1. Codrus unistria, new species

Figure 107 (♂ propodeum and base of abdomen)

Male: Front wing 3.4 to 3.7 mm. long. Hairs on eye very sparse, 0.4 as long as width of last segment of maxillary palpus. Genal carina meeting oral carina at its angulation toward base of mandible. Tyloids small and indistinct or apparently absent. Scrobe of pronotum smooth. Side of pronotum with a large median hairless area (uniformly hairy in other species of the genus). Radius meeting costa at 30°. Metapleurum with reticulate wrinkling posteriorly, the wrinkling weaker anteriorly and the metapleurum smooth on its front 0.5 to 0.7. Metapleurum with a hairless area in its upper front corner. Stalk of abdomen 2.5 as long

as its median depth, its upper side with 6-8 strong longitudinal wrinkles. Base of syntergite with a long median groove, to each side of median groove with or without very short weak lateral grooves (in other species of the genus always with short but distinct lateral grooves).

Black. Mandible, scape, pedicel, and tegula brown. Palpi, front coxa, and trochanters stramineous. Front and middle legs beyond trochanters light brown to medium brown, their femora stramineous at base and apex. Hind leg beyond trochanter dark brown, the base of its femur stramineous. Wings faintly infuscate, the stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, Mt. Kainde, 2,300 m., New Guinea, Dec. 19, 1978 to Jan. 18, 1979, J. Sedlacek (Townes).

Paratypes: 3♂, same locality and collector as type, dated Dec. 19, 1978 to Jan. 18, 1979, and Jan. 18 to Feb. 14, 1979 (Townes).

2. Codrus philippinus, new species

Figures 108 and 109 (♂, ♀ propodeum and base of abdomen)

Front wing 3.2 to 3.7 mm. long. Hairs on eye 0.4 as long as width of last segment of maxillary palpus. Genal carina meeting oral carina just above its curve laterad to base of mandible. Male flagellum with tyloids on segments 2-4, the tyloids in the form of a long narrow ridge that is shiny and about 0.5 as long as the segments. Scrobe of pronotum smooth. Radius meeting costa at 30°. Metapleurum punctato-rugulose, its upper front 0.3± smooth and partly hairless. Stalk of abdomen about 1.7 as long as its median depth, its upper side with 5 strong longitudinal wrinkles in male and 7 strong longitudinal wrinkles in female. Ovipositor sheath striate and punctate (punctate in other species of the genus).

Black. Scape and pedicel of male yellow with some brown areas, of female medium brown. Labrum, mandible, and tegula fulvous. Palpi, coxae, and trochanters stramineous. Front and middle legs beyond trochanters pale fulvous. Hind femur pale fulvous, its apical 0.3± brownish above. Hind tibia and tarsus brown. Wings subhyaline. Stigma and strong veins medium brown. Weak veins light brown. Male clasper brownish fulvous.

Type: ♀, Los Baños, Laguna, Philippines, Jan. 10, 1954, H. and M. Townes (Townes). Figure 109 is from the type.

Paratypes: ♂, Benaue, Mountain Province, Philippines, Jan. 1, 1954, H., M., and D. Townes (Townes). 2♂, Quercus forest at 7,800 ft., Mt. Data, Philippines, Dec. 31, 1952, H., M., and D. Townes (Townes). ♂, ♀, Mt. Data, 7,800 ft., Philippines, Jan. 1, 1953, Townes family (Townes). ♂, Mt. Santo Tomás (near Baguio), 7,200 ft., Philippines, Nov. 29, 1953, H., M., and D. Townes (Townes). 2♂, Mt. Canlaon, 6,500 ft. and 7,000 ft., Negros Oriental, Philippines, H., M., and D. Townes (Townes). 6♂, Ilong, 4,500 ft., on Mt. Halcon, Mindoro, Philippines, May 7, 9, and 11, 1954, M. and D. Townes (Townes).

This species is known only from the mountains of the Philippines.

3. Codrus picicornis Foerster

Figures 110 and 111 (♂, ♀ propodeum and base of abdomen)

- **Disogmus picicornis* Foerster, 1856. Hymenopterologische Studien 2: 100. ♂. des. in key. Type: ♂, Germany? (Vienna). Examined in 1975.
- Disogmus Picicornis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 285. key.
- Disogmus picicornis* Kieffer, 1914. Das Tierreich 42: 20. ♂, key, des. Probably Germany.
- **Phaenoserphus subcompressus* Hedicke, 1927. Deut. Ent. Ztschr. 1927: 32. ♂, ♀. des. Types: ♂, ♀, East Germany: Bellinchen Nature Preserve (Oder), (destroyed, according to Pschorn-Walcher, 1958). Examination of paratype reported by Nixon, 1938. New synonym.
- **Phaenoserphus vexator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 456. ♂, ♀. key, des. Type: ♀, England: Weybridge in Surrey (London). Examined in 1975. Ireland: 5 localities. "possibly a synonym of *P. subcompressus* Hedicke".
- Phaenoserphus vexator* Murray, 1939. Ent. Monthly Mag. 75: 163. ♂. Scotland: Quentin's Hill.
- **Phaenoserphus subclavatus* Hellén, 1941. Notulae Ent. 21: 34. ♂. key, des. Type: ♂, Finland: Kexholm (Hellén). Pschorn-Walcher states in a letter that his synonymy of *subclavatus* with *vexator* was based on a study of the type.
- Phaenoserphus subcompressus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. "Type lost according to Peus *in litt*".
- Phaenoserphus (Phaenoserphus) vexator* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North, west, & central Europe.
- Phaenoserphus vexator* Davies, 1959. Ent. Monthly Mag. 95: 27. Hosts: *Notiophilus biguttatus*; *N. rufipes*.
- Phaenoserphus (Phaenoserphus) vexator* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 32, 33. ♂, ♀. ecology. West Germany: 4 localities.
- Phaenoserphus vexator* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 6. Europe. Japan.
- Phaenoserphus vexator* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 8. ♀. type data.
- Phaenoserphus vexator* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. Austria. Czechoslovakia: Moravia. Switzerland. USSR. West Germany: 2 localities.
- Phaenoserphus vexator* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 536. Ireland: 3 counties.
- Phaenoserphus pallipes* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 43. syn. (in part). Misdet. of *pallipes* Jurine.
- Phaenoserphus (Phaenoserphus) vexator* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 44, 46. ♂, ♀. key, syn., biol. Austria. Czechoslovakia. Germany. Great Britain. Japan. Scandinavia. Switzerland. USSR. Host: *Notiophilus biguttatus*.
- Phaenoserphus vexator* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 119. ♂, ♀. Austrian-German boundary. Germany. Switzerland.
- Phaenoserphus (Phaenoserphus) vexator* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 547. ♂, ♀. key. North-western Europe. USSR: Yarslovskaya oblast.

Front wing 3.0 to 3.4 mm. long. Hairs on eye about 0.7 as long as width of last segment of flagellum. Genal carina joining oral carina just above its curve laterad to base of mandible. Male flagellum with tyloids on segments 4-6, the tyloids in the form of a thin faint ridge that is about 0.7 as long as the segment. Scrobe of pronotum smooth or with faint transverse wrinkling. Radius meeting costa at about 32°.

Metapleurum sharply rugose with a smoother band along its upper edge, without a small anterior smooth area below the smooth band. Stalk of abdomen about 1.4 as long as deep, its upper side with 6 longitudinal wrinkles and often some interspersed fine sculpture.

Black. Labrum and mandible light brown. Palpi stramineous. Antenna of male with scape and base of first flagellar segment brown, the pedicel yellow, and the rest of antenna dark brown or black. Antenna of female with scape light brown, pedicel yellow, and flagellum shading from light brown or yellowish brown at base to brown or dark brown at apex. Tegula and trochanters pale fulvous. Front and middle coxae light brown, paler toward apex. Hind coxa dark brown, paler toward apex. Front and middle legs beyond trochanters yellowish or light fulvous. Hind femur light brown, its basal $0.25\pm$ and apical $0.12\pm$ pale. Hind tibia and tarsus yellow to pale brown. Wings subhyaline. Stigma and strong veins medium brown. Weak veins pale brown. Male clasper medium brown.

Specimens (all European): 25♂, 13♀ from Austria (near Linz, Dürrwien, Marchtrenk, and Sarleinsbach); Czechoslovakia (Kytín and Starkoc in Bohemia); Denmark (Copenhagen); England (Bagley Woods near Oxford, Dorking in Surrey, and Leicester); Ireland (Digby Brook in Co. Kildare, Lake Dan in Co. Wicklow, and Slade Brook in Co. Dublin); Italy (Naturally in Trentino); Russia (Moscow); Sweden (Ljungby, Messaure, Skåne, and Uppsala University); and West Germany (Schliersee in Bayern at 700 to 1,100 m. and Siebengebirge). Dates of collection are from June 14 to September 27.

This species is widespread in Europe. It has been collected from mid June to late September. Davies, 1959, recorded it as a solitary parasite of *Notiophilus biguttatus* and *N. rufipes* (Carabidae).

4. Codrus striatus, new species

Figure 112 (♀ propodeum and base of abdomen)

Male: Unknown.

Female type: Front wing 3.2 mm. long. Hairs on eye about 0.6 as long as width of last segment of maxillary palpus. Genal carina joining oral carina just above its curve laterad to base of mandible. Scrobe of pronotum crossed by distinct striae, the direction of striae convergent toward hind corner of pronotum. Radius joining costa at 30°. Metapleurum punctulato-rugulose, with a smoother band along its upper edge and a small smoother area below front end of the smoother band. Stalk of abdomen 2.2 as long as its median depth, its upper face with mixed longitudinal grooves and longitudinal rows of punctures that become obsolescent near apical 0.25.

Black. Labrum, mandible, and scape brown. Palpi stramineous. Pedicel yellow. Flagellum blackish. Tegula fulvous. Front and middle coxae brown, paler apically. Hind coxa blackish, its apex light brown. Trochanters stramineous. Front and middle femora, tibiae, and tarsi light brown, the base and apex of the femora paler. Hind leg beyond trochanters dark brown, the basal 0.2 of hind femur stramineous.

Wings subhyaline. Stigma and strong veins light brown. Weak veins tinged with pale brown.

Type: ♀, Nepal at 28° 00' N, 85° 00' E., 500 ft., May 30, 1967 (Ottawa).

5. *Codrus ciliatus*, new species

Figures 113 and 114 (♂, ♀ propodeum and base of abdomen)

Front wing 4.5 to 5.8 mm. long. Hairs on eye about 2.5 as long as width of last segment of maxillary palpus. Genal carina joining oral carina at the middle of its curve laterad to the base of mandible. Male flagellum with tyloids on segments 2-10, the tyloids in the form of a thin faint ridge that is about 0.8 as long as the segment, not always easily discernible. Scrobe of pronotum smooth. Radius meeting costa at about 42°. Metapleurum rugose, its upper front 0.25± and a band along upper edge almost smooth. Stalk of abdomen of male about 1.35 as long as its median depth, its upper face with about 8 very strong longitudinal wrinkles. Stalk of abdomen of female about 2.1 as long as its median depth, its upper face a little wrinkled near base, mat on basal 0.7±, the apical 0.3± polished or subpolished.

Black. Mandible and labrum brown. Antenna of male with scape and pedicel light brown, the flagellum black or blackish brown. Antenna of female with scape and pedicel brownish yellow, the flagellum dark brown, lighter brown basally and base of its first segment brownish yellow. Palpi and trochanters stramineous. Tegula fulvous. Front and middle coxae basally pale brown to dark brown, apically paler (usually stramineous brown). Front and middle legs beyond trochanters stramineous or pale fulvous. Hind femur pale fulvous to fuscous, its basal 0.3 and apical 0.1 stramineous. Hind tibia and tarsus dark brown to blackish. Wings weakly infuscate. Stigma and strong veins dark brown. Weak veins medium brown. Male clasper dark brown. In females the legs may be entirely brown and fuscous.

Type: ♀, Sapporo, Japan, July 6, 1954, Townes family (Townes).

Paratypes: 11♂, 2♀, Sapporo, Japan, July 6 and 12, 1954, Townes family and David Townes (Townes and Ottawa). 13♂, 7♀, Kamikochi, Japan, July 22, 23, 24, 25, and 31, 1954, Townes family (Townes). 2♂, Mt. Norikura, 2,200 m., Japan, July 29, 1954, Townes family (Townes).

This species is known only from Japan.

6. *Codrus nebriae* Watanabe

Figures 115 and 116 (♂, ♀ propodeum and base of abdomen)

Phaenoserphus sp. Kurosa, 1952. Insect Ecology, Tokyo 4: 86. figs. 6 & 7.
**Phaenoserphus nebriae* Watanabe, 1954. Mushi 26: 8. ♂. des., biol. Type: ♂, Japan: Saeki on Kyushu (should be in Fukuoka, but not found there in 1975). Host: *Nebria lewisi*. Type examination reported by Pschorn-Walcher, 1964, who synonymized this with "*ballipes*", but description shows it to be a distinct species.

Phaenoserphus nebriae Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn.

Phaenoserphus pallipes Pschorn-Walcher, 1964. Insecta Matsumurana 27: 6. syn. Europe. Japan. Mongolia. Siberia. (in part). Misdet. of *pallipes* Jurine.

Phaenoserphus (Phaenoserphus) pallipes Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 26, 42, 43, 46. ♂, ♀. key, syn., des., figs., biol. From all of Europe except Mediterranean Region. Japan. (in part). Misdet. of *pallipes* Jurine.

Front wing 4.0 to 5.0 mm. long. Hairs on eye about 1.2 as long as width of last segment of maxillary palpus. Genal carina joining oral carina at the middle of its curve laterad to the base of mandible. Male flagellum with tyloids on segments 1-10, the tyloids in the form of a thin faint ridge that is about 0.7 as long as the segment, not always easily discernible. Scrobe of pronotum smooth. Radius meeting costa at about 42°. Metapleurum rugose, a band along its upper margin and a small area below front end of the band almost smooth. Stalk of abdomen of male about 1.45 as long as its median depth, its upper side with about 6 very strong longitudinal wrinkles. Stalk of abdomen of female about 1.9 as long as its median depth, its upper side with irregular, moderately fine longitudinal wrinkling on its basal 0.75±, the apical 0.25± almost smooth.

Black. Mandible and labrum dark brown. Palpi stramineous. Scape dark brown or black. Pedicel brown or dark brown. Flagellum black. Tegula fulvous. Front and middle coxae light brown to blackish brown, paler apically. Trochanters pale fulvous. Front and middle legs beyond trochanters fulvous or light brown, their femora often a somewhat darker brown. Hind coxa blackish brown basally, light brown apically. Hind femur pale brown to fuscous, its basal 0.25 pale brown and apex narrowly paler. Hind tibia and tarsus dark brown to blackish. Wings weakly infuscate. Stigma and strong veins dark brown. Weak veins pale brown. Male clasper dark brown.

Specimens: 3♂, 2♀, Kamikochi, Japan, July 24, 1954, Townes family (Townes). 6♂, Kinasa, 400 m. and 600-1,000 m., Nagano, Japan, May 5, 13, and 20, 1962, T. Hayasaka (Ottawa). 19♂, 8♀, Nagano, 400-1,000 m., Nagano, Japan, May 5, 8, and 13, 1962, T. Hayasaka (Ottawa). ♂, Toyooka, 900 m., Nagano, Japan, Apr. 30, 1961, T. Hayasaka (Ottawa).

This species is known only from Japan. Watanabe, 1954, recorded this as a solitary parasite of *Nebria lewisi* (Carabidae).

7. Codrus niger Panzer

Figures 117 and 118 (♂, ♀ propodeum and base of abdomen)

**Codrus niger* Panzer, 1805. Faunae insectorum Germaniae . . . 85: 9. ♂. des., fig.

Type: ♂, Germany (lost). Significant characters in the description and figure are: First segment of antenna yellow, nervulus opposite basal vein, and "anus bisetosus". The species usually identified as *niger* is *Exallonyx pallidistigma*.

Proctotrupes niger Klug, 1807. Mag. . . . Gesell. Naturf. Freunde Berlin 1: 73. syn.

Proctotruces (!) *nigra* Spinola, 1808. Insectorum Liguriae . . . 2: 168. syn.

Italy: Liguria.

- Oxyurus niger* Lamarck, 1817. Hist. nat. des animaux sans vertèbres 4: 130. des. Germany.
- Proctotrupes niger* Lepeletier, 1827. Encyclopédie méthodique . . . insectes 10: 209. ♂. des. France: near Paris.
- Proctotrupes niger* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain.
- Codrus pallipes* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 356. ♂, ♀. syn., des. France: Paris. Germany: Sickershausen [in Franconia]. Italy: Liguria. Switzerland. (in part).
- Codrus niger* Zetterstedt, 1838. Insecta Lapponica 1: 416. ♂, ♀. des. Lappland. (in part).
- Proctotrupes pallipes* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 11. ♂, ♀. des. Frequent & widely distributed in woods. Misdet. of *pallipes* Jurine.
- Proctotrupes pallipes* Blanchard, 1840. Histoire naturelle des insectes 3: 284. syn., des. Europe. (in part).
- Proctotrupes niger* Vollenhoven, 1876. Pinacographia, p. 31. Host: *Brevicornu griseicollis*.
- Proctotrupes pallipes* Bormans, 1885. Ann. Soc. Ent. de Belg. 29: CXLVIII. Belgium: Brussels. Misdet. of *pallipes* Jurine.
- Proctotrypes pallidipes* (!) Lameere, 1907. Manuel de la faune de Belgique 3. Insectes supérieurs . . . p. 250. key. Belgium. Hosts: larvae of fungus gnats. Misdet. of *pallipes* Jurine.
- Proctotrypes niger* Lameere, 1907. Manuel de la faune de Belgique 3. Insectes supérieurs . . . p. 250. key. Belgium. Hosts: larvae of fungus gnats.
- Serphus* (*Phaenoserphus*) *Pallipes* "Hal." Kieffer, 1908. In Andre: Species des hyménoptères d'Europe et d'Algérie . . . 10: 309. ♂, ♀. des. in key, fig. Austria: 2 localities. England. France: 7 localities. Germany. Hungary. Sweden: 1 locality. Switzerland: 1 locality.
- Phaenoserphus niger* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Proctotrypes pallidipes* (!) Morley, 1911. Proc. Roy. Irish Acad. 31: 18. ♀. Ireland: Clare Island. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Kieffer, 1914. Das Tierreich 42: 27. ♂, ♀. key, des., fig. Austria. England. France. Germany. Sweden. Misdet. of *pallipes* Jurine.
- Proctotrypes pallipes* (as *pallidipes* in key) Morley, 1922. Entomologist 55: 60, 135. key, syn., biol. England: 8 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Hellén, 1923. Notulae Ent. 3: 32. Finland. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. ♂, ♀. Belgium: 3 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 455, 456, 457. ♂, ♀. keys, des., figs. England: 4 localities. Ireland: 3 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: 3 localities in Dumfriesshire. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Hellén, 1941. Notulae Ent. 21: 34. ♂, ♀. key. Finland: 27 localities. USSR: Karelien [= Kola Peninsula]. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 5 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Tomšik, 1942. Ent. Listy 5: 73. ♂, ♀. des., figs. Czechoslovakia: localities in Bohemia & Moravia. Misdet. of *pallipes* Jurine.
- Phaenoserphus* (*Phaenoserphus*) *pallipes* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North, west, & central Europe. Misdet. of *pallipes* Jurine.
- Serphus* (*Phaenoserphus*) *pallipes* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. France: Bitche. Yugoslavia: Dolenji Logatec (= Loitsch) in W. Slovenia (= Krain). Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Meyer, 1961. Bombus 2: 94. West Germany: 7 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Boness, 1962. Bombus 2: 113. biol., ecology. West Germany: Schättbek near Kiel. Misdet. of *pallipes* Jurine.

- Phaenoserphus (Phaenoserphus) pallipes* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 32, 33. ♂, ♀. ecology. West Germany: 8 localities. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Meyer, 1963. Bombus 2: 143. ♂. [Denmark]: Sønderborg (=Sonderburg). Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 6. syn. Europe. Japan. Mongolia. [USSR]: Siberia. (in part). Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 535. Ireland: 14 counties. Misdet. of *pallipes* Jurine.
- Phaenoserphus (Phaenoserphus) pallipes* Pschorn-Walcher, 1971. Insecta Helvetica. 4. Hymenoptera, p. 26, 42, 43, 46. ♂, ♀. key, syn., des., figs., biol. From all of Europe (including Switzerland & USSR) except Mediterranean Region. Japan. (in part). Misdet. of *pallipes* Jurine.
- Phaenoserphus (Phaenoserphus) pallipes* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. fig. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Critchley, 1973. [Proc. Roy. Ent. Soc. London]. Jour. Ent. (A) 48: 38, 40-41. biol. England: Silwood Park in Berkshire. Hosts: *Agonum dorsale*; *Calathus fuscipes*; *Nebria brevicollis*; *Notiophilus* spp.; *Pterostichus vulgaris*. Misdet. of *pallipes* Jurine.
- Phaenoserphus pallipes* Luff, 1976. Ent. Monthly Mag. 111: 252-255. biol. Host: *Nebria brevicollis*. Misdet. of *pallipes* Jurine.
- Phaenoserphus (Phaenoserphus) pallipes* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 547. ♂, ♀. key, figs. USSR: Moskovskaya and Yaroslvsckaya oblasti. Misdet. of *pallipes* Jurine.

Front wing 3.6 to 4.5 mm. long. Hairs on eye about 1.2 as long as width of last segment of maxillary palpus. Genal carina meeting oral carina at center of its curve laterad toward base of mandible. Male flagellum with tyloids on flagellar segments 2-10, the tyloids in the form of a faint narrow ridge that is about 0.6 as long as the segment, not always easy to discern. Scrobe of pronotum smooth. Radius meeting costa at about 42°. Metapleurum rugulose, with a smoother band along its upper edge and a small smoother area at front end just below the smoother band. Stalk of abdomen of male about 1.1 as long as its median depth, its upper face with about 6 very strong longitudinal wrinkles. Stalk of abdomen of female about 1.1 as long as its median depth, its upper face with fine longitudinal wrinkling, rugosity, or these mixed with small punctures.

Black. Mandible and labrum brown. Antenna of male with scape and pedicel yellowish brown, the scape darker brown above near apex and flagellum blackish with base of first segment brown. Antenna of female with first 3 to 5 segments yellowish brown, the rest dark brown or blackish. Palpi and trochanters stramineous. Tegula fulvous. Legs except trochanters light yellowish fulvous, the hind coxa usually brown basally. Sometimes the legs are mostly light brown rather than yellowish fulvous and all coxae are brown with their apices paler. Wings weakly infusate or brownish. Stigma and strong veins dark brown. Weak veins light brown. Male clasper brown.

Specimens (all European): 98♂, 37♀ from Austria (Leonfelden, Linz, Marchtrenk, Sarleinsbach, and Traunau); Czechoslovakia (Kytin and Starkoc in Bohemia); Denmark (Copenhagen); East Germany (Eberswalde); England (Bagley Woods near Oxford, Leicester, and Oxford); France; Germany (Schliersee in Bavaria at 700 to 1,100 m); Ireland

(Ballinaclea, Connary in Co. Wicklow, Coombe Wood, Co. Kerry, Murlough Ho dunes in Co. Dublin, and Slade Brook in Co. Dublin); Italy (Naturno in Trentino at 500 to 1,000 m., Pizzighettone, and Unserfrau in Trentino at 1,500 m.); Japan (Kamikochi and Sapporo); Russia (Moscow); Sweden (Harparbol in Uppsala, Ljungby, Rjörkö in Uppsala, Skåne, and Vallentuna in Uppsala); and West Germany (Bonn and Siebengebirge). Collection dates are from mid May to late September, most of them in July, August, and the first half of September. One specimen was taken at Leicester, England in October.

This species is Palearctic, widely distributed from Europe to Japan. Critchley, 1973, recorded this as a solitary parasite of several carabid larvae. Luff, 1976 records it from *Nebria brevicollis* (Carabidae) and describes oviposition into *Nebria* larvae. Records by Snellen, 1876, and Lameere, 1907, from non-carabid hosts are considered erroneous.

2. Genus PHAENOSERPHUS

Figures 19 (side view); 44 (front wing)

Phaenoserphus Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 289, 298.

Type: (*Proctotrupes curtipennis* Haliday) = *viator* Haliday. Designated by Muesebeck and Walkley, 1951.

Carabiphagus Morley, 1929. Trans. Suffolk Nat. Soc. 1: 40.

Type: (*Proctotrupes laevifrons* Foerster) = *viator* Haliday. Monobasic.

Phaulloserphus Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63.

New synonym.

Type: *Phaenoserphus gregori* Tomšik. Original designation.

Front wing 2.1 to 5.7 mm. long. Frons without a distinct median swelling. Area between antennal sockets with a low weak ridge and usually a small median tubercle. Mandible with a single tooth. Side of pronotum smooth or sometimes its antero-ventral 0.4± partly rugosopunctate, covered with hairs or its median part hairless, or in the species *gregori* mostly hairless. Propodeum reticulately wrinkled, with a long median carina, the wrinkling on its dorsal face finer and weaker than elsewhere, sometimes obsolescent. Longer spur of hind tibia about 0.35 to 0.6 as long as hind tibia in male, about 0.3 to 0.45 as long in female. Tarsal claws simple. Costal side of radial cell about 0.4 as long as depth of stigma. First and second discoidal cells confluent. Nervulus distad of basal vein by 0.5 to 0.8 its length. Stalk of abdomen 0.45 to 1.55 as long as wide. Syntergite black except in *P. melliventris* and *P. partipes*. Lower half of lateral aspect of syntergite with moderately dense hairs. Male clasper narrowly triangular. Ovipositor sheath 0.25 to 0.68 as long as hind tibia, decurved at tip and tapered to a point, its surface punctate and usually with irregular longitudinal furrows.

Phaenoserphus is different from *Serphus* in only minor characters. It is doubtful that it should be maintained as a distinct genus.

This is a Holarctic genus. Seventeen species are known. Most of them are restricted to colder climates. One species, (*P. viator*) has

been reliably recorded as a parasite of Carabidae (*Carabus*, *Leistus*, *Nebria*, and *Pterostichus*). There are less reliable records of Staphylinidae and Elateridae as hosts, plus a certainly incorrect record of parasitism on Fungivoridae.

Key to the species of Phaenoserphus

(Abandon hope, all ye who enter here.)

1. Side of pronotum smooth and with very fine punctures, or less than half of it with small close punctures in front of scrobe. . . 2
Side of pronotum completely ruguloso-punctate in front of scrobe. 17
2. Genal carina incomplete below, not reaching oral carina. Temple almost flat. Costal side of radial cell unusually long, 0.6 as long as depth of stigma. U. S. A. (Colorado).
16. disjunctus, new species (p. 167)
Genal carina complete, reaching oral carina (but sometimes weak and irregular near oral carina). Temple moderately to strongly convex. 3
3. Genal carina curved evenly toward oral carina, without a distinct angulation or bend, meeting oral carina at less than 80°. . . . 4
Genal carina angled or abruptly curved mesad toward oral carina, meeting oral carina at 80° to 90°. 11
4. Side of pronotum with a hairless area occupying 0.3 to 0.7 of its surface, or almost entirely hairless. Stalk of abdomen 0.4 to 0.8 as long as wide. 5
Side of pronotum without a hairless spot or with a small hairless area that is not larger than the tegula. Stalk of abdomen 1.0 to 1.6 as long as wide. 7
5. Side of pronotum hairless except for a narrow band along upper edge. Clypeus about 4.0 as wide as long. Thorax elongate. Europe. 1. gregori Tomšik (p. 146)
Side of pronotum with hairs around the edges and the median part bare. Clypeus about 2.5 as wide as long. Thorax of normal proportions. 6
6. Hind femur of female 3.8 as long as deep, of male 4.8 as long as deep. Female wings vestigial. Northern part of Nearctic Region.
2. genualis, new species (p. 147)
Hind femur of female 5.6 as long as deep (male unknown). Female wings fully developed. Yukon Territory.
3. leptopygus, new species (p. 149)

7. Upper face of propodeum usually with longitudinal or oblique fine wrinkling (the wrinkles varying from faint to conspicuous), its other sculpture consisting of faint to moderately strong, very fine rugulation. Temple 1.0 as long as eye in male, 1.4 as long as eye in female. Mesopleurum below tegula with fine, weak, oblique wrinkles. Female wings vestigial. Tundra of Nearctic Region. 4. nigripes Ashmead (p. 149)
- Upper face of propodeum rugose or wrinkled, the wrinkling irregular or transverse instead of longitudinal or oblique. Temple 0.6 to 1.0 as long as eye, in both sexes. Mesopleurum below tegula smooth or with fine wrinkling. Female wings fully developed. 8
8. Hairs on upper face of propodeum not unusually dense or short, the hair sockets separated by 0.5 the length of the hairs. Northern part of Holarctic Region. 5. borealis Hellén (p. 150)
- Hairs on upper face of propodeum unusually dense and short, the hair sockets separated by 0.3 the length of the hairs. 9
9. First pair of thyridia separated on midline by 1.3 the width of a thyridium. Penultimate segment of female flagellum about 2.9 as long as wide. Bristles on female subgenital plate unusually dense. British Columbia to Colorado. 6. trieces, new species (p. 152)
- First pair of thyridia separated on midline by 0.2 to 0.8 the width of a thyridium. Penultimate segment of female flagellum 2.0 to 2.7 as long as wide. Bristles on female subgenital plate sparse. 10
10. Ovipositor sheath 0.50 as long as hind tibia. Syntergite not unusually inflated, the grooves at its base 0.6 as long as width of stalk of abdomen. Nearctic Region, in Hudsonian Zone. 7. granulatus, new species (p. 152)
- Ovipositor sheath 0.25 as long as hind tibia. Syntergite somewhat inflated, the grooves at its base 0.4 as long as width of stalk of abdomen. Palearctic Region. 8. fuscipes Haliday (p. 153)
11. Syntergite entirely ferruginous, or ferruginous with some infuscation. Eastern Nearctic Region. 9. melliventris Ashmead (p. 155)
- Syntergite entirely or mostly black or blackish brown. 12
12. Lateral aspect of pronotum with a large median hairless area that covers 0.2 to 0.6 of its surface. 13
- Lateral aspect of pronotum entirely hairy or with a small median hairless area that covers less than 0.2 of its surface and is up to 1.5 as large as tegula. 15

13. Male with tyloids present on most flagellar segments, in the form of a thin weak ridge. Female with a ventro-lateral ridge on apical 0.7± of ovipositor sheath. Northern Nearctic Region.
 10. lineatus, new species (p. 156)
 Male without distinct tyloids. Female without a ventro-lateral ridge on ovipositor sheath. 14
14. Stalk of abdomen 1.0 as long as wide. Thyridia unusually wide, separated from each other by 0.3 the width of a thyridium. Northern Nearctic Region. 11. glabratus, new species (p. 157)
 Stalk of abdomen 1.5 as long as wide. Thyridia moderately wide, separated from each other by 0.9 the width of a thyridium. Europe. 12. chittii Morley (p. 158)
15. Thyridia very small, separated from each other by 3.0 the width of a thyridium. Second flagellar segment of male 3.0 as long as deep. Scape of male black, fulvous below. Washington State in USA. 13. longipes Brues (p. 159)
 Thyridia moderately large, separated from each other by 1.0 the width of a thyridium. Second flagellar segment of male 2.0 to 3.4 as long as deep. Scape of male entirely black or mostly yellow. 16
16. Flagellum of male dark brown or black. Side of pronotum usually with a hairless area that is 0.5 to 1.5 as large as tegula. Reticulation on upper face of propodeum a little coarser than in *P. pallipes*. Ovipositor sheath a little thicker than in *P. pallipes*. Holarctic Region. 14. viator Haliday (p. 160)
 Flagellum of male yellow with the apical 0.4 of last segment infuscate. Side of pronotum without a hairless area or with a hairless area up to 0.5 as large as tegula. Reticulation on upper face of propodeum a little finer than in *P. viator*. Ovipositor sheath a little more slender than in *P. viator*. Southern Europe. 15. pallipes Jurine (p. 165)
17. Syntergite entirely black. Mongolia. 17. punctatus Kozlov (p. 167)
 Syntergite ferruginous, infuscate at base and apex. India. 18. partipes Dodd (p. 168)

1. Phaenoserphus gregori Tomšík

Figures 119 (♀ propodeum and base of abdomen); 442 (ovipositor sheath)

**Phaenoserphus gregori* Tomšík, 1942. Ent. Listy 5: 74. ♀. des., fig. Type: ♀, Czechoslovakia: Čejč (Tomšík). Pschorn-Walcher informs us that he has seen the type.

Phaenoserphus (Phaulloserphus) gregori Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. Central Europe.

- **Phaenoserphus gregori* var. *ultonica* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 537. ♀. des., biol. Lectotype: ♀ (labeled by Townes, 1975 and hereby designated), Ireland: "The New Lough", Tramore, Horn Head in West Donegal (Washington). Examined in 1975. New synonym.
- Phaenoserphus (Phaulloserphus) gregori* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 42, 45. ♀. des., fig. Czechoslovakia.
- Phaenoserphus (Phaulloserphus) gregori* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. fig.
- Phaenoserphus (Phaenoserphus) gregori* Kozlov, 1978. Opredelitel' nasekomykh evropeishoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 547. ♀. key, figs. Czechoslovakia.

Male: Unknown.

Female: Front wing 2.1 to 2.3 mm. long. Front wing 0.28 as wide as long (unusually narrow), its apex evenly rounded. Stigma and radial cell small. Thorax exceptionally elongate and narrow. Clypeus unusually wide. Cheek only 1.0 as long as width of mandible at base. Temple 1.15 as long as eye. Genal carina almost straight, meeting oral carina at about 45°. Flagellum 1.5 as wide near apex as near base, its penultimate segment 1.5 as long as wide. Side of pronotum smooth, hairless except for a narrow band along upper edge. Mesopleurum below tegula almost smooth. Upper face of propodeum finely rugulose marginally and at median carina, the rest of the area polished and with fine indistinct wrinkling. Median carina of propodeum weak. Stalk of abdomen 1.0 as long as wide, its surface finely rugulose. Grooves on base of syntergite reaching 0.3 the distance to thyridia. Thyridia each 1.45 as wide as long, separated from each other by 1.2 the width of a thyridium. Ovipositor sheath as in figure 442, 0.40 as long as hind tibia.

Black. Mouth parts brown. Tegula and legs blackish brown. Wings with a fuscous tinge. Stigma and strong veins brown. Weak veins pale brown.

Specimens: 3♀ (lectotype and paratypes of the variety *ultonica*), Tramore, Horne Head, County Waterford, Ireland, June 6, 1955, A. W. Stelfox (Washington). According to Stelfox, these specimens were swept either from dunes or from marshy ground.

This species is known only from Czechoslovakia and Ireland.

2. Phaenoserphus genualis, new species

Figures: 120 (♂ propodeum and base of abdomen); 443 (ovipositor sheath)

Male: Front wing 3.4 to 4.1 mm. long. Thorax narrower than usual. Temple 0.90 as long as eye. Genal carina curving mesad to meet oral carina at 60°, with a short sinuation just before meeting oral carina. Second segment of flagellum 3.0 as long as wide. Tyloids usually visible on flagellar segments 3-5, in the form of a thin low ridge that is 0.5 as long as the segments. Pronotum smooth between collar and scrobe. Median 0.5 to 0.8 of side view of pronotum hairless. Mesopleurum below tegula with 2-5 fine weakly diverging wrinkles that are approximately horizontal. Metapleurum reticulately wrinkled, with an upper front area that is almost smooth. Propodeum long, its upper face weakly reticulate. Hind femur 4.8 as long as deep. Stalk of abdomen 0.70 as

long as wide. Abdomen somewhat compressed. First thyridium 3.0 as wide as long, the thyridia separated on midline by about 0.37 their width. Wrinkles at base of syntergite reaching about 0.6 the distance to thyridia.

Black. Mandible and palpi brown. Coxae and femora brown to blackish, the apical 0.2± of femora fulvous brown. Tibiae light brown. Tarsi dark brown. Wings subhyaline. Stigma and strong veins blackish brown. Weak veins light brown.

Female specimen from Lac Chicobi, Que.: Front wing 2.8 mm. long. Head and body compressed, the thorax 1.35 as high as wide. Temple 1.0 as long as eye (the eye small). Frons protruding. Genal carina with a weakly concave curve, meeting oral carina at about 30°. Flagellum very short, the penultimate segment 1.6 as long as wide. Pronotum smooth between collar and scrobe. Median 0.7 of side view of pronotum hairless. Mesopleurum below tegula with three horizontal wrinkles. Metapleurum with small close punctures, near hind end and lower edge punctato-rugulose. Stalk of abdomen only 0.45 as long as wide. Hind femur 3.2 as long as deep, compressed. Ovipositor sheath 0.68 as long as hind tibia, as in figure 443.

Black. Scape, mouth parts, tegula, and coxae dark brown. Legs beyond coxae fulvous brown. Wings subhyaline. Stigma and strong veins blackish brown. Weak veins tinged with brown.

Female specimen from Glenn Highway, Alaska: Brachypterous, the front wing reaching to end of scutellum. Body somewhat more strongly compressed than in female from Chicobi, Que. and the antenna and legs a little shorter. Top of propodeum smooth, without sculpture.

Black. Antenna, mouth parts, and tegula brown. Coxae dark brown. Trochanters and femora brown, the femora paler apically. Tibiae and tarsi fulvous brown. Ovipositor sheath blackish.

This female may belong to a closely related species rather than being conspecific with the female from Lac Chicobi, Que., and association of both of these females with the males is on inconclusive evidence.

Type: ♂, Stone Mt. Park, 3,800±ft., B. C., Aug. 24, 1973, H. and M. Townes (Townes).

Paratype males: 106♂ from Alaska (Anchorage, Big Delta, Curry, Fairbanks, Matanuska, mile 315 on the Richardson Highway, Seward, Shaw Creek at mile 289 on the Richardson Highway, and Tsaina River); Alberta (Frank, Jumping Pound Creek 20 miles west of Calgary, and McMurray); British Columbia (Alaska Highway at mile 343 at 2,700 ft., Liard Hot Spring at mile 496 on the Alaska Highway at 1,500 ft., Racing River at 2,400 ft., and Toad River Lodge at mile 422 on the Alaska Highway at 4,500 ft.); Northwest Territories (Fort Simpson); and Yukon Territory (Dawson, 13 and 14 miles east of Dawson, and North Fork Crossing at 3,500 ft.). Collection dates are distributed from June 7 to August 24.

Paratype females: ♀, Glenn Highway at mile 24-26, Alaska, July 27, 1956, K. Sommerman (Washington). ♀, Lac Chicobi, Que., Aug. 17, 1971, A. Sauvé (Ottawa).

Paratypes are in the collections of Townes, Ottawa, and Washington.

This is a species of the Hudsonian Zone of northwestern North America. There is also a record from Quebec.

3. Phaenoserphus leptopygus, new species

Figure 444 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.9 mm. long. Body compressed, the thorax elongate. Temple 1.0 as long as eye. Genal carina curving mesad to meet oral carina at 60°, with a short sinuation just before meeting oral carina. Penultimate segment of flagellum 2.3 as long as wide. Pronotum smooth between collar and scrobe. Median 0.4 of side aspect of pronotum hairless. Mesopleurum below tegula with four horizontal wrinkles. Metapleurum with close reticulate wrinkling. Propodeum long and high, its upper face dimpled in the smoother areas, closely reticulately wrinkled on sides and behind. Hind femur 5.6 as long as deep. Stalk of abdomen 1.12 as long as wide, its upper side rugulose. Abdomen compressed. First thyridium 2.0 as wide as long, the first thyridia separated on midline by 1.1 the width of a thyridium. Ovipositor sheath as in figure 444, 0.57 as long as hind tibia. The figure of the ovipositor sheath shows surface droplets that are not to be interpreted as structural.

Black. Mouth parts, tegula, and legs brown, the legs darker brown basally and apex of femora light brown. Wings subhyaline. Stigma and strong veins brown. Weak veins with a faint tinge of brown. Ovipositor sheath black.

Type: ♀, North Fork Pass, Ogilvie Mts., Yukon Territory, Canada, July 7, 1962, P. J. Skitsko (Ottawa).

4. Phaenoserphus nigripes Ashmead

Figures 121 (♂ propodeum and base of abdomen); 445 (ovipositor sheath)

**Proctotrypes nigripes* Ashmead, 1902. Proc. Wash. Acad. Sci. 4: 136. ♂. des.

Type: ♂, USA: St. Paul Is. in Pribilof Islands of Alaska (Washington). Examined in 1975.

Phaenoserphus nigripes Kieffer, 1909. Genera Insectorum 95: 6. syn.

Phaenoserphus nigripes Kieffer, 1914. Das Tierreich 42: 34. ♂. key, des. USA: St. Paul Is. in Alaska.

Phaenoserphus nigripes Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. USA: Alaska; Oregon.

Phaenoserphus nigripes Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♂. type data.

Male: Front wing 3.6 to 4.5 mm. long. Body and legs slender. Genal carina evenly curved mesad, meeting oral carina at 70°, far above base of mandible. Temple 1.0 as long as eye. Second flagellar segment 3.6 as long as wide. Tyloids usually visible on flagellar segments 2-4, in the form of a faint thin ridge that is about 0.3 as long as the segments. Side of pronotum smooth between collar and sulcus, the side covered with hair except for a very small area that is sparsely hairy or bare, the bare area usually 0.3 as large as tegula. Mesopleurum below tegula with very fine weak wrinkling that usually curves

downward along front edge of mesopleurum. Propodeum long, weakly compressed, its upper face almost smooth except for fine wrinkles that are usually oblique but sometimes nearly longitudinal, the wrinkles often very weak. Hind femur about 0.72 as long as deep. Stalk of abdomen 1.1 as long as wide. Grooves at base of syntergite reaching 0.4 to 0.7 the distance to first thyridia. First thyridia each 4.0 as wide as long, separated on midline by about 0.55 the width of a thyridium.

Black. Mouth parts and tegula light brown. Coxae dark brown to blackish. Legs beyond coxae fulvous to brown or fuscous, when dark colored the apex of trochanters, apex of femora and base and apex of tibiae paler. Wings hyaline. Stigma and strong veins blackish brown. Weak veins hardly at all pigmented.

Female: Brachypterous, the front wing reaching almost to propodeal spiracle. Body somewhat compressed. Genal carina as in male. Temple about 1.1 as long as eye. Penultimate segment of flagellum 1.75 as long as wide. Side of pronotum smooth, covered with hairs. Mesopleurum below tegula with a few fine weak wrinkles. Metapleurum finely rugulose. Hind femur 3.9 as long as deep. Propodeum high, its profile strongly downcurved near apex, its upper face with fine close longitudinal or weakly oblique wrinkles. Ovipositor sheath as in figure 445, about 0.63 as long as hind tibia.

Black. Mouth parts and antenna brown or brownish fulvous. Tegula and legs fulvous, the tarsi brown apically. Ovipositor sheath blackish, its apex light brown.

Specimens: 175♂, 4♀ from Alaska (Anchorage, Athel Creek 18 miles northeast of "Indnai R. Im.", Cape Thompson, Fairbanks, Healy, Lower Tonsina, Mt. Fairplay at mile 32 on the Taylor Highway at 3,600 ft., Mt. McKinley at 2,500 ft. and 3,500 ft., Naknek, Nome, Paxson Lodge at 4,000 ft., St. Paul Island, Tangle Lakes, Umiat, and Unalakleet); Northwest Territories (Kidluit Bay on Richards Island, Herschel Island, and Masik River on Banks Island); and Yukon Territory (Firth River in the British Mts. and North Fork Crossing in the Ogilvie Mts.). Collection dates are mostly from July 5 to August 10. A few are as early as June 12 or as late as August 26.

This is a purely arctic species found so far only in North America. Very few females have been found, likely because they are brachypterous and stay at or below ground level.

5. Phaenoserphus borealis Hellén

Figures 122 and 123 (♂, ♀ propodeum and base of abdomen);
446 (ovipositor sheath)

**Phaenoserphus borealis* Hellén, 1941. Notulae Ent. 21: 35. ♂, ♀. key, des. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), Finland: Ivalo (Hellén).

Examined in 1975. Finland: Siikajoki; Paanajarvi.

Phaenoserphus (Phaenoserphus) borealis Fschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North Europe.

Phaenoserphus (Phaenoserphus) borealis Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 32, 33. ♂. ecology. West Germany: Plön.

Phaenoserphus borealis Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology, West Germany. Schleswig-Holstein; Cologne?

Phaenoserphus (Phaenoserphus) borealis Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 45. ♂, ♀. des.

Phaenoserphus borealis Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Perepomchatokrylye 2: 545, 547. ♀. key, fig. USSR: Archangelskaya oblast.

Front wing 2.9 to 4.2 mm. long. Body of moderate proportions. Temple about 0.66 as long as eye. Genal carina evenly curved mesad, meeting oral carina at 60°. Second flagellar segment of male 4.0 as long as wide. Penultimate segment of female flagellum 2.6 as long as wide. Tyloids usually present on flagellar segments 4-9, in the form of a weak narrow ridge that is 0.25 as long as a segment. Pronotum between collar and scrobe smooth or with fine weak surface irregularity. Side of pronotum covered with hairs. Mesopleurum below tegula usually with very low, mostly horizontal wrinkles; mesopleurum in front of speculum often with some very low oblique wrinkling. Upper face of propodeum weakly rugose, the rugosity with a weakly transverse bias. Hairs on upper face of propodeum of moderate length, their sockets separated by 0.5 the length of the hairs. Hind femur of male 5.6 as long as deep, of female 5.4 as long as deep. Stalk of abdomen 1.33 as long as wide. Grooves on base of syntergite reaching 0.35 the distance to first thyridia. First thyridia each 2.25 as wide as long, separated on midline by 0.85 the width of a thyridium. Ovipositor sheath as in figure 446, 0.48 as long as hind tibia.

Black. Scape and pedicel fulvous brown to blackish. Flagellum medium brown to blackish. Mouth parts, tegula, and legs pale fulvous to fulvous brown, the coxae usually brown. Wings faintly infuscate. Stigma and strong veins brown or dark brown. Weak veins tinged with brown. Ovipositor sheath dark brown to black.

European specimens: ♀, Auer (Ora), near Bozen, 250 m., Italy, July 10, 1958, David Townes (Townes). 2♂, Messaure, Sweden, July 28, 1972, Karl Müller (Townes).

Nearctic specimens: 124♂, 42♀ from Alaska (Cold Bay at 163° W., junction of Stirling Road with road to Kenai, King Salmon on the Naknek River, Matanuska, Richardson Highway at mile 236, Summit Lake at Isabel Pass, Tsaina River, Umiat, Umnak, and Unalaska); Alberta (Aspen Beach, Frank, McMurray, and Vermillion Lake near Banff at 4,500 ft.); British Columbia (Chetwynd, Deep River, Kitimat, Kleanza Creek 14 miles east of Terrace, Mission City, Robson, Spring Creek near Terrace, Summit Lake at 4,500 ft. at mile 392 on the Alaska Highway, Taylor, Terrace, 17 miles west of Terrace, 22 miles southwest of Terrace, and 33 miles west of Terrace); Colorado (Gould and Hayden); Idaho (Priest Lake); Newfoundland (Goose Bay); Quebec (Chimo, Great Whale River, Mt. Albert at 1,500 ft., and Mt. Jacques Cartier at 3,000 ft.); Utah (Fruitland); and Washington (Christina Falls on Mt. Rainier). Collection dates are from May 29 to August 29. Most of them are in July and August.

This is a Holarctic species. In Europe it has been reported from Finland (type locality) and West Germany. We list specimens from Sweden and northern Italy. In North America it is widespread and common in the Hudsonian Zone.

6. Phaenoserphus trieces, new species

Figures 124 (σ propodeum and base of abdomen); 447 (ovipositor sheath)

Front wing 3.5 to 5.7 mm. long. Body slender. Genal carina evenly, weakly curved or its lower end a little more incurved than the rest, joining oral carina at about 60° . Temple weakly convex, 0.70 as long as eye. Second flagellar segment of male 4.0 as long as wide. Penultimate segment of flagellum of female 2.9 as long as wide. Tyloids present on flagellar segments 2-4, in the form of a very weak narrow ridge that is 0.25 as long as the segment. Side of pronotum between collar and sulcus very faintly finely dimpled. Side of pronotum entirely covered with hairs. Mesopleurum below tegula with very fine, weak or faint, weakly oblique wrinkling. Propodeal reticulation unusually fine. Upper side of propodeum with moderately dense short hairs whose sockets are separated by about 0.3 the length of the hairs. Upper face of propodeum, between spiracle and apical slope, bounded on each side by a weak irregular ridge. Hind femur 7.4 as long as deep in male, 6.7 as long as deep in female. Stalk of abdomen 1.55 as long as wide in male, about 1.1 as long as wide in female. First thyridia each 2.7 as wide as long, separated on midline by 1.3 the width of a thyridium. Female subgenital plate with numerous bristles. Ovipositor sheath as in figure 447, 0.33 as long as hind tibia.

Black. Labrum and apical half of mandible brown. Palpi light brown. Pedicel and flagellum brown. Tegula and legs brownish fulvous, the coxae light brown to dark brown, hind tibia often brownish, and tarsi partly brown. Wings with a faint tinge of brown. Stigma and strong veins dark brown. Weak veins pale brown. Ovipositor sheath brown or blackish brown.

Type: ♀, Agassiz, B. C., Apr. 30, 1927, H. H. Ross (Ottawa). Figure 447 is from the type.

Paratypes: ♂, Chicago Creek, 8,800 ft., Clear Creek Co., Colo., Aug. 2, 1961, C. H. Mann (Ottawa). ♀, Moscow Mt., Ida., Aug. 28, 1916, A. L. Melander (Cambridge).

This species is known only from the Rocky Mountains.

7. Phaenoserphus granulatus, new species

Figures 125 (σ propodeum and base of abdomen);
448 (ovipositor sheath)

Front wing 2.5 to 3.4 mm. long. Body moderately slender. Temple about 0.90 as long as eye. Genal carina evenly curved mesad, meeting oral carina far above base of mandible at an angle of 70° . Second flagellar segment of male 3.2 as long as wide. Penultimate flagellar segment of female 2.05 as long as wide. Tyloids usually visible on flagellar segments 3-9, in the form of a faint narrow ridge that is 0.25 as long as a segment. Side of pronotum smooth, completely covered with hairs. Mesopleurum below tegula and in front of speculum smooth. Propodeum

moderately long, finely granular-reticulate, its upper face with dense short hairs, the hair sockets separated by 0.3 the length of the hairs. Hind femur 6.3 as long as deep in male, 5.6 as long as deep in female. Stalk of abdomen 1.35 as long as wide, its upper side with sharp longitudinal wrinkles. Grooves at base of syntergite reaching 0.4 the distance to first thyridia. First pair of thyridia each 2.7 as wide as long, separated on midline by 0.25 the width of a thyridium. Ovipositor sheath as in figure 448, 0.50 as long as hind tibia.

Black. Mouth parts and legs fulvous brown to medium brown, the coxae, tarsi, and hind tibia usually darker than the rest. Flagellum of male brown basally. Antenna of female brown or dark brown, darkening apically to black. Tegula fulvous. Wings faintly infusate. Stigma and strong veins brown or dark brown. Weak veins tinged with light brown. Ovipositor sheath blackish brown.

Type: ♂, Mt. McKinley, Alaska, Aug. 5, 1954, David Townes (Townes).

Paratypes: 59♂, 7♀ from Alaska (Cold Bay on the Alaska Peninsula, Fairbanks, King Salmon on the Naknek River, Kotzebue, Mt. McKinley at 2,500 ft., Tsaina River, and Umiat); Alberta (McMurray); British Columbia (Glacier Creek 10 miles west of Terrace, Spring Creek near Terrace, Summit Lake at 4,500 ft. at mile 392 on the Alaska Highway, and Terrace and vicinity); Colorado (Chicago Creek in Clear Creek County at 8,800 ft., Cottonwood Pass in Gunnison Co. at 11,000 ft., Hayden, and west slope of Loveland Pass at 9,850 ft.); New Mexico (Cimarron); Northwest Territories (Norman Wells); and Washington (Glacier). Collection dates are from June 11 to August 25. Paratypes are in the collections of Ottawa, Townes, Cambridge, and Washington.

This species occurs in the western half of North America, in the Hudsonian and Arctic Zones.

8. Phaenoserphus fuscipes Haliday

Figures 126 (♂ propodeum and base of abdomen); 449 (ovipositor sheath)

Proctotrupes fuscipes Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.

**Proctotrupes fuscipes* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 13. ♀. des., biol. Types: ♀, Ireland and Scotland: Edinburgh (Dublin). Types examined by Nixon and reported in 1938.

Proctotrupes fuscipes Curtis, 1839. British Entomology . . . XVI: text for fig. 744. key.

Proctotrupes fuscipes Dalla Torre, 1898. Catalogus humenopterorum . . . 5: 464. syn. *Serphus (Phaenoserphus) Fuscipes* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 307. ♀. Haliday des. repeated in key. Northern Ireland. Scotland.

Proctotrupes fuscipes Morley, 1911. Proc. Roy. Irish Acad. 31: 17. Ireland: Carrowmore Hill; Clare Island.

Phaenoserphus fuscipes Kieffer, 1914. Das Tierreich 42: 27. ♀. key, des. Ireland. Scotland.

Proctotrupes fuscipes Morley, 1922. Entomologist 55: 3, 60, 134. ♂, ♀. key, biol. England: 17 localities. Ireland. Scotland.

- Phaenoserphus fuscipes* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 455, 457, 458. ♂, ♀, keys, des., figs. Ireland: 3 localities. Scotland: Edinburgh. Wales: Glamorgan [Co.].
- Phaenoserphus (Phaenoserphus) fuscipes* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 13: 63. North, west, central, & south Europe.
- Phaenoserphus fuscipes* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 443. Austria. Czechoslovakia: Bohemia. Italy: Calabria. Spain. Switzerland. USSR: Siberia. Yugoslavia.
- Phaenoserphus (l) fuscipes* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 536. ♂, ♀. Ireland: Dublin or Wicklow.
- Phaenoserphus (Phaenoserphus) fuscipes* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, pp. 42, 44. ♂, ♀, key, des., fig., biol. Austria. Czechoslovakia. Germany. Great Britain. Southern Italy. Spain. Switzerland. USSR.
- Phaenoserphus fuscipes* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 119. ♂, ♀. Austria. Germany. Switzerland.

Front wing 2.6 to 3.2 mm. long. Temple 0.95 as long as eye. Genal carina almost straight, joining oral carina far above base of mandible at 50°. Second flagellar segment of male 4.1 as long as wide. Penultimate flagellar segment of female 2.6 as long as wide. Tyloids on flagellar segments 3-6, faint, in the form of a narrow faint ridge that is 0.25 as long as a segment. Upper front swelling of side aspect of pronotum a little roughened, the rest smooth. Side aspect of pronotum without a hairless area. Mesopleurum below tegula smooth. Upper face of propodeum with granular dimpled surface, its hairs short and dense, the hair sockets separated by 0.3 the length of the hairs. Stalk of abdomen 1.1 as long as wide, with strong longitudinal ridges, the apical 0.4 of stalk with deep fossae between the ridges. Grooves on base of syntergite reaching 0.4 the distance to first thyridia. First thyridia each 3.8 as wide as long, separated on midline by 0.5 the width of a thyridium. Ovipositor sheath as in figure 449, 0.25 as long as hind tibia.

Black. Mouth parts, tegula, and legs brown, the coxae, tarsi, and hind tibia darker than the rest. Wings faintly infuscate. Stigma and strong veins blackish brown. Weak veins with a faint tinge of brown. Ovipositor sheath blackish.

Specimens: ♂, Lunz am See, Austria, Sept. 16-22, 1974, O. S. Flint, Jr. (Washington). ♀, stream above Kasten, Austria, Sept. 21 1974, O. S. Flint, Jr. (Washington). 3♂, Obergurgl, 1,950 m., Tirol Austria, Aug. 15 and 18, 1953, J. R. Vockeroth (Ottawa). ♀, Clara, Co. Wicklow, Ireland, Apr. 28, 1940, A. W. Stelfox (Washington). ♀, Glenasmole, Co. Dublin, Ireland, May 8, 1940, A. W. Stelfox (Washington). ♂, Lawers, Ireland, June 30, 1952, A. W. Stelfox (Washington). 4♂, 2♀, north slope of Veleta, 2,400 m., Sierra Nevada, Spain, July 22 and 25, 1960, J. R. Vockeroth (Ottawa). ♂, Åre, Sweden, July 16, 1929, J. M. Aldrich (Washington). ♂, Jamptland, Sweden (Stockholm). 5♂, 2♀, Messaure, Sweden, July 6, 11, and 28, 1971 and 1972, Sept. 15 and 22, 1972, and Oct. 7, 1972, Karl Müller (Townes). ♂, Schliersee at 700 to 1,100 m., Bavaria, West Germany, July 28, 1958, David Townes (Ottawa).

This species is widespread and moderately common in Europe.

9. Phaenoserphus melliventris Ashmead

Figures 127 (♂ propodeum and base of abdomen);
450 (ovipositor sheath)

- **Proctotrupes melliventris* Ashmead, 1887. Ent. Amer. 3: 99. ♂. des. Type: ♂, USA: [Jacksonville in] Florida (Washington). Examined in 1975.
Proctotrupes melliventris Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 337. ♂. key, des. USA: Jacksonville in Florida.
Serphus melliventris Kieffer, 1914. Das Tierreich 42: 14. ♂. key, des. USA: Florida.
Serphus melliventris Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. ♂. key, des. USA: New Haven in Connecticut.
Proctotrupes melliventris Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 7. ♂. type data.

Front wing 2.5 to 4.6 mm. long. Temple of male 0.95 as long as eye, of female 0.78 as long as eye. Genal carina sharply turned mesad to meet oral carina at almost 90° and close to base of mandible, at the turn usually with a short carina continuing toward base of mandible. Second flagellar segment of male 3.5 as long as wide. Penultimate flagellar segment of female 1.9 as long as wide. Tyloids usually absent, sometimes present as faint narrow ridges on the median flagellar segments. Side of pronotum smooth, with hairs on its entire surface or sometimes with a median hairless area that is 0.5 as large as the tegula. Mesopleurum below tegula smooth or with a single weak wrinkle. Upper face of propodeum with coarse reticulate wrinkling but near base almost smooth. Hind femur of male 6.0 as long as deep, of female 4.2 as long as deep. Stalk of abdomen 1.20 as long as wide, with two blunt median longitudinal ridges and an overlying coarse wrinkling. Grooves at base of syntergite reaching 0.4 the distance to thyridia. Thyridia each 2.4 as wide as long, separated from each other by 0.8 the width of a thyridium. Bristles on female subgenital plate moderately dense. Ovipositor sheath as in figure 450, 0.56 as long as hind tibia, with a broad smooth stripe along dorsal edge and with a latero-ventral carina along its apical 0.7±.

Black. Mouth parts fulvous to black. Scape of male black or sometimes more or less fulvous. Scape, pedicel, and basal 0.4± of flagellum of female fulvous, the flagellum darkened beyond the basal fulvous area to dark brown or black. Tegula and legs fulvous, the hind femur sometimes brownish fulvous. Wings tinged with brown. Stigma and strong veins dark brown. Weak veins tinged with brown. Abdomen beyond stalk fulvous, the syntergite usually blackish in the area of its basal grooves, synsternite usually with two wide fuscous bands, median part of syntergite sometimes brownish, and apical part of abdomen brownish. Ovipositor sheath fulvo-ferruginous.

Specimens: ♀, Tama, Iowa, June 13, 1940 (Cambridge). ♀, Lawrence, Kans., May 24, 1941, H. K. Townes (Townes). ♂, Mayo, Md., Oct. 27, 1945, H. and M. Townes (Townes). ♀, Plummers Island, Md., June 21, 1960, K. V. Krombein (Washington). 5♂, 2♀, Ann Arbor, Mich., Oct. 2-3, 6-10, and 11-14, 1960, Oct. 14, 1974,

and Oct. 3-6, 1975, H. and M. Townes and M. G. Fitton (Townes). ♂, Bay Co., Mich., Aug. 11, 1951, R. R. Dreisbach (East Lansing). ♀, Emmet Co., Mich., July 31, 1959, George Steyskal (Townes). ♂, George Reserve, Livingston Co., Mich., June 24, 1956, H. Townes (Townes). ♂, ♀, Midland Co., Mich., June 23, 1952 and Aug. 11, 1941, R. R. Dreisbach (East Lansing). ♂, ♀, Saginaw Co., Mich., June 9 and 18, 1952, R. R. Dreisbach (East Lansing). ♀, Wexford Co., Mich., July 3, 1944, R. R. Dreisbach (Washington). ♂, Plummer, Minn., Sept. 18, 1931, D. G. Denning (St. Paul). ♀, Moorestown, N. J., Jul. 7, 1939, H. and M. Townes (Townes). ♂, Ringwood, near Ithaca, N. Y., Sept. 23, 1951, John C. Martin (Ottawa). 3♀, Cumberland, Ont., July 9 and 13, 1975, L. Ling (Townes). 4♂, Attons Lake, Sask., Sept. 4, 1940, A. R. Brooks (Ottawa). 20♂, 1♀, Christopher Lake, Sask., Aug. 26, 27, and 29, and Sept. 3, 1948, A. R. Brooks (Ottawa). ♂, Dead Run, Fairfax Co., Va., June 6, 1914, R. C. Shannon (Washington).

This species is widespread in eastern United States, and has been collected also in Saskatchewan, Canada.

10. Phaenoserphus lineatus, new species

Figures: 128 (♂ propodeum and base of abdomen);
451 (ovipositor sheath)

Front wing 2.7 to 4.0 mm. long. Temple of male 0.90 as long as eye, of female 0.88 as long as eye. Genal carina angled mesad to join oral carina at 80°, at the angulation with a short carina that continues toward base of mandible. Oral carina 0.8 as long below junction of genal carina as the portion of genal carina angled mesad. Second flagellar segment of male 3.1 as long as deep. Penultimate segment of female flagellum 2.1 as long as wide. Tyloids on all or most of flagellar segments 1-10, in the form of a weak narrow ridge that is 0.4 as long as the segments. Pronotum in front of sulcus smooth or with weak fine rippling or dimpling. Side of pronotum with a median hairless area that covers 0.25 of its surface. Mesopleurum below speculum smooth or with faint, fine horizontal wrinkles. Hind femur of male 5.7 as long as deep, of female 4.7 as long as deep. Upper face of propodeum with strong reticulate wrinkling, smoother near base. Stalk of abdomen 1.25 as long as wide, its upper side rugose, the median 0.5 of its upper side raised and with a weak median longitudinal impression. Grooves at base of syntergite reaching about 0.5 the distance to thyridia. Thyridia each 4.0 as wide as long, the space between them 0.7 as great as the width of a thyridium. Ovipositor sheath as in figure 451, 0.58 as long as hind tibia, with a broad polished band along upper edge and a ventrolateral carina on its apical 0.7.

Black. Palpi dark brown. Antenna of female brown basally, darkening to black toward middle. Tegula and legs brown, the coxae dark brown or blackish, the tibiae and tarsi lighter brown. Wings tinged with brown. Stigma and strong veins blackish brown. Weak veins pale brown. Ovipositor sheath blackish brown.

Type: ♂, Raleigh, Newfoundland, Aug. 4, 1975, H. and M. Townes (Townes).

Paratypes: 66♂, 22♀ from Alaska (Anchorage, Deering, Fish Creek Flats at Anchorage, Naknek, Tangle Lakes, and Summit Lake in Isabel Pass); Alberta (Blairmore, Edmonton, and Scandia); Idaho; Manitoba (Fort Churchill, Herchmer, and Warkworth Creek); Michigan (Douglas Lake in Cheyboygan Co. and Schoolcraft Co.); Newfoundland (Raleigh); North Dakota (Freshwater Township in Ramsey Co.); Northwest Territories (Exmouth Lake at 65° 02' N. 115° 54' W., Fort Smith, Norman Wells, and Yellowknife); Quebec (Chimo, Ellis Bay on Anticosti Island, Great Whale River, and Indian House Lake); Wyoming (Canyon Camp in Yellowstone Park); and Yukon Territory (Gravel Lake 58 miles east of Dawson at 2,050 ft., Sheldon Lake at 3,000 ft. at 131° 6' W. 62° 40' N., and Whitehorse). Collection dates are from June 18 to August 24. Paratypes are in the collections of Ottawa, Washington, Townes, and Cambridge.

This is a Nearctic species. Most collections have been made in the Hudsonian Zone; a few in the Canadian Zone.

11. Phaenoserphus glabratus, new species

Figures 129 (♂ propodeum and base of abdomen);
452 (ovipositor sheath)

Front wing 2.7 to 3.6 mm. long. Body a little stouter than in most species of the genus. Temple 0.85 as long as eye in male, 0.78 as long as eye in female. Genal carina angled mesad and meeting oral carina at 80°, at the angulation a short carina continuing toward base of mandible. Oral carina below juncture with genal carina 0.9 as long as the portion of genal carina angled mesad. Second segment of male flagellum 2.7 as long as deep. Penultimate segment of female flagellum 1.8 as long as wide. Tyloids absent, or present as very short, weak, narrow ridges on the median segments. Side of pronotum smooth or with faint fine rippling in front of scrobe, with a median hairless area that occupies 0.5 of its surface. Mesopleurum below tegula with very fine, weak, horizontal wrinkles. Upper face of propodeum mostly reticulately wrinkled, with a smooth or relatively smooth area near base on each side of midline. Hind femur 5.6 as long as deep in male, 4.3 as long as deep in female. Stalk of abdomen 1.0 as long as wide, its upper face rugosopunctate, with a weak median longitudinal impression. Grooves at base of syntergite reaching 0.4 the distance to thyridia. Thyridia each 5.5 as wide as long, separated from each other by about 0.3 the width of a thyridium. Ovipositor sheath as in figure 452, 0.64 as long as hind tibia.

Black. Palpi brown. Tegula and legs light brown, the base of middle and hind coxae brown, segment 5 of front and middle tarsi brown, and hind tarsus brown. Wings with a tinge of brown. Stigma and strong veins dark brown. Weak veins light brown. Abdomen reddish brown, the stalk black and syntergite blackish except on base, apex, and lower part.

Type: ♂, Racing River, 2,400 ft., B. C., July 27, 1973, H. and M.

Townes (Townes).

Paratypes: 16♂, same locality and collectors as type, dated July 23, 25, and 27, 1973 (Townes). ♂, Deering, Alaska, Aug. 31, 1968, J. Matthews (Ottawa). 2♂, 1♀, Churchill, Man., July 10 and 16, 1952 and Aug. 13, 1949, J. G. Chillcott and R. G. Watkin (Ottawa). ♂, Canton Island, Labrador, Newfoundland, Packard (Cambridge). 3♂, Raleigh, Newfoundland, July 30 and Aug. 1, 1975, H. and M. Townes (Townes). ♂, Yellowknife, Northwest Territories, Aug. 16, 1949, E. F. Cashman (Ottawa).

This is a Nearctic species, occurring in the Hudsonian Zone.

12. Phaenoserphus chittii Morley

Figures: 130 (♂ propodeum and base of abdomen);
453 (ovipositor sheath)

- **Proctotrypes Chittii* (as *Chittii* in text heading) Morley, 1922. Entomologist 55: 60, 159. ♂, ♀, key, des. Lectotype: ♀ (designated by Masner, 1965), England: Faversham in Kent (London). Examined in 1975. England: Huntingfield in Kent.
- Phaenoserphus viator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 453. syn. (in part).
- **Phaenoserphus dubiosus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 455, 457. ♂, ♀, keys, des., figs. Type: ♀, England: Weybridge in Surrey (London). Examined in 1975. England: 2 localities. Ireland: 3 localities. New synonym.
- Phaenoserphus (Phaenoserphus) dubiosus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. West & central Europe.
- Phaenoserphus dubiosus* Boness, 1962. Bombus 2: 113. biol., ecology. West Germany: Schädtebek near Kiel.
- Phaenoserphus (Phaenoserphus) dubiosus* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 32. ♂. ecology. West Germany: Rendsburg.
- Phaenoserphus dubiosus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 6. Europe. Japan.
- Phaenoserphus chittii* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 8. ♀. Lectotype designated.
- Phaenoserphus dubiosus* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 8. ♂, ♀. type data.
- Phaenoserphus dubiosus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. Austria. Belgium. Switzerland. West Germany: 4 localities.
- Phaenoserphus dubiosus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 535. ♂, ♀. Ireland: 5 counties.
- Phaenoserphus (Phaenoserphus) dubiosus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 45. ♂, ♀. key, biol. Austria. Belgium. Germany. Great Britain. Japan. Switzerland. Host: *Carabus*.
- Phaenoserphus dubiosus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 119. ♀. Germany. Switzerland.
- Phaenoserphus (Phaenoserphus) dubiosus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 547. ♂, ♀. key. Western Europe. USSR: Chelyabinskaya oblast.

Front wing 2.5 to 3.4 mm. long. Temple of male 0.90 as long as eye, of female 0.78 as long as eye. Genal carina angled mesad to meet oral carina at 80°, often with a short stub of a carina continued toward base of mandible from the angulation. Oral carina below juncture with genal carina 0.7 as long as the portion of genal carina angled mesad.

Second flagellar segment of male 3.0 as long as deep. Penultimate segment of female flagellum 2.1 as long as wide. Tyloids absent. Side of pronotum smooth, with a large median hairless area that covers 0.2 to 0.4 its surface. Mesopleurum smooth below tegula or with fine weak horizontal wrinkles. Upper face of propodeum mostly smooth or with weak wrinkling, with coarse wrinkles laterally, apically, and next to median carina. Hind femur 5.5 as long as deep in male, 5.0 as long as deep in female. Stalk of abdomen 1.5 as long as wide, its upper face rugose with median 0.5 raised. Grooves at base of syntergite reaching 0.4 the distance to thyridia. Thyridia each 2.6 as wide as long, separated from each other by about 0.9 the width of a thyridium. Ovipositor sheath as in figure 453, 0.38 as long as hind tibia.

Black. Male antenna dark brown or blackish, often lighter brown basally. Female antenna fulvous brown basally, darkening to blackish toward apex. Mouth parts, tegula, and legs fulvous to fulvous brown, the basal 0.4± of hind coxa darker. Wings with a tinge of brown. Stigma and strong veins dark brown. Weak veins pale brown. Ovipositor sheath blackish brown.

Specimens: 81♂, 25♀ from Austria (Linz, Pulgarn, Scheffau in the Tirol at 800 m., and Zwieselstein in the Tirol at 1,400 m.); Denmark (Copenhagen); England (Dewsbury in Yorkshire, Essex, and Leicester); Finland (Helsinki); Ireland (Athdown in Co. Wicklow, Athgurrett in Co. Dublin, Balbriggan in Co. Dublin, The Birks at Aberfeldy, Darby in Co. Dublin, Glenasmole in Co. Dublin, Glencullen in Co. Wicklow, Co. Kerry, Lake Melvin in Co. Leitrim, Luggacurran in Co. QC, Lynch Park in Co. Dublin, Mayfield at Rathgar, The Mullet at Annagh Dubin in Co. Westmeath, Saggart in Co. Dublin, Slade Brook in Co. Dublin, Trawalua in Co. Sligo, and Tullybrannigan in Co. Dublin); Italy (near Mt. Alto at Unserfrau at 1,500 m.); Sweden (Ljungby and Skåne); Russia (Moscow); and West Germany (Schliersee in Bavaria at 700 to 1,100 m. and Siebengebirge). Collection dates are from June 3 to October 9. Most of them are from July through September.

This is a common species of Europe. Pschorn-Walcher, 1971, recorded it as a parasite of *Carabus* (Carabidae).

13. Phaenoserphus longipes Brues

Figure: 131 (♂ propodeum and base of abdomen)

**Phaenoserphus longipes* Brues, 1919. Jour. New York Ent. Soc. 27: 9. ♂. des., figs.

Type: ♂, USA: Almota in Washington (Cambridge). Examined in 1975.

Phaenoserphus longipes Masner, 1966. Psyche 72: 297. ♂. type data.

Male: Front wing 3.7 to 3.8 mm. long. Temple 0.92 as long as eye. Genal carina angled mesad to meet oral carina at 80°, at the angulation with a short carina that continues toward base of mandible. Oral carina below juncture with genal carina 0.6 as long as the part of genal carina that is turned mesad. Second flagellar segment 3.0 as long as deep. Tyloids absent. Side of pronotum smooth, with a median hairless area

that is 0.8 as large as tegula. Mesopleurum below tegula with faint, fine horizontal wrinkles. Upper face of propodeum with reticulate wrinkling, the wrinkles mostly weak. Hind femur 4.9 as long as deep. Stalk of abdomen 1.25 as long as wide, its upper surface rugose, with a weak median longitudinal impression. Grooves at base of syntergite reaching 0.35 the distance to first thyridia. First thyridia very small, each 2.0 as wide as long, separated from each other by 3.0 the width of a thyridium.

Black. Maxillary palpus, under side of scape, tegula, and legs brownish fulvous, the front and middle coxae brown at base and hind coxa brown except below. Wings tinged with brown. Stigma and strong veins dark brown. Weak veins pale brown.

Female: Unknown.

This may prove to be a synonym of *viator*, based on unusual individuals or a race.

Specimens: ♂ (type), Washington, June 24, A. L. Melander (Cambridge). ♂, Trinidad, Calif., Sept. 18, 1934, A. L. Melander (Cambridge). Figure 131 is from the type.

14. Phaenoserphus viator Haliday

Figures: 132 (♂ propodeum and base of abdomen);
454 (ovipositor sheath)

- Proctotrupes Viator* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.
- Proctotrupes curtipennis* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.
- **Proctotrupes viator* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 12, 15. ♂, ♀. des., biol. Types: ♂, ♀, England and Finland (Dublin). Types examined by Nixon and reported in 1938.
- **Proctotrupes curtipennis* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 12. ♀. des. Type: ♀, England (lost).
- Proctotrupes viator* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes curtipennis* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes viator* Curtis, 1846. Gard. Chron. 3: 36. ♂, ♀. des., figs., biol. Hosts: Carabidae or Staphylinidae.
- Proctotrupes niger* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 418. ♂, ♀. syn., des. Lappland. Sweden: several localities. Misdet. of *niger* Panzer according to Hellén, 1941.
- Proctotrupes viator* Klippart, 1860. The wheat plant, p. 631. biol. Host: elaterid larva.
- **Proctotrupes laevifrons* Foerster, 1861. Programm Realschule in Aachen . . . Ein tag in der Hoch-Alpen, p. XL. ♀. des. Type: ♀, locality not given (Vienna). Examined in 1975. New synonym.
- Proctotrupes viator* (!) Vollenhoven, 1876. Pinacographia, p. 30, pl. 19 fig. 7. ♀. figs.
- **Proctotrupes Sixianus* Vollenhoven, 1879. Tijdschr. voor Ent. 22: Verslag XIII. ♀. des. Type: ♀, ?Netherlands (lost). Type could not be found in Wageningen nor in Leiden by Zwart, nor could it be found by Ellis in Amsterdam. A female in the Townes collection is labeled as agreeing with the description. New synonym.
- Proctotrupes viator* Curtis, 1883. Farm Insects, p. 131, 198. biol. Hosts: *Nebria brevicollis*; *Pterostichus melanarius*.
- Proctotrupes curtipennis* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 464. syn.
- Proctotrupes levifrons* (!) Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn.

- Proctotrypes sixianus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 467. syn.
- Proctotrypes viator* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 467. syn.
- Serphus (Phaenoserphus) Curtipennis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 300. ♀. des. in key. England. Ireland.
- Serphus (Phaenoserphus) Viator* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 311. ♂, ♀. des. in key. Czechoslovakia: Košice (= Crimée: Kaffa). England. France: 11 localities. Hungary. Italy: Trieste. Scotland. Switzerland: 2 localities.
- Serphus (Phaenoserphus?) levifrons (!)* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 312. ♀. Foerster des. repeated.
- Serphus (Phaenoserphus?) sixianus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 313. ♀. Vollenhoven des. repeated.
- Proctotrypes pallidipes (!)* Elliot & Morley, 1911. Trans. Ent. Soc. London 1911: 453. England. Host: *Creophilus maxillosus*. Misdet. of *pallidipes* Dalla Torre, according to Morley, 1922.
- Phaenoserphus viator* Kieffer, 1914. Bul. Soc. Ent. France 1914: 210. Host: *Nebria brevicollis*.
- Phaenoserphus curtipennis* Kieffer, 1914. Das Tierreich 42: 24. ♀. key, des. England. Ireland.
- Phaenoserphus viator viator* Kieffer, 1914. Das Tierreich 42: 29. ♂, ♀. key, des., biol. Austria. Belgium. "Crimea". England. France. Germany. Hungary. Luxembourg. Norway. Switzerland. Host: *Nebria brevicollis*.
- Phaenoserphus viator testaceicornis* Kieffer, 1914. Das Tierreich 42: 29. ♂, ♀. des. Austria. Czechoslovakia: Košice (= "Krim"). France. Italy: Sicily. Norway. (in part). Misdet. of *testaceicornis* Kieffer.
- Phaenoserphus laevifrons* Kieffer, 1914. Das Tierreich 42: 30. ♀. copy of original description. Switzerland.
- Phaenoserphus sixianus* Kieffer, 1914. Das Tierreich 42: 30. ♀. copy of original description. "Probably Holland".
- Phaenoserphus levifrons (!)* Box, 1921. Ent. Monthly Mag. 57: 92. ♂, ♀. des. England. Host: carabid larva.
- Proctotrypes curtipennis* Morley, 1922. Entomologist 55: 60, 134. key, syn., des. England.
- Proctotrypes viator* Morley, 1922. Entomologist 55: 60, 158. key, biol. England: 9 localities. Ireland. Scotland. Hosts: coleopterous larvae; *Creophilus maxillosus*; *Ocyptus olens*.
- Phaenoserphus viator* Eastham, 1929. Parasitology 21: 1-21. figs. of larvae, biol. Host: *Pterostichus niger*.
- Carabiphagus laevifrons* Morley, 1929. Trans. Suffolk Nat. Soc. 1: 40. syn.
- Phaenoserphus viator* Eastham, 1929. Trans. 4th Internatl. Cong. Ent. Ithaca, N. Y., 1928. II: 547-550. biol. Host: *Pterostichus niger*.
- Carabiphagus laevifrons* Morley, 1931. Entomologist 64: 14. ♂, ♀. syn., des. England: Great Salkeld in Cumberland.
- Phaenoserphus viator* Raynaud, 1935. Misc. Ent. (Rev. Ent. Internatl.) 36: 99. biol. France: 3 localities. Hosts: *Carabus splendens*; *Leistus nitidus*; *Nebria psammodes*.
- Phaenoserphus viator* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. Belgium: 7 localities.
- Phaenoserphus curtipennis* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. ♀. Belgium: 2 localities.
- Phaenoserphus viator* Maneval, 1937. Bul. Mus. Roy. d'Hist. Nat. Belgique 13: 2. ♀. biol. Belgium: Lierre. Hosts: larvae of Carabidae & Staphylinidae.
- Phaenoserphus viator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 453, 455, 457, 458. ♂, ♀. keys, syn. (in part), des., figs., biol. England: 11 localities. Germany. Ireland: 7 counties. Host: *Carabus violaceus*.
- Phaenoserphus viator* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Phaenoserphus viator* Kerrich, 1940. Notulae Ent. 19: 101. ♀. Finland: 3 localities.
- Phaenoserphus viator* Hellén, 1941. Notulae Ent. 21: 35. ♂, ♀. key, syn. Finland. USSR.
- Phaenoserphus viator* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 4 localities.

- Phaenoserphus viator viator* Tomšík, 1942. Ent. Listy 5: 73. des. Czechoslovakia: localities in Bohemia and Moravia.
- Phaenoserphus viator* Richards, 1946. Ent. Monthly Mag. 82: 225. biol.
Host: *Nebria brevicollis*.
- Phaenoserphus viator* Leclercq, 1952. Lambillionea 52: 71. Belgium: 6 localities.
- Phaenoserphus viator* var. *curtipennis* Leclercq, 1952. Lambillionea 52: 71. Belgium: Beyne-Heusay.
- Phaenoserphus viator* Watanabe, 1954. Mushi 26: 7. ♂, ♀. des., biol. Europe. Japan.
Host: *Carabus procerulus*.
- Phaenoserphus viator* Gauss, 1957. Aus der Heimat 65: 215, 216. figs., biol.
Host: *Carabus granulatus*.
- Phaenoserphus (Phaenoserphus) viator* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North, west, central, & south Europe. Japan.
- Serphus (Phaenoserphus) viator* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. France: Bitche.
- Phaenoserphus viator* Basden, 1959. Ent. Monthly Mag. 95: 35. fig., biol. Scotland.
Host: *Pterostichus madidus*.
- Phaenoserphus viator* Jansson, 1960. Opuscula Ent. 25: 86. ♂, ♀. Sweden. Host: *Carabus violaceus*.
- Phaenoserphus viator* Meyer, 1961. Verh. Ver. naturw. Heimatforsch. Hamburg 35: 69. ♂. West Germany: Hohwacht in East Holstein.
- Phaenoserphus viator* Meyer, 1961. Bombus 2: 94. West Germany: 6 localities.
- Phaenoserphus viator* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 2 localities.
- Phaenoserphus (Phaenoserphus) viator* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 31, 33, 34. ♂, ♀. biol., ecology. West Germany: 11 localities.
- Phaenoserphus viator* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 6. Europe. Japan. Mongolia. USSR: Siberia. Hosts: *Carabus procerulus*; Carabidae larvae.
- Phaenoserphus viator* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. West Germany: 10 localities.
- Phaenoserphus viator* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Phaenoserphus viator* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 535. des. Ireland: 8 counties.
- Phaenoserphus viator* Weidemann, 1967. Faunistisch - Ökologische Mitt. 3: 168, 169. biol. West Germany: Habel.
- Phaenoserphus (Phaenoserphus) viator* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 13, 33, 42, 44, 45. ♂, ♀. key, figs., biol. In all of Europe (including Switzerland). Japan. USSR. Host: *Carabus scheidleri*; *Pterostichus vulgaris*.
- Phaenoserphus (Phaenoserphus) viator* Kozlov, 1971. Vses. ent. obschch. Trudy 54: 5. figs.
- Phaenoserphus viator* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 119. From Lake Garda, Italy to mountain meadows. Hosts: Carabidae.
- Phaenoserphus viator* Critchley, 1973. [Proc. Roy. Ent. Soc. London] Jour. Ent. (A) 48: 38-41. biol. England: Silwood Park in Berkshire. Hosts: *Nebria brevicollis*; *Pterostichus madidus*; *Pterostichus vulgaris*.
- Phaenoserphus viator* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♂. Rumania.
- Phaenoserphus (Phaenoserphus) viator* Teodorescu & Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 166. ♂, ♀. Rumania: 5 localities.
- Phaenoserphus viator* Luff, 1976. Ent. Monthly Mag. 111: 252. fig., biol.
Host: *Nebria brevicollis*.
- Phaenoserphus (Phaenoserphus) viator* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 547. ♂, ♀. key, figs. Northwest and Central Europe. USSR: Moldaviya and Ul'yanskovskaya oblasts.

Front wing 2.5 to 4.2 mm. long (or in occasional females the wings reduced to about half the normal length). Temple of male 0.90 as long as eye, of female 0.78 as long as eye. Genal carina angled mesad to meet oral carina at 80°, usually with a short stub of a carina originating from the angulation. Portion of oral carina below the juncture with genal carina 0.6 to 1.5 as long as the part of genal carina that is angled mesad. Second flagellar segment of male faintly to strongly compressed, 2.0 to 3.2 as long as deep. Penultimate segment of female flagellum 2.5 as long as wide. Tyloids absent. Side of pronotum faintly to strongly dimpled by medium sized shallow punctures in front of the scrobe. Hairs on side of pronotum usually with a median bare spot that is 0.5 to 1.5 as large as the tegula, sometimes completely hairy. Mesopleurum below tegula almost smooth or with some fine horizontal wrinkles. Upper face of propodeum with moderately coarse reticulate wrinkling, the wrinkling weaker toward base of propodeum and in females the basal 0.3± of upper face sometimes almost smooth except next to median carina. Hind femur 5.5 as long as deep in male, 5.3 as long as deep in female. Stalk of abdomen 1.0 as long as wide, its upper face coarsely rugose and with a median pair of blunt longitudinal ridges. Grooves on base of syntergite reaching about 0.3 to 0.8 the distance to thyridia. Thyridia each 2.5 to 3.5 as wide as long, separated from each other by 1.0 the width of a thyridium. Ovipositor sheath as in figure 454, 0.38 as long as hind tibia.

Black. Mouth parts brownish fulvous to black. Male antenna blackish. Female antenna fulvous on basal 0.3±, thence gradually darkened to black at apex. Legs fulvous, the basal 0.6± of hind coxa brown or fuscous. Wings faintly tinged with brown. Stigma and strong veins dark brown. Weak veins light brown. Ovipositor sheath dark brown.

This species has a very wide range and shows some racial differentiation in different parts of the range. The width of the basal flagellar segments of males is greatest in Japanese specimens, intermediate in European specimens, and averages smallest in North American specimens. North American specimens have an average longer distance between the juncture of the genal carina with the oral carina and the base of the mandible, narrower thyridia, and somewhat smaller size. Specimens from Alaska tend to be more like those of Europe than do specimens from other parts of North America. Short winged females are known only from Europe. It has not proven feasible, however, to subdivide the species into subspecies.

European specimens: 171♂, 50♀ from Austria (Aschachtal, Linz, Marchtrenk, Mauthausen, Pulgarn, Raxalpe at 1,500 m., Sarleinsbach, Scheffau in Tirol at 800 m., and Vienna); Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Leicester); Finland (Helsinki); France (Munster); Hungary (Budapest); Ireland (Bellevue in Co. Wicklow, Boher-na Breena in Co. Dublin, Bunduff in Co. Sligo, Cloghleague in Co. Wicklow, Conarry in Co. Wicklow, Glenree in Co. Wicklow, Glenasmole in Co. Dublin, Glencar in Co. Leitrim, Glencullen in Co. Wicklow, Glen of the Downs in Co. Wicklow, Harolds Cross in Co. Dublin, Co. Kerry, Killeel in Co. Kildare, Lake Dan in Co. Wicklow, Meeting of the Waters in Co. Wicklow, Morristown in Co. Kildare, The Mullet in Co. Westmeath, Saggart in Co. Dublin, and The Slade of Saggart in Co. Dublin);

Italy (Naturno in Trentino at 500 to 1,000 m. and Pizzighettone); Sweden (Köping in Västmanland, Ljungby, Skåne, and north side of Torneträsk); Russia (Leningrad); and West Germany (Bonn, Kiel, Munich, Schliersee in Bavaria at 700 to 1,100 m., Siebengebirge, and Siegmündung). Collection dates are mostly in July, August and September. Those outside of these three months are: May 8 and 16 at Pizzighettone, Italy; May 21 at Harolds Cross, Co. Dublin, Ireland; May 23 in Austria; May at Leicester, England; June 3 at Linz, Austria; October at Leicester, England; October 1 at Meeting of the Waters, Co. Wicklow, Ireland; October 3 and 8 at Linz, Austria; October 10 at Siegmündung, West Germany; October 11 at Glenasmole, Co. Dublin, Ireland; October 12 at Glen of the Downs, Co. Wicklow, Ireland; October 14 at Boherna Breena in Co. Dublin, Ireland; October 16 at Conarry in Co. Wicklow, Ireland; and October 27 at The Slade of Saggart, Co. Dublin, Ireland.

Japanese specimens: ♂, Jozankei (near Sapporo), July 10, 1954, Townes family (Townes). 2♂, Kamikochi, July 22 and 23, 1954, Townes family (Townes). 6♂, Sapporo, July 6, 9, 11, 13, and 15, David Townes and Townes family (Townes). ♂, Mt. Takao, 600 m., Tokyo, May 10, 1959, T. Hayasaka (Ottawa).

Nearctic specimens: 60♂, 13♀ from Alberta (Cascade Mt. near Banff at 7,500 to 8,600 ft., Lake Louise, and Vermillion Lake near Banff at 4,500 ft.); Alaska (Mt. McKinley at 1,600 ft. and Tangle Lakes); British Columbia (Diamond Head Trail near Squamish at 3,200 ft., Summit Lake at 4,200 ft. and at 4,500 ft. at mile 392 on the Alaska Highway, and Toad River at 4,500 ft. at mile 422 on the Alaska Highway); Colorado (Loveland Pass at 12,000 ft. and "Sci Lodge"); Connecticut (Canaan); Idaho (Flat Rock); Manitoba (Churchill and Churchill River 20 miles north of Churchill); Michigan (Baker woodlot in East Lansing); Minnesota (near Blakely and Washington Island in Basswood Lake in Lake Co.); New Hampshire (Base Station in Coos Co. and Mt. Washington); New York (Lake Placid at 2,000 ft.); Ontario (Crow Lake in the Marmora area); Oregon (Ochoco Creek and Strawberry Mt. in Grant Co. at 8,000 ft.); Quebec (Chimo, Great Whale River, and Indian House Lake); Washington (Yakima Park on Mt. Rainier); Wisconsin (Polk Co.); Wyoming (Dunraven Pass in Yellowstone Park); and Yukon Territory (Herschel Island). Collection dates are from July 19 to August 29, plus two later dates as follows: September 3 at 8,000 ft. on Strawberry Mt., Grant Co., Oreg. and Oct. 8 at East Lansing, Mich.

This species is Holarctic. In Europe and Japan it is widespread in areas of moderate or cold climate, in North America it is mostly an Arctic and Hudsonian species but it occurs also in the Canadian Zone. It has been reared from several species of Carabidae. Records of hosts other than Carabidae are believed to be erroneous.

Eastman, 1929 and 1929 gives details of its life history and the morphology of the larval stages and pupa. His biological observations (in England) are worthy of repetition: There is one generation a year, with adults emerging in August and September. Oviposition was not observed. Overwintering is as small larvae within young larvae of *Pterostichus* (Carabidae). There are 9 to 45 parasite larvae per host. Parasite larvae begin to grow rapidly in April. During May the host

larva becomes sluggish and by the beginning of June host larvae are found quiescent in cells in the soil; by the end of June such parasitized larvae no longer respond to stimulation. The parasite larvae continues to feed inside, stretching the host skin. They emerge in mid-August through the intersegmental membranes on the under side of the abdomen and thorax. On emergence the larvae immediately moult to prepupae. The prepupae last about 10 days, become pupae *in situ*, and adults 5 to 7 days after the pupa is formed. There are 4 larval instars, excluding the prepupa.

Eastman describes the larvae, prepupa, and pupa in some detail and gives figures. His fullest treatment is in Parasitology. This is abridged in Transactions of the fourth International Congress of Entomology (without figures).

Gauss, 1957, gives additional details on the biology and doubts Eastman's conclusion that there is only one generation per year because adult parasites occur throughout the growing season. (It may be that the parasites' seasonal cycle is dependent on that of the particular host species.)

Luff, 1976, describes courtship behavior, the males rapidly curling their flagella around those of the female. (This habit is correlated with an unusual flattening and flexibility of the male flagellum of *P. viator*.)

Curtis, 1846, Raynaud, 1935, and Basden, 1959 tell of rearing *P. viator* from field-collected hosts.

15. Phaenoserphus pallipes Jurine

Figures 133 (♂ propodeum and base of abdomen);
455 (ovipositor sheath)

- **Codrus Pallipes* Jurine, 1807. Nouvelle méthode de classer les hyménoptères et les diptères, p. 309. pl. 13. ♂. des. as fig. Type: ♂, Switzerland? (lost). This name has usually been applied to *Codrus niger* but Jurine's figure shows the flagellum entirely yellow and the nervulus far distad of the basal vein. This combination of characters agrees only with the species treated as *pallipes* below.
- Proctotrupes pallipes* Latreille, 1809. Genera crustaceorum et insectorum . . . 4: 38. syn.
- Cleptes pallipes* Lamarck, 1817. Hist. nat. des animaux vertèbres 4: 128. des. France: near Paris.
- Proctotrupes pallipes* Lapeletier, 1827. Encyclopédie méthodique . . . insectes 10: 209. ♀. des. France: near Paris.
- Proctotrupes pallipes* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain.
- Codrus pallipes* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 356. ♂, ♀. syn., des. France: Paris. Germany: Sickershausen [in Franconia]. Italy: Liguria. Switzerland. (in part).
- Codrus pallipes* Labrom & Imhoff, 1838. Insekt. Schweiz . . . 2: legend & fig. 24. ♂, ♀. des., figs.
- Proctotrupes pallipes* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes rufipes* Brullé, 1846. Histoire naturelle des insectes hyménoptères 4: pl. 39, figs. 4, 4a. *Lapsus* for *pallipes* Jurine.
- Codrus pallipes* Kawaii, 1855. Stettin. Ent. Ztg. 16: 261. USSR: Courland in Latvia. Host: *Staphylinus* larva.
- Proctotrupes pallipes* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 418. ♂, ♀. des. Norway. Sweden: 4 localities.

- Proctotrupes pallipes* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: 5 localities.
- Proctotrupes pallipes* Vollenhoven, 1876. Pinacographia p. 30, pl. 19, fig. 1. ♂, ♀. syn., des., figs. Host: *Macrocera maculata*.
- **Proctotrypes pallidipes* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 466. emendation.
- Proctotrypes rufipes* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 467. *Lapsus for pallipes* Jurine.
- **Serphus (Phaenoserphus) Viator* var. *Testaceicornis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 311. ♂, ♀. des. Lectotype: ♀ (designated by Kelner-Pillault, 1958), Austria: Loitsch in Carniola (Paris). Examined in 1975. Paratypes, from many localities, are mostly or entirely *viator*. New synonym.
- Phaenoserphus viator testaceicornis* Kieffer, 1914. Das Tierreich 42: 29. ♂, ♀. des. Austria. Czechoslovakia: Kóšice (= "Krim"). France. Italy: Sicily. Norway. (in part).
- Phaenoserphus viator v. testaceicornis* Tomšík, 1942. Ent. Listy 5: 73. des. Czechoslovakia: localities in Bohemia and Moravia.
- Serphus (Phaenoserphus) viator* var. *testaceicornis* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. ♀. lectotype designated.

Front wing 3.8 to 4.3 mm. long. Temple of male 0.78 as long as eye, of female 0.60 as long as eye. Genal carina turned sharply mesad to oral carina, which it meets at 80°. Oral carina below its juncture with genal carina about equal in length to the part of genal carina that is turned mesad. Second segment of male flagellum 3.4 as long as deep. Penultimate segment of female flagellum 2.8 as long as wide. Tyloids absent. Front 0.5± of side of pronotum with partially confluent medium sized punctures that vary from very shallow to moderately deep. Side of pronotum covered with hairs, or sometimes with a median hairless area that is 0.4 as large as tegula. Mesopleurum below tegula with a few fine weak horizontal wrinkles. Upper face of propodeum with moderately fine irregular wrinkling. Hind femur of male 6.9 as long as deep, of female 6.4 as long as deep. Stalk of abdomen 1.0 as long as wide, its upper face rugosely wrinkled, with a pair of indistinct median longitudinal ridges. Grooves at base of syntergite reaching 0.65 the distance to first thyridia. First thyridia each 3.0 as wide as long, separated from each other by 0.88 the width of a thyridium. Ovipositor sheath as in figure 455, 0.37 as long as hind tibia.

Black. Mouth parts, tegula, and legs yellow or yellowish fulvous, the basal 0.25± of hind coxa fuscous. Antenna of male yellow, the upper side of scape and apical 0.4± of last segment brownish. Antenna of female yellow, beyond the first 3-4 segments of flagellum gradually darkened to blackish at apex. Wings almost hyaline. Stigma and strong veins brown. Weak veins pale brown. Ovipositor sheath blackish.

Specimens: ♂, Bucklige Welt, Austria, A. L. Mader (Washington). ♂, Feldkirchen, Austria, Octo. 27, 1924 (Washington). ♀, near Linz, Austria, Oct. 17, 1936, J. Kloiber (Washington). 4♂, 3♀, near Linz, Austria, July 30, 1947, Aug. 16, 1947, and Sept. 5, 11, and 26, 1947, H. Priesner (Washington). ♂, Salzburg, Austria, Jul. 13, 1940

(Ottawa). ♂, Sarleinsbach, Austria, Oct. 5, 1932, J. Kloiber (Washington). ♂, Somme east of Amiens, France, June 3, 1961, Erich Schmidt (Ottawa). ♂, Palermo, Italy, May 10-28, 1931 (Washington). 2♂, Coll. Imhoff (Cambridge).

This species occurs in the southern parts of Europe. Records of "*pallipes*" in literature are numerous but these are based mostly on misdeterminations of *Codrurus niger*. The record of a staphylinid as host by Kawall, 1855, and of a fungivorid as host by Vollenhoven, 1876, are presumed to be erroneous, as the usual hosts of *Phaenoserphus* are Carabidae.

16. *Phaenoserphus disjunctus*, new species

Figure 134 (♂ propodeum and base of abdomen)

Male type: Front wing 4.8 mm. long. Temple 0.95 as long as eye, more nearly flat than in any other species of the genus except *P. par-tipes*. Occipital carina gradually curved mesad, incomplete below so that it does not reach oral carina. Second flagellar segment 4.0 as long as wide. Tyloids absent. Pronotum between collar and scrobe faintly dimpled. Hairless area on pronotum 0.3 as large as tegula. Propodeum long, its upper side finely reticulate, smoother basad, its hairs moderately dense. Hind femur 8.5 as long as deep. Radial cell larger than in any other species of the genus, its costal side 0.6 as long as depth of stigma. Stalk of abdomen 1.25 as long as wide, finely rugulose and mat above. Grooves at base of syntergite reaching 0.2 the distance to first thyridia. First thyridia each 2.9 as wide as long, the space between them 2.2 as wide as the width of a thyridium.

Black. Labrum and palpi brown. Tegula, front coxa, trochanters, femora, and tibiae light fulvous. Middle and hind coxae brown. Tarsi brown, the front and middle tarsi fulvescent basad. Wings subhyaline. Stigma and strong veins dark brown. Weak veins with a tinge of brown. Abdomen blackish brown.

Female: Unknown.

Type: ♂, Silverton, 9,800 ft., Colo., Aug. 11, F. M. Carpenter (Cambridge).

17. *Phaenoserphus punctatus* Kozlov, new combination

**Codrurus punctatus* Kozlov, 1972. Insects of Mongolia 1: 646. ♀. des. Type: ♀, Mongolia: 30 km. south of Mungen-Morut in central Ajmak (Leningrad). Examined in 1978.

Male: Unknown.

Female: Front wing 2.8 mm. long. Cheek 1.0 as long as width of mandible at base. Temple weakly convex, 0.62 as long as eye. Occipital carina moderately high. Genal carina running downward toward hind condyle of mandible and ending in a short out-curve just above mandible. There is also a carina-like wrinkle that runs toward hind

condyle of mandible and another such wrinkle inside of genal carina that runs toward oral carina. Segment 8 of flagellum 2.2 as long as wide, the segments beyond missing. Side of pronotum covered in front of scrobe with small sharp crowded punctures that, on collar, are interspersed with wrinkling, behind scrobe smooth with small or fine distant punctures, the side of pronotum without a hairless area. Mesopleurum with a little wrinkling along the horizontal groove and somewhat rugulose on lower hind corner, the rest smooth. Propodeum with strong reticulate wrinkling, without a median carina, above near base the wrinkling with a longitudinal bias and with a pair of small dorsal smooth areas at extreme base. Stalk of abdomen 1.5 as long as wide, above irregularly wrinkled and with 4 transverse rugae on basal 0.6. Base of syntergite with 4 grooves on each side of midline, the grooves reaching 0.5 to thyridia. Thyridia each 2.4 as wide as long, separated from each other by 1.5 the width of a thyridium. Ovipositor sheath 0.37 as long as hind tibia, moderately slender, evenly curved and tapered to a sharp point, laterally its surface with dense elongate punctures, dorsally smooth.

Black. Mandible ferruginous, fuscous at base. Palpi light brown. Scape, pedicel, tegula, and legs ferruginous, the middle coxa ferruginous brown and hind coxa dark brown. Flagellum dark brown, light reddish brown toward base. Wings with a faint brownish tinge, the front wing with a brown cloud in radial cell and below stigma. Stigma and strong veins dark brown. Weak veins light brown.

Specimen: Redescribed from the type, a female from 30 kilometers south of Mungen-Morut in central Ajmak, Mongolia, July 8, 1967 (Lenigrad).

18. Phaenoserphus partipes Dodd, new combination

**Proctotrupes gravidator* var. *partipes* Dodd, 1920. Trans. Ent. Soc. London 1919: 365.

♂. des. Type: ♂, India: Kashmir at 5,000 ft. (London). Examined in 1975.

Serphus gravidator var. *partipes* Gardner, 1929. Indian Forest Record 14 (4): 107. figs., biol. Host: *Nebria cameroni*.

Proctotrupes partipes Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 9. ♂, ♀. type data.

Front wing 5.7 to 5.9 mm. long. Cheek 0.9 as long as width of mandible at base. Temple only faintly convex, in profile 0.71 as long as eye in both sexes. Occipital carina high. Genal carina evenly curved, joining oral carina at about 75°. Second flagellar segment of male 6.7 as long as wide. Penultimate flagellar segment of female 4.4 as long as wide. Male without tyloids on flagellar segments 1-4, the flagellum missing beyond segment 4 in the only male specimen available. Side of pronotum evenly covered with dense, small, crowded punctures, the hairs on pronotum short, dense, and evenly distributed. Mesopleurum with fine, dense horizontal wrinkles. Propodeum with fine but strong ruguloso-punctate sculpture, except on its dorsal face, also with some coarse wrinkles. Median carina of propodeum moderately strong but somewhat obscured by rugulosity. Stalk of abdomen 1.4 as wide as long, its upper surface rugose. Base of syntergite with

about 7 grooves on each side of the midline, the grooves reaching about 0.5 the distance to thyridia. Thyridia each 1.8 as wide as long, separated from each other by about 2.2 the width of a thyridium. Ovipositor sheath 0.22 as long as hind tibia, evenly curved and tapered, with scattered elongate punctures.

Black. Mouth parts and tegula brown. Front and middle femora blackish or in male the middle femur partly ferruginous. Hind femur ferruginous with apex very narrowly fuscous. Front and middle tibiae and tarsi pale brown. Hind tibia and tarsus fuscous. Wings with a tinge of pale brown. Stigma and strong veins brown. Weak veins pale brown. Syntergite and synsternite ferruginous, both black at base and more broadly infuscate at apex. Ovipositor sheath black.

Specimens: ♂ (type), Kashmir, India (London). ♀, parasitic on larva of *Nebria cameroni* (Carabidae), Tons River, Dehra Dun, U. P., India, Mar. 11, 1929 (London).

3. Genus SERPHUS

Figures 20 (side view); 45 (front wing)

Serphus Schrank, 1780. Schrift. Berlin. Gesell. Naturf. Freunde 1: 307.

Type: *Serphus brachypterus* Schrank. Monobasic.

Proctotrupes Latreille, 1796. Précis caractères génériques des insectes, . . . , p. 108.

Type: (*Proctotrupes brevipennis* Latreille) = *brachypterus* Schrank. Included by Latreille, 1802.

Erodorus Walckenaer, 1802. Faune Parisienne, Insectes . . . 2: 47.

Type: (*Erodorus bimaculatus* Walckenaer) = *brachypterus* Schrank. Monobasic.

Proctotrupes Rafinesque, 1815. Analyse, Nature ou Tabl. Univers, Palermo p. 125.

Emendation.

Proctotrypes Agassiz, 1846. Nomenclator zoologicus, Index universalis, p. 309.

Emendation.

Proctotropis Gistel, 1848. Naturgeschichte des Tierreichs für höhere Schulen, p. 143.

Emendation.

Front wing 3.1 to 8.8 mm. long. Frons without a distinct median swelling. Area between antennal sockets with a low weak ridge and usually a small median tubercle. Mandible with a single tooth. Side of pronotum partly or entirely covered with hairs (sometimes with hairs only dorsally and anteriorly), with a variable amount of wrinkling or rugulosity. Propodeum reticulately wrinkled or the wrinkles mostly longitudinal, usually with a long median carina that may be partly obscured by wrinkling. Longer spur of hind tibia about 0.33 as long as basitarsus. Tarsal claws simple. Costal side of radial cell about 0.33 as long as depth of stigma. First and second discoidal cells confluent. Nervulus distad of basal vein by 0.5 to 0.8 its length. Stalk of abdomen about 0.4 as long as wide. Syntergite nearly always red or partly red or reddish brown (black in *S. maurus* and sometimes blackish in *S. bistriatus*). Lower half of lateral aspect of syntergite with moderately dense hairs. Male clasper narrowly triangular. Ovipositor sheath 0.6 to 1.5 as long as hind tibia, decurved throughout or decurved at tip, the tip tapered to a sharp or a blunt point, the surface of ovipositor sheath punctate or punctate and longitudinally grooved.

The genus *Serphus* has often been called *Proctotrupes* or *Proctotrypes*, and the family Serphidae has consequently been called Proctotrupidae or Proctotrypidae. *Proctotrupes* and *Proctotrypes* are both junior synonyms of *Serphus*, and all three have the same genotype. These are bibliographic facts that are not contestible. Some authors who use one of the junior synonyms state that the name *Serphus* has been suppressed by the International Commission on Zoological Nomenclature. Whether or not one accepts "suppressions" of otherwise valid names, the International Commission did not go through its standard routine for "suppressing" *Serphus*. There is, however, a spurious "Opinion of the International Commission" (no. 178) that was published under the personal responsibility of Francis Hemming, without the knowledge or consent of the International Commission, and without an official vote of the Commission on the matter. Citations of this "Opinion" have been misleading. Its spurious origin is documented and well known, and one wonders why certain authors cite it as valid. For a recent discussion of the details of this case, see Townes and Townes, 1969, Mem. Amer. Ent. Inst. 11: 15-18. In this reference the names discussed are certain ichneumonid names rather than *Serphus*, but exactly the same facts apply to *Serphus*, as *Serphus* was on the same list of names as the ichneumonids discussed, and had the same history in regard to Hemming's publications. It is unfortunate that in English pronunciation the names *Serphus* and Serphidae are practically indistinguishable from *Syrphus* and Syrphidae, but a similarity in sound is not considered an acceptable reason for discarding a scientific name.

Serphus is a Holarctic genus. Seven species are known. Since these are larger species and often are common they are the best known members of the family. The hosts are Carabidae.

Key to the species of Serphus

1. Side of pronotum without a median hairless area. Upper 0.3± of metapleurum much less coarsely sculptured than lower 0.7±. Radial vein moderately curved, except sometimes in brachypterous specimens. Spurs of middle and hind tibiae weakly curved in male, strongly curved in female. Ovipositor sheath with longitudinal grooves. Brachypterous Group. 2
- Side of pronotum nearly always with a median hairless area. Upper 0.3± of metapleurum almost as coarsely sculptured as the rest except that its upper front corner is usually smoother. Radial vein straight or almost so. Spurs of middle and hind tibiae straight. Ovipositor sheath without longitudinal grooves. Gravidator Group. 3
2. Head and thorax entirely black except for a dusky ferruginous area on lower part of cheek. Radial cell strongly narrowed toward rear. Sculpture of metapleurum and propodeum a little finer than in *S. caudatus*. Europe. 1. brachypterus Schrank (p. 172)

Head and thorax partly to entirely ferruginous, or at least the pronotum and upper part of head dusky ferruginous. Radial cell only very weakly narrowed toward rear. Sculpture of metapleurum and propodeum a little coarser than in *S. brachypterus*. Eastern and central Nearctic Region. 2. caudatus Say (p. 176)

3. Median hairless area on side of pronotum about 0.7 as large as tegula. Genal carina often absent or weak next to oral carina, with often several oblique wrinkles next to oral carina in place of a distinct genal carina. Clypeus 2.8 to 3.1 as wide as long. 4

Median hairless area on side of pronotum about 2.0 as large as tegula, or larger. Genal carina reaching oral carina. Clypeus 2.5 to 2.9 as wide as long. 5

4. Thorax fulvous or partly fulvous except sometimes in males. Side of pronotum behind the sulcus mostly finely rugulose. Reticulation of propodeum with a bias toward longitudinal ridging. Ovipositor sheath about 0.7 as long as hind tibia. Nearctic Region. 3. pallidus Say (p. 177)

Thorax entirely black. Side of pronotum behind the sulcus mostly smooth. Reticulation of propodeum without a bias toward longitudinal ridging. Ovipositor sheath about 1.0 as long as hind tibia. Holarctic Region. 4. gravidator Linnaeus (p. 179)

5. Lower hind part of pronotum (below spiracular swelling and within and behind the sulcus) without any hairs (or sometimes as many as 4 hairs). Upper front corner of metapleurum rugose. Apical 0.2 of ovipositor sheath a little thicker than in *S. terminalis*. Holarctic Region. 7. bistriatus Möller (p. 188)

Lower hind part of pronotum (below spiracular swelling and within and behind the sulcus) with a moderate number of small hairs. Upper front corner of metapleurum usually moderately smooth and distinctly punctate but sometimes rugose. Apical 0.2 of ovipositor sheath a little more slender than in *S. bistriatus*. 6

6. Syntergite entirely black. Alps of Europe. 5. maurus Kieffer (p. 184)

Syntergite entirely or mostly red. Nearctic Region. 6. terminalis Ashmead (p. 184)

Brachypterus Group

Front wing 5.0 to 8.8 mm. long (or some females brachypterous). Clypeus wide. Genal carina curved strongly mesad to oral carina, which it meets far above base of mandible. Thorax long and narrow, especially in females. Side of pronotum with a little wrinkling anteriorly and in scrobe, elsewhere smooth, its hairs evenly distributed and not leaving a median hairless area (fig. 150). Upper 0.3± of metapleurum less strongly sculptured than lower 0.7±. Propodeal sculpture

tending to form longitudinal wrinkles. Spurs of middle and hind tibiae weakly curved in males, strongly curved in females. Radial vein moderately curved, or in brachypterous specimens more nearly straight. Ovipositor sheath with sharp longitudinal grooves, about 1.4 as long as hind tibia, down-curved throughout but more strongly curved apically (fig. 456).

Two species are known, one Nearctic and one Palearctic. The two are very closely related.

1. Serphus brachypterus Schrank

Figures 142 and 143 (♂, ♀ propodeum)

- **Serphus brachypterus* Schrank, 1780. Schriften Berlin. Gesell. Naturf. Freunde 1: 307. ♀. des., fig. Type: ♀, West Germany: Passau (lost). Description and figure adequate for identification.
Sp. 545. Zschach, 1789. Museum . . . Leskeanum, p. 82, no. 545. pl. 2, fig. 545. ♀. des., fig.
- **Ichneumon divagator* Olivier, 1792. Encyclopédie méthodique . . . 7: 192. ♀. des. Type: ♀, France: Paris (lost).
- **Ichneumon campanulator* Fabricius, 1798. Supplementum entomologiae systematicae, p. 227. [♂]. des. Lectotype: ♂, (labeled by Townes, 1975 and hereby designated), East Germany: Halle in Saxony (Copenhagen, on deposit from Kiel). Examined in 1975. New synonym.
- **Ichneumon emarciator* Fabricius, 1798. Supplementum entomologiae systematicae, p. 227. [♀]. des. Lectotype: ♀ (designated by Hedqvist, 1963), East Germany: Halle in Saxony (Copenhagen, on deposit from Kiel). Examined in 1975.
- **Proctotrupes brevipennis* Latreille, 1802. Histoire naturelle . . . des crustacés et des insectes 13: 232. ♀. des. Types: ♀, France (lost).
Serphus brachypterus Schrank, 1802. Fauna Boica 2 (2): 225. des., biol. West Germany: Ingolstadt; Passau.
- **Erodorus bimaculatus* Walckenaer, 1802. Faune Parisienne, Insectes . . . 2: 47. ♀. des. Type: ♀, France: Beauvais (lost).
Bassus campanulator Fabricius, 1804. Systema piezatorum . . . , p. 99. syn., des. East Germany: Halle in Saxony.
Bassus emarciator Fabricius, 1804. Systema piezatorum . . . , p. 100. ♀. syn., des.
Proctotrupes brevipennis Latreille, 1806. Genera crustaceorum et insectorum . . . 1: pl. 13, fig. 1. ♀. fig.
Proctotrupes campanulator Klug, 1807. Mag. . . . Gesell. Naturf. Freunde Berlin 1: 73. syn.
Proctotrupes emarciator Klug, 1807. Mag. . . . Gesell. Naturf. Freunde Berlin 1: 73. syn.
Proctotrupes campanulator Illiger, 1807. Mag. f. Insektenkunde 6: 193. syn.
Proctotrupes campanulator Spinola, 1808. Insectorum Liguriaee . . . 12: 167. syn. Italy: Liguria.
- Oxyurus brevipennis* Lamarck, 1817. Histoire Naturelle des animaux sans vertèbres 4: 129. des. Southern France.
- Ichneumon emarciator* Thunberg, 1822. Mém. Acad. Imp. Sci. St. Pétersbourg 8: 264. key; 1824. *Ibid.* 9: 318. syn.
- Ichneumon campanulator* Thunberg, 1822. Mém. Acad. Imp. Sci. St. Pétersbourg 8: 267. key; 1824. *Ibid.* 9: 332. syn.
- Proctotrupes bimaculata* Lepeletier, 1827. Encyclopédie méthodique . . . insectes 10: 209. ♂, ♀. des. France: near Paris.
- Proctotrupes brevipennis* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain.
- Proctotrupes Gladiator* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum.*

- Proctotrupes bicolor* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.
- Proctotrupes brevipennis* Haliday, 1833. Ent. Mag. 1: 274. syn.
- Codrus campanulator* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 353. ♂, ♀. des. Italy: Liguria.
- Codrus brevipennis* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 355. ♀. des. Germany: Sickershausen [in Franconia].
- Codrus emarciator* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 355. ♀. des. Germany: Sickershausen [in Franconia].
- Proctotrupes gravidator* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 10. syn. (in part).
- **Proctotrupes gladiator* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 10. ♀. des. biol. Types: ♀, Ireland (Dublin). Examination of types reported by Nixon, 1938.
- **Proctotrupes bicolor* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 10. ♂. des. Types: ♂, France and Ireland "near Eblanam" (Dublin). Examination of types reported by Nixon, 1938.
- Proctotrupes gravidator* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key, syn. (in part).
- Proctotrupes gladiator* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes bicolor* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrupes brevipennis* Blanchard, 1840. Histoire naturelle des insectes 3: 284. syn., des. France.
- Proctotrupes campanulator* Blanchard, 1840. Histoire naturelle des insectes 3: 284. des. Europe.
- Proctotrupes brevipennis* Westwood, 1840. An introduction to the modern classification of insects 2: 167. figs.
- Proctotrupes gravidator* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 412. syn. (in part).
- Proctotrupes brevipennis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 414. ♂, ♀. syn., des. Sweden: 4 localities.
- Codrus emarciator* Nylander, 1859. Bidr. Finlands Naturkänn. Etnog. Statis. 4: 112. Finland: "Uguniemi".
- Codrus campanulator* Nylander, 1859. Bidr. Finlands Naturkänn. Etnog. Statis. 4: 112. Finland: Karelén [? = USSR: Kola Peninsula].
- Proctotrupes campanulator* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: 4 localities.
- Proctotrupes Gravidator* Vollenhoven, 1876. Pinacographia, p. 29. ♀. syn., des., figs. Host: *Bolitophila hybrida*. (in part).
- Proctotrupes Campanulator* Vollenhoven, 1876. Pinacographia, p. 29. ♂. des., fig.
- Proctotrupes Emarciator* Vollenhoven, 1876. Pinacographia, p. 29, 31. pl. 18, no. 6. ♀. syn., des., figs. Host: *Mycomya limbata*.
- Proctotrupes brevipennis* var. *emarciator* Martorell & Peñá, 1879. Catalogos sinonímicos de los insectos encontrado en Cataluña, p. 91. Spain: Cataluña. Reference not seen.
- Proctotrypes brachypterus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.
- Proctotrypes gravidator* var. *devagator* (!) Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn.
- Proctotrypes emarciator* Lameere, 1907. Manuel de la faune de Belgique 3. Insectes supérieures . . . , p. 251. key, syn., biol. Belgium. Hosts: larvae of fungus gnats.
- **Serphus (Serphus) Sulcatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 290. ♀. Nees des. repeated in key. New name for *brevipennis* Nees, not Latreille. Type: ♀, Germany: Sickershausen in Franconia (destroyed). Description sufficient for identification. New synonym.
- **Serphus (Serphus) Divagator* var. *Microptera* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 291. ♀. des. in key. Type: ♀, USSR: Charkov (lost). New synonym.

- Serphus (Serphus) Divagator* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 292. ♀. des. in key. Hosts: gall of *Lonchaea lasiophthalma* on *Cynodon dactylon*; *Mycomya limbata*. Germany. Hungary. Italy.
- Serphus (Serphus) Gladiator* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 294. ♂, ♀. des. in key. England. Hungary: Budapest. Ireland. Sweden. Switzerland.
- Serphus (Serphus) Divagator* var. *Brachypterus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 294. ♀. des. in key. Austria. France. Hungary. USSR.
- Serphus (Serphus) Gladiator* var. *Bicolor* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 295. ♂. des. in key. Northern Ireland. Scotland.
- Serphus sulcatus* Kieffer, 1914. Das Tierreich 42: 8. ♀. key, syn., des. Germany.
- Serphus micropterus* Kieffer, 1914. Das Tierreich 42: 9. key, des. USSR: Charkov.
- Serphus divagator* Kieffer, 1914. Das Tierreich 42: 9. ♀. key, syn., des. France. Germany. Hungary. Italy. Hosts: gall of *Lonchaea lasiophthalma*; *Mycomya limbata*.
- Serphus brachypterus* Kieffer, 1914. Das Tierreich 42: 10. ♀. key, des. Austria. France. Hungary. USSR.
- Serphus gladiator gladiator* Kieffer, 1914. Das Tierreich 42: 10. ♂, ♀. key, des. England. Hungary. Ireland. Sweden. Switzerland. USSR.
- Serphus gladiator bicolor* Kieffer, 1914. Das Tierreich 42: 10. ♂. key, des. Ireland. Scotland.
- Proctotrypes devagator* (!) Morley, 1922. Entomologist 55: 60, 109. ♀. key, syn., des., biol. England: near Ipswich. (in part).
- Proctotrypes gladiator* Morley, 1922. Entomologist 55: 60, 110. ♂. key, des., biol. England: 10 localities.
- Phaenoserphus emarciator* Hellén, 1923. Notulae Ent. 3: 32. Finland.
- Serphus gladiator* Saunt, 1930. Ent. Monthly Mag. 66: 152. England: Ramsgate. Hosts: larvae of carabid beetles.
- Proctotrupes gladiator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 451. ♂, ♀. keys, syn., des. England: 3 localities. Ireland.
- Serphus gladiator* Murray, 1939. Entomologist 72: 116. ♂, ♀. biol. Scotland: 2 localities in Dumfriesshire.
- Proctotrupes gladiator* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- Proctotrupes gladiator* Hellén, 1941. Notulae Ent. 21: 33. ♂, ♀. key. Finland: 2 localities.
- Serphus gladiator gladiator* Tomšík, 1944. Ent. Listy 7: 52. ♂, ♀. Czechoslovakia: 2 localities in Moravia.
- Serphus gladiator bicolor* Tomšík, 1944. Ent. Listy 7: 52. ♂. Czechoslovakia: 3 localities in Moravia.
- **Serphus hofferi* Tomšík, 1944. Časopis Č. Spol. Ent. 41: 137. ♀. des., fig. Type: ♀, Czechoslovakia; Hodonín in Moravia (Prague?). Type not seen.
- Proctotrupes gladiator* Varley, 1950. Ent. Monthly Mag. (4) 86: 312. ♀. des. England: Oxford.
- **Serphus azarbaijdzhanicus* Samedov, 1954. Akad. Nauk Azerbaidzhanskoi SSR Dok. 10 (8): 581. ♂, ♀. des., fig., biol. Types: ♂, ♀, USSR: Khaldon district in Azerbaidzhan (location unknown). Host: *Zabrius tenebrioides elongatus*. Identified from description. New synonym.
- Proctotrupes gladiator* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 61. syn. Host: Carabidae larvae.
- Proctotrupes gladiator* Meyer, 1961. Bombus 2: 93. West Germany: Wobek/Krs. Helmstedt.
- Proctotrupes gladiator* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 28, 33. ♂, ♀. ecology. West Germany: 2 localities.
- Proctotrupes gladiator* var. *bicolor* Pisičá & Fabritius, 1962. Studii și Cercetări Științifice Biologie și Științe Agricole (Iași) 13: 82. ♂. des., fig. Rumania.
- Proctotrupes gladiator* Hedqvist, 1963. Ent. Tidskr. 84: 62. ♀. syn. Lectotype of *Ichneumon emarciator* designated.
- Proctotrupes gladiator* Inyaeva, 1964. Rev. d'Ent. de l'URSS 43: 559. figs., biol. Host: *Harpalus rufipes*.

- Proctotrupes gladiator* Meyer, 1963. *Bombus* 2: 143. ♂, ♀. [Denmark]: Sønderborg (= Sønderburg).
- Proctotrupes gladiator* Weidemann, 1965. *Ztschr. f. Morph. u. Ökol. der Tiere* 55: 440 et seq. ecology. West Germany: 5 localities. USSR: 3 localities.
- Proctotrupes gladiator* Weidemann, 1965. *Proc. XII Internat. Cong. Ent.* London 1964. 1965: sect. 6: 427. ecology.
- Proctotrupes gladiator* Stelfox, 1966. *Proc. Roy. Irish Acad.* 64 (B): 535. ♂, ♀. des., biol. Ireland: 4 counties.
- Proctotrupes gladiator* Teodorescu, 1969. *Soc. Ști. Biol. Repub. Socialist. România. Comunicari Zool.* c. 2403: 131. ♂. des. & figs. ♂ genitalia. Rumania: Greci in Tulcea district.
- Proctotrupes gladiator* Pschorn-Walcher, 1971. *Insecta Helvetica* 4. Hymenoptera, p. 35, 37. ♂, ♀. key, des., figs., biol. Austria. France. Germany. Great Britain. Hungary. Italy. Scandinavia. Switzerland. USSR.
- Proctotrupes gladiator* Kozlov, 1971. *Vses. ent. obshch. Trudy* 54: 5. ♀. figs.
- Proctotrupes gladiator* Pschorn-Walcher & Haeselbarth, 1972. *Nachrichtenbl. Bayerischen Ent.* 21: 118. ♂, ♀. Austria. Germany.
- Proctotrupes gladiator* Teodorescu, 1973. *Univ. București Facult. Biol. Rezumatul tezei de doctorat* p. 31. ♂. Rumania.
- Proctotrupes gladiator* Teodorescu & Fabritius, 1975. *In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog.*, p. 166. ♂. Rumania: Arad; Caras-Severin; and Tulcea.
- Proctotrupes gladiator* Kozlov, 1978. *Opredelitel' nasekomykh evropeiskoi chasti SSSR.* t. 3: *Pereponchatokrylye* 2: 542, 544, 545, 546. ♀. key, figs. USSR: western and central Lithuania. Yugoslavia: western part.

Front wing 5.0 to 7.0 mm. long, but in brachypterous specimens (all females) shorter, sometimes so short as to reach only to base of abdomen. Radial cell strongly narrowed toward rear. Sculpture of metapleurum and propodeum a little finer than in *S. caudatus*.

Head and thorax black, the cheek with a dusky ferruginous area next to mandible. Mandible ferruginous, its base black. Palpi brown. Antenna blackish brown to black. Coxae and trochanters black to fusco-ferruginous. Tegula, femora, and tibiae ferruginous. Tarsi fuscous brown. Wings with a pale brownish tinge. Abdomen ferruginous, the petiole black and apical 3 tergites and sternites of male blackish. Ovipositor sheath ferruginous.

Specimens: ♀, Stammersdorf, Austria, A. I. Mader (Townes). ♀, Vienna, Austria, H. Sach (Washington). ♀, Dyrehavn, Zealand, Denmark, Sept. 29, 1907, J. P. Kryger (Washington). ♀, Gentofte, Zealand, Denmark, Sept. 8, 1903, J. P. Kryger (Washington). ♀, Oxford, England, 1976, Linda Losito (Townes). ♀, Villers-le-Bel, France (Washington). ♀, France (Washington). ♂, Budapest, Hungary (St. Paul). ♂, Hungary (Washington). ♀, Gollierstown, Co. Dublin, Ireland Sept. 17, 1949, A. W. Stelfox (Washington). 4♂, Greenhills, Co. Dublin, Ireland, Oct. 11, 1954, A. W. Stelfox (Washington and Townes). 3♂, Landerstown, Co. Kildare, Ireland, Sept. 13, 1942, A. W. Stelfox (Washington). ♂, ♀, Tullybrannigan, Co. Donegal, Ireland, Sept. 17, 1949 and Oct. 1, 1956, A. W. Stelfox (Washington). 2♂, Piacenza, Italy, Sept. 1, 1953 and Oct. 9, 1954 (Ottawa). ♀, Leningrad, Russia, J. Schreiner (Washington). 6♂, Sweden (Cambridge).

This species is widespread in Europe and Russia. It was reported as a parasite of *Zabrius tenebrioides elongatus* by Samedov, 1954 and of *Harpalus rufipes* by Inyaeva, 1954. Both are Carabidae. There are also several records of Diptera as hosts, but these are considered erroneous.

2. Serphus caudatus Say

Figures 150 (pronotum and mesopleurum); 144 and 145 (♂, ♀ propodeum); 456 (ovipositor sheath)

- **Proctotrupes caudatus* Say, 1824. In Keating: Narrative of an expedition to the source of St. Peters River . . . 2: appendix p. 329 (Leconte Ed. 1: 221). ♀. des. Types ♀, USA: Northwest Territory and Missouri (destroyed). Description sufficient for identification.
- **Proctotrupes crenulatus* Patton, 1879. Canad. Ent. 11: 64. ♀. des. Type: ♀, USA: Connecticut (lost). Description adequate for identification.
- Proctotrupes crenulatus* Cresson, 1887. Synopsis . . . Hymenoptera of North America, p. 248. syn.
- Proctotrupes caudatus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 335. pl. XIII, fig. 7. ♂, ♀. key, syn., des., figs. USA.
- Proctotrupes caudatus* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 193. Canada: Osoyoos in Okanagan Valley in British Columbia.
- **Proctotrupes longiusculus* Brues (1908) 1909. Bul. Wisconsin Nat. Hist. Soc. (2) 6: 155. ♂. des., fig. Type: ♂, USA: Harrisburg in Pennsylvania (Washington). Examined in 1975. USA: Enola in Pennsylvania. New synonym.
- Serphus caudatus* Kieffer, 1909. Genera Insectorum 95: 4. syn.
- Serphus longiusculus* Kieffer, 1909. Genera Insectorum 95: 5. syn.
- Proctotrupes caudatus* Smith, 1900. Insects of New Jersey, p. 544. USA: Philadelphia in Pennsylvania.
- Serphus caudatus* Kieffer, 1914. Das Tierreich 42: 13. ♂, ♀. key, des. USA: common.
- Serphus longiusculus* Kieffer, 1914. Das Tierreich 42: 14. ♂. key, des. USA: Harrisburg in Pennsylvania.
- Serphus caudatus* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 529. ♂, ♀. key, des., fig. USA: 2 localities in Connecticut.
- Proctotrupes caudatus* Brimley, 1938. The insects of North Carolina. North Carolina Dept. of Agr., p. 417. USA: Yonahlossee Road in North Carolina.
- Proctotrupes caudatus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 663. Canada: British Columbia; Manitoba. USA: Indiana; Iowa; Kansas; Missouri; Ohio; Tennessee.
- Proctotrupes caudatus* Muesebeck, 1958. U. S. Dept. Agr., Agr. Monog. 2, suppl. 1: 89. syn. USA: District of Columbia; Maryland; New York; Pennsylvania.
- Proctotrupes longiusculus* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♂. type data.

Front wing 5.6 to 8.8 mm. long, but in brachypterous specimens (all females) shorter, sometimes so short as to reach only to base of abdomen. Radial cell only slightly narrowed toward rear. Sculpture of metapleurum and propodeum a little coarser than in *S. brachypterus*. Ovipositor sheath as in figure 456. Brachypterous females are known only from Saskatchewan, Colorado, Wyoming, and Utah.

Entirely ferruginous or the head, thorax, petiole, scape, flagellum, and tarsi more or less infusate or black, or in males often almost entirely black. Males commonly have the head, thorax, scape, flagellum, and tarsi black with some ferruginous stains on the upper part of head, mesoscutum, and pronotum. Females commonly are entirely ferruginous with the flagellum, hind part of thorax, and abdominal petiole mostly fuscous. Wings with a light brown tinge.

Specimens: 112♂, 31♀ from Alberta (Medicine Hat); Colorado (Boulder, Colorado Springs, and South Park); District of Columbia (Washington); Idaho (American Falls); Iowa (Iowa City and Mt. Pleasant);

Kansas (Riley Co.); Manitoba (Aweme); Maryland (Hagerstown, Silver Spring, and Takoma Park); Massachusetts (Dorchester and Wellesley); Michigan (East Lansing, Grand Rapids, and Wayne Co.); Minnesota (Itasca Park and Wabasha); Missouri (Columbus); New Jersey (New Brunswick); New Mexico (Santa Fe and 3 miles southwest of Ute Pass); New York (Nyack, Oswego, Stone Ridge in Ulster Co., and West Farms in New York City); Nova Scotia (Annapolis); Ohio (Columbus); Ontario (Beamsville and Chatterton); Pennsylvania (Danville, Enola, New Market in York Co., North Cumberland, and North East); Quebec (Lac Mondor at St. Flore); Saskatchewan (Indian Head, Saskatoon, and Willow Bunch); South Dakota (Custer State Park); Utah (Panguitch); Virginia (Blacksburg, Charlottesville, and Falls Church); and Wyoming (Powell).

Collection dates are mostly from July 19 through October, with a concentration in September and October. Those outside of this range are May 24 at East Lansing, Mich.; June 16 in Custer State Park, S. Dak.; July 14 at Medicine Hat, Alta.; Nov. 2 at Charlottesville, Va.; and Nov. 16 and 20 at Washington, D. C.

This species occurs in the United States and southern Canada, from the Atlantic Ocean to the Sierra Nevada. It is adult mostly in late summer and early fall.

Gravidator Group

Front wing 3.1 to 5.5 mm. long. Brachypterous specimens unknown. Clypeus wide to moderately narrow. Genal carina sloped mesad to meet oral carina a moderate distance above base of mandible, sometimes the genal carina incomplete ventrad. Thorax of moderate proportions. Side of pronotum wrinkled or punctato-rugulose on collar, in more or less of scrobe, and along upper edge, its hairs having a bare space medially, the bare space very small to quite large (figs. 151-154). Metapleurum reticulate rugose, its upper front corner often punctate and moderately smooth. Propodeal sculpture reticulate, the reticulation tending toward longitudinal wrinkling. Spurs of middle and hind tibiae straight. Radial vein straight or weakly curved. Ovipositor sheath with scattered punctures, 0.7 to 1.0 as long as hind tibia, weakly decurved with strongly down-curved apex (figs. 457-459).

This is a Holarctic group. There are four species.

3. Serphus pallidus Say

Figures 151 (pronotum and mesopleurum),
146 (♂ propodeum), 457 (ovipositor sheath)

**Codrus pallidus* Say, 1828. Contrib. Maclurian Lyceum . . . 1 (2): 80. (Leconte Ed. 1: 382 [♂]. des. Type: ♂, USA: Indiana (destroyed). Description deficient. Name applied according to Ashmead, 1893.

Proctotrupes pallidus Say, 1836. Boston Jour. Nat. Hist. 1: 278. (Leconte Ed. 2: 725). ♂. syn., des.

Proctotrypes pallidus Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 336. ♂, ♀. key, des. USA.

**Proctotrypes coloradicus* Cockerell, 1905. Ann. & Mag. Nat. Hist. (7) 15: 204. ♀. des.
Type: ♀, USA: Boulder in Colorado (Washington). Examined in 1975.

Proctotrypes Coloradicus Cockerell, 1905. Canada. Ent. 37: 362. syn.

Serphus pallidus Kieffer, 1909. Genera Insectorum 95: 5. syn.

Serphus pallidus Kieffer, 1914. Das Tierreich 42: 13. ♂, ♀. key, des. USA.

Serphus pallidus Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 574. ♀.
key, des.

Proctotrupes pallidus Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog.
2: 662. Canada: Ontario. USA: New York to Georgia, west to South Dakota,
Colorado & Oklahoma.

Proctotrupes pallidus Muesebeck, 1958. U. S. Dept. Agr., Agr. Monog. 2, suppl.
1: 89. USA: Idaho.

Proctotrupes coloradicus Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6.
♀. type data.

Front wing 4.0 to 5.9 mm. long. Clypeus about 2.9 as wide as long, with moderately coarse punctures and more or less rugose between the punctures. Genal carina curved strongly toward oral carina, usually not reaching oral carina but near oral carina represented by a few wrinkles. Pronotum rugulose, more finely and weakly rugulose medially and posteroventrally, with a median hairless area that is about 0.7 as large as tegula. Wrinkling in front of lower half of speculum fine, often weak, sloping about 60° from the horizontal. Upper front part of metapleurum weakly rugose to almost smooth, usually with distinct small punctures. Propodeum with a strong median carina, its reticulation usually with a bias toward longitudinal wrinkling. Ovipositor sheath as in figure 457, 0.7 as long as hind tibia.

Entirely fulvous or in males more or less brown or black on head, antenna, thorax, tegula, and abdomen behind the syntergite. Mouth parts, coxae, and trochanters of darker colored males brown. Wings tinged with fulvous brown, the stigma and stronger veins brownish fulvous to dark brown.

Specimens: 81♂, 24♀ from Alabama (Marion); Alberta (Lethbridge, Dominion Ranger Station at Manyberries, and Medicine Hat); Arkansas (Washington Co.); Arizona (Point Sublime in Coconino Co. and Portal); Colorado (Walnut Butte near Boulder at 5,300 ft.); District of Columbia (Washington); Georgia (Atlanta); Idaho (American Falls, Berger, Burley, Hagerman, Hansen, Hollister, Kimama, Milner, Murtaugh, Oakley, Paul, Rupert, and Tuttle); Illinois (Bluffs in Scott Co. and Urbana); Indiana (Lafayette); Iowa (Iowa City and Sioux City); Kansas (Manhattan, Riley Co., and Wellington); Kentucky (Golden Pond and Louisville); Maryland (Takoma Park); Michigan (Menominee Co.); Missouri (Williamsville); Montana (Forsyth); Nebraska (Malcolm); North Dakota (Leonard and Roosevelt Park 13 miles south of Watford City at 2,000 ft.); Ohio (Columbus); Oklahoma (Eagletown); Saskatchewan (Palmer); South Dakota (Elk Point, Sheridan Lake in the Black Hills, Spearfish Creek, and Warrens Woods near White); Tennessee (Knoxville); Texas (Abilene State Park in Taylor Co., Lee Co., and Williamson Co.); Utah (Salt Lake); and Virginia (Prospect Hill).

Collection dates are through the growing season. The earliest and latest dates are May 7 at Manhattan, Kans.; May 20 at Hollister, Ida.; May 22 at Tuttle, Ida.; May 24 at Leonard, S. Dak.; Oct. 17 at Atlanta, Ga.; Oct. 19 in Williamson Co., Tex.; Oct. 20 in Abilene State Park in

Taylor Co., Tex.; Nov. 1 at Marion, Ala.; Nov. 6 at Takoma Park, Md.; and Nov. 10 at Rupert, Ida.

This species occurs in the United States and southern Canada from the Atlantic Ocean to the Rocky Mts. in Canada and westward to Utah in the United States. It is adult throughout the growing season.

4. Serphus gravidator Linnaeus

Figures 152 (pronotum and mesopleurum);

147 (♂ propodeum)

- **Ichneumon gravidator* Linnaeus, 1758. *Systema naturae* . . . edition 10 1: 565. [♂].
des. Type: ♂, Europe (Linnean Soc. Collection in London). Examined in 1975.
- Ichneumon gravidator* (!) Brunnich, 1761. *Prodromus insectologiae Siaeollandicae* . . .
p. 18. [Netherlands]: Zeeland.
- Ichneumon gravidator* Müller, 1775. In Linné: *Vollständiges Natursystem der
Insecten* . . . 2: 855. des. Sweden.
- Ichneumon gravidator* Christ, 1791. *Naturgeschichte, Klassifikation, und
Nomenclature der Insekten* . . . , p. 374. des.
- Ichneumon gravidator* Olivier, 1792. *Encyclopédie méthodique* . . . 7: 192. des.
Europe.
- Ichneumon gravidator* Walckenaer, 1802. *Faune parisienne, insecta* . . . 2: 61. des.
In gardens.
- Banchus gravidator* (!) Fabricius, 1804. *Systema piezatorum* . . . , p. 128. syn., des.
In European gardens.
- Codrus gravidator* Panzer, 1805. *Faunae insectorum germaniae* . . . 85: 9. syn., des.
- Ichneumon gravidator* Bechstein & Scharfenberg, 1805. *Naturgesch. Schädlichen
Forstinsekten* 3: 960. des. Host: *Lymantria monacha*.
- Proctotrubes gravidator* Latreille, 1809. *Genera crustaceorum et insectorum* . . .
4: 38. syn.
- Ichneumon gravidatus* (!) Bechstein, 1818. *Forst und Jagdwissenschaft* . . . 4 (2): 144,
294. des., biol. Host: *Lymantria monacha*.
- Proctotrubes campanulator* Germar, 1822. *Fauna insectorum Europae* 5: figs. 16b,
16c. ♂, ♀. des., figs. Misdet. of *campanulator* Fabricius.
- Ichneumon Gravidator* Thunberg, 1822. *Mém. Acad. Imp. Sci. St. Pétersbourg* 8: 268.
key; 1824. *Ibid.* 9: 331. syn.
- Codrus gravidator* Nees, 1834. *Hymenopterorum ichneumonibus affinium
monographiae*, . . . 2: 354. ♀. des. Germany: Sickershausen [in Franconia].
- Codrus gravidator* Zetterstedt, 1838. *Insecta lapponica* 1: 416. ♂, ♀. des. Lapland.
- Prototrubes gravidator* Haliday, 1839. *Hymenoptera Britannica*. *Oxyura*, p. 10. ♂, ♀.
syn. (in part), des., biol. From Sweden to Italy.
- Proctotrubes gravidator* Curtis, 1839. *British entomology* . . . XVI: text for fig. 744.
key, syn. (in part).
- Proctotrubes gravidator* Thomson, 1857. *Öfvers. Svenska Vetensk. Akad. Förh.*
14: 412. ♂, ♀. syn. (in part), des. All of Scandinavia, including 9 localities in
Sweden.
- Proctotrubes Gravidator* Vollenhoven, 1876. *Pinacographia*, p. 29. pl. 18, fig. 3.
♀. syn., des., figs. Host: *Bolitophila hybrida* (in part).
- Prototrubes gravidator* Fitch, 1880. *Entomologist* 13: 260. ♀. From galls of
Cynips kollari.
- **Proctotrubes meridionalis* Gribodo, 1880. *Bol. Soc. Ent. Italiana* 12: Resoconti, p. 8.
♀. des. Type: ♀, Italy: Piana di Ravello near Nicotera (lost). New synonym.
- **Proctotrubes rufigaster* Provancher, 1881. *Nat. Canad.* 12: 263 (Faune 4: 561). ♂, ♀.
key, des. Lectotype: ♀ (designated by Masner, 1969), Canada: Ottawa (Sainte Foy).
Examined in 1975. New synonym.
- Proctotrubes rufigaster* Ashmead, 1893. *Bul. U. S. Natl. Mus.* 45: 336. ♂. key, des.
Canada: Ottawa.
- Proctotrubes gravidator* Dalla Torre, 1898. *Catalogus hymenopterorum* . . . 5: 464.
syn.

- Proctotrypes gravidator* var. *devagator* (!) Dalla Torre, 1898. *Catalogus hymenopterorum* . . . 5: 465. syn. (in part).
- Proctotrypes rufigaster* Harrington, 1899. *Trans. Roy. Soc. Canada* (2) 5: 193. ♂, ♀. Canada: Hull in Quebec; Ottawa & Sudbury in Ontario; Winnipeg in Manitoba.
- **Proctotrupes collaris* Szépligeti, 1901. In Horvath: *Zoologische Ergebnisse der dritten asiatischen Forschungsreise des Grafen Eugen Zichy* 2: 156. ♀. des. Type: ♀, USSR: Kazan (lost, not found in Budapest in 1975). Specimen from USSR determined by Szépligeti (but not the type) is in Budapest and was examined in 1975. New synonym.
- Proctotrypes rufigaster* Cockerell, 1905. *Canada. Ent.* 37: 362. USA: Monument Rock in Santa Fé Canyon in New Mexico.
- Proctotrypes gravidator* Lameere, 1907. *Manuel de la Faune Belgique* 3. *Insectes supérieurs* . . . , p. 250. key, syn., fig. Belgium. Hosts: larvae of fungus gnats.
- Serphus* (*Serphus*) *Gravidator* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 297. ♂, ♀. des. in key, fig. All of Europe, from Sweden to USSR to Sicily.
- Serphus* (*Serphus*) *Gravidator* var. *Campanulator* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 297. ♀. des. Misdet. of *campanulator* Fabricius.
- **Serphus* (*Serphus*) *Gravidator* var. *Petiolaris* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 297. ♀. des. Lectotype: ♀ (designated by Masner, 1965), Scotland (London). Examined in 1975. Germany. New synonym.
- Serphus* (*Serphus*) *Gravidator* var. *Meridionalis* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 298. ♀. Gribodo des. repeated.
- **Serphus* (*Serphus*) *Gravidator* var. *Nigrescens* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 298. ♂, ♀. Lectotype: ♂ (labeled by Townes in 1974 and hereby designated), Austria: Tragöss (Bitsche). Examined in 1975. England. Italy: Trieste. New synonym. The lectotype represents a race that is common in Austria, with relatively long, smooth wrinkles on the pronotum.
- **Serphus* (*Serphus*) *Gravidator* var. *Indivisus* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 298. No sex nor locality given. Lectotype: ♂ (labeled by Townes, 1975 and hereby designated), France: Paris (Paris). Examined in 1975. New synonym.
- **Serphus* (*Serphus*) *Gravidator* var. *Collaris* Kieffer, 1908. In André: *Species des hyménoptères d'Europe et d'Algérie* . . . 10: 298. No locality nor sex given. Lectotype: ♂ (labeled by Townes, 1975 and hereby designated), Italy: mountains near Pegli [near Genoa] (Genoa). Examined in 1975. Name preoccupied in *Serphus* by Szépligeti, 1901. New synonym.
- Serphus gravidator* Kieffer, 1909. *Genera Insectorum* 95: 11. figs. 4, 6-10, 12, 17.
- Serphus rufigaster* Kieffer, 1909. *Genera Insectorum* 95: 5. syn.
- **Proctotrupes suzukii* Matsumura, 1912. *Thousand insects of Japan suppl.* 4: 156. pl. 52, fig. 5. ♀. des., fig. Type: ♀, Japan: Kyoto on Honshu (Sapporo). Examined in 1975.
- Serphus gravidator gravidator* Kieffer, 1914. *Das Tierreich* 42: 2, 3, 11. ♂, ♀. key, des., figs., biol. Europe: from Sweden to Sicily. Host: *Bolitophila hybrida*.
- Serphus gravidator petiolaris* Kieffer, 1914. *Das Tierreich* 42: 12. ♀. des. Germany. Scotland.
- Serphus gravidator campanulator* Kieffer, 1914. *Das Tierreich* 42: 12. ♀. des. Germany. Italy.
- Serphus gravidator meridionalis* Kieffer, 1914. *Das Tierreich* 42: 12. ♀. des. Italy.
- Serphus gravidator nigrescens* Kieffer, 1914. *Das Tierreich* 42: 12. ♂, ♀. des. Austria: Tragöss. England. Italy: Trieste.
- Serphus gravidator indivisus* Kieffer, 1914. *Das Tierreich* 42: 13. des. Almost all of Europe but rarely.
- **Serphus gravidator ruficollis* Kieffer, 1914. *Das Tierreich* 42: 13. des. Austria. Italy. New name for *collaris* Kieffer.
- Serphus collaris* Kieffer, 1914. *Das Tierreich* 42: 13. ♀. key, des. USSR: Kazan.
- Serphus rufigaster* Kieffer, 1914. *Das Tierreich* 42: 14. ♂. key, des. Canada: Ottawa. USA: New Mexico.

- **Serphus zabriskiei* Brues, 1919. Jour. New York Ent. Soc. 27: 3. ♀. key, des., figs. Type: ♀, USA: Rochester in New York (Cambridge). Examined in 1975. New synonym.
- Proctotrupes gravidator* Morley, 1922. Entomologist 55: 60, 109. ♂, ♀. key, des., biol. England: 16 localities.
- Proctotrupes devagator* (!) Morley, 1922. Entomologist 55: 60, 109. ♀. key, syn., des., biol. England: near Ipswich. (in part).
- Proctotrupes gravidator* Hellén, 1923. Notulae Ent. 3: 32. Finland.
- Proctotrupes rufigaster* Fouts, 1928. Cornell Univ. Agr. Expt. Sta. Mem. 101: 964. USA: Onteora Mt. at 2500 ft. in New York.
- Proctotrupes gravidator* Bischoff, 1931. Senckenbergiana (B) 13 (1): 7 Spain: Huesca. Reference not seen.
- Serphus gravidator* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. ♂, ♀. Belgium: 5 localities.
- Serphus gravidator* Lameere, 1938. Précis de Zoologie 5: 435. fig.
- Proctotrupes gravidator* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 451. ♂, ♀. keys, des., biol. England: 5 localities. Germany: 1 locality. Ireland: 6 localities. Host: *Amara apricaria* larvae.
- Proctotrupes rufigaster* Brimley, 1938. The insects of North Carolina. North Carolina Dept. of Agr., p. 417. USA: Bryson City in North Carolina.
- Serphus gravidator* Crèvecoeur & Maréchal, 1939. Bul. & Ann. Soc. Ent. Belgique 79: 443. Belgium: 2 localities.
- Proctotrupes gravidator* Murray, 1939. Ent. Monthly Mag. 75: 163. ♂. biol. Scotland: Newton Moss in Dumfriesshire.
- Proctotrupes gravidator* Hellén, 1941. Notulae Ent. 21: 32. ♂, ♀. key. Denmark: Furesø. Finland: 60 localities. Sweden: Gotland. USSR: Kola Peninsula.
- Serphus gravidator* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 5 localities.
- Serphus gravidator gravidator* Tomšík, 1944. Ent. Listy 7: 50. ♂, ♀. key. Czechoslovakia: localities in Bohemia and Moravia.
- Serphus gravidator campanulator* Tomšík, 1944. Ent. Listy 7: 50. ♀. key. Misdet. of *campanulator* Fabricius.
- Serphus gravidator meridionalis* Tomšík, 1944. Ent. Listy 7: 50. ♀. key.
- Serphus gravidator petiolaris* Tomšík, 1944. Ent. Listy 7: 51. ♀. key. USSR: Uzhgorod.
- Serphus gravidator nigrescens* Tomšík, 1944. Ent. Listy 7: 51. ♂. key. Czechoslovakia: various localities in Bohemia & Moravia.
- Serphus gravidator indivisus* Tomšík, 1944. Ent. Listy 7: 51. ♂, ♀. key. Czechoslovakia: localities in Bohemia & Moravia. Yugoslavia: Vrlika.
- Serphus gravidator ruficollis* Tomšík, 1944. Ent. Listy 7: 51. ♀. key. Czechoslovakia: localities in Moravia.
- **Serphus gravidator antennalis* Tomšík, 1944. Ent. Listy 7: 51. ♂. key, des. Type: ♂, Czechoslovakia: Somotor (Prague?). Type not seen. New synonym.
- Proctotrupes gravidator* Watanabe, 1949. Insecta Matsumurana 17: 23. ♂, ♀. syn., des., fig. Europe. Japan.
- Proctotrupes zabriskiei* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. syn.
- Proctotrupes gravidator* Leclercq, 1952. Lambillionea 52: 71. Belgium: 2 localities.
- Proctotrupes gravidator* Zhigaeov, 1954. Tr. Inst. entomol. i fitopatol. AN USSR 5: 157-158. [Host: *Lacon murinus*]. Reference not seen.
- Proctotrupes gravidator* Richards, 1956. Handbooks for the identification of British insects. Roy. Ent. Soc. London 6 (1): 44, 64. figs.
- Proctotrupes gravidator* Gradwell, 1957. Ent. Monthly Mag. 93: 149. ♀. des. England: Wytham in Berkshire.
- Serphus* (*Phaenoserphus*) *gravidator* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. Italy: Trieste. Yugoslavia: Tolmin.
- Proctotrupes gravidator* Gilbert, 1958. Ent. Monthly Mag. 94: 153. biol. England: Anglesey. Host: *Amara bifrons*.
- Proctotrupes gravidator* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 61. North, west, central, & south Europe. Japan. Host: Carabidae larvae.

- Serphus gravidator* Dobrovolskii, 1959. IX Internatl. Konf. für Quarantäne u. Schutz der Pflanzen vor Schädli- u. Krankheiten Moskau 1958 p. 12. biol. Host: *Lacon murinus*.
- Proctotrupes gravidator* Oeser, 1961. Mitt. Zool. Mus. Berlin 37: 71, 116, 117. ♀. morphology, figs.
- Proctotrupes gravidator* Meyer, 1961. Verh. Ver. Naturw. Heimatforsch. Hamburg 35: 69. ♀. West Germany: Hohwacht in East Holstein.
- Proctotrupes gravidator* Meyer, 1961. Bombus 2: 93. West Germany: 5 localities.
- Proctotrupes gravidator* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 28, 33. ecology. West Germany: 8 localities.
- Proctotrupes gravidator* Pisiică & Fabritius, 1962. Studii și Cercetari Științifice, Biologie și Științe Agricole (Iași) 13: 80. ♂, ♀. des., figs. Rumania: 9 localities.
- Proctotrupes gravidator* Hedqvist, 1963. Ent. Tidskr. 84: 62. ♂, ♀. syn. Sweden: 2 localities. Host: *Amara* sp. Lectotype of *P. bistratus* designated. (in part).
- Proctotrupes gravidator* Meyer, 1963. Bombus 2: 143. ♂, ♀. [Denmark]: Sønnderborg (= Sonderburg).
- Proctotrupes gravidator* Palm, 1964. Opuscula Ent. 29: 246. ♀. biol. Sweden. Host: *Amara* larva.
- Proctotrupes gravidator* Injaeva, 1964. Rev. d'Ent. de l'URSS 43: 558. ♀. biol. Hosts: *Amara* (8 - 10 species); *Harpalus* (2 - 3 species).
- Proctotrupes gravidator* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 4. [China]: Manchuria. Europe. Japan. [USSR]: Siberia.
- Proctotrupes gravidator* var. *petiolaris* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 9. ♀. lectotype designated.
- Proctotrupes gravidator* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. Austria. Switzerland. USSR: 4 localities. West Germany: 10 localities. Yugoslavia.
- Proctotrupes gravidator* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Proctotrupes zabriskiei* Masner, 1966. Psyche 72: 298. ♀. type data.
- Proctotrupes rufigaster* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog. 2, suppl. 2: 286. USA: New Hampshire.
- Proctotrupes gravidator* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 534. des., biol. Ireland: 14 counties.
- Proctotrupes gravidator* Teodorescu, 1969. Soc. Ști. Biol. Repub. Socialist. Comunicări de Zool. c. 2403: 130. ♂, ♀. des. & fig. ♂ genitalia. Rumania: 9 localities.
- Proctotrupes rufigaster* Masner, 1969. Nat. Canad. 96: 781. ♀. lectotype designated.
- Proctotrupes gravidator* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 9, 35, 36, 37. ♂, ♀. key, des., figs., biol. From all of Europe (including Switzerland) from the Mediterranean Region (including Yugoslavia) through the Soviet Union to Siberia and Japan.
- Proctotrupes gravidator* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 118. From Lake Garda, Italy to the alpine region of the central Alps.
- Proctotrupes gravidator* Kozlov, 1972. Insects of Mongolia 1: 646. Mongolia: 9 localities. Hosts: larvae of *Amara* & *Harpalus*.
- Proctotrupes gravidator* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 31. ♂, ♀. Rumania.
- Proctotrupes gravidator* Teodorescu & Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 116. ♂. Rumania. Common.
- Proctotrupes gravidator* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 539, 544, 545, 546. ♀. key, figs. Widespread.

Front wing 3.3 to 5.8 mm. long. Clypeus about 3.0 as wide as long, its subapical punctures large and shallow with usually low rugosity between the punctures. Genal carina sometimes joining oral carina or sometimes fading to a few oblique wrinkles before reaching oral carina. Side of pronotum with hairs over its entire surface except usually for a

median hairless (or very sparsely hairy) area about 0.7 as large as the tegula. Wrinkling in front of lower half of speculum moderately coarse and usually irregular, slanted about 30° from the horizontal. Upper front corner of metapleurum rugose, sometimes with distinct punctures. Propodeum in profile strongly arched. Surface of propodeum with coarse strong reticulation and a median carina. Ovipositor sheath about 1.0 as long as hind tibia, similar in length and shape to that of *S. terminalis* (fig. 458).

Black. Scape and mandible usually stained with ferruginous. Palpi brown to blackish. Tegula ferruginous to fuscous. Coxae dark brown to blackish. Trochanters ferruginous to dark brown. Femora ferruginous or more or less infusate, sometimes black. Tibiae and tarsi fulvous or ferruginous to dark brown. Abdomen ferruginous or fusco-ferruginous, the petiole black and apical 0.4± fusco-ferruginous to black. Ovipositor sheath ferruginous, its curved tip blackish toward apex. Wings with a faint tinge of brown, the stigma and strong veins dark brown.

Nearctic specimens: 35♂, 7♀ from Alaska (Unalakleet); California (Alameda); Manitoba (Churchill); Michigan (Cheboygan Co.); Northwest Territories (Baychimo Harbor on Bathurst Island and Reindeer Depot); Nova Scotia (Aldershot); Ontario (Ottawa); Prince Edward Island (Dalvay House in Canadian National Park); Quebec (Cap Chat and Cap Rouge); and Yukon Territory (Firth River in British Mts. and Firth River).

Collection dates for Nearctic specimens are from July 6 to August 27, plus a record for June 19 at Unalakleet, Alaska.

Palaearctic specimens: 126♂, 26♀ from Austria (Bucklige Welt, Guntraumsdorf, Linz, Marchfeld, Marchtrenk, Pottsching, Sarleinsbach, Scheffau in Tirol at 800 m., Schiltenberg, Stammersdorf, Tirol at 900 m., Traun, Traunau, and Vienna); China (Ningyenfu at 6,000 to 10,800 ft.); Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Dawlish Warren in Devon, Leicester, and Oxford); Hungary (Budapest); Ireland (Rathmines in Co. Dublin, Annagh in Co. Westmeath, Balbriggan in Co. Dublin, Ballyhack in Co. Wexford, Bellevue in Co. Wicklow, Cartron in Co. Westmeath, Dollymount in Co. Dublin, Dunes Lahinch in Co. Clare, Dunkerrin, Furry Glen in Co. Dublin, Green Hills in Co. Dublin, Harold's Cross in Co. Dublin, Co. Kerry, Kilkeel in Co. Donegal, Killbarrack in Co. Dublin, Killaughter in Co. Wicklow, Little Bray in Co. Dublin, Glengariff, Meeting of the Waters in Co. Wicklow, Rush in Co. Dublin, and Tullaghan in Co. Leitrim); Italy (Castegglo in Paria, Mareto in Piacenza, Naturno in Trentino at 500 to 1,000 m., Piacenza, and Pracorno in Trento); Japan (Niizamachi in Saitama and Yokohama); Jordan (Dehbeenob Jerash); Poland (Stettin); Spain (Grenada at 700 m. and Valencia); Sweden (Åhus in Skaraborg, Andebol in Östergötland, Hällnäs in Västerbotten, and Småland); Turkey (Pamukkala b. Denizli); and West Germany (Gelnhausen, Ingelheim am Rhein, Mainz, and "Hensburg").

Collection dates for Palaearctic specimens are from May 27 to October 16; also April 15 at Niizamachi, Saitama, Japan. April 26 at Pamukkala b. Denizli, Turkey; and May 6 at Dehbeenob Jerash, Jordan.

This species is Holarctic. In the Nearctic Region it occurs from the Canadian to the Arctic zones. In the Palaearctic Region it ranges into

warmer climates. In Europe it has been reported as a parasite of various Carabidae by Nixon, 1938, Gilbert, 1958, and Injaeva, 1964. Additional records, from non-carabid hosts, are considered erroneous.

5. Serphus maurus Kieffer

**Serphus (Serphus) Maurus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 295. ♂, ♀. des. in key. Lectotype: ♀ (labeled by Townes, 1975 and hereby designated), Italy: [Breuil], Val d. Aosta [near Mt. Blanc] (Genoa). Examined in 1975.

Serphus maurus Kieffer, 1914. Das Tierreich 42: 10. ♂, ♀. key, des. Northern Italy.

Size and general structure similar to that of *S. gravidator*, except that side of pronotum has a median hairless area that is about 0.35 as large as tegula and that genal carina joins oral carina at an angle of about 70°.

Black. Colored as in *S. gravidator* except that the hind femur is dark brown, front and middle femora medium brown, and abdomen entirely black except sometimes for restricted ferruginous stains on the syntergite.

This is probably a local race or subspecies of *S. gravidator*.

Specimens: Redescribed from the types (♂ and ♀), from Breuil, Val d. Aosta [near Mt. Blanc], Italy, Aug. 30, 1906, Solari (Genoa).

6. Serphus terminalis Ashmead

Figures 153 (pronotum and mesopleurum); 148 (♂ propodeum);
458 (ovipositor sheath)

**Proctotrypes terminalis* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 337. ♂. key, des. Lectotype: ♂ (designated by Muesebeck & Masner, 1968), USA: Columbus in Ohio (Washington). Examined in 1975. USA: Washington in D. C.

**Proctotrypes Linellii* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 337. ♂. key, des. Type: ♂, USA: Long Island [in New York] (Washington). Examined in 1975. New synonym.

Proctotrypes terminalis Kieffer, 1906. Berlin. Ent. Ztschr. 50: 276. ♂. des. USA: Santa Clara in California.

Proctotrypes terminalis Brues, (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 112. key. USA: Washington Territory.

Serphus Linnellii (!) Kieffer, 1909. Genera Insectorum 95: 4. syn.

Serphus terminalis Kieffer, 1909. Genera Insectorum 95: 5. syn.

Serphus terminalis Kieffer, 1914. Das Tierreich 42: 15. ♂. key, des. USA: California; Ohio; Washington in D. C.

Serphus linellii Kieffer, 1914. Das Tierreich 42: 15. ♂. key, des. USA: Long Island in New York.

Serphus linellii Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 574. key, des.

Proctotrupes terminalis Fouts, 1928. Cornell Univ. Agr. Expt. Sta. Mem. 101: 964. USA: 3 localities in New York.

Proctotrupes terminalis Johnson, 1930. Nantucket Maria Mitchell Assoc. 3 (2): 107. USA: Nantucket Is. in Massachusetts.

Proctotrupes terminalis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. USA: California; D. C.; Iowa; Kansas; Michigan; Ohio; South Dakota; Washington.

Proctotrupes linellii Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♂. type data.

Proctotrupes terminalis Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 7. ♂. lectotype designated.

Front wing 3.2 to 5.8 mm. long. Clypeus about 2.7 as wide as long, with moderate sized punctures and usually some large shallow punctures between which the clypeus is weakly rugose. Genal carina joining oral carina. Side of pronotum with fine hairs except for a median hairless area that is about 2.0 the size of tegula. Lower hind corner of side of pronotum (below spiracular swelling and in and behind the sulcus) smooth, with a moderate number of fine hairs. Wrinkling in front of lower half of speculum mostly regular and strong, slanted at 60° from the horizontal. Upper front corner of metapleurum moderately smooth, with distinct punctures, or sometimes rugose and not distinctly punctate. Profile of propodeum a little less strongly arched than in *S. gravidator*. Surface of propodeum with coarse strong reticulation and a median carina that disappears on the apical slope of propodeum. Ovipositor sheath about 1.0 as long as hind tibia, its apical curve tapered to a point (fig. 458).

Black. Clypeus and scape ferruginous to black. Mandible partly or mostly ferruginous. Palpi brown or dark brown. Tegula ferruginous. Legs ferruginous, the hind coxa more or less infuscate and hind femur sometimes brownish, or in specimens from the Rocky Mountains westward the front and middle coxae reddish brown to black, front and middle trochanters and femora ferruginous to black, hind femur nearly always darkened with apical 0.15 of all femora ferruginous or brown, and tibiae and tarsi ferruginous to brown. Wings with a faint tinge of brown. Stigma and strong veins dark brown. Abdomen ferruginous, the apex of syntergite and the abdomen beyond syntergite usually fusco-ferruginous to black. Petiole black. Ovipositor sheath ferruginous, its apical curve blackish.

Specimens: 1, 148♂, 177♀ from Alabama (Coosa River in Chelton Co. and Longdale); Alaska (Anchorage, Colville River at Umiat, and Nunivak); Alberta (Acme, 14 miles north of Banff at 4,500 ft., "Big River", Brooks, Cassils, Conrad, Drumheller, Edmonton, Elkwater Park, Frank, Grand Prairie, High Prairie, Johnston Canyon near Banff at 4,700 ft., Jumping Pound Creek 20 miles west of Calgary, Kananaskis, Lethbridge, "Levine", Lundbreck, Manyberries, McMurray, Milk River, 15 miles east of Morley, Oldman River, Red Deer, Rycroft, Scandia, Slave Lake, Stettler, Valleyview, and Waterton); Arizona (Greenland Lake in Coconino Co. and Oak Creek Canyon); Arkansas (Fayetteville); British Columbia (Bear Lake at 7,000 ft., Bowser, Chilcotin, Clinton, Gagnon Road 6 miles west of Terrace at 220 ft., Jesmond, Kamloops, Ketchum Lake at 3,600 ft., Mt. Douglas in Victoria, Oak Bay in Victoria, Okanagan Valley, Pete Lake, Revelstoke, Robson, Sawmill Lake at Oliver, Spring Creek at Terrace, Summerland, 54 miles northeast of Terrace, Vaseaux Lake at Oliver, White Lake 9 miles northwest of Oliver, Williams Lake, and near Woodcook); California (Anderson in Shasta Co., Berkeley, Carnelian Bay on Lake Tahoe, Dardanelles, Fish Camp, near Jamesburg, near Leggett,

Mt. Tamalpais in Marin Co., 4 miles west of Quincy in Plumas Co., Sagehen Creek in Nevada Co., San Jose, 4 miles north of Silver Lake in Amador Co., and 15 miles southeast of Smith Mill); Colorado (Boulder at 5,000 ft., Chicago Creek in Clear Creek Co. at 8,800 ft., Colorado Springs at 6,000 to 7,000 ft., Deer Creek Canyon at 5,000 ft., Doolittle Ranch on Mt. Evans at 9,800 ft., Estes Park, Glen Haven, 4 miles west of Golden at 7,400 ft., Granby at 7,900 ft., Jefferson at 9,400 ft., Lyons at 5,000 ft., Pagosa, Rabbit Ears Pass at 9,500 ft., and Steamboat Springs); Connecticut (Canaan and Kent); District of Columbia (Rock Creek Park); Georgia (Clayton at 2,000 ft. and Pine Mt. in Rabun Co. at 1,400 ft.); Idaho (Challis in Custer Co., Galena Summit near Stanley at 8,700 ft., Glens Ferry, Hazelton, Idaho City, Jerome, Lowman at 4,000 ft., Moscow, Priest Lake, Swan Lake in Bannock Co., and Wallace); Illinois (Chicago and Urbana); Iowa (Ames, Dubuque, Mt. Pleasant, and Sioux City); Kansas (Baldwin, Lawrence, and Manhattan); Maine (Casco Bay, Monmouth, Oquossoc, Perry, Salsbury Cove, and Seal Harbor on Mt. Desert); Manitoba (Aweme, Bald Head Hills 14 miles north of Glenboro, Carberry, Churchill, Cranberry Portage, Melita, 5 miles north of Minnedosa, Ninette, Reynolds, Riding Mt. Park, 5 miles southwest of Shilo, Treesbank Ferry, Virden, and Winnipeg); Maryland (Forest Glen, Laurel, Patuxent Refuge near Bowie, Plummers Island near District of Columbia, and Takoma Park); Massachusetts (Amherst, Auburndale, Blue Hills Res. near Milton, Dorchester, Forest Hills, Holliston, Nantucket, North Framingham, Wellesley, and Woods Hole); Michigan (Allegan State Game Area in Allegan Co., Baraga Co., Big Star Lake in Lake Co., Clare Co., Delta Co., East Lansing, Galien in Berrien Co., Gladwin Co., Gratiot Co., Gull Lake Biological Station in Kalamazoo Co., Leelanau Co., Luce Co., Mackinac Co., Manistique, Mason Co., Mecosta Co., Midland Co., Missaukee Co., Newaygo Co., Port Austin in Huron Co., and 3 miles northeast of Quincy in Branch Co.); Minnesota (Baptism Creek in Lake Co., Basswood Lake in Lake Co., Blackduck, Camp Carlos near Alexandria, Cascade River near Lake Superior in Cook Co., Chisago Co., Clearwater Co., Crow Wing Co., Desoto Lake in Itasca Park, Fairbault Co., Hennepin Co., southeastern tip of Houston Co., south of Minneiska in John Latch State Park, North Branch, Oakland Park in St. Paul, Pine Co., Plummer, Polk Co., Pope Co., Roseau Co., St. Anthony Park in Ramsey Co., Sandstone, Two Rivers State Park in Kittson Co., Wabasha Co., Washington Co., Winnebago Creek Valley, and Yellow Medicine Co.); Missouri (Columbia); Montana (Bozeman and Toston); Nebraska ("Dunning", Fontinella Forest in Omaha, Overton, and Sheridan Co.); Nevada (Green Mt. Creek in Elko Co., Patrick in Washoe Co., and Tuscarora); New Brunswick (Nerepis and Tabusintac); Newfoundland (Gander, Goose Bay, Nain, Raleigh, and agricultural experiment station at St. Johns); New Hampshire (Dolly Copp Camp in the White Mts., Dublin, Hanover, Keene, Littleton, and Pinkham Notch); New Jersey (Moorestown and Trenton); New Mexico (Hawley Lake at 8,000 ft. and Ruidoso in Lincoln Co.); New York (Babylon, Bayville, Barrytown, Bear Mt. in Palisades Park, Bemus Point, Canadarago Lake, Greene Co. at 2,500 ft., Ithaca, Manitou Beach, New Berlin, New York City, Oak Orchard Swamp in Genesee Co., Poukeepsie, Seacliff, and Shokan); North Carolina

(Cherokee, Clinton, Crabtree Meadows in Yancey Co., Highlands, Morganton, Mt. Mitchell at 6,400 ft., Mt. Pisgah at 5,000 to 5,700 ft., North Fork of Swannanoa River, Wayah Gap in Macon Co. at 3,800 ft., White Lake in Columbus Co., and Whiteside Cove near Highlands); North Dakota (Leonard, McHenry Co., Tower City, and University); Nova Scotia (Kentville and Truro); Northwest Territories (Fort Simpson); Ontario (Bancroft, Beamsville, Belleville, Bells Corners, Brighton, Britannia, Chatterton, Crystal Beach at Madoc, Dresden, Fitzroy Harbor, Florence, Frankford, Goderich, Golden Lake, Guilds, Jordan, Leamington, Marmora, Maynooth, Mer Bleue near Ottawa, "Mt. Pokenham" Ogoki, One-sided Lake, Orillia, Ottawa, Rockcliffe, Rondeau Park, St. Catherines, Sudbury, Turkey Point, Tweed, and Wilcox Lake); Oregon (Ashland, Catherine Creek in Union Co. State Park, Corvallis, Hat Rock State Park in Umatilla Co., La Grange, Oak Creek in MacDonald Forest near Corvallis, Riley, Seaside, Siskiyou, Three Creeks Lake, and Vale); Pennsylvania (Milford and Philadelphia); Prince Edward Island (Brackley Beach in Canadian National Park); Quebec (Beach Grove in Gatineau Park, Brome, Cascapedia, Chimo, Danford Lake, Ellis Bay on Anticosti Island, Forestville, Gracefield, Granby, Great Whale River, Hull, Kazabazua, King Mt. near Old Chelsea at 1,150 ft., Knowlton, Lac Brûle, Lac Mercier, Lac Mondor at Ste. Flore, Mistassini, Mt. Albert at 1,500 ft., Old Chelsea, Shawville, Stoneham, "Williamsville", and Yarm); Rhode Island (Westerly); Saskatchewan (Big River, Christopher Lake, Elbow, Indian Head, Pike Lake, Saskatoon Landing, Saskatchewan River, Saskatoon, Scout Lake, Swift Current, Swift River, Val Marie, Waskesiu, White Fox, Willow Bunch, and Wood Mt.); South Carolina (Anderson, Cleveland, Long Cane Creek near Greenwood, and Seneca); South Dakota (Brookings, Custer State Park, Elk Point, Highmore, Vermillion, and White); Tennessee (Clingmans Dome in Smoky Mts. Park, Cub Lake Camp in Natchez Trace State Park in Henderson Co., and Knoxville); Texas (Rockpile 30 miles northwest of Fort Davis at 8,000 ft.); Utah (Cramer, Delta, Duck Creek in Kane Co. at 9,000 ft., Echo in Summit Co., Ogden, and Vernal); Vermont (Grand Isle, South Newfane, and Woodstock); Virginia (Arlington, Blacksburg, Chain Bridge near District of Columbia, Eagle Rock, Falls Church, Glencarlyn, Great Falls, Mt. Vernon, Rosslyn, and Vienna); Washington (Almota, Dalesport, Elbe, Mt. Rainier at 2,700 ft., Okanogan, Ritzville, Seattle, Swank Creek near Blewitt Pass, Wawawai, and Yakima); West Virginia (Bolivar); Wisconsin (Grantsburg, Jacksonport in Door Co., and Milwaukee); Wyoming (Canyon Camp in Yellowstone Park, Grand Teton Park, Laramie, Moran, and Saratoga); and Mexico (Atlatcomulco at 8,500 ft., 10 kilometers northeast of Agua Bendita at 10,000 ft., Cholula in Puebla, 6 miles east of Durango at 6,000 ft., Navíos 26 miles east of El Salto at 8,000 ft., 3 miles west of Oaxaca, 3 miles east of Rio Frio, and 10 miles east of Toluca at 5,900 ft.).

Collection dates are mostly from May 20 to September 15. The records prior to May 15 and after September are as follows: March 23 at Berkeley, Calif.; May 1, 14, and 15 at Wawawai, Wash.; May 1 at White Lake, Columbus Co., N. C.; May 4 to 5, 6 to 8, and 9 to 11 at Quincy, Branch Co., Mich.; May 5 at Cleveland, S. C.; May 6 at East

Lansing, Mich. and at Glencarlyn, Va.; May 9 at Dalesport, Wash. and in Washington Co., Minn.; May 10 at Mt. Pleasant, Ia., May 14 at Oliver, B. C. and at Pine Mt., 3,800 ft., Rabun Co., Ga.; October 3 at East Lansing, Mich.; October 4 at Rockcliffe, Ont.; October 6 at Edmonton, Alta., October 8 at Summerland, B. C.; October 9 at Ashland, Oreg., October 10 and 20 at Babylon, N. Y.; October 30 at Corvallis, Oreg.; and November 25 at Vienna, Va.

This species occurs throughout the Canadian, Transition, and Upper Austral zones of the Nearctic Region. It is adult from mid spring to early fall. Collections are usually made in non-forested habitats.

7. Serphus bistriatus Möller

Figures 154 (pronotum and mesopleurum); 149 (σ propodeum);
459 (ovipositor sheath)

- **Proctotrupes bistriatus* Möller, 1882. Ent. Tidskr. 3: 180. ♀. des. Lectotype: ♀ (designated by Hedqvist, 1963), Sweden: "Kempinje" Bog (= Ljung) (Göteborg). Examined in 1975.
- Proctotrypes bistriatus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.
- **Disogmus pubescens* Kieffer, (1905) 1906. Berlin. Ent. Ztschr. 50: 272. ♂, ♀. key, des. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), USA: Ormsby [Co.] in Nevada (San Francisco). Examined in 1975. New synonym.
- Disogmus bistriatus* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 279. Möller des. repeated in key. Scandinavia.
- **Proctotrypes florissantensis* Rohwer, 1909. Trans. Amer. Ent. Soc. 35: 134. ♂, ♀. des. Lectotype: ♀ (designated by Muesebeck & Masner, 1968), USA: Colorado (Washington). Examined in 1975. New synonym.
- Disogmus pubescens* Sanders, 1910. Canad. Ent. 42: 48. ♀. biol. USA: Aurora & Urbana in Illinois. Host: *Amara carinata*.
- Serphus florissantensis* Kieffer, 1914. Das Tierreich 42: 5. syn. (in part).
- Disogmus bistriatus* Kieffer, 1914. Das Tierreich 42: 17. ♀. key, des. Scandinavia.
- Disogmus pubescens* Kieffer, 1914. Das Tierreich 42: 20. ♂, ♀. key, des. USA: Ormsby [Co.] in Nevada.
- **Serphus cockerelli* Brues, 1919. Jour. New York Ent. Soc. 27: 4. ♂. key, des., figs. Type: ♂, USA: Eldora in Colorado (Cambridge). Examined in 1975. New synonym.
- **Serphus sequoiarum* Brues, 1919. Jour. New York Ent. Soc. 27: 4. ♂. key, des., figs. Type: ♂, USA: Muir Woods in Marin Co. in California (Cambridge). Examined in 1975. New synonym.
- **Serphus debilis* Brues, 1919. Jour. New York Ent. Soc. 27: 5. ♂. key, des., figs. Type: ♂, USA: Wawawai in Washington (Cambridge). Examined in 1975. New synonym.
- Serphus florissantensis* Snodgrass, 1941. Smithsonian Misc. Collect. 99 (14): 39 & pl. 10. ♂. figs., morphology.
- **Serphus gravidator niger* Tomsík, 1944. Ent. Listy 7: 51. ♂, ♀. key, des. Syntypes: 11♂, 1♀, Czechoslovakia: 1 locality in Bohemia; 7 localities in Moravia (Prague?). Identified from the description. New synonym.
- Proctotrupes debilis* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 663. syn.
- Proctotrupes sequoiarum* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. ♂: 663. syn.
- Proctotrupes florissantensis* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 663. USA: Colorado; Idaho; Iowa.
- Disogmus pubescens* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. USA: Illinois; Nevada. Host: *Amara carinata*.

- Phaenoserphus cockerelli* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 664. syn.
- Proctotrupes florissantensis* Muesebeck, 1958. U. S. Dept. Agr., Agr. Monog. 2, suppl. 1: 89. USA: Washington; Wyoming.
- Proctotrupes gravidator* Hedqvist, 1963. Ent. Tidskr. 84: 62. ♂, ♀. syn. (in part). Sweden: 2 localities. Host: *Amara* sp. Lectotype of *P. bistriatus* designated.
- Proctotrupes cockerelli* Masner, 1966. Psyche 72: 297. ♂. type data.
- Proctotrupes debilis* Masner, 1966. Psyche 72: 298. ♂. type data.
- Proctotrupes sequoiarum* Masner, 1966. Psyche 72: 298. ♂. type data.
- Proctotrupes florissantensis* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 6. ♀. lectotype designated.

Front wing 3.0 to 5.0 mm. long. Clypeus about 2.6 as wide as long, with moderately small punctures, its surface smooth or with low weak wrinkling. Genal carina meeting oral carina. Side of pronotum in and in front of sulcus rugulose or punctato-rugulose, behind the sulcus smooth except for some fine wrinkling along upper margin. Side of pronotum with moderately sparse fine hairs in front of sulcus, along upper margin, and near spiracle, elsewhere hairless (except sometimes with up to 4 hairs in lower corner). Wrinkling in front of lower half of speculum weak and irregular, slanted about 50° from the horizontal. Upper front corner of metapleurum rugulose. Propodeum with a sharp median carina that reaches apex or may become obsolete on apical slope. Reticulation of propodeum a little finer, sharper, and less regular than in *S. terminalis*. Ovipositor sheath about 1.0 as long as hind tibia, its curved tip a little thicker than in *S. terminalis* and *S. gravidator* (fig. 459).

Black. Median part of mandible ferruginous. Tegula ferruginous or fusco-ferruginous. Coxae and trochanters fuscous to black. Femora ferruginous to black with apical 0.15 reddish brown, the hind femur nearly always at least a little infuscate. Tibiae and tarsi ferruginous to brown. Wings with a tinge of brown. Stigma and stronger veins blackish brown. Abdomen black, dusky ferruginous, or rarely ferruginous, usually darker apically. Petiole black. Ovipositor sheath ferruginous, the curved tip black, more extensively black or blackish than in *S. gravidator* and *S. rufigaster*.

European specimens: ♀, Zwiesselstein, 1,400 m., Tirol, Austria, J. R. Vockeroth (Ottawa). ♀, Köping, Västerbotten, Sweden, Oct. 6, 1972, K.-J. Heqvist (Stockholm). 12♂, 8♀, Messaure, Sweden, collected on 14 different dates from Aug. 1 to Oct. 10, 1971 and 1972, Karl Müller (Townes).

Nearctic specimens: 507♂, 131♀ from Alaska (Badenburgh Butte, Colville Road at Umiat, Delta Junction, Fairbanks, King Salmon River at Naknek, Matanuska, Mt. McKinley at 1,600 ft., Paxson, Savage River in Mt. McKinley Park, Skagway, Tangle Lakes, Tsaina River, Umiat, and Unalakleet); Alberta (Banff, 14 miles north of Banff at 4,500 ft., Brooks, Burmis, Calgary, Cassils, Edmonton, Elkwater, Frank, Grand Prairie, Grimshaw, Hotchkiss, Irvine, Jasper, Jumping Pound Creek 20 miles west of Calgary, Kananaskis, Lake Louise, Mc-Murray, Dominion Ranger Station at Manyberries, Morrin, Medicine Hat, 15 miles east of Morley, Orion, and Waterton); British Columbia (Atlin, Clinton, Deep Bay on Vancouver Island, Diamond Head Trail near Squamish, Kaslo, Ketchum Lake at 3,600 ft., Longford, Merritt, Mt.

Henry in Revelstoke Park at 6,200 ft., 5 miles south of Nanaimo, Oliver, Robson, Rock Creek, Rolla, Saanich District, Summerland, Summit Lake at mile 392 on Alaska Highway, Stone Mt. Park at 3,800 ft., and Vaseaux Lake at Oliver); California (Hallelujah Junction in Lassen Co., Hope Valley in Alpine Co., San José, Sierra Co., Tule Lake in Siskiyou Co., and Westwood); Colorado (Boulder Canyon at 7,800 ft., Caribou near Nederland at 10,000 ft., Chicago Creek in Clear Creek Co. at 8,800 ft., Creede at 9,000 ft., Denver, Doolittle Ranch on Mt. Evans at 9,800 ft., Durango at 6,000 ft., Echo Lake on Mt. Evans at 10,600 ft., Estes Park at 7,500 ft., west of Estes Park at 7,800 ft., Fairplay at 9,800 ft., Florissant, Gothic at 9,600 ft., Hoosier Pass at 12,000 ft., Idaho Springs at 9,800 ft., Jefferson at 9,400 ft., Loveland Pass at 9,850 ft. and at 12,000 ft., Lyons at 5,000 ft., Mt. Evans at 11,700 ft. and 12,000 ft., Mt. Goliath in Clear Creek Co. at 10,900 ft., Muddy Pass in Jackson Co. at 8,800 ft., Nederland at 9,500 ft., Pando, Peaceful Valley, Phantom Valley in Rocky Mt. Park at 9,400 ft., Pineywood Springs in Larimer Co., Rabbit Ears Pass at 9,500 ft., State Bridge near Bend at 7,000 ft., Steamboat Springs, Summit in Albany Co. at 8,500 ft., Summit Lake on Mt. Evans at 12,800 ft., Tundra Curves in Rocky Mt. Park at 12,000 ft., and West Chicago Creek); Idaho (Berger, Flat Rock, Franklin, Galena Summit near Stanley at 8,700 ft., Hansen, Hazelton, Hollister, Hubbs Butte, Lewiston, Oakley, near Stanley, Swan Lake in Bannock Co., and 12 miles east of Terretre in Jefferson Co.); Manitoba (Cedar Lake, Churchill, and Riding Mt. Park); Michigan (Midland Co.); Minnesota (Cass Co., Duluth, Grand Marais, Itasca Park, and St. Paul); Nebraska; Nevada (Nixon in Washoe Co., Pyramid Lake, Thomas Creek in the Ruby Mts., and Tuscarora); New Brunswick (St. John); New Mexico (Chama and Cimarron at 9,500 ft.); New York (Axton in the Adirondack Mts.); North Dakota (Leonard); Northwest Territories (Fort Simpson and Norman Wells); Ontario (Macdiarmid on Lake Nipigon, Maynooth, Ottawa, and Pinewood); Oregon (Iron Mt. 6 miles east of Upper Soda at 6,000 ft., Juntura, Sisters, Steens Mt. at 5,500 ft., and Vale); Quebec (Chimo, Great Whale River, and Indian House Lake); Saskatchewan (Asquith, Attons Lake, Cypress Hills, Elbow, Great Deer, Great Sand Hills west of Swift Current, Indian Head, Lancer Ferry at Swift Current, Melfort, Rutland, Saskatoon, Scout Lake, Snowden, Strongfield, Val Marie, and White Fox); South Dakota; Washington (Asotin Creek, Dartford, Olympia, Pullman, Seattle, Wallula, Wawawai, and Wilma); Wisconsin (Rib Mt. State Park); Wyoming (Canyon Camp in Yellowstone Park, Curtis Gulch Campground in Albany Co., Jackson Hole Biological Station near Moran at 6,750 ft., Saratoga, Shoshone Canyon, Snowy Range at 10,000 ft., and east side of Teton Pass at 7,400 to 8,400 ft.); and Yukon Territory (Dawson, 14 miles east of Dawson at 1,300 ft., Haines Junction, Marsh Lake, Sheldon Lake at 3,000 ft., Snag, Takhini Hot Springs at 2,400 ft., and Whitehorse).

Collection dates for Nearctic specimens are throughout the growing season, mostly May 18 to the end of August. Those outside of this range are April 12 at Wallula, Wash.; Apr. 29 at Vale, Oreg.; Apr. 24 and May 15 at Wawawai, Wash.; May 10 at Wilma, Wash. and at Elbow, Sask.; May 11 at Tule Lake, Siskiyou Co., Calif.; May 11, 14, and 15

at Oliver, B. C.; May 18 at Hollister, Ida.; Sept. 5 at Hollister, Ida.; Sept. 6 in the Saanich District, B. C.; Sept. 9 at St. John, N. B.; Sept. 10 at Strongfield, Sask.; Sept. 12 at Matanuska, Alaska; Sept. 21 at Lake Louise, Alta.; and Sept. 23 at Banff, Alta.

In our own collecting we found the species common among grassy ground cover in coniferous forests.

This species is Holarctic, occurring in northern Europe, and in the Canadian, Hudsonian, and Arctic zones of North America. It is adult through the growing season. Sanders, 1910, records rearings from *Amara carinata* (Carabidae).

4. Genus PARTHENOCODRUS

Figures 21 (side view); 46 (front wing)

Parthenocodrus Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63.

Type: *Proctotrupes elongatus* Haliday. Original designation.

Cryptocodrus Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 69.

New synonym.

Type: (*Proctotrupes buccatus* Thomson) = *elongatus* Haliday. Original designation.

Front wing 2.3 to 3.1 mm. long. Head broad, with small eye, wide clypeus, short cheek, and long mandible. Frons strongly convex. Interantennal area with a fine, weak vertical carina. Mandible with two teeth, the upper tooth very small to 0.6 as long as lower tooth. Side of pronotum smooth or part of it weakly mat and rugulose, with hairs anteriorly and along upper margin, elsewhere hairless. Propodeum ruguloso-punctate, smooth near base of upper face, the upper face with a weak median groove, rugulose within the groove. Longer spur of hind tibia about 0.4 as long as hind basitarsus. Tarsal claws simple. Costal side of radial cell about 0.43 as long as depth of stigma. First and second discoidal cells confluent. Nervulus distad of basal vein by about 0.8 its length. Weak veins all very faint. Stalk of abdomen about 0.6 as long as wide. Lower half of lateral aspect of syntergite with sparse hairs. Ovipositor sheath about 0.76 as long as hind tibia, evenly decurved and gradually tapered to a point, its surface with fine longitudinal striae.

This is a Palearctic genus. Two species are known, one in Europe and one in Nepal. The European species has been reared from Elateridae (*Athous* spp.).

Key to the species of Parthenocodrus

1. Upper tooth of mandible about 0.6 as long as lower tooth. Upper part of pronotal scrobe wrinkled. First thyridium about 3.5 as wide as long. Europe. 1. elongatus Haliday (p. 192)
- Upper tooth of mandible in the form of a small projection far basad of apex of lower tooth. Upper part of pronotal scrobe smooth. First thyridium about 1.7 as wide as long. Nepal. 2. laevicollis, new species (p. 193)

1. Parthenocodrus elongatus Haliday

Figures 21 (side view); 46 (front wing)

- **Proctotrupes elongatus* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 11. ♀. des., biol. Types: ♀, Ireland (Dublin). Types examined and reported by Nixon, 1938.
- Proctotrupes elongatus* Curtis, 1839. British Entomology . . . XVI. text for fig. 744. key.
- **Proctotrupes buccatus* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 421. ♀. des. Lectotype: ♀(lacking abdomen, labeled by Townes, 1975 and hereby designated), Sweden: Stockholm (Stockholm). Examined in 1975. Sweden: Östergötland. New synonym.
- Proctotrupes elongatus* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Utrecht.
- Proctotrypes buccatus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.
- Proctotrypes elongatus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 464. syn.
- Serphus (Phaenoserphus) Buccatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 302. ♀. Thomson des. repeated in key. Sweden: Stockholm: Östergötland.
- Serphus (Phaenoserphus) Elongatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 302. ♀. Haliday des. repeated in key. Ireland: seacoast.
- Phaenoserphus buccatus* Kieffer, 1914. Das Tierreich 42: 25. ♀. key, des. Sweden: 2 localities.
- Phaenoserphus elongatus* Kieffer, 1914. Das Tierreich 42: 25. ♀. key, des. Ireland: on seashore.
- Phaenoserphus ?fuscipes* Roberts, 1919. Ann. Appl. Biol. 5: 133. biol. England: Windermere. Host: *Athous haemorrhoidalis* Misdet. of *fuscipes* Haliday.
- Proctotrypes buccatus* Morley, 1922. Entomologist 55: 60, 132. key, biol. England: 7 localities.
- Proctotrypes elongatus* Morley, 1922. Entomologist 55: 60, 133. key.
- Phaenoserphus pallipes* Régnier, 1928. Rev. Path. Veg. Ent. Agr. 15: 44-46. biol. France: Rouen. Host: *Agriotes obscurus*. Misdet. of *pallipes* Jurine.
- Phaenoserphus elongatus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 455, 459. ♀. key, des., figs. England: 3 localities. Ireland: 5 localities. Host: *Athous haemorrhoidalis*.
- Phaenoserphus fuscipes* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terrebrantia, p. 30. Finland. Misdet. of *Proctotrupes fuscipes* Haliday teste Hellén, 1941.
- Phaenoserphus elongatus* Hellén, 1941. Notulae Ent. 21: 36. ♀. key. England. Finland. Sweden.
- Phaenoserphus elongatus* Murray, 1941. Ent. Monthly Mag. 77: 56. ♀. des., biol. Scotland: Dumfriesshire.
- Phaenoserphus elongatus* Gauss, 1957. Aus der Heimat 65: 217. fig., biol. Host: *Athous niger*.
- Parthenocodrus elongatus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North, west, & central Europe. Hosts: Elateridae larvae.
- Parthenocodrus elongatus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 443, 471. ecology. Austria. Czechoslovakia: East Bohemia.
- Phaenoserphus elongatus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 536. ♀. biol. Ireland: 4 counties.
- Parthenocodrus elongatus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 14, 38, 39. ♀. figs., biol. Austria. Czechoslovakia. England. Scandinavia.
- Parthenocodrus elongatus* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. fig.
- Parthenocodrus elongatus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 548. ♀. des., fig. Europe.

Male: Unknown.

Female: Front wing 2.3 to 2.8 mm. long. Mandible moderately wide apically, its upper tooth about 0.6 as long as lower tooth and similar in shape to lower tooth. First segment of flagellum about 2.2 as long as wide; penultimate segment about 1.45 as long as wide. Upper front part of lateral aspect of pronotum weakly mat and finely wrinkled, this sculpture occurring in the upper half of scrobe. Profile of propodeum with a relatively horizontal upper face and steeply declivous posterodorsal face. Upper face of propodeum with crowded small punctures and some mat sculpture, its basal 0.25 almost smooth except in the median groove. First thyridium about 3.5 as wide as long. Ovipositor sheath about 0.76 as long as hind tibia, its surface with fine longitudinal striae.

Black. Mouth parts, tegula, and coxae dark brown. Legs beyond coxae brown. Wings hyaline, the stigma and strong veins brown. Ovipositor sheath blackish brown.

Specimens: ♀, Hofgastein, [Austria], Aug. 15, 1936, H. Priesner (Washington). ♀, Connary, Co. Wicklow, Ireland, Aug. 27, 1939, A. W. Stelfox (Washington). ♀, Landenstin, Co. Kildare, Ireland, Aug. 28, 1946, A. W. Stelfox (Washington). ♀, Co. Wicklow, Ireland, July 22, 1940, B. Beirne (Townes).

This species is widespread in Europe. Males are unknown, so reproduction is presumed to be parthenogenetic. Rearings from Elateridae are reported by Roberts, 1919, Régnier, 1928, Nixon, 1938, and Gauss, 1957. Roberts, Régnier, and Gauss give some details on the biology.

2. Parthenocodrus laevicollis, new species

Male type: Front wing 3.1 mm. long. Mandible tapered to a narrow point, some distance back from apical point with a small tooth on dorsal edge. First segment of flagellum 2.0 as long as wide; penultimate segment also 2.0 as long as wide. Upper front part of lateral aspect of pronotum smooth except for a weak carina diverging from edge of collar. Profile of propodeum evenly arched, its upper face rugulose with its basal 0.7± smooth except along midline and lateral edge. First thyridium 1.7 as wide as long.

Black. Mouth parts, tegula, tibiae, and tarsi blackish brown. Wings subhyaline, the stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, Nepal at 12,000 to 13,000 ft., 28° 00' N., 84° 59' E., June 8, 1967 (Ottawa).

5. Genus PARACODRUS

Figure 22 (side view)

Paracodrus Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 272, 273.

Type: (*Paracodrus bethyliiformis* Kieffer) = *apterogynus* Haliday. Original designation.

Front wing of male 2.7 to 3.2 mm. long. Female wingless, the wings represented by vestiges that are shorter than the tegula. Male moderately slender. Female stout, somewhat depressed, with wide head and small eye. Frons convex, in female strongly convex. Inter-antennal area with a vertical carina. Clypeus wide. Mandible with one tooth, stout. Maxillary palpus short, with 3 segments (with 4 segments in all other Serphidae). Side aspect of pronotum with sparse hairs anteriorly and along dorsal edge (elsewhere bare), anterodorsally with some weak fine wrinkling (elsewhere smooth). Side aspect of propodeum rugoso-punctate, the rest smooth with very sparse punctures, polished or very weakly mat, without a median carina. Longer spur of hind tibia about 0.47 as long as hind basitarsus in male, about 0.40 as long in female. Tarsal claws simple. Costal side of radial cell (in male) about 0.8 as long as depth of stigma. First and second discoidal cells (in male) confluent. Nervulus distad of basal vein (in male) by about 1.6 its length. Lower half of lateral aspect of syntergite almost hairless. Ovipositor sheath 0.52 as long as hind tibia, very stout, strongly decurved, and evenly tapered to the point, its surface sparsely punctate and ventrally with longitudinal grooves.

This is a European genus, containing one species. It is parasitic on Elateridae (*Agriotes*, *Athous*, and *Ctenicera*).

1. Paracodrus apterogynus Haliday

Figure 22 (side view of ♀)

- **Proctotrupes apterogynus* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 15. ♂, ♀. des., biol. Types: ♂, ♀, England: near London and southern England (Dublin). Types examined and reported by Nixon, 1938.
- Proctotrupes apterogynus* Curtis, 1839. British Entomology . . . XVI: text for fig. 744. key.
- **Codrus albipennis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 422. ♂, ♀. des. Lectotype: ♀(labeled by Townes in 1975 and hereby designated), Sweden: Råby near Lund (Stockholm). Examined in 1975.
- Proctotrupes apterogynus* Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Utrecht.
- Codrus apterogyne* (!) Vollenhoven, 1876. Pinacographia, p. 28, pl. 18, fig. 1. ♂, ♀. syn., figs. England: 2 localities. Netherlands: near Utrecht. Scandinavia.
- Codrus apterogynus* (!) Ashmead, 1893. Bul. U. S. Natl. Mus. 45: pl. XIII, figs. 8, 9.
- Codrus apterogynus* Lameere, 1907. Manuel de la Faune de Belgique 3. Insectes supérieurs . . . , p. 251. ♂, ♀. syn., des., biol. Belgium.
- **Paracodrus Bethyliformis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 275. ♂, ♀. des. in key. Lectotype: ♀(labeled by Townes, 1975 and hereby designated), England (London). Examined in 1975.
- Paracodrus Apterogynus* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 276. ♂, ♀. Haliday des. repeated in key, fig. England: seaside and near London.
- Paracodrus Albipennis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 277. ♂, ♀. Thomson des. repeated in key. Netherlands: Sweden: Lund.
- Paracodrus apterogynus* Kieffer, 1909. Genera Insectorum 95: 11, fig. 18.
- Paracodrus bethyliformis* Kieffer, 1914. Das Tierreich 42: 6. ♂, ♀. key, des. England.
- Paracodrus apterogynus* Kieffer, 1914. Das Tierreich 42: 6. ♂, ♀. key, des., fig. England.

- Paracodrus albipennis* Kieffer, 1914. Das Tierreich 42: 7. ♂, ♀. key, des. Netherlands. Sweden.
- Paracodrus apterogynus* Morley, 1922. Entomologist 55: 185. ♀. key, des., biol. England: 13 localities. Ireland: Bangor. Host: *Agriotes*.
- Paracodrus Bethyloformis* Morley, 1922. Entomologist 55: 185, 186. key, syn.
- Paracodrus apterogynus* Koblova, 1922. Tr. 3-go Vserossiisk entomol. - fitopatol. s'ezda v Petrograde 7: 34-35. [Host: *Agriotes lineatus*]. Reference not seen.
- Paracodrus apterogynus* Zolk, 1924. Tartu ülikooli Entomoloogia-katsejaama teadaanded 3: 3-10. ♂, ♀. des., figs., biol. USSR: Estonia. Host: *Agriotes obscurus*.
- Paracodrus apterogynus* Zolk, 1924. Tartu ülikooli Entomoloogia-katsejaama teadaanded 5: 3-10. ♂, ♀. figs., biol. Host: *Agriotes obscurus*.
- Paracodrus apterogynus* Blunck, 1925. Ztschr. f. Angew. Ent. 11: 148. ♂, ♀. biol. East Germany: Naumburg. Host: *Agriotes*.
- Paracodrus apterogynus* Zolk, 1929. Ent. News 40: 288. biol.
- Paracodrus apterogynus* Subklew, 1935. Ztschr. f. Angew. Ent. 21: 119. biol. Austria: Freiland. Host: *Agriotes obscurus*.
- Paracodrus apterogynus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 446, 449. ♂, ♀. syn., des., figs. England: 9 localities. Ireland: 5 localities. Hosts: larvae of *Agriotes obscurus*, of *Agriotes* sp., and of *Athous* sp.
- Paracodrus apterogynus* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Paracodrus apterogynus* Miles & Cohen, 1940. Univ. Manchester [England] Agr. Advisory Dept. Rpt. 1939 and 1940. p. 16, 17. fig., biol. Host: *Agriotes obscurus*.
- Paracodrus apterogynus* d'Aguilar, 1948. Bul. Soc. Ent. France 53: 154. ♂, ♀. biol. France: Pleyber-Christ in Finistère. Host: *Agriotes obscurus* or *A. lineatus*.
- Paracodrus apterogynus* Zhigaev, 1954. Tr. Inst. entomol. i fitopatol. AN USSR 5: 153-156. [Host: *Agriotes* sp.]. Reference not seen.
- Paracodrus apterogynus* Cherepanov, 1957. Zhuki-shchelkuny Zapadnoi Sibiri (Coleoptera, Elateridae). Novosibirsk: 143-144. [Hosts: *Agriotes obscurus*; *Meligethes aeneus*]. Reference not seen.
- Paracodrus apterogynus* Masner, 1957. Acta Funa Ent. Mus. Natl. Pragae 2: 87. ♂. Czechoslovakia: 3 localities in Bohemia.
- Paracodrus apterogynus* Masner, 1957. Klíč Zvířeny ČR 2: 399. key. Czechoslovakia.
- Paracodrus apterogynus* (!) Dobrovolskii, 1959. IX Internatl. Konf. für Quarantäne u. Schutz der Pflanzen vor Schädli - u. Krankheiten Moskau 1958 p. 12. biol. Host: *Agriotes*.
- Paracodrus apterogynus* Ozols, 1960. *Paracodrus apterogynus* Hal. --- parazit dichinok shchelkunov roda *Agriotes* V Kn.: Kratkie itogi Nauchnykh issledovaniï po zashchite rastenii v Pribaltiiskoi zone SSSR. Riga. [Host: *Agriotes* sp.]. Reference not seen.
- Paracodrus apterogynus* Boness, 1962. Bombus 2: 113. biol., ecology. West Germany: 2 localities.
- Paracodrus apterogynus* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 32, 33. ♂, ♀. biol., ecology. West Germany: 7 localities.
- Paracodrus apterogynus* Jegina, 1964. In Zinowskis: Akad. Nauk Latviiskoi Inst. Biol. Fauna of the Latvian SSR and adjacent Territories 4: 73, 74. fig., biol. Hosts: *Agriotes obscurus*; *Limonius aeruginosus*.
- Paracodrus apterogynus* (!) Titov, 1964. Zashch. Rast. ot Vred. i Bol. 1964 (2): 57. ♂, ♀. des., fig., biol. USSR: Estonia; Latvia; Leningrad. Hosts: *Agriotes* sp., *Ctenicera* sp.
- Paracodrus apterogynus* Titov, 1964. Parakodrus-parazit provolochnikov. Zashch. rast. ot vrediteli i boleznei 2: 57. [Host: *Ctenicera* sp.]. Reference not seen.
- Paracodrus apterogynus* Titov, 1965. Tr. Sev.-Zan. n.-i. inst. sel'sk khoz. 9: 145-151. [Hosts: *Ctenicera* sp.; *Agriotes* sp.]. Reference not seen.
- Paracodrus apterogynus* Cherepanov, 1965. Provolochniki Zapadnoi Sibiri. Opredelitel' Izd. "Nauka", M.: 138-139. [Host: *Agriotes* sp.]. Reference not seen.
- Paracodrus apterogynus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. West Germany: 5 localities.

- Paracodrus apterogynus* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Paracodrus bethyliformis* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 8. "real type unknown".
- Paracodrus apterogynus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 532. ♂, ♀. des., biol. Ireland: 7 counties. Hosts: *Agriotes* sp.; *Athous* spp.
- Paracodrus apterogynus* Weidemann, 1967. Faunistisch-Ökologische Mitt. 3: 168, 169. biol. West Germany: Habel.
- Paracodrus apterogynus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 38, 39. ♂, ♀. figs., biol. Czechoslovakia. France. Germany. Great Britain. Netherlands. Scandinavia. Switzerland. USSR.
- Paracodrus apterogynus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 118. Germany. Hosts: Elateridae larvae.
- Paracodrus apterogynus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 548. ♂, ♀. des., figs. Europe.

Front wing of male 2.7 to 3.2 mm. long. Female wingless. Other structure as described under the generic heading.

Male coloration: Black. Mouth parts, tegula, and legs medium brown. Wings hyaline, the stigma and strong veins light brown.

Female coloration: Head, thorax (except pronotum), abdomen, and ovipositor sheath dark brown. Mouth parts, antenna, pronotum, tegula, and legs light brown.

Specimens: ♂, 20♀, Gentofte, Zealand, Denmark, Sept. 1903, J. P. Kryger (Washington). 5♀, reared from *Agriotes* sp., Valentine Island, Co. SK, Ireland, June 29, 1926, Miss Delap (Washington). ♂, Sweden (Cambridge). ♀, Ballymagee, Bangor, Co. Dublin, Ireland (Washington). 18♂, 6♀ (specimens in Washington) collected by Stelfox at the following places in Ireland: 2♀, Buckronev in Co. Wicklow, Sept. 28, 1924; ♂, Collierst'n in County Dublin, September 11, 1946; ♀, Dungaravan, Co. Waterford, July 28, 1928; ♂, Furry Glen, Co. Dublin, Sept. 29, 1937; ♂, Lahore, Co. Wexford, Aug. 6, 1930; 4♂, Landens, Co. Kildare, Sept. 13, 16, and 28, 1942, 1947, and 1951; ♂, 2♀, R. Canal, Co. Kildare, July 8 and 11, 1943 and 1945; 8♂, Rye Water, Co. Kildare, Aug. 7, 12, and 16, 1940, 1941, and 1942; ♂, 2♀, Trawalua, Co. Sligo, July 29 and Aug. 3, 1933; and ♂, Woodend, Co. Wicklow, Sept. 29, 1951.

This species is widespread in Europe. It is adult from the end of June till the end of September. Recorded hosts are several species of Elateridae and a doubtful record from *Meligethes aeneus*. There are numerous descriptions of its biology, as cited in the synonymy above. It is an important parasite of wireworms in Europe.

6. Genus PHANEROSERPUS

Figures 23 (side view); 47 (front wing)

- Phaneroserphus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. Type: *Proctotrupes calcar* Haliday. Original designation.

Front wing 2.2 to 3.8 mm. long. Front of head with a high to very high median vertical carina between antennal sockets and on lower part of frons. Mandible with one tooth. Lateral aspect of pronotum smooth except for a weak carina diverging from collar, with hairs anteriorly, near upper edge, and on hind corner, elsewhere hairless. Propodeum reticulately wrinkled, its upper face with a median carina and usually a smooth area near base on each side of median carina. Longer spur of hind tibia of male strongly curved, about 0.65 as long as hind basitarsus. Longer spur of hind tibia of female about 0.47 as long as hind basitarsus. Tarsal claws simple. Costal side of radial cell about 1.25 as long as stigma is deep. First and second discoidal cells confluent. Nervulus distad of basal vein by about 1.5 its length. Stalk of abdomen about 1.1 as long as wide. Lower half of lateral aspect of syntergite quite hairless. Ovipositor sheath about 0.35 as long as hind tibia, with sparse punctures, weakly decurved and tapered to a point.

This is a Holarctic genus. Five species are known. One of the species (the European *P. calcar*) has been reared from Staphylinidae (*Quedius* and *Boletochara*) and from a centipede (*Lithobius forficatus*).

Key to the species of Phaneroserphus

1. Front edge of mesopleurum with a continuous (or sometimes interrupted) band of hairs from tegula to the horizontal groove. Head in side view projecting forward from eye only a short distance (by about 0.38 the length of eye in males, by about 0.62 the length of eye in females). Europe. 1. calcar Haliday (p. 198)
- Front edge of mesopleurum with an interrupted band of hairs, with hairs below tegula and above the horizontal groove, and a bare area in between. Head in side view projecting forward from eye a longer distance (by about 0.52 the length of eye in males, by 0.78 to 1.0 the length of eye in females). 2
2. Crest between antennal sockets with a secondary ridge diverging from each side at the upper 0.35 of crest. Upper face of propodeum with a pair of smooth areas that are about 0.4 as long as the propodeum. Metapleurum with a large smooth area anteriorly. Japan.
 2. cristatus, new species (p. 201)
 Crest between antennal sockets only moderately high, without a secondary ridge diverging from each side. Upper face of propodeum either entirely reticulate or with small bare areas at base. Metapleurum entirely sculptured or with a small bare area anteriorly. 3
3. Stigma about 2.6 as long as deep. Propodeum with a subapical transverse ridge. Western Canada.
 3. longistigma, new species (p. 201)
 Stigma 1.6 to 2.1 as long as deep. Propodeum without a subapical transverse ridge. 4

4. Base of syntergite with 3 longitudinal grooves on each side of median groove. Metapleurum punctato-rugose. Japan.

4. punctibasis, new species (p. 202)

- Base of syntergite with 1 or 2 longitudinal grooves on each side of median groove. Metapleurum reticulate rugose. Alaska.

5. brevistigma, new species (p. 202)

1. Phaneroserphus calcar Haliday

Figures 135 and 136 (♂, ♀ propodeum and base of abdomen)

Proctotrupes Calcar Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.

**Proctotrupes calcar* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 12. ♂, ♀. des., biol. Types: ♂, ♀, England (Dublin). Types examined by Nixon and reported in 1938.

Proctotrupes calcar Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.

**Proctotrupes calcaratus* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 419. ♂. des. Lectotype: ♂ (labeled by Townes in 1975 and hereby designated), Sweden: Småland (Stockholm). Examined in 1975. Sweden: 2 additional localities.

**Proctotrupes seticornis* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 419. ♂, ♀. des. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), Sweden: Småland (Stockholm). Examined in 1975. Sweden: Bohuslän. Paratypes belong to *Exallonyx ater* and *E. quadriceps*.

Proctotrupes Calcar Newman, 1867. Entomologist 46: 342. biol. Host: *Lithobius forficatus*.

Proctotrupes calcar Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Utrecht.

Proctotrupes calcar Vollenhoven, 1876. Pinacographia pl. 19, fig. 10. ♂. figs.

Proctotrypes calcar Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.

Proctotrypes calcaratus Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 463. syn.

Proctotrypes seticornis Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 467. syn.

Serphus (Phaenoserphus) seticornis Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 304. ♂, ♀. Thomson des. repeated in key. Scandinavia.

Serphus (Phaenoserphus) Calcar Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 306. ♂, ♀. syn., des. in key. Algeria. Austria. England. France. Germany. Hungary. Italy. Scandinavia. Spain. Yugoslavia: Dalmatia.

**Serphus (Phaenoserphus) Calcar* var. *Transversalis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 306. ♀. des. Type: ♀, France: Dieppe (lost). New synonym.

**Serphus (Phaenoserphus) Calcar* var. *Areolatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 306. ♂. des. Type: ♂, France: Maisons-Laffitte (Paris). Examined in 1975. New synonym.

**Serphus (Phaenoserphus) Castaneus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 307. "♀" = ♂. Type: ♂, Czechoslovakia: Košice (Budapest). Examined in 1975. The type is labeled Kassa (= Košice), which Kieffer read incorrectly as Kaffa, a Crimean locality. New synonym.

Phaenoserphus seticornis Kieffer, 1914. Das Tierreich 42: 26. ♂, ♀. key, des. Scandinavia.

Phaenoserphus calcar calcar Kieffer, 1914. Das Tierreich 42: 26. ♂, ♀. key, syn., des. Algeria. Austria. England. France. Germany. Italy. Scandinavia. Spain. Frequent in woods.

Phaenoserphus calcar transversalis Kieffer, 1914. Das Tierreich 42: 27. ♀. des. France: Dieppe.

- Phaneroserphus calcar areolatus* Kieffer, 1914. Das Tierreich 42: 27. ♂. des.
France: Maisons-Laffitte.
- Phaneroserphus castaneus* Kieffer, 1914. Das Tierreich 42: 27. ♂. key, des.
- Proctotrypes calcar* Morley, 1922. Entomologist 55: 60, 133. key, biol. England: 17 localities. Ireland.
- Proctotrypes seticornis* Morley, 1922. Entomologist 55: 60, 134. ♀. key, biol. England: 3 localities.
- Phaneroserphus calcar* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. Belgium: 8 localities.
- Phaneroserphus calcar* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 455, 457, 458, 459. ♂, ♀. keys, syn., des., figs. England: 5 counties. Ireland: 12 counties.
- Phaneroserphus calcar* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Phaneroserphus calcar* Kerrich, 1940. Notulae Ent. 19: 101. ♂, ♀. Finland: 3 localities.
- Phaneroserphus calcar* Hellen, 1941. Notulae Ent. 21: 34. ♂, ♀. key, des. Denmark. Finland. Sweden. USSR.
- **Phaneroserphus calcar* a. *nigrofemoratus* Hellen, 1941. Notulae Ent. 21: 34. ♂. des. Types: ♂, Finland (Hellen). Types not seen. New synonym.
- Phaneroserphus calcar* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 9 localities.
- Phaneroserphus calcar areolatus* Tomšik, 1942. Ent. Listy 5: 74. ♂, ♀. des. Czechoslovakia: localities in Bohemia and Moravia.
- Phaneroserphus calcar* Leclercq, 1952. Lambillionea 52: 71. Belgium: Grivegnée.
- Phaneroserphus calcar* Richards, 1956. Handbooks for the identification of British insects. Roy. Ent. Soc. London 6 (1): 62, 64. figs.
- Phaneroserphus (Phaneroserphus) calcar* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn. North, west, and central Europe.
- Phaneroserphus calcar* Smith, 1958. Ent. Monthly Mag. 94: 94. England: Lundy Is. in Devon.
- Serphus (Phaneroserphus) calcar* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. Yugoslavia: Trieste.
- Phaneroserphus calcar* Meyer, 1961. Bombus 2: 94. West Germany: From May-Sept. most frequent species in many localities in the Hamburg area.
- Phaneroserphus calcar* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 5 localities.
- Phaneroserphus (Phaneroserphus) calcar* Pisič & Fabritius, 1962. Studii și Cercetări Științifice, Biologie și Științe Agricole (Iasi) 13: 82. ♂. des. Hungary. Rumania: 1 locality. Yugoslavia.
- Phaneroserphus (Phaneroserphus) calcar* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 31, 33, 34. ♂, ♀. biol., ecology. West Germany: 22 localities. Host: *Quedius simplicifrons*.
- Phaneroserphus calcar* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. West Germany: 12 localities.
- Phaneroserphus calcar* Weidemann, 1965. Proc. XII Internat. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Phaneroserphus calcar* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 536. biol. Ireland: 20 counties.
- Phaneroserphus calcar* Beaver, (1966) 1967. Ent. Monthly Mag. 102: 165. ♀. biol. Host: *Bolitochara obliqua*.
- Phaneroserphus calcar* Weidemann, 1967. Faunistisch-Ökologische Mitt. 3: 168, 169. biol. West Germany: Gräde; Habel.
- Phaneroserphus (Phaneroserphus) calcar* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 9, 42, 43, 46. ♂, ♀. From all of Europe, including Switzerland. Japan. USSR. Host: *Bolitochara obliqua*.
- Phaneroserphus (Phaneroserphus) calcar* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 5. figs.
- Phaneroserphus calcar* Askew, 1971. Parasitic insects. Heinemann Educational Books, London, p. 157. ♀. fig.
- Phaneroserphus calcar* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 119. Austria. Germany. Italy. Lichtenstein. Switzerland.

- Phaenoserphus (Phaenoserphus) calcar* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♂. Rumania.
- Phaenoserphus (Phaenoserphus) calcar* Teodorescu & Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 166. ♂. Rumania: 2 localities.
- Phaenoserphus (Phaenoserphus) calcar* Koxlov, 1978. Opređelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 546. ♀. key, figs. Northwestern and central Europe.

Front wing 2.2 to 3.8 mm. long. Head in side view projecting forward from eye by about 0.38 the length of eye in male, by about 0.63 the length of eye in female. Ridge between antennal sockets moderately low, its sides meeting at an angle of about 45° (as seen from above), the ridge without secondary ridges diverging on each side. Second flagellar segment of female about 2.8 as long as wide. Front edge of mesopleurum with a hair band that is sometimes complete from tegula to its horizontal groove and sometimes interrupted. Metapleurum punctato-rugulose, its front corner somewhat smoother or with a small smooth area. Upper face of propodeum with a pair of small smooth areas near base, the smooth areas not reaching farther caudad than front edge of propodeal spiracle. Stigma about 2.1 as long as deep. Upper side of stalk of abdomen in male with about 2 transverse wrinkles and a few punctures on its basal 0.35, the apical 0.65 with coarse longitudinal wrinkles. Upper side of stalk of abdomen in female with about 4 transverse wrinkles, not punctate. Base of syntergite with 2 or 3 longitudinal grooves on each side of median groove, in both sexes.

Black. Scape, pedicel, tegula, and legs light fulvous brown, the hind coxa usually brown to fuscous basally, middle coxa often brown basally, hind femur often more or less dark brown or infuscate except at ends, and middle femur often brown except at base. Flagellum fuscous, brownish near base. Labrum and mandible light brown. Palpi pale brown. Wings with a weak tinge of brown. Stigma and strong veins dark brown. Weak veins with a tinge of brown.

Specimens (all European): 260♂, 103♀ from Austria (Ebelsberg near Traunau, Eichgraben, Karlstift Moor, Liebenau, Linz, Mautern near Krems, Sarleinsbach, Scheffau in Tirol at 800 m., Schiltensberg, and Traunau); Denmark (Copenhagen); England (Bagley Woods near Oxford, Dorking in Surrey, Heathfield in Devon, Leicester, Newcastle-on-Tyne, and Oxford); Finland (Helsinki); France (Etang d'Holland); Ireland (Athdown in Co. Wicklow, Coombe Wood, Ferns Lock in Co. Meath, Glen of the Downs in Co. Wicklow, Kileen in Co. Dublin, Lake Dan in Co. Wicklow, Co. Kerry, Landenstown in Co. Kildare, Lawers, and M. Kilbride in Co. Wicklow); Italy (Auer near Bozen at 250 m., Cansiglio, Franzensfeste at 1,000 m., Naturno in Trentino at 500 to 1,000 m., Pizzighettone, Rossore, Tiarno Sopra, and Unserfrau near Mont Alto in Trentino at 1,500 m.); Luxemburg (Dierkirch); Norway (Balestrand); Russia (Moscow); Scotland (Bonhill and Kinlockewe); Spain (Grenada); Sweden (Åre, Boda in Öland, Ekshärad, Harparbol in Uppsala, Kastlösa in Öland, Ljungby, Lysekil, Messaure, Oskarhamn, Skåne, north side of Torneträsk, and Växjö); Turkey (Aband b. Bolu); and West Germany (Mainz and Schliersee at 700 to 1,100 m.). Collection dates are from June to October, also with captures on April 30 and through the month of May at Pizzighettone, Italy, and captures on Nov. 14 at

Leicester, England.

This is a common species throughout Europe. It is adult from late spring to fall. It was recorded as a parasite of a centipede (*Lithobius forficatus*) by Newman, 1867, and of a staphylinid (*Bolitochara obliqua*) by Beaver, 1967. Weidemann, 1962, records it as a parasite of *Quedius simplicifrons* (Staphylinidae).

2. *Phaneroserphus cristatus*, new species

Figures 137 and 138 (σ , ♀ propodeum and base of abdomen)

Front wing 2.7 to 3.7 mm. long. Head in side view projecting forward from eye by about 0.60 the length of eye in male, by about 0.83 the length of eye in female. Ridge between antennal sockets very high, its sides meeting at an angle of about 40° (as seen from above), the ridge with a secondary lateral ridge just above each antennal socket. Second flagellar segment of female about 2.6 as long as wide. Front edge of mesopleurum with a group of hairs below tegula and a group just above its horizontal groove, hairless in between. Metapleurum punctato-rugulose, its front $0.35 \pm$ smooth. Upper face of propodeum with a pair of elongate smooth areas, the smooth areas about 0.45 as long as propodeum. Stigma about 2.1 as long as deep. Upper side of abdominal stalk of male with about 4 transverse wrinkles on its basal half and with coarse longitudinal wrinkles on its apical half. Upper side of abdominal stalk of female with about 7 transverse wrinkles on its basal 0.8, the rest smooth. Base of syntergite with 1 or 2 longitudinal grooves on each side of midline in male, with a single short groove on each side of midline in female.

Coloration as in *P. calcar* except that scape of female is medium brown with apical $0.12 \pm$ fulvous brown.

Type: ♀ , Kamikochi, Japan, July 24, 1954, Townes family (Townes).

Paratypes: 17σ , 3♀ , same locality and collectors as type, July 22, 23, and 26, 1954 (Townes and Ottawa). σ , 5♀ , Sapporo, Japan, July 11, 1954, David Townes (Townes). 5σ , Sapporo, Japan, July 5, 6, and 8, 1954, Townes family (Townes).

This species is known only from Japan.

3. *Phaneroserphus longistigma*, new species

Figure 139 (♀ propodeum and base of abdomen)

Male: Unknown.

Female type: Front wing 2.8 mm. long. Head in side view projecting forward from eye by 0.78 the length of eye, the eye small. Ridge between antennal sockets high, its sides meeting at an angle of 50° (as seen from above), the ridge without secondary divergent lateral ridges. Second flagellar segment 3.5 as long as wide. Front edge of mesopleurum with a group of hairs below tegula and another above the horizontal groove, hairless in between. Metapleurum completely rugulose. Propodeum reticulate-rugulose, without distinctly smooth areas at base,

subapically with a short projecting transverse flange. Stigma 2.6 as long as deep. Upper side of abdominal stalk granulate and with fine irregularly transverse wrinkling. (The photograph shows the basal 0.45 of the stalk smooth, but this is only because of grease on the base of the stalk.) Base of syntergite with 1 or 2 short longitudinal grooves on each side of median groove. First thyridium smaller than usual.

Black. Palpi pale brown. Mandible, scape, pedicel, tegula, and front and middle legs light brown. Flagellum light brown basally, darkening to blackish at middle and beyond. Hind leg dark brown. Wings subhyaline, the stigma and strong veins blackish brown, the weak veins not pigmented.

Type: ♀, Terrace, 220 ft., B. C., Canada, July 15, 1960, B. Heming (Ottawa).

4. Phaneroserphus punctibasis, new species

Figure 140 (♀ propodeum and base of abdomen)

Male: Unknown.

Female type: Front wing 3.5 mm. long. Head in side view projecting forward from eye by 1.0 the length of eye. Ridge between antennal sockets moderately high, its sides meeting at an angle of 30° (as seen from above), the ridge without secondary ridges on each side. Second flagellar segment 2.8 as long as wide. Front edge of mesopleurum with a small group of hairs below tegula and another above its horizontal groove, hairless in between. Metapleurum with crowded moderately large punctures, its front 0.18 smooth. Upper face of propodeum with a pair of small smooth areas at base, the hind edge of the smooth areas just in front of propodeal spiracle. Stigma 2.1 as long as deep. Upper side of stalk of abdomen with small deep closely spaced punctures, the punctures tending to be in 8 transverse rows, the apical 0.25 of the stalk almost smooth. Base of syntergite with 3 longitudinal grooves on each side of median groove.

Black. Scape, pedicel, labrum, mandible, tegula, and legs light fulvous brown, the middle coxa medium brown on its basal 0.4, hind coxa dark brown on its basal 0.8, middle femur medium brown with base and apex paler, and hind femur dark brown with basal 0.3 and apical 0.18 light brown. Wings with a faint tinge of brown. Stigma and strong veins medium brown. Weak veins tinged with brown.

Type: ♀, Mt. Norikura, 2,000 m., Japan, July 30, 1954, Townes family (Townes).

5. Phaneroserphus brevistigma, new species

Figure 141 (♂ propodeum and base of abdomen)

Male: Front wing 2.4 to 2.6 mm. long. Head in side view projecting forward from eye by 0.52 the length of eye. Ridge between antennal sockets high, its sides meeting at an angle of 40° (as seen from above), the ridge without secondary diverging ridges. Front edge of meso-

pleurum with a band of hairs that has a median gap. Metapleurum reticulately rugose, its upper front $0.2 \pm$ almost smooth. Propodeum coarsely reticulate, its basal 0.1 almost smooth. Stigma 1.6 as long as deep. Upper side of stalk of abdomen with coarse longitudinal wrinkles and at base one or a few transverse wrinkles. Base of syntergite with 1 or 2 short longitudinal grooves on each side of median groove.

Blackish brown. Mandible, scape, pedicel, tegula, and legs light brown, the coxae darker brown except towards apex. Palpi pale brown. Flagellum medium or light brown basally, dark brown apically. Wings subhyaline. Stigma and strong veins light brown. Weak veins not pigmented.

Female: Unknown.

Type: σ , Umiat, Alaska, Aug. 12, 1959, R. Madge (Ottawa).

Paratypes: 3σ , same data as type (Ottawa). σ , Umiat, Alaska, July 21, 1959, R. Madge (Townes).

7. Genus EXALLONYX

Figures 24 (side view); 48 (front wing)

Front wing 1.6 to 5.8 mm. long. Front of head with a ridge or carina between antennal sockets. Mandible with one tooth. Lateral aspect of pronotum smooth except for a carina that parallels margin of collar and which, above, is continuous with epomia (if epomia is present). Upper margin of pronotum with a hair band that is 1-5 hairs wide and expanded on hind corner of pronotum. Pronotum with hairs in front of carina on collar, sometimes a few hairs behind epomia and upper end of carina on collar, and sometimes with hairs between middle and lower part of carina on collar and the pronotal sulcus. Elsewhere the pronotum is always smooth and hairless. Front and middle tarsal claws stramineous to light brown, with a long black divergent tooth near base. Hind tarsal claws sometimes with a short black tooth at base. Apical segments of front and middle tarsi unusually small. Costal side of radial cell 1.0 to 2.0 as long as stigma is deep. Radius descending briefly from lower corner of stigma then turned at a right angle toward costa. First and second discoidal cells (if distinguishable) confluent. Nervulus (if distinguishable) distad of basal vein by $1.5 \pm$ its length. Abdominal stalk 0.5 to 3.5 as long as wide. Hairs on syntergite usually very sparse, sometimes moderately dense. Ovipositor sheath 0.2 to 0.7 as long as hind tibia, tapered from base, decurved except in *E. pallidistigma*, its surface punctate, striate, or both punctate and striate.

Exallonyx is worldwide. We treat 162 species, which is more than half of the entire family. The hosts are Staphylinidae. There are two subgenera, as keyed below:

Key to the subgenera of Exallonyx

1. Stalk of abdomen with scattered hairs along its sides. Side of syntergite with moderately dense hairs down to within 0.3 the length

of tegula from its lower margin. Ovipositor sheath about 0.24 as long as hind tibia, its surface punctured and not striate.

7a. Subgenus Eocodrus (p. 204)

Stalk of abdomen without hairs along its sides, but often with hairs at its base. Side of syntergite with sparse hairs or sometimes the hairs moderately dense but the hairy area not reaching to within less than 0.5 the length of tegula from its lower margin. Ovipositor sheath 0.2 to 0.7 as long as hind tibia, its surface punctate or striate or both. . 7b. Subgenus Exallonyx (p. 210)

7a. Subgenus EOCODRUS

Eocodrus Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62.

Type: *Codrus longicornis* Nees. Original designation.

The subgeneric characters are summarized in the key to the subgenus.

This subgenus contains one Holarctic species and four more in Europe and Asia Minor.

Key to the species of the subgenus Eocodrus

1. Second segment of flagellum short, about 2.6 as long as wide in male, about 2.0 as long as wide in female. Stalk of abdomen about 0.5 as long as wide. Holarctic Region.
 1. brevicornis Haliday (p. 205)
Second flagellar segment long, at least 3.2 as long as wide. Stalk of abdomen 0.9 to 1.7 as long as wide. 2
 2. Antenna entirely yellow. Syria. 2. ruficeps Kieffer (p. 207)
Antenna entirely fuscous or black, or at least its apical half fuscous or blackish. 3
 3. Pronotum with hairs on the entire area in front of the bottom of the scrobe. Base of syntergite with a median groove that reaches about 0.4 the distance to first thyridia. Temple of male nearly always with a tubercle near its middle. Europe.
 3. longicornis Nees (p. 207)
Pronotum with hairs on the collar, this group of hairs not extending down to the bottom of pronotal scrobe. Base of syntergite without a median groove or with a short, V-shaped median groove.
Temple of male without a tubercle. 4
 4. Upper face of propodeum with irregularly reticulate wrinkling. Scape fulvous. Cyprus, Turkey, and Jordan.
 4. certus, new species (p. 209)
Upper face of propodeum with mostly longitudinal wrinkling. Scape blackish. Turkey. 5. striatus, new species (p. 210)

1. Exallonyx brevicornis Haliday

Figures 155 and 156 (♂, ♀ metapleurum, propodeum,
and abdominal stalk); 460 (ovipositor sheath)

- Proctotrupes brevicornis* Curtis, 1829. Guide . . . British insects . . . ed. 1, column 109. listed from Britain. *Nomen nudum*.
- **Proctotrupes brevicornis* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 9. ♂, ♀. des., biol. Types: ♂, ♀, Northern Ireland (Dublin). Examination of types reported by Nixon, 1938.
- Proctotrupes brevicornis* (!) Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.
- Proctotrypes brevicornis* Dalla Torre, 1898. Catalogus hymenopterorum . . . , p. 463. syn.
- Exallonyx brevicornis* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. syn.
- Exallonyx Brevicornis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 337. ♂, ♀. des. in key. England. Ireland. Italy: frontier Alps.
- **Exallonyx Brevicornis* var. *Lineata* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 338. "♀" = ♂. des. Lectotype: ♂ (labeled by Townes, 1975 and hereby designated), England: St. Alban (Budapest). Examined in 1975. England: "Govilon". New synonym.
- Exallonyx brevicornis brevicornis* Kieffer, 1914. Das Tierreich 42: 49. ♂, ♀. key, des. England. Italy.
- Exallonyx brevicornis lineata* Kieffer, 1914. Das Tierreich 42: 49. "♀" = ♂. des. England.
- Exallonyx brevicornis* Morley, 1922. Entomologist 55: 159, 160. ♀. key. England: near Nottingham.
- Exallonyx brevicornis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 436, 437, 440, 442, 445. ♂, ♀. keys, des., figs. England: 7 localities. Ireland: 8 localities.
- Exallonyx brevicornis* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Springfield in Dumfriesshire.
- Exallonyx brevicornis* Kerrich, 1940. Notulae Ent. 19: 101. ♀. USSR ("Finland"): Sortavala.
- Exallonyx brevicornis* Hellén, 1941. Notulae Ent. 21: 38. ♀. key. England. Finland: 2 localities. Sweden.
- Exallonyx brevicornis* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: Ringsjö.
- Exallonyx brevicornis* Tomšik, 1944. Ent. Listy 7: 53. ♂, ♀. des. Czechoslovakia: localities in Moravia.
- Exallonyx brevicornis* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.
- Codrus brevicornis* Smetana, 1957. Beitr. Ent. Berlin 7: 336-337. biol. Czechoslovakia. Host: *Quedius vexans*.
- Codrus (Eocodrus) brevicornis* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, and central Europe.
- Codrus brevicornis* Meyer, 1961. Bombus 2: 94. West Germany: Hamburg.
- Codrus (Eocodrus) brevicornis* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 29, 33. ecology. West Germany: 3 localities.
- Codrus brevicornis* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 4. Europe. Japan. Host: *Quedius* sp.
- Codrus brevicornis* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ecology. Austria. Carpathian Mts. Switzerland. West Germany: 3 localities.
- Codrus brevicornis* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: Sect. 6: 427. ecology.
- Codrus brevicornis* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 532. Ireland: 5 counties.

- Codrus (Eocodrus) brevicornis* Pschorn-Walcher, 1971. *Insecta Helvetica* 4. Hymenoptera, p. 39, 46, 48, 50, 53. ♂, ♀. keys, des., figs., biol. Austria. Czechoslovakia. Germany. Great Britain. Italy. Northern Japan. Rumania. Scandinavia. Switzerland. Host: *Quedius vexans*.
- Codrus brevicornis* Pschorn-Walcher & Haeselbarth, 1972. *Nachrichtenbl. Bayerischen Ent.* 21: 120. ♀. Austria. Germany.
- Codrus brevicornis* Dessart, 1975. *Pub. Natuurhist. Genootsch. Limburg* 24: 8. des. Netherlands: Aalbeek. With *Donisthorpea fuliginosa*.
- Codrus (Eocodrus) brevicornis* Kozlov, 1978. *Opredelitel' nasekomykh evropeiskoi chasti SSSR.* t. 3: Pereponchatokrylye 2: 548. key. Western Europe.

Front wing 2.0 to 3.5 mm. long. Subapical transverse carina of clypeus not as far ventrad as true apex of clypeus. Temple of male without a tubercle. Flagellum short, the second segment about 2.6 as long as wide in male, about 2.0 as long as wide in female. Pronotum in front of sulcus usually with hairs only near the epomia, sometimes with a few hairs as far ventrad as its lower corner. Upper face of propodeum rugulose, the rugulosity with an obliquely longitudinal bias. Hind femur about 5.0 as long as deep in male, about 3.5 as long as deep in female. Basal black tooth of front and middle tarsi about 0.9 as long as the part of claw distad of the tooth. Stalk of abdomen about 0.5 as long as wide in both sexes. Base of syntergite with a median groove that reaches about 0.3 the distance to first thyridia. Ovipositor sheath as in figure 460.

Black. Scape brownish fulvous. Mouth parts and tegula stramineous. Front coxa light brown apically. Legs beyond coxae fulvous brown. Wings subhyaline. Stigma and strong veins brown or dark brown.

Nearctic specimens: 4♂, 25♀ from British Columbia (Cowichan Lake, Lac la Hache, Racing River at 2,800 ft., Robson, and Stone Mt. Park at 3,800± ft.); California (Crescent City); Kentucky (Mammoth Cave); Louisiana (Lake Bistineau State Park); New York (Ithaca); North Carolina (Andrews Bald in Smoky Mt. Park); Nova Scotia (Lockport); Ontario (Cumberland and Marmora area); Oregon (Forest Grove); South Carolina (Greenville); and Washington (Mt. Rainier at 2,700 ft.). Collection dates are from April 9 to September 16.

European specimens: 17♂, 24♀ from Czechoslovakia (Homyle in Bohemia); England (Leicester and Newcastle-on-Tyne); Ireland (Athdown in Co. Wicklow, Boher-na-breena in Co. Dublin, Cerriglead in Co. Carlow, Coombe Wood, Deputy's Pass in Co. Wicklow, Dunran in Co. Wicklow, George's Br. in Co. Wicklow, Lake Dan in Co. Wicklow, Murlough Ho Dunes in Co. Donegal, The Slade of Saggart in Co. Dublin, and Upper Glenasmole in Co. Dublin); Italy (Pizzighettone); Russia (Kiev); Scotland (Bonhill); and Sweden (Skåne and Småland). Collection dates are from April 24 to December 3.

This species is widespread in Europe and North America. Smetana, 1957 records it as a parasite of *Quedius vexans* (Staphylinidae).

2. Exallonyx ruficeps Kieffer

**Serphus (Phaenoserphus) Ruficeps* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 301. ♂, ♀. des. in key. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), Syria: Damascus (Paris). Examined in 1975.

Phaenoserphus ruficeps Kieffer, 1914. Das Tierreich 42: 25. ♂, ♀. key, des. Syria: Damascus.

Similar to *E. longicornis* except as follows: Stalk of abdomen in both sexes about 25% longer than in *longicornis* and with finer sculpture. Antenna entirely yellow. Legs yellow with coxae brown but yellowish apically.

The above descriptive notes were made from a superficial study of the types in 1975. They cannot be relied upon for structural characters not specifically mentioned above. The grooves at the base of the syntergite of the types were obscured by grease. The temple of the male paratype was obscured by glue but apparently had a weak tubercle.

Specimens: ♂, ♀ (lectotype ♀, hereby designated, and paratype ♂), Damascus, Syria, May 1889 (Genoa).

3. Exallonyx longicornis Nees

Figures 157 and 158 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 461 (ovipositor sheath)

**Codrus longicornis* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 358. ♀. des. Type: ♀, Germany: Sickershausen [in Franconia] (destroyed). Interpretation of the species according to Haliday, 1839. Study of Haliday specimens reported by Nixon, 1938.

Proctotrupes longicornis Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 9. ♂, ♀. des. England. Ireland. Scotland.

Proctotrupes longicornis Curtis, 1839. British entomology . . . XVI: text for fig. 744. key.

Proctotrupes longicornis Vollenhoven, 1873. Tijdschr. voor Ent. 16: 205. Netherlands: Brummen.

Proctotrypes longicornis Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 465. syn.

Exallonyx longicornis Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. syn.

**Serphus (Phaenoserphus) Micrurus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 312. ♂, ♀. des. in key. Lectotype: ♀ (designated by Kelnner-Pillault, 1958), Portugal: "St. Fiel" (Paris). Examined in 1975. France: Sévres. New synonym.

Exallonyx Longicornis Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 335. ♀. des. in key. England. France: 1 locality. Germany. Ireland. Italy: 2 localities. Scotland.

Phaenoserphus micrurus Kieffer, 1914. Das Tierreich 42: 29. ♂, ♀. key, des. Algeria. France. Portugal.

Exallonyx longicornis Kieffer, 1914. Das Tierreich 42: 48. ♂, ♀. key, des. England. France. Germany. Ireland. Northern Italy. Scotland.

Proctotrypes micrurus Morley, 1922. Entomologist 55: 60, 158. ♀. key. England: near Ipswich.

Exallonyx longicornis Morley, 1922. Entomologist 55: 159, 160. key, biol. England: 17 localities. Scotland.

- Exallonyx longicornis* Mohr, 1930. Mitt. Höhl. Karstforsch. 1930: 87. biol. West Germany: in cave in Asselberg in Schleswig-Holstein. Hosts: Staphylinidae larvae.
- Exallonyx longicornis* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 239. ♂, ♀. biol. Belgium: 9 localities.
- Exallonyx longicornis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 436, 438, 440, 443, 445. ♂, ♀. keys, des., figs. England: 7 localities. Ireland: 4 localities.
- Exallonyx longicornis* Leruth, 1939. Mém. Mus. Roy. d'Hist. Nat. de Belgique 87: 274. ♀. fig., biol. Belgium: 8 localities in caves.
- Exallonyx longicornis* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: 2 localities in Dumfriesshire.
- Exallonyx longicornis* Kerrich, 1940. Notulae Ent. 19: 101. ♂. USSR (= "Finland"): Sortavala.
- Exallonyx longicornis* Hellén, 1941. Notulae Ent. 21: 38. ♂. key. Finland: 4 localities. Sweden.
- Exallonyx longicornis* Perkins, 1942. Entomologist 75: 194. ♂, ♀. Sweden: 2 localities.
- Phaenoserphus micrurus* Tomsík, 1942. Ent. Listy 5: 74. ♂. Czechoslovakia: 1 locality in Bohemia.
- Exallonyx longicornis* Tomsík, 1944. Ent. Listy 7: 53. ♂, ♀. des. Czechoslovakia: localities in Moravia.
- Serphus (Phaenoserphus) micrurus* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. "♂" = ♀. lectotype designated.
- Codrus (Eocodrus) longicornis* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn.
- Codrus longicornis* Meyer, 1961. Bombus 2: 93. West Germany: 8 localities.
- Codrus (Eocodrus) longicornis* Wiedemann, 1962. Faun. Mitt. aus Norddeutschland 2: 28, 33. ♂, ♀. ecology. West Germany: 5 localities.
- Codrus longicornis* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 442. Austria. Czechoslovakia: Moravia. Switzerland.
- Codrus longicornis* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 531. biol. Ireland: 7 counties.
- Codrus (Eocodrus) longicornis* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera p. 39, 46, 48, 50, 53. ♂, ♀. keys, des., figs., biol. Austria. France. Germany. Great Britain. Northern Greece. North Italy. Scandinavia. Switzerland.
- Codrus longicornis* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. ♂, ♀. Austria. Germany. Italy. Switzerland.
- Codrus longicornis* Kozlov, 1972. Insects of Mongolia 1: 646. Mongolia: 4 localities.
- Codrus (Eocodrus) longicornis* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 548. key, fig. USSR: Yaroslavskaia oblast.

Front wing 3.2 to 3.7 mm. long. Subapical transverse carina of clypeus projecting just as far ventrad as the true apex of clypeus. Temple of male usually with a weak median tubercle that is emphasized by a tuft of short hairs. Flagellum very long, the second segment about 3.2 as long as wide in male, about 5.5 as long as wide in female. Pronotum in front of sulcus covered with hairs. Upper face of propodeum rugulose, the rugulosity with an obliquely longitudinal bias. Hind femur about 5.0 as long as deep in male, about 6.5 as long as deep in female. Basal black tooth of front and middle tarsal claw about 0.55 as long as the part of claw distad of this tooth. Stalk of abdomen about 1.3 as long as wide in male, about 1.0 as long as wide in female. Base of syntergite with a median groove that reaches about 0.4 the distance to first thyridia. Ovipositor sheath as in figure 461.

Black. Male with scape and pedicel light brown and flagellum light brown toward base. Female with scape blackish brown, pedicel medium

brown, and flagellum dark brown. Labrum and apical half of mandible brown. Palpi pale brown. Tegula and legs beyond coxae pale fulvous brown, the trochanters, hind femur, apex of hind tibia, and hind tarsus sometimes darker brown. Wings hyaline, the stigma and radius dark brown, costa and subcosta light brown. Ovipositor sheath black.

Specimens: 14♂, 51♀ from Austria (Eichgraben, Liebenau, Maria Anzbach, Pitten, and Raab); East Germany (Beekow); England (Dorking in Surry and Leicester); France (Calais and Forêt de Roumare south-west of Rouen); Hungary (Vécs); Italy (Collí Euganie and Cansiglio in Belluno); Ireland (Buckronev in Co. Wicklow, Drinnahilly in Co. Donegal, Imaal in Co. Leitrim, Lawers, Slade Brook in Co. Dublin, and Tanrego in Co. Sligo); Scotland (Dunoon and South Uist in the Hebrides); Spain (north slope of Veleta in the Sierra Nevada); Sweden (Abisko and Skåne); and West Germany (Aber near Regen in Bavaria at 600 to 1,900 m., Achslach near Deggendorf in Bavaria at 600 to 1,000m., Löwanburger in Siebengebirge, and Lohrberg-Fuss in Siebengebirge). Collection dates are distributed from May 16 to October 19. There are also records for February and April at Leicester, England and April 28 at the Lührberg-Fuss in Siebengebirge, West Germany. The collections are more in the early season than is usual for serphids.

This species is widespread in Europe. It is adult from spring to mid fall. Mohr, 1930, states that it parasitizes staphylinid larvae.

4. Exallonyx certus, new species

Figures 159 and 160 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 462 (ovipositor sheath)

Front wing 2.9 to 3.8 mm. long. Subapical transverse carina of clypeus not as far ventrad as true apex of clypeus. Temple of male without a tubercle. Flagellum long, the second flagellar segment about 3.4 as long as wide in both sexes. Pronotum with hairs on the full length of collar, but no hairs between collar and the bottom of pronotal scrobe. Upper face of propodeum with irregularly reticulate wrinkling that has an obliquely transverse bias. Hind femur about 5.8 as long as deep in both sexes. Basal long black tooth on front and middle tarsal claws about 0.65 as long as the part of claw distad of the tooth in male, about 1.1 as long in female. Stalk of abdomen about 1.3 as long as wide in male, about 1.2 as long as wide in female. Base of syntergite without a groove at midline or with a short V-shaped groove. Ovipositor sheath as in figure 462.

Black. Scape, pedicel, and first 2-4 segments of flagellum light fulvous brown, the rest of flagellum fuscous. Mouth parts, tegula, and legs beyond coxae brownish fulvous, the coxae brown at apex. Wings hyaline. Stigma dark brown. Strong veins light brown.

Type: ♀, Kato Amiendos, 3,000 ft., Cyprus, Apr. 4, 1946, Mavroumoustakis (Townes).

Paratypes: ♂, same data as type except that the altitude is 3,500 ft. (Townes). ♂, Mansura, near Mafrak, Jordan, Oct. 22, 1965, J. Klapperich (Ottawa). ♀, Aband, near Bolu, western Turkey, June 6, 1966,

J. Klapperich (Ottawa). ♂, Pamukkala, near Denizli, southern Turkey
Apr. 26, 1967, J. Klapperich (Ottawa).

5. Exallonyx striatus, new species

Type male: Front wing 3.2 mm. long. Upper face of propodeum with long longitudinal wrinkles, the wrinkles obsolescent near base. Upper side of abdominal stalk somewhat smoother than in other species of the genus, and striation on side of stalk somewhat finer. Antenna blackish throughout. Otherwise agreeing with the description of *E. certus*.

Female: Unknown.

Type: ♂, Bergama, southern Turkey, Apr. 29, 1967, J. Klapperich (Ottawa).

7b. Subgenus EXALLONYX

Exallonyx Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 34.

Type: *Exallonyx formicarius* Kieffer. Original designation.

The subgeneric characters are summarized in the key to the subgenera.

This subgenus is worldwide. We treat 157 species. That number probably includes most of the species of Europe and the Nearctic Region, but because of inadequate collections only a small portion of those of the rest of the world. Specimens occur mostly in damp habitats. The species are divided into 11 species groups to express some of the apparent relationships and for easier mechanics of taxonomic treatment. Though the groups are as natural as we could devise, they are somewhat arbitrary and difficult to define precisely.

It is easy to misidentify specimens. Users of this revision are cautioned to work carefully and to have a collection large enough for learning the appearance of the characters and the variation to be expected.

Key to the species groups of the subgenus Exallonyx

1. Lower corner of pronotum with two pits (or rarely three), one above the other, of equal depth, and separated by a narrow ridge or high wrinkle. 2
 Lower corner of pronotum with one pit, rarely also with 1-3 shallow dimples above the pit. 8
2. Under side of base of abdominal stalk with several transverse wrinkles, the longitudinal ridges of stalk ending at the hind-most of these wrinkles. Old World tropics.

C. Cingulatus Group (p. 306)

- Under side of base of abdominal stalk with one transverse ridge, the longitudinal ridges of stalk ending at this ridge or close to it. 3
3. Males. 4
Females. 6
4. Clasper tapered to a slender point, decurved, claw-like. Neotropic Region. D. Leptonyx Group (p. 308)
Clasper narrowly triangular, straight, its apex sharp or narrowly rounded. 5
5. Syntergite with lower-most hairs close to its lower margin, the sockets of the lowest hairs separated from lower margin of tergite by 1.0 to 1.4 the length of the hairs. Holarctic Region.
A. Ater Group (p. 213)
Syntergite with lower-most hairs distant from its lower margin, the sockets of the lowest hairs separated from lower margin of tergite by more than 1.6 the length of the hairs. Worldwide.
B. Formicarius Group (p. 230)
6. Base of syntergite with 3 grooves (a median groove and 1 groove on each side). Side of pronotum never with hairs behind upper end of carina on collar. Posterodistal side of stigma straight. Neotropic Region. D. Leptonyx Group (p. 308)
Base of syntergite with 3-9 grooves (a median groove and 1-4 grooves on each side). Side of pronotum often with hairs behind upper end of carina on collar. Posterodistal side of stigma usually weakly convex. 7
7. Syntergite with lower-most hairs close to its lower margin, the sockets of the lowest hairs separated from lower margin of tergite by 1.0 to 1.4 the length of the hairs. Holarctic Region.
A. Ater Group (p. 213)
Syntergite with lower-most hairs distant from its lower margin, the sockets of the lowest hairs separated from lower margin of tergite by more than 1.6 the length of the hairs. Worldwide.
B. Formicarius Group (p. 230)
8. Hind margin of hind wing without a distinct notch near its basal 0.3, the hind wing unusually narrow near base. Front wing 1.6 to 2.9 mm. long. Europe, Philippines, and New Guinea.
K. Wasmanni Group (p. 378)
Hind margin of hind wing with a prominent rounded notch near its basal 0.3. 9
9. Base of under side of abdominal stalk with a projecting transverse ridge. 10

- Base of under side of abdominal stalk without a transverse ridge, or with a very low ridge that does not project below the longitudinal wrinkles on under side of stalk. 16
10. Dorsal smooth areas of propodeum short, usually not reaching behind propodeal spiracle. Upper margin of pronotum with a single row of sparse hairs. Male clasper narrowly triangular, not decurved. New Guinea and Madagascar.
 H. Dictyotus Group (p. 365)
 Dorsal smooth areas of propodeum moderately long, reaching far behind propodeal spiracle. Upper margin of pronotum with a hair band that is two or more hairs wide, a single row of hairs, or sometimes only a few sparse hairs. Male clasper variable, sometimes claw-like and decurved. 11
11. Males. 12
 Females. 14
12. Clasper slender, faintly to strongly decurved, claw-like (except in the Philippine species *E. planocaulis* and *E. datae*). Northern Hemisphere and Neotropic Region. . E. Atripes Group (p. 324)
 Clasper narrowly triangular, not decurved. 13
13. Neotropic species. F. Evanescens Group (p. 342)
 Holarctic species (Some abnormal specimens of *E. minor* and other small species will key to here.)
 B. Formicarius Group (p. 230)
14. Ovipositor sheath punctate and usually more or less striate. Upper margin of pronotum usually with a stripe or row of hairs, the stripe often 2-6 hairs wide. Hairs on syntergite sparse and short to moderately numerous and long. Northern Hemisphere and Neotropic Region. E. Atripes Group (p. 324)
 Ovipositor sheath punctate, not striate. Upper margin of pronotum with a single (or sometimes partly double) row of hairs, or the row sometimes reduced to a few scattered hairs. Hairs on syntergite very sparse and short. 15
15. Neotropic species. F. Evanescens Group (p. 342)
 Holarctic and New Guinea species (The New Guinea *E. siccatus* and *monotrema*, and some abnormal specimens of *E. minor* and of other small species will key to here.).
 B. Formicarius Group (p. 230)
16. Side of pronotum with hairs behind upper part of carina on collar. Hairs on propodeum and metapleurum very long and dense. New Guinea. J. Capillatus Group (p. 376)
 Side of pronotum without hairs behind upper part of carina on collar. Hairs on propodeum and metapleurum moderately sparse. . . 17

17. Upper margin of pronotum with a band of hairs that is about 3 hairs wide. Base of syntergite of male with strong lateral longitudinal grooves that are almost as long as median groove. Holarctic Region and Mexico. G. Obsoletus Group (p. 354)
 Upper margin of pronotum with a single row of sparse hairs.
 Base of syntergite of male without lateral longitudinal grooves or with a single lateral groove that is not more than half as long as median groove. New Guinea. . . I. Unisulcus Group (p. 373)

A. Ater Group

Front wing 2.2 to 4.0 mm. long. Male flagellum without raised tyloids. Second flagellar segment of male 2.5 to 3.0 as long as wide, of female 2.0 to 2.4 as long as wide. Tenth flagellar segment of male 2.5 to 3.3 as long as wide, of female 1.5 to 2.2 as long as wide. Lower corner of pronotum with 2 pits, one above the other. Upper margin of pronotum with a hair band that is several hairs wide. Pronotum behind epomia and upper part of carina on collar usually with numerous hairs, sometimes hairless. Pronotum sometimes with hairs behind middle and behind lower part of carina on collar. Paired smooth areas on upper side of propodeum extending far behind spiracle. Hind margin of hind wing with a shallow rounded notch at basal 0.35. Abdominal stalk with upper profile straight or weakly convex, side with strong longitudinal grooves, and lower front edge, with or without a transverse ridge. Syntergite, or at least the lower half of syntergite, with long moderately dense hairs, the sockets of lowest hairs separated from lower margin of syntergite by 1.0 to 1.4 hair lengths. Base of syntergite with 2 to 4 grooves on each side of median groove. Ovipositor sheath punctate and smooth, or in *E. quadriceps* punctate and longitudinally striate.

This is a Holarctic group. It contains 9 species.

Keys to the species of the Ater Group

Males

1. Side of syntergite with a hairless band between second and third thyridia that completely subdivides the hairy area. 2
 Side of syntergite without a hairless band that completely subdivides the hairy area, the hairs continuous near lower edge of syntergite. 3
2. Side of pronotum without hairs behind epomia and upper part of carina on pronotum. Front lower edge of abdominal stalk rounded off. Clypeus weakly convex. Alaska, British Columbia, and Montana. 1. sparsus, new species (p. 216)

Side of pronotum with about 6 hairs behind epomia and upper part of carina on collar. Front lower edge of abdominal stalk angularly projecting. Clypeus moderately convex. Europe.

2. quadriceps Ashmead (p. 217)

3. Side of pronotum with 0-6 hairs behind epomia and upper part of carina on collar, or sometimes more hairs in larger specimens. Species of Europe and Japan. 4

Side of pronotum with about 5-40 hairs behind epomia and upper part of carina on collar, or sometimes fewer hairs in unusually small specimens. Species of North America. 5

4. Clypeus in profile convex just above subapical overhang, the overhang with a sharply rounded margin. Base of syntergite with 2 grooves on each side of median groove. Japan.

3. styracura, new species (p. 219)

Clypeus in profile approximately flat just above subapical overhang, the overhang with sharp margin. Base of syntergite with 3 or 4 grooves on each side of median groove. Europe.

4. ater Gravenhorst (p. 220)

5. Profile of clypeus moderately or weakly convex just above the subapical overhang. Subapical overhang not forming a sharp-edged flange. 6

Profile of clypeus flat or weakly concave just above the subapical overhang. Subapical overhang a sharp-edged flange. 7

6. Stigma receiving radius a little distad of middle. Hind femur 4.5 as long as deep, the hairs on apical 0.4 of its hind side moderately dense. Grooves at base of syntergite deep and moderately long. Nearctic Region. 5. texanus Ashmead (p. 223)

Stigma receiving radius at middle. Hind femur 5.9 as long as deep, the hairs on apical 0.4 of its hind side sparse. Grooves at base of syntergite shallow and short. Arctic, Canadian, and Hudsonian zones of North America. . . . 6. boreus, new species (p. 225)

7. Apical margin of clypeal overhang strongly convex and projecting below true apex of clypeus. Hairs on front edge of mesopleurum continuous or with an interruption not more than 0.5 as long as tegula. Median groove at base of syntergite about 1.5 as long as the lateral grooves. Northwestern North America.

9. simplicior Brues (p. 229)

Apical margin of clypeal overhang weakly convex or subtruncate, not projecting ventrad as far as true apex of clypeus. Hairs on front edge of mesopleurum with an interruption about 1.0 as long as tegula. Median groove at base of syntergite 1.0 to 1.4 as long as the lateral grooves. 8

8. Lower front edge of abdominal stalk angulate. Subapical overhang of clypeus not projecting as far ventrad as apex of clypeus. First thyridium 3.0 as wide as long. Northwestern North America.
 7. nevadensis Kieffer (p. 226)
- Lower front edge of abdominal stalk rounded off. Subapical overhang of clypeus projecting about as far ventrad as true apex of clypeus. First thyridium 3.9 as wide as long. Northwestern North America. 8. artoculus, new species (p. 228)

Females

1. Ovipositor sheath striate, with indistinct punctures. Side of syntergite with a hairless band between second and third thyridia that completely or almost completely subdivides the hairy area. Front end of ridges on lower half of abdominal stalk usually strongly curved downward. Europe. 2. quadriiceps Ashmead (p. 217)
- Ovipositor sheath punctate, often with elongate punctures but not distinctly striate. Side of syntergite usually with a hairless area between second and third thyridia but except in the species *sparsus* (from northwestern North America), the hairless area does not extend to lower edge of hairy area and thus does not completely subdivide it. Front end of ridges on lower half of abdominal stalk horizontal to moderately curved downward. 2
2. Area behind epomia and upper end of carina on collar with 0-6 hairs or sometimes with as many as 15 hairs. Species of Europe, Japan, and Alaska. 3
- Area behind epomia and upper end of carina on collar with 6-50 hairs. Species of North America. 5
3. Side of syntergite with a wide, complete hairless band between second and third thyridia. Metapleurum with a large anterodorsal hairless area. Northern North America.
 1. sparsus, new species (p. 216)
- Side of syntergite without a complete hairless band between second and third thyridia. Metapleurum without an anterodorsal hairless area or with only a small hairless area. 4
4. Profile of clypeus moderately convex, its subapical overhang weak and with a sharply rounded margin. Base of syntergite with one strong groove (plus some weak rudiments) on each side of midline. Japan. 3. styracura, new species (p. 219)
- Profile of clypeus weakly convex, its subapical overhang strong and with a broad sharp margin. Base of syntergite with 3 or 4 strong grooves on each side of midline. Europe.
 4. ater Gravenhorst (p. 220)
5. Stigma 2.4 as long as deep. Anteroventral corner of basal truncation of abdominal stalk acute (about 80°). Hind femur 3.7 as long as deep. Nearctic Region. 5. texanus Ashmead (p. 223)

- Stigma about 1.95 as long as deep. Anteroventral corner of basal truncation of abdominal stalk a right angle or weakly obtuse, often rounded. 6
6. Profile of clypeus moderately convex, its subapical overhang, as seen from below, a crescent of moderate width. Hind femur 4.7 as long as deep. North America in Canadian, Hudsonian, and Arctic zones. 6. boreus, new species (p. 225)
 Profile of clypeus weakly convex, its subapical overhang, as seen from below, a very narrow crescent. (Beyond here, the key is unreliable because the characters are indistinct and variable.) 7
7. Front margin of mesopleurum with hairs continuous or almost continuous from upper front corner to the horizontal groove. Lateral grooves at base of syntergite about 0.6 as long as median groove. Western Nearctic Region. 9. simplicior Brues (p. 229)
 Front margin of mesopleurum with a hairless area midway between its upper front corner and the horizontal groove. Lateral grooves at base of syntergite about 0.6 to 0.75 as long as median groove. 8
8. Lower front corner of abdominal stalk somewhat angulate. First thyridium 3.0 as wide as long. Northwestern North America. 7. nevadensis Kieffer (p. 226)
 Lower front corner of abdominal stalk rounded off. First thyridium 3.9 as wide as long. Northwestern North America. 8. artoculus, new species (p. 228)

1. Exallonyx sparsus, new species

Figures 161 and 162 (σ , φ metapleurum, propodeum, and abdominal stalk); 463 (ovipositor sheath)

Front wing 2.8 to 3.2 mm. long. Clypeus weakly convex, the under side of its apical overhang very narrowly crescentic, weakly concave. Side of pronotum without hairs behind epomia and upper end of carina on collar. Front margin of mesopleurum, above the horizontal groove, with a hairless area 1.0 as long as width of tegula. Hind part of thorax and abdominal stalk as in figures 161 (σ) or 162 (φ), the metapleurum smoother than in other species of the Ater Group. Hind femur 4.3 as long as deep in male, 3.8 as long as deep in female. Stigma short and deep, 1.55 as wide as deep, receiving radius at middle. Abdominal stalk of male 0.65 as long as high, its front lower corner rounded off. Abdominal stalk of female 0.30 as long as high, its lower front corner prominent, somewhat acute. Hairy area on syntergite interrupted subapically and subbasally by complete hairless bands. Median groove on syntergite reaching 0.6 to 0.8 to space between thyridia, the lateral grooves 0.6 to 0.9 as long as median groove. First thyridium 2.8 as wide as long. Ovipositor sheath as in figure 463.

Black. Mandible brown. Palpi stramineous. Scape and pedicel of

male brown or light brown. Antenna of female entirely black or more or less brown toward base. Tegula and legs beyond coxae fulvous, the hind tarsus infusate and hind tibia darkened toward apex. Front coxa fulvous. Middle and hind coxae brown or blackish brown, paler at apex. The female may have the legs entirely blackish. The type is such a female. Wings subhyaline, the stigma and strong veins blackish or dark brown.

Type: ♀, Paxson, Alaska, Aug. 10, 1973, H. and M. Townes (Townes).

Paratypes: 27♂, 10♀ from Alaska (Big Delta, Cold Bay at 163° W., Matanuska, Mt. McKinley at 2,500 ft., Paxson, St. George Is. in Behring Sea, Tsaina River, and Valdez); Alberta (Jumping Pound Creek 20 miles west of Calgary); British Columbia (Atlin at 2,200 ft., 14 miles north of Banff at 4,500 ft., Bevan, and 54 miles east of Terrace); Colorado (west slope of Loveland Pass at 9,850 ft.); Massachusetts (Holliston); Montana (Lake McDonald in Glacier National Park); Quebec (Parke Reserve at 950 ft. in Kamouraska Co.); and Utah (Cache National Forest in Wasatch Mts.). Collection dates are mostly in July and August. The earliest and latest dates are June 18 at Matanuska, Alaska; September 13 at Matanuska, Alaska; and September 14 at Holliston, Mass. Paratypes are in the collections of Ottawa, Townes, Washington, and Cambridge.

This species occurs in North America in the Arctic, Hudsonian, and Canadian zones.

2. Exallonyx quadriceps Ashmead

Figures 163 and 164 (♂, ♀ metapleurum, propodeum, and stalk of abdomen); 464 (ovipositor sheath)

- **Proctotrypes quadriceps* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 343. ♀. key, des. Type: ♀, USA: "New Jersey" (Washington). Examined in 1977. Type believed to be actually from Europe.
- ?*Proctotrypes quadriceps* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 195. ♀. Canada: Hull [in Quebec] and Ottawa [in Ontario].
- Exallonyx crassicornis* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. *Nomen nudum*.
- **Exallonyx filicornis* var. *Crassicornis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 341. ♀. des. Type: ♀, Germany: Helgoland Is. (Maastricht). Examined in 1975. New synonym.
- Exallonyx quadriceps* Kieffer, 1909. Genera Insectorum 95: 8. syn.
- Exallonyx filicornis crassicornis* Kieffer, 1914. Das Tierreich 42: 51. ♀. des., biol. Germany: Helgoland Is. From rotting seaweed on beach.
- Exallonyx quadriceps* Kieffer, 1914. Das Tierreich 42: 57. ♀. key, des. USA: New Jersey.
- ?*Serphus quadriceps* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 576. ♀. key, des. USA: New Haven in Connecticut.
- Exallonyx quadriceps* Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.
- **Proctotrypes hyalinipennis* Morley, 1922. Entomologist 55: 60, 157. ♂, ♀. key, des. Lectotype: ♀ (designated by Masner, 1965), England: Bentley Woods (London). Examined in 1975. England: Tostock in Suffolk. Name preoccupied by Kieffer, 1908. New synonym.
- Exallonyx ligatus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 440, 443, 446. ♂?, ♀. key, syn., des., figs. England: 6 localities. Ireland: 6 localities. Scotland: Nairn. Host: *Quedius* sp. larvae found in mole's nest. (in part).

- Codrus quadriceps* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.
Codrus hyalinipennis Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 6. ♀. lectotype designated.
Codrus quadriceps Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♀. type data.
Codrus? ater Dessart, 1975. Pub. Natuurhist. Genootsch. Limburg 24: 9. syn. (in part). type data for *crassicornis*.

Front wing 2.2 to 3.7 mm. long. Clypeus weakly convex, its subapical overhang, as seen from below, narrowly crescentic, concave. Side of pronotum with about 12 hairs behind epomia and upper end of carina on collar. Front margin of mesopleurum, above the horizontal groove, in male with a continuous or narrowly interrupted band of hairs, in female with a hairless area that is about as wide as length of tegula. Hind part of thorax and stalk of abdomen as in figure 163 (♂) and 164 (♀). Stigma 1.9 as wide as deep in male, 2.4 as long as deep in female, receiving radius at middle. Abdominal stalk 0.50 as long as high, its lower front corner rectangular in male, weakly acute in female. Hairy area on syntergite almost always completely subdivided between second and third thyridia by a hairless band. Male syntergite with median groove reaching 0.45 to thyridial interspace, the lateral grooves nearly as long as median groove. Female syntergite with median groove reaching 0.7 to thyridial interspace, the lateral grooves 0.4 to 0.7 as long as median groove. First thyridium 4.4 as wide as long in male, 3.7 as wide as long in female. Ovipositor sheath as in figure 464. (This is the only species of the *Ater* Group with longitudinal striae on the ovipositor sheath.)

Black. Mandible and labrum light brown. Palpi stramineous or fulvous. Antenna of male brown to black, the scape darker than the flagellum. Antenna of female light brown to medium brown, darker apically, the scape brown or dark brown with base and apex paler. Coxae brown to black, the hind coxa darkest. Legs beyond coxae fulvous, the front and middle tarsi stramineous or pale fulvous, hind femur often tinged with brown, and hind tarsus light fulvous. Wings subhyaline, the stigma and strong veins dark brown.

Specimens: 97♂, 161♀ from Austria (Linz, Obergurgl at 1,950 m., Ötztal, Raxalpe at 1,500 m., Sarleinsbach, Scharten, and Scheffau in the Tirol at 800 m.); Czechoslovakia (Kytřín in Bohemia); Denmark (Copenhagen); East Germany (Beekow); England (Bagley Woods near Oxford, Heathfield in Devon, Leicester, and Torquay in Devon); Ireland (in County Carlow: Borris; County Donegal: Donard Lo, Drinnahilly, Millisle D'du, and Murlough Ho Dunes; County Dublin: Dollymount, Furry Glen, Gleasmole, Saggart, and The Slade of Saggart; County Kerry; County Kildare: Athgarrett and Landestown; County Leitrim: Schriff Wood, and Tullingham; County Sligo: Bunduff, Toberescana, and Trawallua; County Waterford: Lismore; County Wexford: south of Cushenstown; and County Wicklow: Athdown, Ballinglass, Bellevue, Clara, Connary, Deputy's Pass, Devils Glen, Downs, Drummin Ho, Dunron, Ennereilly, Glencree, and Raheen); Italy (Auer near Bozen at 250 m., Fuoine in Trento, Franzenfeste at 1,000 m., Naturno in Trentino at 500 to 1,000 m., and Pizzighettone); Luxemburg (Dierkirch); Russia (Moscow);

Spain (Grenada at 1,200 ft. and north slope of Veleta at 2,400 ft. in Sierra Nevada); Sweden (Ljungby in Småland, Masugnsbyn in Lappland, Messaure, Öl Böda, Riksgränsen at 500 m. in Lappland, Skåne, and Vallentuna in Uppland); West Germany (Aber near Regen at 600 to 1,900 m. in Bavaria and Mainz).

Collection dates are mostly from June to the end of October. Some are in May. Dates outside of this range are April 14 at Drummin Ho, County Wicklow, Ireland; April 24 at Deputy's Pass, County Wicklow, Ireland; and November 6 and 10 at the Slade of Saggart, County Dublin, Ireland.

This species is common and widespread in Europe, but it has previously been confused with *E. ligatus* so European literature has no notice of it.

3. Exallonyx styracura, new species

Figures 165 and 166 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 465 (ovipositor sheath)

Front wing 2.3 to 2.7 mm. long. Clypeus strongly convex, its subapical overhang, as seen from below, small, narrowly crescentic, and weakly concave. Side of pronotum without hairs behind epomia and the upper end of carina on collar. Front edge of mesopleurum in male with a continuous band of hairs from upper corner to the horizontal groove. Front edge of mesopleurum of female with hairs on upper corner and just above the horizontal groove, none in between. Hind part of thorax and stalk of abdomen as in figure 165 (♂) and 166 (♀). Hind femur of both sexes 4.8 as long as deep. Stigma 2.0 as long as high, receiving radius at apical 0.47. Stalk of male abdomen 0.92 as long as high, its lower front corner about 95°. Stalk of female abdomen 0.70 as long as high, its lower front corner about 85°. Hairs on syntergite moderately sparse, the hairy area partly divided by incomplete hairless bands between first and second thyridia and second and third thyridia. Median groove at base of syntergite of male reaching 0.5 to space between thyridia, on each side only 2 lateral grooves that are about 0.4 as long as median groove. Median groove of female syntergite reaching 0.63 to space between thyridia, on each side with a broad, partially double groove that is 0.6 as long as median groove. First thyridium 3.5 as wide as long in both sexes. Ovipositor sheath as in figure 465.

Black. Mouth parts and tegula stramineous. Antenna pale brown basally, darkening apicad to blackish at apex. Legs pale fulvous. Front and middle coxae fulvous brown. Hind coxa brown. Hind tibia and tarsus light brown. Wings with a tinge of fuscous, the stigma and strong veins dark brown.

Type: ♀, Sapporo, Japan, Jul. 11, 1954, David Townes (Townes).

Paratype: ♂, Kamikochi, Japan, July 25, 1954, Townes family (Townes).

4. Exallonyx ater Gravenhorst, new combination

Figures 167 and 168 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 466 (ovipositor sheath)

- **Codrus ater* Gravenhorst, 1807. Vergleichende uebersicht des . . . zoologischen Systeme, p. 263 [?]. des. Type: ♀, Germany (lost). The description fits several smaller species with the basal 0.25 of antenna and the legs fulvous. As first revisor, the name is hereby applied to "ater Nees" as interpreted by Nixon. A female in the Townes collection is labeled as agreeing with the description.
- Proctotrupes ater* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 8, 15. ♂, ♀. des., biol. England. Finland. Frequent in autumn in woods in Ireland. Misdet. of *ater* Nees.
- Proctotrupes ater* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 420. ♂, ♀. syn., des. Norway. Sweden: 4 localities. Misdet. of *ater* Nees (in part).
- Proctotrupes ater* Vollenhoven, 1876. Pinacographia p. 31, pl. 19, fig. 5. ♀. syn., des., fig. (representing *ater* of Thomson, not Nees, and not Gravenhorst).
- Proctotrupes ater* Frohawk, 1886. Entomologist 19: 225. figs., biol. England. Host: *Creophilus maxillosus*. Misdet. of *ater* Nees.
- Proctotrypes ater* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 462. syn. (in part).
- **Proctotrypes aterrimus* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 462. New name for *ater* Thomson. Lectotype: ♀ (labeled by Townes in 1978 and hereby designated), Sweden: Småland (Stockholm). Examined in 1978. Norway. Sweden: 3 localities. New synonym.
- **Exallonyx Xanthocerus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 332. ♀. des. in key. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated). Italy: Villoria (Genoa). Examined in 1975. New synonym..
- **Exallonyx Syriacus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 334. ♂. des. in key. Lectotype: ♂ (labeled by Townes in 1975 and hereby designated). Syria: Damascus (Genoa). Examined in 1975. New synonym.
- **Exallonyx Filicornis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 341. ♂, ♀. copy of Haliday description of *ater*. New name for *ater* Haliday. Types: ♂, ♀. England. Ireland. Sweden (Dublin). Types examined by Nixon and reported in 1938.
- **Exallonyx Ligatus* var. *Coxalis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 345. ♀. des. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), Czechoslovakia: Košice (Budapest). Examined in 1975. The lectotype is labeled Kassa (= Košice), which Kieffer read incorrectly as Kaffa, a Crimean locality. New synonym.
- Phaenoserphus ? aterrimus* Kieffer, 1909. Genera Insectorum 95: 5. syn.
- Exallonyx xanthocerus* Kieffer, 1914. Das Tierreich 42: 47. ♀. key, des. Hungary. Italy.
- Exallonyx syriacus* Kieffer, 1914. Das Tierreich 42: 48. ♂. key, des. Syria: Damascus.
- Exallonyx ligatus coxalis* Kieffer, 1914. Das Tierreich 42: 52. ♀. des. Czechoslovakia: Košice (= USSR: Kaffa in Crimea).
- Exallonyx aterrimus* Kieffer, 1914. Das Tierreich 42: 53. ♂, ♀. Copy of Thomson's description. Sweden.
- Exallonyx xanthocerus* Morley, 1922. Entomologist 55: 159, 161. ♂, ♀. key, des. England: Wilverley Inclosure in New Forest.
- Exallonyx ater* Morley, 1922. Entomologist 55: 160, 183. key, biol. England: 10 localities. Misdet. of *ater* Nees.
- Exallonyx ater* Bayford, 1924. Ent. Monthly Mag. 60: 233. biol. Host: *Pterostichus ? madidus*. Misdet. of *ater* Nees.
- Serphus filicornis* Pax & Maschke, 1935. Beiträge zur Biologie des Glatzer Schneeberges (Breslau) 1: 12, 61. Poland: Wolmsdorf cave [southwest of Klodzko (= Glatz)].

- Exallonyx ater* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 439, 440, 443, 446. ♂?, ♀. key, syn., des., figs., biol. England: London. Ireland: 8 localities. Misdet. of *ater* Nees.
- **Exallonyx gracilis* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 439, 440, 443. ♀. key, des., figs. Type: ♀, England: Ashtead in Surrey (London). Examined in 1977. England: 3 additional localities. Ireland: 4 localities. New synonym.
- Exallonyx ater* Kerrich, 1940. Notulae Ent. 19: 101. ♀. USSR (= "Finland"): Valmo. Misdet. of *ater* Nees.
- Exallonyx aterrimus* Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera 2. Terebrantia, p. 30. Finland.
- Exallonyx ater ater* Hellén, 1941. Notulae Ent. 21: 38. ♂, ♀. key, des. Finland. Misdet. of *ater* Nees.
- Exallonyx ater* v. *aterrimus* Hellén, 1941. Notulae Ent. 21: 39. des. Finland.
- Exallonyx ater* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: Ringsjön. Misdet. of *ater* Nees.
- Exallonyx ater aterimus* (!) Tomšík, 1944. Ent. Listy 7: 55. ♂?, ♀. Czechoslovakia: 18 localities.
- Serphus ater* Risbec, 1950. Travaux Lab. Ent. Sect. Soudanais Recherches Agron. I, II: 515. "Host: *Lithobius* sp." Misdet. of *ater* Nees.
- Exallonyx ater* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des. Misdet. of *ater* Nees.
- Codrus (Codrus) ater* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, and central Europe. Misdet. of *ater* Nees.
- Codrus (Codrus) gracilis* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, and central Europe.
- Codrus ater* Meyer, 1961. Bombus 2: 94. West Germany: 4 localities. Misdet. of *ater* Nees.
- Codrus gracilis* Meyer, 1961. Bombus 2: 94. West Germany: 5 localities.
- Codrus ater* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 2 localities. Misdet. of *ater* Nees.
- Codrus (Codrus) ater* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 30, 33, 34. ♀. biol., ecology. West Germany: 14 localities. Misdet. of *ater* Nees.
- Codrus (Codrus) gracilis* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 31, 33, 34. ♀. biol., ecology. West Germany: 25 localities.
- Codrus ater* Meyer, 1963. Bombus 2: 143. ♀. [Denmark]: Sønderborg (= Sonderburg). West Germany: Satrup in Schleswig-Holstein. Misdet. of *ater* Nees.
- Codrus gracilis* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 5. Europe. Japan.
- Codrus gracilis* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 6. ♀. type data.
- Codrus gracilis* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 *et seq.* ♂, ♀. figs. (p. 485, 504, 505), ecology, biometrics. Austria. Switzerland. West Germany: 11 localities.
- Codrus ater* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 *et seq.* ♂, ♀. figs. (p. 485, 504, 505), ecology, biometrics. Austria. Switzerland. West Germany: 8 localities. Misdet. of *ater* Nees.
- Codrus ater* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology. Misdet. of *ater* Nees.
- Codrus gracilis* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Codrus ater* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 531. ♀. biol. Ireland: 4 counties. Misdet. of *ater* Nees.
- Codrus gracilis* Weidemann, 1967. Faunistisch-Ökologische Mitt. 3: 168, 169. biol. West Germany: Gröde; Habel.
- Codrus (Codrus) ater* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 39, 46, 48, 50, 52, 55. ♂, ♀. keys, des., figs., biol. Austria. France. Germany. Great Britain. Scandinavia. Switzerland. Host: *Ocyopus olens*. This is a misinterpretation of Morley, 1922. Misdet. of *ater* Nees.
- Codrus (Codrus) gracilis* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 48, 50, 52, 56. ♂, ♀. keys, des., figs., biol. Austria. Finland. Germany. Great Britain. Southern Italy. Northern Japan. Switzerland.

- Codrus ater* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. ♀. Austria. Germany. Lichtenstein. Switzerland. Misdet. of *ater* Nees.
- Codrus gracilis* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. Austria. Germany. Northern Italy.
- Codrus ater* Kozlov, 1972. Insects of Mongolia 1: 647. ♀. Mongolia: 1 locality. Hosts: *Creophilus maxillosus*; *Ocybus olens*. Misdet. of *ater* Nees.
- Codrus filicornis* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♂. Rumania.
- Codrus (Codrus) filicornis* Teodorescu & Fabritius, 1975. In Ionescu: Fauna Acad. Rep. Soc. România, Ser. Monog., p. 165. ♂. Rumania: Ogradena.
- Codrus (Codrus) gracilis* Teodorescu & Fabritius, 1975. In Ionescu: Fauna Acad. Rep. Soc. România, Ser. Monog., p. 165. Rumania: Iași; Sibiu; Suceava.
- Codrus (Codrus) ater* Kozlov, 1978. Opređelitel' nasekomykh evropeiskoï chasti SSSR. t.3: Pereponchatokrylye 2: 547. key. USSR: Leningradskaya, Ul'yanovskaya, and Yaroslavskaya oblasti. Misdet. of *ater* Nees.
- Codrus (Codrus) gracilis* Kozlov, 1978. Opređelitel' nasekomykh evropeickoï chasti SSSR. t. 3: Pereponchatokrylye 2: 547. key. USSR: Leningradskaya oblast.

Front wing 2.5 to 3.6 mm. long. Clypeus in profile nearly flat or weakly convex, with a broad, sharply margined subapical overhang. Side of pronotum with 0 to 6 hairs behind epomia and upper part of carina on collar. Front edge of mesopleurum with a hairy area on upper corner and another above the horizontal groove, between these hairy areas a bare area that is a little longer than length of tegula. Hind part of thorax and stalk of abdomen as in figure 167 (♂) or 168 (♀). Hind femur of male 4.6 as long as deep, of female 5.1 as long as deep. Stigma 1.9 as long as deep in both sexes, receiving radius at apical 0.47. Abdominal stalk of male 0.85 as long as high, its lower front corner 100°. Abdominal stalk of female 0.78 as long as high, its lower front corner prominent, 80°. Hairs on syntergite long, moderately sparse but with hairless areas on upper half, moderately dense and continuous on lower half, the sockets of lowest hairs separated from lower edge of syntergite by 1.1 hair lengths. Base of syntergite with median groove reaching 0.7 to space between thyridia, with 3 grooves on each side that are 0.6 as long as median groove. First thyridium 2.8 as wide as long, in both sexes. Ovipositor sheath as in figure 466.

Black. Palpi stramineous. Mandible and tegula pale fulvous. Antenna light brown or medium brown, darkened apicad to dark brown or blackish brown. Coxae fulvous to blackish. Legs beyond coxae fulvous, the hind femur sometimes brown. Wings hyaline, the stigma and strong veins dark brown.

Specimens: 136♂, 63♀ from Austria (Bucklige Welt, Dauerbach at Oberwang, Ebelsburg, near Linz, Sarleinsbach, Tamsweg, and Traunau); Cyprus (Yermasoyia River); Czechoslovakia (Kytín in Bohemia); England (Dawish Warren in Devon, Leicester, and Torquay in Devon); Finland (Helsinki); Ireland (Athdown in Co. Wicklow, Coombe in Co. SR, Furry Glen in Co. Dublin, Glenasmole in Co. Dublin, Glencully in Co. Wicklow, Lake Dane in Co. Wicklow, Powerscourt in Co. Wicklow, and the Slade of Saggart in Co. Dublin); Italy (Genoa, Mt. Alto at 1,500 m. near Unserfrau in Trentino, Naturno at 500 to 1,000 m. in Trentino, and Pizzighetone); Sweden (Abisko in Lappland, Enviken, Eshärad in Varmland, Hällnäs in Västerbotten, Gustavs Solvarbo, Harmsarv in Kopparberg, Harparbol, Alunge in Uppland, north of Knivsta in Uppland, Ljungby in Småland, Los Kyrkbyn in Hälsingland, Masungsbyn in Lappland, Messaure, Skåne, Stockholm, Vallentuna in Uppland, and

Vassunda Tursbo in Uppland); and West Germany (Kegelsbach at Kirchheim unter Teck and Schliersee in Bavaria at 900 to 1,100 m.).

Collection dates are from May 9 (near Linz, Austria); June 22 and 27 (in Cyprus); and June 27 (in Hälsingland, Sweden) to November 22 (in Co. Dublin, Ireland). Most of the collections are from mid July through October.

In literature there are records from the additional countries of France, Hungary, Japan, Lichtenstein, Mongolia, Switzerland, and Syria. Rearings recorded are from *Creophilus maxillosus* and *Ocyopus olens* (both Staphylinidae). Risbec, 1950, records *Lithobius* as host, but this must be an error based on Newman's record of *Phaneroserphus calcar* from *Lithobius*. This species is widespread in Europe and is recorded in literature from Mongolia and Japan. It is adult mostly from midsummer to mid fall.

5. Exallonyx texanus Ashmead, new combination

Figures 169 and 170 (♂, ♀ metapleurum, propodeum, and stalk of abdomen); 467 (ovipositor sheath)

- **Proctotrypes texanus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 341. "♀" = ♂. key, des. Type: ♂, USA: Texas (Washington). Examined in 1977.
- **Proctotrypes canadensis* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 342. ♀. key, des. Type: ♀, Canada: Ottawa (Washington). Examined in 1977. New synonym.
- **Proctotrypes simulans* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 342. ♀. key, des. Type: ♀, USA: Arlington in Virginia (Washington). Examined in 1975. New synonym.
- Proctotrypes canadensis* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♀. Canada: Hull in Quebec and Ottawa in Ontario.
- Phanoserphus texanus* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Exallonyx canadensis* Kieffer, 1909. Genera Insectorum 95: 7. syn.
- Exallonyx simulans* Kieffer, 1909. Genera Insectorum 95: 7. syn.
- Phanoserphus texanus* Kieffer, 1914. Das Tierreich 42: 35. ♂. key, des. USA: Texas.
- Exallonyx canadensis* Kieffer, 1914. Das Tierreich 42: 56. ♀. key, des. Canada: Ottawa.
- Exallonyx simulans* Kieffer, 1914. Das Tierreich 42: 57. ♀. key, des. USA: Arlington in Virginia.
- Codrus canadensis* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn. Canada: Ontario; Quebec. USA: New York.
- Codrus simulans* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn. USA: Illinois; Maryland; Virginia; West Virginia.
- Codrus texanus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.
- Codrus canadensis* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 4. ♀. type data.
- Codrus simulans* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♀. type data.
- Codrus texanus* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♂. type data.

Front wing 1.7 to 3.3 mm. long. Clypeus in profile moderately or weakly convex, its subapical overhang with a rounded margin, the overhang as seen from below almost flat and narrowly crescentic. Side of pronotum with 10-20 hairs behind epomia and upper end of carina on collar. Front edge of mesopleurum with a hairy area below tegula and

and another above the horizontal groove, in between without hairs. Hind part of thorax and stalk of abdomen as in figure 169 (♂) or 170 (♀). Hind femur of male 4.5 as long as deep, of female 3.7 as long as deep. Stigma of male 1.95 as long as deep, receiving radius at apical 0.43. Stigma of female 2.4 as long as deep, receiving radius at apical 0.45. Abdominal stalk of male 0.88 as long as high, its lower front corner about 85°. Abdominal stalk of female 0.68 as long as high, its lower front corner prominent, about 80°. Hairs on syntergite dense on lower half, sparse on upper half, the lowest hair sockets separated from lower edge of syntergite by 1.2 hair lengths. Syntergite with median groove reaching 0.7 to space between thyridia, on each side with 3-5 grooves that are about 0.6 as long as median groove. First thyridium 3.2 as wide as long in male, 2.5 as wide as long in female. Ovipositor sheath as in figure 467.

Black. Palpi stramineous. Mandible and tegula fulvous. Antenna of male light brown basally, darkening apicad to blackish brown at apex. Antenna of female medium brown to blackish brown basally, darkening apicad. Legs fulvous to brown. Wings subhyaline, the stigma and strong veins dark brown.

Specimens: 214♂, 58♀ from Alaska (Matanuska and Valdez); Alberta (McMurray and Slave Lake); California (Crescent City); Colorado; Connecticut (Canaan and Redding); Georgia (Hiawassee and Holcomb Creek); Illinois (Algonquin); Indiana (Lafayette and Mineral Springs); Iowa (Sioux City); Maine (Fort Kent and Mt. Desert); Manitoba (International Peace Gardens in Turtle Mt. National Forest); Massachusetts (Chester, Forest Hills, Holliston, Pepperell, Southfield, and Woods Hole); Michigan (Ann Arbor, Bay Co., Clare Co., Crawford Co., Dublin in Manistee Co., East Lansing, Galien in Berrien Co., George Reserve in Livingston Co., Gull Lake Biological Station in Kalamazoo Co., Iron River, Mackinac Co., Mecosta Co., Midland Co., Muskegon Co., Ogemaw Co., Osceola Co., and Saginaw Co.); Minnesota (Eaglesnest, Duluth, Itasca Park, and Olmsted Co.); New Brunswick (St. John); Newfoundland (northwest arm of Bonavista Bay, Raleigh, and South Branch); New Hampshire (Cragway Spring at 4,700 ft. on Mt. Washington and Etna); New York (Beaverkill, Canadarago Lake, Hancock, Ithaca, Keene Valley at 1,200 ft. in Essex Co., Lake Placid at 2,000 ft., McLean Bogs in Tompkins Co., Oneonta, Sloansville, and Taughanick Falls); North Carolina (Franklin at 2,000 ft., Highlands at 3,800 ft. and at 4,100 ft., Looking Glass Rock near Pisgah Forest at 2,500 ft., Pink Beds on Mt. Pisgah, and Whiteface Mt. at 4,600 to 4,872 ft.); North-west Territories (Norman Wells); Ohio (Steubenville); Ontario (Bell's Corners, Brighton, Chatterton, Constance Bay, Crows Lake in Marmora area, Cumberland, Marmora, Merivale, Midland, One Sided Lake, 6 miles west of Richmond in Carleton Co., Rondeau Park, Stittsville, and Wallaceburg); Oregon (Mt. Hood at 3,500 ft.); Pennsylvania (North East, Pitcairn, and Ralston); Quebec (Hull, Île de Perrot, King Mt. at 1,150 ft. near Old Chelsea, Knowlton, Lac Brûlé, Mt. Albert at 1,500 ft., Old Chelsea, Parke Reserve at 950 ft. in Kamouraska Co., and Quyon); Saskatchewan (Hudson Bay and Waskesiu); South Carolina (Cleveland); South Dakota (Cheyenne Crossing in Lawrence Co.); Virginia (Falls Church, Galax, and Vienna); and West Virginia (Fort

Pendleton).

Collection dates are mostly from July to October, but there are some in June, a few in May, and one November 7 at Stittsville, Ont.

This species occurs in the Canadian, Transition, and Upper Austral zones of North America. It is most common east of the Rocky Mts. Adults occur mostly from mid summer to fall. A few specimens have been taken in mid spring and early summer.

6. Exallonyx boreus, new species

Figures 171 and 172 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 468 (ovipositor sheath)

Front wing 2.3 to 3.0 mm. long. Profile of clypeus weakly to moderately convex, its subapical overhang moderately narrow, its juncture with rest of clypeus not sharp. Side of pronotum with 10-15 hairs behind epomia and upper part of carina on collar, also with a few hairs behind median and lower part of carina on collar. Front edge of mesopleurum with hairs in upper corner and above the horizontal groove, usually also with sparse hairs between these two hairy areas. Hind part of thorax and stalk of abdomen as in figure 171 (♂) or 172 (♀). Hind femur 5.9 as long as deep in male, 4.7 as long as deep in female, the hairs on apical 0.4 of its hind side sparse (an exceptional character). Stigma 1.95 as long as deep in male, 2.1 as long as deep in female, receiving radius at or a little before middle. Abdominal stalk of male 1.0 as long as deep, its lower front corner rounded off, about 100°. Abdominal stalk of female 0.87 as long as deep, its lower front corner about 100°. Hairs on syntergite long, less dense than usual in the Ater Group, with indistinctly defined bare areas on its upper 0.6 between first and second thyridia and second and third thyridia. Sockets of lowest hairs of syntergite separated from lower margin by 1.3 hair lengths. Base of syntergite with median groove reaching 0.35 to space between thyridia, with 3 grooves on each side that are 0.75 as long as median groove. First thyridium 2.8 as wide as long in both sexes. Ovipositor sheath as in figure 468.

Black. Mouth parts medium brown to dark brown. Antenna of male blackish, of female dark brown or blackish brown, blackish apically. Tegula pale brown. Coxae brown to blackish. Legs beyond coxae brownish fulvous to brown or blackish brown. Wings faintly infusate, the stigma and strong veins blackish.

Type: ♂, Tuckerman's Ravine, Mt. Washington, N. H., Aug. 24, 1951, H. and D. Townes (Townes). Figure 171 is from the type.

Paratypes: 207♂, 32♀ from Alaska (Fish Creek on Douglas Island, on tundra at Naknek, Thompson Pass, Tsaina River, and Valdez); Alberta (Banff, Bow River Valley at 4,500 ft. eleven miles west of Banff, Elkwater Lake, Lake Louise, and Waterton); British Columbia (Bevan, Burnaby, Copper Slough 10 miles east of Terrace, Cowichan Lake, Crowsnest, Cultus Lake, Diamond Head Trail in Garibaldi Park at 3,200 ft., 3,400 ft., 3,500 ft., 4,000 ft., and 4,600 ft., Gagnon Road 6 miles west of Terrace, 17 miles west of Hedley, Jesmond, Hot

Springs area at Lakelse, Kitsumkalum Lake 20 miles north of Terrace, Kleanza Creek at 250 ft. 14 miles east of Terrace, Marble Creek 10 miles west of Terrace, Mt. Thornhill near Terrace at 700 ft., Nass River at 500 ft. at Aiyansh, Oliver, Point Grey in Vancouver, Robson, Shames 16 miles southwest of Terrace, Spring Creek at Terrace, Summerland, Summit Lake at 4,000 ft. at mile 392 on Alaska Highway, Terrace, 5 miles south of Terrace, 33 miles west of Terrace, 50 miles southwest of Terrace, and Zymagotitz River 6 miles west of Terrace); California (Big Pines in San Gabriel Mts., Leevining, Oakes at 4,700 to 5,000 ft., near Sonora Pass at 8,000 ft., Thousand Palms, and White Water on Snow Creek at 1,500 ft.); Colorado (Cottonwood Pass at 12,100 ft. in Gunnison Co., Doolittle Ranch at 9,000 ft. on Mt. Evans, Gould, Silverton at 9,800 ft., and Tennessee Pass at 10,240 ft.); Idaho (Hunt Lake at Priest Lake, Moscow Mt., and Priest Lake); Maine (Ft. Kent); Manitoba (5 miles southwest of Shilo); Michigan (Mackinac Co.); Nevada (Patrick in Washoe Co.); Newfoundland (Cartwright in Labrador); New Hampshire (Lake of the Clouds at 5,000 ft. on Mt. Washington and Tuckerman's Ravine on Mt. Washington); New York (Whiteface Mt. at 4,600 to 4,872 ft.); Ontario (Island Falls); Oregon ("Benson Pk."); Quebec (King Mt. at 1,150 ft. near Old Chelsea); Saskatchewan (Saskatoon); Washington (Big Four, Lilliwaup, Mt. Rainier at 2,700 ft., Saltese, Skyline Trail on Mt. Baker, Tacoma, Valleyford, Vashon, and the following four localities on Mt. Rainier: Frying Pan, Summerland Trail, White River, and Yakima Park); and Yukon (Gravel Lake at 2,050 ft. fifty-eight miles east of Dawson and North Fork Pass in the Ogilvie Mts.). Paratypes are in the collections of Ottawa, Cambridge, Townes, Washington, Davis, St. Paul, and East Lansing.

Collection dates are mostly from June to August. Those outside of this range are March 15 at Thousand Palms, Calif.; March 29 and April 7 at White Water, 1,500 ft., Snow Creek, Calif; May 19, 22, 24, and 30 at Robson, B. C.; May 27 at Burnaby, B. C.; May 28 at Vashon, Wash.; May 31 at Kitsumkalum Lake, 20 miles north of Terrace, B. C.; May at Point Grey, Vancouver, B. C.; September 1 at Hunt Lake, Priest Lake, Ida.; September 3 at Lake of the Clouds, 5,000 ft., Mt. Washington, N. H.; September 7 at Saskatoon, Sask.; September 13, 17, 21, and 28 at Robson, B. C.; September 25 at Summerland, B. C.; and November at Point Grey, Vancouver, B. C.

This species occurs in the Arctic, Hudsonian, and Canadian zones of North America. It is adult from late spring to fall.

7. Exallonyx nevadensis Kieffer, new combination

Figures 173 and 174 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 469 (ovipositor sheath)

**Proctotrupes nevadensis* Kieffer (1905) 1906. Berlin. Ent. Ztschr. 50: 275. ♂. des. Lectotype: ♂ (labeled by Townes in 1975 and hereby designated), USA: mountains near Claremont in California (San Francisco). Examined in 1977. USA: Ormsby [Co.] in Nevada.

Serphus nevadensis Kieffer, 1909. Genera Insectorum 95: 5. syn.

Phaenoserphus nevadensis Kieffer, 1914. Das Tierreich 42: 35. ♂. key, des. USA: Claremont in California; Ormsby [Co.] in Nevada.

**Exallonyx similis* Brues, 1919. Jour. New York Ent. Soc. 27: 11. ♀. key, des., figs.

Type: ♀, USA: Tacoma in Washington (Cambridge). Examined in 1977. USA:

Berkeley in California; 3 localities in Washington. New synonym.

Codrus similis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.

Codrus similis Masner, 1966. Psyche 72: 297. ♀. type data.

Front wing 2.4 to 3.7 mm. long. Profile of clypeus of male flat or weakly concave just above the subapical overhang. Subapical overhang of clypeus of male sharp-margined, subtruncate, not projecting as far ventrad as apical margin of clypeus. Profile of clypeus of female weakly convex above the subapical overhang, the margin of subapical overhang almost sharp. Side of pronotum with 6-15 hairs behind epomia and upper part of carina on collar. Front edge of mesopleurum with hairs below tegula and above the horizontal groove, with a hairless portion between these two hairy areas that is 0.7-1.2 as long as tegula. Hind part of thorax and stalk of abdomen as in figure 173 (♂) and 174 (♀). Hind femur of male 5.0 as long as deep, of female 4.9 as long as deep. Stigma 2.0 as long as deep in both sexes, receiving radius at midlength. Abdominal stalk 1.0 as long as deep in male, 0.85 as long as deep in female, its lower front corner subrectangular but somewhat beveled off. Hairs on syntergite long, on lower half moderately dense, on upper half sparser, the sockets of lowest hairs separated from lower margin of syntergite by 1.3 hair lengths. Base of syntergite with median groove that reaches 0.6 to space between thyridia, on each side with 3 or 4 grooves that are 0.6 as long as median groove. First thyridium 3.0 as wide as long in both sexes. Ovipositor sheath as in figure 469.

Black. Mouth parts and legs fulvous or fulvous brown to dark brown, the hind coxa brown to blackish. Antenna dark brown, blackish toward apex or entirely black. Tegula brownish fulvous. Wings faintly infuscate, the stigma and strong veins blackish.

Specimens: 143♂, 37♀ from Alberta (Banff, Edmonton, and 8 miles east of Morley); Arizona (Rose Creek in the Sierra Ancha); British Columbia (Bevan, Cultus Lake, Cowichan Lake, Mission City, Point Grey in Vancouver, Richter Pass near Osoyoos, Robson and Vaseux Lake at Oliver); California (Blue Canyon in Nevada Co., Bridgeville, Crescent City, Fish Camp, Lake Wohlford, Lily Pond at Alpine Lake at 1,500 ft. in Marin Co., and Riverside); Montana; New Hampshire (Benton in the White Mts.); Oregon (Cannon Beach, Corvallis, Marshfield, Seaside, and Silver Falls); Washington (Ashford, La Push, Lake Chelan at Lucerne, Lake Stevens near Everett, Mt. Rainier at 2,700 ft., Oroville, Pullman, Sequim, Skyline Trail on Mt. Baker, and Tacoma); and Yukon (13 miles east of Dawson at 1,300 ft.).

Collection dates are mostly in June through August. Dates outside of that range are: April 28 at Rose Creek, Sierra Ancha, Ariz.; April 29 and May 1 at Lake Wohlford, Calif.; May 1 at Oroville, Wash.; May 9 at Lily Pond, 1,500 ft., Alpine Lake, Marin Co., Calif.; May 25 at Riverside, Calif.; May 27 at Tacoma, Wash.; September 3 at Sequim, Wash.; September 4 at La Push, Wash.; September 10 and 28 at Cowichan Lake, B. C.; September 12 at Banff, Alta.; September 14 at Marshfield, Oregon; and September 25 and November at Point Grey, Vancouver,

B. C.

This species occurs in the Transition and Canadian zones of western North America, and there is one collection record for New Hampshire. It is adult from late spring to fall.

8. Exallonyx artoculus, new species

Figures 175 and 176 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 470 (ovipositor sheath)

Front wing 2.8 to 3.7 mm. long. Clypeus of male with a profile that is flat or weakly concave and with a prominent sharp-edged subapical overhang whose lower edge projects as far or almost as far ventrad as lower edge of clypeus. Clypeus of female flat in profile, with a sharp-margined subapical overhang. Side of pronotum with about 20 hairs behind epomia and upper part of carina on collar. Front margin of mesopleurum with hairs on upper corner and above the horizontal groove, between these hairy areas with a hairless spot that is about 0.7 as large as tegula. Hind part of thorax and abdominal stalk as in figure 175 (σ) or 176 (♀). Hind femur of male 5.0 as long as deep, of female 4.6 as long as deep. Stigma 1.7 as long as deep in both sexes. Abdominal stalk of male 0.68 as long as deep, its lower front corner rounded off. Abdominal stalk of female 0.53 as long as deep, its lower front corner rounded off. Hairs on syntergite long and numerous, the hairy area partially interrupted between first and second thyridia and between second and third thyridia, the sockets of lowest hairs separated from lower margin of syntergite by 1.4 hair lengths. Base of syntergite with a median groove reaching 0.7 to space between thyridia, on each side with 3 grooves that are almost as long as median groove. First thyridium 3.9 as wide as long in both sexes. Ovipositor sheath as in figure 470.

Black. Mouth parts, scape, and pedicel fulvous to dark brown. Flagellum of male often brown near base. Flagellum of female brown, dark brown apicad. Tegula fulvous. Front and middle coxae fulvous to brown. Hind coxa light brown to blackish. Legs beyond coxae fulvous to light brown, the hind femur fulvous brown to brown. Wings faintly infusate, the stigma and strong veins brown to blackish.

Type: σ , Tahkenitch Lake, Oreg., May 6, 1976, H. and M. Townes (Townes). Figure 175 is from the type.

Paratypes: σ , Cowichan Lake, B. C., July 6, 1964, J. A. Chapman (Ottawa). σ , MacMillan Park on the Al̄berni Highway, B. C., June 22, 1955, G. E. Shewell (Ottawa). σ , Point Grey, Vancouver, B. C., July 1973, J. R. Vockeroth (Ottawa). σ , Royston, B. C., July 7, 1955, R. Coyles (Ottawa). 2 σ , Sproat Lake, B. C., July 22, 1955, R. Coyles (Ottawa). 2 σ , Fish Camp, Calif., July 11 and 14, 1948, H., M., G., and D. Townes (Townes). ♀ , Inverness, Calif., Oct. 6, 1946, H. Townes (Townes). 11 σ , 6 ♀ , Corvallis, Oreg., several dates from May 8 to June 14, 1978, H. and M. Townes (Townes). σ , Corvallis, Oreg., May 11, 1976, H. and M. Townes (Townes). 3 σ , Elkton, Oreg., May 4, 1976

(Townes). ♂, Hood River rapids, 3,000 ft., Mt. Hood, Oreg., July 29, 1921, A. L. Melander (Cambridge). ♂, Lebanon, Oreg., May 2, 1976, H. and M. Townes (Townes). ♂, Pinehurst, Oreg., July 2, 1978, H. and M. Townes (Townes). 6♂, Selma, Oreg., May 13, 20, and 29, 1978, H. and M. Townes (Townes). 2♂, same data as type (Townes). ♂, Alga, Wash., May 1910, A. L. Melander (Cambridge). ♂, Ashford, Wash., July 6, 1940, H. and M. Townes (Townes). 3♂, Bingen, Wash., May 8 and 9, 1976, H. and M. Townes (Townes). ♂, ♀, Mt. Rainier, Wash., 2,700 and 2,900 ft., July 11 and 14, 1940, H. and M. Townes (Townes). ♂, Pelvis, Wash., July 16, 1922, A. L. Melander (Cambridge). ♂, Pullman, Wash., A. L. Melander (Cambridge). ♂, Tylalip Indian Reservation, Wash., Aug. 13, 1917, A. L. Melander (Cambridge).

This species ranges from British Columbia to central California. It is adult mostly in spring and early summer. Our collections have been in forested areas.

9. Exallonyx simplicior Brues

Figures 177 and 178 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 471 (ovipositor sheath)

**Proctotrypes simplicior* Brues, (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 116.

♂. key, des. Lectotype: ♂, USA: Puget Sound region in Washington (Cambridge).

Examined in 1975. USA: Mt. Constitution on Orcas Is. in San Juan Co. in Washington.

Phaenoserphus simplicior Kieffer, 1914. Das Tierreich 42: 34. ♂. key, des. USA: Orcas Island in San Juan Islands in Washington.

Exallonyx simplicior Brues, 1919. Jour. New York Ent. Soc. 27: 11. key, figs.

**Exallonyx carinatus* Brues, 1919. Jour. New York Ent. Soc. 27: 15. ♂. key, des., figs. Type: ♂, USA: Oroville in Washington (Cambridge). Examined in 1975. New synonym.

Codrus carinatus Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus carinatus Masner, 1966. Psyche 72: 296. ♂. type data.

Codrus simplicior Masner, 1966. Psyche 72: 297. ♂. Lectotype designated.

Front wing 2.2 to 4.0 mm. long. Clypeus of male flat or weakly concave in profile, with an overhanging subapical flange that reaches below apical margin of clypeus. Clypeus of female flat or weakly convex in profile, with a sharp-margined subapical overhang. Side of pronotum with hairs in front of the scrobe, the hairs sparse ventrally, moderately dense behind epomia and upper part of carina on collar. Front edge of mesopleurum with a continuous band of hairs from tegula to the horizontal groove, or the hair band sometimes narrowly interrupted. Hind part of thorax and abdominal stalk of male as in figure 177, of female similar to those of male except that abdominal stalk is shorter and thicker (fig. 178). Hind femur of male 5.5 as long as deep, of female 5.1 as long as deep. Stigma 2.0 as long as deep in both sexes, receiving radius near middle. Abdominal stalk of male 1.2 as long as high, its lower front corner rounded off. Abdominal stalk of female 0.70 as long as high, its lower front corner approximately 90°. Hairs on syntergite long, moderately dense on lower half, the lowest hair sockets separated from lower edge of syntergite by 1.3 hair lengths. Base of

syntergite with median groove reaching 0.6 to space between thyridia, on each side with 3 grooves that are 0.7 as long as median groove. First thyridium 2.6 as wide as long in both sexes. Ovipositor sheath as in figure 471.

Black. Mouth parts, scape, and pedicel of male brown. Antenna of female brown, infusate apicad. Tegula fulvous. Front and middle coxae brown. Hind coxa dark brown or blackish. Legs beyond coxae brownish fulvous to brown. Wings faintly infusate, the stigma and strong veins dark brown to blackish.

Specimens: 68♂, 43♀ from Alberta (Cameron Lake Road in Waterton Park); British Columbia (Cultus Lake, Jade Lake Trail at 6,300 ft. in Mt. Revelstoke National Park, Mt. McIntyre Creek near Oliver, Mt. McLean, North Vancouver, Oliver, Osoyoos, Point Grey in Vancouver, Richter Pass near Osoyoos, Robson, and Vaseux Lake at Oliver); California (Dardanelle, Donner Pass, near Glacier Point in Yosemite Park, Hallelujah Junction in Lassen Co., Leevining, Silver Creek Campground at 5,314 ft. in Eldorado National Forest, Snow Flat at 8,700 ft. in Yosemite Park, and Upper Lake); Colorado (Doolittle Ranch at 9,800 ft. on Mt. Evans, Estes Park, Gould, Mt. Vernon Canyon at 7,200 ft. near Golden, State Bridge at 7,000 ft. near Bond, and Steamboat Springs); Idaho (Echo Bay on Lake Coeur d'Alene, Hollister, Idaho City, and Lowman at 4,000 ft.); Montana (Missoula); Nevada (Reno and Tuscarora); Oregon (Dairy, Ochoco Creek, Hyatt Reservoir, Pinehurst, and Steens Mt. at 7,200 ft.); Utah (Big Brush Creek at 8,000 ft. 22 miles north of Vernal and Cedar Canyon in Iron Co.); Washington (Longratee, Mt. Rainier at 2,700 ft., and White River on Mt. Rainier); and Wyoming (Pole Creek Campground at 8,300 ft. in Medicine Bow National Forest and Tie Hook Campground in Bighorn National Forest).

Collection dates are mostly from June through August. Those outside of this range are: May 7 at Ochoco Creek, Oreg.; May 14, 17, 19, and 20 at Oliver, B. C.; May 20 and 30 at Selma, Oreg.; May 22 at Richter Pass, Osoyoos, B. C.; May 28 at Reno, Nev.; May 28 to 31 at Robson, B. C.; September 3 and 16 at Robson, B. C.; November at Point Grey, Vancouver, B. C.; and November 3 at Hollister, Ida. Males are common in the spring; females after June. In our collecting we found the species in dry shrubby areas, notably where there was sagebrush (*Artemisia*).

This species occurs in the Transition and Canadian zones of western North America. It is adult from spring into the fall.

B. Formicarius Group

Front wing 1.6 to 5.8 mm. long. Male flagellum with tyloids in approximately 30% of the species. Lower corner of pronotum with 2 pits, one above the other, rarely with a row of 3 or 4 pits, or in the species *siccatus* and *monotrema* there is one pit in the lower corner of the pronotum, in *pissimus* about half of the specimens have a single pit, as do some specimens of *minor*. Upper edge of pronotum with a band of hairs that is 1 to 4 hairs wide. Epomia present or absent. Side of pronotum often with hairs behind epomia and upper end of carina on collar, sometimes with hairs behind middle or lower part of carina on collar. Paired

smooth areas on propodeum nearly always extending behind propodeal spiracle. Hind margin of hind wing with a shallow notch at basal 0.35. Abdominal stalk with a transverse projecting ridge at front end of lower side. Upper profile of abdominal stalk usually straight, rarely a little concave. Hairs on syntergite short to moderately long, usually sparse, none of the hairs near lower margin of syntergite (their sockets separated from lower edge by at least 2 times the length of the hairs). Base of syntergite with a median groove and usually with 2 to 5 lateral grooves, rarely with one lateral groove or none. Male clasper narrowly triangular, not distinctly decurved. Ovipositor sheath striate, punctate, or both striate and punctate.

This group is worldwide. It is a large miscellaneous central group from which the more distinctive groups have been separated. We treat 61 species. Most of the Holarctic species belong here.

Keys to the species of Formicarius Group

Males

(Males of *angulatus*, *confusus*, *formicarius*, *kenyensis*, *leptocerus*, *microcerus*, *monotrema*, *obscuratus*, *piliventris*, *seabrai*, *siccatus*, and *visayanus* are unknown.)

1. Flagellum with raised, ridge-like or tooth-like tyloids, on at least segments 2-6. Hair band on upper margin of pronotum irregularly 2-5 hairs wide. Lower half of pronotum often with hairs between sulcus and carina on collar. Western Hemisphere. 2
- Flagellum without raised tyloids (except in the Ethiopian *leptocorsa* and the Neotropic *nodosus*, both of which have only 1 row in the hair band on upper margin of pronotum). Lower half of pronotum without hairs between sulcus and carina on collar except in some specimens of *E. trifoveatus* and of *E. asper*. 17
2. First flagellar segment without a tyloid or with a very small tubercle-like tyloid. 3
- First flagellar segment with a tyloid that is at least 0.25 as large as the tyloid on second segment. 5
3. Side of pronotum covered with sparse hairs between sulcus and carina on collar. Front wing 3.7 to 5.8 mm. long. Nearctic Region west of Rocky Mts. 1. *placidus* Brues (p. 243)
- Side of pronotum without hairs between sulcus and carina on collar. Front wing 2.6 to 3.7 mm. long. 4
4. Tyloids in the form of a low triangular tooth with its outer profile diverging from segment at 40°. Nearctic Region east of Rocky Mts. 2. *fuscicornis* Brues (p. 244)
- Tyloids in the form of a very low ridge with its outer profile diverging hardly at all from segment. Mexico.
 3. *leiopleurum*, new species (p. 246)

5. Tyloid on first flagellar segment 0.7 as high as diameter of the segment. South America. 6
 Tyloid on first flagellar segment 0.3 to 0.5 as high as diameter of the segment. Nearctic Region. 7
6. Flagellar segments 1-7 with tyloids. Chile and Argentina.
 4. diminuens, new species (p. 246)
 Flagellar segments 1-10 or 1-11 with tyloids. Chile.
 5. multidens, new species (p. 247)
7. Tyloids on flagellar segments 2-4 in the shape of a tooth, the apical 0.5 of their outer profile strongly diverging from the segment. 8
 Tyloids on flagellar segments 2-4 in the shape of an arched ridge, the apical 0.5 of their outer profile subparallel to the segment. 11
8. Side of pronotum without hairs directly behind epomia. Last 5 or 6 flagellar segments without tyloids. Northern Nearctic Region.
 6. pleuralis Brues (p. 248)
 Side of pronotum usually with hairs directly behind epomia. Last 3 or 4 flagellar segments without tyloids. 9
9. Lower half of pronotum with 0-15 hairs between sulcus and carina on collar. Lower part of metapleurum with front 0.2± lacking coarse sculpture. Arctic, Hudsonian, and Canadian zones of North America. 7. equidens, new species (p. 250)
 Lower half of pronotum with more than 20 hairs between sulcus and carina on collar. Lower half of metapleurum with coarse sculpture reaching or almost reaching to lower front corner. 10
10. Front wing 2.5 to 3.6 mm. long. Metapleural sculpture in the form of crowded pits. Transition and Upper and Lower Austral zones of North America. 8. bisulcus, new species (p. 251)
 Front wing 3.2 to 4.7 mm. long. Metapleural sculpture in the form of strong, sharp, irregularly reticulate wrinkling. Transition, Canadian and Hudsonian zones of North America.
 9. californicus Holmgren (p. 253)
11. Margin of subapical overhang of clypeus sharp, projecting below apex of clypeus. Lower half of side of pronotum with more than 20 hairs between sulcus and carina on collar. Western North America. 10. decumbens, new species (p. 255)
 Margin of subapical overhang of clypeus sharply rounded, not projecting below apex of clypeus. Lower half of side of pronotum with less than 20 hairs between sulcus and carina on collar, sometimes with none. 12
12. Side of pronotum with 0 to 3 hairs behind epomia and carina on collar. 13
 Side of pronotum with 4 to 15± hairs behind epomia and carina on collar. 14

13. Front part of grooves on lower half of abdominal stalk strongly slanted downward. Hairs on lower half of mesopleurum moderately sparse. Northern Nearctic Region.
 11. declivus, new species (p. 256)
 Front part of grooves on lower half of abdominal stalk almost horizontal. Hairs on lower half of mesopleurum very sparse. North America in Canadian Zone. . . . 12. angusticeps Brues (p. 257)
14. Flagellar segment 7 without a raised tyloid, or sometimes in *E. seticornis* with a very low elongate tyloid. 15
 Flagellar segment 7 with a raised tyloid that is in the shape of a low lobe or tubercle. 16
15. Flagellar segment 6 without a raised tyloid. Base of syntergite with lateral grooves about 0.8 as long as median groove. Eastern half of North America. . . 13. ashmeadi Brues (p. 259)
 Flagellar segment 6 with a raised tyloid. Base of syntergite with lateral grooves approximately the same length as median groove. British Columbia to California.
 14. seticornis, new species (p. 260)
16. Temple weakly convex. Flagellar segment 8 with a tyloid. Tyloid on flagellar segment 7 moderately small. Hind femur fulvous to brown. British Columbia to California and Nevada.
 15. crenaticornis Kieffer (p. 261)
 Temple moderately convex. Flagellar segment 8 usually without a tyloid. Tyloid on flagellar segment 7 very small. Hind femur light brown to blackish brown, its apex pale brown. Western North America in Canadian Zone.
 16. femoratus Ashmead (p. 263)
17. Median part of hair band on upper margin of pronotum irregularly 2 to 5 rows wide. (*E. asper*, *pallidicornis*, and *alticola* are variable in this character and are keyed through both halves of the couplet.) 18
 Median part of hair band on upper margin of pronotum only 1 hair wide. 39
18. Side of pronotum with a few hairs behind epomia (or behind position of epomia if epomia is absent). 19
 Side of pronotum without hairs behind epomia (or behind position of epomia if epomia is absent). 27
19. Trochanters and femora black. 20
 Trochanters and femora fulvous to dark brown. 21
20. First thyridium 2.5 as wide as long. Front wing 2.7 to 3.5 mm. long. Chile and Peru. (Keys also at couplet 27.)
 18. asper, new species (p. 265)
 First thyridium 5.3 as wide as long. Front wing 4.7 mm. long. Mexico. 20. daschi, new species (p. 268)

21. Stalk of abdomen 1.15 as long as deep. 22
 Stalk of abdomen 0.5 to 0.9 as long as deep. 23
22. Side of pronotum with about 12 hairs behind epomia. Grooves on side of abdominal stalk sloped 20° from horizontal. Mexico.
 24. oaxacae, new species (p. 271)
 Side of pronotum with 1 to 5 hairs behind epomia. Grooves on side of abdominal stalk sloped about 5° to 10° from horizontal. Ethiopian Region. (Keys also at couplet 37.).
 48. alticola Kieffer (p. 297)
23. Scape light fulvous. Front truncation of abdominal stalk making an 80° angle with lower margin of abdominal stalk. Nearctic Region east of Rocky Mts. (Keys also at couplet 39.)
 19. pallidicornis Brues (p. 266)
 Scape brown to black. Front truncation of abdominal stalk making a 90° angle with lower margin of abdominal stalk. 24
24. Median ridge on hind slope of propodeum strong and regular, conspicuously stronger than surrounding wrinkles. Front wing 3.7 to 4.5 mm. long. Mexico and southwestern U. S. A.
 21. arizonicus, new species (p. 269)
 Median ridge on hind slope of propodeum incomplete to complete, usually not conspicuously stronger than wrinkles. Front wing 2.0 to 3.2 mm. long. (Males of *formicarius* and *microcerus* are unknown. If they exist they would probably key to here.)
 25
25. Stigma 2.0 as long as deep. Wrinkling on hind slope of propodeum moderately fine. Europe.
 44. trichomus, new species (p. 292)
 Stigma 1.65 to 1.75 as long as deep. Wrinkling on hind slope of propodeum moderately coarse. 26
26. Median ridge of propodeum reaching to, or almost to lower edge of hind slope, leaving only one or none of the transverse spaces undivided at midline. Epomia indistinct. Hind coxa and femur fulvous to dark brown. Worldwide.
 28. trifoveatus Kieffer (p. 275)
 Median ridge of propodeum absent from lower part of hind slope, leaving the lower 2 or 3 transverse spaces undivided at middle. Epomia strong. Hind coxa and femur fulvous or brownish fulvous. Europe. 29. ligatus Nees (p. 278)
27. Trochanters and femora black. Chile and Peru. (Keys also at couplet 20.). 18. asper, new species (p. 265)
 Trochanters and femora fulvous to light brown. 28
28. Metapleurum sculptured on its hind 0.4 or less. Mexico.
 25. vietus, new species (p. 271)
 Metapleurum sculptured on its hind 0.6 or more. 29

29. Propodeum rugoso-punctate. Ecuador.
 35. phaeomerus, new species (p. 284)
 Propodeum reticulately wrinkled. 30
30. Subapical part of clypeus forming a sharp-margined overhanging
 ridge. 31
 Subapical part of clypeus moderately to sharply convex, not an
 overhanging ridge. 33
31. All coxae dark brown. Japan.
 31. polysulcus, new species (p. 282)
 All coxae fulvous, or the hind coxa partly brown. 32
32. Stigma 1.8 as long as deep. Hind basitarsus fulvous. Chile.
 36. claripes, new species (p. 285)
 Stigma 1.9 as long as deep. Hind basitarsus dark brown. South
 Africa. 41. subteres, new species (p. 288)
33. Epomia absent or indistinct. 34
 Epomia present, distinct. 36
34. Abdominal stalk 0.7 as long as deep. Front and middle coxae
 brown. Northern Nearctic Region.
 30. crassulus, new species (p. 280)
 Abdominal stalk 1.0 to 1.2 as long as deep. Front and middle
 coxae fulvous. Ethiopian Region. 35
35. Abdominal stalk 1.0 as long as deep. Ethiopian Region. (Keys
 also at couplet 22.). 48. alticola Kieffer (p. 297)
 Abdominal stalk 1.2 as long as deep. Ethiopian Region.
 49. parvus Risbec (p. 299)
36. Cheek 0.33 as long as temple. Europe.
 42. brevimala, new species (p. 289)
 Cheek 0.6 to 1.0 as long as temple. 37
37. Front truncation of abdominal stalk making an 80° angle with lower
 margin of stalk. Stigma receiving radius a little distad of
 middle. Scape fulvous. Nearctic Region east of Rocky Mts.
 (Keys also at couplet 23.). 19. pallidicornis Brues (p. 266)
 Front truncation of abdominal stalk making a 90° angle with lower
 margin of stalk. Stigma receiving radius near middle. Scape
 fulvous to black. 38
38. Profile of clypeus evenly convex. Trochanters and femora fulvous,
 or the hind femur brownish above. Europe.
 46. nixoni, new species (p. 294)
 Profile of clypeus convex with apical 0.25 declivous to apical
 flange. Trochanters and femora dark brown or sometimes light
 brown or fulvous. Northern part of Holarctic Region.
 47. minor, new species (p. 295)

39. Lower part of clypeus with a sharp preapical transverse ridge.
Cheek 0.33 as long as temple. Europe.
43. suberratus Kieffer (p. 290)
Lower part of clypeus convex or beveled. Cheek 0.33 to 1.0 as
long as temple. 40
40. Base of syntergite with a single broad longitudinal groove on each
side of median groove. 41
Base of syntergite with 2 to 4 longitudinal grooves on each side
of median groove. 42
41. Reticulate wrinkling on propodeum and metapleurum exceptionally
coarse. Hind femur 4.3 as long as deep. Jamaica.
39. brutus, new species (p. 287)
Reticulate wrinkling on propodeum and metapleurum of moderate
coarseness. Hind femur 5.4 as long as deep. Mexico.
57. cervicatus, new species (p. 303)
42. Median groove on syntergite reaching 0.9 to space between
thyridia. Occipital carina high and conspicuously reflexed.
Costa Rica. 58. reflexus, new species (p. 304)
Median groove on syntergite reaching 0.4 to 0.8 to space between
thyridia. Occipital carina not unusually high. 43
43. Epomia absent. 44
Epomia present, weak to strong. 45
44. Side of pronotum with about 5 hairs behind position of epomia.
Flagellar segments 2-4 without tyloids. Costa Rica.
23. frater, new species (p. 270)
Side of pronotum without hairs behind position of epomia.
Flagellar segments 2-4 often with weak tyloids. Kenya
and South Africa. 40. leptocorsa, new species (p. 287)
45. Neotropic species. 46
Oriental and Australian species. 49
46. Lower corner of pronotum with a row of 4 pits. Mexico.
59. rhadinus, new species (p. 305)
Lower corner of pronotum with two pits, or sometimes three. . 47
47. Stalk of abdomen 0.9 as long as deep. Clypeus 2.7 as wide as
long. Ecuador. 55. penāi, new species (p. 302)
Stalk of abdomen 2.0 as long as deep. Clypeus 2.0 or 2.8 as wide
as long. 48
48. Flagellar segments 2-5 with small raised tyloids. Radius meeting
costa at 40°. Costa Rica. . 60. nodosus, new species (p. 305)
Flagellar segments without tyloids. Radius meeting costa at 25°.
Costa Rica. 61. rudis, new species (p. 306)

- 49. Radius meeting costa at an angle of 35° to 45° 50
 Radius meeting costa at an angle of 20°: 51
- 50. Clypeus 2.6 as wide as long. Stalk of abdomen 1.0 as long as deep.
 Philippines. 33. *luzonicus* Kieffer (p. 283)
 Clypeus 3.5 as wide as long. Stalk of abdomen 1.35 as long as deep.
 Philippines. 34. *latilabris*, new species (p. 284)
- 51. Propodeal reticulation a little coarser (fig. 255). Femora brown
 to black. New Guinea. 53. *pissinus*, new species (p. 301)
 Propodeal reticulation a little finer (fig. 257). Femora fulvous to
 brown. Taiwan. 54. *chiuae*, new species (p. 301)

Females

(Females of *brutus*, *chiuae*, *claripes*, *decumbens*, *frater*, *latilabris*, *leiopleurum*, *luzonicus*, *multidens*, *nodosus*, *oaxacae*, *parvus*, *phaeomerus*, *reflexus*, *rhadinus*, *rudis*, and *vietus* are unknown. The female of *declivus* is known, but not included in the key.)

- 1. Ovipositor sheath with longitudinal striae, usually also with more
 or less distinct punctures. 2
 Ovipositor sheath with punctures only, not distinctly striate. 32
- 2. Head 1.2 as long as wide. Front wing 1.5 to 1.9 mm. long. North
 America in Canadian Zone. 12. *angusticeps* Brues (p. 257)
 Head not more than 1.1 as long as wide. Front wing 1.5 to 4.8
 mm. long. 3
- 3. Lower half of pronotum with 1 to 20 or more hairs between scrobe
 and carina on collar. (*E. trifoveatus* and *E. ashmeadi* are vari-
 able in this character and are keyed through both halves of the
 couplet.) Males of the females running here, except for those of
asper, *trifoveatus*, and probably *piliventris* have raised tyloids.
 American species, except that *trifoveatus* is worldwide. 4
 Lower half of pronotum without hairs between scrobe and carina
 on collar. 15
- 4. Base of syntergite with 4 or 5 lateral grooves that are sharp and
 reach 0.6 to thyridium. Hairs in lower row of band of hairs on
 upper margin of pronotum 0.7 to 1.0 as long as distance to upper
 margin of pronotum. Clypeus weakly convex, with a sharp-
 margined abrupt subapical overhang. Worldwide. (Keys also at
 couplet 24.). 28. *trifoveatus* Kieffer (p. 275)
 Base of syntergite with 2-5 lateral grooves or sometimes none, the
 grooves often very shallow and usually not reaching 0.5 to
 thyridium. Hairs in lower row of band of hairs on upper margin
 of pronotum usually less than 0.7 as long as distance to upper
 margin of pronotum. 5

- 5. Side of pronotum without hairs directly behind epomia; sometimes with 1-4 hairs a little below epomia. Legs black. 6
 Side of pronotum with hairs behind epomia, or behind position of epomia if epomia is absent. Legs variously colored. 8
- 6. Trochanters and femora fulvous. Tenth flagellar segment 1.7 as long as wide. Northern Nearctic Region.
 6. pleuralis Brues (p. 248)
 Trochanters and femora black. Tenth flagellar segment 1.3 to 3.2 as long as wide. 7
- 7. Median groove at base of syntergite reaching 0.3 to space between thyridia. Lower front quarter of upper half of mesopleurum with numerous hairs. Argentina.
 17. piliventris, new species (p. 265)
 Median groove at base of syntergite reaching 0.65 to space between thyridia. Lower front quarter of upper half of mesopleurum almost hairless. Chile and Peru.
 18. asper, new species (p. 265)
- 8. Subapical overhang of clypeus a long sharp-edged flange that projects ventrad almost as far as lower edge of clypeus. Northern and western part of Nearctic Region.
 1. placidus Brues (p. 243)
 Subapical overhang of clypeus blunt to moderately sharp, not long, not projecting ventrad to lower margin of clypeus. 9
- 9. Lower half of side of pronotum with 12 or more hairs between sulcus and carina on collar. 10
 Lower half of pronotum with 1-12 hairs between sulcus and carina on collar. 11
- 10. Base of syntergite with 2 lateral grooves. Grooves on front half of side and underneath of abdominal stalk absent or obsolescent. Transition and Lower Austral zones of Nearctic Region.
 8. bisulcus, new species (p. 251)
 Base of syntergite with 3-5 lateral grooves. Grooves on front half of side and underneath of abdominal stalk distinct. Transition, Canadian, and Hudsonian zones of Nearctic Region.
 9. californicus Holmgren (p. 253)
- 11. Scape fulvous. Hind face of propodeum 80° from horizontal. Eastern half of North America. (Keys also at couplet 18.)
 13. ashmeadi Brues (p. 259)
 Scape brown to blackish brown. Hind face of propodeum 65° to 75° from horizontal. 12
- 12. Temple 1.35 as long as eye. Nearctic Region east of Rocky Mts.
 2. fuscicornis Brues (p. 244)

- Temple 1.1 to 1.3 as long as eye. Nearctic Region from Rocky Mts. to Pacific Ocean. 13
13. Temple in dorsal view a little more strongly convex just behind middle than elsewhere. Pedicel pale brown, strongly contrasting with darker brown of flagellum. Femora medium brown to dark brown. Second flagellar segment 1.5 as long as wide. Western North America in Canadian Zone.
16. femoratus Ashmead (p. 263)
Temple in dorsal view evenly weakly convex. Pedicel light brown, moderately contrasting with darker brown of flagellum. Femora fulvous to brown. 14
14. Grooves at base of syntergite on each side of median groove, 4 in number, parallel, and equal in length.
14. seticornis, new species (p. 260)
Grooves at base of syntergite on each side of median groove, 3 or 4 in number, weakly convergent anteriorly, and usually of unequal length. 7. equidens, new species (p. 250) and
15. crenaticornis Kieffer (p. 261)
(These two females apparently indistinguishable.)
15. Side of pronotum with a few hairs behind epomia (or behind position of epomia if epomia is absent). 16
Side of pronotum without hairs behind epomia (or behind position of epomia if epomia is absent). 24
16. Scape fulvous. Basal truncation of abdominal stalk forming an angle of 80° with lower edge of abdominal stalk. 17
Scape fulvous to brown or black. Basal truncation of abdominal stalk forming an angle of 85° to 90° with lower edge of abdominal stalk. 18
17. Base of syntergite with 4 longitudinal grooves on each side of median groove. Upper and hind faces of propodeum meeting in a rounded angle of 80°. Eastern half of Nearctic Region. (Keys also at couplet 11.). . . . 13. ashmeadi Brues (p. 259)
Base of syntergite with 2 longitudinal grooves on each side of median groove. Upper and hind faces of propodeum meeting in a rounded angle of 75°. Nearctic Region east of Rocky Mts. (Keys also at couplet 26.). . . 19. pallidicornis Brues (p. 266)
18. Second flagellar segment 2.2 to 3.1 as long as wide. Tenth flagellar segment 1.8 to 2.25 as long as wide. Species of southwestern U. S. A., Mexico, and Costa Rica. 19
Second flagellar segment 1.4 to 2.1 as long as wide. Tenth flagellar segment 1.2 to 1.8 as long as wide. 21
19. Trochanters black to blackish brown. Grooves on abdominal stalk very shallow and indistinct. Mexico.
20. daschi, new species (p. 268)
Trochanters buff to brownish fulvous. Grooves on abdominal stalk distinct. 20

20. Lateral grooves at base of syntergite 0.6 as long as median groove. Grooves on side of abdominal stalk distinct on hind 0.7 of stalk. Trochanters brownish fulvous. Mexico and southwestern U. S. A.
21. arizonicus, new species (p. 269)
- Lateral grooves at base of syntergite 0.4 as long as median groove. Grooves on side of abdominal stalk distinct on hind 0.5 of stalk. Trochanters buff colored. Mexico and Costa Rica.
22. obscuratus, new species (p. 270)
21. Abdominal stalk in side view with approximately 6 longitudinal grooves apparent. Flagellum distinctly enlarged apicad, the tenth segment 1.15 as wide as second segment. Europe.
26. formicarius Kieffer (p. 272)
- Abdominal stalk in side view with approximately 8 longitudinal grooves apparent. Flagellum not distinctly enlarged apicad, the tenth segment not wider than second segment. 22
22. Second flagellar segment 1.4 as long as wide. Tenth flagellar segment 1.2 as long as wide. Hind face of propodeum with a dimpled sculpture or more or less smoothed off. Base of syntergite usually with 3 grooves on each side of median groove. Grooves on side of abdominal stalk small and shallow. Europe.
27. microcerus Kieffer (p. 273)
- Second flagellar segment 1.5 to 2.1 as long as wide. Tenth flagellar segment 1.4 to 1.8 as long as wide. Hind face of propodeum coarsely reticulate or transversely wrinkled. Base of syntergite with 4 or sometimes 3 grooves on each side of median groove. Grooves on side of abdominal stalk moderately small. . . . 23
23. Hind face of propodeum coarsely reticulate. Hind trochanter and femur light brown to dark brown. Worldwide. (Keys also at couplet 4.) 28. trifoveatus Kieffer (p. 275)
- Hind face of propodeum with coarse transverse wrinkling. Hind trochanter and femur fulvous to brownish fulvous. Europe.
29. ligatus Nees (p. 278)
24. Profile of lower front corner of abdominal stalk an angle of 75° to 80° 25
Profile of lower front corner of abdominal stalk an angle of 85° to 90° 28
25. Abdominal stalk 1.1 as long as high. Scape blackish. Hind femur dark brown. Brazil. 38. seabrai, new species (p. 286)
- Abdominal stalk 0.4 to 0.7 as long as high. Scape fulvous. Hind femur fulvous to brown. 26
26. Coxae fulvous, the hind coxa sometimes brown at base. Hair band on upper margin of pronotum irregularly 3 hairs wide. Nearc-

- tic Region east of Rocky Mts. (Keys also at couplet 17).
 19. pallidicornis Brues (p. 266)
 Coxae dark brown or blackish, paler at apex. Hair band on upper margin of pronotum irregularly 2 hairs wide. 27
27. Femora light fulvous. Radius arising at mid-length of stigma.
 Japan. 31. polysulcus, new species (p. 282)
 Femora fulvous brown. Radius arising at apical 0.4 of stigma.
 Sweden. 37. angulatus, new species (p. 285)
28. Femora fulvous. Second flagellar segment 1.65 as long as wide.
 Tenth flagellar segment 1.45 as long as wide. Northern North America. 30. crassulus, new species (p. 280)
 Femora brown or black. Non-North American species. 29
29. Hind face of propodeum weakly rugoso-punctate, more or less polished. South Africa. . . 41. subteres, new species (p. 288)
 Hind face of propodeum strongly punctate or rugoso-punctate. . 30
30. Rough sculpture of metapleurum showing some horizontal wrinkles.
 Kenya and South Africa. . 40. leptocorsa, new species (p. 287)
 Rough sculpture of metapleurum reticulate or punctate. 31
31. Hind 70% of metapleurum sculptured. Temple 1.33 as long as eye.
 Chile and Argentina. 4. diminuens, new species (p. 246)
 Hind 50% of metapleurum sculptured. Temple 1.1 as long as eye.
 Philippines. 32. visayanus, new species (p. 283)
32. Stalk of abdomen smooth, without grooves. Ecuador.
 55. peñai, new species (p. 302)
 Stalk of abdomen with strong longitudinal grooves. 33
33. Cheek 0.36 to 0.62 as long as short diameter of eye. 34
 Cheek 0.70 to 1.1 as long as short diameter of eye. 35
34. Clypeus rounded above the marginal flange. Base of syntergite with 2 longitudinal grooves on each side of median groove. Hair band on upper edge of pronotum 2 hairs wide. Europe.
 42. brevimala, new species (p. 289)
 Clypeus with a sharp transverse ridge above marginal flange.
 Base of syntergite with 3 or 4 longitudinal grooves on each side of median groove. Hair band on upper edge of pronotum 1 hair wide. Europe. 43. subserratus Kieffer (p. 290)
35. Epomia entirely absent. 36
 Epomia present, but short and sometimes weak. 38
36. Base of syntergite without longitudinal grooves on each side of median groove. Wrinkling on propodeum very coarse. Femora black. New Guinea. 51. siccatus, new species (p. 300)

- Base of syntergite with 2-4 longitudinal grooves on each side of median groove. Wrinkling on propodeum not unusually coarse. Femora fulvous to brown. 37
37. Second flagellar segment 2.3 as long as wide. Ethiopian Region.
48. alticola, new species (p. 297)
Second flagellar segment 3.9 as long as wide. Kenya.
50. kenyensis, new species (p. 299)
38. Hair band on upper edge of pronotum moderately dense, 1 to 3 hairs wide. Holarctic species. 39
Hair band on upper edge of pronotum very sparse, only 1 hair wide. Neotropic and New Guinea species. 42
39. Side of pronotum with a few hairs behind epomia. 40
Side of pronotum without hairs behind epomia. 41
40. Stalk of abdomen with regular longitudinal grooves extending to front margin. Hair band on upper edge of pronotum 2 hairs wide. Europe. 44. trichomus, new species (p. 292)
Stalk of abdomen with regular grooves on hind half, on front half with irregular grooves and pits. Hair band on upper edge of pronotum 1 hair wide. Europe. . . 45. confusus Nixon (p. 293)
41. Base of syntergite with median groove reaching 0.75 to space between thyridia, on each side of median groove with 3 to 5 longitudinal grooves. Syntergite with moderately sparse hairs, about 8 hairs on lower half of its front 0.3. Europe.
46. nixonii, new species (p. 294)
Base of syntergite with median groove reaching 0.4 to space between thyridia, on each side of median groove with 1 to 3 longitudinal grooves. Syntergite with very sparse hairs, with 0 to 3 hairs on lower half of its front 0.3. Northern part of Holarctic Region.
47. minor, new species (p. 295)
42. Second flagellar segment 2.0 to 2.4 as long as wide. Scape black. New Guinea species. 43
Second flagellar segment 3.7 to 4.3 as long as wide. Scape fulvous to brown. Neotropic species. 44
43. Hind trochanter buff colored. Abdominal stalk 1.0 as long as deep. New Guinea. 52. monotrema, new species (p. 300)
Hind trochanter dark brown. Abdominal stalk 1.5 as long as deep. New Guinea. 53. pissinus, new species (p. 301)
44. Abdominal stalk 0.85 as long as deep. Brazil.
56. leptocerus, new species (p. 303)
Abdominal stalk 1.5 to 1.7 as long as deep. Brazil and Mexico.
57. cervicatus, new species (p. 303)

1. Exallonyx placidus Brues

Figures 556 (♂ flagellum); 179 and 180 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 472 (ovipositor sheath)

**Proctotrypes placidus* Brues, (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 113. ♂. key, des. Type: ♂, USA: Mt. Constitution on Orcas Is. in Washington (Cambridge). Examined in 1975.

Phaenoserphus placidus Kieffer, 1914. Das Tierreich 42: 31. ♂. key, des. USA: Orcas Island in Washington.

Exallonyx placidus Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.

Codrus placidus Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 3.7 to 5.8 mm. long. Clypeus very wide, weakly convex with a sharp subapical overhanging narrow flange. Flagellum with tyloids as in figure 556, the tyloids becoming smaller apicad and ending on flagellar segment 8 or 9. Second flagellar segment 3.0 as long as wide. Tenth flagellar segment 4.7 as long as wide. Epomia strong. Hair band on upper edge of pronotum 4-5 hairs wide. Side of pronotum with a large group of hairs behind epomia, its lower 0.4 covered with sparse hairs between scrobe and carina on collar and some additional hairs further dorsad behind carina on collar. Upper half of mesopleurum covered with long hairs except on lower 0.4 of speculum and often with a bare area at front edge. Metapleurum, propodeum, and stalk of abdomen as in figure 179. Hind femur 4.8 as long as deep. Stigma 1.6 as long as deep, receiving radius at middle. Base of syntergite with median groove reaching 0.65 to space between thyridia, on each side with 2 (or sometimes 3) grooves that are 0.7 as long as median groove. Thyridium 4.5 as wide as long.

Black. Scape, pedicel, and mouth parts reddish brown, the scape often partly fuscous and basal 0.4 of mandible fuscous. Tegula and legs beyond coxae ferruginous. Front and middle coxae ferruginous, the middle coxa brown basad. Hind coxa brown, ferruginous apically. Wings with a fuscous tinge, the stigma and strong veins blackish brown.

Female: Front wing 3.3 to 4.8 mm. long. Temple 1.25 as long as eye. Cheek 1.05 as long as short diameter of eye. Clypeus very wide and weakly convex, with a subapical overhanging narrow flange. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 2.0 as long as wide. Epomia strong. Pronotum and mesopleurum with hairs as in male. Sculpture of metapleurum and propodeum as extensive as in male (fig. 180) but somewhat finer and more regular, the metapleural wrinkling mostly horizontal. Hind femur 4.5 as long as deep. Stigma 2.0 as long as deep, receiving radius at middle. Abdominal stalk 0.55 as long as high, its lower front corner 75°, prominent, its side with moderately coarse grooves that are 40° from the horizontal. Base of syntergite with median groove reaching 0.7 to space between thyridia, on each side 2-4 weak or faint grooves that are 0.5± as long as median groove. Thyridium 4.5 as wide as long. Ovipositor sheath as in figure 472, 0.45 as long as hind tibia, longitudinally striate, very weakly curved.

Black. Palpi light brown. Pedicel and mandible red brown. Scape

and flagellum blackish brown, the ends of scape and basal flagellar segments more or less red brown. Tegula and legs ferruginous, the hind coxa brown to fuscous with apex ferruginous, the middle coxa brown to brownish ferruginous with apex ferruginous, and front coxa ferruginous or brownish ferruginous. Wings faintly infusate, the stigma and strong veins dark brown or blackish brown.

Specimens: 30♂, 4♀ from Alberta (Banff and Eisenhower Lookout near Banff at 4,600 ft.); British Columbia (Robson, Steelhead, Twin Lakes near Keremeos at 4,700 ft., Vancouver, and Victoria); California (Crescent City, Davis, near Glacier Point in Yosemite Park, Winters, and Pine Crest in Tuolumne Co.); Idaho (Moscow Mt. and Priest Lake); Oregon (Iron Mt. 6 miles east of Upper Soda in Linn Co. at 5,000 ft. and Mt. Hood at 5,000 ft.); and Washington (Ashford, Mt. Baker, Mt. Rainier at 2,900 ft., and Tacoma Fork on Mt. Rainier).

Collection dates are from July 3 to August 28; also a collection April 17 at Davis, Calif. and another September 8 at Banff, Alta.

This species occurs from Alberta and British Columbia southward into California, in the Canadian and Transition zones. It is adult mostly in July and August.

2. Exallonyx fuscicornis Brues

Figures 557 (♂ flagellum); 181 and 182 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 473 (ovipositor sheath)

**Exallonyx fuscicornis* (as *fuscicornis* in key) Brues, 1919. Jour. New York Ent. Soc. 27: 12. ♂. key, des., figs. Type: ♂, USA: Woods Hole in Massachusetts (Cambridge). Examined in 1975.

Codrus fuscicornis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus fuscicornis Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 2.6 to 3.7 mm. long. Clypeus of moderate size, strongly convex, abruptly declivous apically, the declivity margined dorsally by a weak overhanging ridge. Flagellum with tyloids as in figure 557, the tyloids smaller apicad and ending on flagellar segment 8. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 2.8 as long as wide. Epomia weak or moderately strong. Hair band on upper margin of pronotum about 3 hairs wide. Side of pronotum with about 4 hairs behind epomia, below area of epomia with 1-15 hairs between scrobe and carina on collar. Upper half of mesopleurum with long hairs, the lower 0.4 of speculum and an area on its front margin hairless. Metapleurum, propodeum, and abdominal stalk as in figure 181. Hind femur 4.2 as long as deep. Stigma 1.85 as long as deep, receiving radius at apical 0.43. Base of syntergite with median groove reaching 0.5 to space between thyridia, with 3 grooves on each side that are 0.8 as long as median groove. Thyridium 3.8 as wide as long.

Black. Palpi pale fulvous. Mandible, tegula, and legs beyond coxae fulvous. Antenna fulvous brown to brown, sometimes dark brown. Front coxa fulvous, brownish basally. Middle coxa brown, paler apically. Hind coxa blackish brown, paler apically. Wings subhyaline, the stigma

and strong veins dark brown.

Female: Front wing 2.3 to 2.7 mm. long. Temple 1.35 as long as eye. Cheek 1.1 as long as short diameter of eye. Clypeus moderately wide, moderately convex, obliquely declivous apically, the declivity margined dorsally by a sharp ridge. Second flagellar segment 1.9 as long as wide. Tenth flagellar segment 1.5 as long as wide. Epomia not distinct. Hairs on pronotum and mesopleurum as in male, except that mesopleural hairs are shorter and the bare areas are a little larger. Sculpture of metapleurum and propodeum as in figure 182, somewhat finer and smoother than in male. Hind femur 4.6 as long as deep. Stigma 2.1 as long as deep, receiving radius at apical 0.35. Abdominal stalk 0.45 as long as deep, its lower front corner 80°, prominent. Grooves on side of abdominal stalk moderately coarse, horizontal with their front ends irregular and tending to curve downward. Base of syntergite with median groove reaching 0.65 to space between thyridia and 3 lateral grooves that are 0.6 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath as in figure 473, 0.48 as long as hind tibia.

Black. Palpi pale fulvous. Mandible, tegula, and legs beyond coxae ferruginous. Scape dark brown, light brown at base and apex. Pedicel and basal part of flagellum light brown, the flagellum shading apically to dark brown. Wings subhyaline, the stigma and strong veins brown.

Specimens: 57♂, 5♀ from Alberta (McMurray); British Columbia (Gagnon Road 6 miles west of Terrace); Colorado (Doolittle Ranch at 9,800 ft. on Mt. Evans); Georgia (Pine Mt. in Rabun Co.); Maine (Ft. Kent); Manitoba (International Peace Gardens in Turtle Mt. Forest Reserve); Maryland (Takoma Park); Massachusetts (Eastham); Michigan (Alger Co., Ann Arbor, Big Star Lake in Lake Co., Clare Co., Dickinson Co., Gladwin Co., Huron Co., Jackson, Iosco Co., Luce Co., Midland Co., Montcalm Co., Muskegon Co., Osceola Co., Ottawa Co., and Roscommon Co.); New Hampshire (Lost River in the White Mts.); New York (Ithaca, McLean in Tompkins Co., and swamp near Oneonta at 1,900 ft.); North Carolina (Highlands and Roan Mt. at 6,200 ft.); Nova Scotia (Seaforth); Ohio (Jerusalem and Steubenville); Ontario (Brighton, Chatterton, Crow Lake near Marmora, Golden Lake, Island Falls, and Leamington); Quebec (Hull); Saskatchewan (Waskesiu); and Vermont (Woodstock).

Collection dates are from mid spring to early fall. The earliest and latest dates are April 17 in Ottawa Co., Mich.; May 4 at Pine Mt., Rabun Co., Ga.; May 17 at Jackson, Mich.; May 22 at Ithaca, N. Y.; September 4, 5 to 6, 11 to 12, and 27 at Ann Arbor, Mich.; September 12 at Waskesiu, Sask.; and September 22 at Takoma Park, Md.

This species occurs in the Canadian and Transition zones of North America east of the Rocky Mts. It is adult from mid spring to early fall.

3. Exallonyx leiopleurum, new species

Figures 558 (♂ flagellum); 183 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.8 to 3.5 mm. long. Clypeus moderately wide, moderately convex, its subapical declivity abrupt with the dorsal margin a faintly overhanging ridge. Flagellum with tyloids as in figure 558, the tyloids weaker apicad and ending on flagellar segment 6. Second flagellar segment 2.6 as long as wide. Tenth flagellar segment 2.7 as long as wide. Epomia strong. Hair band on upper margin of pronotum 2 hairs wide. Side of pronotum without hairs behind epomia and carina on collar. Upper half of mesopleurum with long sparse hairs except on lower 0.4 of speculum and an area on its front edge. Metapleurum, propodeum, and abdominal stalk as in figure 183. Hind femur 4.4 as long as deep. Stigma 1.75 as long as deep, receiving radius at its apical 0.40. Base of syntergite with median groove reaching 0.5-0.7 to space between thyridia, on each side with 3 grooves that are 0.75 as long as median groove. Thyridium 3.0 as wide as long.

Black. Scape, pedicel, and apical 0.6 of mandible brown. Palpi and tegula fulvous. Front coxa fulvous. Middle coxa dark brown (in type) or fulvous (in paratypes). Hind coxa dark brown or blackish, paler at apex. Legs beyond coxae fulvous, the middle and hind femora sometimes brownish, hind tibia brownish at apex, and hind tarsus brown. Wings subhyaline, the stigma and strong veins brown or blackish brown.

Female: Unknown.

Type: ♂, Vista Hermosa, 1,450 m., 96.5 kilometers southwest of Tuxtepec, Mexico, Oct. 19, 1962, H. and M. Townes (Townes). Figures 183 and 558 are from the type.

Paratypes: 4♂, 10 miles west of El Salto, 9,000 ft., Durango, Mexico, June 2-6, 1964 and June 16, 1964, W. R. M. Mason (Ottawa).

4. Exallonyx diminuens, new species

Figures 559 (♂ flagellum); 184 and 185 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 474 (ovipositor sheath)

Male: Front wing 2.5 to 2.8 mm. long. Clypeus moderately wide, moderately convex, subapically with an abrupt declivity to the apical margin that is bordered dorsad by a weakly overhanging ridge. Flagellum with tyloids as in figure 559, the tyloids smaller apicad. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 2.8 as long as wide. Hair band on upper margin of pronotum about 3 hairs wide. Epomia strong. Side of pronotum without hairs behind epomia but sometimes its lower part with 1-3 hairs between scrobe and carina on collar. Upper half of mesopleurum with long sparse hairs except on lower 0.5 of speculum and a very large area at front edge. Metapleurum, propodeum, and abdominal stalk as in figure 184. Hind femur 5.5 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical

0.47. Base of syntergite with median groove reaching 5.5 to space between thyridia, on each side with 3 grooves that are 0.9 as long as median groove. Thyridium 2.7 as wide as long.

Black. Scape brown to black. Pedicel brown. Flagellum black, sometimes brown basally. Mouth parts brown. Tegula fulvous to brown. Coxae fulvous or fulvous brown to black (fulvous or fulvous brown in type). Legs beyond coxae fulvous to blackish (fulvous in type). Wings with a faint fuscous tinge. Stigma and strong veins brown or blackish brown.

Female: Front wing 3.1 mm. long. Temple 1.33 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus as in male. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.9 as long as wide. Epomia strong. Hairs on pronotum and mesopleurum as described for male, no hairs behind carina on collar of single female at hand. Sculpture of metapleurum and propodeum as in figure 185, slightly finer and smoother than in male. Hind femur 4.3 as long as deep. Stigma 2.4 as long as deep, receiving radius at apical 0.40. Abdominal stalk 0.65 as long as high, its front basal corner 80°, prominent, the grooves on side moderately fine, down-curved toward front end. Base of syntergite with median groove reaching 0.50 to space between thyridia, with 3 grooves on each side that are 0.9 as long as median groove. First thyridium 3.0 as wide as long. Ovipositor sheath as in figure 474, 0.50 as long as hind tibia.

Black. Pedicel, palpi, apical half of mandible, and tegula brown. Tibiae dark brown. Tarsi brown. Wings tinged with fuscous, the stigma and strong veins blackish brown.

Type: ♂, Pucará, Lago Lacar, Neuquén, Argentina, January to May, 1969, Charles Porter (Townes). Figure 184 is from the type.

Paratypes: 3♂, 1♀, same data as type (Townes). 2♂, Concepción, Chile, Nov. 8, 1970, T. Cekalovic (Townes). ♂, Dalcahue, Chiloé Island, Chile, Jan. 17 to Feb. 14, 1962, Luis E. Peña (Townes). ♂, ♂, Río Göl-Gol, Osorno, Chile, Mar. 13 to 19, 1955, Luis E. Peña (Ottawa).

This species is known from Argentina and Chile.

5. Exallonyx multidens, new species

Figures 560 (♂ flagellum); 186 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.8 to 3.5 mm. long. Clypeus moderately wide, moderately convex, subapically with an abrupt declivity to the apical margin, the declivity bordered dorsad by a weakly overhanging ridge. Flagellum with tyloids as in figure 560, the tyloids smaller apicad and ending on flagellar segment 10 or 11. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 3.4 as long as wide. Epomia strong. Hair band on upper edge of pronotum about 3 hairs wide. Side of pronotum without hairs behind epomia and carina on collar. Upper half of mesopleurum with long sparse hairs, the lower 0.5 of speculum and large area at front margin hairless, the hair area just above hori-

zontal groove usually not continuous with hair area on speculum. Metapleurum, propodeum, and abdominal stalk as in figure 186. Hind femur 4.7 as long as deep. Stigma 1.9 as long as deep, receiving radius at apical 0.41. Base of syntergite with median groove reaching 0.6 to space between thyridia, on each side with 3 or sometimes 4 grooves that are 0.8 as long as median groove. Thyridium 3.6 as wide as long.

Black. Palpi brown. Apical half of mandible ferruginous. Tegula red brown. Legs beyond coxae fulvous to blackish, when fulvous the tarsi brownish apically, when blackish the tibiae and tarsi dark brown. (The legs of the type are fulvous beyond the coxae.) Wings with a fuscous tinge, the stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, Cueva del Miladón, Magallanes, Chile, Feb. 13, 1962, T. Cekalovic (Townes). Figure 186 is from the type.

Paratypes: 9♂, same data as type (Townes). 2♂, Concepción, Chile, Jan. 4 to 18, 1970, T. Cekalovic (Townes). ♂, El Colgo, Curicó City, Curicó, Chile, Jan. 1961, Luis E. Peña (Ottawa). 6♂, El Ganso, Magallanes, Chile, Feb. 13 and 14, 1962, M. Etcheverry (Washington). ♂, Estero La Jaula, Los Queñes, Curicó, Chile, Jan. 4 to 18, 1964, Luis E. Peña (Townes). ♂, Río Mañihuales, 20 kilometers east of Puerto Aysén, Chile, Jun. 25 to 28, 1961, Luis E. Peña (Townes).

This species occurs in Chile.

6. Exallonyx pleuralis Brues

Figures 561 (♂ tyloids); 187 and 188 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 475 (ovipositor sheath)

**Exallonyx pleuralis* Brues, 1919. Jour. New York Ent. Soc. 27: 14. ♂. key, des., fig.

Type: ♂, USA: Monroe in Washington (Cambridge). Examined in 1975.

Codrus pleuralis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.

Codrus pleuralis Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 3.5 to 4.3 mm. long. Clypeus with moderate sized punctures, the edge of subapical declivity abruptly rounded. Flagellum with tyloids as in figure 561, the tyloids smaller apicad and ending on flagellar segments 6 or 7. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 3.3 as long as wide. Epomia strong. Hair band on upper margin of pronotum 4+ hairs wide. Side of pronotum without hairs behind epomia, with or without 1 to 4 hairs behind subdorsal part of carina on collar, with 1-14 hairs behind lower half of carina on collar, or sometimes without hairs. Upper half of mesopleurum nearly always with a hairless area on front margin that is 1.0 as large as tegula. Speculum with hairs on upper 0.6 and on front edge, the hairs on speculum usually not continuous with hair group above front end of horizontal groove. Metapleurum, propodeum, and abdominal stalk as in figure 187. Hind femur 5.0 as long as deep. Stigma 1.95 as long as deep, receiving radius at apical 0.42. Base of

syntergite with median groove reaching 0.65 to space between thyridia, with 3 grooves on each side that are 0.7 as long as median groove. Thyridium 4.0 as wide as long.

Black. Antenna brown to black. Palpi stramineous to light brown. Tegula fulvous. Coxae brown to black, the front coxa palest and hind coxa darkest. Trochanters fulvous to dark brown, the front trochanter palest and hind trochanter darkest. Legs beyond femora fulvous, the middle and hind femora sometimes darkened basad. Wings faintly infuscate, the stigma and strong veins blackish.

Female: Front wing 3.0 to 3.5 mm. long. Temple 1.60 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus with moderate sized punctures, the margin of subapical declivity sharply rounded. Second flagellar segment 1.9 as long as wide. Tenth flagellar segment 1.7 as long as wide. Epomia strong. Hairs on pronotum and on mesopleurum as in male. Sculpture of metapleurum and propodeum as in figure 188, similar to that of male but a little finer and smoother. Hind femur 5.0 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.36. Abdominal stalk 0.45 as long as high, its front lower corner 85°, the grooves on side coarse, slanted about 45° from horizontal. Ovipositor sheath as in figure 475, 0.46 as long as hind tibia.

Antenna light fulvous brown, the scape brown and flagellum darkened apically to brown. Stigma and strong veins brown. Color otherwise as in male.

Specimens: 129♂, 5♀ from Alaska (Anchorage, Curry, King Salmon on the Naknek River, Thompson Pass, Tsaina River, and Valdez); Alberta (Aspen Beach, Beaverlodge, Blairmore, Eisenhower Junction in Banff Park, Eisenhower Lookout at 4,600 ft. in Banff Park, Elkwater Park, Jumping Pound Creek 20 miles west of Calgary, Kananaskis, Lake Louise, McMurray, Rycroft, Slave Lake, and Whitehorn Lake at 6,800 ft. at Lake Louise); British Columbia (Atlin, Crowsnest, Diamond Head Trail at 3,200 ft. in Garibaldi Park, Hixon, Lac la Hache, Moosehorn Lake (58°10' N 132° 07'W) at 4,500 ft., Racing River at 2,700 ft., Summit Lake at 4,500 ft. at mile 392 on Alaska Highway, Temple Chalet at 7,000 ft. in Banff Park, and Yoho River); California (Crane Flat in Yosemite Park and Dardanelle); Colorado (Cottonwood Pass at 11,000 ft. in Gunnison Co., Doolittle Ranch at 9,800 ft. on Mt. Evans, Hoosier Pass at 10,500 ft. in Summit Co., Loveland Pass at 12,000 ft., Pikes Peak at 9,000 ft., and Poudre Lake at 11,000 ft. in Rocky Mt. Park); Idaho (Idaho City and Lowman at 4,000 ft.); Maine (Tumbledown Mt. near Weld); Newfoundland (Big Brook and Raleigh); New Hampshire (Base Station and the following 3 places on Mt. Washington: Cragway Spring at 4,700 ft., Lakes of the Clouds, and Tuckermans Ravine at 4,700 ft.); New York (North Trail on Mt. Marcy); Oregon (Seaside); Quebec (Mistassini, Mt. Albert at 1,500 ft., Mt. Lyall at 1,500 ft., and Parke Reserve at 950 ft. in Kamouraska Co.); and Yukon (Otter Lake 62° 30' N 130° 25' W).

Collection dates are mostly from June 20 to August 22. Those outside of this range are June 9 and 12 at Lowman, 4,000 ft., Ida.; June 11 and 14 at Idaho City, Ida.; June 11 to 15 at Lac la Hache, B. C.; June 17 at Crowsnest, B. C.; June 18 at Blairmore, Alta.; June 19 at 9,000 ft. on Pikes Peak, Colo.; and September 16 at Lake Louise, Alta.

This species occurs in the Arctic, Hudsonian, and Canadian zones of North America. It is adult from mid June to mid September.

7. Exallonyx equidens, new species

Figures 562 (♂ tyloids); 189 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.1 to 3.3 mm. long. Clypeus moderately narrow, strongly convex, with small punctures, abruptly rounded to the subapical impression without a distinct overhang at margin of impression. Tyloids as in figure 562, similar to those of *E. bisulcus* except that the apical tyloids are more tubercle-like. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 3.0 as long as wide. Epomia strong, behind the epomia no hairs, or sometimes 1-3 hairs. Hair band on upper margin of pronotum about 3 hairs wide. Lower 0.6 of side of pronotum with or without hairs between scrobe and carina on collar, when present the hairs 1-10 in number. Upper half of mesopleurum with sparse hairs except on lower 0.4 of speculum and usually a small area on front margin. Metapleurum and propodeum sculptured as in figure 189. Abdominal stalk similar to that of *E. bisulcus* but shorter, about 0.50 as long as high. Hind femur 5.0 as long as deep. Stigma 1.85 as long as deep, receiving radius at apical 0.37. Syntergite with median groove reaching 0.55 to space between thyridia and usually 3 lateral grooves that are 0.8 as long as median groove. Thyridium 3.2 as wide as long.

Black. Palpi, mandible, and pedicel light brown to dark brown. Tegula fulvous. Coxae fuscous with apex pale brown. Legs beyond coxae fulvous to brown, the hind femur and apical part of tarsi darker than the rest. Wings faintly infuscate, the stigma and strong veins dark brown.

Female: Females which may belong to *E. equidens*, or to *E. crenaticornis*, or to a mixture of both are at hand. Their characters are as follows:

Front wing 1.8 to 2.5 mm. long. Temple 1.30 as long as eye. Cheek 0.97 as long as short diameter of eye. Clypeus moderately narrow, strongly convex, its apical 0.3 with an obliquely flat area. Second flagellar segment 1.5 as long as wide. Tenth flagellar segment 1.3 as long as wide. Epomia strong. Hairs on pronotum and mesopleurum as in male. Sculpture of metapleurum and propodeum a little finer and weaker than in male (fig. 189). Hind femur 4.0 as long as deep. Stigma 2.1 as long as deep, receiving radius at apical 0.28. Stalk of abdomen 0.57 as long as high, lower front corner about 90°, on side with moderately fine grooves that are slightly oblique and at front end strongly down-curved. Base of syntergite with median groove reaching 0.45 to space between thyridia, on each side 3 or 4 grooves that are 0.7 as long as median groove. Thyridium 2.9 as wide as long. Ovipositor sheath 0.48 as long as hind tibia, shaped and sculptured as in *E. ligatus* (fig. 490).

Black. Palpi light brown. Mandible and labrum red brown. Scape

dark brown. Pedicel and flagellum medium brown, the flagellum darkening apically to dark brown. Tegula fulvous. Front and middle coxae brown. Hind coxa blackish brown. Legs beyond coxae fulvous, the middle and hind femora often with a tinge of brown. Wings tinged with fuscous, the stigma and strong veins dark brown.

Type: ♂, Raleigh, Newfoundland, Aug. 1, 1975, H. and M. Townes (Townes). Figure 562 is from the type.

Paratypes: 102♂ from Alaska (Birch Lake near Fairbanks, Mt. McKinley Park at 1,600 ft., Naknek, and Tsaina River); Alberta (Bilby, Eisenhower Lookout near Banff at 4,600 ft., Slave Lake, and Vermillion Lake near Banff at 4,500 ft.); British Columbia (Cultus Lake, Fish Lake at Summerland, Ketchum Lake (58° 22' N 130° 45' W), Liard Hot Springs, Stone Mt. Park at 3,800± ft., Summit Lake in Stone Mt. Park, Williams Lake, and Yoho Park); California (Shively); Colorado (Doolittle Ranch on Mt. Evans at 9,800 ft. and at 10,000 ft., Echo Lake on Mt. Evans at 10,600 ft., Golden, Gould, and west slope of Loveland Pass at 9,850 ft.); Manitoba (Ft. Churchill, 5 miles southwest of Shilo, mile 509 on the Hudson Bay Railway, and Warkworth Creek near Churchill); Michigan (Chippewa Co., Gladwin Co., Iron River, St. Charles in Saginaw Co., and Wexford Co.); Minnesota (Big Fork, Basswood Lake in Lake Co., and Eaglenest); Montana (Georgetown Lake at 6,500 ft.); Newfoundland (Cartwright in Labrador and Raleigh); New York (Whiteface Mt. at 4,600 ft.); Northwest Territories (Geillini Lake); Ontario (Island Falls, near Marmora, and Ottawa); Quebec (Chimo, Hull, Lac Ste. Marie, Mistassini, Mt. Albert at 1,500 ft., Mt. Jacques Cartier at 3,000 ft., and Parke Reserve in Kamouraska Co. at 950 ft.); Utah (Logan Canyon); Wyoming (Sylvan Pass in Yellowstone Park); and Yukon (Otter Lake at 4,000 ft., 62° 30' N 130° 25' W). Paratypes are in the collections of Ottawa, Townes, Washington, East Lansing, and St. Paul.

Collection dates are mostly in July and August; some are in June. The earliest and latest collection dates are June 1 at Bilby, Alta., June 6 to 13 in Wexford Co., Mich.; June 7 in Chippewa Co., Mich.; June 8 at Lac Ste. Marie, Que.; June 14 in Gladwin Co., Mich.; September 5 at Eaglenest, Minn.; and September 23 at Fish Lake, Summerland, B. C.

This species occurs in the Arctic, Hudsonian, and Canadian zones of North America. It is adult mostly in July and August.

8. Exallonyx bisulcus, new species

Figures 563 (♂ flagellum); 190 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.5 to 3.6 mm. long. Clypeus moderately wide, moderately convex, with fine weak punctures, its subapical overhang bordered by a narrow overhanging flange. Tyloids as in figure 563, becoming smaller apically, the distal tyloid (faint and elongate) on flagellar segment 8. Second flagellar segment 2.5 as long as wide, the tenth segment 2.8 as long as wide. Hair band on upper margin of pro-

notum about 3 hairs wide. Epomia weak. Side of pronotum with about 4 hairs behind the epomia. Lower 0.6 of side of pronotum covered with sparse hairs between sulcus and carina on collar. Upper half of mesopleurum with sparse hairs, hairless on lower 0.4 of speculum and usually an area in front that is $0.7\pm$ as large as tegula. Metapleurum, propodeum, and abdominal stalk as in figure 190. Hind femur 5.0 as long as deep. Stigma 2.3 as long as deep, receiving radius at apical 0.43. Syntergite with median groove reaching 0.6 to space between thyridia, and 2 broad lateral grooves about 0.7 as long as median groove. Thyridium 3.0 as wide as long.

Black. Palpi, mandible, scape, and pedicel brownish fulvous. Tegula, trochanters, femora, tibiae, and front coxa fulvous, the front coxa brownish basally. Middle and hind coxae dark brown. Tarsi infuscate. Wings subhyaline, the stigma and strong veins medium brown.

Female: Front wing 2.2 to 2.9 mm. long. Temple 1.35 as long as eye. Cheek 1.1 as long as short diameter of eye. Clypeus moderately wide and convex, with small punctures, its subapical impression broad, with a rounded upper margin. Second flagellar segment 1.8 as long as wide, the tenth segment 1.6 as long as wide. Hairs of pronotum and mesopleurum as described for male, except that there are only about 20 hairs on lower 0.6 of pronotum between sulcus and carina on collar. Sculpture of metapleurum and propodeum as in male (fig. 190). Abdominal stalk 0.55 as long as deep, its lower front corner (in profile) about 80° , its upper side with coarse transverse wrinkles, the front margin in side view paralleled by a few fine wrinkles, the rest of side view with weak fine grooves that are obsolete on front $0.5\pm$. Hind femur 4.1 as long as deep. Stigma 2.1 as long as deep, receiving radius at apical 0.35. Syntergite with median groove reaching 0.5 to space between thyridia and 2 lateral grooves that are 0.65 as long as median groove. Thyridium 2.5 as wide as long. Ovipositor sheath 0.61 as long as hind tibia, moderately stout, with fine closely spaced longitudinal striae.

Type: σ , Greenville, S. C., May 4, 1952, G. and L. Townes (Townes). Figure 190 is from the type.

Paratypes: σ , Lake Pleasant, 10 miles west of New River, Ariz., May 24, 1965, R. and J. Matthews (East Lansing). σ , Oak Creek, Ariz., May 16, 1947, H. and M. Townes (Townes). 5 σ , Portal, Ariz., Sept. 2 to 12, 1976, J. van der Vecht (Townes). σ , Portal, Ariz., Aug. 14, 1974, H. and M. Townes (Townes). 2 σ , 1 φ , Ramsey Canyon, 6,000 ft., Huachuca Mts., Ariz., May 5, 1967 and June 25 and 30, 1967, Sternitzky (Ottawa). 2 σ , Washington, D. C., C. N. Ainslie (Washington). φ , Carterville, Ill., Sept. 22, 1958, V. Cole (Davis). σ , Gobles, Mich., Aug. 1, 1939 (East Lansing). 5 σ , Columbia, Mo., May 7 and 18, 1970 and June 7, 1970, F. D. Parker (Davis). σ , Highlands, N. C., June 26, 1977, H. and M. Townes (Townes). 8 σ , Greenville, S. C., several dates from Apr. 27 to May 27, 1952 and 1956, G. and L. Townes (Townes). σ , Rosslyn, Va., Apr. 30, 1913, R. C. Shannon (Washington).

This species occurs from Michigan and the District of Columbia to South Carolina and Arizona.

9. Exallonyx californicus Holmgren

Figures 564 (♂ flagellum); 191 (♂ metapleurum, propodeum, and abdominal stalk)

- **Proctotrupes californicus* Holmgren, 1868. Kongliga svenska fregatten Eugenie's Resa . . . Zool. 1: 434. "♀" = ♂. des. Type: ♂, USA: California (Stockholm). Examined in 1975.
- Proctotrupes californicus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 338. ♂. key, des. Canada. USA: California; Virginia.
- Proctotrupes californicus* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 193. ♂. Canada: Hull [in Quebec]; Ottawa [in Ontario].
- **Exallonyx dentaticornis* Kieffer (1905) 1906. Berlin. Ent. Ztschr. 50: 275. ♂. key, des. Type: ♂, USA: Ormsby [Co.] in Nevada (San Francisco). Examined in 1975. New synonym.
- Exallonyx Californicus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 327. syn.
- Exallonyx californicus* Kieffer, 1909. Genera Insectorum 95: 7. syn.
- Exallonyx dentaticornis* Kieffer, 1909. Genera Insectorum 95: 11, fig. 13.
- **Proctotrupes serricornis* Brues, (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 115. ♂. key, des. Type: ♂, USA: Islands in Puget Sound in Washington (Cambridge). Examined in 1975. USA: Mt. Constitution on Orcas Is., San Juan Co. in Washington. New synonym.
- Phaenoserphus serricornis* Kieffer, 1914. Das Tierreich 42: 31. ♂. key, des. USA: Orcas Island in San Juan Islands in Washington.
- Exallonyx dentaticornis* Kieffer, 1914. Das Tierreich 42: 54. ♂. key, des., fig. USA: Ormsby [Co.] in Nevada.
- Exallonyx californicus* Kieffer, 1914. Das Tierreich 42: 54. ♂. key, des. Canada. USA: California; Virginia.
- Serphus californicus* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. ♂. key, des. USA: New Haven in Connecticut.
- Exallonyx dentaticornis* Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.
- Exallonyx serricornis* Brues, 1919. Jour. New York Ent. Soc. 27: 10. key, figs.
- Codrus californicus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.
- Codrus dentaticornis* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.
- Codrus serricornis* Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 3.2 to 4.7 mm. long. Clypeus moderately wide and convex, with dense small punctures, slightly rounded to subapical overhang, the overhang margin sharp but little projecting downward. Tyloids as in figure 564, the apical tyloid on segment 8. Second flagellar segment 4.8 as long as wide. Tenth flagellar segment 3.5 as long as wide. Epomia weak. Hair band on upper margin of pronotum about 4 hairs wide. Side of pronotum with a large group of hairs behind epomia. Area between pronotal scrobe and carina on collar mostly covered with long sparse hairs. Front part of mesopleurum above the horizontal groove with long hairs, nearly always with a median hairless area (of variable size). Upper 0.6 of speculum with hairs. Metapleurum, propodeum, and abdominal stalk as in figure 191. Hind femur 5.0 as long as deep. Stigma 1.85 as long as deep, receiving radius at middle. Median groove of syntergite reaching 0.45 to space between thyridia, with 2-4 grooves in each side that are 0.7-1.0 as long as median groove. Thyridium 4.0 as wide as long.

Black. Palpi and mandible dark brown. Scape fusco-ferruginous to fuscous. Pedicel and flagellum dark reddish brown to black, usually black. Tegula fulvous to reddish brown. Coxae brown or blackish, ferruginous apically, the front coxa usually mostly ferruginous. Legs beyond coxae fulvous. A common color variant has the coxae black, trochanters light brown to blackish, femora (especially hind femur) more or less light brown to dark brown or fuscous with apex fulvous, tibiae fulvous to dark brown, and tarsi light brown to dark brown. Wings faintly infuscate, the stigma and strong veins dark brown.

Female: Front wing 2.9 to 4.3 mm. long. Temple 0.92 as long as eye. Cheek 0.75 as long as short diameter of eye. Clypeus moderately narrow, convex, the subapical overhang crescentic, somewhat oblique, the median part of its margin sharply rounded. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.5 as long as wide. Hair band on upper margin of pronotum about 4 hairs wide. Epomia weak, behind the epomia an area of hairs. Lower 0.6 of side of pronotum with 12-25 sparse hairs between scrobe and carina on collar. Upper half of mesopleurum with lower 0.5 of speculum and an area on front margin as large as tegula bare, the rest with moderately long hairs. Metapleurum and propodeum sculptured as in male (fig. 191). Abdominal stalk 0.42 as long as deep, its lower front corner about 80°, its side with moderately fine grooves, the lower grooves abruptly decurved at front end. Syntergite with median groove reaching 0.7 to space between thyridia, with 3-5 lateral grooves that are weak or faint and 0.5 to 0.7 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath 0.45 as long as hind tibia, moderately stout, with close longitudinal striae.

Black. Palpi stramineous to light brown. Mandible brown. Antenna dark brown, the scape paler. Tegula fulvous. Front and middle coxae brownish fulvous, darker at base. Hind coxa dark brown, its apex fulvous brown. Legs beyond coxae fulvous. Wings faintly infuscate, the stigma and strong veins medium brown.

Specimens: 124♂, 9♀ from Alaska (Matanuska, Thompson Pass, Tsaina River, and Valdez); Alberta (Banff, Eisenhower Junction at 4,700 ft. near Banff, Grande Prairie, and Wabamun); British Columbia (Bevan, Bowser, Gagnon Road 6 miles west of Terrace, Ketchum Lake at 3,600 ft., 58° 32' N 131° 45' W, Mission City, Qualicum, Racing River at 2,400 ft., Spring Creek at Terrace, Summerland, and Terrace); California (Camino, Crane Flat in Yosemite Park, Donner Pass, Dutch Flat in Placer Co., near Glacier Point in Yosemite Park, Lake Wohlford, Potrero, Shively, and near Sonora Pass at 8,000 ft.); Colorado (Cameron Pass at 10,000 to 11,000 ft., Chambers Lake in Larimer Co., Chicago Creek at 8,800 ft. in Clear Creek Co., Doolittle Ranch at 9,800 ft. on Mt. Evans, Fall River Pass at 11,600 ft. in Rocky Mt. Park, Gould, Peaceful Valley, Poudre Lake at 11,000 ft. in Rocky Mt. Park, Rabbit Ears Pass at 9,500 ft., and Union Pass Road in Freemont Co.); Michigan (Mecosta Co.); Montana (Missouri River); Nevada (Washoe Lake in Washoe Co.); New York (Oswego); Ontario (Effingham, Go Home Bay, Leamington, and Point Pelee); Quebec (Lac Mondor); Saskatchewan (Attons Lake, Otosquen, and Saskatoon); Utah (Mill Creek Canyon in Salt Lake Co. and Strawberry Daniel Pass); Washington (Centralia, Clarkston,

Colfax, Mt. Rainier at 2,700 ft., Puget Sound, Skyline Trail on Mt. Baker, Wawawai, and Westport); and Wyoming (Battle Lake Road in Sierra Madre Range at 8,500 ft., Big Horn Mts., Curtis Gulch Camp Ground in Medicine Bow National Forest, Sylvan Pass in Yellowstone Park, and Togwotee Pass in Teton Co.).

Collection dates are mostly from June through August. Those outside of this range are April 22, 26, 28 and 29 and May 1 at Lake Wohlford, San Diego Co., Calif.; May 1 at Wawawai, Wash.; May 15 at Clarkston, Wash.; May 23 at Centralia, Wash.; September 4 at Attons Lake, Sask.; September 9 at Saskatoon, Sask. and at Point Pelee, Ont.; September 12 at Otosquen, Sask.; September 15 at Matanuska, Alaska; and September 18 and 24 at Summerland, B. C.

This species occurs in the Canadian and Hudsonian zones of North America. It is common in the West and scarce in the East. Adults have been collected through the growing season.

10. Exallonyx decumbens, new species

Figures 565 (♂ flagellum); 192 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.5 to 4.0 mm. long. Clypeus moderately wide, moderately convex, with close small punctures, its subapical overhang with a sharp flange-like margin that projects ventrad almost to level of clypeal apex. Tyloids as in figure 565, diminishing apicad, the last tyloid on flagellar segment 8. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 3.2 as long as wide. Hair band on upper margin of pronotum about 4 hairs wide. Epomia strong, behind epomia an area of hairs. Side of pronotum covered with hairs between scrobe and carina on collar. Upper half of mesopleurum with long hairs except on lower 0.35 of speculum and often a small bare area on front margin. Metapleurum, propodeum, and abdominal stalk as in figure 192. Hind femur 5.0 as long as deep. Stigma 1.9 as long as deep, receiving radius at middle. Syntergite with median groove reaching 0.55 to space between thyridia and 2 lateral grooves, the inner lateral grooves the same length as median groove and outer lateral grooves shorter. Thyridium 4.5 as wide as long.

Black. Palpi and mandible brown or blackish. Tegula reddish brown. Trochanters fuscous. Femora and tibiae ferruginous. Tarsi fuscous brown.

Female: Unknown.

Type: ♂, Potrero, Calif., Apr. 9, 1974, H. and M. Townes (Townes). Figure 192 is from the type.

Paratypes: 4♂, Bowser, B. C., May 30 and 31, 1955, R. Coyles (Ottawa). ♂, 34 miles north of Creston, B. C., July 30, 1960, D. F. Hardwick (Ottawa). ♂, Ladysmith, B. C., June 2, 1955, R. Coyles (Ottawa). ♂, Camino, Calif., June 20, 1948, H., M., G., and D. Townes (Townes). ♂, Davis, Calif., Apr. 17, 1949, E. I. Schlinger (Townes). 2♂, Lake Wohlford, San Diego Co., Calif., Apr. 26 and 27, 1974, H. and M. Townes (Townes). 5♂, Potrero, Calif., Apr. 9, 15,

16, and 17, 1974, H. and M. Townes (Townes). ♂, Colorado (Washington). ♂, Waha, Ida., Aug. 12, 1923, A. L. Melander (Cambridge). 4♂, Ochoco Creek, Oreg., Jul. 8 and 11, 1978, H. and M. Townes (Townes). ♂, Heber, 5,200 ft., Utah, Jul. 27, 1958, R. R. Dreisbach (East Lansing). ♂, Centralia, Wash., May 23, 1917, A. L. Melander (Cambridge). 2♂, Olympia, Wash. (Washington).

This species occurs in the western Nearctic Region. It is adult from late spring to late summer.

11. Exallonyx declivus, new species

Figures 566 (♂ flagellum); 193 and 194 (♂, ♀ metapleurum propodeum, and abdominal stalk); 476 (ovipositor sheath)

Male: Front wing 2.8 to 3.2 mm. long. Clypeus wide, moderately convex, the upper edge of its subapical declivity with an overhanging ridge. Male flagellum with tyloids as in figure 566, in the shape of a low crescentic ridge with apical end obliquely truncate, the tyloids on basal 0.6 of segments. Tyloid on segment 1 a little longer than that on segment 2, tyloids on segments 2-4 equal, tyloids on segments 6 and 7 diminishing in size, and segments 7-10 without tyloids. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 2.4 as long as wide. Epomia moderately strong, short. Hair band on upper margin of pronotum 2 to 3 hairs wide. Side of pronotum with 0 to 4 hairs behind epomia and upper end of carina on collar, farther ventrad without hairs between carina on collar and the scrobe. Upper half of mesopleurum with long sparse hairs except on lower 0.6 of speculum and except on most of the area near front margin. Sculpture of metapleurum and propodeum as in figure 193, similar to that of male of *E. seticornis*. Hind femur 4.6 as long as deep. Stigma 2.2 as long as deep, receiving radius at its middle. Abdominal stalk 0.85 as long as deep, on side with about 6 coarse grooves that slant downward anteriorly (at an average of 30° from the horizontal). Lower front corner of abdominal stalk 75°. Base of syntergite with median groove reaching 0.6 to space between thyridia, on each side with 3 grooves that are weakly convergent anteriorly and 0.8 as long as median groove. Thyridium 2.4 as wide as long.

Black. Labrum and mandible fulvous brown. Palpi stramineous. Antenna dark brown basally, very dark brown toward apex. Tegula fulvous. Front coxa light brown. Middle coxa medium brown. Hind coxa dark brown. Legs beyond coxae brownish fulvous, the upper edge of hind femur a little darker. Wings subhyaline, the stigma and strong veins blackish brown.

Female: Front wing 2.6 mm. long. Temple moderately convex, 1.2 as long as eye. Cheek 0.82 as long as short diameter of eye. Clypeus moderately wide, moderately convex, its subapical declivity faintly concave. Second flagellar segment 1.6 as long as wide. Tenth flagellar segment 1.3 as long as wide. Epomia strong, short. Hairs on pronotum and mesopleurum as in male. Sculpture of metapleurum and propodeum as in figure 194, similar to that of male but slightly

smoother. Hind femur 4.0 as long as deep. Stigma 2.4 as long as deep, receiving radius at apical 0.46. Base of syntergite with median groove reaching 0.65 to space between thyridia, on each side of median groove with 3 grooves that are 0.7 as long as median groove. Ovipositor sheath 0.54 as long as hind tibia, shaped and sculptured as in *E. microcerus* (fig. 476).

Black. Labrum and mandible light brown. Palpi and tegula stramineous. Antenna brown. Legs colored as in male. Wings with a weak brown tinge, the stigma and strong veins brown.

Type: ♂, Tsaina River, Alaska, Aug. 15, 1973, H. and M. Townes (Townes). Figures 193 and 566 are from the type.

Paratypes: ♂, Anchorage, Alaska, July 25, 1961, R. S. Bigelow (Ottawa). 2♂, Mt. McKinley, 1,600 ft. and 2,000 ft., Alaska, Aug. 6 and 14, 1954, David Townes (Townes). 2♂, Tsaina River, Alaska, Aug. 15 and 17, 1973, H. and M. Townes (Townes). 4♂, McMurray, Alta., Aug. 8, 1953, G. Ball (Ottawa). 19♂, 1♀, Terrace, B. C., July 23, 1960 and Aug. 5, 1960, W. R. Richards (Ottawa). 2♂, Terrace airport, B. C., Aug. 2, 1960, B. Heming (Ottawa). ♂, King Mt., 1,150 ft., Old Chelsea, Que., July 18, 1961, J. R. Vockeroth (Ottawa). ♂, Otosquen, Sask., Sept. 12, 1959, J. R. Vockeroth (Ottawa).

This species occurs in northern North America. It is adult from mid July to mid September.

12. Exallonyx angusticeps Brues

Figures 567 (♂ flagellum); 195 and 196 (♂, ♀ metapleurum propodeum, and abdominal stalk); 477 (ovipositor sheath)

**Proctotrypes angusticeps* Brues (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 112. ♀. key, des. Type: ♀, USA: Mt. Constitution on Orcas Is., San Juan Co., Washington (Cambridge). Examined in 1975.

Exallonyx (?) *angusticeps* Kieffer, 1914. Das Tierreich 45: 55. ♀. key, des.

USA: Orcas Island in Washington.

Codrus (?) *angusticeps* Muesebeck and Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus angusticeps Masner, 1966. Psyche 72: 295. type data.

Male: Front wing 2.0 to 2.6 mm. long. Clypeus moderately wide, moderately convex, its apical declivity almost at right angles and margined above with an overhanging low carina. Flagellum with raised tyloids on segments 1-6, the tyloids in the form of low weakly arched ridges whose outer edges are almost parallel to surface of segments. See figure 567. Tyloids nearly the same size except that first tyloid is long and low and there is a diminution in size in the apical two tyloids. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 2.25 as long as wide. Epomia moderately strong to weak or obsolescent. Hair band on upper margin of pronotum 2+ hairs wide. Side of pronotum without hairs behind epomia and carina on collar, or sometimes with 1 or 2 hairs between lower part of carina on collar and pronotal scrobe. Upper half of mesopleurum with sparse hairs except for

median and lower part of speculum and most of antero-median part. Lower half of mesopleurum with long very sparse hairs, the hair sockets separated by about the length of the hairs. Sculpture of metapleurum and propodeum as in figure 195, coarser and stronger than that of female. Hind femur 4.8 as long as deep. Stigma 2.1 as long as deep, receiving radius at middle. Abdominal stalk 0.9 as long as high, its side with coarse grooves that are almost horizontal, its basal truncation approximately 90°. Base of syntergite with median groove reaching 0.4-0.6 to space between thyridia, on each side with 3 or 4 lateral grooves that are 0.9 as long as median groove. Thyridium 3.1 as wide as long.

Very dark brown. Mandible and palpi light brown. Antenna brown, paler toward base and darker toward apex, the scape very little darker than pedicel. Tegula light brown. Legs brownish fulvous to brown. Wings with a brown tinge, the stigma and strong veins medium brown.

Female: Front wing 1.5 to 1.9 mm. long. Head exceptionally long and narrow, 1.2 as long as wide. Temple 1.7 as long as eye. Cheek 1.25 as long as short diameter of eye. Clypeus moderately small and convex, its apical impression oblique with a blunt overhang on its upper edge. Second flagellar segment 1.65 as long as wide. Tenth flagellar segment 1.55 as long as wide, the flagellum enlarged apically. Epomia short. Hairs on pronotum and mesopleurum as in male. Metapleurum, propodeum, and abdominal stalk as in figure 196. Hind femur 4.0 as long as deep. Stigma 2.3 as long as deep, receiving radius at apical 0.44. Base of syntergite with median groove reaching 0.6 to space between thyridia and about 4 grooves on each side that are 0.7 as long as median groove. Thyridium 3.2 as wide as long. Ovipositor sheath as in figure 477.

Blackish. Mandible, palpi, and tegula pale brown. Antenna fulvous brown, darkening apicad to dark brown, the pedicel only faintly paler than scape. Coxae dark brown. Legs beyond coxae fulvous brown. Wings with a tinge of brown, the stigma and strong veins brown.

Specimens: ♀, Slave Lake, Alta., Aug. 7, 1924, O. Bryant (Washington). 6♀, Cultus Lake, B. C., July 1, 1948 and July 13-17, 1948, H. R. Foxlee (Ottawa and Townes). ♂, Kleanza Creek, 14 miles east of Terrace, B. C., July 4, 1960, B. Heming (Ottawa). 6♂, 1♀, Doolittle Ranch, 9,800 ft., Mt. Evans, Colo., July 25, 1961 and Aug. 3 and 4, 1961, W. R. M. Mason and S. M. Clark (Ottawa). 2♀, Colorado (Washington). ♂, Whiteside Cove, 2,800 ft., near Highlands, N. C., July 11, 1957, J. G. Chillcott (Ottawa). ♀, Deerrock Lake, Ont., July 18, 1960, S. M. Clark (Ottawa). ♂, Marmora, Ont., Sept. 4, 1952, J. F. McAlpine (Ottawa). ♂, Mt. Ste. Marie, Low, Que., July 15, 1957, W. R. M. Mason (Ottawa). ♂, Ashford, Wash., July 13, 1940, H. and M. Townes (Townes).

This species is widely distributed in North America. It occurs mostly in the Canadian Zone.

13. Exallonyx ashmeadi Brues

Figures 568 (♂ flagellum); 197 and 198 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 478 (ovipositor sheath)

Proctotrypes californicus Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 338. ♂. key, des. Canada. USA: California; Virginia. Misdet. of *californicus* Holmgren.

**Exallonyx ashmeadii* (as *ashmeadi* in key) Brues, 1919. Jour. New York Ent. Soc. 27: 13. ♂. key. des., figs. Type: ♂. USA: Machias in Maine (Cambridge). Examined in 1975. USA: Eastport in Maine.

Codrus ashmeadii (!) Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus ashmeadi Masner, 1966. Psyche 72: 295. ♂. type data for *ashmeadi*.

Male: Front wing 2.3 to 3.0 mm. long. Temple 0.95 as long as eye. Clypeus moderately wide and convex, its subapical impression concave and margined above by an overhanging ridge. Flagellum with tyloids as in figure 568, segments 6-11 without tyloids. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 2.6 as long as wide. Epomia short, moderately strong. Hair band on upper margin of pronotum about 2 hairs wide. Side of pronotum with a few hairs behind epomia and upper end of carina on collar, farther ventrad with 0-8 sparse hairs between carina on collar and the sulcus. Upper half of mesopleurum with hairs below tegula, on upper 0.5 of speculum and on front edge above the horizontal groove, elsewhere hairless. Metapleurum, propodeum, and abdominal stalk as in figure 197, the apical declivity of propodeum unusually steep. Hind femur 4.4 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.43. Base of syntergite with median groove reaching 0.6 to space between thyridia, and 3 lateral grooves that are 0.8 as long as median groove. Thyridium 3.1 as wide as long.

Black. Palpi pale fulvous. Mandible and antenna fulvous brown, the flagellum darkened apicad to dark brown. Tegula and legs fulvous, the hind coxa dark brown basally to mostly dark brown. Middle coxa often more or less brown. Upper edge of hind femur often brown. Wings subhyaline, the stigma and strong veins dark brown.

Female: Front wing 2.4 to 3.0 mm. long. Temple 0.95 as long as eye. Cheek 0.75 as long as short diameter of eye. Clypeus weakly convex, its subapical declivity very steep, concave with upper edge margined by an overhanging ridge. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.55 as long as wide. Epomia short, strong. Hairs on pronotum and upper half of metapleurum as described for male. Metapleurum and propodeum as in figure 198, similar to those of male but the sculpture a little smoother and apical declivity of propodeum a little steeper. Hind femur 4.0 as long as deep. Stigma 2.0 as long as deep, receiving radius at its apical 0.35. Stalk of abdomen 0.55 as long as high, its lower front corner 80°, the grooves on its side of moderate size, their front ends strongly curved downwards. Base of syntergite with median groove reaching 0.6 to space between thyridia and 3 lateral grooves that are 0.7 as long as median groove. Thyridium 2.8 as wide as long. Ovipositor sheath 0.6 as long as hind

tibia, shaped and sculptured as in figure 478.

Black. Palpi pale fulvous. Mandible and antenna brownish fulvous, the flagellum darkened apicad to dark brown. Tegula and legs fulvous, the hind coxa and sometimes also middle coxa brown. Upper edge of hind femur sometimes brownish. Wings subhyaline, the stigma and strong veins brown.

Specimens: 58♂, 4♀ from Georgia (Pine Mt. in Rabun Co., at 1,400 ft.); Maine (Bar Harbor and Mt. Desert); Maryland (Takoma Park); Michigan (Alger Co., Baraga Co., Delta Co., Gull Lake Biological Station in Kalamazoo Co., Houghton Co., Huron Mts., Iron River, and Sylvania Tract); Minnesota (Houston Co.); New Brunswick (St. John); Newfoundland (South Branch); New Hampshire (Dolly Copp Camp in White Mts., Mt. Madison, Mt. Washington, and Pinkham Notch); New York (Babylon, Fish Creek in Adirondack Mts., Keene Valley in Essex Co. at 1,200 ft., and Upper Ausable Lake in Essex Co.); Ohio (Steubenville); Ontario (Chatterton, Cumberland, near Marmora, and Stittsville); Pennsylvania (Swarthmore); Quebec (Mt. Albert at 1,500 ft. and Parke Reserve in Kamouraska Co. at 950 ft.); South Carolina (Greenville); Tennessee (Knoxville); and Virginia (Arlington and Chain Bridge).

Collection dates are from mid spring to mid fall, the earliest and latest dates being May 2 at Takoma Park, Md. and at Swarthmore, Pa., May 15 on Pine Mt., 1,400 ft., Rabun Co., Ga.; May 22 at Bar Harbor, Me.; September 17 at Chain Bridge, Va.; and November 17 at Stittsville, Ont.

This species occurs in eastern North America from Quebec to Georgia. It is adult from spring to fall.

14. Exallonyx seticornis, new species

Figures 569 (♂ tyloids); 199 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.6 to 3.7 mm. long. Temple weakly evenly convex, 0.76 as long as eye. Clypeus moderately wide, moderately convex, the upper margin of its apical declivity not distinctly overhanging. Flagellum with tyloids as in figure 569, the tyloids diminishing in size apicad, absent from segments 8-11, usually absent also on segment 7, when present on segment 7 in the form of a very low long ridge. Second flagellar segment 2.6 as long as wide. Tenth flagellar segment 3.0 as long as wide. Epomia strong, short. Hair band on upper edge of pronotum about 2 hairs wide. Side of pronotum with about 6 hairs behind epomia and carina on collar, farther ventrad with very sparse long hairs between its scrobe and carina on collar. Upper half of mesopleurum with long sparse hairs, the median and lower part of speculum and a large area on front edge hairless. Metapleurum, propodeum, and abdominal stalk as in figure 199. Hind femur 6.1 as long as deep. Stigma 1.7 as long as deep, receiving radius at apical 0.42. Base of syntergite with median groove reaching 0.6 to space between thyridia, with 3 lateral grooves that are parallel and 0.95 as long as median groove. Thyridium 2.6 as wide as long.

Black. Labrum, mandible, and legs fulvous, the middle and hind coxae brown. Palpi stramineous. Scape fulvous brown. Pedicel light brown. Flagellum brown to blackish brown. Tegula fulvous. Wings with a brown tinge, the stigma and strong veins brown.

Female: Front wing 2.3 to 3.3 mm. long. Temple 1.2 as long as eye. Cheek 0.86 as long as short diameter of eye. Clypeus moderately wide, moderately convex, its subapical declivity flat. Second flagellar segment 1.7 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia strong, short. Hairs on pronotum and mesopleurum as described for male. Sculpture of mesopleurum and propodeum smoother and finer than in male. Hind femur 3.9 as long as deep. Stigma 1.9 as long as deep, receiving radius at apical 0.38. Abdominal stalk 0.55 as long as high, its lower front corner 80°, the grooves on its side moderately fine, strongly downcurved anteriorly. Base of syntergite with median groove reaching 0.7 to space between thyridia, with 4 grooves on each side that are 0.7 as long as median groove. Thyridium 2.8 as wide as long. Ovipositor sheath 0.56 as long as hind tibia, shaped and sculptured as in *E. ligatus* (fig. 490).

Black. Labrum and mandible fulvous brown. Palpi pale fulvous. Scape dark brown, paler at apex. Pedicel and base of flagellum fulvous brown, the flagellum darkened apicad to dark brown. Front and middle coxae light brown. Hind coxa dark brown. Legs beyond coxae brownish fulvous. Wings faintly tinged with brown, the stigma and strong veins brown.

Type: ♂, Crescent City, Calif., Aug. 4, 1940, H. and M. Townes (Townes).

Paratypes: 73♂, 6♀ from Alberta (Valleyview); British Columbia (Cowichan Lake, Cultus Lake, Fish Lake at Summerland, Lac la Hache, Mission City, Point Grey in Vancouver, Racing River at 2,400 ft., and Robson); California (Crescent City and Eureka); Oregon (Cannon Beach, Hyatt Reservoir, Ochoco Creek, near Prineville, and Seaside); Idaho (Idaho City, Lowman, and near Stanley); Washington (Ashford, Elbe, Mt. Rainier at 2,700 ft. and 2,900 ft., and Westport); and Utah (Big Brush Creek 22 miles north of Vernal at 8,000 ft.).

Collection dates are mostly from June 20 through August. Those outside of this range are: May at Point Grey, Vancouver, B. C.; May 22 at Eureka, Calif.; June 9, 11, and 14 at Idaho City, Ida. June 12, and 13, at Robson, B. C.; and October 15 at Fish Lake, Summerland, B. C. Our own collections have been from moist dense undergrowth. Paratypes are in the collections of Townes, Ottawa, and Washington.

This species ranges from British Columbia and Alberta to Utah and northern California.

15. Exallonyx crenaticornis Kieffer

**Exallonyx crenaticornis* Kieffer (1905) 1906. Berlin. Ent. Ztschr. 50: 274. ♂ key, des. Type: ♂, USA: Santa Clara in California (San Francisco). USA: Ormsby [Co.] in Nevada. Examined in 1975.

Exallonyx crenaticornis Kieffer, 1908. Species des hyménoptères d'Europe et d'Algérie ... 10: 327. syn.

Exallonyx crenaticornis Kieffer, 1909. Genera Insectorum 95: 11. fig. 14.

Exallonyx crenaticornis Kieffer, 1914. Das Tierreich 42: 54. ♂. key, des., fig.

USA: Santa Clara in California; Ormsby [Co.] in Nevada.

Exallonyx crenaticornis Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.

Codrus crenaticornis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Male: Front wing 2.6 to 3.3 mm. long. Temple weakly convex, 0.85 as long as eye. Clypeus moderately wide, moderately convex, the upper edge of its subapical declivity with a weakly overhanging lip. Flagellum with tyloids similar to those of *E. seticornis* (fig. 569) but higher, more strongly arched, and blunter, the tyloids diminishing in size apicad, lacking from segments 9-11, small on segment 7, and very small but still an elevated lobe on segment 8. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 3.1 as long as wide. Epomia short, strong. Hair band on upper margin of pronotum 2 to 3 hairs wide. Side of pronotum with about 8 hairs behind epomia and carina on collar, farther ventrad with sparse or very sparse hairs between scrobe and carina on collar. Upper half of mesopleurum with long sparse hairs except on median and lower part of speculum and a large area next to front margin. Metapleurum, propodeum, and abdominal stalk similar to those of *E. seticornis* (fig. 199) except that the stalk is slightly longer. Hind femur 4.8 as long as deep. Stigma 1.95 as long as deep, receiving radius at its apical 0.43. Base of syntergite with median groove reaching 0.6 to space between thyridia and 3 lateral grooves that converge anteriorly and are 0.9 as long as median groove. Thyridium 2.5 as wide as long.

Black. Mouth parts brown. Antenna dark brown or blackish brown, the outer edges of tyloids and the pedicel paler brown. Front coxa light brown. Middle and hind coxae medium brown to blackish brown. Legs beyond coxae brownish fulvous, the middle and hind legs often brown with hind femur darker than the rest. Wings with a faint tinge of brown, the stigma and strong veins dark brown.

Female: Not distinguished from female of *E. equidens*. See the description under *equidens*.

Specimens: 4♂, Cowichan Lake, B. C., Jul. 2, 11, and 21 to 27, 1966 and Aug. 30, 1966, J. A. Chapman (Ottawa). ♂, Diamond Head Trail, 3,200 ft., Garibaldi Park, B. C., Aug. 26, 1953, W. R. M. Mason (Ottawa). 14♂, Crescent City, Calif., Aug. 2, 3, and 4, 1940, and May 28, 1978, H. and M. Townes (Townes). ♂, Dardanelle, Calif., Jul. 5, 1948, H., M., G., D., and J. Townes (Townes). ♂, Lowman, 4,000 ft., Ida., June 11, 1978, H. and M. Townes (Townes). 2♂, near Stanley, Ida., Aug. 2, 1978, H. and M. Townes (Townes). 2♂, Mt. Hood, 3,500 ft., Oreg., July 18 and 20, 1978, H. and M. Townes (Townes). ♂, Pinehurst, Oreg., June 16, 1978, H. and M. Townes (Townes). 4♂, Ashford, Wash., Jul. 8, 13, 26, and 27, 1940, H. and M. Townes (Townes). 11♂, Mt. Rainier, 2,900 ft. and 4,700 ft., Wash., July 12, 20, and 28, 1940 and Aug. 13, 1940, H. and M. Townes (Townes). 4♂, Westport, Wash., Jul. 17, 1940, H. and M. Townes (Townes).

This species occurs from British Columbia to northern California. It is adult from June to August.

16. Exallonyx femoratus Ashmead

Figures 570 (♂ tyloids); 200 and 201 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 479 (ovipositor sheath)

**Proctotrypes femoratus* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 344. ♀. key, des. Type: ♀, USA: Wyoming (Washington). Examined in 1975.

**Exallonyx*(?) *fallacicornis* Kieffer, (1905) 1906. Berlin. Ent. Ztschr. 50: 274. ♂. key, des. Type: ♂, USA: Santa Clara in California (San Francisco). Examined in 1977. New synonym.

Exallonyx femoratus Kieffer, 1909. Genera Insectorum 95: 7. syn.

Exallonyx fallacicornis Kieffer, 1909. Genera Insectorum 95: 11. fig. 15.

Proctotrypes femoratus Brues (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 112. key. USA: Mt. Constitution on Orcas Is. in Washington.

**Proctotrypes obscuripes* Brues (1909) 1910. Bul. Wisconsin Nat. Hist. Soc. 7: 114. ♂. key, des. Type: ♂, USA: Mt. Constitution on Orcas Is. in Washington (Cambridge).

USA: Islands in Puget Sound in Washington. Examined in 1975. New synonym.

Phaenoserphus obscuripes Kieffer, 1914. Das Tierreich 42: 32. ♂. key, des. USA: Orcas Island in Washington.

Exallonyx fallacicornis Kieffer, 1914. Das Tierreich 42: 55. ♂. key, des., fig. USA: Santa Clara in California.

Exallonyx femoratus Kieffer, 1914. Das Tierreich 42: 56. ♀. key, des. USA: Orcas Island in Washington; Wyoming.

Exallonyx femoratus Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.

Exallonyx fallacicornis Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.

Exallonyx obscuripes Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.

Codrus fallacicornis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus femoratus Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn.

Codrus obscuripes Masner, 1966. Psyche 72: 296. ♂. type data.

Codrus femoratus Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 4. type data.

Male: Front wing 2.3 to 3.4 mm. long. Temple moderately convex, 1.0 as long as eye. Clypeus moderately wide, moderately convex, its subapical impressed area margined above with a weak overhanging ridge. Flagellum with tyloids on segment 1-7, the tyloid on segment 7 small, tubercle-like, and near base of the segment. See figure 570. In some large specimens there is a very small tyloid on segment 8. Tyloids similar, in the shape of a crescentic ridge on basal 0.6± of each segment, with apex of each tyloid obliquely truncate, the tyloid on segment 1 a little smaller than that on segment 2, and on segments 5-7 the tyloids successively smaller. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 2.4 as long as wide. Epomia short, moderately strong. Hair band on upper margin of pronotum about 3 hairs wide. Side of pronotum with about 8 hairs behind epomia and upper end of carina on collar, farther ventrad with a few sparse hairs between scrobe and carina on collar. Upper half of mesopleurum with long sparse hairs, the lower 0.5 of speculum and usually a large area at front edge hairless. Metapleurum, propodeum, and abdominal stalk as in figure 200, similar to those of *E. crenaticornis* except that the stalk is slightly longer and that the grooves on the stalk are almost straight rather than curved downward at front end. Hind femur 4.8 as long as deep. Stigma 1.9 as long as deep, receiving radius at apical

0.44. Base of syntergite with median groove reaching 0.45 to space between thyridia and 3 lateral grooves that are somewhat convergent anteriorly and about 0.8 as long as median groove. Thyridium 2.3 as wide as long.

Black. Mandible and palpi dark brown. Antenna blackish brown, the pedicel light brown. Tegula brown. Coxae dark brown to black. Trochanters and femora light brown to blackish, the apical 0.15± of femora paler. Tibiae and tarsi median brown to dark brown. Wings faintly infusate, the stigma and strong veins blackish brown.

Female: Front wing 1.7 to 2.8 mm. long. Head 1.0 to 1.1 as long as wide. Temple in dorsal view weakly convex but with a stronger convexity just behind middle. Temple 1.3 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus of moderate size, moderately convex, its subapical declivity bordered above by a weak overhanging rim. Second flagellar segment 1.5 as long as wide. Tenth flagellar segment 1.35 as long as wide. Flagellum enlarged apicad. Epomia short, moderately strong. Hairs on pronotum and mesopleurum as in male. Sculpture of metapleurum and propodeum as in figure 201, similar to those of female of *E. angusticeps* but a little finer. Hind femur 3.8 as long as deep. Stigma 2.2 as long as deep, receiving radius at its apical 0.42. Abdominal stalk 0.75 as long as deep, its side with fine grooves that at front end turn sharply downward, the base of stalk truncate at 90°. Ovipositer sheath as in figure 479, 0.52 as long as hind tibia.

Black. Mandible, palpi, and antenna dark brown, the flagellum not as dark as scape, and pedicel a contrasting pale brown. Coxae blackish brown. Trochanters and femora brown to blackish brown, the apex of femora narrowly paler. Tibiae and tarsi light brown, the hind tibia somewhat darker than the rest. Wings with a tinge of brown, the stigma and strong veins brown.

Specimens: 128♂, 42♀ from Alaska (Naknek); British Columbia (Cultus Lake, Fish Lake at Summerland, Gagnon Road 6 miles west of Terrace, Hixon, Kaslo, Kleanza Creek 16 miles east of Terrace, Nass River at Aiyansh, Point Grey in Vancouver, Robson, and Steelhead); California (Camino, Crescent City, north of Leggett, Potrero in San Diego Co., Sacramento, and Stanford University); Idaho (near Stanley); Oregon (Cannon Beach, Cave Junction, Corvallis, Mt. Hood at 3,500 ft. and 5,400 ft., Hyatt Reservoir, Ochoco Creek, Parkdale, Pinehurst, Seaside, Selma, Tidewater, and Warrenton); and Washington (Ashford, Dallesport, Elbe, Mt. Constitution, Mt. Rainier at 2,700 ft., Puget Sound, and Westport). Collection dates are mostly from May 1 to September 20. Dates outside of this range are March 18 at Stanford University, Calif.; April 16 at Potrero, San Diego Co., Calif.; September 23 at Fish Lake, Summerland, B. C.; September 29 at Robson, B. C.; and October 4 at Robson, B. C.

This species occurs from Alaska to Wyoming and southern California, in moist dense vegetation.

17. Exallonyx piliventris, new species

Figures 202 (♀ metapleurum, propodeum, and abdominal stalk);
480 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.5 mm. long. Temple 1.35 as long as eye. Cheek 1.1 as long as short diameter of eye. Clypeus of moderate size and convexity, its subapical declivity concave with its median part bordered dorsad by a weakly overhanging ridge. Second flagellar segment 2.7 as long as wide. Tenth flagellar segment 2.4 as long as wide. Epomia strong, short. Hair band on upper margin of pronotum about 3 hairs wide. Side of pronotum without hairs behind epomia and upper end of carina on collar, with about 6 scattered hairs on its lower half between carina on collar and the scrobe. Upper half of mesopleurum with long hairs, the lower 0.5 of speculum and a large area at front margin hairless. Metapleurum, propodeum, and abdominal stalk as in figure 202. Hind femur 5.0 as long as deep. Stigma 2.2 as long as deep, receiving radius at its basal 0.44. Hairs on syntergite long and moderately numerous. Base of syntergite with median groove reaching 0.33 to space between thyridia, with 3 lateral grooves that are about as long as median groove. First thyridium 3.1 as wide as long. Ovipositor sheath as in figure 480.

Black. Mandible and palpi dark brown. Antenna blackish brown, the pedicel brown. Tegula light brown. Tibiae and tarsi dark brown or blackish brown, the rest of legs black. Wings with a fuscous tinge, the stigma and strong veins blackish brown.

Type: ♀, Pucará, Lago Lacar, Neuquén, Argentina, January to May, 1969, Charles Porter (Townes).

18. Exallonyx asper, new species

Figures 203 and 204 (♂, ♀ metapleurum, propodeum,
and abdominal stalk); 481 (ovipositor sheath)

Male: Front wing 2.7 to 3.5 mm. long. Cheek 0.90 as long as temple. Clypeus 2.5 as wide as long, moderately convex. Tyloids absent. Second flagellar segment 2.9 as long as wide. Pronotum with epomia weak or absent, often with a few hairs behind upper end of carina on collar and position of epomia, sometimes with one or several hairs behind lower part of carina on collar. Hair band on upper margin of pronotum irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 203. Hind femur 5.7 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.48. Radius joining costa at 42°. Syntergite with median groove reaching 0.4 to 0.7 toward space between thyridia and 2 or 3 lateral grooves that are 0.4 to 0.9 as long as median groove. Thyridium 2.5 as wide as long. Black, including palpi. Wings subhyaline. Stigma and strong veins dark brown.

Female: Front wing 3.0 mm. long. Temple 1.1 as long as eye.

Cheek 1.1 as long as short diameter of eye. Clypeus 3.0 as wide as long, weakly convex. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 1.65 as long as wide. Pronotum with epomia moderately strong, with sparse scattered hairs behind epomia and the full length of carina on collar. Hair band on upper edge of pronotum irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 204. Hind femur 5.5 as long as deep. Stigma 2.3 as long as deep, receiving radius at its mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.65 to space between thyridia and 2 lateral grooves that are 0.6 as long as median groove. Thyridium 2.2 as wide as long.

Ovipositor sheath 5.2 as long as hind tibia, sculptured as in figure 481.

Black, including palpi. Wings subhyaline. Stigma and strong veins blackish brown.

Type: ♂, Cuzco, Peru, Nov. 23, 1965, H. and M. Townes (Townes). Figure 203 is from the type.

Paratypes: ♂, Chepu, western Chiloé Island, Chile, Apr. 4 to 6, 1968, Luis Peña (Townes). 2♂, Concepción, Concepción Prov., Chile, Oct. 12 to 15 and 15 to 30, 1970, T. Cekalovic (Townes). ♂, Rio Mañihuales, 20 kilometers east of Puerto Aysén, Chile, Jan. 26 to 28, 1961, Luis Peña (Townes). ♂, ♀, Cuzco, Peru, Nov. 21, 1965, H. and M. Townes (Townes).

19. Exallonyx pallidicornis Brues

Figures 205 and 206 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 482 (ovipositor sheath)

**Exallonyx pallidicornis* Brues, 1919. Jour. New York Ent. Soc. 27: 14. ♂. key, des., figs. Type: ♂, USA: Putnam (= Putman) in Connecticut (Cambridge). Examined in 1975. USA: Wisconsin.

Codrus pallidicornis Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.

Codrus pallidicornis Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 2.4 to 3.4 mm. long. Cheek 0.65 as long as temple. Clypeus 3.3 as wide as long, moderately convex, abruptly declivous next to apex. Tyloids lacking. Second flagellar segment 2.7 as long as wide. Pronotum with epomia weak to strong, often with 1 to 6 hairs behind epomia but none behind median and lower part of carina on collar. Hair band next to upper margin of pronotum irregularly two hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 205. Hind femur 3.9 as long as deep. Stigma 1.75 as long as deep, receiving radius at its apical 0.44. Radius joining costa at 50°. Syntergite with median groove reaching 0.7 to space between thyridia and 2 or 3 lateral grooves that are 0.7 to 1.0 as long as median groove. Thyridium 4.0 as wide as long.

Black. Mandible fulvous brown. Palpi stramineous or pale fulvous. Antenna light fulvous at base, gradually darkened apicad to dark brown at apex. Sometimes only the scape and pedicel are fulvous. Rarely

these are brownish. Tegula and legs light fulvous, the hind part of hind coxa usually brown basally. Wings subhyaline. Stigma and strong veins brown.

Female: Front wing 2.2 to 3.2 mm. long. Temple 1.05 as long as eye. Cheek 1.1 as long as short diameter of eye. Clypeus 2.8 as wide as long, moderately convex, with a short steep bevel to apical flange. Second flagellar segment 1.85 as long as wide. Tenth flagellar segment 1.65 as long as wide. Pronotum with epomia weak, usually several hairs behind epomia, no hairs behind median and lower part of carina on collar, and hair band at its upper edge irregularly 3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 206. Hind femur 3.8 as long as deep. Stigma 2.0 as long as deep, receiving radius at its apical 0.40. Radius joining costa at 42°. Syntergite with median groove reaching 0.65 to space between thyridia, with 3 or 4 lateral grooves that are 0.4 to 0.7 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath 0.57 as long as hind tibia, sculptured as in figure 482.

Black. Mandible brownish fulvous. Palpi pale fulvous. Antenna light fulvous at base, gradually darkened to brown or fulvous brown at apex. Tegula and legs fulvous, the hind coxa sometimes brown at base. Stigma and strong veins light brown.

Specimens: 231♂, 50♀ from British Columbia (Fort Nelson and Summit Lake at mile 392 on Alaska Highway at 4,200 ft.); Connecticut (Canaan, Colebrook, Deane's Ravine at Lime Rock Station, and Lake Waramaug); Georgia (Hiawassee and base of Rabun Bald); Iowa (Jefferson Co.); Kansas (Wathena); Maine (Liberty and Mt. Desert); Maryland (Chesapeake Beach and Takoma Park); Massachusetts (Holliston, Nantucket, Riverside, South Hadley, and West Falmouth); Michigan (Alger Co., Ann Arbor, Arenac Co., Bond Falls in Ontonagan Co., Brevort, Cheboygan Co., Crawford Co., East Lansing, Galien in Berrien Co., Gladwin Co., Gogebic Co., Grand Traverse Co., Gull Lake Biological Station in Kalamazoo Co., Iron River, Kalkaska Co., Mackinac Co., Mecosta Co., Midland Co., Ogemaw Co., Roscommon Co., St. Charles, Tuscola Co., and Wexford Co.); Minnesota (Hennepin Co., Itasca Park, St. Paul, and Warroad); Nova Scotia (McGrath Cove and Truro); New Brunswick (Nerepis and Plaster Rock); New Hampshire (Randolph); New Jersey (High Point State Park); New York (Ithaca, Middleburgh, Oswego, and Whiteface Mt. at 4,600 to 4,872 ft.); North Carolina (Cherokee at 4,200 ft., Franklin at 2,000 ft., Hamrick, Highlands at 3,800 and 4,100 ft., Pink Beds on Mt. Pisgah, and Rich Mt.); Northwest Territories (Fort Simpson); Ohio (Columbus, Jerusalem, Mentor, and Steubenville); Oklahoma (Oklahoma Co.); Ontario (Ancaster, Brighton, Chatterton, Craw Lake in the Marmora area, Cumberland, Inglenook, Ottawa, Rondeau Park, Sauble Beach, Southampton, Stittsville, and Sudbury); Pennsylvania (5 miles southwest of Davidsburg in York Co.); Quebec (Buckingham Township in Papineau Co., Gracefield, Hull, King Mt. at 1,150 ft. near Old Chelsea, Lac Modor at Ste. Flore, Laniel, Old Chelsea, and Parke Reserve in Kamouraska Co.); South Carolina (Cleveland and Greenville); Tennessee (Chimney Camp at 2,500 ft. in Smoky Mts. Park); Vermont (Union Village); Virginia (Arlington, Mt. Jackson, Mountain Lake Biological Station in Giles Co., and Rosslyn);

West Virginia (Aurora); Wisconsin (Columbus); and Yukon Territory (Gravel Lake at 58 miles east of Dawson at 2,050 ft.).

Collection dates are mostly from mid May through September. Those outside of this range are May 4 at Greenville, S. C.; May 9 and 12 at Highlands, N. C.; May 10 at Franklin, N. C.; May 11, 12, and 15 at Mountain Lake Biological Station in Giles Co., Va.; May 14 at Galien, Berrien Co., Mich.; October 1 at Stittsville, Ont.; October 4 at Ottawa, Ont.; and October 5 to 6 and 12 at Ann Arbor, Mich.

This species occurs from the Atlantic Ocean to the Rocky Mts., from the Upper Austral to the Hudsonian Zone. It is adult throughout the growing season.

20. Exallonyx daschi, new species

Figures 207 and 208 (σ , ♀ mesopleurum, propodeum, and abdominal stalk); 483 (ovipositor sheath)

Male: Front wing 4.7 mm. long. Cheek 0.67 as long as temple. Clypeus 3.0 as wide as long, strongly punctate, very weakly convex, its apex narrowly truncate at a sharp angle with rest of clypeus. Tyloids absent. Second flagellar segment 3.0 as long as wide. Pronotum with epomia weak or indistinct, a few hairs behind epomia and upper end of carina on collar, and hair band on its upper edge 3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 207. Hind femur 4.8 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.43. Radius joining costa at 45°. Syntergite with median groove reaching 0.4 toward space between thyridia, with 3 lateral grooves that are as long as median groove. Thyridium 5.3 as wide as long.

Black, including palpi. Mandible dark ferruginous, black basad. Tegula dark ferruginous. Wings subhyaline. Stigma and strong veins blackish brown.

Female: Front wing 4.7 to 5.0 mm. long. Temple 1.34 as long as eye. Cheek 0.85 as long as short diameter of eye. Clypeus 2.9 as wide as long, strongly punctate, weakly convex, its apex narrowly truncate with a transverse ridge on front edge of truncation and a narrow concavity between this ridge and the true apex. Second flagellar segment 2.6 as long as wide. Tenth flagellar segment 2.25 as long as wide. Pronotal characters as in male except that hair band next to upper edge is only 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 208. Hind femur 5.0 as long as deep. Stigma 2.3 as long as deep, receiving radius at apical 0.45. Radius joining stigma at 40°. Syntergite with median groove reaching 0.5 to space between thyridia, with 2 or 3 very weak lateral grooves that are 0.35 as long as median groove. Thyridium 6.4 as wide as long. Ovipositor sheath 0.52 as long as hind tibia, sculptured as in figure 483.

Black. Apical half of mandible ferruginous. Tegula ferruginous. Palpi, antenna, and legs dark brown or black. Wings tinged with fuscous. Stigma and strong veins blackish brown.

Type: σ , 12 miles north of Oaxaca, Mexico, Nov. 20, 1972, B. and C. Dasch (Townes). Figure 207 is from the type.

Paratypes: ♂, same data as type (Dasch). ♀, Lagunas de Zempoala, 9,200 ft., Morelos, Mexico, Aug. 11, 1962, H. E. Evans (Townes). ♀, San Miguel, Hidalgo, Mexico, W. M. Mann (Cambridge).

This species is known only from Mexico. The specific name is in honor of Prof. Clement Dasch.

21. Exallonyx arizonicus, new species

Figures 209 and 210 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 484 (ovipositor sheath)

Male: Front wing 3.7 to 4.5 mm. long. Cheek 0.50 as long as temple. Clypeus 2.9 as wide as long, weakly convex with apical 0.2 abruptly declivous, concave below and bordered anteriorly by a ridge. Tyloids lacking. Second flagellar segment 3.1 as long as wide. Tenth flagellar segment 1.8 as long as wide. Pronotum lacking epomia, with about 10 hairs behind upper end of carina on collar and the position of epomia. Hair band on upper margin of pronotum irregularly 3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 209. Hind femur 4.4 as long as deep. Stigma 2.0 as long as deep, receiving radius at its midlength. Radius joining costa at 40°. Syntergite with median groove reaching 0.5 to 0.7 toward space between thyridia, with 2 (or sometimes 3) lateral grooves 0.7 as long as median groove. Thyridium 4.3 as wide as long.

Black. Scape and pedicel ferruginous to black. Mandible ferruginous, blackish toward base. Palpi stramineous. Tegula and legs beyond coxae fulvous, the hind femur often brownish with ends paler. Hind tarsus brownish. Coxae blackish brown or black. Wings with a tinge of fuscous. Stigma and strong veins blackish brown.

Female type: Front wing 3.5 mm. long. Temple 1.2 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus 2.6 as wide as long, with a narrow subapical overhang that is bordered by a transverse ridge. Second flagellar segment 1.9 as long as wide. Tenth flagellar segment 1.45 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 210. Hind femur 4.8 as long as deep. Stigma 2.4 as long as deep, receiving radius at its mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.7 to space between thyridia, with 3 lateral grooves that are 0.5 as long as median groove. Thyridium 2.5 as wide as long. Ovipositor sheath 0.52 as long as hind tibia, sculptured as in figure 484.

Black. Antenna blackish brown. Mandible ferruginous, blackish at base. Palpi stramineous. Coxae blackish. Tegula, front and middle legs beyond coxae, and hind trochanter brownish fulvous. Hind femur light brown, fulvous at base and apex. Hind tibia fulvous, brown apically. Hind tarsus brown. Wings with a faint fuscous tinge. Stigma and strong veins dark brown.

Type: ♀, Sandia Mts., 8,500 ft., N. Mex., July 21, 1975, S. and J. Peck (Townes). Figures 210 and 484 are from the type.

Paratypes: 13♂, Oak Creek Canyon, Ariz., May 13, 14, 16, and 21, 1947, H. and M. Townes (Townes). ♂, Portal, Ariz., Sept. 2-12,

1976, J. van der Vecht (Townes). 2♂, near Roosevelt Lake, Ariz., May 11, 1947, H. and M. Townes (Townes). ♂, Ramsey Canyon, 6,000 ft., Huachuca Mts., Ariz., Nov. 30, 1967, Sternitzky (Ottawa). 5♂, same data as type (Townes). ♂, Big Bend, 5,000 ft., Tex., Aug. 19, 1975, S. and J. Peck (Townes). 4♂, Cholula, Puebla, Mexico, Feb. 7 and 10, 1973 and Nov. 7, 1972, B. and C. Dasch (Dasch). ♂, 6 miles west of Saltillo, 5,200 ft., Coahuila, Mexico, July 22, 1972, B. and C. Dasch (Dasch). ♂, Xochimilco, Distrito Federal, Mexico, July 30, 1939, C. H. Townes (Townes).

This species occurs in southwestern United States, southward to Mexico City.

22. Exallonyx obscuratus, new species

Figures 211 (♀ metapleurum, propodeum, and abdominal stalk); 485 (ovipositor sheath)

Male: Unknown.

Female: Front wing 3.4 to 3.6 mm. long. Temple 1.15 as long as eye. Cheek 0.93 as long as short diameter of eye. Clypeus 3.1 as wide as long, weakly convex. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.8 as long as wide. Pronotum with epomia lacking, about 10 to 20 hairs behind position of epomia and upper end of carina on collar, and next to its upper edge a hair band that is irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 211. Hind femur 4.7 as long as deep. Stigma 2.6 as long as deep, receiving radius at its mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.6 to space between thyridia, with 2 lateral grooves that are 0.4 as long as median groove. Thyridium 3.1 as wide as long. Ovipositor sheath 0.51 as long as hind tibia, sculptured as in figure 485.

Black. Mandible dark brown. Palpi stramineous. Tegula stramineous to light brown. Coxae blackish brown. Trochanters pale brown to light brown. Front and middle legs beyond trochanters light brown to medium brown. Hind leg beyond trochanter dark brown to blackish. Wings subhyaline. Stigma and strong veins blackish brown.

Type: ♀, Cholula, Puebla, Mexico, Nov. 7, 1972, B. and C. Dasch (Townes). Figures 211 and 485 are from the type.

Paratypes: ♀, Monteverde, Costa Rica, June 10 to 15, 1974, Julian Donohue (Townes). ♀, La Ciudad, 7,000 ft., Durango, Mexico, Aug. 2, 1964, W. R. M. Mason (Ottawa).

23. Exallonyx frater, new species

Figure 212 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.7 mm. long. Cheek 0.75 as long as temple. Clypeus 3.0 as wide as long, moderately convex. Tyloids absent. Second flagellar segment 2.9 as long as wide. Pronotum with epomia lacking, with approximately 6 hairs behind position of epomia, the hair

band next to its upper edge 1 hair wide. Metapleurum, propodeum, and abdominal stalk as in figure 212. Hind femur 4.7 as long as deep. Stigma 2.0 as long as deep, receiving radius at its mid-length. Radius joining costa at 35°. Syntergite with median groove reaching 0.6 to space between thyridia and 2 lateral grooves that are 0.6± as long as median groove. Thyridium 4.0 as wide as long.

Black. Mandible, scape, and pedicel fulvous brown. Flagellum light brown, gradually darkened apicad. Palpi light fulvous. Middle and hind coxae blackish brown, pale at apex. Rest of legs fulvous. Wings with a tinge of brown. Stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, 14 kilometers north of Ureña, Costa Rica, June 20 to 23, 1974, Julian Donahue (Townes).

24. Exallonyx oaxacae, new species

Figure 213 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.6 to 2.8 mm. long. Cheek 0.70 as long as temple. Clypeus 2.3 as wide as long, weakly convex. Tyloids absent. Second flagellar segment 2.9 as long as wide. Pronotum with epomia present, about 8 hairs behind epomia and upper end of carina on collar, and next to its upper edge an irregularly double row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 213. Hind femur 4.3 as long as deep. Stigma 1.75 as long as deep, receiving radius at its apical 0.38. Radius joining costa at 43°. Syntergite with median groove reaching 0.5 to space between thyridia, with 2 or 3 lateral grooves that are 0.8 as long as median groove. Thyridium 3.1 as wide as long.

Black. Mandible dark brown. Palpi brown. Coxae blackish brown. Trochanters fulvous. Tegula, front and middle legs beyond trochanters, and hind femur light brownish fulvous, upper part of hind femur sometimes brownish apically. Hind tibia and tarsus brown. Wings subhyaline. Stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, kilometer 185.5 on Tuxtepec to Oaxaca road, 2,200 m., Oaxaca, Mexico, Oct. 22, 1962, H. and M. Townes (Townes). Figure 213 is from the type.

Paratypes: 2♂, same data as type (Townes).

25. Exallonyx vietus, new species

Figure 214 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.5 to 3.7 mm. long. Cheek 0.50 as long as temple. Clypeus 2.7 as wide as long, weakly convex. Tyloids lacking. Second flagellar segment 3.3 as long as wide. Pronotum with epomia strong and no hairs behind epomia and carina on collar, the hair band on its upper edge irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 214. Hind femur 4.7 as long as deep.

Stigma 2.2 as long as deep, receiving radius at basal 0.43. Radius joining costa at 42°. Syntergite with median groove reaching 0.6 to space between thyridia, with 2 lateral grooves 0.85 as long as median groove. Thyridium 2.8 as wide as long.

Black. Mandible fulvous brown, black at base. Scape fulvous, infusate at apex. Palpi stramineous. Tegula and legs light fulvous, the coxae sometimes light brown, femora usually brownish above (especially toward apex), tarsi brown, and hind tibia sometimes brown. Wings faintly tinged with fuscous. Stigma and strong veins brown.

Female: Unknown.

Type: ♂, Hidalgo National Park, 3,000 m., State of Mexico, Mexico, Oct. 12, 1962, H. and M. Townes (Townes). Figure 214 is from the type.

Paratypes: 7♂, same data as type (Townes). ♂, Cholula, Puebla, Mexico, Nov. 7, 1972, B. and C. Dasch (Dasch). 2♂, 3 miles east of El Salto, 8,400 ft., Durango, Mexico, June 21, 1964, W. R. M. Mason (Ottawa). 6♂, 10 miles west of El Salto, 9,000 ft., Durango, Mexico, June 27, 1964, July 6, 8, and 9, 1964, and Aug. 7, 1964, W. R. M. Mason, J. E. H. Martin, and W. C. McGuffin (Ottawa). ♂, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 30, 1964, W. R. M. Mason (Ottawa). ♂, San Cristóbal de las Casas, 7,200 ft., Durango, Mexico, May 29, 1969, W. R. M. Mason (Ottawa). 2♂, 10 miles east of Toluca, 8,900 ft., Mexico, July 31, 1964, J. G. Chillcott (Ottawa).

This species is known only from Mexico.

26. Exallonyx formicarius Kieffer

Figures 216 (♀ metapleurum, propodeum, and abdominal stalk);
487 (ovipositor sheath)

**Exallonyx formicarius* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. ♀. des.

Type: ♀, Germany: Linz on Rhine (Maastricht). Examined in 1975. With *Myrmica laevinodis*.

Exallonyx Formicarius Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 332. ♀. des. in key. Germany: Linz on Rhine. "Host": *Myrmica laevinodis*.

Exallonyx formicarius Kieffer, 1914. Das Tierreich 42: 47. ♀. key, des., biol. Germany: Linz on Rhine. In a nest of *Myrmica laevinodis*.

Exallonyx formicarius Hellén, 1940. Enumeratio insectorum Fenniae II. Hymenoptera. 2. Terebrantia, p. 30. Finland.

Codrus formicarius Dessart, 1975. Pub. Natuurhist. Genootsch. Limburg 24: 8. syn., des., type data.

Male: Unknown.

Female: Front wing 1.8 to 2.6 mm. long. Temple 1.30 as long as eye. Cheek 0.87 as long as short diameter of eye. Clypeus 3.0 as wide as long, with a moderately strong convexity and with a moderately wide apical truncation, the apical truncation slightly concave and bordered anteriorly by a weak ridge. Flagellum weakly enlarged apicad, 1.15 as wide at tenth segment as at second. (Other species of the *Formicarius* Group have the flagellar subapical diameter, compared with flagellar diameter near base the same, or very slightly greater.) Sec-

ond flagellar segment 1.6 as long as wide. Tenth flagellar segment 1.3 as long as wide. Pronotum with epomia absent or weak, 2 to 10 hairs behind position of epomia and upper end of carina on collar, and hair band next to its upper edge irregularly 2 to 3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 216. Hind femur 3.9 as long as deep. Stigma 2.2 as long as deep, receiving radius at its apical 0.47. Radius joining costa at 45°. Syntergite with median groove reaching 0.6 to space between thyridia, with 2 or 3 lateral grooves that are 0.6 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath 0.62 as long as hind tibia, sculptured as in figure 487.

Black. Mandible fulvous brown, its base fuscous. Palpi pale brown. Scape, pedicel, and base of pedicel pale brown to brown, the rest of flagellum dark brown or blackish. Front coxa dark brown. Middle and hind coxae blackish brown. Femora dark brown, paler on ends. Tegula, trochanters, tibiae, and tarsi pale brown to medium brown. Wings subhyaline. Stigma and strong veins dark brown.

Specimens: 58♀ from Austria (Dürrwien, Linz, Prater, Raxalpe at 1,500 m., Saalbach, Sarleinsbach, Scharten b. W., and Spitzzicken), Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Dawlish Warren in Devon and Torquay in Devon); Ireland (Ballinlea in Co. Wicklow, Connary in Co. Wicklow, Dundrum in Co. Donegal, Glenasmole in Co. Dublin, Collierstown in Co. Dublin, Johnstown in Co. Dublin, Co. Kerry, Landestin in Co. Kildare, Lawers in Co. Monaghan, and Tollymore Park in Co. Donegal); Italy (Pizzighettone); Russia (Moscow); Scotland (Bonhill); and Sweden (Björklinga in Uppsala, Ekohärad in Varmland, Hällnäs in Västerbotten, Harparbol in Uppsala, Messaure, Skåne, Småland, and Uppsala National Park in Uppsala).

Collection dates are from July 3 to October 24, also one collection June 13 in Co. Wicklow, Ireland and another June 13 in Skåne, Sweden.

This species is widespread in Europe. It is adult mostly in July through October.

27. Exallonyx microcerus Kieffer

Figures 217 (♀ metapleurum, propodeum, and abdominal stalk);
488 (ovipositor sheath)

Proctotrupes ligatus Vollenhoven, 1876. Pinacographia p. 31, pl. 19, fig. 9. ♀. Misdet. of *ligatus* Nees.

**Exallonyx Subserriatus* var. *Hyalinipennis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 336. ♀. des. in key. Type: ♀, France: Bitche (Paris). Examined in 1975. New synonym.

**Exallonyx Microcerus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 343. ♂, ♀. des. in key. Lectotype: ♀ (labeled by Townes in 1975 and hereby designated), France: Megève in Haute-Savoie (Paris). Examined in 1975. The paratypes represent several species.

Exallonyx subserriatus hyalinipennis Kieffer, 1914. Das Tierreich 42: 49. ♀. key, des. France: Bitche.

Exallonyx microcerus Kieffer, 1914. Das Tierreich 42: 51. ♂, ♀. key, des. France. Italy: Giglio Island.

Exallonyx microcerus Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 438, 440, 443, 446. ♂?, ♀. key, des., figs., biol. England: 7 localities. Ireland: 8 localities.

- Exallonyx microcerus* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: Dumfriesshire.
- Exallonyx microcerus* Kerrich, 1940. Notulae Ent. 19: 101. USSR (= "Finland"): Sortavala.
- Exallonyx microcerus* Hellén, 1941. Notulae Ent. 21: 38. ♂, ♀. key, des. Denmark: Furesö. Finland: 44 localities. Sweden: Götland.
- Exallonyx microcerus* Tomsík, 1944. Ent. Listy 7: 54. ♂, ♀. des. Carpathian Mts. Czechoslovakia: localities in Bohemia and Moravia.
- Exallonyx microcerus* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: 7 localities.
- Exallonyx microcerus* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.
- Codrus (Codrus) microcerus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, central, & south Europe.
- Exallonyx subseerratus* var. *hyalinipennis* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. ♀. type data.
- Codrus microcerus* Meyer, 1961. Bombus 2: 94. West Germany: 10 localities.
- Codrus microcerus* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 2 localities.
- Codrus (Codrus) microcerus* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 30, 33, 34. ♀. ecology. West Germany: 24 localities.
- Codrus microcerus* Hedqvist, 1963. Ent. Tidskr. 84: 63. ♀. Sweden: 3 localities. Hosts: *Xantholinus* sp.; larva of Tachyporini.
- Codrus microcerus* Meyer, 1963. Bombus 2: 143. ♀. [Denmark]: Sønderborg. (= Sonderburg).
- Codrus microcerus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 4. Europe. Japan.
- Codrus microcerus* Palm, 1964. Opuscula Ent. 29: 245. biol. Sweden: Arlöv in Skåne. Host: *Xantholinus ?linearis* larva.
- Codrus microcerus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ♂, ♀. figs. (p. 484). ecology, biometrics. West Germany: 10 localities.
- Codrus microcerus* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Codrus microcerus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 530. biol. Ireland: 7 counties.
- Codrus microcerus* Weidemann, 1967. Faunistische-Ökologische Mitt. 3: 168, 169. biol. West Germany: Habel.
- Codrus (Codrus) microcerus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 48, 50, 52, 54. ♂, ♀. keys, des., figs., biol. In almost all of Europe (including Austria and Switzerland). Japan.
- Codrus microcerus* Kozlov, 1971. Vses. ent. obshch. Trudy 54: 9. fig.
- Codrus microcerus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. Austria.
- Codrus microcerus* Kozlov, 1972. Insects of Mongolia 1: 647. ♀. Mongolia: Ulan-Bator.
- Codrus microcerus* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.
- Codrus (Codrus) microcerus* Teodorescu and Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 165. ♂, ♀. Rumania: Iași and Șibiu.
- Codrus (Codrus) microcerus* Kozlov, 1978. Opredeliye! nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 547, 548. key, figs. USSR: Moldsviya and Yaroslavskaia oblasti, "Pribaltika".

Male: Unknown.

Female: Front wing 2.0 to 2.7 mm. long. Temple 1.30 as long as eye. Cheek 0.76 as long as short diameter of eye. Clypeus 2.9 as wide as long, its apex truncate, the truncation concave beneath and bordered in front by a low ridge. Second flagellar segment 1.4 as long as wide. Tenth flagellar segment 1.2 as long as wide. Pronotum with epomia absent or weak and 2 to 6 hairs behind position of epomia and upper end of carina on collar. Hair band next to upper edge of pronotum

irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 217. Hind femur 3.6 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.38. Radius joining costa at 40°. Syntergite with median groove reaching 0.7 to space between thyridia and 2 or 3 weaker lateral grooves that are 0.5 as long as median groove. Thyridium 2.5 as wide as long. Ovipositor sheath 0.60 as long as hind tibia, sculptured as in figure 488.

Black. Mandible brownish fulvous. Antenna dark brown to fulvous brown. When pale colored the scape has basal 0.75 darker and flagellum gradually darkened apicad. Palpi stramineous. Coxae dark brown, the front coxa a little paler than middle coxa and hind coxa darker. Tegula and trochanters pale fulvous. Femora fulvous to brown with ends narrowly paler. Tibiae and tarsi light fulvous to fulvous brown. Wings hyaline. Stigma and strong veins pale brown to medium brown.

Specimens: 125♀ from Austria (Buklige Welt, Raxalpe at 1,500 m., Scheffau in the Tirol at 800 m., and Wienerwald at Vienna); Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Oxford and Leicester); Ireland (Athdown in Co. Wicklow, Coag in Co. Wicklow, Dundrum in Co. Donegal, Glen of the Downs in Co. Wicklow, Co. Kerry, Kilkea Pk. in Co. Kildare, Glenasmole in Co. Dublin, Lake Dan in Co. Wicklow, Co. Leitrim, Merrion Sq. in Co. Dublin, Murlough Ho Dunes, in Co. Donegal, Portrane in Co. Dublin, and Tallymore Park in Co. Donegal); Italy (Naturno in Trentino at 500 m.); Russia (Moscow); Sweden (Åhus in Skaraborg, Eskelhem in Gotland, Hall in Gotland, Hällnäs in Västerbotten, Klinte in Gotland, Småland, Vallentuna in Uppland, and Uppsala); and West Germany (Ingelheim am Rhein, Kottenforst near Bonn, and Lohrberg in the Siebengebirge).

Collection dates are in July through October, plus the following: June 8 at Portrane, Co. Dublin, Ireland; June 12 at Athdown, Co. Wicklow, Ireland, June at Leicester, England; and November 2 at Leicester, England.

This species is widespread in Europe. It is adult mostly from July through October. Hedqvist, 1963 and Palm, 1964, record it as parasitizing larvae of *Xantholinus* and Tachyporini (both Staphylinidae).

28. *Exallonyx trifoveatus* Kieffer

Figures 218 and 219 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 489 (ovipositor sheath)

Exallonyx trifoveata Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. *Nomen nudum*.

**Exallonyx Trifoveatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 334. ♂. des. in key, fig. Type: ♂, Italy (lost). Identified from description, especially by the dark legs.

Exallonyx trifoveatus Kieffer, 1909. Genera Insectorum 95: 11. fig. 3.

**Proctotrypes borneanus* Cameron, 1912. Soc. Ent. 27: 64. ♀. des. Type: ♀, Malaysia: Kuching in Sarawak (London). Examined in 1975. New synonym.

**Exallonyx ligatus* var. *talpae* Kieffer, 1914. Bul. Soc. Ent. France 1914: 210. [♀]. des. Type: ♀, Denmark: Copenhagen (Copenhagen). Examined in 1975. Host: *Quedius* in nest of mole. New synonym.

- Exallonyx trifoveatus* Kieffer, 1914. Das Tierreich 42: 3, 47. ♂. key, des., figs. Italy.
- Exallonyx ligatus talpae* Kieffer, 1914. Das Tierreich 42: 53. ♀. des., biol. Denmark: Copenhagen. Emerged from *Quedius* larva in nest of *Talpa europaea*.
- **Proctotrupes Reicherti* Enderlein, 1916. Zool. Anz. 47: 236. ♀. des. Types: ♀, [East] Germany: Leipzig (lost, could not be found in Warsaw by Kierych in 1975). Host: *Quedius* larva in nest of *Vespa vulgaris*. Identified from description. New synonym.
- **Exallonyx parvulus* Brues, 1919. Jour. New York Ent. Soc. 27: 16. ♂. key, des., figs. Type: ♂, USA: Oroville in Washington (Cambridge). Examined in 1975. USA: 2 localities in California; 5 localities in Washington. New synonym.
- Serphus reicherti* Bischoff, 1923. Biologie der Tiere Deutschlands 8 (42): 66. Host: *Quedius* larva in wasp nest.
- **Exallonyx philonthiphagus* Williams, 1932. Proc. Hawaiian Ent. Soc. 8: 205. ♂, ♀. des., figs., biol. Type: ♀, USA: Nauh on the island of Hawaii at 5,250 ft. (Honolulu). Paratype at Cambridge examined in 1975. Host: *Philonthus turbidus*. New synonym.
- Exallonyx ligatus* var. *talpae* Maneval, 1937. Bul. Mus. Roy. d'Hist. Nat. Belgique 13: 3. fig.
- Exallonyx ligatus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 440, 443, 446. ♂?, ♀. key, syn., des., figs. England: 6 localities. Ireland: 6 localities. Scotland: Nairn. Host: *Quedius* larva found in mole's nest. (in part).
- Codrus parvulus* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.
- Codrus borneanus* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. Suppl. 1: 5. ♀. type data.
- Codrus parvulus* Masner, 1966. Psyche 72: 296. ♂. type data.

Male: Front wing 2.4 to 3.1 mm. long. Cheek 0.55 as long as temple. Clypeus 3.1 as wide as long, with a moderately weak convexity, narrowly truncate at apex with a groove between apical flange and the close-by subapical overhang. Tyloids absent. Second flagellar segment 2.1 as long as wide. Pronotum with epomia weak or absent, a group of hairs behind epomia and upper end of carina on collar, and sometimes a few hairs between lower half of carina on collar and the pronotal sulcus. Hair band next to upper margin of pronotum irregularly 2 to 4 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 218. Hind femur 4.3 as long as deep. Stigma 1.65 as long as deep, receiving radius at its basal 0.48. Radius joining costa at 50°. Syntergite with median groove reaching 0.65 to space between thyridia, with 3 to 5 lateral grooves that are 0.6 to 1.0 as long as median groove. Thyridium 2.8 as wide as long.

Black. Mandible brown. Palpi pale brown. Scape and pedicel dark brown. Flagellum blackish brown. Tegula and tibiae brownish fulvous. Trochanters brownish fulvous to dark brown. Femora brownish fulvous to dark brown, the hind femur darkest of the three and front femur palest, when dark colored the femora are paler at ends. Front and middle basitarsi brownish fulvous. Hind tarsus brown. Wings subhyaline. Stigma and strong veins brown.

Female: Front wing 2.2 to 4.7 mm. long. Temple 1.25 as long as eye. Cheek 0.90 as long as short diameter of eye. Clypeus 3.0 as wide as long, weakly convex, with a narrow apical truncation. Second flagellar segment 2.05 as long as wide. Tenth flagellar segment 1.8 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 219. Hind femur 4.2 as long as deep.

Stigma 2.1 as long as wide, receiving radius at its mid-length. Radius joining costa at 45°. Syntergite with median groove reaching 0.65 to space between thyridia, with 4 or 5 lateral grooves that are 0.4 to 0.8 as long as median groove. Thyridium 2.8 as wide as long. Ovipositor sheath 0.57 as long as hind tibia, sculptured as in figure 489.

Black. Mandible light brown. Palpi pale brown. Scape blackish brown, its apical 0.25, pedicel, and first flagellar segment usually paler. Flagellum dark brown to black. Tegula, tibiae, and tarsi fulvous to fulvous brown. Coxae dark brown to black. Trochanters light brown to dark brown. Femora light brown to dark brown, their ends light brown.

Nearctic specimens: 2♂, 39♀, from British Columbia (Cowichan Lake); California (Davis and Fairfield); Maryland (Beltsville); Massachusetts (Cambridge); Michigan (Ann Arbor, Gull Lake Biological Station in Kalamazoo Co., and Roscommon Co.); New Hampshire (Durham, Hanover, and Mt. Washington); New York (Ithaca, Quioque, Renselaerville, and Rochester); North Carolina (Highlands); Ontario (Chatham, Hastings Co., Marmora, Ottawa, Point Pelee, and Trenton); Oregon (Beach Farm in Corvallis); Pennsylvania (Kennett Square); and Virginia (Luray Cave).

Collection dates of Nearctic specimens are from July through September, with the following additional dates: April 16 at Fairfield, Calif.; May 22 at Highlands, N. C.; May 26 in Roscommon Co., Mich.; June 6 at Marmora, Ont.; June 26 at Chatham, Ont.; October 8 and 10 at Ottawa, Ont.; and October 20 at Luray Cave, Va.

European specimens: 54♂, 114♀ from Austria (Bucklige Welt, Ebelsburg, Kahlenberg, Kaltenleutgeben, near Linz, Schiltensburg, Traunau, and near Uhrfahr); Czechoslovakia (Behdaneč in Bohemia, Kláštev in Bohemia, Komyle in Bohemia, and Kytín in Bohemia); England (Bagley Woods near Oxford, Leicester, Paignton in Devon, and Torquay in Devon); Ireland (Athdown in Co. Wicklow, Ballyhubbock in Co. Wicklow, Boher-na-breëna in Co. Dublin, Bunduff in Co. Sligo, Connary in Co. Wicklow, Digby Brook in Co. Kildare, Dunrah in Co. Wicklow, Enniskerry in Co. Wicklow, Glenasmole in Co. Dublin, Harolds Cross in Co. Dublin, Co. Kerry, Killbarrack in Co. Dublin, King W's Glen in Co. Louth, Little Bray in Co. Dublin, Mitchellstown, Powerscourt in Co. Wicklow, Sutton in Co. Dublin, and Tullaghan in Co. Leitrim); Italy (Pizzighettone and Tiarno Sopra in Trento); Spain (north slope of Veleta in the Sierra Nevada at 2,400 m.); Sweden (Knivsta in Uppsala, Skåne, Småland, and Vallentuna in Uppsala); and West Germany (Kottenforst near Bonn, Mainz, and Mürel-Wald near Blankenheim on the Eifel).

Collection dates for European specimens are from May through October.

Specimens from elsewhere: 4♂, 7♀ from Cyprus (Limassol); Hawaii (Pohakuloa at 6,500 ft. and Waimea); New Zealand (Owairaka); South Africa (Jonkershoek near Stellenbosch); and Tasmania (Hobart).

This species is worldwide. Its wide distribution and the collection data suggest that it parasitizes staphylinids in compost heaps. It was recorded as a parasite of *Quedius* (Staphylinidae) by Kieffer, 1914 and by Enderlein, 1916; and as a parasite of *Philonthus turbidus* by Williams, 1932.

29. Exallonyx ligatus Nees

Figures 220 and 221 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 490 (ovipositor sheath)

- **Codrus ligatus* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 359. ♀. des. Type: ♀, Germany: Sickershausen [in Franconia] (destroyed). From *Boletus* infested with *Fungivora* larvae. The description states: legs pale with hind coxa black and hind side of femora fuscous toward apex; antenna black with first segment piceous. These characters occur in only one of the 3 species previously confused under *ligatus*. A female in Townes collection is labeled as agreeing with description.
- Proctotrupes ligatus* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 8, 15. ♂, ♀. syn., des., biol. Finland.
- Proctotrupes ligatus* Curtis, 1839. British entomology . . . XVI: text for fig. 744. key, syn.
- Proctotrupes ater* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 420. ♂, ♀. syn., des. Norway. Sweden: 4 localities. Misdet. of *ater* Nees. (in part).
- Proctotrupes ater* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 462. syn. (in part).
- Exallonyx ligatus* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. syn.
- Exallonyx Ligatus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 344. ♂, ♀. des. in key, biol. Algeria: Tlemcen. England. Finland. France: 7 localities. Germany. Hungary. Italy: 3 localities, including Trieste. Spain: Barcelona. Sweden.
- Exallonyx ligatus ligatus* Kieffer, 1914. Das Tierreich 42: 52. ♂, ♀. key, des. Algeria. Europe, from Sweden to Sicily.
- Exallonyx ligatus* Morley, 1922. Entomologist 55: 160, 183. key, biol. England: 17 localities.
- Exallonyx ligatus* Bischoff, 1923. Biologie der Tier Deutschlands Lief 8, Teil 42: 66. Host: *Quedius* sp. larvae in mole's nest.
- Exallonyx ligatus* Smith, 1927. Ann. Appl. Biol. 14 (3): 326. fig., biol. Host: *Aleochara bilineata*.
- Exallonyx ligatus* Austin, 1933. Ent. Monthly Mag. (3) 69: 133. In mushrooms infested with *Lycoria* spp.
- Serphus ligatus* Pax & Maschke, 1935. Beiträge zur Biologie des Glatzer Schneeberges (Breslau) 1: 12, 61. Poland: Wolmsdorf cave [southwest of Klodzko (= Glatz)].
- Exallonyx ligatus* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 238. Belgium: 15 localities.
- Exallonyx ligatus* Maneval, 1937. Bul. Mus. Roy. Hist. Nat. Belgique 13: 2. ♂, ♀. des., fig. Belgium: Lierre.
- Exallonyx ligatus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437, 440, 443, 446. ♂?, ♀. key, syn., des., figs. England: 6 localities. Ireland: 6 localities. Scotland: Nairn. Host: *Quedius* sp. larvae found in mole's nest. (in part).
- Exallonyx ligatus* Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: 3 localities in Dumfriesshire.
- Exallonyx ligatus* Kerrich, 1940. Notulae Ent. 19: 101. ♀. USSR (= "Finland"): Valamo.
- Exallonyx ligatus* Hellén, 1941. Notulae Ent. 21: 37. ♂, ♀. key, des., syn. Finland: 17 localities. Sweden: Storlien. USSR: Solovetsk.
- Exallonyx ligatus* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: 4 localities.
- Exallonyx ligatus* Tomšik, 1944. Ent. Listy 7: 55. ♂, ♀. des. Czechoslovakia: localities in Bohemia & Moravia; eastern Carpathians.
- Exallonyx ligatus* Carpenter, 1950. Ent. Monthly Mag. (4) 86: 269. England: Shetland Isles on flowers of *Angelica*.
- Exallonyx ligatus* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des.

- Codrus ligatus* Smetana, 1957. Beitr. Ent. Berlin 7: 336-337. ♀. biol. [Czechoslovakia]: northeast Bohemia. Host: *Quedius vexans*. [Note: Smetana specimens, apparently from this work, are in Ottawa and are actually *Exallonyx trifoveatus*.]
- Codrus (Codrus) ligatus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, central, and south Europe.
- Codrus ligatus* Meyer, 1961. Bombus 2: 94. West Germany: 10 localities.
- Codrus ligatus* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 3 localities.
- Codrus (Codrus) ligatus* Weidemann, 1962. Faun. Mitt. Norddeutschland 2: 30, 33, 34. ♀. biol., ecology. West Germany: 25 localities. Host: *Quedius simplicifrons*.
- Codrus ligatus* Hedqvist, 1963. Ent. Tidskr. 84: 63. ♀. Sweden: 2 localities. Hosts: *Philonthus* sp.; *Xantholinus* sp.
- Codrus ligatus* Bazavan-Teodorescu, 1963. Bucuresti U. Ann., ser. Sti. Nat. Biol. 12: 118. ♀. des., fig. Rumania: 2 localities. Host: *Fungiivora fungorum*.
- Codrus ligatus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 4. Europe. Japan. Hosts: *Quedius* spp.
- Codrus ligatus* Palm, 1964. Opuscula Ent. 29: 245. ♀. biol. Sweden: 2 localities. Hosts: *Philonthus ?albipes*; *Tachyporus*; *Xantholinus ?linearis*.
- Codrus ligatus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ♂, ♀. figs. (p. 484), ecology, biometrics. West Germany: 12 localities.
- Codrus ligatus* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Codrus ligatus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 530. ♀. des., biol. Ireland: 7 counties.
- Codrus ligatus* Weidemann, 1967. Faunistisch-Ökologische Mitt. 3: 168, 169. biol. West Germany: Gröde; Habel.
- Codrus (Codrus) ligatus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 39, 48, 50, 52, 54. ♂, ♀. key, figs., biol. All of Europe (including Austria, Switzerland & Mediterranean area). Japan.
- Codrus ligatus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. Austria. Germany. Northern Italy. Switzerland.
- Codrus ligatus* Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30 & fig. II. ♂, ♀. fig. ♂ genitalia. Rumania.
- Codrus (Codrus) ligatus* Teodorescu and Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 165. ♂. Rumania: Brăila; Buzău; Iași; Ilfov; and Suceava.
- Codrus (Codrus) ligatus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoï chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 547. key, fig. USSR: Leningradskaya, Ryazanskaya, Yaroslavskaia oblasts.

Male: Front wing 2.2 to 3.2 mm. long. Cheek 0.61 as long as temple. Clypeus 2.8 as wide as long, with a moderately weak convexity, its apex with a moderately broad truncation, the front edge of truncation bordered by a weak ridge. Tyloids lacking. Second flagellar segment 2.0 as long as wide. Pronotum with epomia weak or absent, about 6 hairs behind position of epomia and upper end of carina on collar, no hairs behind middle and lower part of carina on collar. Hair band next to upper margin of pronotum irregularly 3 hairs wide. Metapleurum, propodeum, and stalk of abdomen as in figure 220. Hind femur 4.2 as long as deep. Stigma 1.75 as long as deep, receiving radius at its basal 0.47. Radius joining costa at 50°. Syntergite with median groove reaching 0.75 to space between thyridia and 3 to 5 lateral grooves that are 0.6 to 1.0 as long as median groove. Thyridium 3.6 as wide as long.

Black. Mandible light brown, fuscous at base. Palpi pale brown. Scape and pedicel brown to black. Front and middle coxae dark brown or blackish brown. Hind coxa black. Tegula and front and middle legs

beyond coxae brownish fulvous. Hind trochanter, femur, and tibia brownish fulvous to light brown, the femur sometimes darkened above. Wings hyaline. Stigma and strong veins dark brown.

Female: Front wing 2.5 to 3.3 mm. long. Temple 1.22 as long as eye. Cheek 0.8 as long as short diameter of eye. Clypeus 2.8 as wide as long, weakly convex, its apex truncate. Second flagellar segment 1.5 as long as wide. Tenth flagellar segment 1.4 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 221. Hind femur 3.5 as long as deep. Stigma 2.0 as long as deep, receiving radius at its midlength. Radius joining costa at 45°. Syntergite with median groove reaching 0.65 to space between thyridia and 4 or 5 lateral grooves that are 0.4 to 0.7 as long as median groove. Thyridium 3.6 as wide as long. Ovipositor sheath 0.62 as long as hind tibia, sculptured as in figure 490.

Black. Mandible brown, fuscous at base. Palpi pale brown. Scape and pedicel dark brown. Flagellum dark brown at base, darkening apicad to black. Front coxa dark brown. Middle and hind coxae black. Tegula, and legs beyond coxae (except hind tarsus) brownish fulvous, the hind femur brownish above. Hind tarsus brown. Wings hyaline. Stigma and strong veins brown.

Specimens: 15♂, 53♀ from Austria (near Linz and Spitzzicken); England (Leicester and Oxford); Ireland (Bere Wood, Boher-na-breena in Co. Dublin, George's Br. in Co. Wicklow, Co. Kerry, Mountmellick, and The Slade of Saggart in Co. Dublin); and Sweden (Skåne).

Collection dates are distributed from June 11 to November 6.

Exallonyx ligatus has regularly been confused with *E. trifoveatus* and *E. quadriceps*. No literature records should be accepted without re-examination of the original specimens.

This species occurs in Europe. It is adult in the summer and fall.

30. *Exallonyx crassulus*, new species

Figures 222 & 223 (♂, ♀ metapleurum, propodeum, and abdominal stalk);
491 (ovipositor sheath)

Male: Front wing 2.4 to 3.2 mm. long. Cheek 0.72 as long as temple. Clypeus 3.0 as wide as long, moderately convex, its apex narrowly truncate, the truncate surface flat. Tyloids absent. Second flagellar segment 2.2 as long as wide. Pronotum with epomia weak or absent, no hairs behind epomia and carina on collar (or sometimes 1-6 hairs), the hair band next to its upper edge with an irregularly double or partially single hair row. Metapleurum, propodeum, and abdominal stalk as in figure 222. Hind femur 4.3 as long as deep. Stigma 1.8 as long as deep, receiving radius at its mid-length. Radius joining costa at 50°. Syntergite with median groove reaching 0.6 to space between thyridia, with 3 or 4 lateral grooves that are 0.6 to 1.0 as long as median groove. Thyridium 4.0 as wide as long.

Black. Mandible light brown, its base dark brown. Palpi pale fulvous. Antenna fulvous to light brown at base, gradually darkened apicad. Front coxa fulvous to brown. Middle and hind coxae dark brown. Tegula and legs beyond coxae light fulvous, the hind femur tinged with brown and

with ends fulvous. Wings subhyaline. Stigma and strong veins dark brown.

Female: Front wing 1.9 to 2.5 mm. long. Temple 1.0 as long as eye. Cheek 0.78 as long as short diameter of eye. Clypeus 2.4 as wide as long, moderately convex, with a narrow apical truncation, the truncate area flat or weakly concave. Second flagellar segment 1.65 as long as wide. Tenth flagellar segment 1.45 as long as wide. Pronotum with epomia weak or absent, no hairs behind collar and position of epomia, with a single row of hairs next to its upper margin. Metapleurum, propodeum, and abdominal stalk as in figure 223. Hind femur 3.7 as long as deep. Stigma 1.7 as long as deep, receiving radius at its mid-length. Radius joining costa at 43°. Syntergite with median groove reaching 0.6 to space between thyridia, with 3 or 4 lateral grooves that are 0.65 as long as median groove. Thyridium 3.5 as wide as long. Ovipositor sheath 0.65 as long as hind tibia, sculptured as in figure 491.

Black. Mandible light brown. Palpi pale brown. Scape and pedicel brownish fulvous. Flagellum brown, darkened apicad. Tegula pale fulvous. Coxae dark brown. Wings with a weak tinge of fuscous. Stigma and strong veins brown.

Type: ♂, Stone Mt. Park, 3,800± ft., B. C., July 18, 1973, H. and M. Townes (Townes). Figure 222 is from the type.

Paratypes: 129♂, 16♀ from Alaska (King Salmon on the Naknek River, Mt. McKinley, Naknek, Paxson, Tangle Lakes, and Unalakleet); Alberta (Banff, McMurray, and Slave Lake); British Columbia (Bowser, Cultus Lake, Robson, Stone Mt. Park, at 3,800± ft., and 32 miles southwest of Terrace); California (Oakes at 4,700 to 5,000 ft. and Shively); Idaho (Priest Lake); Illinois (Urbana); Manitoba (Cranberry, Portage, Eastern Creek near Churchill, and Churchill); Minnesota (Duluth and Grand Marais); New Brunswick (St. John); Newfoundland (Raleigh); New Hampshire (Mt. Washington); New York (Lake Placid at 2,000 ft. and Slide Mt. at 4,200 ft.); North Carolina (Highlands); North Dakota (Cheyenne Crossing in Lawrence Co.); Northwest Territories (Fort Simpson, Norman Wells, and Yellowknife); Ontario (Island Falls and Marmora); Oregon (Mt. Hood at 3,000 ft. on the Hood River rapids); Quebec (King Mt. at 1,150 ft. near Old Chelsea, Mistassini, Mt. Albert at 1,500 ft., Old Chelsea, Parke Reserve in Kamouraska Co. at 950 ft., and Taylor Lake); Saskatchewan (Otosquen); Tennessee (Elkmont); Vermont (Grand Lake and Union Village); Virginia (Fairfax Co.); Washington (Ashford, Mt. Rainier at 2,700 ft., Seattle, and Sultan); and Yukon Territory (Gravel Lake 58 miles east of Dawson, Otter Lake at 4,000 ft., and Watson Lake). Paratypes are in the collections of Ottawa, Townes, Washington, Cambridge, St. Paul, and East Lansing.

Collection dates are in July and August with the following exceptions: May 28 to 30 at Bowser, B. C.; June 4, 32 miles southwest of Terrace, B. C.; June 12 at Island Falls, Ont.; June 19 at Shively, Calif.; September 12 at Otosquen, Sask.; September 16 in Fairfax Co., Va.; and September 18 at St. John, N. B.

This species is transcontinental, mostly in the Canadian and Hudsonian zones. There are a few collections from the Transition Zone. It is adult mostly in July and August.

31. Exallonyx polysulcus, new species

Figures 224 and 225 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 492 (ovipositor sheath)

Male: Front wing 2.9 to 3.8 mm. long. Cheek 0.62 as long as temple. Clypeus 2.5 as wide as long, with a moderately strong convexity, abruptly declivous at apex. Tyloids lacking. Second flagellar segment 3.0 as long as wide. Pronotum with epomia weak, no hairs behind epomia and carina on collar, and hair band next to its upper edge irregularly 3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 224. Hind femur 4.2 as long as deep. Stigma 1.85 as long as deep, receiving radius at its apical 0.46. Radius joining costa at 48° . Syntergite with median groove reaching 0.5 to space between thyridia, with 3 lateral grooves that are 0.7 to 1.0 as long as median groove. Thyridium 2.7 as wide as long.

Black. Mandible brown. Palpi stramineous. Scape and pedicel pale brown to dark brown. Flagellum often light brown near base. Front coxa brown. Middle coxa dark brown. Hind coxa blackish brown. Hind tarsus brown. Rest of legs and the tegula light fulvous. Wings with a weak tinge of fuscous. Stigma and strong veins dark brown.

Female: Front wing 3.1 to 3.3 mm. long. Temple 1.0 as long as eye. Cheek 0.85 as long as short diameter of eye. Clypeus 2.7 as wide as long, strongly convex, abruptly declivous at apex. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 2.0 as long as wide. Pronotum with epomia moderately strong, no hairs behind epomia and carina on collar, the hair band next to its upper edge irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 225. Hind femur 4.2 as long as deep. Stigma 2.0 as long as deep, receiving radius at its apical 0.43. Radius joining costa at 45° . Syntergite with median groove reaching 0.65 to space between thyridia, with 3 to 5 lateral grooves that are 0.65 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath 0.60 as long as hind tibia, sculptured as in figure 492.

Black. Mandible brown. Palpi stramineous. Antenna fulvous or light brown at base, gradually darkened apicad. Tegula and trochanters pale fulvous. Coxae blackish brown or black. Legs beyond trochanters fulvous. Wings with a tinge of brown. Stigma and strong veins dark brown.

Type: ♀ , Sapporo, Japan, July 6, 1954, Townes family (Townes). Figures 225 and 492 are from the type.

Paratypes: 10 σ , 1 ♀ , Kamikochi, Japan, July 22, 23, 24, 25, and 31, 1954, Townes family (Townes). 4 σ , Katayama, Saitama, Japan, Apr. 14, 1960, T. Hyasaka (Ottawa). 5 σ , Nagano, 400 m. and 400 to 800 m., May 3, 1960 and May 20, 1962, T. Hyasaka (Ottawa). 4 σ , Niizamachi, Saitama, Japan, Apr. 15, 1960, T. Hyasaka (Japan). σ , same data as type (Townes). σ , Tokyo, Japan, July 11, 1953, P. W. Oman (Washington).

This species occurs in Japan.

32. Exallonyx visayanus, new species

Figures 226 (♀ metapleurum, propodeum, and abdominal stalk);
493 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.7 mm. long. Temple 1.1 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus 2.1 as wide as long, weakly convex. Second flagellar segment 1.65 as long as wide. Tenth flagellar segment 1.4 as long as wide. Pronotum lacking epomia, without hairs behind position of epomia and carina on collar, the hair band near its upper edge irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 226. Hind femur 4.2 as long as deep. Stigma 2.2 as long as deep, receiving radius at its apical 0.48. Radius joining costa at 35°. Syntergite with median groove reaching 0.75 to space between thyridia, with 3 lateral grooves that are 0.5 as long as median groove. Thyridium 2.6 as wide as long. Ovipositor sheath 0.50 as long as hind tibia, sculptured as in figure 493.

Black. First three segments of antenna dark brown. Mandible ferruginous brown. Palpi brown. Tegula and trochanters fulvous brown. Coxae blackish brown. Legs beyond trochanters brown, the femora paler at base. Wings with a tinge of fuscous. Stigma and strong veins brown.

Type: ♀, Mt. Canlaon, 7,000 ft., Negros Oriental, Philippines, May 4, 1953, H., M., and D. Townes (Townes).

33. Exallonyx luzonicus Kieffer

Figure 227 (♂ metapleurum, propodeum, and abdominal stalk)

**Exallonyx luzonicus* Kieffer, 1914. Bul. Soc. Ent. France 1914: 181. sex?. des.

Type: sex?, Philippines: Luzon (lost). Identified from topotypes and the description.

Exallonyx luzonicus Kieffer, 1914. Das Tierreich 42: 53. ♂. key, des., fig.

Philippines: Mt. Makiling near Manila.

Codrus luzonicus Baltazar, 1966. Pacific Insects Monog. 8: 162. syn.

Male: Front wing 2.3 to 2.4 mm. long. Cheek 0.75 as long as temple. Clypeus 2.6 as wide as long, moderately convex. Tyloids absent. Second flagellar segment 3.1 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and near upper margin a single row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 227. Hind femur 4.3 as long as deep. Stigma 2.1 as long as deep, receiving radius at its mid-length. Radius joining costa at 35°. Syntergite with median groove reaching 0.7 to space between thyridia, with 3 lateral grooves that are 0.4 to 0.7 as long as median groove. Thyridium 3.2 as wide as long.

Black. Scape, pedicel, and mandible brownish fulvous, the apex of scape a little infusate. Palpi and tegula pale fulvous. Middle coxa brown. Hind coxa dark brown. Hind tibia and tarsus brown, the hind tarsal segments 2-4 pale brown. Rest of legs fulvous. Wings subhyaline.

Stigma and strong veins brown.

Female: Unknown.

Specimens: 2♂, Mt. Makiling, Luzon, Philippines, C. F. Baker (Washington and Townes).

34. Exallonyx latilabris, new species

Figure 228 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.6 to 2.7 mm. long. Cheek 0.35 as long as temple. Clypeus 3.5 as wide as long, moderately convex. Tyloids lacking. Second flagellar segment 3.4 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and next to upper edge a single row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 228. Hind femur 4.5 as long as deep. Stigma 1.7 as long as deep, receiving radius at its mid-length. Radius joining costa at 45°. Syntergite with median groove reaching 0.5 to space between thyridia and two lateral grooves that are 0.75 as long as median groove. Thyridium 3.1 as wide as long.

Black. Scape and pedicel light fulvous. Mandible fulvous brown. Palpi stramineous. Hind coxa dark brown. Middle coxa brown or fulvous. Hind tibia and tarsus light brown. Rest of legs and the tegula fulvous. Wings with a light brown tinge. Stigma and strong veins brown.

Female: Unknown.

Type: ♂, Mt. Polis, 5,500 ft., Luzon, Philippines, Dec. 29, 1953, H., M., and D. Townes (Townes). Figure 228 is from the type.

Paratypes: 2♂, same locality and collectors as type, dated Jan. 2, 1954 (Townes).

35. Exallonyx phaeomerus, new species

Figure 229 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.9 to 3.0 mm. long. Cheek 0.56 as long as temple. Clypeus 3.3 as wide as long, with a moderately strong convexity, its apical 0.25 abruptly declivous. Tyloids absent. Second flagellar segment 2.8 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and a single row of hairs next to its upper edge. Metapleurum, propodeum, and abdominal stalk as in figure 229. Hind femur 4.5 as long as deep. Stigma 1.85 as long as deep, receiving radius at its basal 0.47. Radius joining stigma at 40°. Syntergite with median groove reaching 0.7 to space between thyridia, with 2 or 3 lateral grooves that are 0.75 as long as median groove. Thyridium 3.1 as wide as long.

Black. Scape light brown in front. Mandible light brown with basal 0.35 blackish. Palpi light brown. Hind coxa brown or black, paler at apex. Front and middle coxae light brown to blackish brown, pale at apex. Tegula and trochanters fulvous. Hind tibia and tarsus dark brown or blackish brown. Front and middle legs beyond trochanters and the hind femur medium brown. Wings subhyaline. Stigma and strong

veins blackish brown.

Female: Unknown.

Type: ♂, north of Perucho, 2,000 m., Ecuador, Jan. 7, 1971, Luis Peña (Townes). Figure 229 is from the type.

Paratype: ♂, between Quito and Santo Domingo, 2,800 m., Ecuador, Dec. 20, 1970, Luis Peña (Townes).

36. Exallonyx claripes, new species

Figure 230 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.0 to 3.3 mm. long. Cheek 0.65 as long as temple. Clypeus 3.0 as wide as long, moderately convex, its apex narrowly truncate. Tyloids lacking. Second flagellar segment 3.2 as long as wide. Pronotum with epomia strong and no hairs behind epomia and upper part of carina on collar, but often with several scattered hairs behind lower half of carina on collar. Hair band next to upper margin of pronotum 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 230. Hind femur 4.7 as long as deep. Stigma 1.8 as long as deep, receiving radius at its apical 0.48. Radius joining costa at 45°. Syntergite with median groove reaching 0.5 to space between thyridia and 3 lateral grooves that are 0.7 to 1.0 as long as median groove. Thyridium 2.2 as wide as long.

Black. Mandible brown. Palpi pale fulvous. Scape, pedicel, tegula, and legs uniformly yellowish fulvous except that tarsi are brown at apex. Flagellum light fulvous brown at base, soon darkened apicad to dark brown or blackish. Wings with a faint tinge of brownish yellow. Stigma and strong veins light brown.

Female: Unknown.

Type: ♂, Las Cabras, 1,500 m., Cordillera Chillán, Chile, Jan. 6 to 31, 1963, Luis Peña (Townes). Figure 230 is from the type.

Paratypes: 4♂, Antillanca, Osorno, Chile, Mar. 18, 1956, Luis Peña (Ottawa). ♂, Bulamalal, Arauco, Chile, Feb. 21, 1957, Luis Peña (Ottawa).

37. Exallonyx angulatus, new species

Figures 231 (♀ metapleurum, propodeum, and abdominal stalk);
494 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.0 to 2.7 mm. long. Temple 1.35 as long as eye. Cheek 0.92 as long as short diameter of eye. Clypeus 1.8 as wide as long, moderately convex, with a narrow apical truncation that is weakly concave. Tyloids lacking. Second flagellar segment 1.5 as long as wide. Tenth flagellar segment 1.35 as long as wide. Epomia strong. Side of pronotum without hairs behind epomia and carina on collar. Hair band on upper margin of pronotum irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 231. Hind femur 3.5 as long as deep. Stigma 1.5 as long as deep, receiving

radius at apical 0.4. Radius joining costa at 40°. Syntergite with median groove reaching 0.6 to space between thyridia, with 4 or 5 lateral grooves that are 0.75 as long as median groove. Thyridium 2.0 as wide as long. Ovipositor sheath as in figure 494, 0.57 as long as hind tibia.

Black. Scape, pedicel, and first two flagellar segments fulvous brown, the rest of flagellum dark brown. Palpi and tegula pale brown. Trochanters and tarsi pale brown. Femora and tibiae fulvous brown. Wings hyaline, the stigma and strong veins brown.

Type: ♀, June 10, 1972, Messaure, Sweden, Karl Müller (Townes). Figures 231 and 494 are from the type.

Paratypes: 10♀, same locality and collector as type, dated June 28 and 30 and Aug. 4, 11, 15, 18, and 22, 1971 and 1972 (Townes). 2♀, Uppsala National Park, Uppsala, Sweden, 1949, O. Lunblad (Stockholm).

38. Exallonyx seabrai, new species

Figures 232 (♀ metapleurum, propodeum, and abdominal stalk);
495 (ovipositor sheath)

Male: Unknown.

Female: Front wing 3.2 to 3.5 mm. long. Temple 0.95 as long as eye. Cheek 0.57 as long as short diameter of eye. Clypeus 2.2 as wide as long, moderately convex, its apex with a narrow, 90° declivity to marginal flange. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.95 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and hair band on upper margin irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 232. Hind femur 5.3 as long as deep. Stigma 2.2 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.65 to space between thyridia, with 3 lateral grooves that are 0.6 to 0.8 as long as median groove. Thyridium 2.3 as wide as long. Ovipositor sheath 0.47 as long as hind tibia, sculptured as in figure 495.

Head and abdomen black. Stalk of abdomen, propodeum, margins of pronotum, mesosternum, and some parts of mesopleurum dark reddish brown. Clypeus and mandible brown. Scape light brown to blackish brown. Palpi stramineous. Tegula, trochanters, and coxae fulvous. Femora and tibiae brown, those of hind leg darkest and all femora pale at base. Front and middle tarsi light brown. Hind tarsus brown. Wings with a tinge of brown. Stigma and strong veins dark brown.

Type: ♀, S. J. Barreiro, Serra da Bocaina, 1,650 m., Brazil, Nov. 1968, Alvarenga and Seabra (Townes).

Paratypes: 3♀, Nova Teutonia, Santa Catarina, Brazil, June 1971, July 15, 1948, and Dec. 1968, Fritz Plaumann (Ottawa).

This species is named in honor of Dr. Carlos Alberto Seabra.

39. Exallonyx brutus, new species

Figure 233 (σ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.5 mm. long. Cheek 0.58 as long as temple. Clypeus 2.8 as wide as long, moderately convex, at midline near apex turned inward to apical flange. Tyloids lacking. Second flagellar segment 2.8 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and near upper edge a single row of hairs at and in front of middle, behind middle the hair row multiple. Metapleurum, propodeum, and abdominal stalk as in figure 233. Hind femur 4.3 as long as deep. Stigma 1.85 as long as deep, receiving radius at its apical 0.45. Syntergite with median groove reaching 0.8 to space between thyridia, on each side with a broad deep groove 0.75 as long as median groove. Thyridium 2.0 as wide as long.

Black. Mandible brown. Palpi whitish. Scape, pedicel, tegula, front and middle legs, and hind trochanter light fulvous. Flagellum dark brown. Hind coxa dark brown, its apical 0.35 pale brown. Hind femur, tibia, and tarsus brown, the femur fulvous at base and apex. Wings subhyaline, the stigma and strong veins dark brown.

Female: Unknown.

Type: σ , Hardwar Gap, 4,000 ft., Jamaica, July 29, 1966, Howden and Becker (Ottawa).

40. Exallonyx leptocorsa, new species

Figures 234 and 235 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 496 (ovipositor sheath)

Male: Front wing 2.5 to 3.0 mm. long. Cheek 0.39 as long as temple. Clypeus 2.9 as wide as long, moderately convex, with an apical truncation that is slightly concave and margined by a sharp ridge. Flagellar segments 2-4 sometimes with tyloids in the form of a low, rounded, obliquely longitudinal ridge. Second flagellar segment 2.9 as long as wide. Pronotum lacking epomia, without hairs behind carina on collar, near its upper margin with a mostly single, irregular row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 234. Hind femur 4.3 as long as deep. Stigma 2.1 as long as deep, receiving radius near its apical 0.4. Radius joining costa at 50°. Syntergite with median groove reaching 0.7 to space between thyridia, with 3 or 4 lateral grooves that are 0.7 to 1.0 as long as median groove. Thyridium 4.0 as wide as long.

Black. Mandible, scape, and pedicel fulvous to dark brown. Palpi whitish. Tegula, front and middle legs beyond coxae, and hind trochanter fulvous to fulvous brown. Front coxa light brown. Middle coxa medium brown. Hind coxa dark brown. Hind femur, tibia, and tarsus brown or light reddish brown. Wings faintly infuscate. Stigma and strong veins brown.

Female: Front wing 2.4 to 2.9 mm. long. Temple 1.2 as long as eye. Cheek 0.64 as long as short diameter of eye. Clypeus 3.0 as wide

as long, weakly convex, with an abrupt, narrow apical declivity that is almost sharp-margined. Second flagellar segment 1.65 as long as wide. Tenth flagellar segment 1.2 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 235. Hind femur 3.6 as long as deep. Stigma 2.3 as long as deep, receiving radius at its apical 0.43. Radius meeting costa at 47°. Syntergite with median groove reaching 0.45 to space between thyridia, with 4 lateral grooves that are 0.6 to 0.8 as long as median groove. Thyridium 3.1 as wide as long. Ovipositor sheath 0.50 as long as hind tibia, sculptured as in figure 496.

Black. Mandible, scape, pedicel, and front and middle legs reddish brown, the front and middle trochanters fulvous. Palpi whitish. Tegula and hind trochanter fulvous. Hind leg except trochanter dark brown, the apex of coxa and base and apex of femur pale brown. Wings with a tinge of fuscous. Stigma and strong veins brown.

Type: ♀, Grahamstown, South Africa, Oct. 20, 1970, H. and M. Townes (Townes). Figures 235 and 496 are from the type.

Paratypes: ♂, 3♀, same data as type (Townes). ♂, 4♀, Karen, Nairobi, 6,000 ft., Kenya, Sept. 1971 and Aug. 25 to 31, 1971. Cunningham-van Someren (Townes).

41. Exallonyx subteres, new species

Figures 236 and 237 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 497 (ovipositor sheath)

Male: Front wing 2.8 to 4.2 mm. long. Cheek 0.50 as long as temple. Clypeus 3.0 as wide as long, weakly convex, its apex with a narrow truncation that is sharp-margined or almost so. Tyloids lacking. Second flagellar segment 3.5 as long as wide. Pronotum with epomia moderately strong, no hairs behind epomia and carina on collar, and on its upper edge a hair band that is irregularly 4 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 236. Hind femur 4.5 as long as deep. Stigma 1.9 as long as deep, receiving radius at its apical 0.4. Radius joining costa at 43°. Syntergite with median groove reaching 0.7 to space between thyridia and 3 lateral grooves that are 0.7 to 0.9 as long as median groove. Thyridium 2.0 as wide as long.

Black. Scape, pedicel, and mandible fulvous brown. Palpi pale fulvous. Tegula and legs fulvous, the front and middle tarsi and hind tibia light brown, hind tarsus brown, and upper edge of hind femur brownish. Wings tinged with brown. Stigma and strong veins brown.

Female: Front wing 2.9 to 3.7 mm. long. Temple 1.1 as long as eye. Cheek 0.83 as long as short diameter of eye. Clypeus 2.9 as wide as long, weakly convex, with a narrow apical truncation which near midline is bordered by a sharp ridge. Second flagellar segment 2.1 as long as wide. Tenth flagellar segment 1.37 as long as wide. Pronotum with epomia moderately strong, no hairs behind epomia and carina on collar, and a single row of hairs near upper edge. Metapleurum, propodeum, and abdominal stalk as in figure 237. Hind femur 3.7 as long

as deep. Stigma 2.4 as long as deep, receiving radius at apical 0.42. Radius joining costa at 40°. Syntergite with median groove reaching 0.5 to space between thyridia and 2 or 3 lateral grooves that are 0.4 to 0.6 as long as median groove. Thyridium 2.0 as wide as long. Ovipositor sheath 0.50 as long as hind tibia, sculptured as in figure 497.

Black. Mandible brown. Palpi pale fulvous. Tegula, front coxa, and all trochanters fulvous. Middle coxa brown. Hind coxa dark brown. Front and middle femora, tibiae, and tarsi brown, the tarsal segments 2-4 pale brown. Hind femur, tibia, and tarsus dark brown. Wings tinged with brown. Stigma and strong veins brown.

Type: ♀, Magoebaskloof (near Tzaneen), South Africa, Jan. 14, 1971, H. and M. Townes (Townes). Figures 237 and 497 are from the type.

Paratypes: 25♂, 1♀, same locality and collectors as type, dated Jan. 12, 14, 15, and 18, 1971 (Townes and Ottawa). 4♂, 1♀, Grahams-town, South Africa, Oct. 20, 1970, H. and M. Townes (Townes). 7♂, 1♀, Karkloof (near Howick), South Africa, Dec. 2 and 5, 1970 and Apr. 1, 1971, H. and M. Townes and L. and K. Stuckenberg (Townes). ♂, Mpendle, South Africa, Dec. 3, 1970, H. and M. Townes (Townes). ♂, 5♀, Pietermaritzburg, South Africa, Oct. 25 and 26, 1970 and Dec. 2 and 4, 1970, H. and M. Townes (Townes and Ottawa). 4♂, Royal Natal National Park, South Africa, Jan. 24, 27, and 29, 1971, H. and M. Townes (Townes).

This species occurs in the eastern part of South Africa.

42. Exallonyx brevimala, new species

Figures 238 and 239 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 498 (ovipositor sheath)

Male: Front wing 2.3 mm. long. Cheek 0.25 as long as temple. Clypeus 3.1 as wide as long, strongly convex, without a preapical transverse ridge. Tyloids absent. Second flagellar segment 3.0 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and on upper margin an irregularly double row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 238. Hind femur 4.3 as long as deep. Stigma 1.8 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.4 to space between thyridia and a single broad lateral groove that is the same length as median groove. Thyridium 3.6 as wide as long.

Black. Mandible, scape, pedicel, tegula, and trochanters light brown. Palpi stramineous. Front coxa light brown. Middle and hind coxae blackish brown. Femora, hind tibia, and hind tarsus brown. Front and middle tibiae and tarsi light brown. Wings tinged with fuscous. Stigma and strong veins brown.

In this male the grooves at base of syntergite are fewer than would be expected for the male of *brevimala*. It might not be the true male of *brevimala*.

Female: Front wing 2.2 to 2.4 mm. long. Temple 1.4 as long as

eye. Cheek 0.62 as long as short diameter of eye. Clypeus 3.0 as wide as long, strongly convex, without a preapical transverse ridge. Second flagellar segment 1.8 as long as wide. Tenth flagellar segment 1.65 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 239. Hind femur 3.6 as long as deep. Stigma 2.1 as long as deep, receiving radius at basal 0.41. Radius joining costa at 40°. Syntergite with median groove reaching 0.4 to space between thyridia and with 3 or 4 lateral grooves that are shorter. Thyridium 2.5 as wide as long. Ovipositor sheath 0.53 as long as hind tibia, sculptured as in figure 498.

Black. Scape, pedicel, mandible, tegula, and legs beyond trochanters pale fulvous, the hind femur usually a little darkened above and the scape and pedicel usually partly brown. Palpi stramineous. Trochanters and front coxa pale brownish fulvous. Middle and hind coxae dark brown. Wings with a weak tinge of brown. Stigma and strong veins brown.

Type: ♀, Abisko, 400 m., Lappland, Sweden, Aug. 3, 1960, W. R. M. Mason (Ottawa).

Paratypes: 2♀, near Linz, Austria, Sept. 5, 1933 and Oct. 5, 1932, J. Kloiber (Washington). ♀, Spitzichen, Bgld., Austria, Aug. 24, 1959, Fischer (Washington). ♂, Leicester, England, June 1974, Jennifer Owen (Townes). ♀, Saggart, Co. Dublin, Ireland, Nov. 18, 1936, A. W. Stelfox (Washington). ♀, Abisko, Lappland, Sweden, Aug. 20, 1951, J. R. Vockeroth (Townes). 4♀, Abisko, 400 m., Lappland, Sweden, July 30, 1960 and Aug. 2 and 6, 1960, W. R. M. Mason (Ottawa).

This species is widespread in Europe.

43. Exallonyx subserratus Kieffer

Figures 240 and 241 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 499 (ovipositor sheath)

**Exallonyx Sub serratus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 336. ♀. des. in key. Type: ♀, from pupa of *Megaselia rufipes*, France: Bitche (Paris). Examined in 1975.

Exallonyx subserratus subserratus Kieffer, 1914. Das Tierreich 42: 49. ♂, ♀. key, des., biol. France: Bitche. Hungary: "Kismaros". Emerged from pupa of *Megaselia rufipes* whose larvae had lived in dead bees.

**Exallonyx curtigena* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 440, 441, 449. ♀. key, des., figs. Type: ♀, England: Ashted in Surrey (London). Examined in 1975. England: 6 additional localities. Ireland: 2 localities. New synonym.

Exallonyx curtigena Murray, 1939. Ent. Monthly Mag. 75: 163. biol. Scotland: 2 localities in Dumfriesshire.

Exallonyx curtigena Kerrich, 1940. Notulae Ent. 19: 101. ♀. USSR (= "Finland"): Valamo.

Exallonyx curtigena Perkins, 1942. Entomologist 75: 194. ♀. Sweden: 2 localities.

Codrus (Codrus) curtigena Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, central, and south Europe.

Exallonyx subserratus Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. ♀. type data.

Codrus curtigena Meyer, 1961. Bombus 2: 94. West Germany: Hamburg.

Codrus curtigena Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 3 localities.

- Codrus (Codrus) curtigena* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 31, 33. ♀. biol., ecology. West Germany: 9 localities.
- Codrus curtigena* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 6. ♀. type data.
- Codrus curtigena* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ♂. fig. (p. 505), ecology, biometrics. Austria. Spain. Switzerland. West Germany: 7 localities. Yugoslavia: Istria.
- Codrus curtigena* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Codrus curtigena* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 532. ♀. Ireland: Dublin.
- Codrus (Codrus) curtigena* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 39, 52. ♂, ♀. keys, des., figs., biol. Austria. Germany. Great Britain. Northern Italy. Scandinavia. Spain. Switzerland. Yugoslavia.
- Codrus curtigena* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 121. ♀. Germany. Italy. Switzerland.
- Codrus subserratus* Dessart, 1975. Pub. Natuurhist. Genootsch. Limburg 24: 9. syn., des. Netherlands: "Exaeton", with *Donisthorpea fuliginosa*.
- Codrus (Codrus) curtigena* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 547. key, fig. USSR: Murmanskaya and Yaroslavsckaya oblasts.

Male: Front wing 2.3 to 2.5 mm. long. Cheek 0.30 as long as temple. Clypeus 3.2 as wide as long, weakly convex, with an apical truncation that is concave below and margined anteriorly by a sharp ridge. Tyloids lacking. Second flagellar segment 3.0 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and a single row of hairs near upper edge. Metapleurum, propodeum, and abdominal stalk as in figure 240. Hind femur 4.5 as long as deep. Stigma 1.57 as long as deep, receiving radius at mid-length. Radius joining costa at 55°. Syntergite with median groove reaching 0.5 to space between thyridia, and with 3 lateral grooves approximately the same length as median groove. Thyridium 2.5 as wide as long.

Black. Scape, pedicel, and mandible brown. Palpi stramineous. Tegula, trochanters, and legs beyond trochanters fulvous to brown. Coxae dark brown or blackish. Wings subhyaline. Stigma and strong veins brown.

Female: Front wing 1.9 to 2.5 mm. long. Temple 1.37 as long as eye. Cheek 0.36 as long as short diameter of eye. Clypeus 3.8 as wide as long, moderately convex, with an apical truncation that is concave below and bordered anteriorly by a sharp ridge. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 1.5 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on pronotum, with a mostly single but dense row of hairs near upper edge. Metapleurum, propodeum, and abdominal stalk as in figure 241. Hind femur 4.0 as long as deep. Stigma 1.6 as long as deep, receiving radius at midlength. Radius meeting costa at 50°. Syntergite with median groove reaching 0.35 to 0.6 toward space between thyridia, with 3 or 4 lateral grooves that are 0.6 to 1.0 as long as median groove. Thyridium 3.0 as wide as long. Ovipositor sheath 0.43 as long as hind tibia, sculptured as in figure 499.

Black. Scape, pedicel, and mandible fulvous brown to dark brown. Tegula and legs beyond coxae fulvous brown to dark brown. Front coxa brown to blackish. Middle and hind coxae dark brown to black. Wings

with a faint fuscous tinge. Stigma and strong veins brown.

Specimens: ♀, Dauerbach Tal, Oberwang, Austria, Oct. 2, 1947 (Washington). ♀, Jungfernhardt, N. Hang, Siebengebirge, Austria, Sept. 6, 1957, Erich Schmidt (Ottawa). ♀, St. Marx, Vienna, Austria, July 4, 1959, Fischer (Washington). ♂, Dorking, Surrey, England, June 17, 1960, W. R. M. Mason (Ottawa). 2♀, Leicester, England, Sept. and Oct., 1974, Jennifer Owen (Townes). ♂, 2♀, Oxford, England, Oct. 25, 1952 (♀) and May 13, 1953 (♂, ♀), J. R. Vockeroth (Ottawa). ♀, Rouen, France, Oct. 10, 1920 (Washington). ♀, Marrion Sqr., Dublin, Ireland, Oct. 5, 1945, A. W. Stelfox (Washington). 3♀, Pizzighettone, Italy, May 8 and 10 and Sept. 17, 1973, Franco Frilli (Townes). ♂, 6♀, Siena, Italy, Aug. 23, 1970, M. Amiata (Ottawa). ♂, Abisko, 400 m., Lappland, Sweden, July 30, 1960, W. R. M. Mason (Ottawa). ♂, Messaure, Sweden, Sept. 1971, Karl Müller (Townes). ♂, ♀, Småland, Sweden, Boheman (Stockholm).

This species is widespread in Europe.

44. Exallonyx trichomus, new species

Figures 242 and 243 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 500 (ovipositor sheath)

Male: Front wing 2.0 to 2.4 mm. long. Cheek 0.75 as long as eye. Clypeus 2.7 as wide as long, moderately convex, its apex truncate with truncate portion weakly concave. Tyloids lacking. Second flagellar segment 3.1 as long as wide. Pronotum with epomia present or absent, about 7 hairs behind upper end of carina on collar and position of epomia, and hair band on its upper margin irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 242. Hind femur 5.0 as long as deep. Stigma 2.0 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.5 to 0.7 toward space between thyridia and 2-4 lateral grooves that are 0.6 to 0.9 as long as median groove. Thyridium 2.4 as wide as long.

Black or blackish brown. Mandible brown. Antenna dark brown basally. Palpi stramineous or light brown. Tegula and legs beyond coxae brownish fulvous, the middle and hind femora with a brownish interval centered beyond the middle. Front coxa brown. Middle and hind coxae dark brown or blackish brown. Wings subhyaline. Stigma brown. Strong veins pale brown.

Female: Front wing 1.8 to 2.4 mm. long. Temple 1.41 as long as eye. Cheek 0.92 as long as short diameter of eye. Clypeus 2.7 as wide as long, moderately convex, its apex abruptly truncate. Second flagellar segment 2.6 as long as wide. Tenth flagellar segment 1.9 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 243. Hind femur 4.7 as long as deep. Stigma 2.0 as long as deep, receiving radius at mid-length. Radius meeting costa at 35°. Syntergite with median groove reaching 0.7 to space between thyridia, and 3 lateral grooves that are 0.6 to 0.8 as long as median groove. Thyridium 2.2 as wide as long. Ovipositor sheath 0.45 as long as hind tibia, sculptured as in figure 500.

Black. Scape brown or pale brown. Pedicel pale brown. Flagellum pale brown basally, gradually darkened apicad. Mandible and palpi pale brown. Tegula and legs beyond coxae brownish fulvous to brown. Front coxa brown. Middle and hind coxae blackish brown. Wings with a faint tinge of brown. Stigma and strong veins light brown.

Type: ♀, Skåne, Sweden, July, 1969, Bo Svenson (Townes). Figures 243 and 500 are from the type.

Paratypes: 17♂, 47♀ from Austria (Linz, Obergurgl, and Sarleinsbach); Denmark: (Copenhagen); England (Leicester and Oxford); Ireland (Athdown in Co. Wicklow, Balbriggan in Co. Dublin, Enniskerry in Co. Wicklow, Fern Lock in Co. Meath, Furry Glen in Co. Dublin, George's Br. in Co. Wicklow, Glenasmole in Co. Dublin, Glencollen in Co. Wicklow, Glending in Co. Kildare, Harolds Cross in Co. Dublin, Kiltel in Co. Kildare, Little Sunarleaf in Co. Wicklow, Marfield in Co. Dublin, Morrystown in Co. Kildare, Powerscourt in Co. Wicklow, Saggart in Co. Dublin, Slade of Saggart in Co. Dublin, Trawallua in Co. Sligo, and Tullaghan in Co. Leitrim); Italy (Naturno in Trentino at 500 to 1,000 m.); Russia (Moscow); Spain (Grenada at 700 m.); Sweden (Stockholm); and West Germany (Ingelheim am Rhein, Lohrberg-Fuss im Siebengebirge, and Spandau).

Collection dates are mostly from August through October. Other collection dates are July 9, 10, and 19 at Grenada, Spain; July 25 at Stockholm, Sweden; July 28 at Lohrberg-Fuss im Siebengebirge, West Germany; and November 6, 10, 18, and 22 and December 26 at Slade of Saggart, Co. Dublin, Ireland.

This species is widespread in Europe.

45. Exallonyx confusus Nixon

Figure 244 (♀ metapleurum, propodeum, and abdominal stalk)

- **Exallonyx confusus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 440, 441, 449. ♀. key, des., figs., biol. Lectotype: ♀ (designated by Masner, 1965), England: Torquay Dist. in Devon (London). Examined in 1977. England: 6 additional localities. Ireland: 4 localities.
- Exallonyx confusus* Kerrich, 1940. Notulae Ent. 19: 101. ♀. USSR (= "Finland"): Sortavala.
- Exallonyx ater* v. *confusus* Hellén, 1941. Notulae Ent. 21: 39. des. Finland: 19 localities.
- Exallonyx confusus* Perkins, 1942. Entomologist 75: 194. ♀. Sweden: 5 localities.
- Codrus* (*Codrus*) *confusus* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, & central Europe.
- Codrus confusus* Meyer, 1961. Bombus 2: 94. West Germany: 5 localities.
- Codrus confusus* Boness, 1962. Bombus 2: 112. biol., ecology. West Germany: 5 localities.
- Codrus* (*Codrus*) *confusus* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 31, 33, 34. ♀. biol., ecology. West Germany: 35 localities.
- Codrus confusus* Palm, 1964. Opuscula Ent. 29: 246. ♀. biol. Host: *Philonthus ?albipes*.
- Codrus confusus* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 5. Europe. Japan.
- Codrus confusus* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 5. ♀. lectotype designated.

- Codrus confusus* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 440 et seq. ♂, ♀. figs. (p. 485, 505). ecology, biometrics. Austria. Switzerland. West Germany: 11 localities.
- Codrus confusus* Weidemann, 1965. Proc. XII Internatl. Cong. Ent. London 1964. 1965: sect. 6: 427. ecology.
- Codrus confusus* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 531. ♂?, ♀. des., biol. Ireland: 7 counties.
- Codrus confusus* Weidemann, 1967. Faunistisch-Ökologische Mitt. 3: 168, 169. biol. West Germany: Habel.
- Codrus (Codrus) confusus* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 39, 48, 52, 56. ♂, ♀. keys, figs., biol. In all of middle Europe (including Austria & Switzerland). Great Britain. Japan. Scandinavia.
- Codrus confusus* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 121. ♀. Italy.
- Codrus confusus* Kozlov, 1972. Insects of Mongolia 1: 647. Mongolia: 3 localities.
- Codrus (Codrus) confusus* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 547. key, fig. USSR: Moldaviya and Yaroslavskaia oblasti.

Male: Unknown.

Female: Front wing 1.7 to 2.3 mm. long. Temple 0.90 as long as eye. Cheek 0.88 as long as short diameter of eye. Clypeus 2.8 as wide as long, moderately convex. Second flagellar segment 1.85 as long as wide. Tenth flagellar segment 1.5 as long as wide. Pronotum with epomia weak or indistinct, with 2-6 hairs behind epomia and on upper margin a hair band that is irregularly 1 or 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 244. Hind femur 4.5 as long as deep. Stigma 2.5 as long as deep, receiving radius at apical 0.4. Radius joining costa at 35°. Base of syntergite with 9 weakly radiating grooves that reach 0.5 to space between thyridia. Thyridium 2.8 as wide as long. Ovipositor sheath 0.44 as long as hind tibia, similar to that of *E. brevimala* (fig. 498).

Blackish. Antenna pale brown at base, gradually darkened apicad. Mandible brown. Palpi stramineous. Middle and hind coxae and hind tibia and tarsus light brown, the rest of legs light brownish fulvous. Tegula pale fulvous. Wings hyaline. Stigma and strong veins brown.

Specimens: ♀, Kytín, Bohemia, Czechoslovakia, July 1958, Jan Maček (Townes). ♀, Hallstatt, Austria, Aug. 19, 1947, V. Hamann (Washington). ♀, Kramsach, Tirol, Austria, Aug. 13, 1932 (Washington). ♀, Sarleinsbach, Austria, Oct. 15, 1930, J. Kloiber (Washington). ♀, Wilhering, Austria, Aug. 27, 1936, J. Kloiber (Washington).

This species is known from Austria, Czechoslovakia, and England. Records of the species in literature are to be discounted, as several species have been confused under "confusus".

46. Exallonyx nixonii, new species

Figures 245 and 246 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 501 (ovipositor sheath)

Male: Front wing 2.6 to 2.8 mm. long. Cheek 0.62 as long as temple. Clypeus 2.6 as wide as long, moderately convex, with a narrow apical

truncation that is concave beneath and bordered anteriorly by a ridge. Tyloids absent. Second flagellar segment 3.0 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and hair band on its upper margin irregularly 2-3 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 245. Hind femur 4.9 as long as deep. Stigma 2.0 as long as deep, receiving radius at apical 0.47. Radius joining costa at 45°. Syntergite with median groove reaching 0.5 to space between thyridia and 3 or 4 lateral grooves that are approximately as long as median groove. Thyridium 4.0 as wide as long.

Black. Mandible light brown. Palpi stramineous. Antenna pale brown at base, gradually darkened apicad. Middle and hind coxae dark brown or blackish. Rest of legs and the tegula fulvous. Wings hyaline. Stigma and strong veins brown.

Female: Front wing 2.3 to 2.8 mm. long. Temple 0.95 as long as eye. Cheek 0.82 as long as short diameter of eye. Clypeus 2.6 as wide as long, with a narrow apical truncation that is concave beneath and bordered anteriorly by a ridge. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 246. Hind femur 4.2 as long as deep. Stigma 2.1 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.6 to space between thyridia, with 3 or 4 lateral grooves 0.5 to 0.7 as long as median groove. Thyridium 2.6 as wide as long. Ovipositor sheath 0.43 as long as hind tibia, sculptured as in figure 501.

Black. Middle coxa dark brown. Hind coxa blackish brown. Hind tarsus brown. Rest of legs, mandible, and base of antenna light brownish fulvous, the antenna gradually darkened apicad. Palpi stramineous. Tegula pale fulvous. Wings subhyaline. Stigma and strong veins brown.

Type: ♀, Leicester, England, Aug. 27, 1972, Jennifer Owen (Townes). Figure 246 is from the type.

Paratypes: 14♂, 23♀ from Austria (Kahlenberg, Linz, Mödling, Sarleinsbach, Scheffau in Tirol at 800 m., Traunau, and Vienna); Czechoslovakia (Kytín in Bohemia); England (Dorking, Leicester, Newport, and Oxford); Italy (Pizzighettone); Spain (Grenada at 700 m.); Sweden (Skane and north side of Torneträsk). Collection dates are mostly July through October. Those outside this range are June 5 at Dorking, England; June 18-20 at Newport, England; November 7 at Leicester, England. Paratypes are in the collections of Townes, Ottawa, and Washington.

This species is widespread in Europe. It is named in honor of Mr. G. E. J. Nixon.

47. Exallonyx minor, new species

Figures 247 and 248 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 502 (ovipositor sheath)

Male: Front wing 1.6 to 2.5 mm. long. Cheek 0.62 as long as temple. Clypeus 2.4 as wide as long, moderately convex, its lower 0.25 with a flat bevel to apical flange. Tyloids absent. Second flagellar

segment 3.0 as long as wide. Pronotum with epomia strong and no hairs behind epomia and carina on collar, the hair band near its upper margin irregularly 2 hairs wide. Lower corner of pronotum usually with 2 pits, sometimes with 1. Metapleurum, propodeum, and abdominal stalk as in figure 247. Hind femur 4.4 as long as deep. Stigma 2.0 as long as deep, receiving radius at mid-length. Radius joining costa at 45°. Syntergite with hairs very sparse and short, its median groove reaching 0.35 to 0.5 toward space between thyridia, with 1 to 3 lateral grooves that are 0.7 to 1.0 as long as median groove. Thyridium 2.3 as wide as long.

Black. Mandible, scape, and pedicel fulvous to dark brown. Palpi stramineous. Scape fulvous to black. Flagellum sometimes brownish near base. Coxae dark brown to blackish. Legs beyond coxae light brown to dark brown or blackish. Wings tinged with fuscous. Stigma and strong veins dark brown.

Female: Front wing 1.6 to 2.3 mm. long. Temple 1.30 as long as eye. Cheek 0.86 as long as short diameter of eye. Clypeus 2.4 as wide as long, moderately convex, declivous near apex. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.7 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 248. Hind femur 3.7 as long as deep. Stigma 2.0 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with hairs unusually sparse and short, its median groove reaching 0.3 to 0.4 toward space between thyridia, with 3 lateral grooves that are 0.6 to 1.0 as long as median groove. Thyridium 2.7 as wide as long. Ovipositor sheath 0.48 as long as hind tibia, sculptured as in figure 502.

Black. Mandible and scape brown to blackish. Tegula light brown. Legs pale brown to blackish. Wings tinged with fuscous. Stigma and strong veins dark brown.

Type: ♀, Pizzighettone, Italy, Jul. 7, 1973, Franco Frilli (Townes). Figures 248 and 502 are from the type.

European paratypes: 62♂, 80♀ from Austria (Dauernbach, Eichgraben, Linz, Marchtrenk, Ötztal, Sarleinsbach, Scharthen, Scheffau in the Tirol at 800 m., and Turnau); Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Leicester, Letchworth in Hertford, Oxford, and Torquay in Devon); Ireland (Athdown in Co. Wicklow, Athgarrett in Co. Kildare, Ballinaclea in Co. Wicklow, Ballyhealy in Co. Westmeath, Ballyhenry in Co. Wicklow, Ballyknockran in Co. Wicklow, Bellevue in Co. Wicklow, south of Bray Hd. in Co. Wicklow, Brockagh in Co. Kildare, Clanskeogh in Co. Dublin, Clara in Co. Wicklow, Deputy's Pass in Co. Wicklow, Digby Br. in Co. Kildare, Furry Glen in Co. Dublin, Glen of the Downs in Co. Wicklow, Glencree in Co. Wicklow, Glending in Co. Wicklow, Greystones in Co. Wicklow, Kileen in Co. Dublin, Kilkea Park in Co. Kildare, Liffey Hd. at 1,700 ft. in Co. Wicklow, Marfield in Co. Dublin, Marrion Sqr. in Co. Dublin, Murlough Ho Dunes in Co. Donegal, Murrrough in Co. Wicklow, Raheen in Co. Wicklow, Saggart in Co. Dublin, east of Scalp in Co. Dublin, Slade Brook in Glensasmole in Co. Dublin, Slade of Saggart in Co. Dublin, Tanrego in Co. Sligo, Trawallua in Co. Sligo, and Tullaghan in Co. Leitrim); Italy (Naturno at 1,000 m. in Trentino, Piacenza, Pizzighettone, Siena, and

Unserfrau at 1,500 m. in Trentino); Scotland (Dunoon); Sweden (Abisko in Lappland, Ekshärad in Varmland, Messaure, Småland, and Stockholm); and West Germany (Lohrberg-Fuss im Siebengebirge, Mainz, and Schliersee at 700 to 1,000 m. in Bavaria).

Nearctic paratypes: 127♂, 53♀ from Alaska (Eagle, King Salmon at Naknek River, Knik River north of Anchorage at 442 ft., Matanuska, Mt. McKinley, Unalakleet, and Valdez); Alberta (Aspen Beach, Aiyansh on Nass River at 5,000 ft., Banff, 14 miles north of Banff at 4,500 ft., Eisenhower Junction in Banff National Park, Elkwater, Mountain View, Scandia, and Slave Lake); Arizona (Rustler's Park in Chirichua Mts. at 8,200 ft.); British Columbia (Bowser, Cowichan Lake, Cultus Lake, Gagnon Road 6 miles west of Terrace, Ketchum Lake at 3,600 ft., Kleanza Creek 14 miles east of Terrace, Liard River Hotsprings at 1,725 ft., Mt. Thornhill near Terrace, New Westminster, Nixon, Queen Charlotte City, Point Grey in Vancouver, Robson, Sawmill Lake at 1,100 ft., Terrace, and 32 miles east of Terrace); California (Crescent City, Dardanelle, and Inverness); Manitoba (Minette); Michigan (Isle Royale); New Hampshire (Lake of the Clouds at 5,000 ft. on Mt. Washington and Mt. Davis at 4,000 ft.); New Mexico (Hondo Canyon near Taos at 9,000 ft.); New York (Whiteface Mt. at 4,600 to 4,872 ft.); Northwest Territories (Yellowknife); Ontario (Brighton, Island Falls, and Oxford Mills); Oregon (Cannon Beach, Salem, and Seaside); Quebec (Cap Rouge, Chimo, Great Whale River, King Mt. near Old Chelsea at 1,150 ft., and Old Chelsea); Saskatchewan (Hudson Bay and Snowden); Washington (Elbe, near Everett on Tulalip Indian Reservation, Ilwaco, Indian Henry on Mt. Rainier, Lake Stevens near Everett, Mt. Rainier at 2,900 ft., Mukilteo, Olga, Olympia, and Pluvius); Yukon Territory (Gravel Lake 58 miles east of Dawson at 2,050 ft. and Dawson); and Mexico (6 miles north of Cuernavaca). Paratypes are in the collections of Ottawa, Washington, Townes, Cambridge, Stockholm and East Lansing.

Dates of collection are from May 23 to October 10, or in Ireland through the fall to as late as December 20. Most collection dates are June to September. In our own experience it is caught by sweeping low vegetation in damp spots.

This species is widespread in Europe and North America. In North America it ranges from the Canadian Zone to the Arctic Zone. It is adult throughout the growing season.

48. Exallonyx alticola Kieffer

Figures 215, 249 and 250 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 503 (ovipositor sheath)

**Exallonyx alticola* Kieffer, 1913. Voyage de Ch. Allaud & R. Jeannel en Afrique Orientale . . . Hyménoptères I: 20. ♂. des. Lectotype: ♂ (labeled by Townes, 1975 and hereby designated), Kenya: Naivasha at 1,900 m. (Paris). Examined in 1975.

Exallonyx alticola Kieffer, 1914. Das Tierreich 42: 3, 53. ♂. key, des., figs. Kenya: Naivasha at 1,900 m.

Exallonyx alticola alticola Risbec, 1950. Travaux Lab. Ent. Sec. Soudanais Recherches Agron. I, II: 515. ♂, ♀. des., figs. Kenya (= English East Africa): Naivasha in Rift Valley at 1,900 m.; Mt. Elgon at Camp III at 3,500 m.

Exallonyx alticola Risbec, 1958. Ann. Mus. Roy. Congo Belge Tervuren (8) 64: 106.

♂, ♀. Zaire: Rwanki, Lake Kivu.

Codrus alticola Sundholm, 1970. South African Animal Life 14: 306. syn.

**Codrus longipetiolatus* Sundholm, 1970. South African Animal Life. 14: 307. ♀. des.,
figs. Type: ♀, South Africa: Storms River Park in Tsitsikama Forest (Lund).

Identified from the description. New synonym.

Male: Front wing 2.3 to 2.8 mm. long. Cheek 1.0 as long as temple. Clypeus 2.5 as wide as long, with a moderately strong convexity and a median apical bevel to marginal flange. Tyloids lacking. Second flagellar segment 3.1 as long as wide. Pronotum lacking epomia, usually with 2-5 hairs behind upper end of carina on collar and behind position of epomia. Hair band on upper margin of pronotum irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 215 and 249. (Figure 215 is from a paratype; figure 249 is from a specimen from Pietermaritzburg, South Africa.) Hind femur 4.5 as long as deep. Stigma 2.1 as long as deep, receiving radius at apical 0.45. Radius joining costa at 45°. Syntergite with median groove reaching 0.65 to space between thyridia and with 2 lateral grooves that are 0.7 as long as median groove. Thyridium 3.8 as wide as long.

Black. Scape, pedicel, and mandible fulvous to light brown. Palpi pale fulvous. Tegula, trochanters, and front and middle legs light fulvous. Middle coxa fulvous or light brown. Hind coxa blackish brown. Hind femur fulvous, usually brownish above. Hind tibia and tarsus fulvous to light brown. Wings subhyaline. Stigma and strong veins dark brown.

Female: Front wing 2.2 to 3.0 mm. long. Temple 1.0 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus 2.8 as wide as long, with a moderately strong convexity and apical bevel to marginal flange. Second flagellar segment 2.3 as long as wide. Tenth flagellar segment 1.75 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 250. Hind femur 4.0 as long as deep. Stigma 2.15 as long as deep, receiving radius at its apical 0.43. Radius joining costa at 40°. Syntergite with median groove reaching 0.6 to space between thyridia, with 3 lateral grooves that are 0.8 as long as median groove. Thyridium 3.8 as wide as long. Ovipositor sheath 0.39 as long as hind tibia, sculptured as in figure 503.

Black. Antenna dark brown or black, the scape, pedicel, and base of first flagellar segment often lighter brown. Mandible, tegula, trochanters, and front leg light fulvous, the trochanters paler than the rest. Palpi very pale fulvous. Middle and hind coxae dark brown or blackish brown. Middle leg beyond trochanter fulvous brown. Hind leg beyond trochanter brown. Wings subhyaline. Stigma and strong veins dark brown.

Specimens: ♂, ♀, Karen, 6,000 ft., Nairobi, Kenya, Aug. 25 to 31, 1971 and Sept. 1971, Cunningham- van Someren (Townes). 2♂, Grahams-town, South Africa, Oct. 20, 1970, H. and M. Townes (Townes). 2♂, 1♀, Kirstenbosch (near Cape Town), South Africa, Sept. 21 and Oct. 6, 1970, H. and M. Townes (Townes). 3♂, 1♀, Pietermaritzburg, South Africa, Oct. 26, 27, and 28, 1970, H. and M. Townes (Townes).

This species is known from Kenya and South Africa.

49. Exallonyx parvus Risbec

Figure 251 (♂ metapleurum, propodeum, and abdominal stalk)

**Exallonyx alticola* var. *parvus* Risbec, 1950. Travaux Lab. Ent. Sect. Soudanais Recherches Agron. I, II: 517. ♂. des. Lectotype: ♂ (labeled by Townes in 1975 and hereby designated), Kenya: Elgon Forest, toward east, 2,700 to 2,800 m., C. Arambourg, P. A. Chappius, and R. Jeannel, 1932-33 (Paris). Examined in 1975. Madagascar: Tananarive.

Codrus alticola var. *parva* Sundholm, 1970. South African Animal Life 14: 307. syn.

This differs from *alticola* only in the slightly longer abdominal stalk. It might not be a distinct species. The figure was made from the lectotype.

Specimen: ♂ (lectotype), Elgon Forest (toward east), 2,700 to 2,800 m., Kenya, 1932-1933, C. Arambourg, P. A. Chappius, and R. Jeannel (Paris).

50. Exallonyx kenyensis, new species

Figures 252 (♀ metapleurum, propodeum, and abdominal stalk);
504 (ovipositor sheath)

Male: Unknown.

Female: Front wing 3.8 mm. long. Temple 1.1 as long as eye. Cheek 0.92 as long as short diameter of eye. Clypeus 2.3 as wide as long, moderately convex, near apex abruptly declivous to marginal flange. Second flagellar segment 3.9 as long as wide. Tenth flagellar segment 2.9 as long as wide. Pronotum without epomia, with a group of hairs behind upper end of carina on collar and behind position of epomia. Hair band on upper edge of pronotum irregularly 2 hairs wide. Metapleurum, propodeum, and abdominal stalk as in figure 252. Hind femur 5.5 as long as deep. Stigma 2.7 as long as deep, receiving radius at its apical 0.43. Radius joining costa at 28°. Syntergite with median groove reaching 0.85 to space between thyridia, with 2 or 3 lateral grooves that are approximately 0.65 as long as median groove. Thyridium 3.5 as wide as long. Ovipositor sheath 0.34 as long as hind tibia, sculptured as in figure 504.

Black. Antenna blackish brown. Mandible fulvous. Palpi and tegula pale fulvous. Legs light fulvous, the hind coxa brown basally, upper edge of hind femur tinged with brown, hind tibia fulvous brown, and hind tarsus brown. Wings subhyaline. Stigma and strong veins dark brown.

Type: ♀, Karen, 6,000 ft., Nairobi, Kenya, Aug. 25 to 31, 1971, Cunningham-van Someren (Townes). Figure 252 is from the type.

Paratype: ♀, Ngong Forest Station, Kenya, Jan. 17-18, 1968, Krombein and Spangler (Washington).

51. Exallonyx siccatus, new species

Figures 253 (♀ metapleurum, propodeum, and abdominal stalk); 505 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.5 mm. long. Temple 1.0 as long as eye. Cheek 1.1 as long as short diameter of eye. Clypeus 2.6 as wide as long, weakly convex. Second flagellar segment 3.4 as long as wide. Tenth flagellar segment 2.0 as long as wide. Pronotum with epomia entirely absent, without hairs behind carina on collar, with a very sparse row of hairs near upper edge. Lower corner of pronotum with a single pit (an unusual feature). Metapleurum, propodeum, and abdominal stalk as in figure 253. Hind femur 4.7 as long as deep. Stigma 2.6 as long as deep, receiving radius at its mid-length. Radius joining costa at 35°. Syntergite with median groove reaching 0.6 to space between thyridia, without lateral grooves. Thyridium 3.5 as wide as long. Ovipositor sheath 0.45 as long as hind tibia, as in figure 505.

Black (including the legs). Palpi and tegula light brown. Wings with a light tinge of brown. Stigma and strong veins blackish.

Type: ♀, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes).

52. Exallonyx monotrema, new species

Figures 254 (♀ metapleurum, propodeum, and abdominal stalk); 506 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.4 to 2.6 mm. long. Temple 1.1 as long as eye. Cheek 1.0 as long as short diameter of eye. Clypeus 2.4 as wide as long, moderately convex. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.55 as long as wide, the flagellum very faintly enlarged apicad. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and a sparse single row of hairs near upper edge. Lower corner of pronotum with a single pit (an unusual feature). Metapleurum, propodeum, and abdominal stalk as in figure 254. Hind femur 4.1 as long as deep. Stigma 2.7 as long as deep, receiving radius at its basal 0.45. Radius joining costa at 40°. Syntergite with median groove reaching 0.55 to space between thyridia, on each side with 2 grooves that are 0.5 as long as median groove. Thyridium 1.7 as wide as long. Ovipositor sheath 0.60 as long as hind tibia, as in figure 506.

Black. Mandible dark brown. Palpi stramineous. Tegula brown. Front and middle legs brown beyond coxae. Hind trochanter and narrow base of hind femur stramineous. Wings subhyaline. Stigma and strong veins dark brown.

Type: ♀, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes). Figures 254 and 506 are from the type.

Paratype: ♀, same data as type (Townes).

53. Exallonyx pissinus

Figures 255 and 256 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 507 (ovipositor sheath)

Male: Front wing 2.0 to 2.4 mm. long. Cheek 1.0 as long as temple. Clypeus 2.9 as wide as long, strongly convex, its apical 0.2 bent inward at almost a rounded right angle. Tyloids lacking. Second flagellar segment 3.1 as long as wide. Pronotum with epomia strong, no hair behind epomia and carina on collar, and a very sparse single row of hairs near upper margin. Lower corner of pronotum with a single pit in about half of the specimens, with a pair of pits in the rest (as compared with 2 pits normal for the species group). Metapleurum, propodeum, and abdominal stalk as in figure 255. Hind femur 4.4 as long as deep. Stigma 2.4 as long as deep, receiving radius at its basal 0.45. Radius joining costa at 35°. Syntergite with median groove reaching 0.4 to 0.7 toward space between thyridia, with 2 or 3 lateral grooves that are 0.4 to 0.9 as long as median groove. Thyridium 2.5 as wide as long.

Black. Mandible dark brown. Palpi whitish. Tegula brown. Legs medium brown to black. Wings with a fuscous tinge. Stigma and strong veins blackish brown.

Female: Front wing 2.4 mm. long. Temple 0.75 as long as eye. Cheek 0.80 as long as short diameter of eye. Clypeus 2.6 as wide as long, moderately convex. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 2.1 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and a very sparse single row of hairs near upper margin. Lower corner of pronotum with 2 pits. Metapleurum, propodeum, and abdominal stalk as in figure 256. Hind femur 5.1 as long as deep. Stigma and radius as in male. Ovipositor sheath 0.36 as long as hind tibia, as in figure 507.

Black. Palpi brown. Tegula and legs blackish brown. Wings with a brown tinge, the stigma and strong veins dark brown.

Type: ♀, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes).

Paratypes: 27♂, Baiyer River, 1,100 m., Papua, New Guinea, several dates from Jan. 25 to Mar. 9, 1979, J. Sedlacek (Townes and Ottawa). ♂, Mt. Giluwe, 2,800 m., Papua, New Guinea, Jan. 3 to Feb. 8, 1979, J. Sedlacek (Townes). ♂, Tomba Pass, 2,600 m., Papua, New Guinea, Jan. 22, 1979, J. Sedlacek (Townes).

This species occurs in the mountains of New Guinea.

54. Exallonyx chiuuae, new species

Figure 257 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.2 to 2.4 mm. long. Lower corner of pronotum with a double pit. Otherwise structurally similar to *E. pissinus* except

that sculpture of metapleurum and propodeum (fig. 257) is a little finer.

Black. Mandible light brown. Palpi whitish. Scape fulvous, fuscous apically. Tegula fulvous. Front coxa fulvous, middle coxa brown, and hind coxa dark brown. Trochanters light fulvous. Front and middle legs beyond trochanters light fulvous, sometimes tinged with brown. Hind femur fulvous to brown. Hind tibia and tarsus brown. Wings lightly tinged with brown. Stigma and strong veins brown.

Female: Unknown.

Type: ♂, Kuanhsi, Sinchu, Taiwan, Jan. 27 to Feb. 2, 1970 (Townes). Figure 257 is from the type.

Paratypes: ♂, Kuandouchi, Taiwan, Mar. 30 to Apr. 5, 1971, Shui-chen Chiu (Townes). 2♂, Sunmoon Lake, Taiwan, Dec. 30 to Jan. 5, 1970 and Jan. 13 to 19, 1970 (Townes).

The species name is in honor of Miss Shui-chen Chiu.

55. Exallonyx peñai, new species

Figures 258 and 259 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 508 (ovipositor sheath)

Male: Front wing 3.0 to 3.5 mm. long. Cheek 0.53 as long as temple. Clypeus 2.7 as wide as long, with a moderately strong convexity, near apex sharply declivous to marginal flange. Tyloids absent. Second flagellar segment 3.1 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and hairs near upper edge in a single row. Metapleurum, propodeum, and abdominal stalk as in figure 258. Hind femur 4.4 as long as deep. Stigma 2.3 as long as deep, receiving radius at its basal 0.44. Radius joining costa at 40°. Syntergite with median groove reaching 0.8 to space between thyridia and 2 (sometimes 3) lateral grooves that are 0.65 as long as median groove. Thyridium 3.3 as wide as long.

Black. Scape, pedicel, and mandible dark brown. Palpi and tegula pale brown. Front coxa light brown. Middle coxa brown. Hind coxa blackish brown. Front trochanter pale brown. Middle and hind trochanters brown. Legs beyond trochanters dark brown, the hind leg darkest. Wings with a brown tinge. Stigma and strong veins dark brown.

Female type: Front wing 2.6 mm. long. Temple 1.2 as long as eye. Cheek 0.95 as long as short diameter of eye. Clypeus 2.2 as wide as long, strongly convex, with an apical bevel to the marginal flange. Second flagellar segment 1.7 as long as wide. Tenth flagellar segment 1.45 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 259. Hind femur 4.2 as long as deep. Stigma 2.4 as long as deep, receiving radius at mid-length. Radius joining costa at 40°. Syntergite with median groove reaching 0.7 to space between thyridia, with a single lateral groove that is 0.25 as long as median groove. Thyridium 2.6 as wide as long. Ovipositor sheath 0.60 as long as hind tibia, sculptured as in figure 508.

Black. Mandible, palpi, and tegula brown. Legs blackish brown. Wings tinged with fuscous. Stigma and strong veins brown.

Type: ♀, Portete de Tarqui, 2,900-3,200 m., Ecuador, Luis E.

Peña (Townes).

Paratypes: 4♂, east of Papallacta, 2,900 m. and 3,000 m., Ecuador, Jan. 11 and Jan. 14 to 17, 1971, Luis E. Peña (Townes).

The specific name is in honor of Mr. Luis E. Peña-G.

56. Exallonyx leptocerus, new species

Figure 260 (♀ metapleurum, propodeum, and abdominal stalk)

Male: Unknown.

Female: Front wing 2.5 mm. long. Temple 0.74 as long as eye. Cheek 0.70 as long as short diameter of eye. Clypeus 2.4 as wide as long, moderately convex, its apical 0.25 declivous to marginal flange. Second flagellar segment 3.7 as long as wide. Tenth flagellar segment 2.6 as long as wide. Pronotum with epomia moderately strong, no hairs behind epomia and carina on collar, and near upper edge a sparse single row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 260. Hind femur 5.0 as long as deep. Stigma 2.0 as long as deep, receiving radius at mid-length. Radius joining costa at 25°. Syntergite with median groove reaching 0.75 to space between thyridia, with 2 lateral grooves that are 0.7 as long as median groove. Thyridium 2.9 as wide as long. Ovipositor sheath 0.38 as long as hind tibia, its shape and sculpture similar to that of *E. peñai* (fig. 508).

Black. Mandible, palpi, scape, pedicel, tegula, trochanters, front leg, and middle tibia and tarsus pale fulvous. Middle coxa brown. Hind coxa darker brown. Middle and hind femora, and hind tibia and tarsus brown. Wings with a weak tinge of brown. Stigma and strong veins brown.

Type: ♀, Represa Rio Grande, Guanabara, Brazil, Feb. 1967, M. Alvarenga (Townes).

57. Exallonyx cervicatus, new species

Figures 261 and 262 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 509 (ovipositor sheath)

Male: Front wing 2.9 mm. long. Cheek 1.0 as long as temple. Clypeus 2.5 as wide as long, strongly convex, its apical 0.25 beveled to lower margin. Flagellum without tyloids. Second flagellar segment 4.3 as long as wide. Pronotum with epomia strong and no hairs behind epomia and carina on collar. Hair band on upper margin of pronotum one hair wide. Metapleurum, propodeum, and abdominal stalk as in figure 261. Hind femur 5.4 as long as deep. Stigma 1.7 as long as deep, receiving radius at basal 0.4. Radius meeting costa at 55°. Base of syntergite with median groove reaching 0.75 to space between thyridia, on each side of median groove a broad longitudinal depression. Thyridium 3.7 as wide as long.

Black. Mandible brown. Scape and pedicel fulvous brown. Palpi, tegula, trochanters, and front and middle legs pale fulvous with femora brownish apically. Hind coxa brownish fulvous, its basal half often

brown. Hind femur fulvous, brown apically or brown with base pale. Hind tibia and tarsus dark brown. Wings with a faint tinge of brown. Stigma and strong veins brown.

Female: Front wing 2.4 to 2.8 mm. long. Temple 1.1 as long as eye. Cheek 1.2 as long as short diameter of eye. Clypeus 2.4 as wide as long, moderately convex, its apical 0.2 beveled to lower margin. Second flagellar segment 3.5 as long as wide. Tenth flagellar segment 2.4 as long as wide. Pronotal characters as in male. Metapleurum, propodeum, and abdominal stalk as in figure 262. Hind femur 5.3 as long as deep. Stigma 2.6 as long as deep, receiving radius at apical 0.45. Radius meeting costa at 35°. Syntergite with median groove reaching 0.6 to space between thyridia, with a broad longitudinal impression on each side of median groove and usually a very narrow groove between the impression and median groove. Thyridium 2.8 as wide as long. Ovipositor sheath as in figure 509.

Black. Mandible, scape, and pedicel pale brown. Flagellum dark brown. Palpi stramineous. Tegula, front leg, middle and hind trochanter, and middle tarsus pale fulvous. Middle femur and tibia fulvous. Hind coxa light brown. Hind femur light brown, paler at ends. Hind tibia and tarsus dark brown. Wings subhyaline, the stigma and strong veins brown.

Type: ♀, Castelo, Espiritu Santo, Brazil, Nov. 1976, M. Alvarenga (Townes). Figures 262 and 509 are from the type.

Paratypes: ♀, Lake Montebello National Park, 5,000 ft., Chiapas, Mexico, June 26, 1969 (Ottawa). 2♀, San Cristóbal de las Casas, 7,200 ft., Chiapas, Mexico, June 21 and 26, 1969, W. R. M. Mason (Ottawa). ♂, ♀, Zontehuitz, near San Cristóbal de las Casas, 9,600 ft., Chiapas, Mexico, June 17 and 25, 1969, W. R. M. Mason (Ottawa).

This species is known from Brazil and southern Mexico.

58. Exallonyx reflexus, new species

Figure 263 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.7 mm. long. Body slender. Eye bulged. Temple short and sloping. Cheek 0.80 as long as temple. Clypeus 2.5 as wide as long, strongly convex, with an apical slope to marginal flange. Occipital carina unusually high, reflexed. Tyloids lacking. Second flagellar segment 6.6 as long as wide. Pronotum with epomia lacking, no hairs behind carina on collar and position of epomia, and a single sparse row of hairs next to upper edge. Propodeum, metapleurum, and abdominal stalk as in figure 263. Hind femur 5.4 as long as deep. Stigma 2.5 as long as deep, receiving radius at its mid-length. Radius joining costa at 20°. Syntergite with 5 longitudinal grooves that reach 0.9 to space between thyridia. Thyridium 3.3 as wide as long.

Black. Scape, pedicel, and mandible fulvous brown. Palpi stramineous. Trochanters stramineous. Tegula and front leg beyond trochanter pale fulvous. Middle coxa dark brown. Hind coxa black. Middle leg beyond trochanter light brown, the femur stramineous basally. Hind femur dark brown, stramineous basally. Hind tibia and tarsus blackish brown. Wings with a light tinge of brown. Stigma

and strong veins blackish brown.

Female: Unknown.

Type: ♂, 14 kilometers north of Ureña, Costa Rica, June 20-23, 1974, Julian Donahue (Townes).

59. Exallonyx rhadinus, new species

Figure 264 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.6 mm. long. Body slender. Cheek 0.95 as long as temple. Clypeus 2.6 as wide as long, moderately convex. Tyloids lacking. Second flagellar segment 4.5 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and near upper edge a dense but mostly single row of hairs. Metapleurum, propodeum, and abdominal stalk as in figure 264. Hind femur 5.1 as long as deep. Stigma 2.0 as long as deep, receiving radius at its midlength. Radius joining costa at 30°. Syntergite with median groove reaching 0.6 to space between thyridia, with 2 lateral grooves that are 0.8 as long as median groove. Thyridium 3.6 as wide as long.

Black. Scape, pedicel, and mandible brownish fulvous. Palpi and trochanters pale fulvous. Tegula, and front and middle legs except trochanters light fulvous, their femora with a brown tinge apically on upper side. Hind coxa dark brown. Hind femur light brown, its basal half light fulvous. Hind tibia and tarsus brown. Wings with a brown tinge. Stigma and strong veins brown.

Female: Unknown.

Type: ♂, Kilometer 185.5 on Tuxtepec to Oaxaca Road, 2,200 m., Oaxaca, Mexico, Oct. 22, 1962, H. and M. Townes (Townes).

60. Exallonyx nodosus, new species

Figure 265 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.4 mm. long. Cheek 0.58 as long as temple. Clypeus 2.8 as wide as long, moderately convex. Flagellar segments 1-6 with a small raised ovate tyloid. Second flagellar segment 3.3 as long as wide. Pronotum with epomia strong, no hairs behind epomia and carina on collar, and a single sparse row of hairs near upper edge. Metapleurum, propodeum, and stalk of abdomen as in figure 265. Hind femur 4.7 as long as deep. Stigma 2.2 as long as deep, receiving radius at apical 0.35. Radius joining costa at 40°. Syntergite with median groove reaching 0.5 to space between thyridia and 3 grooves on each side that are the same length as median groove. Thyridium 2.9 as wide as long.

Black. Pedicel brown, the rest of antenna blackish brown. Mandible brown. Palpi, tegula, trochanters, and front and middle coxae stramineous. Legs beyond trochanters brown with femora pale at base, the hind femur, tibia, and tarsus darker brown. Hind coxa brown, pale apically. Wings faintly tinged with fuscous, the stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, 14 km. north of Ureña, Costa Rica, June 20 to 23, 1974, Julian Donohue (Townes). Figure 265 is from the type.

Paratype: ♂, Monteverde, Costa Rica, June 10 to 15, 1974, Julian Donohue (Los Angeles).

61. Exallonyx rudis, new species

Figure 266 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.0 to 3.3 mm. long. Body slender. Eye bulged. Temple short and sloping. Cheek 0.88 as long as temple. Clypeus 2.0 as wide as long, moderately convex. Tyloids lacking. Second flagellar segment 3.8 as long as wide. Pronotum with epomia weak, no hairs behind epomia and carina on collar, and a single row of moderately sparse hairs near upper edge. Metapleurum, propodeum, and abdominal stalk as in figure 266. Hind femur 5.0 as long as deep. Stigma 2.3 as long as deep, receiving radius near basal 0.43. Radius joining costa at 25°. Syntergite with median groove reaching 0.67 to space between thyridia, with 2 deep lateral grooves that are 0.7 as long as median groove. Thyridium 3.2 as wide as long.

Black. Scape and pedicel stramineous to dark brown. Mandible brown. Palpi stramineous. Tegula, front leg, and middle and hind trochanters entirely stramineous or the front femur partly light brown. Middle coxa light brown to dark brown. Hind coxa blackish brown. Middle and hind femora brown, the hind femur darker and both femora very pale at base. Middle tibia and tarsus pale brown or light brown. Hind tibia and tarsus brown. Wings with a faint tinge of brown. Stigma and strong veins blackish brown.

Female: Unknown.

Type: ♂, 14 kilometers north of Ureña, Costa Rica, June 20 to 23, 1974, Julian Donohue (Townes).

Paratypes: 12♂, same data as type (Los Angeles and Townes).

C. Cingulatus Group

Front wing 2.8 to 3.7 mm. long. Male flagellum without raised tyloids. Lower corner of pronotum with two adjacent pits, one above the other. Upper edge of pronotum with a single row of sparse hairs or none. Epomia present or absent. Side of pronotum without hairs behind upper end of carina on collar. Paired smooth areas on upper face of propodeum reaching a little behind spiracle. Hind margin of hind wing with shallow rounded notch at basal 0.35. Under side of abdominal stalk with several transverse ridges at front end. Side of abdominal stalk with distinct grooves. Upper profile of abdominal stalk straight. Hairs on syntergite short and sparse, none of them close to lower edge of syntergite. Base of syntergite with a median longitudinal groove and 2 or 3 grooves on each side of median groove. Male clasper of one species (*E. seyrigi*) tapered to a slender point, decurved, claw-like. Male of other species unknown. Ovipositor sheath punctate and longitudinally striate.

This group includes 3 species, one in South Africa, one in Madagascar, and one in the Philippines.

Key to the species of the Cingulatus Group

1. Epomia absent. Madagascar. 1. seyrigi Risbec (p. 307)
Epomia present. 2
2. Grooves on abdominal stalk fine. Scape blackish. South Africa.
2. cingulatus, new species (p. 307)
Grooves on abdominal stalk moderately coarse. Scape light brown.
Philippines. 3. mindorensis, new species (p. 308)

1. Exallonyx seyrigi Risbec

Figure 267 (♂ metapleurum, propodeum, and abdominal stalk)

**Exallonyx alticola* var. *Seyrigi* Risbec, 1950. Travaux Lab. Ent. Sect. Soudanais Recherches Agron. I, II: 516. ♂. des., figs. Lectotype: ♂ (labeled by Townes in 1975 and hereby designated), Madagascar: Tananarive (Paris). Examined in 1975.
Codrus alticola var. *seyrigi* Sundholm, 1970. South African Animal Life 14: 307. syn.

Male: Front wing 3.1 to 3.7 mm. long. Temple 0.50 as long as eye. Cheek 0.25 as long as short diameter of eye. Second flagellar segment 3.6 as long as wide. Tenth flagellar segment 3.3 as long as wide. Epomia absent. Stalk of abdomen and hind part of thorax as in figure 267. Hind femur 4.7 as long as deep. Median groove on syntergite reaching 0.75 to space between thyridia, on each side of it 2 or 3 grooves that are 0.75 to 0.9 as long as median groove. Clasper slender, decurved, claw-like.

Black. Mandible dark brown. Palpi and tegula pale fulvous. Front and middle legs fulvous, their trochanters pale fulvous and middle coxa brown. Hind coxa and femur dark brown, the femur pale brown basally. Hind trochanter pale brown. Hind tibia and tarsus brown. Wings with a weak fuscous tinge, the stigma and strong veins dark brown.

Female: Unknown.

Specimens: 10♂, near Rogez, Madagascar, May, June, July to Aug., and Nov., 1946, C. Lambertson (Townes). ♂, Tananarive, Madagascar, Mar. 3, 1932, A. Seyrig (Townes).

2. Exallonyx cingulatus, new species

Figures 268 (♀ metapleurum, propodeum, and abdominal stalk);
510 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.8 to 3.1 mm. long. Temple 1.0 as long as eye. Cheek 0.86 as long as short diameter of eye. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 1.8 as long as

wide. Epomia strong. Abdominal stalk and hind part of thorax as in figure 268. Hind femur 4.0 as long as deep. Syntergite with a median groove reaching 0.65 to space between thyridia, plus 2 grooves on each side that are 0.4 to 0.6 as long as median groove. Ovipositor sheath as in figure 510.

Black. Mouth parts and front and middle legs dark brown, the trochanters a little paler than the femora and coxae. Tegula reddish brown. Hind leg blackish brown, its trochanter light brown. Wings faintly infuscate, the stigma and strong veins dark brown.

Type: ♀, Magoebaskloof (near Tzaneen), South Africa, Jan. 18, 1971, H. and M. Townes (Townes). Figures 268 and 510 are from the type.

Paratypes: ♀, Jonkershoek (near Stellenbosch), South Africa, Jan. 4, 1971, H. and M. Townes (Townes). 2♀, Kenton-on-Sea, South Africa, May 1971 and Oct. 1971, Rex Jubb (Townes).

3. Exallonyx mindorensis, new species

Figures 269 (♀ metapleurum, propodeum, and abdominal stalk);
511 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.0 mm. long. Temple 0.79 as long as eye. Cheek 0.53 as long as short diameter of eye. Second flagellar segment 1.9 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia weak. Metapleurum, propodeum, and abdominal stalk as in figure 269. Hind femur 3.8 as long as deep. Grooves at base of syntergite as in *E. cingulatus*. Ovipositor sheath 0.50 as long as hind tibia, as in figure 511.

Black. Mandible dark brown. Palpi stramineous. Scape, pedicel, and first segment of flagellum light brown, the first segment of flagellum blackish beyond middle. Tegula fulvous. Front and middle legs light brown, the middle coxa dark brown, trochanters pale fulvous, and femora pale fulvous basally and narrowly at apex. Hind leg dark brown, the narrow apex of coxa and of femur, the trochanter, and base of femur pale fulvous. Wings with a faint tinge of brown, the stigma and strong veins dark brown.

Type: ♀, Ilong, 4,500 ft. on Mt. Halcon, Mindoro, Philippines, May 9, 1954, M. and D. Townes (Townes).

D. Leptonyx Group

Front wing 2.4 to 4.8 mm. long. Male flagellum with or without raised tyloids, the tyloids in the shape of raised flat topped tubercles or raised ridges. Lower corner of pronotum with two adjacent pits, one above the other. Upper edge of pronotum with a variable number of hairs, sometimes with none. Epomia present or absent. Side of pronotum without hairs behind epomia and upper end of carina on collar. Paired smooth areas on upper face of propodeum reaching far behind propodeal

spiracle. Hind margin of hind wing with a shallow notch at basal 0.35. Hairs on syntergite sparse to numerous, short to long, in a few species the lowermost hair sockets within 1.3 hair lengths of lower margin of syntergite. Base of syntergite with a median groove, and 1 or 2 grooves on each side of median groove. Male clasper slender, sharply pointed, decurved, claw-like. Ovipositor sheath punctate, often also with longitudinal striae.

This group includes 20 species, all of them Neotropic.

Keys to the species of the Leptonyx Group

Males

(Males of *livatus*, *leptopus*, *enomus*, and *lispus* are unknown.)

1. Hairs on syntergite unusually long and numerous, the hair sockets closest to lower margin of syntergite separated from lower margin by no more than 1.3 hair lengths. Slender species with large wings. 2
- Hairs on syntergite not unusually long and numerous, the hair sockets closest to lower margin of syntergite separated from lower margin by less than 1.4 hair lengths. 3
2. Flagellar segments without tyloids. Hind coxa pale fulvous.
 - Colombia. 1. amplipennis, new species (p. 311)
 - Flagellar segments 3-8 with ridge-shaped tyloids. Hind coxa more or less dark brown. Colombia.
 2. lophotos, new species (p. 312)
3. Flagellar segments 3-8 with tyloids in the form of raised elliptic areas. 4
- Flagellum without tyloids. 6
4. Clasper very weakly curved and only moderately slender. Tyloids about 0.3 as long as flagellar segments, not polished. Ecuador.
 3. pustula, new species (p. 313)
- Clasper strongly decurved and slender, claw-like. Tyloids more than 0.3 as long as segments, polished. 5
5. Larger tyloids about 0.6 as long as their segments. Hairs on upper margin of pronotum in a double row. Trochanters black. Ecuador. 4. specularis, new species (p. 313)
- Larger tyloids about 0.4 as long as their segments. Hairs on upper margin of pronotum in a single row. Trochanters brown to blackish. Ecuador and Peru.
 5. carbunculus, new species (p. 314)
6. Trochanters black. 7
- Trochanters ochraceous to fulvous or light brown. 8

7. Front 0.4 of metapleurum smooth. Upper profile of stalk of abdomen straight. Ecuador. 6. truncatus, new species (p. 315)
 Front 0.15 of metapleurum smooth. Upper profile of stalk of abdomen convex because of a dorsal rugose bulge. Ecuador.
 7. thymobasis, new species (p. 316)
8. Metapleurum rugose on hind 0.4 or more. 9
 Metapleurum rugose on less than hind 0.4. 13
9. Hind coxa black. Hind half of speculum with hairs only on upper 0.15. Ecuador. 8. calvescens, new species (p. 316)
 Hind coxa fulvous or fulvous and brown. Hind half of speculum with hairs on upper 0.6±. 10
10. Metapleurum rugose on hind 0.9. Brazil.
 12. durus, new species (p. 318)
 Metapleurum rugose on hind 0.4 to 0.7. 11
11. Upper profile of abdominal stalk straight. Clasper very slender. Occipital carina of normal height. Mexico.
 13. triglyptus, new species (p. 319)
 Upper profile of abdominal stalk convex. Clasper moderately slender. Occipital carina high, reflexed. 12
12. Clypeus small, strongly convex, its apical 0.5 beveled to marginal flange. Abdominal stalk 1.2 as long as high. Ecuador.
 14. angustoralis, new species (p. 320)
 Clypeus large, weakly convex, its apical 0.2 concavely declivous to margin, with a sharp-edged overhang. Abdominal stalk 0.8 as long as high, with a pair of long tubercle-like ridges above. Ecuador. 15. binodus, new species (p. 320)
13. Lateral grooves of syntergite about 0.9 as long as median groove. First thyridia very close together, separated from each other by 0.4 the width of a thyridium. Mexico.
 17. pentaglyptus, new species (p. 322)
 Lateral grooves of syntergite 0.4 to 0.8 as long as median groove. 14
14. Upper margin of pronotum with hairs only on hind half. Abdominal stalk 1.8 as long as high. Weak veins light brown. Bolivia.
 18. leptonyx, new species (p. 322)
 Upper margin of pronotum with hairs the entire length. Abdominal stalk 0.6 to 1.0 as long as high. Weak veins unpigmented to faintly brown. 15
15. Hind half of speculum with hairs on upper 0.7. Sculpture of hind half of propodeum mostly reticulations or pock marks. Ecuador.
 19. variolae, new species (p. 323)
 Hind half of speculum with hairs on upper 0.15. Sculpture of hind half of propodeum mostly transverse wrinkles. Mexico.
 20. substriatus, new species (p. 323)

Females

(Females of *amplipennis*, *lophotos*, *specularis*, *thymobasis*, *calvescens*, *triglyptus*, *angustoralis*, *binodus*, *pentaglyptus*, *leptonyx*, *variolae*, and *substriatus* are unknown.)

1. Trochanters brown or black. 2
Trochanters stramineous. 5
2. Side of abdominal stalk with the usual strong ridges. 3
Side of abdominal stalk smooth or almost smooth. 4
3. Ovipositor sheath punctate, not striate. Second flagellar segment
1.7 as long as wide. Ecuador.
3. pustula, new species (p. 313)
Ovipositor sheath punctate and striate. Second flagellar segment
2.0 as long as wide. Ecuador and Peru.
5. carbunculus, new species (p. 314)
4. Hind slope of propodeum coarsely reticulate. Ecuador.
6. truncatus, new species (p. 315)
Hind slope of propodeum transversely wrinkled. Colombia.
9. liratus, new species (p. 317)
5. Hind slope of propodeum almost smooth. Costa Rica.
16. lispus, new species (p. 321)
Hind slope of propodeum strongly reticulate. 6
6. Second flagellar segment 4.3 as long as wide. Upper margin of
pronotum with a band of hairs that is about 3 hairs wide.
Mexico. 10. leptopus, new species (p. 317)
Second flagellar segment 2.3 to 2.8 as long as wide. Upper margin
of pronotum with a single row of sparse hairs. 7
7. Metapleurum with upper front 0.35 smooth, the rest strongly reticu-
lately wrinkled. Stalk of abdomen 1.0 as long as high. Brazil.
11. enomus, new species (p. 318)
Metapleurum almost completely reticulately wrinkled, only a small
upper front corner not wrinkled. Stalk of abdomen 1.15 as long
as high. Brazil. 12. durus, new species (p. 318)

1. Exallonyx amplipennis, new species

Figure 270 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.6 to 4.8 mm. long. Body slender and wings large. Clypeus large, very weakly, evenly convex. Tyloids absent. Second flagellar segment 5.1 as long as wide. Tenth flagellar segment 3.8 as long as wide. Epomia absent. Upper margin of pronotum with a

single row of moderately long hairs. Speculum with hairs on upper 0.4. Lower half of mesopleurum with hair sockets separated by 0.35 hair length. Abdominal stalk and hind part of thorax as in figure 270. Hind femur 6.3 as long as deep. Hairs on syntergite numerous and long, the sockets of lower hairs separated from lower end of syntergite by 1.3 hair lengths. Median groove of syntergite reaching 0.75 to space between thyridia. Syntergite with 2 lateral grooves, the first 0.8 as long as median groove and second 0.6 as long as median groove. First thyridium 3.8 as wide as long. Clasper very slender, strongly decurved.

Black. Mandible brown. Palpi, tegula, coxae, and trochanters very pale fulvous. Legs beyond trochanters light brown, the lower 0.7± of femora pale fulvous. Wings with a faint tinge of brown. Stigma and strong veins blackish brown. Weak veins pale brown.

Female: Unknown.

Type: ♂, elfin forest, Caldás, 5° 15' N, 76° 25' W, 3,300-3,500 m., Colombia, Apr. 5, 1973, J. Helava (Ottawa).

Paratype: ♂, same data as type (Ottawa).

2. Exallonyx lophotos, new species

Figures 571 (♂ tyloids); 271 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.6 to 4.1 mm. long. Body slender and wings large. Clypeus of moderate size, moderately convex, its apical 0.4 with a flat bevel to marginal flange. Tyloids on flagellar segment 3-8, as in figure 571, the tyloids diminishing in size from segment 5 to 8. Second flagellar segment 3.1 as long as wide. Tenth flagellar segment 3.3 as long as wide. Epomia weak. Upper margin of pronotum with a single, moderately dense row of hairs. Speculum with hairs on upper 0.6. Lower half of mesopleurum with hair sockets separated by 0.4 hair length, its upper median section bare or with sparser hairs. Abdominal stalk and hind part of thorax as in figure 271. Hind femur 5.3 as long as deep. Hairs on syntergite long and very numerous, the lowest hair sockets separated from lower margin of syntergite by 0.8 hair length. Syntergite with median groove reaching 0.9 to space between thyridia, and 2 lateral grooves 0.5 as long as median groove. First thyridium 3 times as wide as long. Clasper slender, strongly decurved.

Black. Palpi stramineous. Mandible dark brown. Tegula light fulvous. Coxae fulvous to dark brown, the hind coxa always dark basally. Trochanters dark brown to black, usually light brown apically. Femora fulvous to brown. Tibiae and tarsi dark brown to black. Wings faintly infuscate. Stigma and strong veins blackish brown. Weak veins tinged with brown.

Female: Unknown.

Type: ♂, elfin forest, Caldás, 5° 15' N, 76° 25' W, 3,300-3,500 m., Colombia, Apr. 5, 1973, J. Helava (Ottawa)

Paratypes: 4♂, same data as type (Ottawa and Townes).

3. Exallonyx pustula, new species

Figures 572 (σ tyloids); 272 and 273 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 512 (ovipositor sheath)

Front wing 2.4 to 3.4 mm. long. Temple of female 1.5 as long as eye. Cheek of female 1.2 as long as short diameter of eye. Occipital carina moderately high. Clypeus moderately large, weakly convex, its apical bevel somewhat concave so that there is a weak median overhang, the bevel 0.3 as long as clypeus in male, 0.2 as long in female. Tyloids present on flagellar segments 3-9 (fig. 572), in the form of slightly raised elliptic areas that may be hairless or are minutely punctate, the tyloids varying from 0.25 as long to 0.4 as long as the segments. Second flagellar segment 3.7 as long as wide in male, 1.7 as long as wide in female. Tenth flagellar segment 3.0 as long as wide in male, 1.4 as long as wide in female. Epomia weak. Upper margin of pronotum with a single, moderately dense row of hairs. Speculum with hairs on upper front 0.4. Lower half of mesopleurum with hair sockets separated by 0.6 hair length. Abdominal stalk and hind part of thorax as in figure 272 (σ) and 273 (♀). Hind femur 4.4 as long as deep in male, 4.1 as long as deep in female. Hairs on syntergite moderately sparse, the hairs in the groups near the 3 pair of thyridia about as long as distance between their sockets, none of the hairs close to lower margin of syntergite. Median groove of syntergite reaching 0.7 to space between thyridia. One (or sometimes two) lateral grooves present, these 0.6 as long as median groove. First thyridium of male 3.0 as wide as long. First thyridium of female 2.4 as wide as long. Clasper very narrowly triangular, very weakly decurved. Ovipositor sheath as in figure 512.

Black. Palpi and tegula dark brown. Mandible brown. Antenna blackish. Front and middle coxae brownish fulvous to brown. Trochanters brown or dark brown, paler at the ends. Front and middle legs brown. Hind legs darker brown than front and middle legs. Wings subhyaline. Stigma and strong veins dark brown. Weak veins unpigmented or with a weak tinge of brown.

Type: σ , Pimo, north of Cañar, 3,200 m., Ecuador, Dec. 10-12, 1970, Luis E. Peña (Townes). Figure 272 as from the type.

Paratypes: 19 σ , 1 ♀ , same data as type (Townes and Ottawa). σ , south of Cuenca, 2,500-2,800 m., Ecuador, Mar. 15, 1965, Luis E. Peña (Townes).

4. Exallonyx specularis, new species

Figures 573 (σ tyloids); 274 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.2 to 4.5 mm. long. Clypeus large, weakly evenly convex. Flagellum with tyloids on segments 3-10 or 3-11 (fig. 573), the tyloids in the form of elliptic, polished, weakly raised areas, largest on segments 5-8 where they are about 0.6 as long as the segments. Second flagellar segment 3.4 as long as wide. Tenth flagellar

segment 2.7 as long as wide. Epomia absent. Upper margin of pronotum with a stripe of hairs that is 2 hairs wide. Speculum with hairs on upper 0.3 and upper front 0.4. Hair sockets on lower half of mesopleurum separated by 0.4 hair length. Abdominal stalk and hind part of thorax as in figure 274. Hind femur 5.6 as long as deep. Hairs on syntergite moderately sparse, the hair groups below the three thyridia with sockets separated by 0.8 hair length, none of the hairs close to lower edge of syntergite. Syntergite with median groove reaching 0.65 to space between thyridia and a broad lateral groove that is 0.75 as long as the median groove. Sometimes there is also a narrow weak groove between the lateral and median grooves. First thyridium 3.4 as wide as long. Clasper moderately slender, decurved.

Black. Palpi light brown. Mandible brown. Tegula reddish brown. Tibiae and tarsi dark brown or blackish, the rest of legs black. Wings with a fuscous tinge. Stigma and strong veins black. Weak veins with a tinge of brown.

Female: Unknown.

Type: ♂, east of Papallacta, 2,900 m., Ecuador, Jan. 14-17, 1971, Luis E. Peña (Townes). Figures 274 and 573 are from the type.

Paratypes: 2♂, same data as type (Townes). ♂, east of Papallacta, 3,000 m., Ecuador, Jan. 11, 1971, Luis E. Peña (Townes).

5. Exallonyx carbunculus, new species

Figures 574 (♂ tyloids); 275 and 276 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 513 (ovipositor sheath)

Front wing 2.7 to 4.1 mm. long. Temple of female 1.2 as long as eye. Cheek of female 0.83 as long as short diameter of eye. Clypeus moderately large, moderately convex, its apical 0.3 sloped to marginal flange. Flagellum with tyloids on segments 3-8 or 3-9 (fig. 574), the tyloids in the form of an elliptic, polished, weakly raised area. Largest tyloids 0.5 as long as segments, the tyloids largest on segments 5 and 6, smaller on segments basad and apicad of these two. Second flagellar segment 2.7 as long as wide in male, 2.0 as long as wide in female. Tenth flagellar segment 2.7 as long as wide in male, 1.6 as long as wide in female. Epomia weak or indistinct. Upper margin of pronotum with a single row of moderately short hairs. Speculum with hairs on upper 0.5 and front 0.2. Lower half of mesopleurum with hairs sparse or absent near its upper edge, elsewhere the hair sockets separated by 0.4 to 0.7 hair length. Abdominal stalk and hind half of thorax as in figures 275 (♂) and 276 (♀). Hind femur 4.9 as long as deep in male, 4.6 as long as deep in female. Hairs on syntergite moderately sparse, the sockets of hair groups below each of the 3 thyridia separated by 0.8 length of hairs, none of the hairs near lower margin of syntergite. Syntergite with median groove reaching 0.65 to space between thyridia, and one broad lateral groove 0.6 as long as median groove. First thyridium of male 4.1 as wide as long. First thyridium of female 3.1 as wide as long. Clasper moderately slender, decurved. Ovipositor sheath as in figure 513.

Black. Palpi stramineous to pale brown. Mandible brown. Scape of male brown to black. Tegula fulvous to light reddish brown. Front and middle coxae fulvous to brown. Hind coxa dark brown with apical part paler, to entirely black. Trochanters of male fulvous to dark brown, of female light brown to dark brown, the hind trochanter darkest of the 3 and front trochanter palest. Legs beyond trochanters brown to black, the front leg palest of the 3 and hind leg darkest. Wings with a weak fuscous tinge. Stigma and strong veins black. Weak veins pale brown.

Type: ♂, Portete de Tarqui, 2,900-3,200 m., Ecuador, Dec. 4-7, 1970, Luis E. Peña (Townes). Figures 276 and 574 are from the type.

Paratypes: ♂, same data as type (Townes). ♂, 2♀, Cerro Tinajillas, 3,200 m., Ecuador, Mar. 18-21, 1965, Luis E. Peña (Townes). 2♂, east of Papallacta, Ecuador, 2,900 m. and 3,000 m., Jan. 11 and Jan. 14-17, 1971, Luis E. Peña (Townes). 2♂, Pimo, north of Cañar, 3,200 m., Ecuador, Dec. 10-12, 1970, Luis E. Peña (Townes). ♂, San Gabriel, Carchi, Ecuador, June 10, 1965, Luis E. Peña (Townes). ♂, Tulcán, 2,800 m., Ecuador, June 27, 1965, Luis E. Peña (Townes). 2♂, Machu Picchu, Peru, Nov. 29, 1965, H. and M. Townes (Townes).

6. Exallonyx truncatus, new species

Figures 277 and 278 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 514 (ovipositor sheath)

Front wing 3.3 to 4.2 mm. long. Temple of female 1.2 as long as eye. Cheek of female 0.76 as long as short diameter of eye. Clypeus moderately large, moderately convex, its apical 0.3 sloped to marginal flange. Tyloids absent. Second flagellar segment 3.2 as long as wide in male, 2.3 as long as wide in female. Tenth flagellar segment 3.1 as long as wide in male, 1.9 as long as wide in female. Epomia indistinct. Upper margin of pronotum with a single row of irregular, moderately sparse hairs. Hair sockets on lower half of mesopleurum separated by 0.5 to 0.7 hair length. Abdominal stalk and hind part of thorax as in figures 277 (♂) and 278 (♀). Hind femur 5.2 as long as deep in male, 4.6 as long as deep in female. Hairs on syntergite moderately sparse, the sockets of hair groups below the 3 thyridia separated by 0.7 hair length in male, by 1.0 hair length in female. Median groove of syntergite reaching 0.55 to space between thyridia, the male with 2 lateral grooves 0.8 as long as median groove, the female without lateral grooves. First thyridium of male 2.6 as wide as long. First thyridium of female 2.5 as wide as long. Clasper moderately slender, decurved. Ovipositor sheath as in figure 514.

Black. Palpi stramineous to brown. Mandible brown. Tegula fulvous brown to dark brown. Legs dark brown to black. Wings with a fuscous tinge. Stigma and strong veins black. Weak veins with a weak tinge of brown.

Type: ♂, Pimo, north of Cañar, 3,200 m., Ecuador, Dec. 10-12, 1970, Luis E. Peña (Townes). Figure 277 is from the type.

Paratypes: ♂, 2♀, same data as type (Townes). ♂, Ambato,

2,600 m., Ecuador, Nov. 30, 1956, J. Foerster (Ottawa). ♂, between Quito and Santo Domingo, 2,800 m., Ecuador, Dec. 20, 1970, Luis E. Peña (Townes). ♂, Portete de Tarquí, 2,900-3,200 m., Ecuador, Dec. 4-7, 1970, Luis E. Peña (Townes). ♂, San Gabriel, Carchi, Ecuador, June 10, 1965, Luis E. Peña (Townes).

7. Exallonyx thymobasis, new species

Figure 279 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.0 to 4.8 mm. long. Clypeus moderately large, moderately convex, its apical 0.4 declivous to marginal flange. Tyloids absent. Second flagellar segment 3.7 as long as wide. Tenth flagellar segment 3.1 as long as wide. Epomia indistinct. Upper margin of pronotum with a single row of moderately dense hairs. Speculum with hairs on upper 0.65 and at front end. Hair sockets on lower half of mesopleurum separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figure 279. Hind femur 5.8 as long as deep. Hairs on syntergite moderately dense and long, the sockets of those grouped below the 3 thyridia separated by 0.5 hair length, the hair sockets closest to lower margin of syntergite distant from margin by 2.5 hair lengths. Syntergite with median groove reaching 0.75 to space between thyridia, with 2 lateral grooves 0.7 to 1.0 as long as median groove. First thyridium 3.2 as wide as long. Clasper slender, strongly decurved.

Black. Palpi, mandible, and front and middle tarsi brown. Tegula fulvous brown. Wings with a fuscous tinge. Stigma and strong veins blackish brown. Weak veins light brown.

Female: Unknown.

Type: ♂, east of Papallacta, 3,000 m., Ecuador, Jan. 11, 1971, Luis E. Peña (Townes). Figure 279 is from the type.

Paratypes: 3♂, east of Papallacta, 2,900 and 3,000 m., Ecuador, Jan. 11 and Jan. 14-17, 1971, Luis E. Peña (Townes).

8. Exallonyx calvescens, new species

Figure 280 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 4.7 mm. long. Clypeus wide, strongly convex, its apical half sloped to marginal flange with a weak concavity. Tyloids absent. Second flagellar segment 3.3 as long as wide. Tenth flagellar segment 2.9 as long as wide. Epomia weak. Upper margin of pronotum with a moderately dense single row of short hairs. Speculum with hairs on upper front 0.3, its hind half with hairs only at upper margin. Lower half of mesopleurum with hair sockets on its upper and median part separated by 1.3 hair lengths, denser elsewhere. Stalk of abdomen and hind part of thorax as in figure 280. Hind femur 5.0 as long as deep. Hairs on syntergite moderately sparse and moderately long, the hair sockets below the 3 thyridia separated by 0.8 hair length, none of them close to lower margin of syntergite. Syntergite with median groove reaching 0.75 to space between thyridia, with two lateral grooves of which

the one closest to median groove is 0.95 as long as median groove, the other 0.7 as long as median groove. First thyridium 3.9 as wide as long. Clasper moderately slender, weakly decurved.

Black. Palpi pale brown. Mandible dark brown. Tegula reddish brown. Front coxa brown. Middle and hind coxa blackish brown. All coxae light brown apically. Trochanters light brown. Front femur brown, middle femur blackish brown, and hind femur black; all femora light brown at base. Front and middle tarsi brown. Wings with a fuscous tinge. Stigma and strong veins blackish brown. Weak veins faintly tinged with brown.

Female: Unknown.

Type: ♂, east of Papallacta, 2,900 m., Ecuador, Jan. 14-17, 1971, Luis E. Peña (Townes).

9. Exallonyx liratus, new species

Figures 281 (♀ metapleurum, propodeum, and abdominal stalk);
515 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 4.6 mm. long. Temple 1.4 as long as eye. Cheek 1.5 as long as short diameter of eye. Clypeus of moderate size, with a weak, even convexity. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 1.8 as long as wide. Epomia absent. Upper margin of pronotum with a single row of sparse hairs. Hair sockets on lower half of mesopleurum separated by 0.6 hair length. Abdominal stalk and hind part of thorax as in figure 281. Hind femur 4.4 as long as deep. Hairs on syntergite moderately sparse, the hair groups below the 3 thyridia with sockets separated by 0.9 hair length. Syntergite with median groove reaching 0.5 to space between thyridia, without lateral grooves. First thyridium 2.9 as wide as long. Ovipositor sheath as in figure 515.

Black. Palpi light brown. Mandible dark brown. Tegula fulvous brown. Tarsi dark brown. Wings with a fuscous tinge. Stigma and strong veins black. Weak veins light brown.

Type: ♀, Páramo Palacio, near Calera, Colombia, Nov. 17, 1965, H. and M. Townes (Townes).

10. Exallonyx leptopus, new species

Figures 282 (♀ metapleurum, propodeum, and abdominal stalk); 516 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.7 mm. long. Temple 1.55 as long as eye. Cheek 0.80 as long as short diameter of eye. Clypeus 2.7 as wide as long, moderately convex, its apical 0.3 declivous to marginal flange, concave in profile with a weak rounded overhang medially. Second flagellar segment 4.3 as long as wide. Tenth flagellar segment 2.7 as long as wide. Epomia moderately strong but blunt. Upper margin of

pronotum with a hair band that is about 3 hairs wide. Speculum with hairs on upper 0.65. Lower half of mesopleurum with hair sockets separated by about 0.65 length of the hairs. Abdominal stalk and hind part of thorax as in figure 282. Hind femur 6.2 as long as deep. Hairs on syntergite moderately long, moderately sparse. Median groove on syntergite reaching 0.85 to thyridial interspace, on each side of median groove a broad deep groove that is 0.6 as long as median groove, also with a shallow groove or impression between it and the median groove. Ovipositor sheath as in figure 516.

Black. Mouth parts, tegula, and trochanters brownish stramineous. Scape, pedicel, and front and middle legs except trochanters pale brown. Flagellum blackish brown. Hind leg except trochanter dark brown. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♀, 15 miles west of El Palmito, 5,000 ft., Sinaloa, Mexico, July 30, 1964, W. R. M. Mason (Ottawa).

11. Exallonyx enomus, new species

Figures 283 (♀ metapleurum, propodeum, and abdominal stalk);
517 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.6 mm. long. Temple 0.9 as long as eye. Cheek 0.59 as long as short diameter of eye. Clypeus of moderate size, moderately convex, its apical 0.4 beveled to apical flange. Second flagellar segment 2.3 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia absent. Upper margin of pronotum with a row of about 8 long hairs (in addition to the group of hairs on hind corner). Speculum with hairs on front edge and upper 0.4. Lower half of mesopleurum with hairs of moderate length, the hair sockets separated by 0.6 the length of the hairs, hairs sparse near the horizontal groove. Stalk of abdomen and hind part of thorax as in figure 283. Hind femur 4.0 as long as deep. Hairs on syntergite sparse. Base of syntergite with median groove reaching 0.7 to thyridial interspace, and one lateral groove that is 0.6 as long as median groove. First thyridium 2.2 as wide as long. Ovipositor sheath as in figure 517.

Black. Palpi stramineous. Mandible brown. Scape, pedicel, tegula, front coxa, and trochanters fulvous. Front and middle legs beyond trochanters light brown. Middle coxa brownish fulvous. Hind leg except trochanter brown. Wings with a brown tinge. Stigma and strong veins dark brown.

Type: ♀, Alto da Serra, Morretes, Brazil, Feb. 9, 1966, H. and M. Townes (Townes).

12. Exallonyx durus, new species

Figures 284 and 285 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 518 (ovipositor sheath)

Front wing 2.4 to 3.0 mm. long. Temple of female 0.88 as long as

eye. Cheek of female 1.15 as long as eye. Clypeus small, with a moderately strong convexity, its apical 0.35 concavely declivous to marginal flange. Second flagellar segment of male 4.2 as long as wide, of female 2.8 as long as wide. Tenth flagellar segment of male 2.7 as long as wide, of female 1.95 as long as wide. Epomia absent. Upper margin of pronotum with a row of about 8 hairs (in addition to the group of hairs at its hind corner). Speculum with hairs on upper front 0.55. Lower half of mesopleurum with hair sockets separated by 0.6 to 0.8 length of the hairs. Stalk of abdomen and hind part of thorax as in figures 284 (♂) or 285 (♀). Hind femur of male 4.8 as long as deep, of female 5.5 as long as deep. Hairs on syntergite sparse, moderately long. Syntergite with median groove reaching 0.7 to interthyridial space, and one broad groove on each side of median groove that is 0.7 (♂) or 0.5 (♀) as long as median groove. Clasper very slender, decurved. Ovipositor sheath as in figure 518.

Black. Palpi stramineous. Mandible light brown. Scape, pedicel, tegula, front and middle legs, and hind trochanter light fulvous. Flagellum of male blackish, of female brown. Hind coxa fulvous, brown basad. Hind femur, tibia, and tarsi brown, the femur paler at base and apex. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♂, Quatro Barros, near Curitiba, Brazil, Feb. 7, 1966, H. and M. Townes (Townes). Figure 284 is from the type.

Paratypes: ♂, Chulumani, 1,700 m., Yungas, Bolivia, Dec. 19-29, 1955, L. E. Peña (Ottawa). 2♀, Nova Teutonia, 300-500 m., Santa Catarina, Brazil, May 1971, Fritz Plaumann (Ottawa).

13. Exallonyx triglyptus, new species

Figure 286 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.4 to 3.7 mm. long. Clypeus of moderate size, weakly convex, its apical 0.2 abruptly declivous to marginal flange. Tyloids absent. Second flagellar segment 3.6 as long as wide. Tenth flagellar segment 3.7 as long as wide. Epomia distinct. Upper margin of pronotum with a moderately dense row of hairs that is partially a double row. Speculum with hairs on upper 0.5 and front 0.2. Hair sockets on lower half of mesopleurum separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figure 286. Hind femur 5.8 as long as deep. Hairs on syntergite moderately long and numerous, the hair sockets below the 3 thyridia separated by 0.7 hair length, the lowest sockets distant from lower edge of syntergite by about 3.5 hair lengths. First thyridium 3.9 as wide as long. Clasper very slender, decurved.

Black. Mandible light brown. Scape and pedicel fulvous, usually brown above. Palpi, tegula, front and middle legs, hind coxa, hind trochanter, and hind femur pale fulvous, the upper side of hind femur brownish. Hind tibia and tarsus brown. Wings with a faint tinge of brown. Stigma and strong veins brown. Weak veins unpigmented.

Female: Unknown.

Type: ♂, kilometer 185.5 on the Tuxtepec to Oaxaca road, 2,200 m.,

Oaxaca, Mexico, Oct. 22, 1962, H. and M. Townes (Townes). Figure 286 is from the type.

Paratypes: 5♂, same data as type (Townes). 3♂, Vista Hermosa, (96.5 kilometers southwest of Tuxtepec), 1,450 m., Oaxaca, Mexico, Oct. 19 and 20, 1962, H. and M. Townes (Townes).

14. Exallonyx angustoralis, new species

Figure 287 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.8 mm. long. Clypeus small, strongly convex, its apical 0.6 beveled to marginal flange. Tyloids absent. Second flagellar segment 3.9 as long as wide. Tenth flagellar segment 2.9 as long as wide. Epomia distinct. Upper margin of pronotum with a single row of fine hairs. Speculum with hairs on upper 0.55 and front 0.25. Lower half of mesopleurum with long hairs the sockets of which are separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figure 287. Hind femur 5.2 as long as deep. Hairs on syntergite sparse, moderately long. Syntergite with median groove reaching 0.65 to space between thyridia, with one broad lateral groove 0.75 as long as median groove. First thyridium 2.7 as wide as long. Clasper moderately slender, decurved.

Black. Mandible, palpi, scape, pedicel, tegula, and front and middle legs light fulvous brown, the front coxa and trochanter paler. Hind coxa brown, the apical 0.3 pale brown. Hind trochanter fulvous. Hind femur fulvous brown. Hind tibia and tarsus dark brown. Wings subhyaline. Stigma and strong veins brown. Weak veins with a tinge of brown.

Female: Unknown.

Type: ♂, Portete de Tarqui, 2,900 to 3,200 m., Ecuador, Dec. 4-7, 1970, Luis E. Peña (Townes).

15. Exallonyx binodus, new species

Figure 288 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.9 mm. long. Clypeus large, weakly convex, its apical 0.2 concavely declivous from a sharp ridge. Tyloids absent. Second flagellar segment 4.3 as long as wide. Tenth flagellar segment 4.2 as long as wide. Epomia absent. Upper margin of pronotum with an irregular row of hairs that is mostly single. Speculum with hairs on upper 0.3, front 0.1, and hind 0.2. Lower half of mesopleurum dorsally and medially with almost no hairs, elsewhere with moderately dense hairs. Abdominal stalk and hind part of thorax as in figure 288. Hind femur 5.7 as long as deep. Hairs on syntergite moderately sparse, the sockets below the 3 thyridia separated by 0.6 hair length. Syntergite with median groove reaching 0.7 to space between thyridia and 2 lateral grooves 0.8± as long as median groove. First thyridium 2.6 as wide as long. Clasper moderately stout, weakly decurved.

Black. Mandible and under side of scape dark brown. Palpi fulvous.

Tegula and front and middle legs brownish fulvous, the front and middle femora brown above. Hind coxa and femur brownish fulvous, the coxa brown at base and femur brown above. Hind trochanter fulvous. Hind tibia and tarsus dark brown. Wings with a tinge of brown. Stigma and strong veins dark brown. Weak veins tinged with brown.

Female: Unknown.

Type: ♂, between Loja and Saraguro, 2,900 m., Ecuador, Dec. 27-29, 1970, Luis E. Peña (Townes).

16. Exallonyx lispus, new species

Figures 289 (♀ metapleurum, propodeum, and abdominal stalk);
519 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.7 mm. long. Temple 1.26 as long as eye. Cheek 0.89 as long as short diameter of eye. Clypeus of moderate size, strongly convex, its apical 0.45 concavely sloping to marginal flange, with a median overhang. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia distinct. Upper edge of pronotum with moderately sparse long hairs in a row partly single and partly double. Speculum with hairs on upper 0.3 and a few hairs near front edge. Lower half of mesopleurum with about 8 hairs on its upper 0.6, the lower 0.4 with hairs moderately dense. Abdominal stalk and hind part of thorax as in figure 289. Hind femur 3.7 as long as deep. Hairs on syntergite very sparse and short. Syntergite with median groove reaching 0.8 to space between thyridia, and 1 lateral groove 0.55 as long as median groove. First thyridium 1.9 as wide as long. Ovipositor sheath as in figure 519.

Black. Palpi stramineous. Mandible brown. Scape, pedicel, and front and middle coxae and trochanters fulvous. Hind trochanter ochraceous. Hind coxa dark brown, its apex fulvous. Front and middle legs beyond trochanters brown, the femora narrowly paler at base, knees narrowly paler, and tarsal segments 2-5 pale brown. Hind femur dark brown, ochraceous at base and narrowly light brown at apex. Hind tibia and tarsus dark brown. Wings with a weak brown tinge. Stigma and strong veins blackish brown. Weak veins not pigmented.

Type: ♀, Monteverde, Costa Rica, June 12-15, 1974, Julian Donohue (Townes). Figures 289 and 519 are from the type.

Paratypes: 4♀, Córdoba, Vera Cruz, Mexico, Apr. 20 and 24 and May 5, 1908, A. Fenyés (Washington). ♀, north of Cortez Pass, 10,000 ft., Mexico, Aug. 11, 1954, R. R. Dreisbach (East Lansing). ♀, San Cristóbal de las Casas, 7,200 ft., Chiapas, Mexico, May 17, 1969, W. R. M. Mason (Ottawa). ♀, Popocatépetl, 10,000 ft., Mexico, Aug. 16, 1956, R. and K. Dreisbach (East Lansing).

17. Exallonyx pentaglyptus, new speciesFigure 290 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.8 to 2.9 mm. long. Clypeus small, moderately convex, its apical 0.55 beveled to marginal flange. Tyloids absent. Second flagellar segment 3.7 as long as wide. Tenth flagellar segment 3.4 as long as wide. Epomia not distinct. Upper margin of pronotum with moderately dense hairs, mostly in a single row. Speculum with hair on upper 0.4 and front 0.3. Lower half of mesopleurum with hair sockets separated by 1.0 hair length. Abdominal stalk and hind part of thorax as in figure 290. Hind femur 5.6 as long as deep. Hairs on syntergite very sparse, long. Syntergite with median groove reaching 0.55 to space between thyridia and 2 lateral grooves almost the same length as median groove. First thyridium 2.7 as wide as long, the space between first thyridia 0.4 as great as width of a thyridium. Clasper very slender, decurved.

Blackish brown. Palpi stramineous. Scape, pedicel, tegula, coxae, and trochanters light fulvous, the hind coxa brown basally. Femora and front and middle tibiae pale fulvous, the femora brownish above. Tarsi and hind tibia brown. Wings subhyaline. Stigma and strong veins brown. Weak veins not pigmented.

Female: Unknown.

Type: σ , Desierto de los Leones, 2,000 m., Distrito Federal, Mexico, Oct. 13, 1962, H. and M. Townes (Townes). Figure 290 is from the type.

Paratype: σ , same data as type (Townes).

18. Exallonyx leptonyx, new speciesFigure 291 (σ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.6 mm. long. Body slender. Clypeus of moderate size, weakly convex, its apical 0.15 beveled to marginal flange. Tyloids absent. Second flagellar segment 4.4 as long as wide. Tenth flagellar segment 4.1 as long as wide. Occipital carina moderately high. Epomia absent. Upper margin of pronotum with hairs only on its hind half. Speculum with hairs on upper 0.65. Hair sockets on lower half of mesopleurum separated by 0.5 hair length, somewhat sparser near upper edge of lower half. Abdominal stalk and hind part of thorax as in figure 291. Hind femur 6.1 as long as deep. Hairs on syntergite long, very sparse. Syntergite with median groove reaching to space between thyridia and 2 lateral grooves 0.5 as long as median groove. First thyridium 2.4 as wide as long. Clasper very slender, decurved.

Black. Mandible brown. Palpi, tegula, coxae, and trochanters pale fulvous, the hind coxa brown basad. Front leg beyond trochanter brownish fulvous. Middle leg beyond trochanter fulvous brown. Hind leg beyond trochanter brown. All femora fulvous at base. Wings with a weak tinge of brown. Stigma and strong veins light brown. Weak veins with a brown tinge.

Female: Unknown.

Type: ♂, Villa Tunari, Chaparé, Bolivia, Jan. 1972, Manfredo Fritz (Townes).

19. Exallonyx variolae, new species

Figure 292 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.7 mm. long. Clypeus of moderate size, moderately convex, its apical 0.35 beveled to marginal flange. Tyloids absent. Second flagellar segment 3.4 as long as wide. Tenth flagellar segment 3.6 as long as wide. Epomia weak. Upper margin of pronotum with a single row of moderately long hairs. Speculum with hairs on upper 0.35 and front 0.3. Hair sockets on lower half of mesopleurum separated by 0.6 hair length. Abdominal stalk and hind part of thorax as in figure 292. Hind femur 5.0 as long as deep. Hairs on syntergite long and moderately numerous, the hair sockets below the 3 thyridia separated by 0.4 hair length. Syntergite with median groove reaching 0.75 to space between thyridia, and one broad lateral groove 0.7 as long as median groove. First thyridium 3.5 as wide as long. Clasper moderately slender, decurved.

Black. Palpi stramineous. Mandible brown. Antenna very dark brown. Tegula, coxae, trochanters, and femora pale fulvous, the hind coxa light brown at base above and femora brownish above. Tibiae and tarsi brown. Wings with a faint tinge of brown. Stigma and strong veins brown. Weak veins not darkened.

Female: Unknown.

Type: ♂, east of Papallacta, 3,000 m., Ecuador, Jan 11, 1971, Luis E. Peña (Townes).

20. Exallonyx substriatus, new species

Figure 293 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.5 mm. long. Clypeus of moderate size, moderately convex, its apical 0.5 sloped to marginal flange. Second flagellar segment 2.7 as long as wide. Tenth flagellar segment 2.3 as long as wide. Epomia indistinct. Upper margin of pronotum with a hair stripe that is about 2 hairs wide. Speculum with hairs on upper 0.65, front 0.3, and hind 0.25. Hair sockets on lower half of mesopleurum separated by 0.3 hair length. Abdominal stalk and hind part of thorax as in figure 293. Hairs on syntergite long, moderately numerous, the hair sockets below the 3 thyridia separated by 0.5 hair length. Syntergite with median groove reaching 0.7 to space between thyridia, and with 2 lateral grooves 0.7 to 0.8 as long as median groove. First thyridium 3.2 as wide as long. Clasper slender, decurved.

Black. Palpi pale brown. Mandible and scape dark brown. Tegula and legs fulvous, the hind coxa brownish at base, narrow apex of hind tibia brownish, and hind tarsus brown. Wings with a faint tinge of brown.

Weak veins not darkened. Stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, Hidalgo National Park, 3,000 m., State of Mexico, Mexico, Oct. 12, 1962, H. and M. Townes (Townes).

E. Atripes Group

Front wing 1.75 to 5.7 mm. long. Male flagellum without raised tyloids. Lower corner of pronotum with a single pit, in a few species with 1-3 shallow dimples above the pit. Upper edge of pronotum often with a band of hairs that is several hairs wide, sometimes with a single row or hairs and in a few species with only scattered hairs or none. Epomia present or absent. Side of pronotum without hairs behind epomia and upper end of carina on collar except in male of *E. nikkoensis*. Paired smooth areas on upper face of propodeum extending far behind propodeal spiracle except in *E. melanomerus* and *E. trachodes*. Hind margin of hind wing with a shallow notch at basal 0.35. Abdominal stalk with a transverse ridge at front end of under side, on sides with grooves or in females of some species partly to completely smooth. Upper profile of abdominal stalk straight or concave. Hairs on syntergite short to long, sparse to moderately dense, none of the hairs near lower margin of syntergite (their sockets separated from lower edge by at least 2 times the length of the hairs). Base of syntergite with a median groove and 0 to 5 lateral grooves. Male clasper elongate, pointed at apex, often slender, weakly to strongly decurved and claw-like except in the Philippine species *E. datae*. Ovipositor sheath punctate, often also longitudinally striate.

This group includes 20 species that occur in North and South America, Asia, Japan, and the Philippines. A majority of the species are Neotropic.

Keys to the species of the Atripes Group

Males

(Males of *nathani* and *applanatus* are unknown)

1. Upper edge of pronotum with a hair band that is 2 to 6 hairs wide, or the band sometimes partly 1 hair wide in small specimens of *E. orientalis* and *masoni*. 2
- Upper edge of pronotum with a hair band that is mostly or entirely only 1 hair wide, or sometimes without hairs. 11
2. Trochanters brown to black. 3
- Trochanters whitish to fulvous. 6

3. Dorsal part of collar transversely punctate-wrinkled, with numerous hairs except at midline. Pronotum with a moderate number of hairs behind upper part of carina on collar. Japan.

4. nikkoensis Pschorn-Walcher (p. 330)

Dorsal part of collar transversely wrinkled, without hairs except a few laterally. Pronotum without hairs behind carina on collar.

4

4. Hairs on syntergite long and numerous, the lowest hair sockets within 2.5 hair lengths from lower edge of syntergite and hair groups on syntergite in places about 6 hairs wide. Japan.

1. japonicus Ashmead (p. 328)

Hairs on syntergite not unusually long and numerous, the lowest hair sockets more than 3 hair lengths from lower edge of syntergite and hair groups on syntergite not more than 4 hairs wide.

5

5. Hair patch on mesopleurum below front edge of tegula continuous with hair patch on speculum. Apical part of clasper somewhat abruptly tapered so that clasper appears a little swollen near middle. Assam and Nepal. 2. orientalis Dodd (p. 329)

Hair patch on mesopleurum below front edge of tegula separated from hair patch on speculum by a bare area. Apical part of clasper uniformly tapered. Arizona to Costa Rica.

5. atripes, new species (p. 331)

6. Syntergite with 2 or 3 grooves on each side of median groove. 7
Syntergite with one groove or none on each side of median groove.

10

7. Clasper straight, not claw-like. Philippines.

20. datae, new species (p. 342)

Clasper weakly decurved, somewhat claw-like. 8

8. Metapleurum smooth, with only minor fine wrinkling. Mexico.

7. lissopleuris, new species (p. 333)

Metapleurum with 0.4 to 0.7 of surface strongly wrinkled. 9

9. Syntergite with 3 or 2 grooves on each side of median groove.

Hair sockets on upper 0.3 of lower half of mesopleurum separated by 0.7 hair length. Hind femur entirely fulvous. Arizona, Texas and Mexico. 6. levibasis, new species (p. 332)

Syntergite with 2 grooves on each side of median groove. Hair sockets on upper 0.3 of lower half of mesopleurum separated by 1.2 hair lengths. Hind femur usually brown to blackish, pale fulvous basally, sometimes entirely fulvous. Mexico.

8. masoni, new species (p. 334)

10. Upper side of abdominal stalk with the usual longitudinal wrinkles.
 India. 9. arctus, new species (p. 335)
 Upper side of abdominal stalk almost smooth except for one longitudinal ridge on each side. Philippines.
 10. planocaulis, new species (p. 336)
11. Middle and hind trochanters fulvous to black. 12
 Middle and hind trochanters whitish or stramineous, paler than their respective femora, which are light brown to fuscous with paler bases. Weak veins hyaline to pale brown. 15
12. Occipital carina low, not strongly reflexed. Hairs on lower half of mesopleurum very sparse. Front wing 1.75 to 2.4 mm. long. 13
 Occipital carina high, strongly reflexed. Hairs on lower half of mesopleurum moderately dense. Front wing 2.3 to 4.5 mm. long. 14
13. Legs brown and fulvous. Upper margin of pronotum with a continuous row of sparse hairs. Grenada.
 12. antillarum Ashmead (p. 337)
 Legs black. Upper margin of pronotum with an incomplete row of hairs. Ecuador. 13. atrellus, new species (p. 337)
14. Stalk of abdomen 1.8 as long as high. Hind coxa and femur ferruginous or ferruginous brown. Brazil.
 14. brunescens, new species (p. 338)
 Stalk of abdomen 2.5 as long as high. Hind coxa and femur black. Peru. 15. culmeus, new species (p. 339)
15. Upper margin of pronotum with a continuous row of hairs. . . . 16
 Upper margin of pronotum bare or with a few scattered hairs, not a continuous row. 17
16. Thyridium moderately wide, about 2.8 as wide as long. Temple 0.65 as long as eye. Clypeus moderately wide. Costa Rica.
 16. parcus, new species (p. 339)
 Thyridium very narrow, 1.3 as wide as long. Temple 0.5 as long as eye. Clypeus narrow. Peru.
 17. oculatus, new species (p. 340)
17. Stalk of abdomen 2.0 as long as high. Metapleurum with front 0.2 smooth, the rest rugose. Costa Rica.
 18. melanomerus, new species (p. 340)
 Stalk of abdomen 1.2 as long as high. Metapleurum entirely rugose. Paraguay and southern Brazil.
 19. trachodes, new species (p. 341)

Females

(Females of *lissopleuris*, *arctus*, *planocaulis*, *antillarum*, *atrellus*, *culmeus*, *parcus*, *oculatus*, *melanomerus*, and *trachodes* are unknown).

1. Upper side of abdominal stalk smooth or with transverse ridges. Syntergite without grooves on each side of median groove, or with short vestigial grooves on each side. 2
 Upper side of abdominal stalk irregularly punctato-rugose or more or less longitudinally wrinkled. Syntergite with 1 to 3 grooves on each side of the median groove. 7
2. Upper side of abdominal stalk with a few or many transverse rugae. 3
 Upper side of abdominal stalk without transverse rugae. 6
3. Side of abdominal stalk covered with oblique wrinkles. Upper side of abdominal stalk covered with transverse rugae. 4
 Side of abdominal stalk mostly smooth, without strong wrinkles. Upper side of abdominal stalk with transverse rugae only near its front end. 5
4. Hairs on syntergite long, many of them longer than the distance between their sockets. Flagellum black. Japan.
 1. *japonicus* Ashmead (p. 328)
 Hairs on syntergite short, none of them longer than the distance between their sockets. Flagellum brown. Assam and Nepal.
 2. *orientalis* Dodd (p. 329)
5. Hair band along upper margin of pronotum about 2 hairs wide. Front 0.45 of metapleurum smooth, the rest rugose. Hind femur dark brown. India. 3. *nathani*, new species (p. 330)
 Hair band along upper margin of pronotum about 4 hairs wide. Front 0.25 of metapleurum smooth, the rest rugose. Hind femur black. Japan. 4. *nikkoensis* Pschorn-Walcher (p. 330)
6. Legs beyond coxae black or blackish brown. Arizona and Mexico.
 5. *atripes*, new species (p. 331)
 Legs beyond coxae fulvous. Arizona, Texas, and Mexico.
 6. *levibasis*, new species (p. 332)
7. Middle and hind trochanters reddish brown to fuscous. 8
 Middle and hind trochanters white to fulvous. 9
8. Profile of propodeum flat above. Trochanters fuscous with apical 0.3 pale brown. Hind femur blackish. Mexico.
 11. *applanatus*, new species (p. 336)
 Profile of propodeum moderately convex above. Trochanters uniformly reddish brown. Hind femur brown. Brazil.
 14. *brunescens*, new species (p. 338)

9. Scape and pedicel pale fulvous. Oblique wrinkling on side of abdominal stalk not unusually fine. Mexico.

8. masoni, new species (p. 334)

Scape and pedicel blackish brown. Oblique wrinkling on side of abdominal stalk fine. Philippines.

20. datae, new species (p. 342)

1. Exallonyx japonicus Ashmead, new combination

Figures 294 and 295 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 520 (ovipositor sheath)

**Proctotrypes japonicus* Ashmead, 1904. Jour. New York Ent. Soc. 12: 68. ♂, des.

Type: ♂, Japan: Sapporo (Washington). Examined in 1975.

Phaenoserphus japonicus Kieffer, 1909. Genera Insectorum 95: 6. syn.

Phaenoserphus? japonicus Kieffer, 1914. Das Tierreich 42: 30. ♂. key, des. Japan: Sapporo.

Phaenoserphus japonicus Watanabe, 1949. Insecta Matsumurana 17: 25. ♂. des., fig. Japan.

Codrus japonicus Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. syn.

Codrus japonicus Pschorn-Walcher, 1964. Insecta Matsumurana 27: 5. syn.

Codrus japonicus Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♂. type data.

Front wing 3.2 to 5.0 mm. long. Head projecting far forward between antennae but not quite as far as in *E. nikkoensis*. Temple of female 1.0 as long as eye. Cheek of female 0.69 as long as short diameter of eye. Clypeus of both sexes 3.0 as wide as long, moderately convex, its apical 0.25 strongly rounded off to apical flange. Second flagellar segment of male 2.7 as long as wide, of female 2.0 as long as wide. Tenth flagellar segment of male 3.0 as long as wide, of female 2.0 as long as wide. Occipital carina of medium height. Dorsal collar with about 5 transverse wrinkles, with very sparse hairs. Epomia weak. Lower corner of pronotum with one pit. Pronotum without hairs behind epomia and carina on collar. Upper margin of pronotum with a band of hairs that is about 4 hairs wide. Speculum with hairs on upper 0.35. Lower half of mesopleurum with hair sockets separated by 0.5 hair length, often sparser on upper median part of lower half. Abdominal stalk and hind part of thorax as in figures 294 (♂) and 295 (♀). Syntergite with median groove reaching 0.8 to thyridial interspace, also with 2 or 3 lateral grooves about 0.3 to 0.5 as long as median groove, the lateral grooves strong in male, weak or vestigial in female. Hairs on syntergite unusually long and dense, the three hair bands 4-6 hairs wide and lower hair sockets within 2.5 hair lengths of lower edge of syntergite. Clasper elongate triangular, faintly decurved. Ovipositor sheath as in figure 520.

Black. Palpi stramineous. Antenna dark brown to blackish, the scape and pedicel often brown. Tegula fulvous. Front and middle legs beyond trochanters and hind tibia and tarsus light brown. Front and middle trochanters and hind femur dark brown or blackish, the apical 0.2 of hind femur blackish. Wings weakly infusate. Stigma and strong veins dark brown. Weak veins with a brown tinge.

Specimens: 3♂, 1♀, Kamikochi, Japan, Jul. 22, 23, 24, and 26, 1954, Townes family (Townes). ♂, Mt. Norikura, 2,000 m., Japan, Jul. 30, 1954, Townes family (Townes). 5♂, Katayama, Saitama, Japan, Apr. 14, 1960, and May 3 and 13, 1962, T. Hayasaka (Ottawa). 4♂, Sapporo, Japan, July 11, 12, and 15, 1954, David Townes (Townes). 2♂, Tokyo, Japan (Cambridge). ♂, Yamanashi, Japan, June 27, 1931, L. Gressitt (Cambridge).

2. Exallonyx orientalis Dodd

Figures 296 and 297 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 521 (ovipositor sheath)

**Exallonyx orientalis* Dodd, 1920. Trans. Ent. Soc. London 1919: 365. ♀. des. Type: ♀, Assam: Shillong at 5,000 ft. (London). Examined in 1975.

Codrus orientalis Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 6. ♀. type data.

Front wing 2.4 to 4.6 mm. long. Temple of female 1.0 as long as eye. Cheek of female 0.8 as long as short diameter of eye. Clypeus 2.5 as wide as long in male, 2.3 as wide as long in female, moderately convex, its apical 0.4 abruptly rounded down to apical flange. Second flagellar segment 3.3 as long as wide in male, 2.1 as long as wide in female. Tenth flagellar segment 2.5 as long as wide in male, 1.8 as long as wide in female. Dorsal collar with about 4 transverse wrinkles, hairless. Epomia present. Lower corner of pronotum with one pit. Pronotum without hairs behind epomia and carina on collar. Upper margin of pronotum with a hair band that is moderately wide at front and hind ends but medially narrowed to a single hair row in smaller specimens or a double or triple row in larger specimens. Speculum with hairs on upper 0.45. Hair sockets on lower half of mesopleurum separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figures 296 (♂) and 297 (♀). Small specimens have less sculpture on the metapleurum than figured, the sculpture sometimes reduced to a few wrinkles. Hind femur 4.2 as long as deep in male, 4.1 as long as deep in female. Syntergite with median groove reaching 0.8 to thyridial interspace, in male also with two lateral grooves 0.35 as long as median groove. Hairs on syntergite moderately long and moderately numerous. Clasper narrowly triangular, weakly decurved, its apical 0.4 weakly attenuate. Ovipositor sheath as in figure 521.

Black. Palpi and tegula pale yellow to pale fulvous. Mandible brown. Antenna of male brown to black basally, the rest black or blackish. Antenna of female brown. Front and middle femora dark brown to blackish, the apical 0.25 of femora light brown. Hind femur black, its apical 0.2 brown. All tibiae and tarsi light brown, or the hind tibia and tarsus darker brown. Wings subhyaline, the stigma and strong veins blackish. Weak veins subhyaline.

Specimens: 2♂, oak forest, Bhurumche, 8,500 to 9,500 ft., near Katmandu, Nepal, May 30, 1967 (Ottawa). 7♂, Godavari, 5,000 ft., near Katmandu, Nepal, Apr. 15, May 1, and July 21, 1967 (Ottawa and

Townes). 10♂, 6♀, Pulchauki, 7,300 ft., near Katmandu, Nepal, six different dates from Jul. 27 to Aug. 31, 1967 (Ottawa and Townes). ♂, 28° 00' N 85° 00' E, 10,500 ft., Nepal, May 21-27, 1967 (Ottawa). The type was described from Assam at 5,000 ft.

3. Exallonyx nathani, new species

Figures 298 (♀ metapleurum, propodeum, and abdominal stalk);
522 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.3 mm. long. Temple 0.92 as long as eye. Cheek 0.78 as long as short diameter of eye. Clypeus 3.0 as wide as long, weakly convex, its apical 0.4 somewhat beveled to apex. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.8 as long as wide. Dorsal collar with about 4 transverse wrinkles, hairless. Epomia indistinct. Lower corner of pronotum with one pit, above the pit with 2 weak dimples. Upper margin of pronotum with a hair band that is about 2 hairs wide. Speculum with hairs on upper 0.5. Hair sockets on lower half of mesopleurum separated by 0.4 hair length. Abdominal stalk and hind part of thorax as in figure 298. Hind femur 3.9 as long as deep. Syntergite with median groove reaching 0.65 to thyridial interspace, with two shallow narrow grooves on each side that are 0.35 as long as median groove. Hairs on syntergite sparse and short. Ovipositor sheath as in figure 522.

Black. Mouth parts, tegula, and legs beyond trochanters brown, the hind femur dark brown. Coxae blackish. Trochanters fulvous. Wings subhyaline, the stigma and strong veins dark brown.

Type: ♀, Kodaikanal, 6,500 ft., Pulney Hills, India, Nov. 1953, P. S. Nathan (Ottawa).

The species name is in honor of the collector.

4. Exallonyx nikkoensis Pschorn-Walcher

Figures 299 and 300 (♂, ♀, metapleurum, propodeum, and abdominal stalk); 523 (ovipositor sheath)

**Codrus nikkoensis* Pschorn-Walcher, 1964. *Insecta Matsumurana* 27: 3, 5. ♀. des., fig. Type: ♀, Japan: Nikko on Honshu (lost, not found by Watanabe in Sapporo in 1975). Identified from the description.

Front wing 4.8 to 5.7 mm. long. Head projecting forward between antennae farther than in most other species. Temple of female 1.0 as long as eye. Cheek of female 0.71 as long as short diameter of eye. Clypeus of male 3.4 as wide as long, of female 3.0 as wide as long, weakly convex, with a narrow median apical overhang that gives the clypeus a double apical edge. Second flagellar segment of male 2.9 as long as wide, of female 2.3 as long as wide. Tenth flagellar segment of male 3.9 as long as wide, of female 2.0 as long as wide. Occipital carina moderately low. Dorsal collar of male weakly swollen, trans-

versely punctate-wrinkled, with numerous hairs except at midline. Dorsal collar of female with six transverse wrinkles, its hairs very sparse. Epomia weak. Lower corner of pronotum with one pit, above the pit a row of about 3 closely spaced dimples. Pronotum of male with a moderate number of fine hairs behind epomia and carina on collar. (No other species of the *Atripes* Group has hairs in that place.) Pronotum of female without hairs behind epomia and carina on collar. Upper margin of pronotum with a broad band of fine dense hairs. Speculum with hairs on upper 0.5. Lower half of mesopleurum with hair sockets separated by 0.4 hair length. Abdominal stalk and hind part of thorax as in figure 299 (σ) and 300 (φ). Hind femur of male 4.6 as long as deep, of female 4.1 as long as deep. Syntergite with median groove reaching 0.8 to thyridial interspace, in male also with 2 or 3 lateral grooves 0.75 as long as median groove. Hairs on syntergite long, moderately dense. Clasper tapered to a blunt point, moderately decurved, somewhat claw-like. Ovipositor sheath as in figure 523.

Black. Palpi stramineous. Antenna dark reddish brown, in male blackish apically. Tegula fulvous. Front and middle trochanters and femora and hind tibia dark brown to blackish. Front and middle tibiae and all tarsi light brown. Wings with a strong tinge of brown. Stigma and strong veins blackish brown. Weak veins light brown.

Specimens: 4 σ , Kamikochi, Japan, June 24 and 25, 1954, Townes family (Townes). φ , Nikko, Japan, Sept. 6, Harrington (Ottawa).

5. *Exallonyx atripes*, new species

Figures 301 and 302 (σ , φ metapleurum, propodeum, and abdominal stalk); 524 (ovipositor sheath)

Front wing 3.0 to 5.0 mm. long. Temple of female 1.3 as long as eye. Cheek of female 1.3 as long as short diameter of eye. Clypeus of male 4.0 as wide as long, of female 3.0 as wide as long, the apical 0.2 abruptly declivous to apical flange with a median overhang that is narrow and blunt in male, somewhat wider and sharp-edged in female. Second flagellar segment of male 3.0 as long as wide, of female 2.7 as long as wide. Tenth flagellar segment of male 3.0 as long as wide, of female 1.9 as long as wide. Occipital carina of moderate height. Dorsal collar with about 6 transverse wrinkles, with very sparse hairs. Epomia present. Lower corner of pronotum with one pit. Pronotum without hairs behind epomia and carina on collar. Upper margin of pronotum with a wide hair band that at midlength is 3-6 hairs wide. Speculum with hairs on upper 0.35. Lower half of mesopleurum with hair sockets separated by 1.0 to 1.5 hair lengths on upper median 0.3, elsewhere the hair sockets separated by about 0.5 hair length. Abdominal stalk and hind part of thorax as in figures 301 (σ) and 302 (φ). Hind femur 4.3 as long as deep in both sexes. Syntergite with median groove 0.7 to 0.8 the distance to thyridial interspace, in male also with two lateral grooves 0.5 as long as median groove. Hairs on syntergite moderately long, of moderate density. Clasper elongate triangular, moderately decurved, tapered to a point. Ovipositor sheath as in figure 524.

Black. Palpi dark brown. Tegula fulvous to dark brown. Tarsi brown to black. Front legs beyond trochanters dark brown to black. Wings faintly infusate. Stigma and strong veins dark brown to black. Weak veins faintly brownish.

Three abnormally small males (from Monteverde in Costa Rica and El Palmito at 6,000 ft., Sinaloa, Mexico) have the front wing 3.0 to 3.2 mm. long and have the scape, pedicel, and front leg light brown and middle and hind legs beyond coxae medium brown.

Type: ♂, 5 kilometers west of El Salto, 8,800 ft., Durango, Mexico, July 10, 1972, B. and C. Dasch (Townes). Figure 301 is from the type.

Paratypes: 5♂, Ramsey Canyon, Huachuca Mts., 6,000 ft., Ariz., Aug. 15 and Sept. 9, 17, and 30, 1967, R. F. Sternitzky (Ottawa). 12♂, 2♀, Ramsey Canyon, Huachuca Mts., Ariz., R. F. Sternitzky (Ottawa and Townes). ♂, Mesa del Huracan, 30° 4' N 180° 15' W, 7,400 ft., Chihuahua, Mexico, Jul. 21 & 25, 1964, J. E. H. Martin (Ottawa). 2♂, 5 to 10 miles southeast of Durango, 6,500 ft., Durango, Mexico, July 4, 1972, B. and C. Dasch (Dasch). 2♂, 5 to 10 miles southeast of Durango, 6,500 ft., Durango, Mexico, July 9, 1972, B. and C. Dasch (Dasch). ♀, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 30, 1964, W. R. M. Mason (Ottawa). 3♂, same locality and collectors as type, July 10 and 12, 1972 (Dasch and Townes). ♂, 8 miles west of El Salto, 8,800 ft., Durango, Mexico, July 12, 1972, B. and C. Dasch (Dasch). 6♂, 3♀, 3 miles east of El Salto at 8,300 ft., 8,400 ft., 8,500 ft., and 9,000 ft., June 23 & July 1, 2, 4, & 10, 1964, Durango, Mexico, J. E. H. Martin, L. A. Kelton, and W. R. M. Mason (Ottawa). 4♂, 14 miles west of Ojuelos, 7,360 ft., Mexico, July 7, 1972, B. and C. Dasch (Dasch). 2♀, half mile west of El Palmito, 6,500 ft., Sinaloa, Mexico, Aug. 11, 1964, W. R. M. Mason (Ottawa). 18♂, 4♀, 15 miles west of El Palmito, 5,000 ft., Sinaloa, Mexico, 6 dates from July 11 to August 12, 1964, W. R. M. Mason (Ottawa). 3♂, El Palmito, 6,000 ft., Sinaloa, Mexico, July 22 and Aug. 29, 1964, W. R. M. Mason (Ottawa).

This species occurs in Mexico and in southern Arizona, at altitudes of 5,000 to 9,000 ft. It is adult from late June to the end of September.

6. *Exallonyx levibasis*, new species

Figures 303 and 304 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 525 (ovipositor sheath)

Front wing 2.7 to 3.6 mm. long. Temple of female 1.4 as long as eye. Cheek of female 1.0 as long as short diameter of eye. Clypeus weakly convex, its apical 0.2 declivous with a sharp-edged overhang. Second flagellar segment 3.2 as long as wide in male, 2.8 as long as wide in female. Tenth flagellar segment 2.5 as long as wide in male, 1.7 as long as wide in female. Occipital carina of moderate height. Epomia present. Hair stripe on upper margin of pronotum about 3 hairs wide in male, about 2 hairs wide in female. Speculum with hairs on upper 0.4 and anterodorsal 0.3. Hair sockets on lower half of mesopleurum separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figures 303 (♂) and 304 (♀). Hind femur 4.6 as long as deep in

male, 4.5 as long as deep in female. Syntergite of male with median groove reaching 0.5 to 0.7 the distance to space between thyridia and 2 or 3 lateral grooves 0.4 to 0.7 as long as median groove. Syntergite of female with median groove reaching 0.65 to interspace of thyridia, without lateral grooves. Thyridium of male 3.8 as wide as long, of female 3.0 as wide as long. Clasper moderately slender, tapered to a point, decurved. Ovipositor sheath as in figure 525.

Black. Palpi and tegula pale fulvous. Antenna of male black, the scape fulvous brown and upper side of flagellar segments 3-9 with a brown stripe. Antenna of female dark brown to blackish, brown basally. Mandible dark brown. Legs beyond coxae fulvous. Front coxa fulvous brown. Middle and hind coxae blackish brown, narrowly fulvous brown at apex. Wings subhyaline, the stigma and strong veins dark brown and weak veins hyaline or pale brown with discocubitus a little darker.

Type: ♀, Portal, Ariz., Aug. 12, 1974, H. and M. Townes (Townes). Figures 304 and 525 are from the type.

Paratypes: 32♂, 14♀, Portal, Ariz., 16 different dates from Aug. 10 to Sept. 7, 1974, H. and M. Townes (Townes). 5♂, 1♀, Portal, Ariz., Sept. 2 to 12, 1976, J. van der Vecht (Townes). ♂, 5 miles west of Portal, Ariz., Aug. 6, 1958, D. D. Linsdale (Davis). 3♂, 1♀, Ramsey Canyon, Huachuca Mts., 5,000 and 6,000 ft., Ariz., July 1968, Sept. 30, 1967, and no date, R. F. Sternitzky (Ottawa). ♂, McKittrick Canyon, 5,200 ft., Culbertson Co., Tex., Aug. 16, 1961, F. and N. Gehlbach (Townes). ♂, 5 kilometers west of El Salto, 8,800 ft., Durango, Mexico, July 12, 1972, B. and C. Dasch (Dasch). 3♂, 9 miles west of La Ciudad, 8,800 ft., Durango, Mexico, B. and C. Dasch (Dasch). 2♂, Navios, 26 miles east of El Salto, 8,000 ft., Durango, Mexico, July 27, 1964, L. A. Kelton (Ottawa).

This species is known from the mountains of southern Arizona and Texas and the mountains of Durango, Mexico. It is adult from July through September.

7. Exallonyx lissopleuris, new species

Figure 305 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.4 to 3.7 mm. long. Clypeus of moderate width, its apical 0.2 concavely beveled to apical flange, medially the bevel with a weak overhang. Second flagellar segment 2.9 as long as wide. Tenth flagellar segment 2.9 as long as wide. Occipital carina of moderate height. Dorsal collar with 4 transverse wrinkles, hairless. Epomia not distinct. Hair stripe on upper margin of pronotum about 2 hairs wide. Speculum with hairs on upper 0.5 and front 0.35. Hairs on lower half of mesopleurum long, dorsomedially sparse but elsewhere the hair sockets separated by 0.4 hair length. Abdominal stalk and hind part of thorax as in figure 305. Hind femur 4.8 as long as deep. Syntergite with median groove reaching 0.7 to space between thyridia and 3 or 4 irregular lateral grooves about 0.8 as long as median groove. Thyridium 0.33 as wide as long. Clasper slender, tapered to a point, decurved,

claw-like.

Black. Scape and mandible brown. Palpi, tegula, and legs beyond coxae fulvous, the middle tarsus weakly infusate, hind tarsus fuscous, and hind tibia somewhat infusate. Front coxa fulvous, middle coxa fulvous brown with apex fulvous, and hind coxa dark brown with apex fulvous. Wings hyaline, the stigma and strong veins dark brown. Weak veins subhyaline.

Female: Unknown.

Type: ♂, Hidalgo National Park, 3,000 m., State of Mexico, Mexico, Oct. 12, 1962, H. and M. Townes (Townes). Figure 305 is from the type.

Paratype: ♂, same data as type (Townes).

8. Exallonyx masoni, new species

Figures 306 and 307 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 526 (ovipositor sheath)

Front wing 2.3 to 4.2 mm. long. Temple of female 1.2 as long as eye. Cheek of female 0.78 as long as short diameter of eye. Clypeus moderately convex, its apical 0.35 beveled to apical flange with a weak concavity and at middle a weak overhang. Second flagellar segment of male 3.0 as long as wide, of female 2.0 as long as wide. Tenth flagellar segment of male 0.3 as long as wide, of female 1.6 as long as wide. Dorsal collar with 3 or 4 transverse wrinkles, with sparse hairs except medially. Epomia weak. Hair stripe on upper margin of pronotum 2 to 4 hairs wide, the hairs slender and moderately short. Speculum with hairs on upper 0.4 and on upper front 0.3. Hairs on lower half of mesopleurum long, sparse on upper part of this area with hair sockets separated by 1.7 hair lengths, denser on lower part with hair sockets separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figures 306 (♂) and 307 (♀). Hind femur 4.6 as long as deep in both sexes. Syntergite of male with median groove reaching 0.8 to space between thyridia and 2 lateral grooves, the lateral groove nearest median groove 0.7± as long as median groove, the lateral groove farthest from median groove 0.5± as long. Female syntergite with median groove reaching 0.9 to space between thyridia and with 2 or 3 short shallow lateral grooves. Thyridium of male 4.0 as wide as long, of female 2.0 as wide as long. Clasper moderately slender, tapered to a point, moderately decurved. Ovipositor sheath as in figure 526.

Black. Palpi and tegula fulvous. Mandible brown. Antenna of male black, the scape and pedicel light brown. Antenna of female brown or blackish brown, the scape and pedicel light brown. Coxae dark brown to blackish brown, or in female the front coxa light brown. Front trochanter stramineous to brownish fulvous. Middle and hind trochanters whitish to stramineous. Front femur usually brown to fulvous, always fulvous basally. Middle and hind femora usually dark brown or fuscous with basal 0.25± pale stramineous to fulvous, in small specimens the middle and hind femora sometimes entirely fulvous. Front and middle tibiae

and tarsi pale fulvous to fulvous. Hind tibia and tarsus brownish fulvous to brown. Wings subhyaline. Stigma and strong veins dark brown. Weak veins faintly brownish, the discocubitus light brown.

Type: ♂, 15 miles west of El Palmito, 5,000 ft., Sinaloa, Mexico, Aug. 4, 1964, W. R. M. Mason (Ottawa).

Paratypes: ♀, San Cristóbal de las Casas, 7,200 ft., Chiapas, Mexico, May 29, 1969 (Ottawa). 3♂, cloud forest, Yerba Buena, 20 miles north of Bochil, 6,500 ft. and 7,000 ft., June 10, 1969, June 9 to 24, 1969, and no date, Chiapas, Mexico, W. R. M. Mason and no collector (Ottawa). ♂, 10 miles west of El Salto, 9,000 ft., Durango, Mexico, June 2 to 6, 1964, W. R. M. Mason (Ottawa). 4♂, El Palmito, 6,000 ft., Sinaloa, Mexico, Aug. 29, 1964, W. R. M. Mason (Ottawa). 2♂, 4.5 miles west of El Palmito, 6,500 ft., Sinaloa, Mexico, Aug. 4 and 11, 1964, W. R. M. Mason (Ottawa). 28♂, 1♀, same locality and collector as type, dated Aug. 4, 8, 12, and 30, 1964 (Ottawa and Townes).

This species occurs in Mexico, at altitudes of 5,000 to 9,000 ft. It is adult from the end of May to the end of August. The name is in honor of Dr. W. R. M. Mason.

9. Exallonyx arctus, new species

Figure 308 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.8 to 3.0 mm. long. Clypeus moderately narrow, moderately convex, its apical 0.3 with concave slope to marginal flange. Second flagellar segment 3.4 as long as wide. Tenth flagellar segment 3.1 as long as wide. Occipital carina of moderate height. Dorsal collar with 2 long transverse wrinkles, hairless. Epomia indistinct. Hair stripe on upper margin of pronotum about 2 hairs wide. Speculum with hairs on upper front 0.3. Lower half of mesopleurum with a median dorsal hairless area, elsewhere the hairs long with sockets separated by 0.4 hair length. Abdominal stalk and hind part of thorax as in figure 308. Hind femur 4.2 as long as deep. Syntergite with median groove reaching 0.9 to space between thyridia and lateral groove 0.3 to 0.6 as long as median groove. Thyridium 3.5 as wide as long. Clasper quite slender, tapered to a sharp point, decurved, claw-like.

Black. Palpi and tegula stramineous. Mandible light brown. Antenna brown, the scape and pedicel light brown. Front coxa brown or light brown. Middle and hind coxae dark brown, all coxae paler at apex. Legs beyond coxae pale fulvous. Wings hyaline. Stigma and strong veins brown.

Female: Unknown.

Type: ♂, Godavari, 5,000 ft., Katmandu, Nepal, July 27 to 30, 1967 (Ottawa). Figure 308 is from the type.

Paratype: ♂, Pulchauki, 8,000 ft., Katmandu, Nepal, Aug. 13 to 17, 1967 (Ottawa).

10. Exallonyx planocaulis, new species

Figure 309 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.2 to 4.4 mm. long. Clypeus wide, weakly convex, its apical 0.2 rounded down to marginal flange. Second flagellar segment 3.7 as long as wide. Tenth flagellar segment 3.1 as long as wide. Occipital carina of moderate height. Dorsal collar with about 3 transverse wrinkles, hairless. Epomia absent. Speculum with hairs on upper front 0.35. Lower half of mesopleurum hairless next to its upper edge, elsewhere with hairs moderately long, the hair sockets separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figure 309, the upper side of abdominal stalk almost smooth except for a ridge along each side of dorsal aspect. Syntergite with median groove reaching 0.55 to space between thyridia, and 2 lateral grooves 0.5 as long as median groove, the lateral grooves shallow and sometimes lacking. Thyridium 4.0 as wide as long. Clasper narrowly triangular, weakly decurved.

Black. Palpi stramineous. Mandible brown. Scape and pedicel fulvous brown. Flagellum blackish. Tegula and legs beyond coxae fulvous, the hind tarsus brown and hind tibia brownish basally and apically. Front coxa light brown. Middle and hind coxae blackish brown. Wings subhyaline. Stigma and strong veins dark brown. Weak veins light brown.

Female: Unknown.

Type: ♂, Mt. Polis, 5,500 ft., Luzon, Philippines, Jan. 2, 1954, H., M., and D. Townes (Townes). Figure 309 is from the type.

Paratypes: 3♂, same data as type (Townes). ♂, Kidapayan Trail, 7,000 to 8,000 ft., Mt. Apo, Mindanao, Philippines, Sept. 20, C. F. Clagg (Cambridge).

11. Exallonyx applanatus, new speciesFigures 310 (♀ metapleurum, propodeum, and abdominal stalk);
527 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 4.1 mm. long. Temple 1.1 as long as eye. Cheek 0.76 as long as short diameter of eye. Clypeus 2.8 as wide as long, its apical 0.4 abruptly declivous to marginal flange with a weakly overhanging ridge at center. Second flagellar segment 3.5 as long as wide. Tenth flagellar segment 2.7 as long as wide. Occipital carina of moderate height. Dorsal collar with 3 transverse wrinkles, with a few hairs laterally, none medially. Epomia absent. Lower corner of pronotum with one pit. Pronotum without hairs behind carina on collar. Upper margin of pronotum with fine short hairs, in a large group near tegula and in a single row farther forward. Speculum with hairs on upper 0.3. Lower half of mesopleurum hairless on median part of upper 0.3, elsewhere with moderately dense hairs. Abdominal stalk and hind part of thorax as in figure 310. Hind femur 5.6 as long

as deep. Syntergite with median groove reaching 0.85 to interthyridial space and 2 shallow lateral grooves 0.35 as long as median groove. Hairs on syntergite sparse and moderately short. Ovipositor sheath as in figure 527.

Black. Palpi stramineous. Mandible and antenna dark brown. Pedicel pale brown. Front part of collar with a ferruginous area on each side of midline. Tegula yellow. Front leg medium brown, the apex of coxa and of trochanter paler. Middle leg dark brown and hind leg blackish, the apex of their coxae paler and apical 0.3 of trochanters pale brown. Hind tarsus dark brown. Wings faintly infusate. Stigma and strong veins dark brown. Weak veins weakly tinged with brown.

Type: ♀, cloud forest, Yerba Buena, 20 miles north of Bochil, 7,000 ft., Chiapas, Mexico, June 10, 1969, W. R. M. Mason (Ottawa).

12. Exallonyx antillarum Ashmead, new combination

Figure 311 (♂ metapleurum, propodeum, and abdominal stalk)

**Proctotrypes antillarum* Ashmead, 1900. Trans. Ent. Soc. London 1900: 240. ♂. des. Type: ♂ (lacking head), Grenada: Grand Etang on windward side at 1900 ft. (London). Examined in 1977.

Phaenoserphus antillarum Kieffer, 1909. Genera Insectorum 95: 5. syn.

Phaenoserphus antillarum Kieffer, 1914. Das Tierreich 42: 35. ♂. key, des. West Indies: Grand Etang at 650 m. on Grenada.

Codrus antillarum Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 5. ♂. type data.

Male type (lacking head): Front wing 1.75 mm. long. Dorsal collar with a transverse carina and 2 faint wrinkles, hairless. Epomia short. Upper edge of pronotum with a moderate number of hairs anteriorly and posteriorly, medially with a single row of moderately sparse hairs. Speculum with hairs on upper 0.4. Lower half of mesopleurum with very sparse hairs. Abdominal stalk and hind part of thorax as in figure 311. Hind femur 4.1 as long as deep. Syntergite with a median groove reaching 0.7 to space between thyridia and two grooves on each side that are 0.6 as long as median groove. Thyridium 2.0 as wide as long. Clasper moderately stout but very sharp at tip, weakly decurved.

Black. Antennal color unknown, from the original description inferred to be black. Color of mandible and palpi also unknown. Front legs, middle legs, and hind trochanters pale fulvous. Hind coxa and femur dark brown, the femur pale basally. Hind tibia and tarsus brown. Wings hyaline, the stigma and strong veins brown.

Female: Unknown.

Specimen: ♂, (type, lacking head), Grand Etang, Windward Side, 1,900 ft., Grenada, West Indies, H. H. Smith (London).

13. Exallonyx atrellus, new species

Figure 312 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.4 mm. long. Clypeus of moderate width,

its apical 0.45 roundly beveled to the apical flange. Second flagellar segment 2.8 as long as wide. Tenth flagellar segment 2.3 as long as wide. Occipital carina of moderate height. Dorsal collar with 4 transverse wrinkles, hairless. Epomia not distinct. Lower corner of pronotum with one pit. Upper margin of pronotum with a few hairs posteriorly, elsewhere hairless. Pronotum without hairs behind epomia and carina on collar. Speculum with hairs on upper 0.3. Lower half of mesopleurum with about 8 long hairs. Abdominal stalk and hind part of thorax as in figure 312. Hind femur 4.9 as long as deep. Median groove on syntergite reaching 0.65 to interthyridial space. Syntergite with 2 lateral grooves that are 0.8 as long as median groove. Hairs on syntergite very sparse (almost lacking). Clasper very slender, evenly and strongly decurved.

Black. Palpi and mandible brown. Tegula blackish. Front and middle legs dark brown, their femora blackish. Wings subhyaline, the stigma and strong veins blackish. Weak veins faintly brownish.

Female: Unknown.

Type: ♂, east of Papallacta, 2,900 m., Ecuador, Jan. 14 to 17, 1971, Luis E. Peña (Townes).

14. Exallonyx brunescens, new species

Figures 313 and 314 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 528 (ovipositor sheath)

Front wing 3.6 to 4.5 mm. long. Temple of female 0.88 as long as eye. Cheek of female 0.59 as long as short diameter of eye. Clypeus 3.0 as wide as long in male, 2.8 as wide as long in female, weakly convex, the apical 0.2 declivous to marginal flange with a median part weakly overhanging. Second flagellar segment of male 3.6 as long as wide, of female 3.2 as long as wide. Tenth flagellar segment of male 3.3 as long as wide, of female 2.2 as long as wide. Occipital carina high, reflexed. Dorsal collar with about 5 transverse wrinkles, hairless. Epomia absent. Lower corner of pronotum with one pit. Pronotum without hairs behind carina on collar. Upper margin of pronotum with a wide group of hairs posteriorly, farther forward the hairs diminished to a single sparse row. Speculum with hairs on upper front 0.25. Lower half of mesopleurum with sparse hairs on upper median 0.3, elsewhere the hairs moderately dense. Abdominal stalk and hind part of thorax as in figures 313 (♂) and 314 (♀). Hind femur of both sexes 5.0 as long as deep. Male syntergite with 5 grooves of equal length, reaching 0.4 to interthyridial space. Female syntergite with a median groove reaching 0.5 to interthyridial space and one lateral groove 0.65 as long as median groove. Hairs on syntergite very sparse, short. Clasper slender, strongly curved near middle, claw-like. Ovipositor sheath as in figure 528.

Head black. Clypeus and mandible reddish brown. Palpi brown. Antenna reddish brown to blackish, the scape reddish brown. Thorax and tegula brownish ferruginous to blackish. Legs brownish ferruginous to dark brown. Wings tinged with brown, the front wing with a weak to

strong brown cloud behind stigma. Stigma and strong veins dark brown. Weak veins mostly brown.

Type: ♂, Campina Grande (near Curitiba), Brazil, Feb. 21, 1966, H. and M. Townes (Townes). Figure 313 is from the type.

Paratypes: ♂, Curitiba, Brazil, Jan. 20 to 31, 1969, L. and J. Stange (Townes). 3♂, 1♀, Teresópolis, Brazil, Mar. 10, 11, and 14, 1966, H. and M. Townes (Townes). 2♀, Reprêsa Rio Grande, Guanabara, Brazil, Aug. and Sept. 1969, M. Alvarenga (Townes).

15. Exallonyx culmeus, new species

Figure 315 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 4.3 mm. long. Apical 0.4 of clypeus sloped toward apical flange. Abdominal stalk and hind part of thorax as in figure 315. Structurally similar to *E. brunescens* except that the clypeus is without a preapical overhang and that the abdominal stalk is longer.

Colored as in *E. brunescens* except that head, clypeus, mandible, body, and hind legs are black and front and middle legs dark brown.

Female: Unknown.

Type: ♂, Machu Picchu, Peru, Dec. 1, 1965, H. and M. Townes (Townes).

16. Exallonyx parvus, new species

Figure 316 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.8 to 3.0 mm. long. Clypeus moderately convex, its apical 0.45 declivous to marginal flange. Second flagellar segment 3.0 as long as wide. Tenth flagellar segment 3.0 as long as wide. Occipital carina moderately high. Dorsal collar with about 3 transverse wrinkles, with a few hairs laterally. Epomia weak. Hairs along upper margin of pronotum mostly in a single row. Speculum with hairs on upper front 0.5. Hair sockets on lower half of mesopleurum separated by an average 1.0 length of hairs, sparser dorsad and denser ventrad. Abdominal stalk and hind part of thorax as in figure 316. Hind femur 4.8 as long as deep. Syntergite with median groove reaching 0.8 to space between thyridia and 2 lateral grooves 0.8 as long as median groove. Thyridium 2.8 as wide as long. Clasper slender, tapered to a sharp point, strongly decurved.

Black. Palpi whitish. Scape and pedicel light brown. Flagellum blackish. Tegula fulvous. Front coxa fulvous to brown. Middle and hind coxae blackish brown. All coxae paler at apex. Trochanters stramineous. Front leg beyond trochanter fulvous to brownish fulvous, its femur stramineous at base. Middle leg beyond trochanter brownish fulvous to brown, the femur paler next to trochanter. Hind leg beyond trochanter dark brown, the femur narrowly paler at base and apex. Wings faintly infusate. Stigma and strong veins dark brown. Weak

veins with a tinge of brown.

Female: Unknown.

Type: ♂, 14 km. north of Ureña, Costa Rica, June 20-23, 1974, Julian Donohue (Townes). Figure 316 is from the type.

Paratypes: 4♂, same data as type (Los Angeles and Townes).

17. Exallonyx oculatus, new species

Figure 317 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.3 mm. long. Eye large, its long diameter only 1.27 as long as short diameter and temple only 0.58 as long as eye. Clypeus very narrow, strongly convex, its apical 0.45 declivous to apex. Second flagellar segment 5.0 as long as wide. Tenth flagellar segment 4.0 as long as wide. Occipital carina of moderate height. Dorsal collar with 3 transverse wrinkles, hairless. Epomia absent. Hairs on upper margin of pronotum in a single row. Speculum with hairs on upper 0.4 and front 0.25. Lower half of mesopleurum with a median dorsal hairless area, elsewhere with moderately long hairs whose sockets are separated by 0.6 hair length. Abdominal stalk and hind part of thorax as in figure 317. Hind femur 5.0 as long as deep. Syntergite with a median groove reaching 0.75 to space between thyridia, on each side of median groove a depressed area containing weak longitudinal grooves. Thyridium 1.3 as wide as long. Clasper very narrowly triangular, weakly decurved, its apex pointed.

Black. Scape and pedicel fulvous, brown above. Flagellum black. Mandible brown. Palpi whitish. Tegula, front leg, and middle tibia and tarsus pale stramineous, the front coxa light brown basally. Middle and hind coxae dark brown. Middle and hind trochanters stramineous, the hind trochanter partly with a tinge of brown. Middle femur brown, paler at base and apex. Hind femur dark brown, its basal 0.2 light brown. Hind tibia brown, paler brown near base. Hind tarsus with first segment light brown and segments 2-5 stramineous. Wings faintly tinged with fuscous. Stigma and strong veins brown. Discocubitus pale brown, the rest of weak veins not darkened.

Female: Unknown.

Type: ♂, Pasco, 10° 35' S, 75° 35' W, 1,600 to 1,800 m., Peru, Dec. 30-31, 1972, J. Helava (Ottawa).

18. Exallonyx melanomerus, new species

Figure 318 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.9 to 3.3 mm. long. Clypeus moderately convex, its apical 0.5 rounded down to marginal flange. Second flagellar segment 3.9 as long as wide. Tenth flagellar segment 3.4 as long as wide. Occipital carina moderately high. Dorsal collar with about 4 transverse wrinkles, with a few hairs laterally. Epomia absent. Upper edge of pronotum with a few scattered hairs, not a row of hairs. Speculum with hairs on upper 0.3 and upper front 0.3. Lower half of mesopleurum with

moderately long hairs, the sockets of hairs on upper portion separated by about 1.2 the hair length, those on lower portion separated by about 0.7 the hair length. Abdominal stalk and hind part of thorax as in figure 318. Hind femur 5.3 as long as deep. Syntergite with median groove reaching 0.8 to space between thyridia, on each side of median groove with impressed area containing a groove 0.7 as long as median groove. Thyridium 2.8 as wide as long. Clasper tapered to slender point, moderately decurved.

Black. Scape and pedicel brown. Flagellum black. Mandible brown. Palpi whitish. Tegula fulvous. Front coxa stramineous. Middle coxa fulvous. Hind coxa dark brown with apex pale brown. Trochanters stramineous. Front leg beyond trochanter brownish fulvous. Middle femur brown with ends paler. Middle tibia and tarsus light brown. Hind femur blackish, its basal 0.18 stramineous and apex narrowly brown. Hind tibia and tarsus blackish brown. Wings subhyaline. Stigma and strong veins brown. Discocubitus light brown, the other weak veins not pigmented.

Female: Unknown.

Type: ♂, 14 km. north of Ureña, Costa Rica, June 20-23, 1974, Julian Donohue (Townes). Figure 318 is from the type.

Paratypes: 3♂, same data as type (Los Angeles and Townes).

19. *Exallonyx trachodes*, new species

Figure 319 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.0 mm. long. Clypeus wide, weakly convex, its profile evenly and weakly convex. Occipital carina of moderate height. Second flagellar segment 3.3 as long as wide. Tenth flagellar segment 2.9 as long as wide. Dorsal collar with about 4 transverse wrinkles, hairless. Epomia absent. Upper edge of pronotum with a few scattered hairs, not a continuous row of hairs. Speculum with hairs on upper front 0.45. Lower half of mesopleurum with very sparse hairs on upper 0.4, elsewhere the hairs denser and with sockets separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figure 319. Hind femur 5.0 as long as deep. Syntergite with median groove reaching 0.75 to space between thyridia and 2 lateral grooves 0.7 as long as median groove. Thyridium 3.1 as wide as long. Clasper tapered to a slender point, moderately decurved.

Black. Mandible, scape, pedicel, and tegula fulvous brown. Flagellum black. Palpi stramineous. Front and middle legs and hind trochanter fulvous. Hind coxa brownish fulvous, its basal 0.3 brown. Hind femur dark brown, light brown at ends. Hind tibia and tarsus blackish brown. Wings subhyaline. Stigma and strong veins dark brown. Weak veins with a faint tinge of brown.

Female: Unknown.

Type: ♂, Pirapó, Paraguay, Dec. 29, 1971, Luis Peña (Townes).

20. Exallonyx datae, new species

Figures 320 and 321 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 529 (ovipositor sheath)

Front wing 2.5 to 3.6 mm. long. Temple of female 1.1 as long as eye. Cheek of female 0.87 as long as short diameter of eye. Clypeus 2.9 as wide as long, moderately convex, its lower 0.35 somewhat flattened. Second flagellar segment 3.0 as long as wide in male, 2.2 as long as wide in female. Tenth flagellar segment 2.7 as long as wide in male, 1.65 as long as wide in female. Lower corner of pronotum with one pit. Upper margin of pronotum with a hair band that is about 2 hairs wide. Speculum with hairs on upper 0.6. Hair sockets on lower half of mesopleurum separated by 0.7 the length of the hairs. Abdominal stalk and hind part of thorax as in figures 320 (σ) and 321 (♀). Hind femur 5.0 as long as deep in male, 4.0 as long as deep in female. Syntergite with median groove that reaches 0.7 the distance to interthyridial space, with 2 or 3 shorter grooves on each side of median groove, these 0.7 (σ) or 0.4 (♀) as long as median groove. Hairs on syntergite sparse and short. Ovipositor sheath as in figure 529.

Black. Mouth parts, tegula, and legs beyond coxae fulvous, the hind femur and tarsus often more or less brown. Front coxa fulvous. Middle coxa brownish fulvous or brown. Hind tarsus dark brown. Wings with a brown tinge, the stigma and strong veins dark brown.

Type: ♀ , oak forest, 7,800 ft., Mt. Data, Philippines, H., M., and D. Townes (Townes). Figures 321 and 529 are from the type.

Paratypes: σ , 3 ♀ , same locality and collectors as type, Dec. 31, 1952 and Jan. 1, 1953 (Townes). σ , Mt. Santo Tomas (near Baguio), 6,500 ft., Philippines, Apr. 4, 1953, H., M., and D. Townes (Townes).

F. Evanescens Group

Front wing 1.6 to 3.0 mm. long. Male flagellum without raised tyloids. Lower corner of pronotum with one pit. Upper margin of pronotum with a single row of long sparse hairs, sometimes the row incomplete or represented by a few scattered hairs, rarely the row partly double. Epomia present, usually strong. Side of pronotum without hairs behind epomia and upper end of carina on collar. Paired smooth areas on upper face of propodeum usually extending to behind propodeal spiracle. Hind margin of hind wing with a shallow notch at basal 0.35. Abdominal stalk with a transverse ridge at base on under side, side of stalk with distinct grooves, and upper profile of stalk straight. Hairs on syntergite short and very sparse, none of them near lower margin of syntergite. Base of syntergite with a median groove or sometimes only a median notch, with 1-3 grooves on each side of median groove or notch. Male clasper narrowly triangular, straight, its apex pointed. Ovipositor sheath short, punctate, not striate.

This group contains 17 species, all of them Neotropic.

Key to the species of the Evanescons Group

1. Median groove of syntergite a short v-shape notch, reaching 0.2-0.3 to space between thyridia. Propodeum often with a postmedian transverse carina. 2
 - Median groove of syntergite of moderate length, reaching 0.4 or more to space between thyridia. Propodeum without a postmedian transverse carina. 4
2. Stalk of abdomen pale yellow. Propodeum without a distinct pre-apical transverse carina. Ovipositor sheath very broad. Mexico.
 1. flavicinctus, new species (p. 344)
 Stalk of abdomen black. Propodeum with a preapical transverse carina. Ovipositor sheath moderately broad. 3
3. Hind face of propodeum with a median carina. Brazil.
 2. evanescons, new species (p. 345)
 Hind face of propodeum without a median carina. Mexico.
 3. semitropis, new species (p. 346)
4. Paired smooth areas on upper face of propodeum less than 0.5 as long as upper face of propodeum, reaching little or not at all behind propodeal spiracle. 5
 - Paired smooth areas on upper face of propodeum more than 0.5 as long as upper face of propodeum, reaching far behind propodeal spiracle, usually reaching almost to hind end of upper face of propodeum. 7
5. Middle coxa blackish brown. Argentina.
 4. capnodes, new species (p. 346)
 Middle coxa stramineous or pale fulvous. 6
6. Hind femur fulvous or fulvous brown. Tenth flagellar segment of female 2.1 as long as wide, of male 2.9 as long as wide. Brazil
 5. mydobius, new species (p. 347)
 Hind femur blackish brown. Tenth flagellar segment of female 1.7 as long as wide. (Male unknown.) Brazil.
 6. intensus, new species (p. 347)
7. Flagellum with last 3 segments white, the rest blackish. Brazil.
 7. trialbus, new species (p. 348)
 Flagellum entirely dark colored. 8
8. Metapleurum with less than 30% of its surface reticulately wrinkled. 9
 - Metapleurum with more than 30% of its surface reticulately wrinkled. 12

9. Trochanters pale fulvous to brownish fulvous. 10
Trochanters blackish. 11
10. Stalk of abdomen 1.0 as long as deep. Hind slope of propodeum with a median carina. Ecuador.
8. castaneipes, new species (p. 349)
Stalk of abdomen 1.6 as long as deep. Hind slope of propodeum usually without a median carina. Ecuador and Colombia.
9. parameces, new species (p. 349)
11. Ridges on side of abdominal stalk horizontal. Colombia.
10. vescus, new species (p. 350)
Ridges on side of abdominal stalk anteriorly curved downward. Ecuador. 11. deflexus, new species (p. 350)
12. Abdominal stalk with longitudinal ridges only at apex, the rest of its surface punctato-rugulose. Venezuela.
12. columnaris, new species (p. 351)
Abdominal stalk with longitudinal or oblique ridges on most or all of its length, at least on under side. 13
13. Abdominal stalk 1.7 to 2.4 as long as high. Hind femur 5.0 to 5.8 as long as deep. 14
Abdominal stalk 0.8 to 1.5 as long as high. Hind femur 4.6 to 5.3 as long as deep. 15
14. Abdominal stalk 1.7 as long as high. Hind femur 5.5 to 5.8 as long as deep. Mexico and Guatemala.
13. antennalis, new species (p. 351)
Abdominal stalk 2.4 as long as high. Hind femur 5.0 as long as deep. Peru. 14. stenostoma, new species (p. 352)
15. Longitudinal ridges on abdominal stalk very thick, 4 ridges on lateral aspect of stalk. Jamaica.
15. burhytis, new species (p. 352)
Longitudinal ridges on abdominal stalk not unusually thick, 5 ridges on lateral aspect of stalk. 16
16. Pronotum partly or entirely fulvous or light brown. Hind tibia pale brown to medium brown. Jamaica.
16. collaris, new species (p. 353)
Pronotum black. Hind tibia pale fulvous. Chile.
17. ochropus, new species (p. 354)

1. Exallonyx flavicinctus, new species

Figures 322 (♀ metapleurum, propodeum, and abdominal stalk); 486 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 1.9 mm. long. Temple 1.0 as long as eye. Cheek 0.69 as long as short diameter of eye. Clypeus of moderate size,

moderately convex, its apical 0.3 convexly declivous to marginal flange. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.8 as long as wide. Epomia strong, continuous with carina on collar. Upper margin of pronotum with only 2 or 3 hairs. Speculum with hairs on upper 0.3 and front 0.3. Lower half of mesopleurum with upper 0.4 bare, the rest with very long hairs, the hair sockets separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figure 322. Hind femur 4.1 as long as deep. Syntergite with median groove short and v-shaped, reaching 0.2 the distance to space between thyridia, also with 2 lateral grooves reaching 0.3 to space between thyridia. Ovipositor sheath as in figure 486.

Blackish. Scape, pedicel, palpi, coxae, and trochanters stramineous. Flagellum dark brown. Tegula fulvous. Legs beyond trochanters pale fulvous, the hind tibia and tarsus with a tinge of brown. Wings subhyaline, the stigma and strong veins light brown. Stalk of abdomen pale yellowish.

Type: ♀, San Cristóbal de las Casas, 7,300 ft., Chiapas, Mexico, June 27, 1969, W. R. M. Mason (Ottawa).

2. Exallonyx evanescens, new species

Figures 323 and 324 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 530 (ovipositor sheath)

Front wing 1.6 to 1.7 mm. long. Temple of female 1.0 as long as eye. Cheek of female 0.75 as long as short diameter of eye. Clypeus small, strongly convex, its apical 0.4 sloping to marginal flange. Second flagellar segment of male 3.0 as long as wide, of female 2.2 as long as wide. Tenth flagellar segment of male 1.7 as long as wide, of female 1.5 as long as wide. Epomia strong, continuous with carina on collar. Upper margin of pronotum with a row of about 8 long hairs. Speculum with hairs on upper 0.3 and front 0.3. Lower half of mesopleurum with long sparse hairs, the hair sockets separated by hair length. Abdominal stalk and hind half of thorax as in figure 323 (♂) and 324 (♀). Hind femur 4.3 as long as deep in male, 4.5 as long as deep in female. Syntergite with median groove represented by v-shaped notch that is about as long as wide and shorter than lateral grooves, with 2 lateral grooves reaching 0.3 to space between thyridia. Ovipositor sheath as in figure 530.

Dark brown. Mandible dark brown. Palpi stramineous. Antenna brown, the scape and pedicel pale brown. Tegula fulvous. Front coxa pale brown. Middle and hind coxae medium or dark brown. Front and middle femora brownish fulvous. Front and middle trochanters, tibiae, and tarsi stramineous. Hind leg beyond coxa light brown. Wings subhyaline. Stigma and strong veins brown.

Type: ♀, Nova Teutonia, 300-500 m., Santa Catarina, Brazil, May 1971, Fritz Plaumann (Ottawa). Figures 324 and 530 are from the type.

Paratypes: 2♂, 1♀, same locality and collector as type, May and June, 1971 (Ottawa and Townes).

3. Exallonyx semitropis, new species

Figures 325 (♀ metapleurum, propodeum, and abdominal stalk);
531 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 1.9 mm. long. Temple 1.0 as long as eye. Cheek 0.67 as long as short diameter of eye. Clypeus moderately small, moderately convex, its lower 0.4 sloped to marginal flange. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia strong, continuous with carina on collar. Upper margin of pronotum with a row of long hairs, the row single with a partial doubling. Speculum with hairs on upper 0.4 and front 0.3. Lower half of mesopleurum with long hairs, the hair sockets separated by 0.7 the hair length. Abdominal stalk and hind part of thorax as in figure 325. Hind femur 3.9 as long as deep. Syntergite with a very short median groove, the groove in the form of a v-shaped notch reaching 0.2 the distance to space between thyridia, the syntergite also with 2 lateral grooves reaching 0.45 to space between thyridia. Ovipositor sheath as in figure 531.

Coloration as in *E. evanescens*.

Type: ♀, Yerba Buena, 20 miles north of Bochil, 5,700 ft., Chiapas, Mexico, June 8, 1969 (Ottawa).

4. Exallonyx capnodes, new species

Figure 326 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.6 mm. long. Clypeus of moderate size, strongly convex, its lower 0.4 declivous to marginal flange. Second flagellar segment 3.5 as long as wide. Tenth flagellar segment 2.9 as long as wide. Epomia strong, a little disjunct from carina on pronotum. Upper margin of pronotum with a row of 10 long hairs. Speculum with hairs on upper 0.2 and front 0.2. Lower half of mesopleurum with a median dorsal bare area, elsewhere with very long hairs, the hair sockets separated by hair length. Abdominal stalk and hind part of thorax as in figure 326. Hind femur 5.3 as long as deep. Syntergite with median groove reaching 0.7 to space between thyridia and 2 lateral grooves 0.75 as long as median groove.

Black. Palpi brown. Scape, pedicel, and tegula dark brown. Flagellum black. Front coxa brown. Middle and hind coxae blackish brown. Trochanters brown, the front trochanter light brown. Front femur light brown. Middle femur brown. Hind femur, tibia and tarsus blackish brown, the femur with base and apex paler. Front and middle tibiae and tarsi fulvous. Wings faintly infuscate. Stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, Villa Nogués, Argentina, Jan. 13 to 17, 1966, H. and M. Townes (Townes).

5. Exallonyx mydobius, new species

Figures 327 and 328 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 532 (ovipositor sheath)

Front wing 1.7 to 2.9 mm. long. Temple of female 1.1 as long as eye. Cheek of female 1.0 as long as short diameter of eye. Clypeus rather strongly convex, its apical 0.4 convexly sloped to apex. Second flagellar segment of male 3.4 as long as wide, of female 2.4 as long as wide. Tenth flagellar segment of male 2.9 as long as wide, of female 2.1 as long as wide. Epomia strong, a little disjunct from carina on collar. Upper margin of pronotum with a single row of sparse long hairs. Speculum with hairs on upper 0.25 and upper front 0.25. Lower half of mesopleurum with long hairs, the hair sockets separated by 1.0 hair length on upper median part, elsewhere a little denser. Abdominal stalk and hind part of thorax as in figures 327 (♂) and 328 (♀). Hind femur of male 4.3 as long as deep, of female 4.8 as long as deep. Syntergite with a median groove and 2 lateral grooves, the median groove reaching 0.5 (♂) or 0.4 (♀) the distance to space between thyridia, the lateral grooves slightly shorter than median groove. Ovipositor sheath as in figure 532.

Blackish brown. Mandible fulvous or light brown. Palpi, tegula, front and middle coxae, trochanters, and tarsi stramineous. Antenna of male dark brown, the scape and pedicel pale brown or fulvous. Antenna of female brown or light brown, the scape, pedicel, and sometimes basal part of flagellum light fulvous. Hind coxa brownish fulvous with basal 0.4 brownish. Femora brownish fulvous or the hind femur light brown, paler at base and apex. Tibiae pale fulvous, Wings subhyaline, the stigma and strong veins brown.

Type: ♂, S. J. Barreiros, Serra da Bocaína, 1,600 m., Brazil, Nov. 4-7, 1967, Alvarenga and Seabra (Townes). Figure 327 is from the type.

Paratypes: 9♂, 12♀, Nova Teutonia, 300-500 m., Santa Catarina, Brazil, April 3, May, June, and July 1971 and Oct. 25, 1962, Fritz Plaumann (Ottawa and Townes).

6. Exallonyx intensus, new species

Figures 329 (♀ metapleurum, propodeum, and abdominal stalk); 533 (ovipositor sheath)

Male: Unknown.

Female: Front wing 1.8 to 1.9 mm. long. Temple 1.0 as long as eye. Cheek 0.75 as long as short diameter of eye. Clypeus of moderate size, moderately convex, its apical 0.35 concavely declivous to apical flange. Second flagellar segment 2.4 as long as wide. Tenth flagellar segment 1.7 as long as wide. Epomia strong, a little disjunct from carina on collar. Upper margin of pronotum with a row of about 8 long hairs. Speculum with hairs on upper front 0.4. Lower half of mesopleurum with a median dorsal hairless area, elsewhere with very

long hairs with hair sockets separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figure 329. Hind femur 4.3 as long as deep. Syntergite with median groove reaching 0.45 to space between thyridia, also with 2 lateral grooves 0.8 as long as median groove. Ovipositor sheath as in figure 533.

Black. Palpi, trochanters, and front and middle tibiae and tarsi stramineous. Mandible, scape, pedicel, tegula, and front and middle coxae pale fulvous. Flagellum blackish brown. Front and middle femora brownish fulvous. Hind coxa dark brown, pale brown apically. Hind femur blackish brown. Hind tibia and tarsus dark brown, the tibia paler basally. Wings subhyaline. Stigma and strong veins dark brown.

Type: ♀, Nova Teutonia, 300-500 m., Santa Catarina, Brazil, Apr. 3, 1971, Fritz Plaumann (Ottawa). Figures 329 and 533 are from the type.

Paratype: ♀, same data as type (Ottawa).

7. Exallonyx trialbus, new species

Figures 330 (♀ metapleurum, propodeum, and abdominal stalk);
534 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.0 mm. long. Temple 1.0 as long as eye. Cheek 0.37 as long as short diameter of eye. Clypeus 0.35 as wide as long, moderately convex, next to apex evenly convex. Second flagellar segment 1.8 as long as wide. Tenth flagellar segment 1.25 as long as wide. Flagellum strongly enlarged apically, its last segment the most swollen. Dorsal collar with about 3 transverse wrinkles, hairless. Upper margin of pronotum hairless except for a few hairs anteriorly and posteriorly. Epomia strong, not continuous with carina on collar. Pronotum without hairs behind epomia and carina on collar. Lower corner of pronotum with one pit. Speculum with a few hairs on upper 0.4. Lower half of mesopleurum with long very sparse hairs whose sockets are separated by the length of the hairs. Abdominal stalk and hind part of thorax as in figure 330. Hind femur 3.8 as long as deep. Base of syntergite with 3 grooves, the median groove reaching 0.6 the distance to thyridial interspace, the lateral groove broad and 0.9 as long as median groove. Ovipositor sheath as in figure 534.

Black. Scape, pedicel, palpi, tegula, front and middle legs, hind trochanter, and hind tarsus stramineous. Mandible pale brown. Flagellum blackish brown, its segment 8 paler and segments 9-11 white. Basal half of hind coxa light brown, the rest stramineous. Hind femur and tibia light brown, stramineous basally. Wings subhyaline, the stigma and strong veins brown.

Type: ♀, Nova Teutonia, Santa Catarina, Brazil, Oct. 29, 1961, Fritz Plaumann (Ottawa).

8. Exallonyx castaneipes, new species

Figure 331 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 3.0 mm. long. Clypeus moderately large and convex, its apical 0.4 declivous to marginal flange. Second flagellar segment 3.5 as long as wide. Tenth flagellar segment 3.6 as long as wide. Epomia present. Upper part of carina on collar vestigial. Upper margin of pronotum with a row of about 8 moderately long hairs. Speculum with hairs on upper 0.4 and front 0.4. Lower half of mesopleurum with a large median dorsal area containing only 3 hairs, elsewhere with long hairs whose sockets are separated by 0.6 hair length. Abdominal stalk and hind part of thorax as in figure 331. Hind femur 4.9 as long as deep. Syntergite with median groove reaching 0.7 to space between thyridia, and 2 lateral grooves 0.8 as long as median groove.

Black. Palpi, mandible, and scape dark brown. Tegula brownish fulvous. Front and middle legs, hind trochanter, and hind femur light brown. Hind coxa, tibia, and tarsus blackish brown, the coxa light brown apically. Wings faintly infusate. Stigma and strong veins dark brown.

Female: Unknown.

Type: ♂, east of Papallacta, 3,000 m., Ecuador, Jan. 11, 1971, Luis E. Peña (Townes).

9. Exallonyx parameces, new species

Figure 332 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.6 to 3.0 mm. long. Clypeus moderately large, moderately convex, its apical 0.45 concavely declivous to marginal flange, with a weak median overhang. Second flagellar segment 3.1 as long as wide. Tenth flagellar segment 0.25 as long as wide. Epomia weak. Upper margin of pronotum with a row of about 15 hairs, the row partially doubled by additional hairs below the primary row. Speculum with hairs on upper 0.4 and front 0.3. Lower half of mesopleurum with a large upper median area that is bare or with very sparse long hairs, elsewhere with long hairs whose sockets are separated by 0.5 hair length. Abdominal stalk and hind part of thorax as in figure 332, the hind slope of propodeum without median carina or sometimes with a partial carina. Syntergite with median groove reaching 0.7 to space between thyridia and 1 or 2 lateral grooves 0.7 as long as median groove.

Black. Mandible, scape, and pedicel fulvous brown. Palpi pale fulvous. Tegula and front and middle legs fulvous or brownish fulvous, their coxae sometimes brown basally and femora sometimes fulvous brown. Hind coxa blackish, brown apically. Hind trochanter and femur brown. Hind tibia and tarsus dark brown. Wings faintly infusate. Stigma and strong veins dark brown.

Type: ♂, between Loja and Saraguro, 2,900 m., Ecuador, Dec. 27-29, 1970, Luis E. Peña (Townes). Figure 332 is from the type.

Paratypes: 2♂, same data as type (Townes). ♂, Ascázubi to Pita, 2,600 m., Ecuador, Jan. 16, 1971, Luis E. Peña (Townes). ♂, Cuenca, Ecuador, Mar. 3-10, 1965, Luis E. Peña (Townes). ♂, Pimo, Cañar, 3,200 m., Ecuador, Dec. 10-12, 1970, Luis E. Peña (Townes). ♂, Tarqui, 2,800 m., Ecuador, Mar. 7-8, 1965, Luis E. Peña (Townes). ♂, Páramo Palacio (near Calera), Colombia, Nov. 17, 1965, H. and M. Townes (Townes).

10. Exallonyx vescus, new species

Figure 333 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.0 mm. long. Clypeus 2.0 as wide as long, rather evenly, strongly convex. Tyloids absent. Second flagellar segment 2.7 as long as wide. Tenth flagellar segment 2.3 as long as wide. Occipital carina of moderate height. Dorsal collar with 2 transverse wrinkles (interrupted medially), without hairs. Epomia present, not joining carina on collar. Upper margin of pronotum with a very few long hairs. Speculum with hairs on upper 0.6. Lower half of mesopleurum with about 14 long hairs. Abdominal stalk and hind half of thorax as in figure 333. Hind femur 5.8 as long as deep. Median groove of syntergite reaching 0.35 to interthyridial space, with 3 grooves on each side as long as median groove. Hairs on syntergite long, very sparse. Clasper very narrowly triangular, faintly decurved.

Blackish brown. Palpi dark brown. Wings subhyaline. Stigma and strong veins blackish. Weak veins tinged with brown.

Female: Unknown.

Type: ♂, in elfin forest, Caldas (5° 15' N, 76° 25' W), 3,300 to 3,500 m., Colombia, Apr. 5, 1973, J. Helava (Ottawa).

11. Exallonyx deflexus, new species

Figure 334 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.2 mm. long. Clypeus narrow, evenly convex. First flagellar segment 3.6 as long as wide, segments 2-11 of flagellum missing. Occipital carina moderately high. Dorsal collar transversely wrinkled, hairless. Epomia strong, not joining carina on collar. Upper margin of pronotum with a few long hairs anteriorly and near tegula, elsewhere hairless. Speculum with hairs on upper 0.35. Low half of mesopleurum hairless on its upper 0.3, the rest with long, moderately sparse hairs. Abdominal stalk and hind part of thorax as in figure 334. Hind femur 6.0 as long as deep. Syntergite with 5 grooves of equal length, reaching 0.6 to interthyridial space. Hairs on syntergite long and very sparse. Clasper narrowly triangular, not decurved, its apex narrowly rounded.

Black, including tegula. Palpi missing. Legs blackish brown. Wings hyaline. Stigma and strong veins blackish brown. Weak veins almost unpigmented.

Female: Unknown.

Type: ♂, east of Loja, 2,800 m., Ecuador, Sept. 20, 1970, Luis E. Peña (Townes).

12. Exallonyx columnaris, new species

Figures 335 (♀ metapleurum, propodeum, and abdominal stalk);
535 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.0 mm. long. Temple 0.76 as long as eye. Cheek 0.67 as long as short diameter of eye. Clypeus of moderate size and convexity, its apical 0.4 sloped to apical flange. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.6 as long as wide. Epomia strong, not continuous with carina on collar. Upper margin of pronotum with a row of about 10 long hairs. Speculum with very few hairs on upper 0.25 and front 0.2. Lower half of mesopleurum with long hairs whose sockets are separated by an average of 1.8 hair lengths, but ventrad the hairs denser. Stalk of abdomen and hind part of thorax as in figure 335. Hind femur 4.4 as long as deep. Syntergite with a median groove reaching 0.5 to space between thyridia and a broad shallow lateral groove 0.5 as long as median groove. Ovipositor sheath as in figure 535.

Black. Palpi stramineous. Mandible, scape, and pedicel light brown. Flagellum blackish brown. Tegula and front leg fulvous. Middle coxa and femur brown, the coxa apically and femur basally pale brown. Middle trochanter, tibia, and tarsus fulvous. Hind leg dark brown, its trochanter fulvous and apex of coxa light brown. Wings subhyaline. Stigma and strong veins dark brown.

Type: ♀, in forest litter, Rancho Grande, Estado Aragua, Venezuela, Feb. 19-27, 1971, S. Peck (Ottawa).

13. Exallonyx antennalis, new species

Figures 336 (♀ metapleurum, propodeum, and abdominal stalk);
536 (ovipositor sheath)

Male: Unknown.

Female: Front wing 2.5 to 2.8 mm. long. Temple 0.94 as long as eye. Cheek 0.95 as long as short diameter of eye. Clypeus small, strongly convex, its apical 0.4 with a flat slope to marginal flange. Second flagellar segment 3.7 as long as wide. Tenth flagellar segment 2.1 as long as wide. Epomia strong, joining carina on collar. Upper edge of pronotum with a row of hairs that is mostly single. Speculum with hairs on upper 0.4 and front 0.3. Lower half of mesopleurum with long hairs, on median section the hair sockets separated on average by 1.3 hair lengths, denser ventrad. Abdominal stalk and hind part of thorax as in figure 336. Hind femur 5.8 as long as deep in type, 5.5 as long as deep in paratype. Syntergite with median groove reaching 0.7 to space between thyridia, and one or two lateral grooves about 0.7 as long as median groove. Ovipositor sheath as in figure 536.

Black. Palpi stramineous. Mandible light brown. Antenna light brown but darkened apically (in type), or dark brown with scape and pedicel light brown (in paratype). Tegula and front and middle legs pale fulvous, the middle coxa brown, in paratype the femora light brown. Hind coxa blackish. Hind trochanter stramineous. Hind femur, tibia, and tarsus dark brown, the base of femur stramineous. Wings subhyaline. Stigma and strong veins brown.

Type: ♀, 24 miles west of La Ciudad, 7,000 ft., Durango, Mexico, July 4, 1964, W. R. M. Mason (Ottawa). Figures 336 and 536 are from the type.

Paratype: ♀, Yepocapa, Guatemala, 1948 or 1949, H. T. Dalmat (Washington).

14. Exallonyx stenostoma, new species

Figure 337 (♂ metapleurum, propodeum, and abdominal stalk)

Male type: Front wing 2.6 mm. long. Clypeus very small, strongly convex, its apical 0.4 declivous and almost flat. Second flagellar segment 4.4 as long as wide. Tenth flagellar segment 3.7 as long as wide. Epomia strong. Upper part of carina on collar strong. Upper margin of pronotum with a row of moderately sparse hairs. Speculum with hairs on upper front 0.4. Lower half of mesopleurum with a median dorsal hairless area, elsewhere the hairs sparse. Abdominal stalk and hind part of thorax as in figure 337. Hind femur 5.0 as long as deep. Median groove of syntergite reaching 0.85 to space between thyridia, with two grooves on each side that are 0.7 as long as median groove.

Black. Mouth parts brownish stramineous. Scape, pedicel, tegula, and front and middle legs brownish fulvous. Hind leg brown, its trochanter and base and apex of femur brownish fulvous. Wings faintly infuscate, the stigma and strong veins dark brown.

Type: ♂, Machu Picchu, Peru, Nov. 29, 1965, H. and M. Townes (Townes).

15. Exallonyx burhytis, new species

Figures 338 and 339 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 537 (ovipositor sheath)

Front wing 1.7 to 2.2 mm. long. Temple of female 1.0 as long as eye. Cheek of female 1.0 as long as short diameter of eye. Clypeus of moderate size and convexity, its apical 0.3 with a flat bevel to marginal flange. Second flagellar segment 3.5 as long as wide in male, 2.8 as long as wide in female. Tenth flagellar segment 2.8 as long as wide in male, 2.0 as long as wide in female. Epomia strong, not joining carina on collar. Upper margin of pronotum with a row of about 6 long hairs. Speculum with hairs on upper 0.2 and front 0.3. Lower half of mesopleurum with long hairs, on its upper and median part the hair sockets separated by 1.5 hair lengths on average, the hairs denser ventrad. Abdominal stalk and hind part of thorax as in figure 338 (♂) and 339 (♀).

Hind femur 5.3 as long as deep in male, 5.0 as long as deep in female. Syntergite with median groove reaching 0.6 to space between thyridia and 2 lateral grooves 0.7 as long as median groove. Ovipositor sheath as in figure 537.

Blackish brown. Palpi, front coxa, trochanters, and front and middle tarsi stramineous. Mandible, scape, pedicel, and tegula pale fulvous. Flagellum dark brown. Middle coxa fulvous in male, pale brown in female. Front and middle femora and tibiae pale fulvous in male, pale brown in female. Hind coxa, femur, tibia, and tarsus brown to dark brown, the ends of femur stramineous and tibia light brown basally. Wings hyaline. Stigma and strong veins dark brown.

Type: ♂, Hardwar Gap, 4,000 ft., Jamaica, July 25, 1966, Howden and Becker (Ottawa).

Paratypes: 4♂, 1♀, same locality and collectors as type, July 25 and 27, 1966 (Ottawa and Townes).

16. Exallonyx collaris, new species

Figures 340 and 341 (♂, ♀ metapleurum, propodeum, and abdominal stalk; 538 (ovipositor sheath)

Front wing 2.0 to 2.3 mm. long. Temple of female 0.93 as long as eye. Cheek of female 0.86 as long as short diameter of eye. Clypeus moderately small, moderately convex, its apical 0.4 with a flat slope to apical flange. Second flagellar segment of male 4.2 as long as wide, of female 2.75 as long as wide. Tenth flagellar segment of male 3.1 as long as wide, of female 1.8 as long as wide. Epomia present, not joining carina on collar. Upper margin of pronotum with a sparse, irregular row of about 8 long hairs. Speculum with hairs on upper 0.4 and front 0.2. Lower half of mesopleurum with long hairs, on upper 0.6 of this area the average distance between hair sockets about 1.8 hair lengths, on lower 0.4 the hairs somewhat denser. Abdominal stalk and hind part of thorax as in figure 340 (♂) and 341 (♀). Hind femur of male 5.0 as long as deep, of female 4.9 as long as deep. Syntergite with median groove reaching 0.7 to 0.8 to space between thyridia and two lateral grooves (or sometimes one) that are 0.7 as long as median groove. Ovipositor sheath as in figure 538.

Black. Pronotum and propleurum fulvous to medium brown. Palpi, front coxa, trochanters, and front and middle tarsi whitish. Mandible, scape, and pedicel brownish fulvous. Flagellum dark brown. Tegula, middle coxa, and front and middle femora and tibiae pale fulvous, in female the middle femur pale brown. Hind coxa and femur of male fulvous, the coxa brown apically and femur more or less brown except toward base. Hind coxa and femur of female brown, the coxa pale apically and femur pale at apex and basally. Hind tibia and tarsus brown, tarsal segments 2-5 pale. Wings subhyaline. Stigma and strong veins brown.

Type: ♂, Hardwar Gap, 4,000 ft., Jamaica, Jul. 25, 1966, Howden and Becker (Ottawa).

Paratypes: 5♂, 1♀, same locality and collectors as type, July 6, 10, 25, and 29, 1966 (Ottawa and Townes). ♂, Hardwar Gap, Jamaica,

July 13, 1966 (Ottawa).

17. Exallonyx ochropus, new species

Figures 342 (♀ metapleurum, propodeum, and abdominal stalk)

Male: Unknown.

Female: Front wing 2.0 to 2.1 mm. long. Temple 1.3 as long as eye. Cheek 0.81 as long as short diameter of eye. Clypeus small, moderately convex, its apical 0.35 declivous to apical flange. Second flagellar segment 2.2 as long as wide. Tenth flagellar segment 1.8 as long as wide. Epomia strong, continuous with carina on collar. Upper margin of collar with a row of 7-10 long hairs. Speculum with hairs on upper 0.4. Lower half of mesopleurum bare near upper edge, elsewhere with long hairs whose sockets are separated by about 0.8 hair length. Abdominal stalk and hind part of thorax as in figure 342. Hind femur 4.6 as long as deep. Syntergite with median groove reaching 0.6 to space between thyridia and 2 lateral grooves 0.8 as long as median groove. Ovipositor sheath 0.41 as long as hind tibia, similar to that of *E. antennalis* (fig. 536).

Black. Palpi straminous. Mandible brown. Scape, pedicel, tegula, and legs light fulvous, the hind tibia and tarsus brownish fulvous and hind coxa brown basally. Flagellum dark brown. Wings hyaline, the stigma and strong veins light brown.

Type: ♀, Lago Lacar, Pucará, Neuquén, Argentina, January to May, 1969, Charles Porter (Townes). Figure 342 is from the type.

Paratypes: ♀, Concepción, Chile, Sept. 13, 1970, T. Cekalovic (Townes). ♀, Los Robles, Magallanes, Chile, Jan. 22, 1961, T. Cekalovic (Townes).

G. Obsoletus Group

Front wing 2.3 to 4.7 mm. long. Male flagellum with raised tyloids only in *E. crenicornis*. Lower corner of pronotum with a single pit. Upper margin of pronotum with a band of hairs that is several hairs wide. Epomia present or absent. Side of pronotum without hairs behind epomia or upper end of carina on collar. Paired smooth areas on upper face of propodeum reaching far behind propodeal spiracle. Hind margin of hind wing with a shallow notch at basal 0.35. Abdominal stalk without a transverse ridge at front end of lower side, or sometimes with a weak ridge that is not higher than the longitudinal ridges. Side of abdominal stalk of male with ridges, of female with ridges, partly with ridges, or entirely without ridges. Upper profile of abdominal stalk straight or weakly concave in male, concave in female. Hairs on syntergite moderately long, none of them close to lower edge of syntergite. Base of syntergite with a long median groove, in male with 3 or sometimes 4 grooves on each side of median groove, in female with 0-3 grooves on each side of median groove. Male clasper tapered to a sharp point, decurved, claw-like. Ovipositor sheath punctate and longitudinally striate.

This group includes 6 species, 4 in North America and 2 in Eurasia and Japan.

Keys to the species of the Obsoletus Group

Males

1. Flagellar segments each with a tyloid in the form of a low rounded longitudinal ridge. Clasper faintly decurved. Europe.
 2. crenicornis Nees (p. 359)
 Flagellar segments without tyloids. Clasper weakly to moderately decurved. 2
2. Flagellum short, the second segment 2.0 as long as wide. Upper profile of abdominal stalk concave. Mexico.
 3. recavus, new species (p. 361)
 Flagellum longer, the second segment 2.4 to 3.5 as long as wide. Upper profile of abdominal stalk straight or weakly convex. . . 3
3. Trochanters and middle and hind femora black or very dark brown. Mexico. 4. achilus, new species (p. 361)
- Trochanters and middle and hind femora fulvous to medium brown. 4
4. Hair stripe on upper margin of pronotum 2 to 3 hairs wide. Clasper moderately slender, weakly decurved. Coxae black or blackish brown. Eurasia. 1. pallidistigma Morley (p. 356)
- Hair stripe on upper margin of pronotum 4 to 6 hairs wide. Clasper slender, moderately decurved. Coxae fulvous to dark brown. . 5
5. Flagellum dark brown, the second segment 2.4 as long as wide. Flagellar segments 2-10 each with a light colored, somewhat smoother dorsal stripe. Hair sockets on upper part of lower half of mesopleurum separated by 0.5 the length of hairs. Dorsal profile of propodeum moderately long, gradually rounded off apically. Stalk of abdomen averaging 1.3 as long as deep. Eastern North America. 5. obsoletus Say (p. 362)
- Flagellum blackish, the second segment 3.5 as long as deep. Flagellar segments without a dorsal lighter colored stripe. Hair sockets on upper part of lower half of mesopleurum separated by 0.7 the length of hairs. Dorsal profile of propodeum quite long, somewhat abruptly rounded off apically. Stalk of abdomen averaging 1.5 as long as deep. Eastern North America.
 6. grandis Brues (p. 364)

Females

(The female of *E. recavus* is unknown.)

1. Ovipositor sheath almost straight. Stalk of abdomen with moderately coarse ridges that are only faintly oblique. Eurasia.
 1. pallidistigma Morley (p. 356)
Ovipositor sheath decurved. Stalk of abdomen smooth or with fine to coarse, strongly oblique ridges. 2
2. Syntergite with strong longitudinal grooves on each side of the median groove, these grooves reaching 0.75 to the space between thyridia. Side of stalk of abdomen with fine oblique ridges. Propodeum of moderate length. Europe.
 2. crenicornis Nees (p. 359)
Syntergite with weak longitudinal grooves on each side of median groove, these lateral grooves reaching 0.3 to 0.5 to the space between thyridia, or sometimes the lateral grooves lacking. Side of stalk of abdomen smooth, or with coarse or fine oblique ridges. Propodeum long. 3
3. Trochanters and femora dark brown. Second flagellar segment 2.4 as long as wide. Mexico. . . 4. achilus, new species (p. 361)
Trochanters and femora fulvous. 4
4. Second flagellar segment 2.4 as long as wide. Propodeum long, but shorter than in *E. grandis*. Ovipositor sheath moderately stout at base. Eastern North America. . . . 5. obsoletus Say (p. 362)
Second flagellar segment 3.1 as long as wide. Propodeum exceptionally long. Ovipositor sheath very stout at base. Eastern North America. 6. grandis Brues (p. 364)

1. Exallonyx pallidistigma Morley

Figures 343 and 344 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 539 (ovipositor sheath)

- Proctotrupes niger* Haliday, 1839. Hymenoptera Britannica. Oxyura, p. 7. ♂, ♀. des. Not infrequent in woods in autumn. Misdet. of *niger* Panzer.
- Proctotrupes niger* Curtis, 1839. British entomology . . . XVI text for fig. 744. key. Misdet. of *niger* Panzer.
- Proctotrupes pallipes* Blanchard, 1840. Histoire naturelle des insectes 3: 284. syn., des. Europe. Misdet. of *pallipes*. (in part).
- Exallonyx niger* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 35. syn. Misdet. of *niger* Panzer.
- Exallonyx Niger* "Hal." Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 340. ♂, ♀. des. in key. England. France: 3 localities. Hungary. Italy. Switzerland: Charmey.
- Proctotrypes niger* Morley, 1911. Proc. Roy. Irish Acad. 31: 17. ♀. Ireland: Brackloon Wood; Clare Island. Misdet. of *niger* Panzer.

- Exallonyx niger* Kieffer, 1914. Das Tierreich 42: 50. ♂, ♀. key, des., biol. England. France. Germany. Hungary. Italy. Switzerland. Guest of *Myrmica scabrinodis*. Misdet. of *niger* Panzer.
- Exallonyx niger* Morley, 1922. Entomologist 55: 160, 182. key, biol. England: 17 localities. Ireland: Killarney. Scotland: Banchory. Misdet. of *niger* Panzer.
- **Exallonyx niger* var. *pallidistigma* Morley, 1922. Entomologist 55: 182. [♀]. des. Lectotype: ♀ (designated by Masner, 1965), England: Wicken Vil[lage] (London). Examined in 1975. England: 4 additional localities.
- Exallonyx niger* Crèvecoeur & Maréchal, 1936. Bul. & Ann. Soc. Ent. Belgique 76: 239. ♀. Belgium: Liège. Misdet. of *niger* Panzer.
- Exallonyx niger* Maneval, 1937. Bul. Mus. Roy. d'Hist. Nat. Belgique 13: 2. ♀. des., fig. Belgium: Liège. France: St. Rambert in Rhône. Misdet. of *niger* Panzer.
- Exallonyx niger* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 436, 437, 440, 443, 445. ♂, ♀. keys, des., figs. England: 6 localities. Ireland: 10 localities. Misdet. of *niger* Panzer.
- Exallonyx niger* Crèvecoeur & Maréchal, 1939. Bul. & Ann. Soc. Ent. Belgique 79: 443. ♀. Belgium: Sterrebeck. Misdet. of *niger* Panzer.
- Exallonyx niger* Hellén, 1941. Notulae Ent. 21: 37. ♂, ♀. key, des. Finland: 5 localities. Misdet. of *niger* Panzer.
- Exallonyx niger* Perkins, 1942. Entomologist 75: 193. ♀. Sweden: 2 localities. Misdet. of *niger* Panzer.
- **Phaenoserphus Milleri* Tomšik, 1942. Ent. Listy 5: 75. ♂. des., figs. Type: ♂ (lacking front tibiae and tarsi, and middle tarsi beyond segment 1), Czechoslovakia: Brno (Brno). Examined in 1975. New synonym.
- Exallonyx niger* Tomšik, 1944. Ent. Listy 7: 54. ♂, ♀. des., biol. Czechoslovakia: localities in Bohemia & Moravia. Misdet. of *niger* Panzer.
- Exallonyx niger* Pschorn-Walcher, 1955. Mitt. Schweizerischen Ent. Gesell. 28: 216. ♀. des. Misdet. of *niger* Panzer.
- Proctotrupes niger* Bradley, 1955. Mém. Soc. Roy. Ent. Belgique 27: 137. fig. Misdet. of *niger* Panzer.
- Codrus (Codrus) niger* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, & central Europe. Misdet. of *niger* Panzer.
- Phaenoserphus milleri* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 63. Probably not *Phaenoserphus* (according to Tomšik *in litt.* not a good species).
- Codrus niger* Meyer, 1961. Bombus 2: 94. West Germany: 2 localities. Misdet. of *niger* Panzer.
- Codrus (Codrus) niger* Weidemann, 1962. Faun. Mitt. aus Norddeutschland 2: 29, 33. ♂, ♀. biol., ecology. West Germany: Rendsburg. Host: *Ocybus ater*. Misdet. of *niger* Panzer.
- Codrus niger* Meyer, 1963. Bombus 2: 143. ♀. [Denmark]: Sønderborg (= Sonderburg). Misdet. of *niger* Panzer.
- Codrus niger* Pschorn-Walcher, 1964. Insecta Matsumurana 27: 4. Europe. Japan. Host: *Ocybus ater*. Misdet. of *niger* Panzer
- Codrus niger* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 442 *et seq.* ecology. Austria. Italy: Calabria. Misdet. of *niger* Panzer.
- Codrus niger* var. *pallidistigma* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. suppl. 1: 6. ♀. lectotype designated.
- Codrus niger* Stelfox, 1966. Proc. Roy. Irish Acad. 64 (B): 530. ♂, ♀. biol. Ireland: 15 counties. Host: ?*Pterostichus*. Misdet. of *niger* Panzer.
- Codrus niger* Weidemann, 1967. Faunistisch - Ökologische Mitt. 3: 168, 169. biol. West Germany: Gröde. Misdet. of *niger* Panzer.
- Codrus (Codrus) niger* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 39, 46, 48, 54. ♂, ♀. keys, des., figs., biol. Austria. Belgium. France. Germany. Great Britain. Hungary. Southern Italy. Japan. Switzerland. Misdet. of *niger* Panzer.
- Codrus niger* Teodorescu, 1971. An. București Biol. Anim. 20: 89. ♂, ♀. des., des. & fig. ♂ genitalia. Rumania: Sinaia in Prahova district. Misdet. of *niger* Panzer.
- Codrus niger* Pschorn-Walcher & Haeselbarth, 1972. Nachrichtenbl. Bayerischen Ent. 21: 120. ♂, ♀. Austria. Germany. Switzerland. Misdet. of *niger* Panzer.
- Codrus niger* Kozlov, 1972. Insects of Mongolia 1: 646. ♂. Mongolia: 1 locality. Host: *Ocybus ater*. Misdet. of *niger* Panzer.

Codrus niger Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♂, ♀. Rumania. Misdet. of *niger* Panzer.

Codrus (Codrus) niger Teodorescu and Fabritius, 1975. In Ionescu: Fauna. Acad. Rep. Soc. România, Ser. Monog., p. 165. ♂, ♀. Rumania: Bihor, Iași, Prahova, and Suceava. Misdet. of *niger* Panzer.

Codrus (Codrus) niger Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 544, 545, 547, 548. figs. Central Europe. Misdet. of *niger* Panzer.

Front wing 3.0 to 4.1 mm. long. Temple of female 1.2 as long as eye. Cheek of female 0.75 as long as short diameter of eye. Clypeus moderately convex, its apical 0.25 concavely beveled and on median half with a sharply margined overhang. Tyloids absent. Second flagellar segment of male 2.5 as long as wide, of female 2.8 as long as wide. Tenth flagellar segment of male 2.7 as long as wide, of female 2.2 as long as wide. Epomia absent. Hair band on upper margin of pronotum 2 or 3 hairs wide (or in female sometimes 1 hair wide). Speculum with hair on upper 0.4. Hairs on lower half of mesopleurum long, their sockets separated by 0.4 hair length. Abdominal stalk and hind half of thorax as in figures 343 (♂) and 344 (♀). Hind femur 4.7 as long as deep in male, 5.0 as long as deep in female. Clasper a narrow triangle with sharp apex, weakly decurved. Ovipositor sheath as in figure 539.

Black. Mandible of male black, of female dark brown. Palpi stramineous. Antenna of male black with scape and pedicel dark brown or blackish. Antenna of female fulvous or brownish fulvous, the scape and apical half brown. Coxae black or blackish brown, the rest of legs fulvous. Wings subhyaline with stigma and strong veins dark brown, weak veins tinged with brown.

Specimens: 112♂, 43♀ from Austria (near Linz, Marchtrenk, Pulgarn, near Salzburg, Scheffau in the Tirol at 800 m., Traunau, Vienna, and Windischgarsten); Cyprus (Yermasoyia River); Czechoslovakia (Kytín in Bohemia); Denmark (Copenhagen); England (Conistan, Essex, Leicester, Oxford, and Spratton); Hungary (Budapest); Ireland (Athdown in Co. Wicklow, Ballyhenry in Co. Wicklow, Berewood, Brockenhurst, Bunduff in Co. Sligo, Coombe Wood, Downs in Co. Wicklow, Dungarvan in Co. Waterford, Dunran in Co. Wicklow, Fairy Bridge, Glencree in Co. Wicklow, Glencullen in Co. Wicklow, Co. Kerry, Lake Dan in Co. Wicklow, Landestown in Co. Kildare, Little Bray in Co. Dublin, Malahide in Co. Dublin, Murlough Ho dunes in Co. Dublin, Slade Brook at Glenasmole in Co. Dublin, The Slade of Saggart in Co. Dublin, and Stranmillis Coll. in Co. Antrim); Italy (Naturno in Trentino at 500 to 1,000 m., Pizzighettone, and Unserfrau in Trentino at 1,500 m.); Luxemburg (Dierkirch); Spain (north slope of Veleta at 2,200 m. in Sierra Nevada); Sweden (Åhus in Skåne, Grotlingbo in Gotland, and Ljungby in Småland); and West Germany (Hohe Acht near Adenau, Kegelsbach at Kirschheim unter Teck, and Mainz). The dates of collection are from early May to late October.

In literature there are locality records from the additional countries Belgium, Finland, France, Japan, Lappland, Mongolia, Scotland, and Switzerland.

This species is common and widespread in Europe. It has been reported also from Japan and Mongolia. Weidemann, 1962, records it as a parasite of *Ocypus ater* (Staphylinidae), and this host record was repeated by Pschorn-Walcher, 1964 and Kozlov, 1972.

2. Exallonyx crenicornis Nees

Figures 575 (♂ tyloids); 345 and 346 (♂, ♀, metapleurum, propodeum, and abdominal stalk); 540 (ovipositor sheath)

- **Codrus crenicornis* Nees, 1834. Hymenopterorum ichneumonibus affinium monographiae, . . . 2: 357. "♀" = ♂. des. Type: ♂, Germany: Sickershausen [in Franconia] (destroyed). Description sufficient for identification.
- **Proctotrupes clavipes* Thomson, 1857. Öfvers. Svenska Vetensk. Akad. Förh. 14: 420. ♀. des. Type: ♀, Norway: Dovre (Stockholm). Examined in 1975. New synonym.
- Proctotrupes crenicornis* Vollenhoven, 1876. Pinacographia, p. 30, pl. 19. fig. 2. ♂. figs. of type.
- Proctotrupes clavipes* (as *claripes* on fig.) Vollenhoven, 1876. Pinacographia, p. 31, pl. 19, fig. 6. ♀. fig. of type.
- Proctotrypes clavipes* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 464. syn.
- Proctotrypes crenicornis* Dalla Torre, 1898. Catalogus hymenopterorum . . . 5: 464. syn.
- Serphus* (*Phaenoserphus*) *Clavipes* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 310. ♀. Thomson des. repeated in key. Scandinavia.
- Exallonyx* ? *Crenicornis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 326. "♀" = ♂. Nees des. repeated in key. Germany: Sickershausen [in Franconia].
- **Exallonyx fumipennis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 339. ♂. des. in key. Type: ♂, France: Bitche (Paris). Examined in 1975. New synonym.
- **Exallonyx fumipennis* var. *donisthorpei* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 339. ♂. des. in key. Lectotype: ♂ (designated by Nixon, 1938), England: [Wallasey] (London). Examined in 1975. France: Nogent-sur-Marne. "Host": *Myrmica scabrinodis*. New synonym.
- Phaenoserphus* ? *clavipes* Kieffer, 1914. Das Tierreich 42: 45. ♀. key, des. Scandinavia.
- Exallonyx crenicornis* Kieffer, 1914. Das Tierreich 42: 45. "♀" = ♂. key, des. Germany.
- Exallonyx fumipennis fumipennis* Kieffer, 1914. Das Tierreich 42: 50. ♂. key, des. Italy: Trieste.
- Exallonyx fumipennis donisthorpei* Kieffer, 1914. Das Tierreich 42: 50. ♂. des., biol. England: London. France: Nogent-sur-Marne. Guest of *Myrmica scabrinodis*.
- Exallonyx fumipennis* Morley, 1922. Entomologist 55: 160, 182. ♂, ♀. key, des. England: 4 localities.
- Exallonyx fumipennis* var. *donisthorpei* Donisthorpe, 1927. Guests of British ants, p. 106. England: Wallasey. With *Myrmica scabrinodis*.
- Exallonyx ligatus* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 437. syn. (in part).
- Exallonyx donisthorpei* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 444, 445. ♂. key, des., figs., biol. England: 3 localities. Scotland: Bishopton.
- Exallonyx donisthorpei* Perkins, 1942. Entomologist 75: 194. ♂. Sweden: Fjellfotasjö.
- Exallonyx fumipennis fumipennis* Tomsík, 1944. Ent. Listy 7: 54. Czechoslovakia: Děvín.
- Exallonyx fumipennis donisthorpei* Tomsík, 1944. Ent. Listy 7: 54. Common in Czechoslovakia.
- Exallonyx fumipennis* Kelner-Pillault, 1958. Bul. Mus. Natl. Hist. Nat., Paris (2) 30: 148. ♂. type data.

- Codrus* ? (*Codrus*) *donisthorpei* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, central, and south Europe.
- Codrus donisthorpei* Palm, 1964. Opuscula Ent. 29: 246. ♂. biol. Sweden. Host: *Staphylinus* larva.
- Codrus funipennis donisthorpei* Masner, 1965. Bul. British Mus. (Nat. Hist.) Ent. Suppl. 1: 6. ♂. lectotype designation.
- Codrus donisthorpei* Weidemann, 1965. Ztschr. f. Morph. u. Ökol. der Tiere 55: 442. Austria. Switzerland.
- Codrus* (*Codrus*) *donisthorpei* Pschorn-Walcher, 1971. Insecta Helvetica 4. Hymenoptera, p. 56. ♂. key, des. Europe (including Sweden & Switzerland).
- Codrus* (*Codrus*) *donisthorpei* Kozlov, 1978. Opredelitel' nasekomykh evropeiskoi chasti SSSR. t. 3: Pereponchatokrylye 2: 548. key. USSR: Yaroslavskaia oblast.

Front wing 2.8 to 3.7 mm. long. Temple of female 1.4 as long as eye. Cheek of female 1.0 as long as short diameter of eye. Clypeus moderately convex, its apical 0.3 declivous and overhanging to marginal flange, on underside of declivity with a weak transverse impression. All flagellar segments of male with a weak longitudinal rounded ridge on outer side (fig. 575). Second flagellar segment of male 2.1 as long as wide, of female 2.2 as long as wide. Tenth flagellar segment of male 2.1 as long as wide, of female 2.0 as long as wide. Epomia present. Upper edge of pronotum with a hair band about 4 hairs wide. Speculum with hairs on upper 0.65. Hair sockets on lower half of mesopleurum separated by 0.5 length of hairs. Abdominal stalk and hind part of thorax as in figure 345 (♂) and 346 (♀). Hind femur 3.9 as long as deep in both sexes. Median groove on syntergite reaching 0.75 toward interspace of thyridia, the lateral grooves numerous, irregular, 0.85 as long as median groove. Clasper elongate triangular, almost straight. Ovipositor sheath as in figure 540.

Black. Palpi stramineous. Mandible and antenna medium brown to dark brown, the tyloids concolorous with antenna or darker or lighter. Female antenna with basal half of antenna pale brown and apical half dark brown. Tegula fulvous. Coxae blackish brown, paler apically, the rest of legs fulvous. Wings faintly to moderately infuscate, the stigma and strong veins dark brown.

Specimens: 16♂, 6♀ from Austria (Diessenleiten Bach, Gunskirchen, Marchtrenk, Raxalpe at 1,500 m., Sarleinsbach, Scheffau in Tirol at 800 m., and Schiltensberg); England (Torquay in Devon); Ireland (Islington); Italy (Naturno in Trentino at 500 to 1,000 m. and Pizzighettone); Sweden (Ljungby in Småland and Vallentuna in Uppland); and West Germany (Munich and Schliersee in Bavaria). Collection dates are mostly from late July to mid September. The total range of dates is June 1 to September 30.

In literature there are locality records from the additional countries Czechoslovakia, France, Norway, and Scotland.

This species is widespread in Europe. It is uncommon in collections. Palm, 1964, records rearing it from a *Staphylinus* larva.

3. Exallonyx recavus, new speciesFigure 347 (σ metathorax, propodeum, and abdominal stalk)

Male: Front wing 2.3 to 3.0 mm. long. Clypeus with apical 0.3 abruptly declivous and from beneath forming a flat crescentic area. Tyloids absent. Second flagellar segment 2.0 as long as wide. Tenth flagellar segment 1.9 as long as wide. Occipital carina of normal height. Epomia weak. Pronotum without hairs behind epomia and carina on collar. Upper margin of pronotum with a stripe of hairs that is about 4 hairs wide. Speculum with hairs on upper front 0.25. Hairs on lower half of mesopleurum sparse, the hair sockets separated by an average of 1.5 the length of the hairs but denser near lower edge of mesopleurum. Abdominal stalk and hind part of thorax as in figure 347. Hind femur 4.6 as long as deep. Syntergite with median groove reaching 0.75 to interspace of thyridia, also with 2 lateral grooves 0.7 as long as median groove. Hairs on syntergite sparse. Clasper tapered to a point, moderately decurved.

Blackish brown. Palpi stramineous. Antenna dark brown. Tegula and front and middle legs fulvous brown, their coxae a little darker than the rest. Hind leg light brown, its coxa brown. Wings subhyaline. Stigma and strong veins brown. Weak veins faintly brownish.

Female: Unknown.

Type: σ , Córdoba, Vera Cruz, Mexico, May 13, 1908, A. Fenyés (Washington). Figure 347 is from the type.

Paratype: σ , same locality and collector as type, Apr. 23, 1908 (Washington).

4. Exallonyx achilus, new speciesFigures 348 and 349 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 541 (ovipositor sheath)

Front wing 3.6 to 4.5 mm. long. Temple of female 1.7 as long as eye. Cheek of female 0.83 as long as short diameter of eye. Clypeus with apical 0.3 impressed and concave above its marginal flange. Tyloids absent. Second flagellar segment of male 3.1 as long as wide, of female 2.4 as long as wide. Tenth flagellar segment of male 3.0 as long as wide, of female 2.0 as long as wide. Epomia vestigial. Upper edge of pronotum with a hair band about 4 hairs wide. Pronotum hairless behind epomia and carina on collar. Speculum with hairs on upper 0.4. Lower half of mesopleurum hairless near upper edge, medially with hairs whose sockets are separated by 0.6 the hair length. Abdominal stalk and hind part of thorax as in figures 348 (σ) and 349 (♀). Hind femur of male 4.5 as long as deep, of female 5.0 as long as deep. Median groove of syntergite reaching 0.7 to 0.9 to thyridial interspace, the male with 2 lateral grooves 0.6 as long as median groove, the female without lateral grooves. Clasper elongate triangular, moderately decurved, claw-like. Ovipositor sheath as in figure 541.

Black. Palpi and tegula brown. Front and middle legs brown, in

male the front and middle coxae and trochanters and middle femur blackish brown. Wings weakly infusate, the stigma and strong veins black.

Type: ♂, Yerba Buena, 6,500 ft., 20 miles north of Bochil, Chiapas, Mexico, June 9 to 24, 1969 (Ottawa).

Paratypes: 4♂, same data as type (Ottawa and Townes). ♂, ♀, 15 miles west of El Palmito, 5,000 ft., Sinaloa, Mexico, July 8 and Aug. 8, 1964, W. R. M. Mason (Ottawa).

5. Exallonyx obsoletus Say, new combination

Figures 350 and 351 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 542 (ovipositor sheath)

- **Proctotrupes obsoletus* Say, 1836. Boston Jour. Nat. Hist. 1: 277 (Leconte Ed. 2: 725). ♀. des. Type: ♀, USA: Indiana (destroyed). Ashmead's interpretation of this species (1893. Bul. U. S. Natl. Mus. 45: 340) applied the name to *Brachyserphus abruptus*, which disagrees with Say's description, particularly in venation. Other authors have followed Ashmead. Say's *obsoletus* is reinterpreted here as representing the present species. A female in the Townes collection is labeled as agreeing with Say's description.
- **Proctotrypes carolinensis* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 341. ♂. key, des. Type: ♂, USA: North Carolina (Washington). Examined in 1977. New synonym.
- **Proctotrypes longiceps* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 342. ♀. key, des. Type: ♀, Canada: Ottawa (Washington). Examined in 1977. New synonym.
- **Proctotrypes medius* Ashmead, 1893. Bul. U. S. Natl. Mus. 45: 343. ♀. key, des. Type: ♀, Canada: Ottawa (Washington). Examined in 1977. New synonym.
- Proctotrypes carolinensis* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♂. Canada: Hull [in Quebec]; Kettle Is. and Ottawa [in Ontario].
- Proctotrypes longiceps* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♀. Canada: Ottawa.
- Proctotrypes medius* Harrington, 1899. Trans. Roy. Soc. Canada (2) 5: 194. ♂?, ♀. Canada: ?Hull in Quebec; Ottawa [in Ontario].
- Phaenoserphus carolinensis* Kieffer, 1909. Genera Insectorum 95: 5. syn.
- Exallonyx longiceps* Kieffer, 1909. Genera Insectorum 95: 8. syn.
- Exallonyx medius* Kieffer, 1909. Genera Insectorum 95: 8. syn.
- Phaenoserphus obsoletus* Kieffer, 1909. Genera Insectorum 95: 6. syn.
- Phaenoserphus carolinensis* Kieffer, 1914. Das Tierreich 42: 34. ♂. key, des. USA: North Carolina.
- Exallonyx longiceps* Kieffer, 1914. Das Tierreich 42: 55. ♀. key, des. Canada: Ottawa.
- Exallonyx medius* Kieffer, 1914. Das Tierreich 42: 57. ♀. key, des. Canada: Ottawa.
- Serphus carolinensis* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. key, des. USA: Putnam in Connecticut.
- Serphus longiceps* Brues, 1917. Connecticut Geol. Nat. Hist. Survey Bul. 22: 575. ♀. key, des.
- Exallonyx longiceps* Brues, 1919. Jour. New York Ent. Soc. 27: 10. key.
- Proctotrypes carolinensis* Johnson, 1930. Nantucket Maria Mitchell Assoc. 3 (2): 107. USA: Nantucket Island in Massachusetts.
- Codrus carolinensis* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 665. syn. Canada: Ontario; Quebec. USA: Indiana.
- Codrus longiceps* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn. Canada: Ontario. USA: Ohio; Virginia.
- Codrus medius* Muesebeck & Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.
- Codrus longiceps* Muesebeck & Masner, 1967. U. S. Dept. Agr., Agr. Monog. 2, suppl. 2: 286. USA: Arkansas. Host: *Staphylinus* sp.

- Codrus carolinensis* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 4. ♂.
type data.
- Codrus longiceps* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♀.
type data.
- Codrus medius* Masner & Muesebeck, 1968. U. S. Natl. Mus. Bul. 270: 5. ♀.
type data.
- Codrus carolinensis* Hoebeke, 1978. Jour. Kansas Ent. Soc. 51: 507-509. ♂, ♀.
figs., biol. Host: *Platydracus violaceus*.

Front wing 2.7 to 4.0 mm. long. Temple of female 1.0 as long as eye. Cheek of female 0.78 as long as short diameter of eye. Clypeus weakly convex with apical 0.3 declivous to marginal flange. Tyloids lacking. Second flagellar segment 2.4 as long as wide in both sexes. 10th flagellar segment 2.3 as long as wide in male, 1.9 as long as wide in female. Epomia present. Hair band on upper margin of pronotum about 4 hairs wide. Pronotum without hairs behind epomia and carina on collar. Speculum with hairs on upper 0.5. Hair sockets on lower half of mesopleurum separated by 0.5 hair length. Abdominal stalk and hind part of metapleurum as in figures 350 (♂) and 351 (♀). Hind femur of male 4.4 as long as deep, of female 4.0 as long as deep. Median groove of syntergite reaching 0.8 to thyridial interspace, the male with 2 or 3 lateral grooves 0.7 as long as median groove, the female with 2 or 3 weak lateral grooves 0.3 as long as median groove. Clasper very narrowly triangular, moderately decurved, somewhat claw-like. Ovipositor sheath as in figure 542.

Black. Palpi white or stramineous. Mandible brown. Scape and pedicel of male, antenna of female, and tegula brownish fulvous. Flagellum of male light brown to dark brown, with a somewhat paler brown stripe above. Legs fulvous, the hind coxa dark brown with apex paler brown and middle coxa pale brown to medium brown with apex paler. Wings subhyaline, the stigma and strong veins brown. Weak veins in part faintly brown.

Specimens: 273♂, 60♀ from Arkansas (Fayetteville and New Creek Falls in Ozark National Forest in Johnson Co.); District of Columbia (Rock Creek); Georgia (Dahlonega, Forsyth, and Pine Mt. at 3,000 ft.); Louisiana (Bayou Chicot, Lake Bistineau State Park in Webster Co., and Rapides Parish); Maine (Dryden); Maryland (near Colesville, Plummers Island, Silver Spring, and Takoma Park); Massachusetts (Holliston); Michigan (Ann Arbor, Branch in Lake Co., Clare, Dickinson Co., East Lansing, Emmet Co., Iron River, near Manitou, 5 miles north of Newago, Rose Lake in Clinton Co., and St. Charles in Saginaw Co.); Missouri (Charleston and Williamsville); New Hampshire (Hanover); New Jersey (High Point State Park and Moorestown); New York (Farmingdale, Ithaca, Kiamesha, McLean Reserve in Tompkins Co., Michigan Hollow near Danby, Milford Center, and Millwood); North Carolina (Crabtree Meadows at 3,600 ft. in Yancey Co., Hamrick, Highlands, Looking Glass Rock near Pisgah Forest at 2,500 ft., Marion, Pisgah Forest, Raleigh, Southern Pines, Wallace, and Wayah Bald at 5,300 ft. in Macon Co.); Ontario (Bothwell, Chaffeys Locks, Chatterton, and Marmora area); Pennsylvania (Bald Eagle State Park, Glenside, and Hamilton); Quebec (Aylmer West, Hull, Old Chelsea, and Wakefield); Rhode Island (Ashaway and Westerly); South Carolina (Anderson, Cleve-

land, Greenville, and Venus); Tennessee (Indian Gap and Natchez Trace State Forest in Henderson Co.); and Virginia (near Arlington, Chain Bridge [near McLean], Dixie Landing, Falls Church, and Rosslyn).

Collection dates are from late spring to mid fall, most of them during the summer. We find the species common in deciduous woods. There are four lots of reared specimens: ♀, from staphylinid larva in cambium of dead *Ulmus americana*, Rose Lake, Clinton Co., Mich., collected Apr. 25, 1976, emerged May 14, 1976, T. Hlavac (East Lansing). ♂, 2♀, and one pupa that did not eclose, from larva of *Staphylinus* or *Creophilus* (Staphylinidae), near Arlington, Va., collected May 20, 1924, emerged June 4, 1924, E. Myers (Washington). ♂, ♀, from larva of *Platydracus violaceus* (Staphylinidae), Michigan Hollow (near Danby), N. Y., collected Mar. 10, 1977, emerged Apr. 12, 1977, R. Hoebecke (Hoebecke). 5 pupae, some of them mature enough for determination, from larva of *Platydracus violaceus* (Staphylinidae) in rotten log of ?*Populus*, near Manitou, Mich., May 22, 1973, R. Hoebecke (Hoebecke).

This species occurs in deciduous woods of eastern North America. It is adult from late spring to mid fall. In literature it is recorded as parasitizing *Staphylinus* by Muesebeck and Walkley, 1967 and *Platydracus violaceus* (Staphylinidae) by Hoebecke, 1978.

6. Exallonyx grandis Brues

Figures 352 and 353 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 543 (ovipositor sheath)

**Exallonyx grandis* Brues, 1919. Jour. New York Ent. Soc. 27: 17. ♀. key, des., figs.

Type: ♀, USA: Ramsey in New Jersey (Cambridge). Examined in 1977.

Codrus grandis Muesebeck and Walkley, 1951. U. S. Dept. Agr., Agr. Monog. 2: 666. syn.

Codrus grandis Masner, 1966. Psyche 72: 296. ♀. type data.

Front wing 3.5 to 4.7 mm. long. Temple of female 1.3 as long as eye. Cheek of female 1.1 as long as short diameter of eye. Clypeus with apical 0.3 beveled or rounded to the marginal flange. Tyloids absent. Second flagellar segment of male 3.5 as long as wide, of female 3.1 as long as wide. Tenth flagellar segment of male 2.8 as long as wide, of female 2.5 as long as wide. Epomia present. Hair band on upper margin of pronotum about 4 hairs wide. Pronotum without hairs behind epomia and carina on collar. Speculum with hairs on upper 0.5. Hair sockets on lower half of mesopleurum separated by 0.5 hair length but on upper median part of lower half hairs sparser or next to transverse groove absent. Abdominal stalk and hind part of thorax as in figures 352 (♂) and 353 (♀). The stalk of female abdomen varies from smooth to obliquely wrinkled as in *E. obsoletus*. Hind femur 4.6 as long as deep in male, 4.2 as long as deep in female. Median groove on syntergite reaching 0.7 to thyridial interspace. Male syntergite with 3± lateral grooves 0.8 as long as median groove. Female syntergite with 1-3 obsolescent lateral grooves 0.25± as long as median groove. Clasper very narrowly triangular, moderately decurved, somewhat claw-like.

Ovipositor sheath as in figure 543.

Black. Palpi pale fulvous. Scape, pedicel, tegula, and legs fulvous, the hind coxa more or less brown (darkest basally). Flagellum of male blackish brown, of female fulvous brown basally, somewhat darker apically. Wings of male faintly tinged with brown, of female distinctly tinged with brown. Stigma and strong veins brown.

Specimens: 29♂, 4♀ from Arizona (Portal); Connecticut (Voluntown); Kansas (Onaga); Louisiana (Lake Bistineau State Park); New York (Farmingdale); Ontario (Chaffeys Locks, Chatterton, Glensutton, and "N. Burgess Twp." in Lanark Co.); Quebec (Aylmer West and Lake Saguy); Rhode Island (Westerly); and South Carolina (Cleveland).

Collection dates are mostly in June, July, and August. Those outside of this range are April in Lake Bistineau State Park, La.; May 3 and 14 at Cleveland, S. C.; and September 7 in Lanark Co., Ont.

This species ranges from Quebec to South Carolina, and westward to Kansas and Arizona. It is the largest Nearctic species of the genus.

H. Dictyotus Group

Front wing 2.6 to 5.3 mm. long. Male flagellum without raised tyloids. Lower corner of pronotum with a single pit. Upper margin of pronotum with a single row of hairs, a partial row, or in *E. nimius* with none. Epomia present or absent. Side of pronotum without hairs behind upper end of carina on collar. Front part of mesopleurum, above the transverse groove, with a few hairs at upper corner and just above transverse groove, elsewhere hairless. Paired smooth areas on upper face of propodeum short or very short, usually not reaching behind propodeal spiracle. Hind margin of hind wing with a shallow notch at basal 0.35. Abdominal stalk with a transverse flange at front end of lower side, the side of stalk with grooves and upper profile straight. Hairs on syntergite very sparse and moderately short, none of them near lower margin of syntergite. Male clasper long triangular, not or weakly decurved, its apex sharp. Ovipositor sheath punctate and longitudinally striate, or only punctate.

This group includes 11 species, one in Madagascar and the rest in New Guinea. It is closely related to the Unisulcus Group.

Keys to the species of the Dictyotus Group

Males

(Males of *camelinus*, *soror*, *ejuncidus*, and *dilatatus* are unknown.)

1. Upper margin of pronotum without a row of hairs. Base of syntergite with 5 longitudinal grooves of almost equal length.
 Madagascar. 1. *nimius*, new species (p. 367)

- Upper margin of pronotum with a row of hairs. Base of syntergite with a single long median groove, or with a median groove and one or two lateral grooves about half as long as median groove. New Guinea species. 2
2. Flagellum with apical 4 or more segments stramineous or whitish. New Guinea. 4. torquatus, new species (p. 369)
Flagellum entirely black. 3
3. Wings blackish. 4
Wings tinged with yellowish brown or weakly infuscate. 5
4. Abdominal stalk 2.0 as long as high, the grooves on its side sloping downward at front end. Small punctures on upper front part of metapleurum very sparse. New Guinea.
5. clinatus, new species (p. 369)
Abdominal stalk 1.0 as long as high, the grooves on its side approximately horizontal. Small punctures on upper front part of metapleurum sparse. New Guinea.
6. melanoptera, new species (p. 370)
5. Hind trochanter black. New Guinea.
11. coracinus, new species (p. 372)
Hind trochanter whitish. 6
6. Scape fulvous or light brown. Hind femur 4.4 as long as deep. Abdominal stalk 0.9 as long as deep. New Guinea.
7. dictyotus, new species (p. 370)
Scape black. Hind femur 5.2 as long as deep. Abdominal stalk 1.3 as long as deep. New Guinea.
8. cracens, new species (p. 371)

Females

(Females of *nimius*, *clinatus*, and *melanoptera* are unknown.)

1. Flagellum with apical 4 or more segments light brown to white. Wings blackish. 2
Flagellum entirely black. Wings weakly tinged with brown or fuscous. 4
2. Epomia absent. Abdominal stalk almost smooth, its upper profile concave. Occipital carina unusually high. New Guinea.
2. camelinus, new species (p. 368)
Epomia present. Abdominal stalk with conspicuous grooves, its upper profile straight. Occipital carina moderately high. . . . 3
3. Abdominal stalk 1.65 as long as deep, the grooves on its side moderately fine and shallow. New Guinea.
3. soror, new species (p. 368)

Abdominal stalk 1.1 as long as deep, the grooves on its side moderately coarse and deep. New Guinea.

4. torquatus, new species (p. 369)

4. Hind trochanters whitish. 5
 Hind trochanters black or dark brown. 6

5. Hind femur 4.2 as long as deep. Clypeus weakly convex. Second flagellar segment 3.0 as long as wide. New Guinea.

7. dictyotus, new species (p. 370)

Hind femur 5.7 as long as deep. Clypeus moderately convex. Second flagellar segment 3.8 as long as wide. New Guinea.

8. cracens, new species (p. 371)

6. Flagellum enlarged apically, the tenth segment 1.7 as wide as second segment. Hind femur 5.5 as long as deep. New Guinea.

9. dilatus, new species (p. 371)

Flagellum not enlarged apically. Hind femur 3.8 to 4.9 as long as deep. 7

7. Abdominal stalk 1.9 as long as deep. New Guinea.

10. ejuncidus, new species (p. 372)

Abdominal stalk 1.3 as long as deep. New Guinea.

11. coracinus, new species (p. 372)

1. Exallonyx nimius, new species

Figure 354 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.6 to 3.2 mm. long. Clypeus moderately convex, its apical 0.4 sloped to marginal flange. Second flagellar segment 3.9 as long as wide. Tenth flagellar segment 3.4 as long as wide. Epomia absent. Upper margin of pronotum without hairs. (All other species of this group have a row of hairs on upper margin of pronotum.) Speculum with hairs on upper 0.3. Hairs on lower half of mesopleurum long, their sockets separated by 0.7 hair length. Abdominal stalk and hind part of thorax as in figure 354. Hind femur 4.8 as long as deep. Syntergite with median groove reaching 0.65 to space between thyridia and 2 lateral grooves almost as long as median groove. Clasper narrowly triangular, its apex sharp.

Female: Unknown.

This species is treated as a member of the Dictyotus Group because it has the key characters of the group. Its relationship, however, is likely closer to the Formicarius Group.

Type: ♂, near Rogez, 900 m., Madagascar, June 1946, C. Lambertson (Townes). Figure 354 is from the type.

Paratype: ♂, same locality and collector as type, Nov. 1946 (Townes).

2. Exallonyx camelinus, new species

Figures 355 (♀ metapleurum, propodeum, and abdominal stalk);
544 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 5.3 mm. long. Temple 0.85 as long as eye. Cheek 1.25 as long as short diameter of eye. Clypeus weakly convex, near middle abruptly declivous to marginal flange. Second flagellar segment 2.7 as long as wide. Tenth flagellar segment 1.8 as long as wide. Occipital carina high and reflexed, higher than in any other species of the Dictyotus Group. Epomia entirely absent. Abdominal stalk and hind part of thorax as in figure 355. Hind femur 4.8 as long as deep. Base of syntergite with median groove reaching 0.75 to space between thyridia, without lateral grooves. Ovipositor sheath as in figure 544, 0.50 as long as hind tibia.

Black. Flagellar segments 4 and 5 brown with infuscation, segments 6-11 light brown. Palpi pale brown. Tegula blackish. First tarsal segments brown, that of hind tarsus dark brown. Tarsal segments 2-5 stramineous to light brown, the apical half of last segment of front and middle tarsus and all of last segment of hind tarsus fuscous. Wings blackish. Stigma and strong veins black. Weak veins dark brown.

Type: ♀, Mt. Otto, 2,000 m., Papua, New Guinea, Dec. 22, 1978 to Jan. 9, 1979, J. Sedlacek (Townes).

3. Exallonyx soror, new species

Figures 356 and 371 (♀ metapleurum, propodeum, and abdominal stalk); 545 (ovipositor sheath)

Male: Unknown.

Female: Front wing 3.7 to 3.8 mm. long. Temple 0.87 as long as eye. Cheek 0.64 as long as short diameter of eye. Clypeus weakly convex, near apex abruptly declivous to apical flange. Second flagellar segment 2.1 as long as wide. Tenth flagellar segment 1.7 as long as wide. Epomia weak. Abdominal stalk and hind part of thorax as in figures 356 and 371. Hind femur 3.9 as long as deep. Base of syntergite with median groove reaching 0.6 to space between thyridia. Ovipositor as in figure 545, 0.57 as long as hind tibia.

Black. Flagellar segments 3-4 dark brown, segment 5 brown, and segments 6-11 light brown to whitish. Palpi stramineous. Tegula dark brown. First tarsal segments brown. Tarsal segments 2-5 pale stramineous. Wings blackish. Stigma and strong veins black. Weak veins dark brown.

Type: ♀, Wau, 1,600 m., Papua, New Guinea, Oct. 1971, P. Shanahan (Townes). Figures 356, 371, and 545 are from the type.

Paratype: ♀, Baiyer River to Jimmi Valley, 1,700 m., New Guinea, Jan. 26 to Mar. 7, 1979. J. Sedlacek (Townes).

4. Exallonyx torquatus, new species

Figures 357 and 358 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 546 (ovipositor sheath)

Front wing 3.1 to 4.5 mm. long. Temple of female 0.85 as long as eye. Cheek of female 0.57 as long as short diameter of eye. Clypeus weakly convex, near apex steeply sloped to apical flange. Second flagellar segment of male 2.9 as long as wide, of female 2.0 as long as wide. Tenth flagellar segment of male 2.9 as long as wide, of female 1.7 as long as wide. Epomia strong. Abdominal stalk and hind part of thorax as in figures 357 (σ) and 358 (♀). Hind femur of male 3.9 as long as deep, of female 3.5 as long as deep. Syntergite of male with median groove reaching 0.6 to space between thyridia, usually also with 2 lateral grooves that are 0.6 as long as median groove. Syntergite of female with median groove reaching 0.66 to space between thyridia, without lateral grooves. Ovipositor sheath as in figure 546, 0.45 as long as hind tibia.

Black. Flagellum blackish at base, pale brownish yellow at apex with a gradual transition from dark at base to pale at apex, the last 5 or 6 segments being entirely pale brownish yellow. Palpi light brown. Tegula blackish. First tarsal segments brown or dark brown, paler apically. Tarsal segments 2-5 pale brown, the apex of segment 5 of front and middle tarsi brown. Wings blackish. Stigma and strong veins black. Weak veins dark brown.

Type: ♀ , Baiyer River, Papua, New Guinea, Feb. 25 to Mar. 9, 1979, J. Sedlacek (Townes). Figures 358 and 546 are from the type.

Paratypes: 9 σ , 2 ♀ , same locality and collector as type, dated between Jan. 25 and Mar. 9, 1979 (Townes and Ottawa). 2 σ , Mt. Kainde, 1,750 m., Papua, New Guinea, Dec. 19, 1978 to Jan. 8, 1979, J. Sedlacek (Townes).

5. Exallonyx clinatus, new species

Figure 359 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.4 to 4.2 mm. long. Epomia weak. Hind femur 4.2 as long as deep. Base of syntergite with median groove reaching 0.6 to space between thyridia, usually also with 1 or 2 weak lateral grooves that are 0.5 as long as median groove. Otherwise similar to *E. melanoptera* in structure and color, except as stated in the key, and except for minor average differences in sculpture of the metapleurum and propodeum. See figure 359.

Female: Unknown.

Type: σ , Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes). Figure 359 is from the type.

Paratypes: 3 σ , same data as type (Townes).

6. Exallonyx melanoptera, new species

Figure 360 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.0 to 5.3 mm. long. Clypeus moderately convex, its subapical 0.3 sloped to the apical flange. Second flagellar segment 3.2 as long as wide. Tenth flagellar segment 3.1 as long as wide. Epomia indistinct. Abdominal stalk and hind part of thorax as in figure 360. Hind femur 4.4 as long as deep. Base of syntergite with median groove reaching 0.6 to space between thyridia, also with 2 moderately deep lateral grooves that are 0.6 as long as median groove.

Black. Flagellum entirely black. Palpi brown. Tegula blackish. Front and middle first tarsal segments brown, paler apically. Front and middle tarsal segments 2-5 light brown. Hind tarsal segments 2-5 brown. Wings black. Stigma and strong veins black. Weak veins dark brown.

Female: Unknown.

Type: σ , Baiyer River, 1,100 m., Papua, New Guinea, Jan. 25 to Feb. 6, 1979, J. Sedlacek (Townes). Figure 360 is from the type.

Paratypes: 3 σ , same locality and collector as type, dated Feb. 6 to 25, 1979 (Townes). σ , Gent River, Jimmi Valley, 650 m., Papua, New Guinea, Feb. 2 to 26, 1979, J. Sedlacek (Townes). σ , Jimmi Valley, Papua, New Guinea, Dec. 27, 1978 to Jan. 26, 1979, J. Sedlacek (Townes). σ , Saruwaged Mts., 500 m., Papua, New Guinea, Feb. 16 to 26, 1979, J. Sedlacek (Townes).

7. Exallonyx dictyotus, new species

Figures 361 and 362 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 547 (ovipositor sheath)

Front wing 3.2 to 3.6 mm. long. Temple of female 0.50 as long as eye. Cheek of female 0.51 as long as short diameter of eye. Clypeus weakly convex, its apical 0.3 steeply sloping. Second flagellar segment of both sexes 3.0 as long as wide. Tenth flagellar segment of male 3.0 as long as wide, of female 2.0 as long as wide. Epomia absent. Abdominal stalk and hind part of thorax as in figures 361 (σ) and 362 (♀). Hind femur of male 4.4 as long as deep, of female 4.2 as long as deep. Base of syntergite of male with median groove reaching 0.75 to space between thyridia, also with 2 shallow lateral grooves 0.35 as long as median groove. Base of syntergite of female with median groove reaching 0.85 to space between thyridia, without lateral grooves. Ovipositor as in figure 547, 0.59 as long as hind tibia.

Black. Scape and pedicel of male fulvous to dark brown. Pedicel of female brown. Flagellum entirely black. Palpi and trochanters pale stramineous. Tegula brown. Front and middle legs beyond trochanters pale stramineous to brown, their tarsal segments 2-5 and base of femora always pale stramineous. Base of hind femur pale stramineous, the rest light brown to black. Hind tibia and hind basitarsus brown, the basitarsus paler apically. Hind tarsal segments 2-5 stramineous or light brown. Wings tinged with fuscous. Stigma and strong veins blackish brown.

Weak veins light brown.

Type: ♀, Baiyer River, 1,100 m., Papua, New Guinea, Jan. 25 to Feb. 6, 1979, J. Sedlacek (Townes). Figures 362 and 547 are from the type.

Paratypes: 115♂, 8♀, same locality and collector as type, dated from Jan. 25 to Mar. 9, 1979 (Townes, Ottawa, Washington, and Cambridge). 3♂, Wau, Papua, New Guinea, Oct. 1969, P. Shanahan (Townes), 2♂, Baiyer River to Jimmi Valley, 1,700 m., Papua, New Guinea, Jan. 26 to Feb. 7, 1979, and Feb. 2 to 26, 1979, J. Sedlacek (Townes).

8. Exallonyx cracens, new species

Figures 363 and 364 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 548 (ovipositor sheath)

Front wing 2.9 to 3.4 mm. long. Temple of female 0.76 as long as eye. Cheek of female 0.90 as long as short diameter of eye. Clypeus weakly convex, at apex declivous to apical flange. Second flagellar segment of male 3.2 as long as wide, of female 3.8 as long as wide. Tenth flagellar segment of male 3.0 as long as wide, of female 2.1 as long as wide. Flagellum of female weakly widened toward apex. (No other species of the Dictyotus Group except *E. dilatatus* has the flagellum enlarged apically.) Epomia absent. Abdominal stalk and hind part of thorax as in figures 363 (♂) and 364 (♀). Hind femur of male 5.2 as long as deep, of female 5.7 as long as deep. Syntergite of both sexes with median groove reaching 0.45 to space between thyridia, also with one shallow lateral groove 0.5 as long as median groove. Ovipositor sheath 0.32 as long as hind tibia, similar to that of *E. dilatatus*. See figure 548.

Black. Flagellum entirely black. Palpi and trochanters whitish. Tegula brown. Femora brown to blackish, white at base. Tibiae blackish. Tarsi of male brown, of female light brown with basitarsi of front and middle legs darker basally and hind basitarsus dark brown. Wings faintly infuscate. Stigma and strong veins blackish brown. Weak veins not pigmented.

Type: ♀, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 6 to 25, 1979, J. Sedlacek (Townes).

Paratypes: 7♂, Mt. Giluwe, 2,800 m., Papua, New Guinea, Jan. 3 to Feb. 8, 1979, J. Sedlacek (Townes).

9. Exallonyx dilatatus, new species

Figures 365 (♀ metapleurum, propodeum, and abdominal stalk); 549 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 2.7 mm. long. Temple 0.90 as long as eye. Cheek 0.80 as long as short diameter of eye. Clypeus weakly convex. Flagellum enlarged toward apex, the tenth segment 1.2 as wide as second segment. (No other species of the Dictyotus Group except

E. cracens has the flagellum enlarged apically.) Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 1.7 as long as wide. Epomia strong. Abdominal stalk and hind part of thorax as in figure 365. Hind femur 5.5 as long as deep. Radial cell 0.8 as long on costa as length of stigma. Base of syntergite with a median longitudinal groove reaching 0.63 to space between thyridia, also with 2 lateral grooves 0.8 as long as median groove. Ovipositor sheath as in figure 549, 0.27 as long as hind tibia.

Black. Flagellum entirely black. Palpi stramineous. Tegula brown. Trochanters, femora, hind tibia, and hind basitarsus dark brown. Front and middle tibiae medium brown. Front and middle tarsi and last 4 segments of hind tarsus light brown. Wings subhyaline. Strong veins brown. Weak veins unpigmented.

Type: ♀, Mt. Wilhelm, 2,500 m., Papua, New Guinea, Dec. 24, 1978 to Jan. 24, 1979, J. Sedlacek (Townes).

10. Exallonyx ejuncidus, new species

Figures 366 (♀ metapleurum, propodeum, and abdominal stalk);
551 (ovipositor sheath)

Male: Unknown.

Female type: Front wing 3.0 mm. long. Temple 0.82 as long as eye. Cheek 1.08 as long as short diameter of eye. Clypeus weakly convex, its apical 0.3 beveled. Second flagellar segment 2.1 as long as wide. Tenth flagellar segment 2.3 as long as wide. Epomia indistinct. Abdominal stalk and hind part of thorax as in figure 366. Hind femur 4.9 as long as deep. Base of syntergite with median groove reaching 0.68 to space between thyridia, without lateral grooves. Ovipositor sheath 0.24 as long as hind tibia, similar to that of *E. torquatus*. See figure 551.

Black. Flagellum entirely black. Palpi pale stramineous. Tegula and front and middle trochanters, femora, and tibiae dark brown. Front and middle basitarsi brown. Front and middle tarsal segments 2-5 light brown. Hind tarsal segments 2-5 brown. Wings tinged with brown. Stigma and strong veins dark brown. Some of the weak veins tinged with brown.

Type: ♀, Kassam Pass, 1,300 m., Papua, New Guinea, Jan. 10 to 23, 1979, J. Sedlacek (Townes).

11. Exallonyx coracinus, new species

Figures 367 and 368 (♂, ♀ metapleurum, propodeum, and abdominal stalk); 550 (ovipositor sheath)

Front wing 3.0 to 3.6 mm. long. Temple of female 0.83 as long as eye. Cheek of female 0.50 as long as short diameter of eye. Clypeus weakly convex, its apical 0.4 convexly beveled to apical flange. Second segment of flagellum 3.0 as long as wide in male, 2.0 as long as wide in female. Tenth segment of flagellum 3.1 as long as wide in male, 1.9

as long as wide in female. Epomia indistinct. Hairs on upper margin of pronotum in a sparse single row. Abdominal stalk and hind half of mesopleurum as in figures 367 (♂) and 368 (♀). Hind femur 3.9 as long as deep in male, 3.8 as long as deep in female. Syntergite with a median groove reaching 0.75 to thyridial interspace, and in male also with 2 lateral grooves that are 0.5 as long as median groove. Ovipositor sheath as in figure 550.

Black. Palpi stramineous. Scape and pedicel dark brown to black. Tegula very dark brown. Front and middle legs dark brown, the tarsal segments 2-5 stramineous. Hind leg blackish, with tarsal segment 1 brown and tarsal segments 2-5 stramineous. Wings fuscous. Stigma and strong veins black. Weak veins dark brown.

Type: ♂, Wau, Papua, New Guinea, Oct. 1969, P. Shanahan (Townes). Figure 367 is from the type.

Paratypes: 4♂, 1♀, same data as type (Townes). ♀, Wau or Mt. Kainde, 4,000 to 6,000 ft., Papua, New Guinea, June 12-22, 1969, Bernd Heinrich (Townes). 2♂, Baiyer River, Papua, New Guinea, Jan. 25 to Feb. 6, 1979 and Feb. 25 to Mar. 9, 1979, J. Sedlacek (Townes). ♀, Bulolo, 800 m., Papua, New Guinea, Feb. 13 to Mar. 13, 1979, J. Sedlacek (Townes). ♂, Gent River, Jimmi Valley, 650 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes). ♂, Jimmi Valley, Papua, New Guinea, Dec. 27, 1978 to Jan. 26, 1979, J. Sedlacek (Townes).

I. Unisulcus Group

Front wing 2.9 to 5.0 mm. long. Clypeus weakly to moderately convex, without a preapical transverse ridge. Male flagellum without raised tyloids. Lower corner of pronotum with a single pit. Upper margin of pronotum with a single row of hairs. Epomia absent. Side of pronotum without hairs behind upper end of carina on collar. Upper half of mesopleurum without hairs on its front part except at upper front corner and just above horizontal groove. Paired smooth areas on upper face of propodeum short to moderately short, sometimes not reaching behind spiracle. Hind margin of wing with a shallow notch at basal 0.35. Abdominal stalk without a transverse ridge at base on under side or with a ridge that does not project below the longitudinal ridges, the upper and lower profiles of stalk straight. Base of syntergite of male with a median longitudinal groove that reaches 0.5 to space between thyridia, sometimes also with a lateral groove that is 0.5 as long as median groove. Hairs on syntergite very sparse, most of them short, none of them near lower edge. Male clasper narrowly triangular, not curved.

This group is closely related to the Dictyotus Group and the Capillatus Group, differing only in the characters mentioned in the key. There are five known species, all from New Guinea.

Key to males of the species of the Unisulcus Group (females unknown)

1. Flagellum with apical 5 or more segments whitish. 2
 Flagellum entirely black. 3
2. Hind trochanter and hind femur entirely black. Propodeal reticulation moderately coarse. Clypeus weakly convex. New Guinea.
 1. unisulcus, new species (p. 374)
 Hind trochanter and base of hind femur whitish. Propodeal reticulation moderately fine. Clypeus moderately convex. New Guinea.
 2. albicornis, new species (p. 375)
3. Hind and middle femora with basal 0.1 to 0.18 pale stramineous. New Guinea. 3. pallibasis, new species (p. 375)
 Hind and middle femora entirely black. 4
4. Palpi blackish brown. Base of syntergite with a median longitudinal groove but no lateral grooves. New Guinea.
 4. fuscipalpis, new species (p. 376)
 Palpi pale stramineous. Base of syntergite with a median longitudinal groove and a short lateral groove. New Guinea.
 5. flavotinctus, new species (p. 376)

1. Exallonyx unisulcus, new species

Figure 369 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.8 to 4.3 mm. long. Clypeus weakly convex. Second flagellar segment 4.2 as long as wide. Tenth flagellar segment 3.6 as long as wide. Metapleurum, propodeum, and abdominal stalk as in figure 369. Hind femur 4.6 as long as deep. Base of syntergite with a median groove reaching 0.6 to space between thyridia, without lateral grooves.

Black. Flagellum blackish at base, gradually paler toward middle, the apical half yellowish white but tinged with brown near midlength. Palpi whitish. Tegula blackish brown. Front femur brownish apically. First tarsal segments brown, stramineous toward apex. Tarsal segments 2-5 stramineous, the last segment brown apically. Wings moderately infuscate. Stigma and strong veins black. Weak veins dark brown.

Female: Unknown.

Type: σ , Mt. Kainde, 2,300 m., Papua, New Guinea, Feb. 13 to Mar. 12, 1979, J. Sedlacek (Townes). Figure 369 is from the type.

Paratypes: σ , same data as type (Townes). σ , Mt. Otto, 2,000 m., Papua, New Guinea, Dec. 22, 1978 to Jan. 9, 1979, J. Sedlacek (Townes).

2. Exallonyx albicornis, new species

Figure 370 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.9 to 3.7 mm. long. Clypeus moderately convex. Second flagellar segment 4.8 as long as wide. Tenth flagellar segment 3.4 as long as wide. Metapleurum, propodeum, and abdominal stalk as in figure 370. Hind femur 4.8 as long as deep. Base of syntergite with a median groove reaching 0.5 to space between thyridia and a lateral groove half as long as median groove.

Black. Flagellum blackish brown at base, becoming lighter toward middle, its apical half yellowish white. Palpi whitish. Tegula brown. Trochanters and narrow base of femora white to brown, the area near joint between trochanter and femur always white or stramineous. Front and middle femora and tibiae dark brown. First tarsal segments brown, paler apically. Tarsal segments 2-5 pale stramineous, the last segment brown apically. Wings weakly infuscate. Stigma and strong veins black. Weak veins brown.

Female: Unknown.

Type: ♂, Wau, 1,600 m., Papua, New Guinea, Oct. 1970, P. Shanahan (Townes). Figure 370 is from the type.

Paratypes: 5♂, Jimmi Valley to Baiyer River, 1,700 m., Papua, New Guinea, Feb. 6 to 25 and Feb. 7 to 26, 1979, J. Sedlacek (Townes). 2♂, Wau, Papua, New Guinea, Oct. 1969, P. Shanahan (Townes).

3. Exallonyx pallibasis, new species

Figure 372 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.7 to 4.3 mm. long. Clypeus weakly convex. Second flagellar segment 4.3 as long as wide. Tenth flagellar segment 3.8 as long as wide. Metapleurum, propodeum, and abdominal stalk as in figure 372. Hind femur 4.4 as long as deep. Base of syntergite with a median groove reaching 0.5 to space between thyridia, on each side of base a shallow impression.

Black. Flagellum entirely black. Palpi whitish. Tegula brownish fulvous. Front leg brown to blackish, the apex of trochanter and base of femur narrowly paler. Apical 0.2 and basal 0.1 to 0.25 of middle and hind femora stramineous. Tarsi brown to blackish. Wings with a weak tinge of brown. Strong veins blackish. Weak veins unpigmented, or indistinctly pigmented.

Female: Unknown.

Type: ♂, Mt. Giluwe, 2,800 m., Papua, New Guinea, Jan. 3 to Feb. 8, 1979, J. Sedlacek (Townes). Figure 372 as from the type.

Paratypes: 4♂, same data as type (Townes).

4. Exallonyx fuscipalpis, new species

Figure 373 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 4.6 to 5.0 mm. long. Clypeus weakly convex. Second flagellar segment 4.2 as long as wide. Tenth flagellar segment 2.9 as long as wide. Metapleurum, propodeum, and abdominal stalk as in figure 373. Hind femur 4.2 as long as deep. Base of syntergite with a median groove reaching 0.5 to space between thyridia, without lateral grooves.

Black. Flagellum entirely black. Palpi blackish. Tegula blackish brown. Front and middle tarsi with apex of segment 1 and all of segments 2-4 brown. Wings faintly infuscate. Strong veins black. Weak veins not pigmented.

Female: Unknown.

Type: ♂, Mt. Giluwe, 2,800 m., Papua, New Guinea, Jan. 3 to Feb. 8, 1979, J. Sedlacek (Townes). Figure 373 is from the type.

Paratypes: 2♂, same data as type (Townes).

5. Exallonyx flavotinctus, new species

Figure 374 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.3 to 3.5 mm. long. Clypeus weakly convex. Second flagellar segment 3.6 as long as wide. Tenth flagellar segment 2.9 as long as wide. Metapleurum, propodeum, and abdominal stalk as in figure 374. Hind femur 4.1 as long as deep. Base of syntergite with median groove reaching 0.5 to space between thyridia, with a lateral groove that is 0.5 as long as median groove.

Black. Flagellum entirely black. Palpi pale brown. Front and middle tarsi brown, the first segment darker brown. Wings with a weak tinge of yellowish brown. Stigma and strong veins dark brown. Weak veins not pigmented.

Female: Unknown.

Type: ♂, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes). Figure 374 is from the type.

Paratypes: ♂, same data as type (Townes). ♂, Jimmi Valley to Baiyer River, 1,500 m., Papua, New Guinea, Dec. 27, 1978 to Jan. 26, 1979, J. Sedlacek (Townes). ♂, Mt. Otto, 2,000 m., Papua, New Guinea, Dec. 22, 1978 to Jan. 9, 1979, J. Sedlacek (Townes).

J. Capillatus Group

Front wing 3.3 to 3.8 mm. long. Male flagellum without raised tyloids. Lower corner of pronotum with a single pit. Upper margin of pronotum with a band of hairs that is 2-6 hairs wide. Side of pronotum with hairs behind upper end of carina on collar. Epomia absent. Metapleurum and propleurum with exceptionally long dense suberect hairs.

Paired smooth areas on upper face of propodeum extending a little behind spiracle. Hind margin of hind wing with a very shallow rounded notch at basal 0.35. Abdominal stalk long and slender, without a transverse ridge at base of under side, with strong longitudinal grooves, its upper profile straight. Hairs on syntergite sparse and short, none of them close to lower margin. Base of syntergite with a longitudinal groove that reaches about 0.35 to 0.6 to space between thyridia, sometimes also with 1 or 2 shorter weak lateral grooves. Clasper narrowly triangular, its apex rounded. Ovipositor sheath sparsely punctate.

This group contains two species, both from New Guinea.

Key to the species of the Capillatus Group

1. Pronotum in front of sulcus covered with hairs. Abdominal stalk of both sexes 2.5 as long as it is deep at midlength. Pedicel and mandible black, the mandible dark brown near apex. New Guinea.
 1. jubatus, new species (p. 377)
- Pronotum in front of sulcus with hairs above and below, medially hairless. Abdominal stalk of male 3.5 as long as it is deep at midlength (female unknown). Pedicel and mandible brown. New Guinea.
 2. capillatus, new species (p. 378)

1. Exallonyx jubatus, new species

Figures 375 and 376 (σ , ♀ metapleurum, propodeum, and abdominal stalk); 553 (ovipositor sheath)

Front wing 3.5 to 4.0 mm. long. Temple of male 0.63 as long as eye, of female 0.89 as long as eye. Second flagellar segment of male 4.0 as long as wide, of female 4.5 as long as wide. Tenth flagellar segment of both sexes 3.0 as long as wide. Pronotum in front of sulcus entirely covered with moderately dense hairs. Upper margin of pronotum with a hair band that is about 5 hairs wide. Abdominal stalk and hind part of thorax as in figures 375 (σ) or 376 (♀). Hairs on propodeum and metapleurum somewhat less dense than in *E. capillatus*. Hind femur of male 5.1 as long as deep, of female 6.5 as long as deep. Median groove on syntergite reaching 0.5 to space between thyridia. Ovipositor sheath 0.35 as long as hind tibia, shaped as in figure 553.

Black. Apical 5 to 6 segments of flagellum whitish. Mandible dark brown apically. Palpi white. Tegula blackish. Tarsi pale brown to whitish, the last segment brown and first segment brown with apical part paler. Wings fuscous. Stigma and strong veins black. Weak veins dark brown.

Type: ♀ , Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7 to 26, 1979, J. Sedlacek (Townes). Figures 376 and 553 are from the type.

Paratypes: 39 σ , 2 ♀ , same locality and collector as type, various dates from Dec. 27, 1978 to Feb. 26, 1979 (Townes and Ottawa).

2. *Exallonyx capillatus*, new species

Figure 377 (σ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 3.3 to 3.8 mm. long. Temple 0.67 as long as eye. Second flagellar segment 4.4 as long as wide. Tenth flagellar segment 3.3 as long as wide. Pronotum in front of sulcus covered with hair dorsally and ventrally, hairless near middle. Upper margin of pronotum with a hair band that is about 3 hairs wide. Abdominal stalk and hind part of thorax as in figure 377. Hind femur 4.7 as long as deep. Median groove of syntergite reaching 0.35 to space between thyridia.

Black. Segments 7-11 of flagellum white, segment 7 brownish basally. Mandible, pedicel and tegula brown. Palpi white. Front tarsus stramineous. Middle and hind tarsi brown, palest apically. Wings fuscous. Stigma and strong veins blackish. Weak veins dark brown.

Female: Unknown.

Type: σ , Wau, Papua, New Guinea, Oct. 1969, P. Shanahan (Townes). Figure 377 is from the type.

Paratypes: 9 σ , same data as type (Townes). σ , Wau, 1,600 m., Papua, New Guinea, Oct. 1970, P. Shanahan (Townes). σ , Kassam Pass, 1,300 m., Papua, New Guinea, Jan. 10 to 23, 1979, J. Sedlacek (Townes), 12 σ , Mt. Kainde, 1,900 m. and 2,300 m., Jan. 18 to Feb. 14, 1979 and Feb. 13 to Mar. 12, 1979, Papua, New Guinea, J. Sedlacek (Townes and Ottawa).

K. Wasmanni Group

Front wing 1.6 to 2.9 mm. long. Male flagellum without tyloids. Clypeus wide and short. Lower corner of pronotum with a single pit. Upper edge of pronotum with a single row of hairs or without hairs. Epomia strong to weak or absent. Side of pronotum without hairs behind epomia and upper end of carina on collar. Paired smooth areas on upper face of propodeum extending far behind spiracle. Hind wing exceptionally narrow, its hind edge without a notch near basal 0.35. Under side of abdominal stalk with a transverse ridge at base. Side of abdominal stalk with strong grooves. Upper profile of abdominal stalk straight. Hairs on syntergite sparse, none of them near lower edge of syntergite. Base of syntergite with a few short weak grooves or none. Male clasper narrowly triangular, not curved. Ovipositor sheath sparsely punctate, the punctures sometimes elongate.

This group includes *E. wasmanni* of Europe and Japan, *E. ringens* of New Guinea, and *E. anceps* of the Philippines. These three are grouped together because of certain taxonomic characters. Probably, however, *wasmanni* is not related to the other two.

Key to the species of the Wasmanni Group

1. Syntergite without a median groove at base. Radial cell 1.5 as long as depth of stigma. Pronotum black. Europe and Japan.
 1. wasmanni Kieffer (p. 379)
- Syntergite with a median groove at base. Radial cell 2.5 to 2.7 as long as depth of stigma. 2
2. Legs and pronotum black. Front wing 2.5 to 2.9 mm. long. New Guinea. 2. ringens, new species (p. 380)
- Legs and pronotum pale fulvous. Front wing 1.6 mm. long. Philippines. 3. anceps, new species (p. 381)

1. Exallonyx wasmanni Kieffer

Figures 378 (♀ metapleurum, propodeum, and stalk of abdomen);
554 (ovipositor sheath)

- **Exallonyx wasmanni* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 36. ♀. des. Type: ♀, [West] Germany: Linz on Rhine (Maastricht). Examined in 1975. With *Myrmica ruginodis*.
- **Exallonyx myrmecophilus* Kieffer, 1904. Bul. Soc. Hist. Nat. Metz 23: 36. ♀. des. Type: ♀, Netherlands: "Exaeton" (Maastricht). Examined in 1975.
- Exallonyx wasmanni* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 328. ♀. des. in key, fig. [West] Germany: Linz on Rhine. In nest of *Myrmica ruginodis*.
- **Exallonyx wasmanni* var. *socialis* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 328. ♂, ♀. des. in key. Lectotype: ♂ (designated by Masner, 1965), England: London [Wellington College] (London). Examined in 1975. "Host": *Donisthorpea fuliginosa*. New synonym.
- Exallonyx myrmecophilus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 329. ♀. des. in key. Netherlands: "Exaeton". "Host": *Donisthorpea fuliginosa*.
- Exallonyx wasmanni* Kieffer, 1909. Genera Insectorum 95: 11. fig. 19.
- Exallonyx wasmanni wasmanni* Kieffer, 1914. Das Tierreich 42: 45. ♀. key, des., fig., biol. [West] Germany: Linz on Rhine.
- Exallonyx wasmanni socialis* Kieffer, 1914. Das Tierreich 42: 46. ♂, ♀. des., biol. England: London. Guest of *Donisthorpea fuliginosa*.
- Exallonyx myrmecophilus* Kieffer, 1914. Das Tierreich 42: 46. ♀. key, des., biol. Netherlands: "Exaeton". In a nest of *Donisthorpea fuliginosa*.
- Exallonyx wasmanni* Morley, 1922. Entomologist 55: 160, 184. ♂, ♀. key. England: 3 localities.
- Exallonyx wasmanni* var. *socialis* Morley, 1922. Entomologist 55: 184. des.
- Exallonyx wasmanni* Donisthorpe, 1927. Guests of British ants, p. 107. ♂, ♀. England: Wellington College. With *Donisthorpea fuliginosa*.
- Exallonyx wasmanni* var. *sociabilis* (!) Donisthorpe, 1927. Guests of British ants, p. 107. England: 2 localities. With *Donisthorpea fuliginosa*.
- Exallonyx myrmecophilus* Donisthorpe, 1927. Guests of British ants, p. 107. England: Wellington College. With *Donisthorpea fuliginosa*.
- Exallonyx wasmanni* Nixon, 1938. Trans. Roy. Ent. Soc. London 87: 443, 449. ♂, ♀. keys, syn., des., fig., biol. England: 3 localities. With *Donisthorpea fuliginosa*.
- Exallonyx ater* v. *Wasmanni* Hellén, 1941. Notulae Ent. 21: 39. syn. Finland: 4 localities.
- Codrus (Codrus) wasmanni* Pschorn-Walcher, 1958. Mitt. Schweizerischen Ent. Gesell. 31: 62. syn. North, west, and south Europe.

- Codrus wasmanni* Boness, 1962. *Bombus* 2: 112. *biol., ecology*. West Germany: Büsum.
- Codrus (Codrus) wasmanni* Weidemann, 1962. *Faun. Mitt. aus Nordeutschland* 2: 31, 33. ♀. *ecology*. West Germany: 6 localities.
- Codrus wasmanni* Pschorn-Walcher, 1964. *Insecta Matsumurana* 27: 5. Europe. Japan.
- Codrus wasmanni* var. *lectalis* Masner, 1965. *Bul. British Mus. (Nat. Hist.) Ent. suppl.* 1: 6 "♀" = ♂. *lectotype* designated.
- Codrus wasmanni* Weidemann, 1965. *Ztschr. f. Morph. u. Ökol. der Tiere* 55: 440 *et seq.* *ecology*. Austria. Czechoslovakia: Moravia. Switzerland. West Germany: Schleswig-Holstein.
- Codrus wasmanni* Weidemann, 1967. *Faunistische-Ökologische Mitt.* 3: 168, 169. *biol.* West Germany: Habel.
- Codrus (Codrus) wasmanni* Pschorn-Walcher, 1971. *Insecta Helvetica* 4. Hymenoptera, p. 55. ♂, ♀. *keys, des., biol.* Austria. Germany. Northern Japan. Scandinavia. Switzerland.
- Codrus wasmanni* Dessart, 1975. *Pub. Natuurhist. Genootsch. Limburg* 24: 8. *type data for wasmanni and myrmecophilus.*
- Codrus (Codrus) wasmanni* Kozlov, 1978. *Opredelitel' nasekomykh evropeiskoï chasti SSSR.* t. 3: *Pereponchatokrylye* 2: 545, 547, 548. *key, fig.* USSR: Leningradskaya oblast.

Male: Similar to female except that flagellar segments are longer. No male specimens are at hand for further description.

Female: Front wing 1.6 to 2.3 mm. long. Temple 0.84 as long as eye. Cheek 0.50 as long as short diameter of eye. Second flagellar segment 2.5 as long as wide. Tenth flagellar segment 1.7 as long as wide. Abdominal stalk and hind part of thorax as in figure 378. Hind femur 4.7 as long as deep. Radial cell 1.5 as long as depth of stigma. Base of syntergite without longitudinal grooves. (This is the only species of *Exallonyx* without at least a median groove at base of syntergite, except that in some members of the *Evanescens* Group there may be a short, v-shaped median notch.) Ovipositor sheath as in figure 554.

Black. Mandible light brown. Palpi stramineous. Antenna brown, blackish brown toward apex. Tegula and legs pale fulvous, the hind coxa more or less brownish. Wings subhyaline, the stigma and strong veins brown.

Specimens: 29♀ from Austria ("Dauerbach Obernwang Hamann", near Linz, Marchtrenk, and Sarleinsbach); and Ireland (Tanrego in Co. Sligo). These specimens were collected on different dates distributed from September 8 to October 24.

In literature there are records from Austria, Czechoslovakia, England, Finland, Germany, Japan, Netherlands, and Switzerland.

Several of the literature records are from specimens taken in the nests of ants (*Donisthorpea fuliginosa* and *Myrmica ruginodis*). Reported collection dates are mostly in the fall.

This species is widespread in Europe and has been reported from Japan. It is adult in the fall.

2. Exallonyx ringens, new species

Figure 379 (♂ metapleurum, propodeum, and abdominal stalk)

Male: Front wing 2.5 to 2.9 mm. long. Temple 0.64 as long as

eye. Cheek 0.25 as long as short diameter of eye. Second flagellar segment 3.3 as long as wide. Tenth flagellar segment 3.0 as long as wide. Abdominal stalk and hind part of thorax as in figure 379. Hind femur 4.4 as long as deep. Radial cell 2.5 as long as depth of stigma. Base of syntergite with median groove reaching 0.4 to space between thyridia, on each side with a short impression or short broad groove. Male clasper narrowly triangular with apex sharply rounded.

Black. Palpi stramineous. Tegula dark brown. Front and middle tarsi light brown, their basitarsi darker brown basad. Wings weakly infusate. Stigma and strong veins dark brown. Weak veins light brown.

Female: Unknown.

Type: ♂, Jimmi Valley to Baiyer River, 1,750 m., Papua, New Guinea, Feb. 7-26, 1979, J. Sedlacek (Townes). Fig. 279 is from the type.

Paratypes: 2♂, same data as type (Townes). ♂, Baiyer River, 1,100 m., Papua, New Guinea, Feb. 26 to Mar. 9, 1979, J. Sedlacek (Townes).

3. Exallonyx anceps, new species

Figures 380 and 381 (♂, ♀ metapleurum, propodeum, and stalk of abdomen); 555 (ovipositor sheath)

Front wing 1.6 mm. long. Thorax compressed. Temple of male 0.93 as long as eye, of female 1.3 as long as eye. Cheek of male 0.57 as long as short diameter of eye, of female 0.33 as long as eye. Second flagellar segment of male 2.8 as long as wide, of female 1.8 as long as wide. Tenth flagellar segment of male 2.2 as long as wide, of female 1.25 as long as wide. Abdominal stalk and hind part of thorax as in figures 380 (♂) and 381 (♀). Hind femur 4.1 as long as deep in both sexes. Radial cell 2.7 as long as depth of stigma. Base of syntergite with a median groove reaching 0.35 to space between thyridia, and a weak short groove or impression on each side. Male clasper narrowly triangular with the apex sharply rounded. Ovipositor sheath as in figure 555.

Blackish brown. Palpi brown. Pedicel pale brown. Scape, tegula, propleurum, pronotum, and legs pale fulvous, the hind 0.3± of pronotum brown. Hind tarsus infusate apically. Wings subhyaline, the stigma and strong veins medium brown.

Type: ♀, Mt. Polis, 5,500 ft., Mountain Province, Philippines, Jan. 2, 1954, H., M., and D. Townes (Townes).

Paratype: ♂, Benaue, Mountain Province, Philippines, Dec. 30, 1953, H., M., and D. Townes (Townes).

NOMINA DUBIA

The following names have not been associated with species in the body of the text.

Disogmus integer Kieffer

- **Disogmus Integer* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 280. ♂. des. in key. Type: ♂, northern Italy (lost).
Disogmus integer Kieffer, 1909. Genera Insectorum 95: 11. fig. 5.
Disogmus integer Kieffer, 1914. Das Tierreich 42: 17. ♀. key, des. Italy: "Mailand".

Disogmus nigricornis Kieffer

- **Disogmus Nigricornis* Kieffer, 1907. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 285. ♂. des. in key. Types: ♂, France and probably Scotland (lost).
Disogmus nigricornis Kieffer, 1914. Das Tierreich 42: 19. ♂. key, des. France. Scotland.
Disogmus nigricornis Morley, 1922. Entomologist 55: 3. key.

Exallonyx leviventris Kieffer

- **Exallonyx Leviventris* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 330. ♂, ♀. des. in key. Types: ♂, ♀, England [Italy]: Trieste (lost).
Exallonyx leviventris Kieffer, 1914. Das Tierreich 42: 46. ♂, ♀. key, des. England. [Italy]: Trieste.
Exallonyx laeviventris (!) Morley, 1922. Entomologist 55: 160, 184. key.
Codrus leviventris Teodorescu, 1973. Univ. București Facult. Biol. Rezumatul tezei de doctorat p. 30. ♀. Rumania.
Codrus (Eocodrus) leviventris Teodorescu and Fabritius, 1975. In Ionescu: Fauna Acad. Rep. Soc. Romania, Ser. Monog., p. 165. ♀, Rumania: Ogradena.

Exallonyx ligatus luteipes Kieffer

- **Exallonyx Ligatus* var. *Luteipes* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 345. ♂. des. Type: ♂, northern Italy (lost).
Exallonyx ligatus luteipes Kieffer, 1914. Das Tierreich 42: 52. ♂. des. Northern Italy.

Exallonyx ligatus subnervosus Kieffer

- **Exallonyx Ligatus* var. *Subnervosus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 344. ♂, ♀. des. Types: ♂, ♀, locality not specified (lost).
Exallonyx ligatus subnervosus Kieffer, 1914. Das Tierreich 42: 52. ♂, ♀. des. Occurring with subspecies *ligatus* and as frequent.

Exallonyx microstylus Kieffer

- **Exallonyx Microstylus* Kieffer, 1908. In André: Species des hyménoptères d'Europe et d'Algérie . . . 10: 331. ♀. des in key. Type: ♀, Switzerland: Zermatt (lost).
Exallonyx microstylus Kieffer, 1914. Das Tierreich 42: 47. ♀. key, des.
 Switzerland: Zermatt.

Exallonyx spp., misdetermined

- Proctotrupes ligatus* Vollenhoven, 1876. Pinacographia, p. 31. pl. 19, fig. 9. ♀.
 figs. Host: *Fungivora fungorum*.
Proctotrupes ligatus Dalla Torre, 1898. Catalogus hymenopterorum . . . 5:465. syn.
Proctotrupes abruptus Provancher, 1881. Nat. Canad. 12: 263. (Faune 4: 562).
 ♂, ♀. key, des. Misdet. of *abruptus* Say.

FOSSIL SERPHIDAE

The fossil Serphidae are listed alphabetically. Assignment to correct genera has not been attempted.

Cryptoserphus gracilis Brues

- **Cryptoserphus gracilis* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 259. ♀. key, des., fig. Type: ♀, Baltic amber (location unknown). Type not seen.

Cryptoserphus hamiferus (Brues)

- **Cryptoserphus hamiferus* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 261. ♀. key, des., figs. Type: ♀, Baltic amber (Cambridge). Type not seen.

Cryptoserphus obsolescens Brues

- **Cryptoserphus obsolescens* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 261. ♀. key, des. Type: ♀, Baltic amber (location unknown). Type not seen.

Cryptoserphus pinorum Brues

- **Cryptoserphus pinorum* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 260. ♀. key, des., figs. Type: ♀, Baltic amber (Cambridge). Type not seen.

Cryptoserphus succinalis Brues

**Cryptoserphus succinalis* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 262. ♀. key, des., figs. Type: ♀, Baltic amber (Cambridge). Type not seen.

Cryptoserphus tertarius Brues

**Cryptoserphus tertarius* Brues, 1940. Proc. Amer. Acad. Arts Sci. 73: 261. ♀. key, des., fig. Type: ♀, Baltic amber (Cambridge). Type not seen.

Serphus cellularis Brues

**Serphus cellularis* Brues, 1923. Proc. Amer. Acad. Arts Sci. 58: 344. ♂. des. Type: ♂, Baltic amber (location unknown). Type not seen.

Serphus exhumatus Brues

**Proctotrypes exhumatus* Brues, 1910. Bul. Mus. Comparative Zool. 54: 9. ♀. des., figs. Type: ♀, USA: Florissant in Colorado in Miocene deposits (Cambridge). Type not seen.

Serphus exhumatus Kieffer, 1914. Das Tierreich 42: 4, 5. syn.

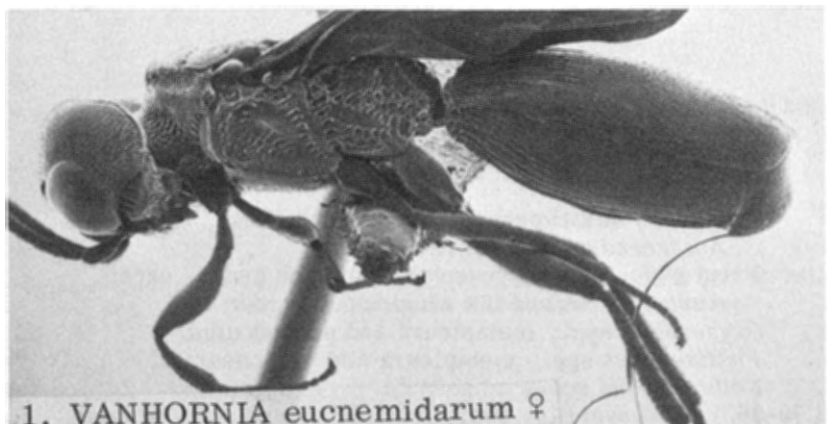
Serphus florissantensis Kieffer, 1914. Das Tierreich 42: 4, 5. syn. (in part).

NOMINA NUDA

The names *Proctotrupes basalis*, *P. minor*, and *P. monilitor* were listed as from Britain by Curtis, 1829, Guide . . . British insects . . . ed. 1, column 109. All three are *nomina nuda*.

LIST OF FIGURES

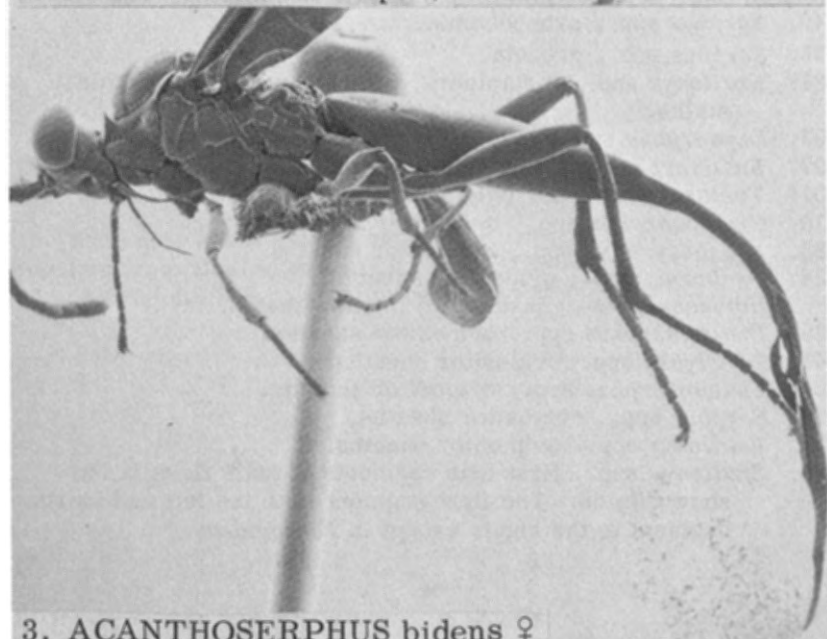
- 1-24. Side views of a representative of each genus, except *Austrocodrus* and *Brachyserphus*.
- 25-48. Front wings of a representative of each genus, except *Austrocodrus* and the wingless *Paracodrus*.
- 49-64. *Oxyserphus* spp., metapleura and propodeums.
- 65-69. *Fustiserphus* spp., metapleura and propodeums.
- 70-73. *Nothoserphus* spp., mesoscuta.
- 74 and 79-96. *Mischoserphus* spp., metapleura and propodeums.
- 75-78. *Cryptoserphus* spp., metapleura and propodeums.
- 97-98. *Apoglypha* spp., side view of thoraces.
- 99-101. *Pschornia* spp., side view of thoraces.
- 102-104. *Brachyserphus* spp., metapleura and propodeums.
- 105-106. *Brachyserphus* spp., pronota.
- 107-118. *Codrus* spp., propodeums, abdominal stalks, and base of syntergites.
- 119-134. *Phaenoserphus* spp., propodeums, abdominal stalks, and base of syntergites.
- 135-141. *Phaneroserphus* spp., propodeums, abdominal stalks, and base of syntergites.
- 142-149. *Serphus* spp., propodeums.
- 150-155. *Serphus* spp., pronota.
- 156-381. *Exallonyx* spp., metapleura, propodeums, and abdominal stalks.
- 382-393. *Oxyserphus* spp., ovipositor sheaths.
- 394-397. *Fustiserphus* spp., ovipositor sheaths.
- 398-401. *Tretoserphus* spp., ovipositor sheaths.
- 402-410. *Cryptoserphus* spp., ovipositor sheaths.
- 411-425. *Mischoserphus* spp., ovipositor sheaths.
- 426-428. *Pschornia* spp., ovipositor sheaths.
429. *Hormoserphus clypeatus*, ovipositor sheath.
- 430-439. *Brachyserphus* spp., ovipositor sheaths.
- 440-441. *Apoglypha* spp.; ovipositor sheaths.
- 442-455. *Phaenoserphus* spp., ovipositor sheaths.
- 456-459. *Serphus* spp., ovipositor sheaths.
- 460-555. *Exallonyx* spp., ovipositor sheaths.
- 556-575. *Exallonyx* spp., first four segments of male flagella, to show tyloids. The first segment is to the left and fourth segment to the right, except in *E. equidens*.



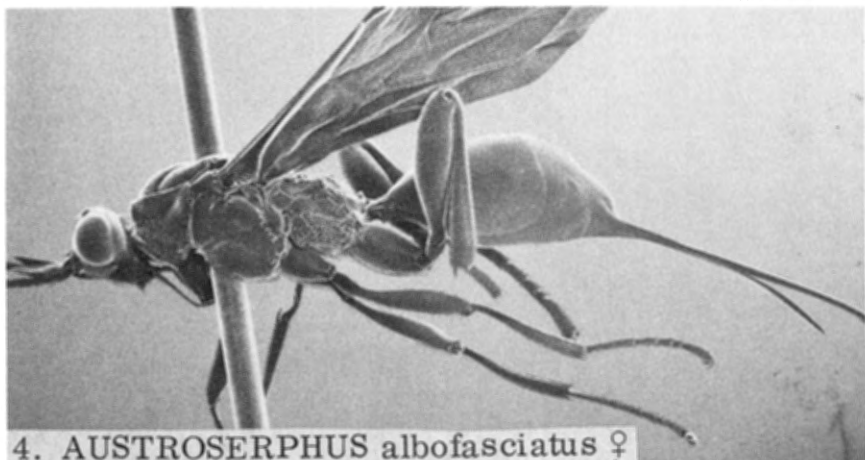
1. VANHORNIA eucnemidarum ♀



2. HELORISERPHUS sp. ♀



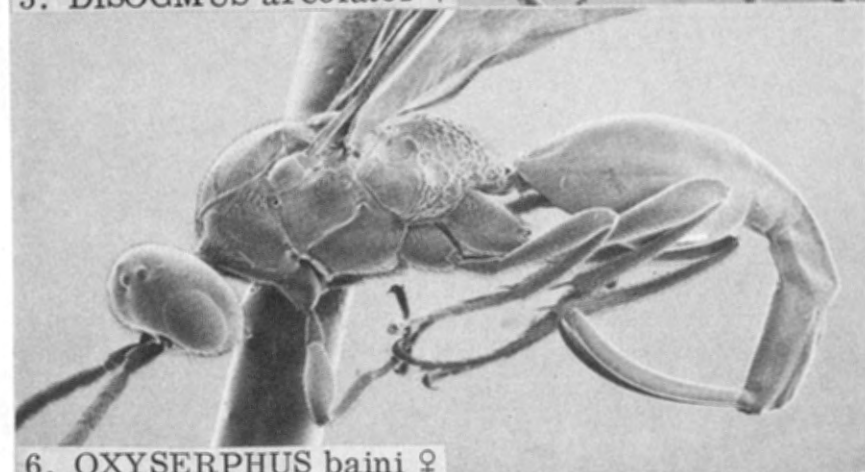
3. ACANTHOSERPHUS bidens ♀



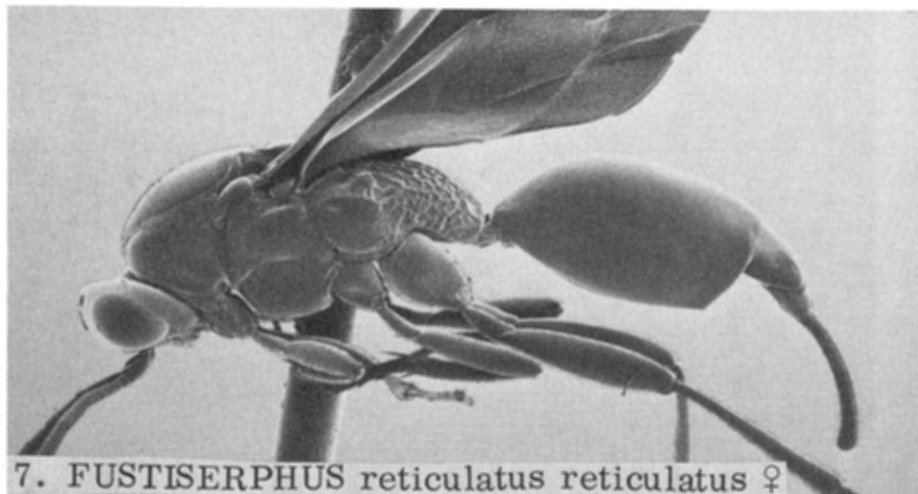
4. *AUSTROSERPHUS* *albofasciatus* ♀



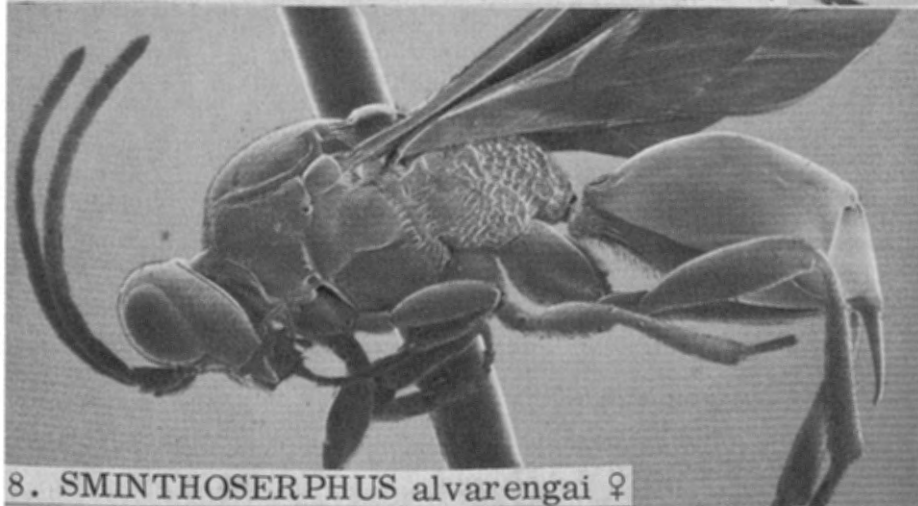
5. *DISOGMUS* *areolator* ♀



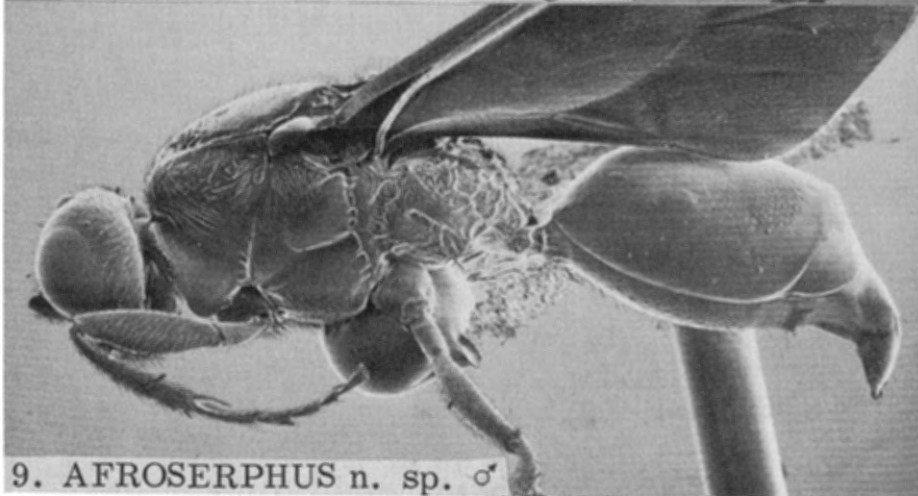
6. *OXYSERPHUS* *baini* ♀



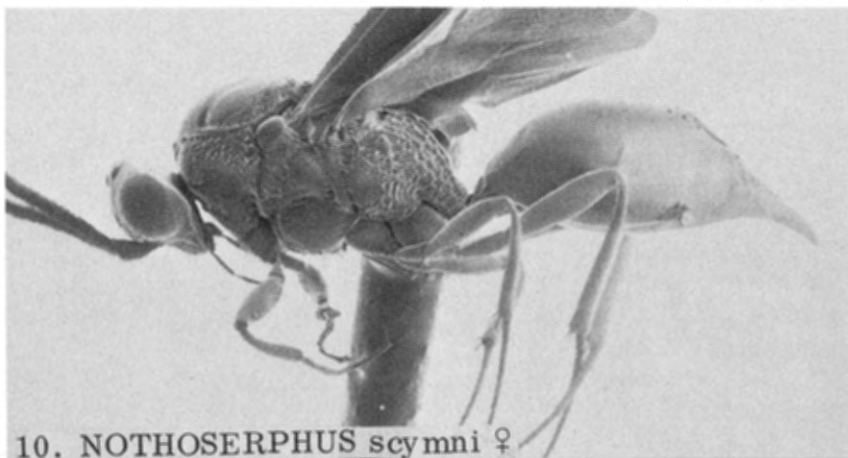
7. *FUSTISERPUS reticulatus reticulatus* ♀



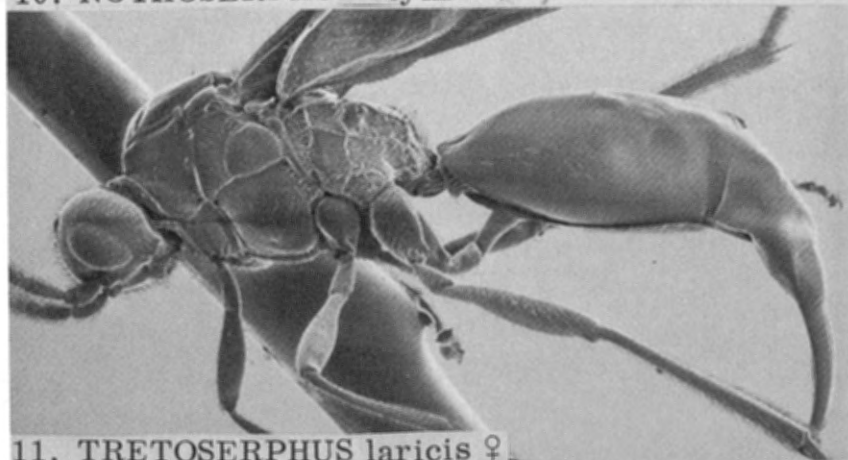
8. *SMINTHOSERPUS alvarengai* ♀



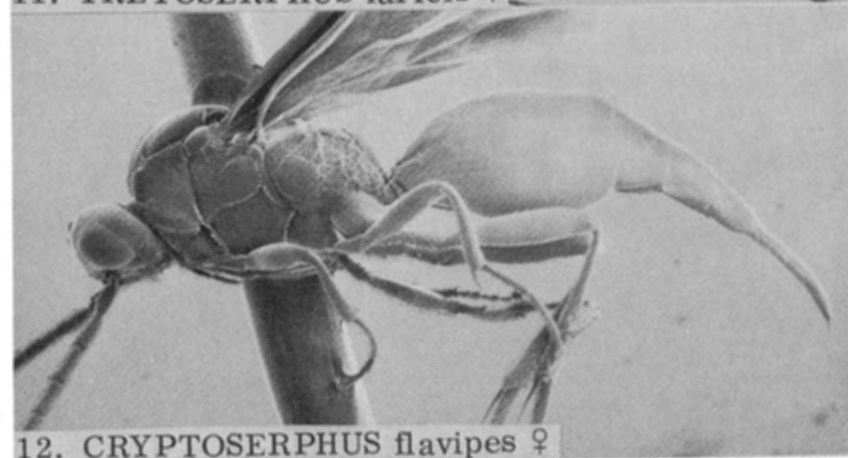
9. *AFROSERPHUS* n. sp. ♂



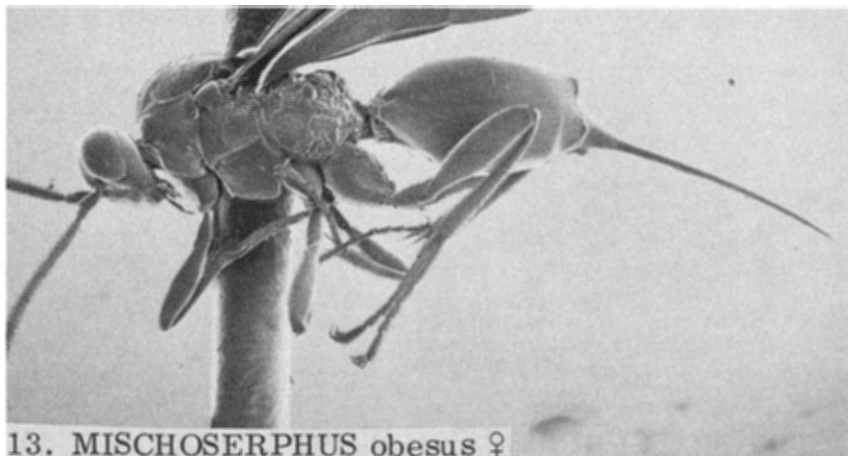
10. NOTHOSERPUS *scymni* ♀



11. TRETOSERPUS *laricis* ♀



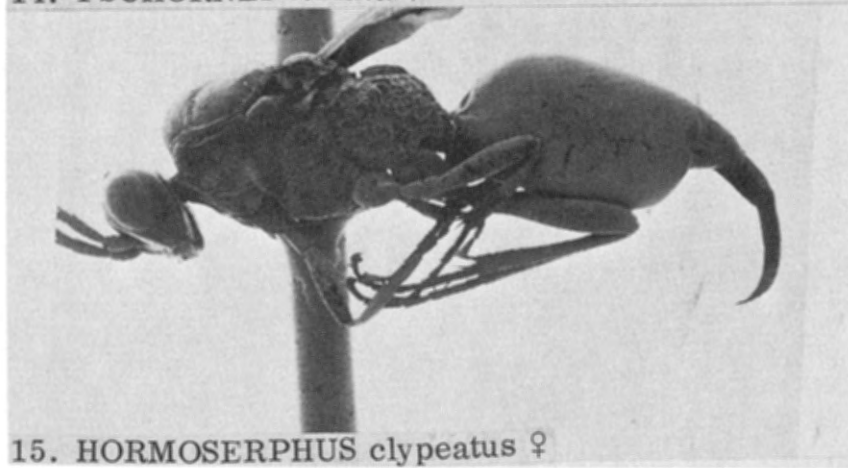
12. CRYPTOSERPUS *flavipes* ♀



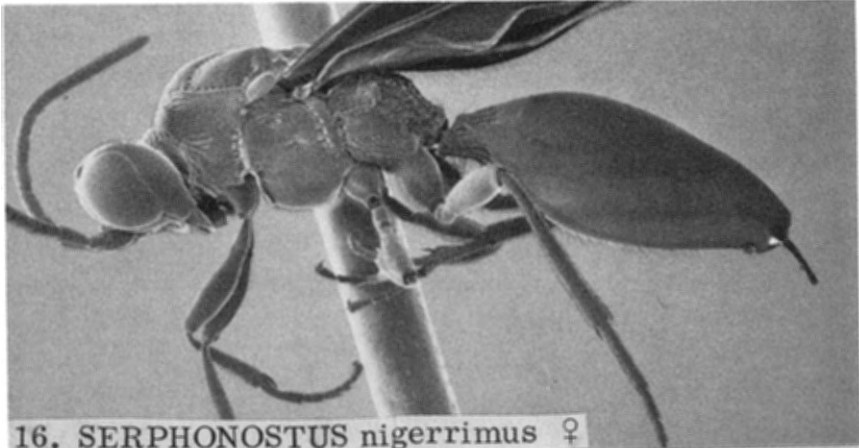
13. MISCHOSERPHUS obesus ♀



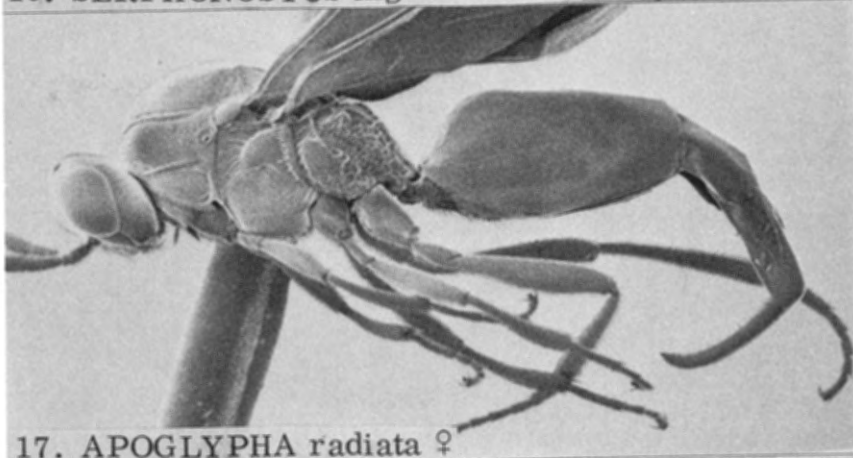
14. PSCHORNIA striata ♀



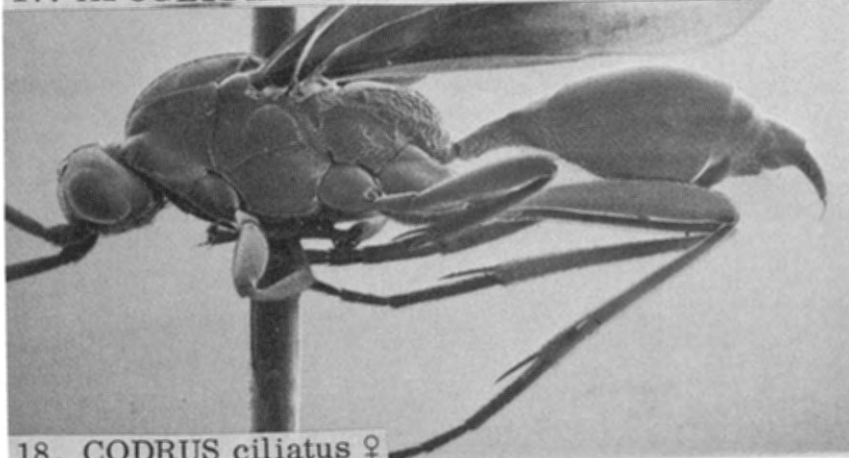
15. HORMOSERPHUS clypeatus ♀



16. SERPHONOSTUS nigerrimus ♀



17. APOGLYPHA radiata ♀



18. CODRUS ciliatus ♀



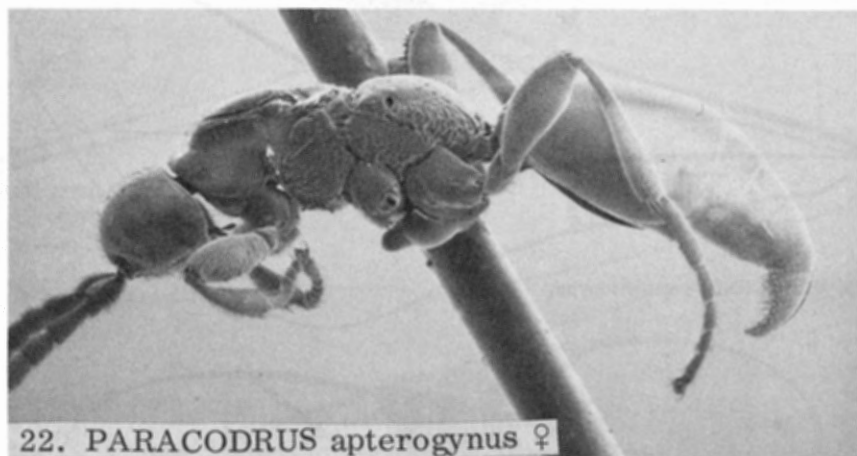
19. PHAENOSERPHERUS chittii ♀



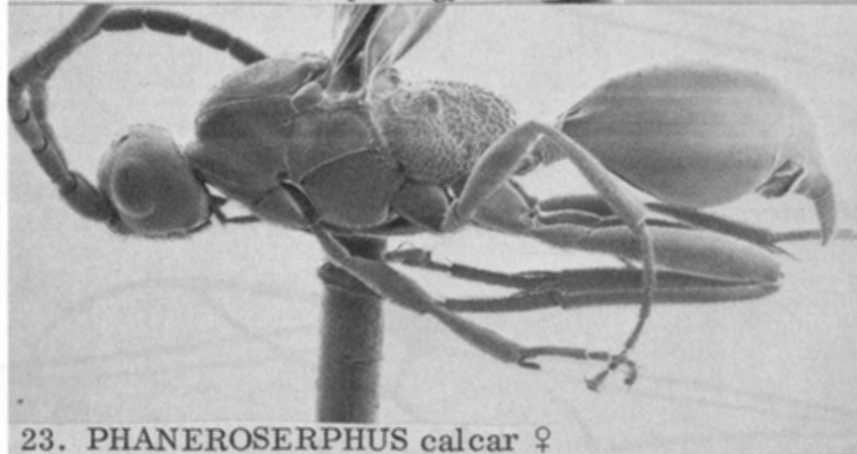
20. SERPHUS bistratus ♀



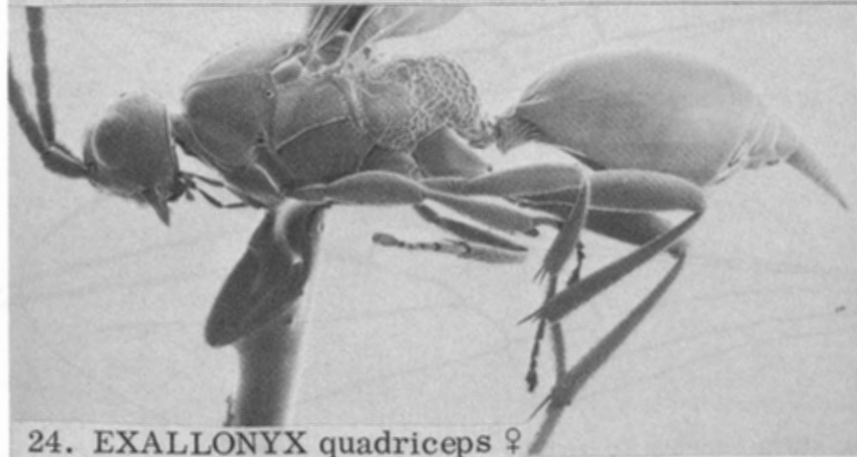
21. PARTHENOCODRUS elongatus ♀



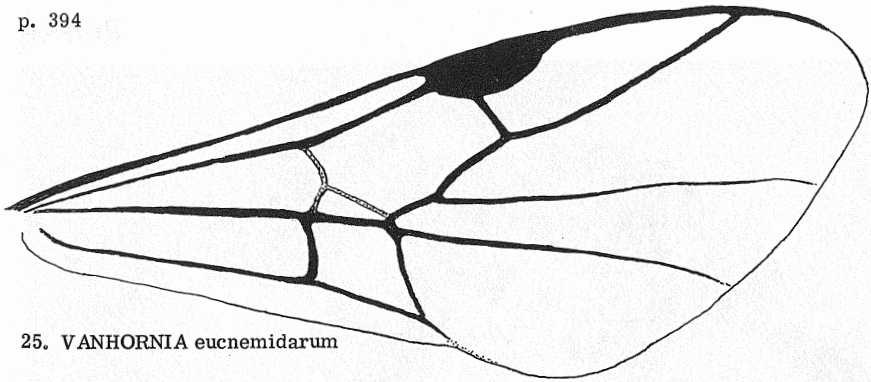
22. *PARACODRUS apterogynus* ♀



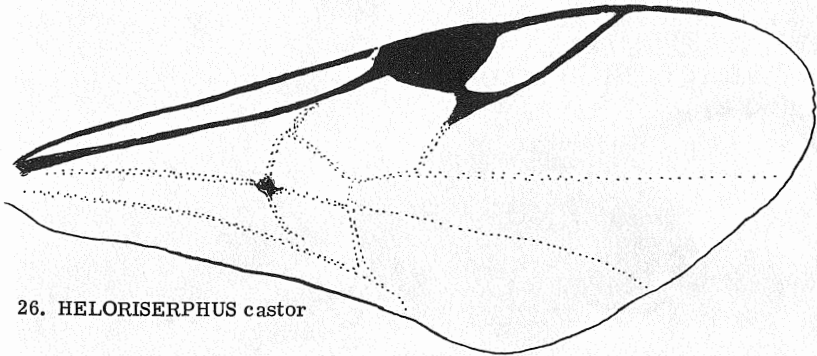
23. *PHANEROSERPHUS calcar* ♀



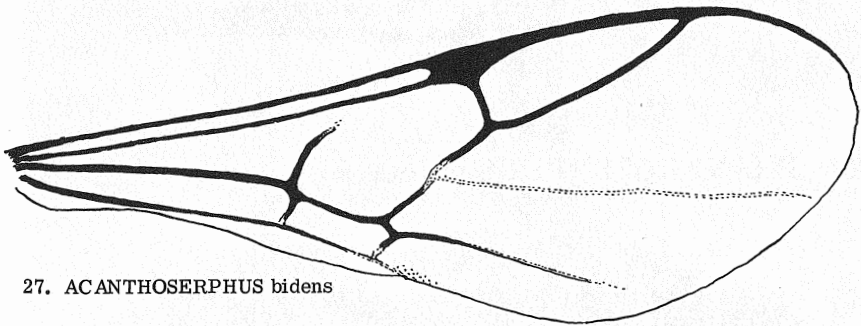
24. *EXALLONYX quadriceps* ♀



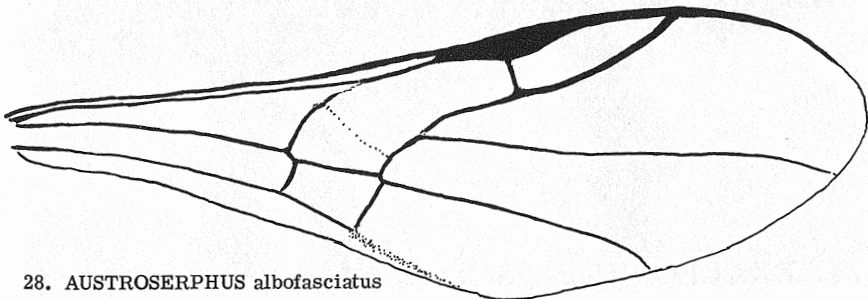
25. VANHORNIA eucnemidarum



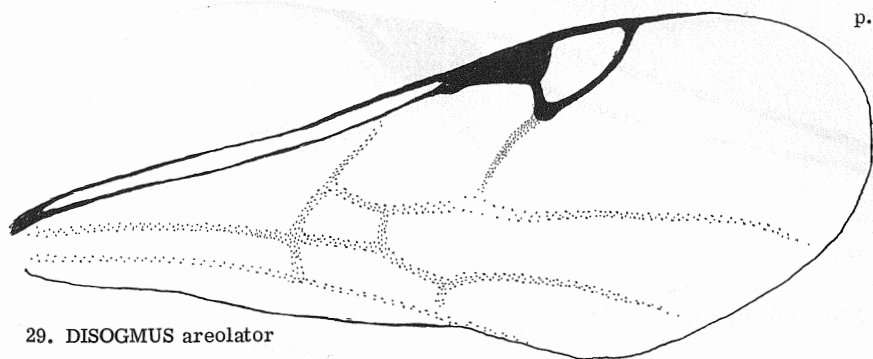
26. HELORISERPHUS castor



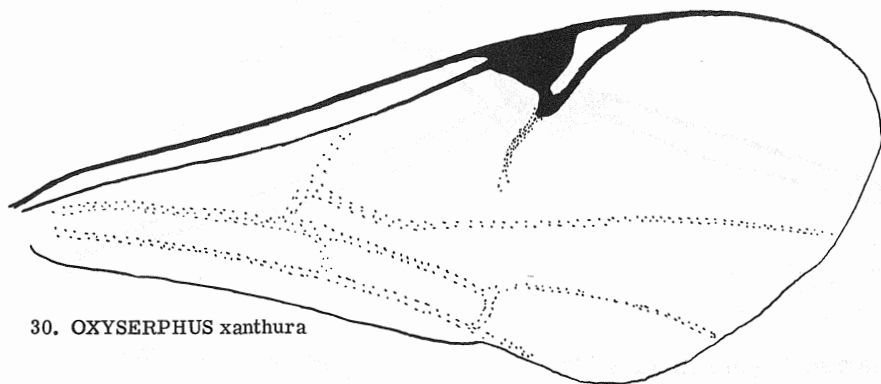
27. ACANTHOSERPHUS bidens



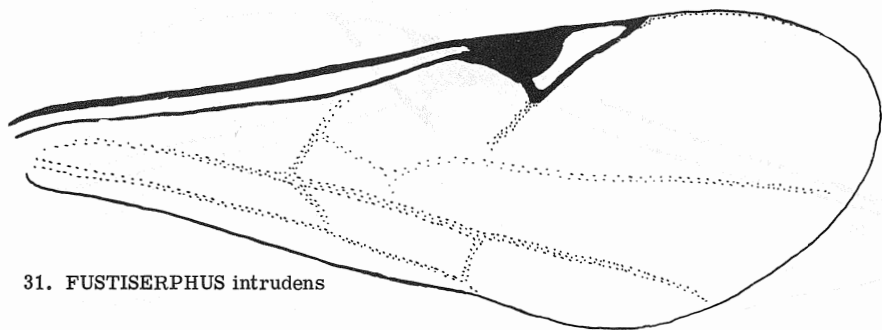
28. AUSTROSERPHUS albofasciatus



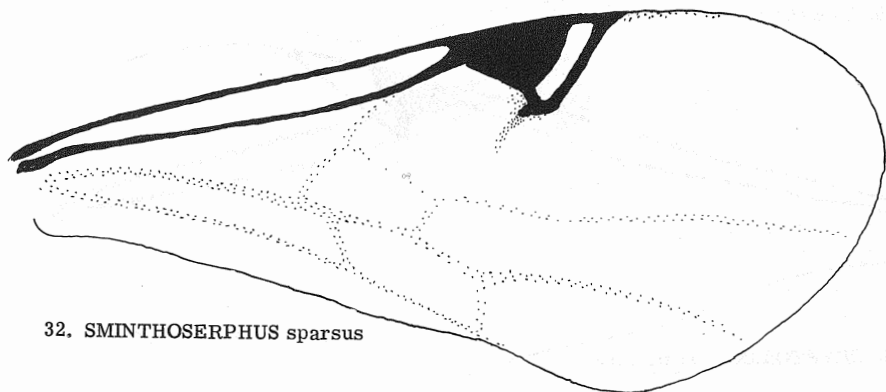
29. *DISOGMUS areolator*



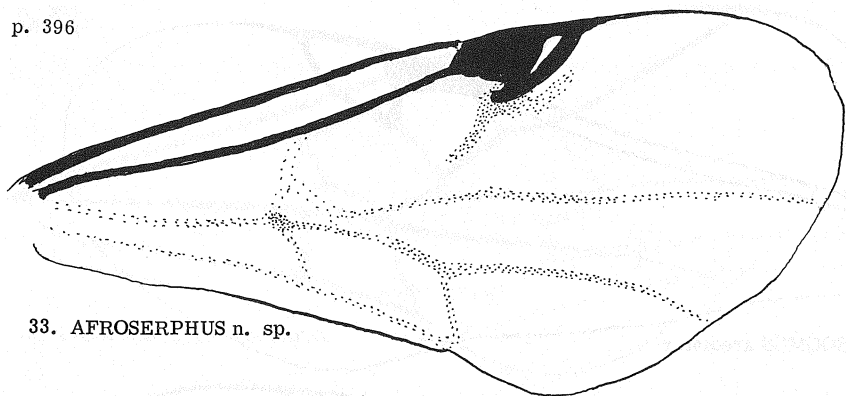
30. *OXYSERPHUS xanthura*



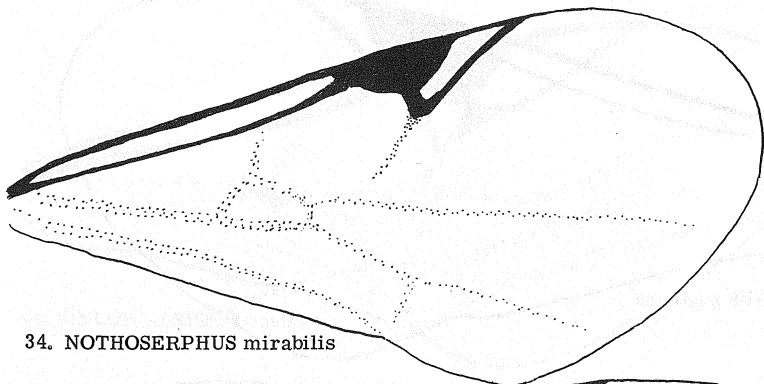
31. *FUSTISERPHUS intrudens*



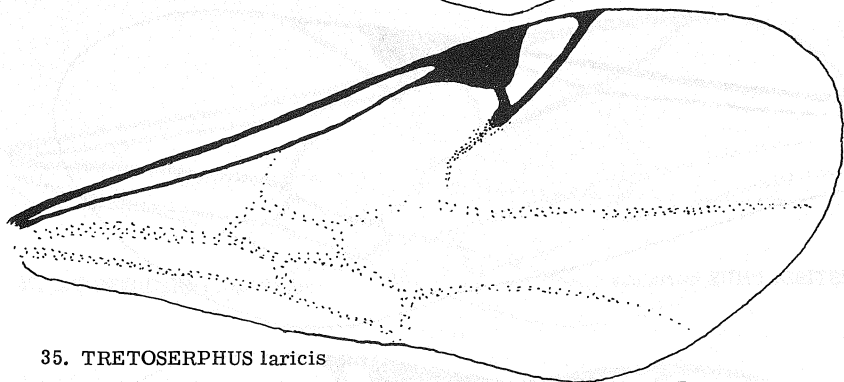
32. *SMINTHOSERPHUS sparsus*



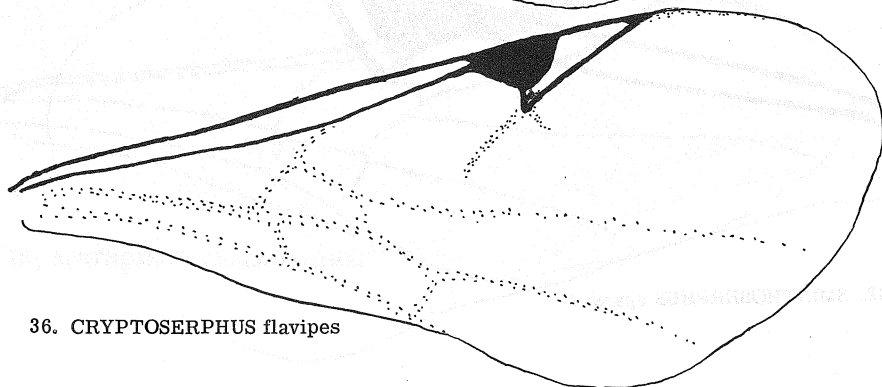
33. AFROSERPHUS n. sp.



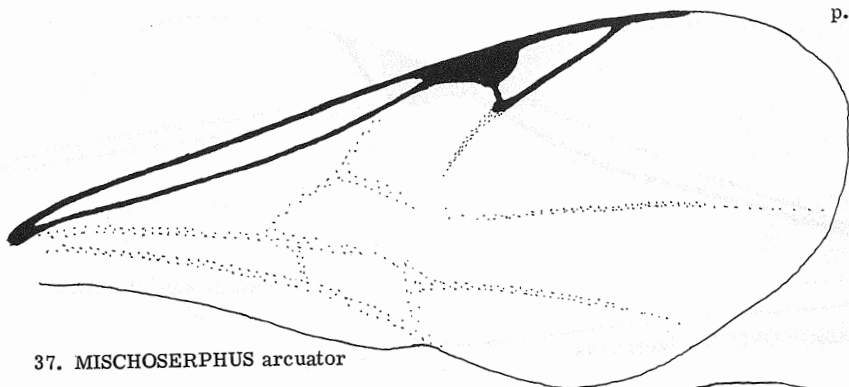
34. NOTHOSERPHUS mirabilis



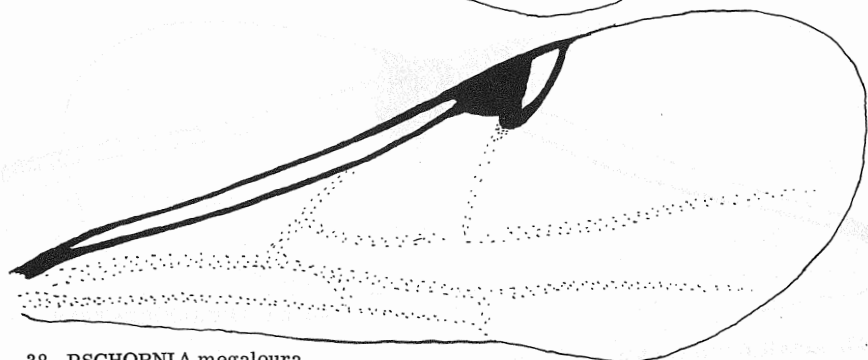
35. TRETOSERPUS laricis



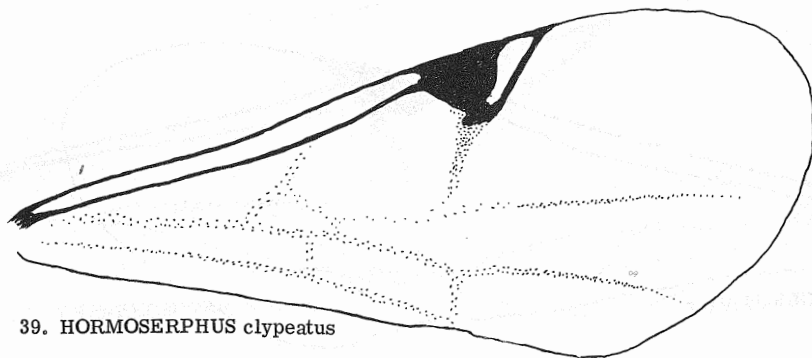
36. CRYPTOSERPUS flavipes



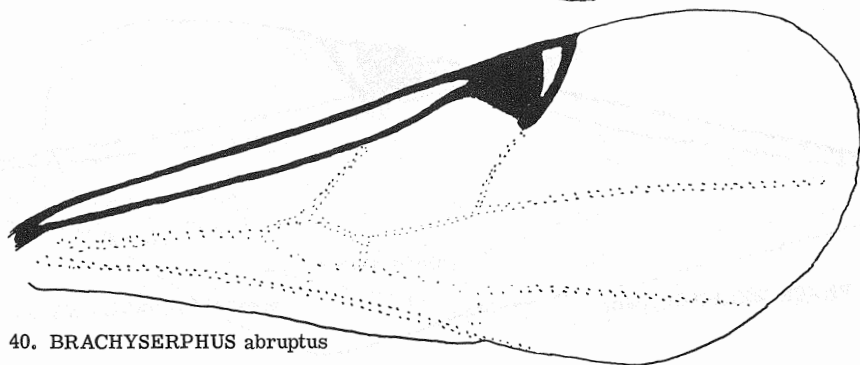
37. MISCHOSERPHUS arcuator



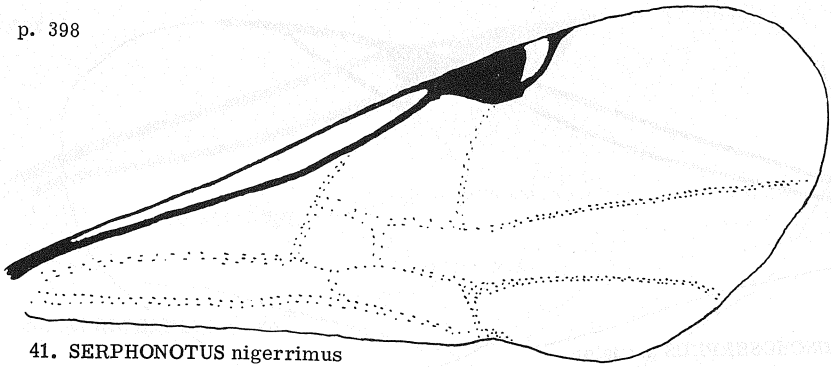
38. PSCHORNIA megaloura



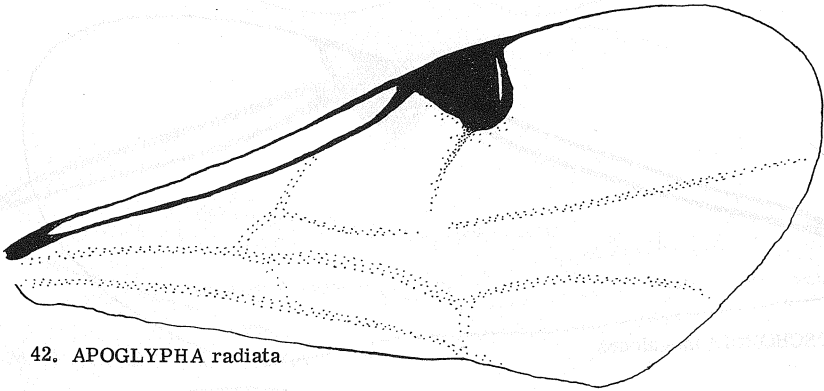
39. HORMOSERPHUS clypeatus



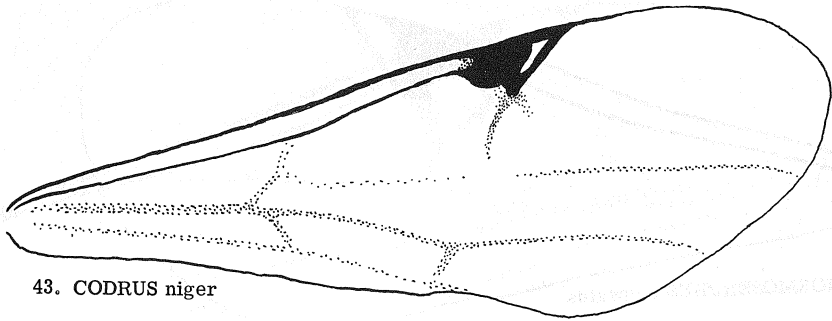
40. BRACHYSERPHUS abruptus



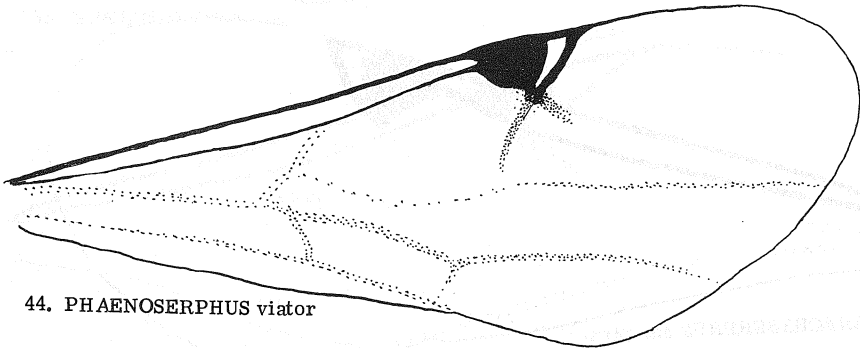
41. *SERPHONOTUS nigerrimus*



42. *AOGLYPHA radiata*

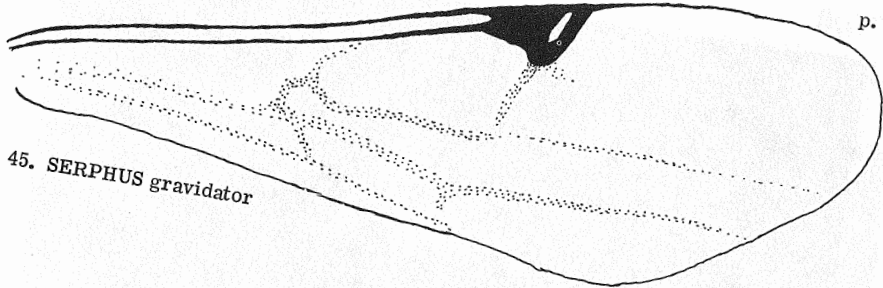


43. *CODRUS niger*

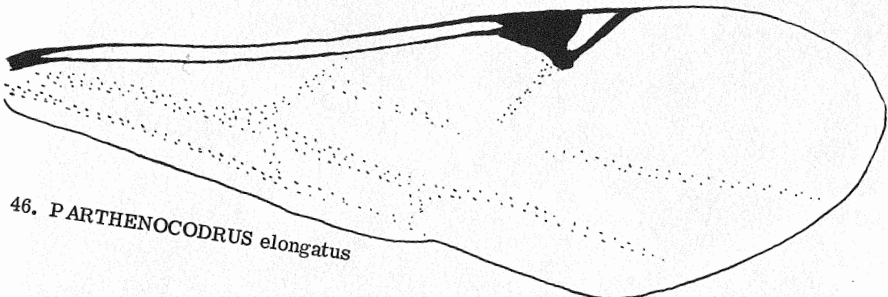


44. *PHAENOSERPHUS viator*

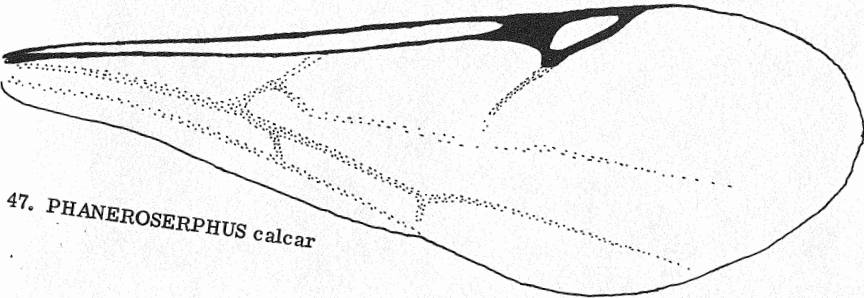
45. SERPHUS gravidator



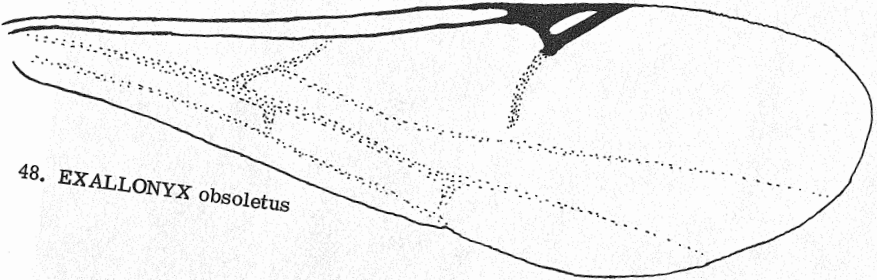
46. PARTHENOCODRUS elongatus

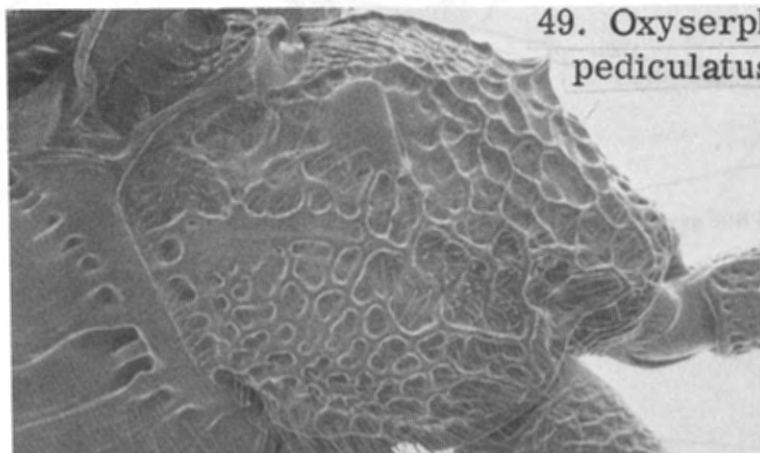


47. PHANEROSERPHUS calcar



48. EXALLONYX obsoletus

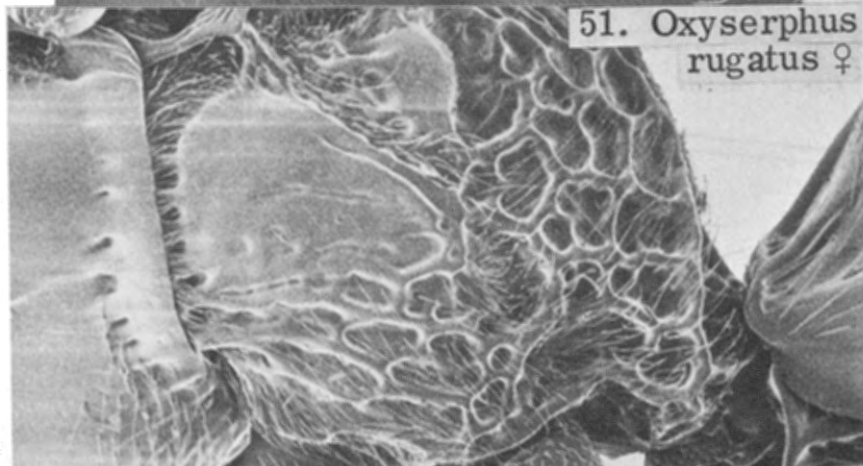




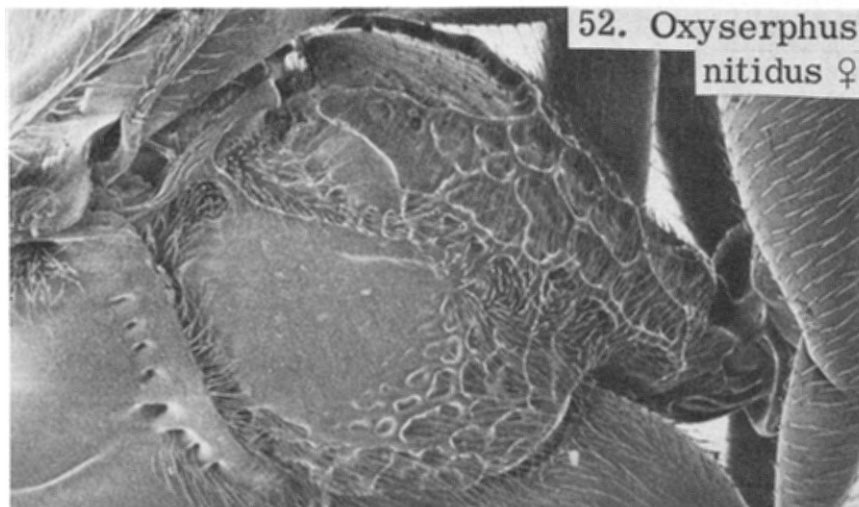
49. *Oxyserphus*
pediculatus ♂



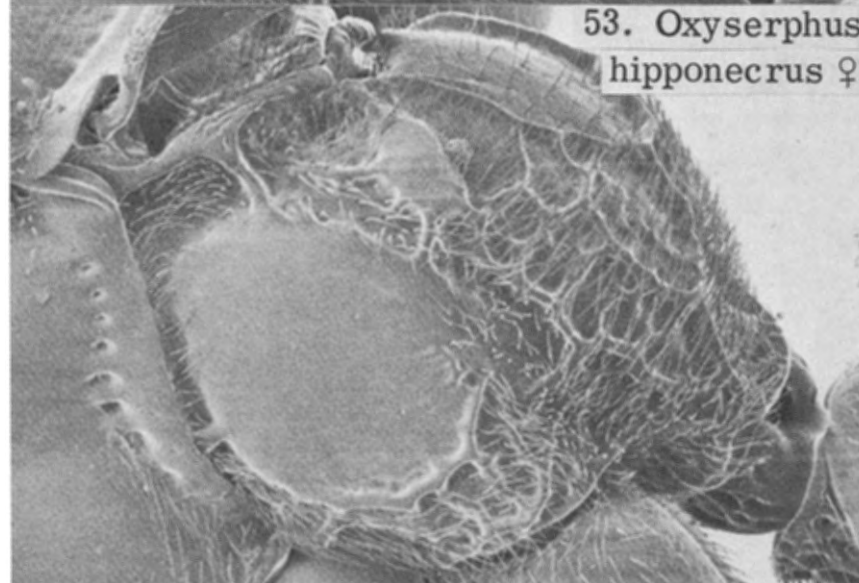
50. *Oxyserphus*
maculipennis ♂



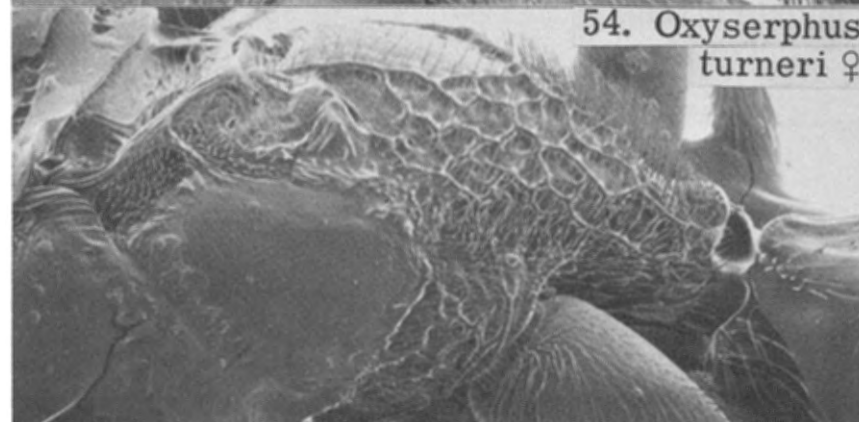
51. *Oxyserphus*
rugatus ♀



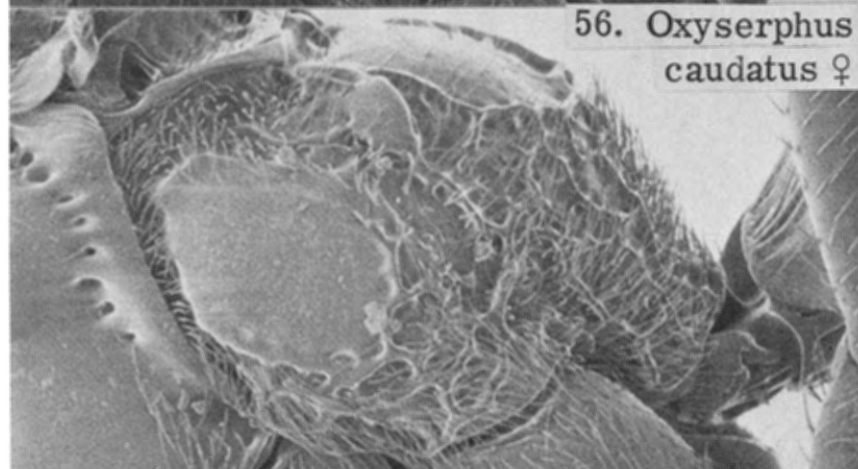
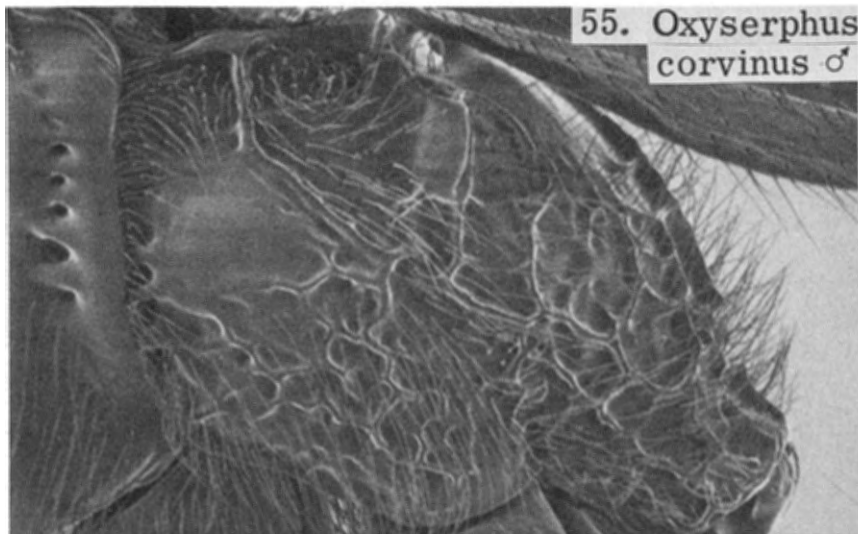
52. *Oxyserphus nitidus* ♀

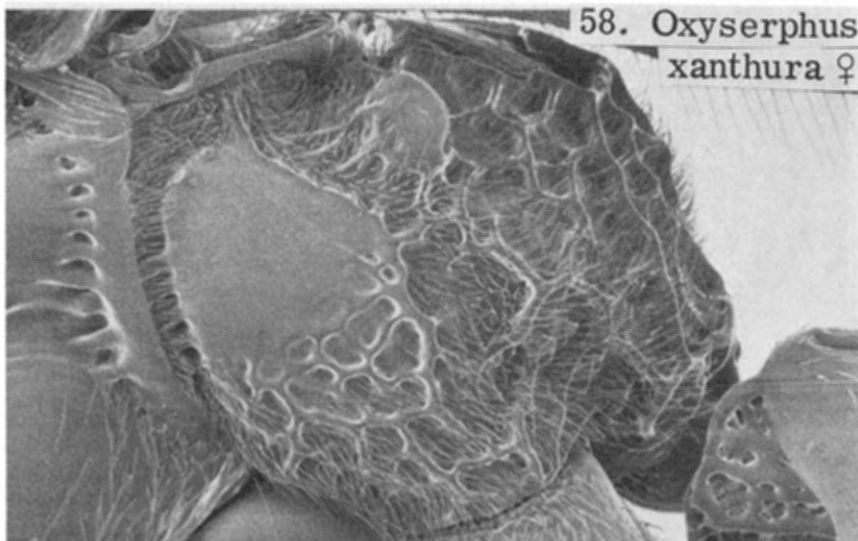


53. *Oxyserphus hipponecrus* ♀

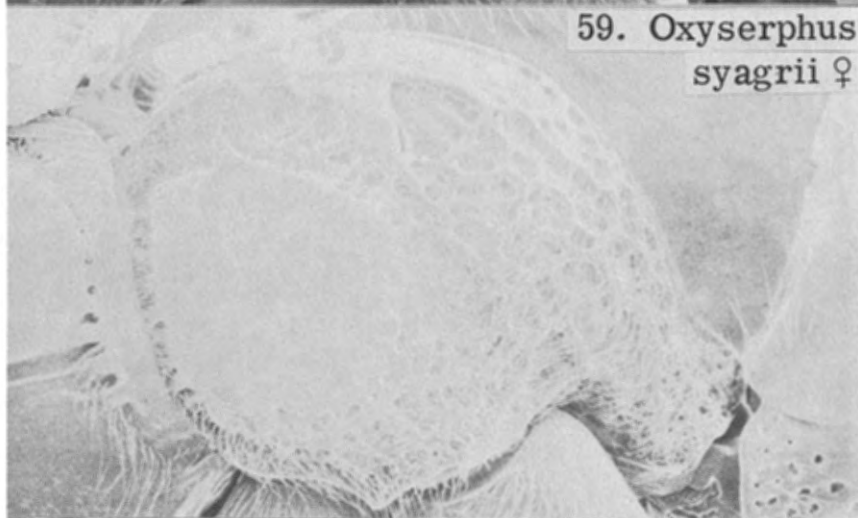


54. *Oxyserphus turneri* ♀

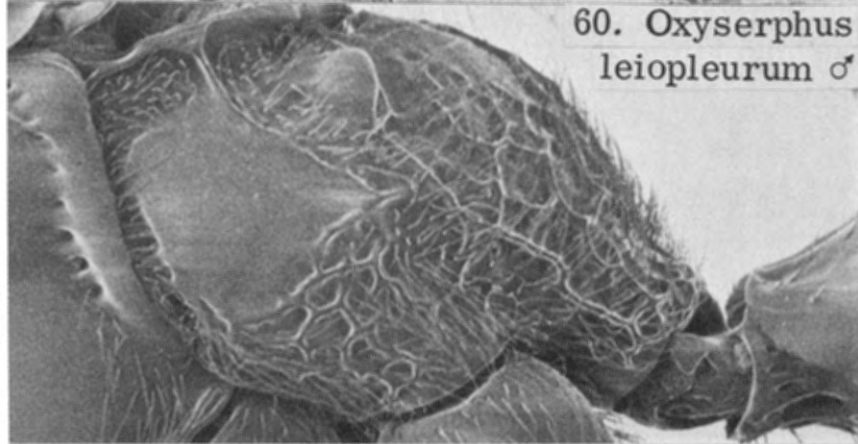




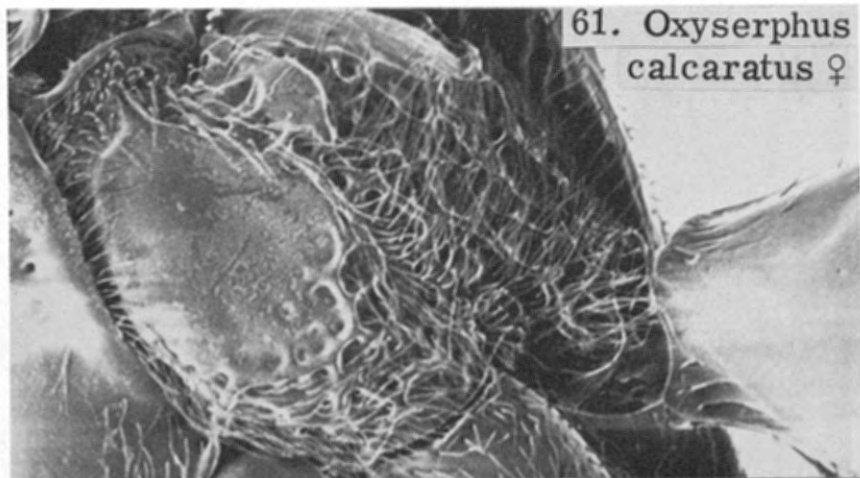
58. *Oxyserphus*
xanthura ♀



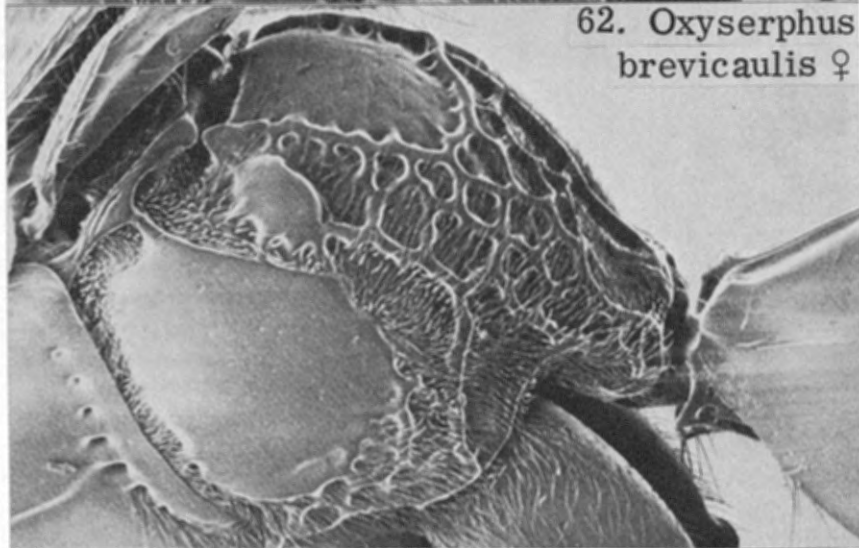
59. *Oxyserphus*
syagrii ♀



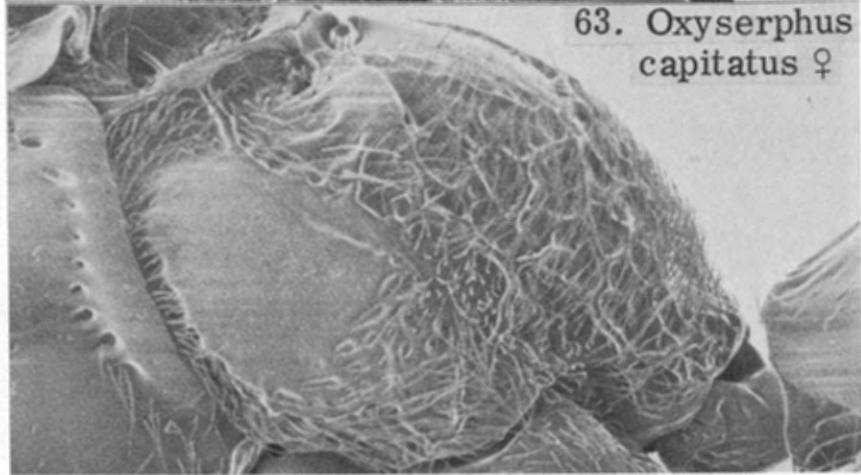
60. *Oxyserphus*
leiopleurum ♂



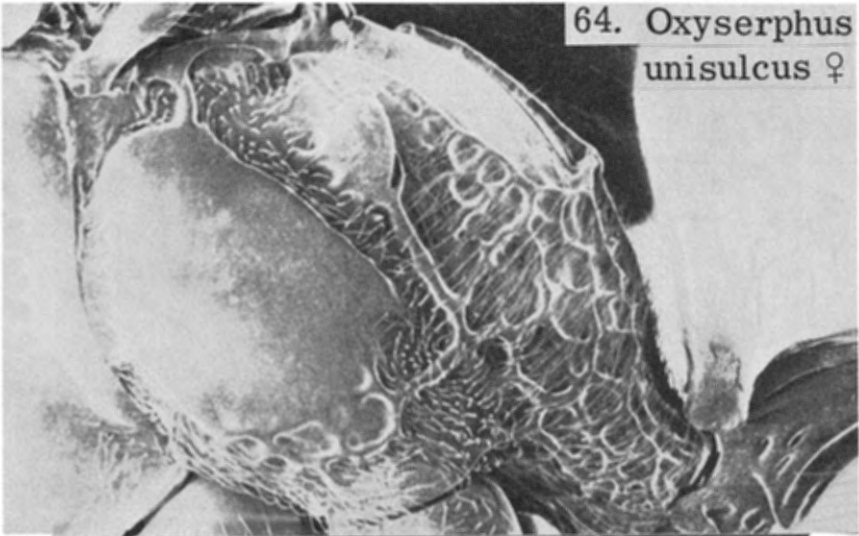
61. *Oxyserphus calcaratus* ♀



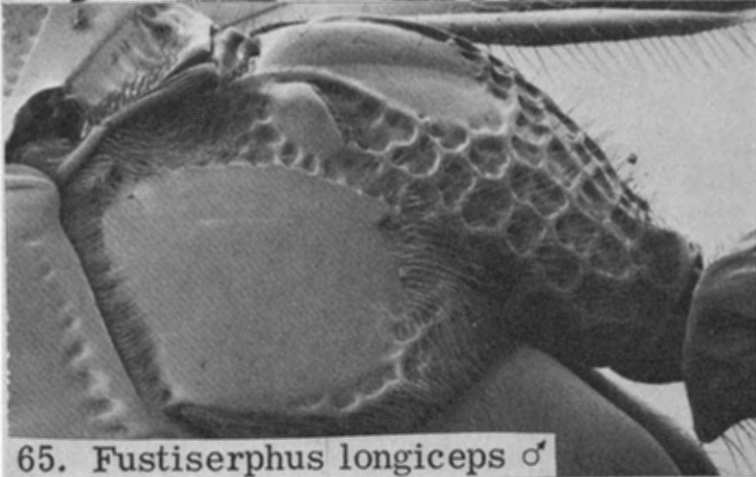
62. *Oxyserphus brevicaulis* ♀



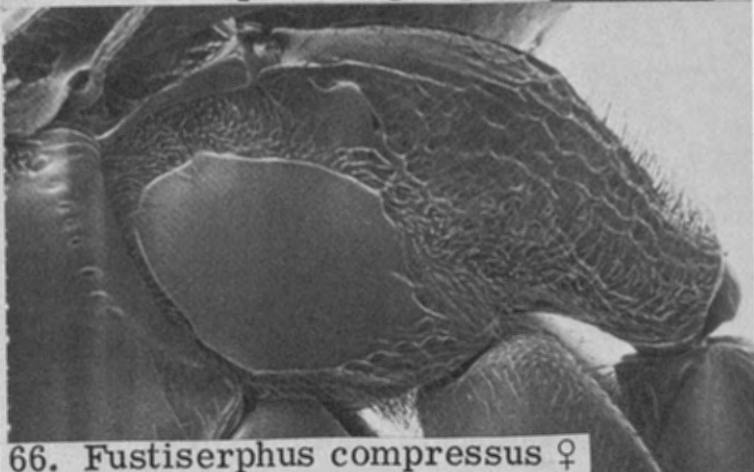
63. *Oxyserphus capitatus* ♀



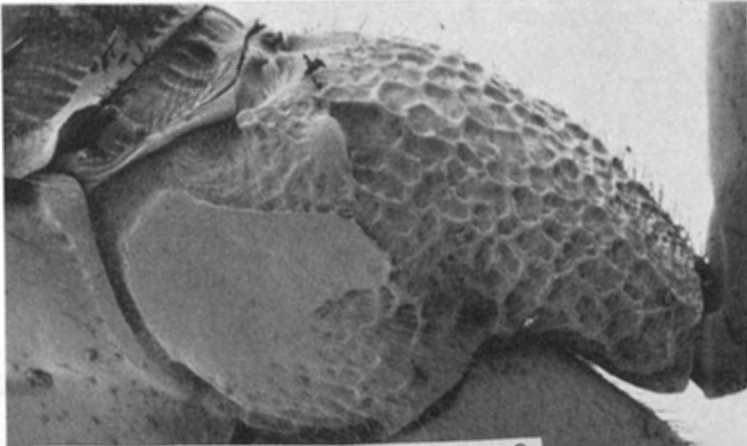
64. *Oxyserphus unisulcus* ♀



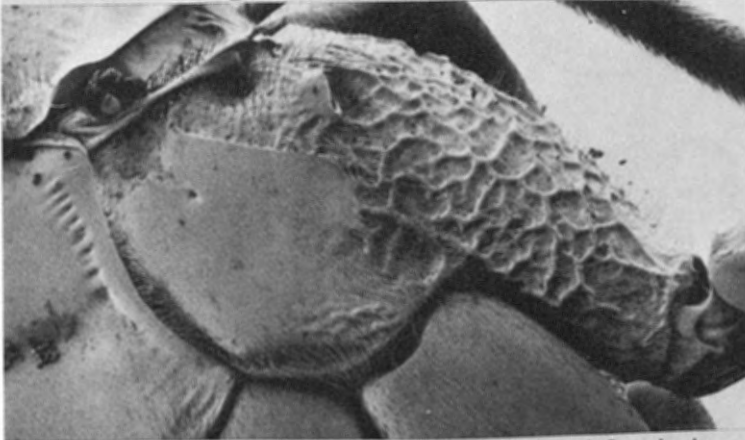
65. *Fustiserphus longiceps* ♂



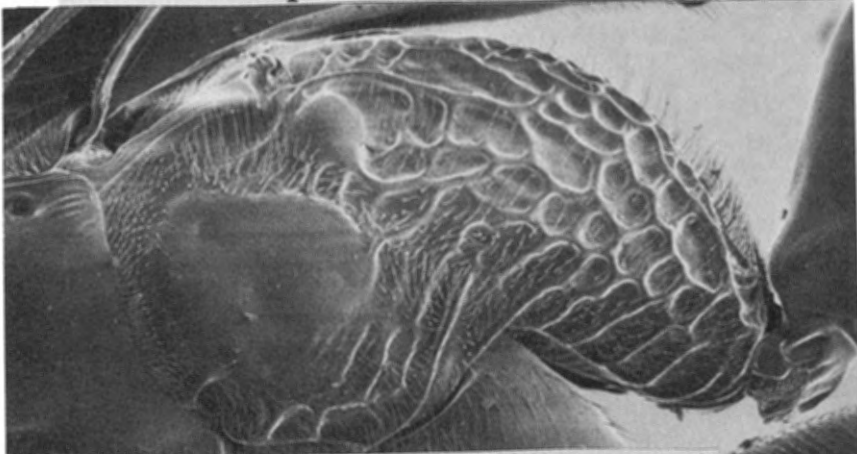
66. *Fustiserphus compressus* ♀



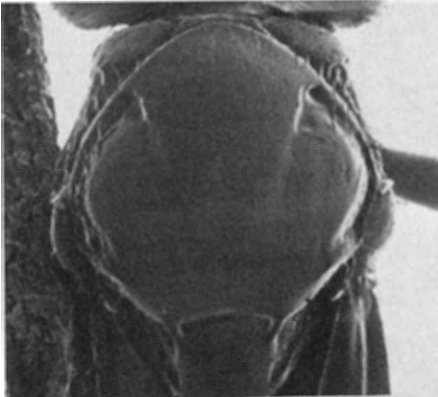
67. *Fustiserphus intrudens* ♀



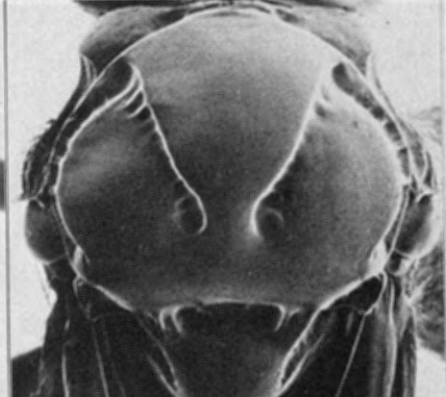
68. *Fustiserphus unidentatus unidentatus* ♀



69. *Fustiserphus reticulatus grossus* ♀



70. *Nothoserphus scymni* ♂



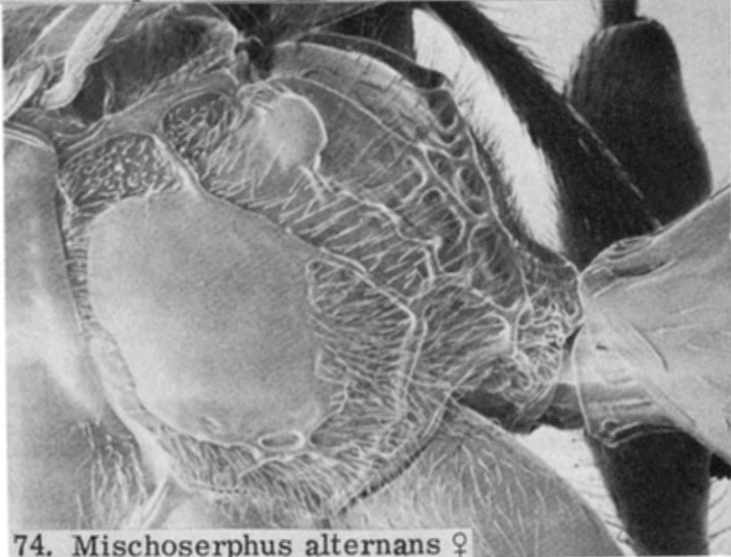
71. *Nothoserphus aequalis* ♀



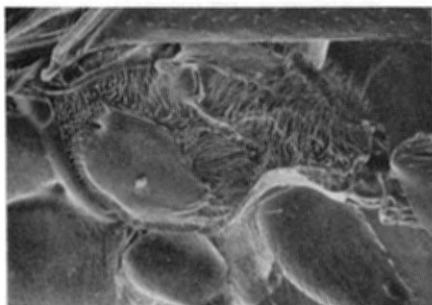
72. *Nothoserphus debilis* ♀



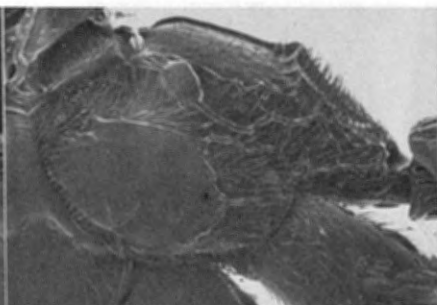
73. *Nothoserphus mirabilis* ♀



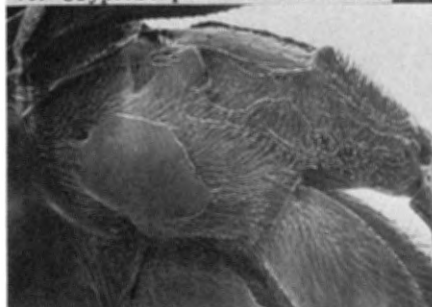
74. *Mischoserphus alternans* ♀



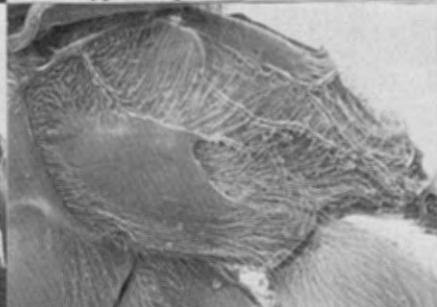
75. *Cryptoserphus occidentalis* ♀



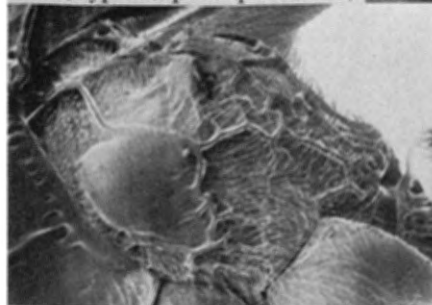
76. *Cryptoserphus aculeator* ♀



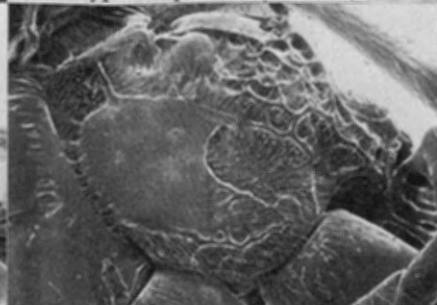
77. *Cryptoserphus quintanus* ♀



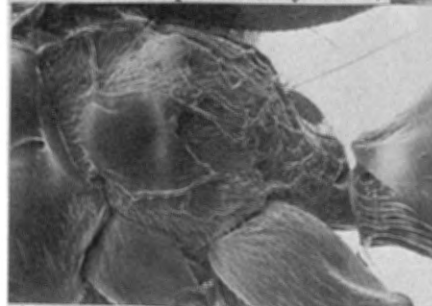
78. *Cryptoserphus rostratus* ♀



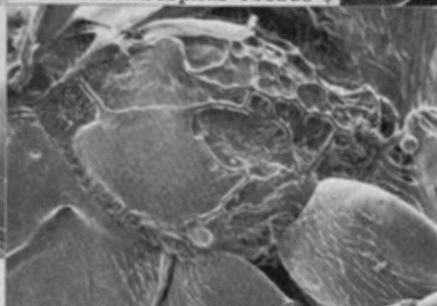
79. *Mischoserphus lachrymans* ♀



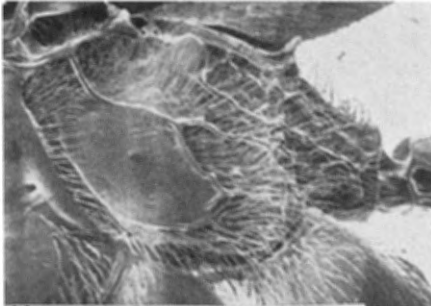
80. *Mischoserphus obesus* ♀



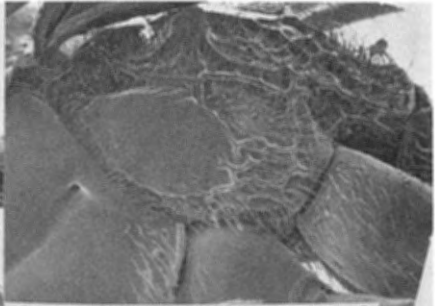
81. *Mischoserphus alaskensis* ♀



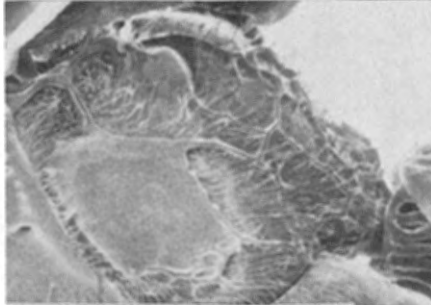
82. *Mischoserphus abbreviatus* ♀



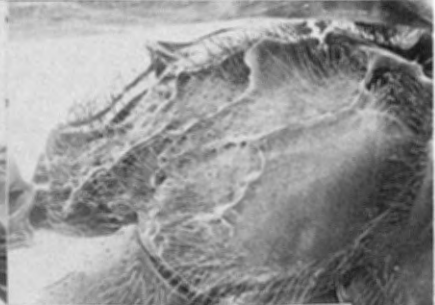
83. *Mischoserphus obscurus* ♂



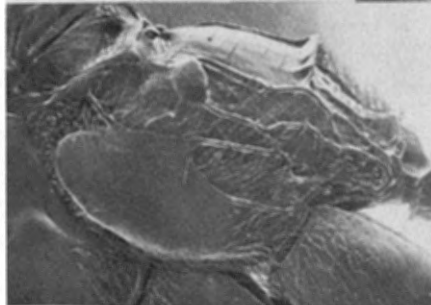
84. *Mischoserphus australiae* ♀



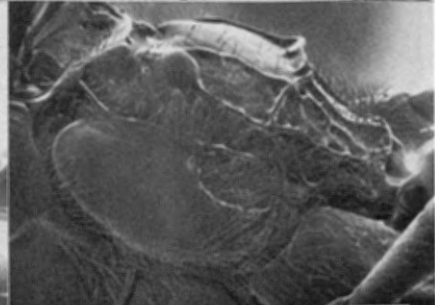
85. *Mischoserphus samurai* ♀



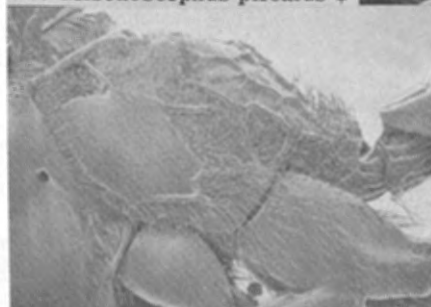
86. *Mischoserphus coxalis* ♂



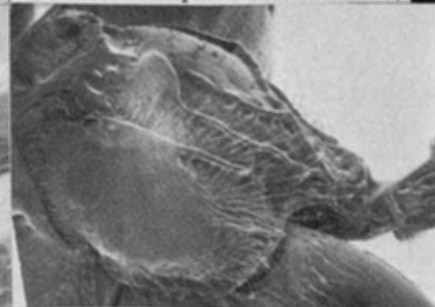
87. *Mischoserphus pileatus* ♀



88. *Mischoserphus crassicornis* ♀



89. *Mischoserphus appendicis* ♀



90. *Mischoserphus petiolatus* ♀



91. *Mischoserphus arcuator* ♀



92. *Mischoserphus acomus* ♀



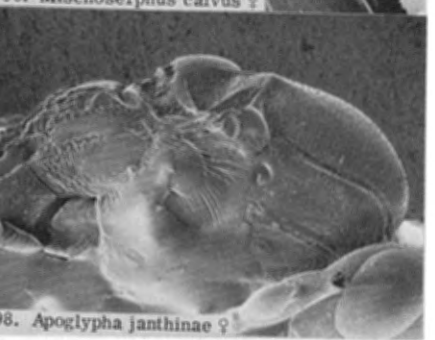
94. *Mischoserphus trichopleurum* ♂



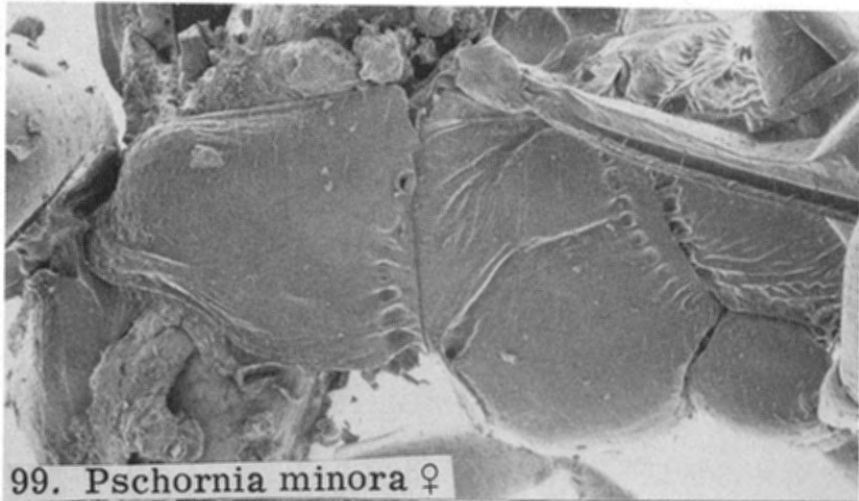
96. *Mischoserphus calvus* ♀



97. *Apoglypha radiata* ♀



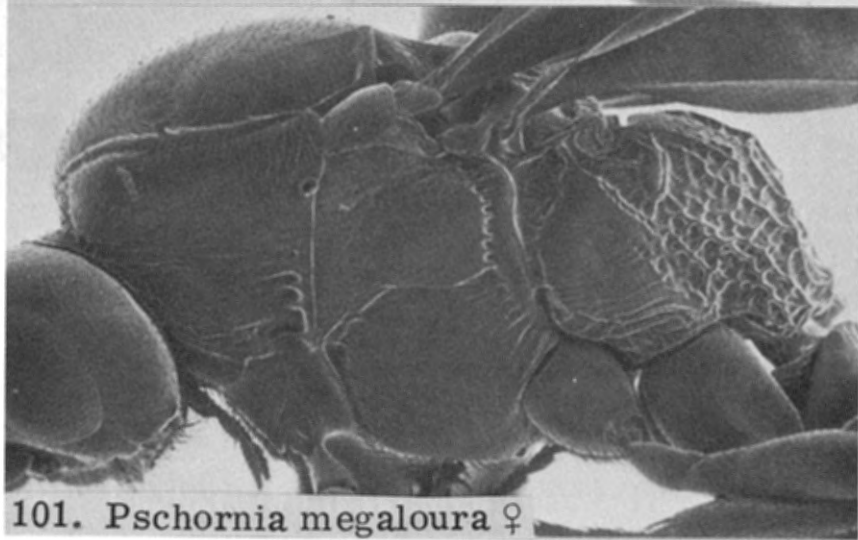
98. *Apoglypha janthinae* ♀



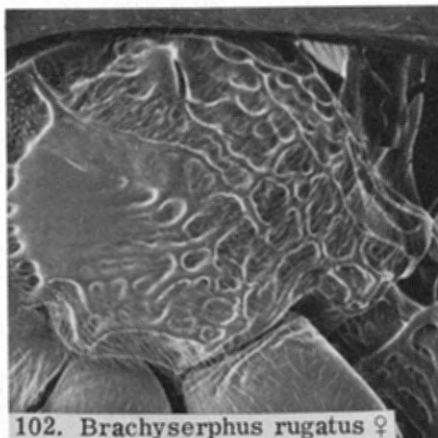
99. *Pschornia minor* ♀



100. *Pschornia striata* ♀



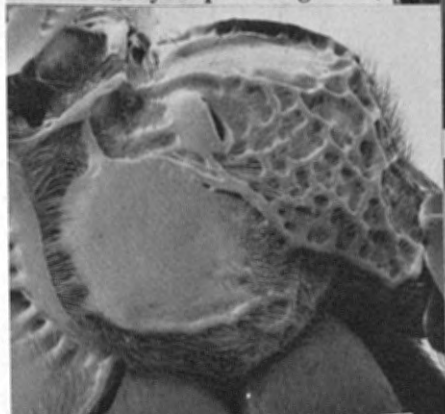
101. *Pschornia megaloura* ♀



102. *Brachyserphus rugatus* ♀



105. *Brachyserphus obliquus* ♀



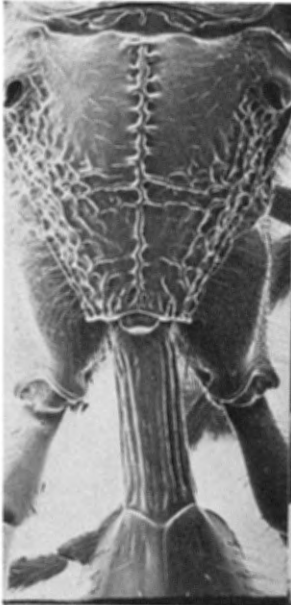
103. *Brachyserphus abruptus* ♀



106. *Brachyserphus hawaiiensis* ♀



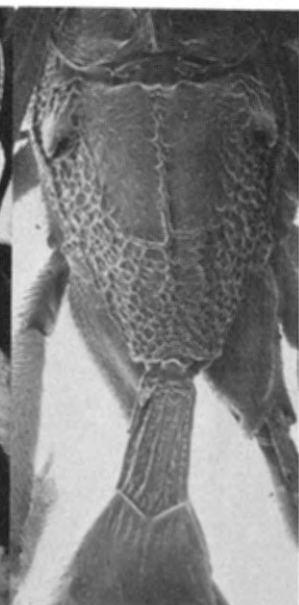
104. *Brachyserphus parvulus* ♀



107. *Codrus unistria* ♂



108. *Codrus philippinus* ♂



109. *Codrus philippinus* ♀



110. *Codrus picicornis* ♂



111. *Codrus picicornis* ♀



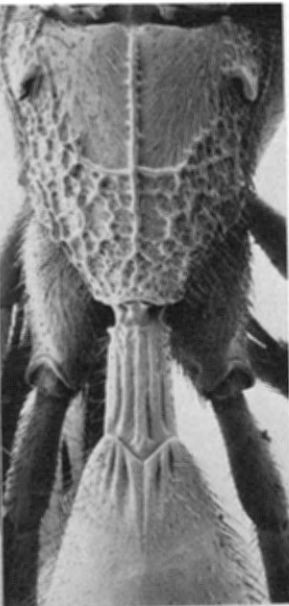
112. *Codrus striatus* ♀



113. *Codrus ciliatus* ♂



114. *Codrus ciliatus* ♀



115. *Codrus nebriae* ♂



116. *Codrus nebriae* ♀



117. *Codrus niger* ♂



118. *Codrus niger* ♀



119. *Phaenoserphus gregori* ♀



120. *Phaenoserphus genualis* ♂



121. *Phaenoserphus nigripes* ♂



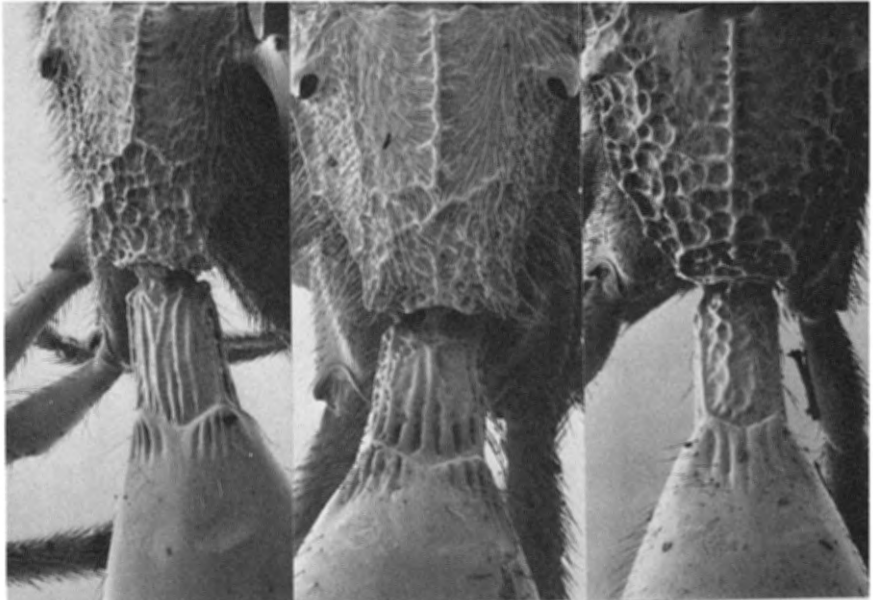
122. *Phaenoserphus borealis* ♂



123. *Phaenoserphus borealis* ♀



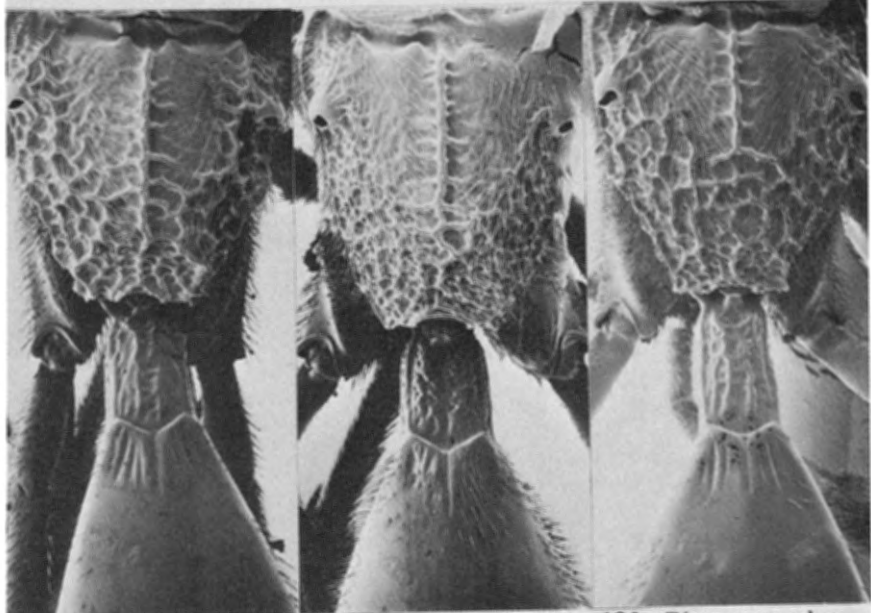
124. *Phaenoserphus trieces* ♂



125. *Phaenoserphus granulatus* ♂

126. *Phaenoserphus fuscipes* ♂

127. *Phaenoserphus melliventris* ♂



128. *Phaenoserphus lineatus* ♂

129. *Phaenoserphus glabratus* ♂

130. *Phaenoserphus chittii* ♂



131. *Phaenoserphus longipes* ♂



132. *Phaenoserphus viator* ♂



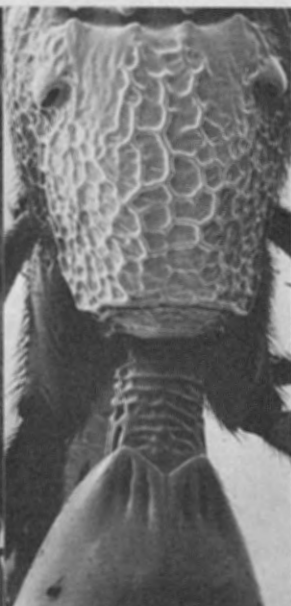
133. *Phaenoserphus pallipes* ♂



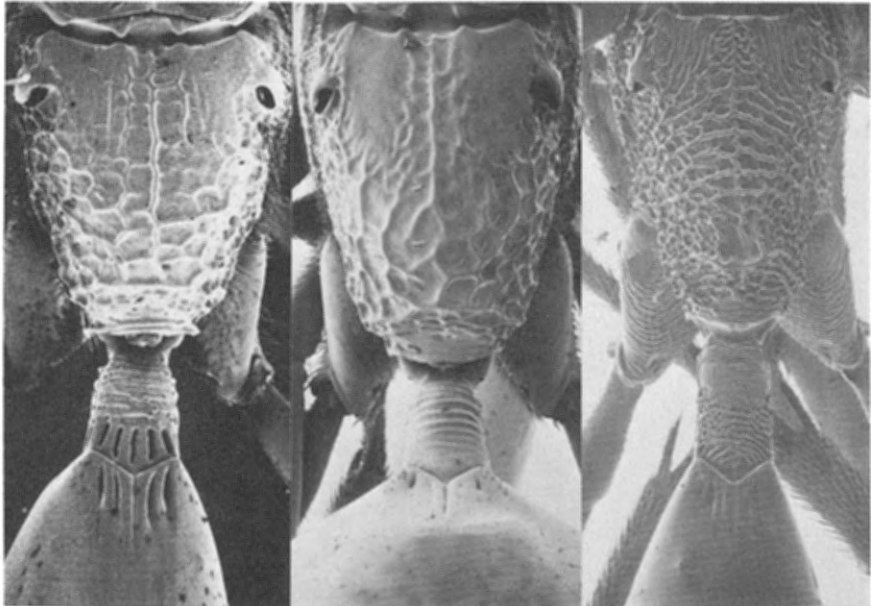
134. *Phaenoserphus disjunctus* ♂



135. *Phaneroserphus calcar* ♂



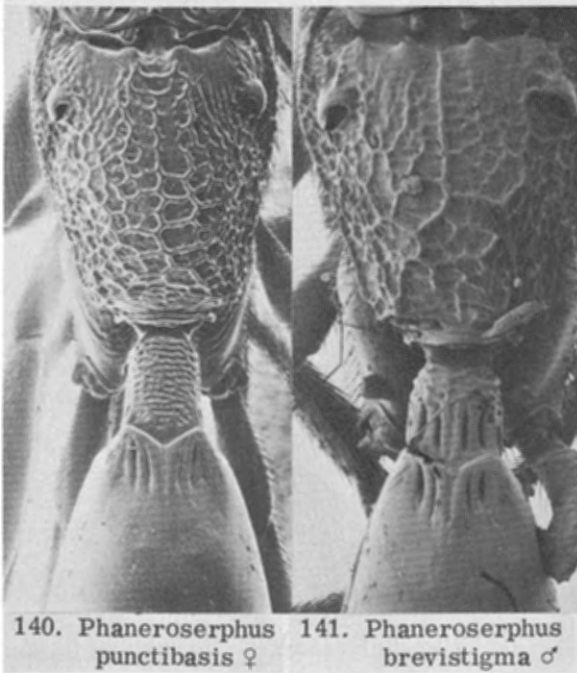
136. *Phaneroserphus calcar* ♀



137. *Phaneroserphus*
cristatus ♂

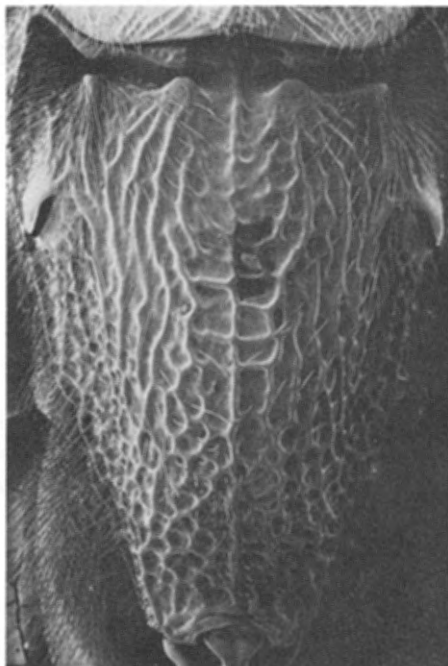
138. *Phaneroserphus*
cristatus ♀

139. *Phaneroserphus*
longistigma ♀



140. *Phaneroserphus*
punctibasis ♀

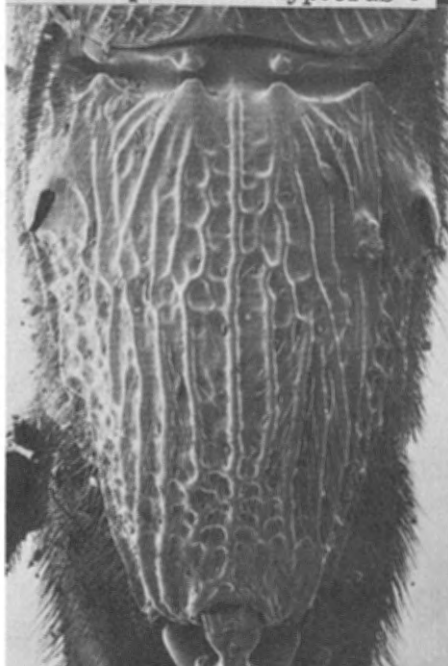
141. *Phaneroserphus*
brevistigma ♂



142. *Serphus brachypterus* ♂



143. *Serphus brachypterus* ♀



144. *Serphus caudatus* ♂



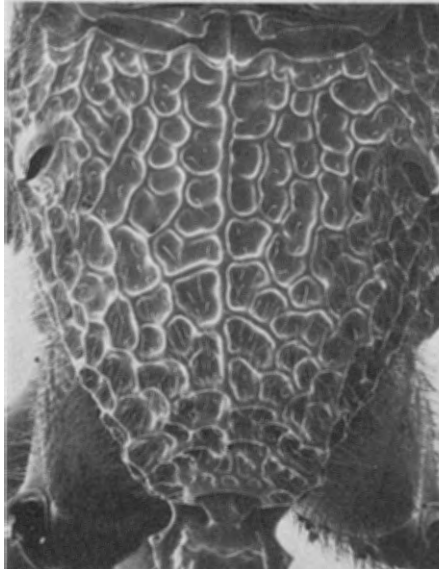
145. *Serphus caudatus* ♀



146. *Serphus pallidus* ♂



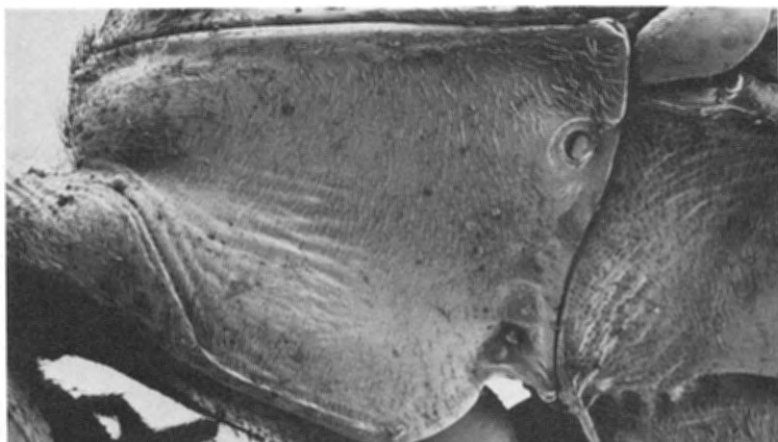
147. *Serphus gravidator* ♂



148. *Serphus terminalis* ♂



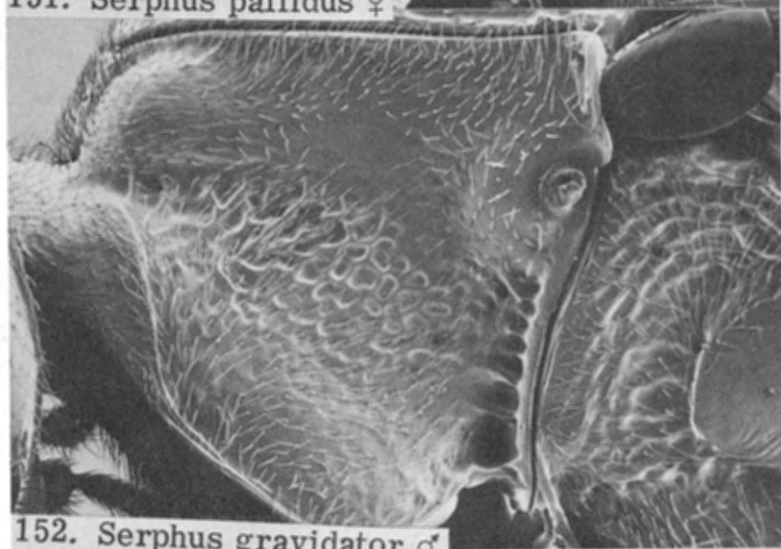
149. *Serphus bistratus* ♂



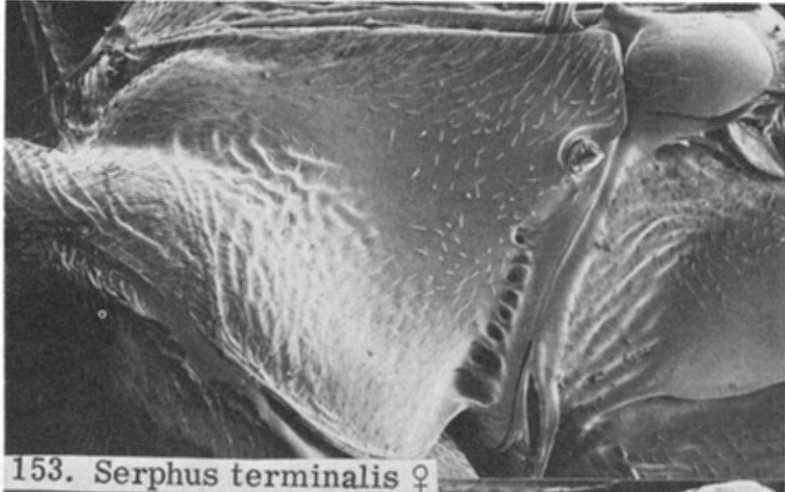
150. *Serphus caudatus* ♀



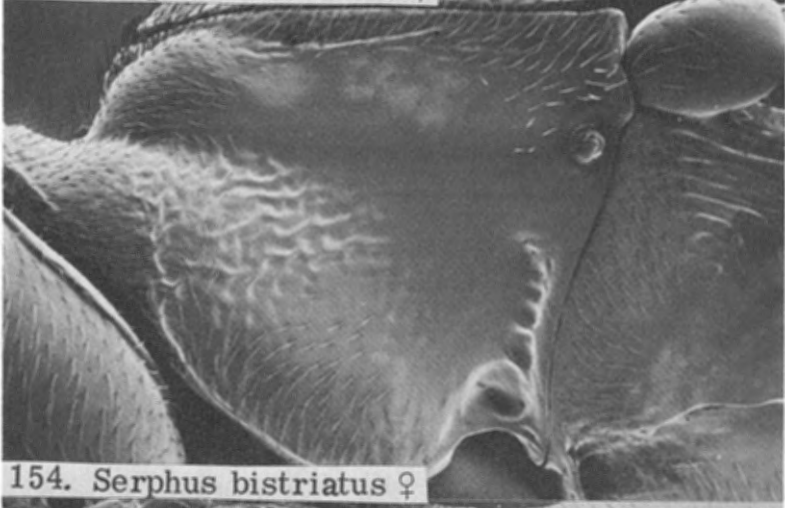
151. *Serphus pallidus* ♀



152. *Serphus gravidator* ♂



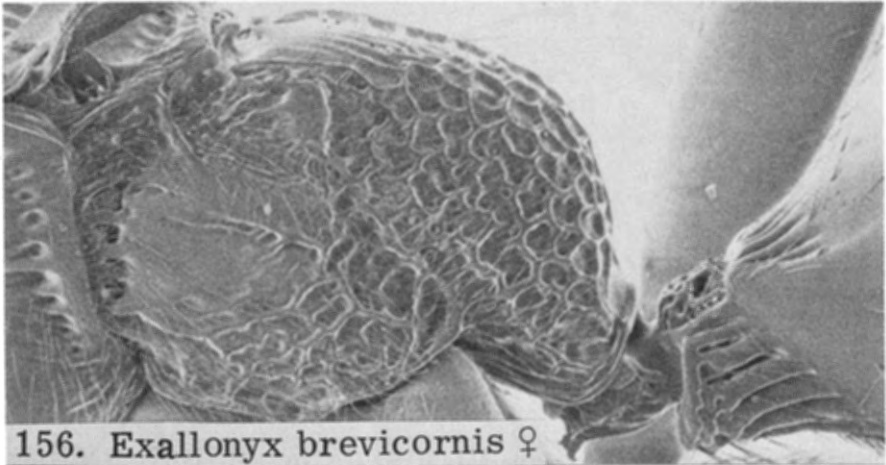
153. *Serphus terminalis* ♀



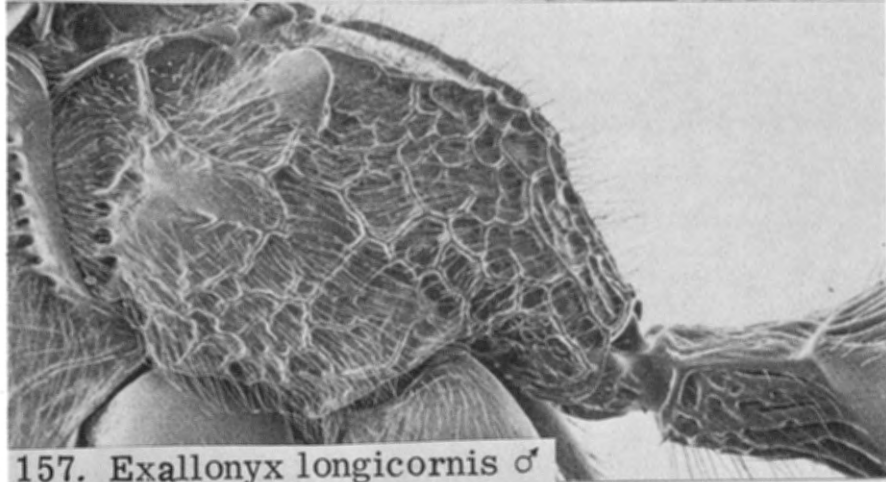
154. *Serphus bistriatus* ♀



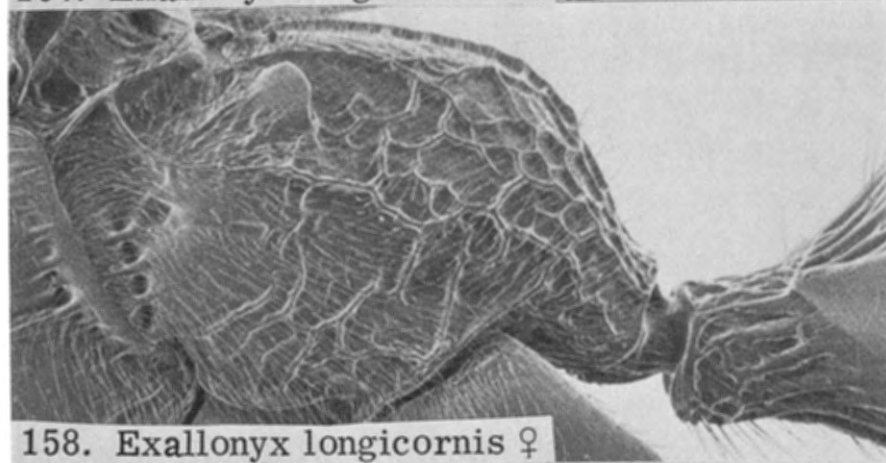
155. *Exallonyx brevicornis* ♂



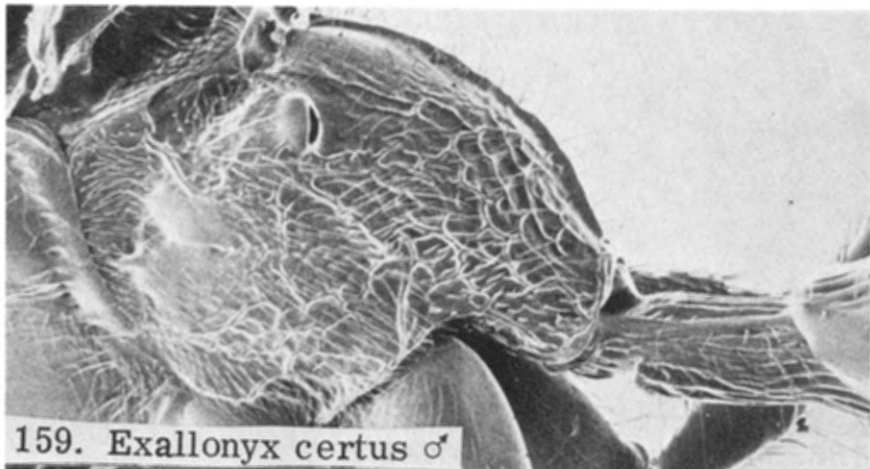
156. *Exallonyx brevicornis* ♀



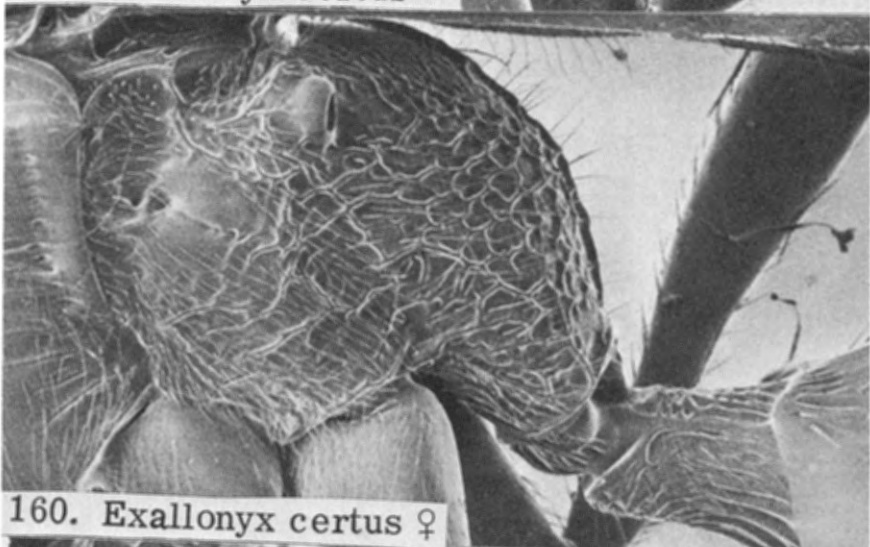
157. *Exallonyx longicornis* ♂



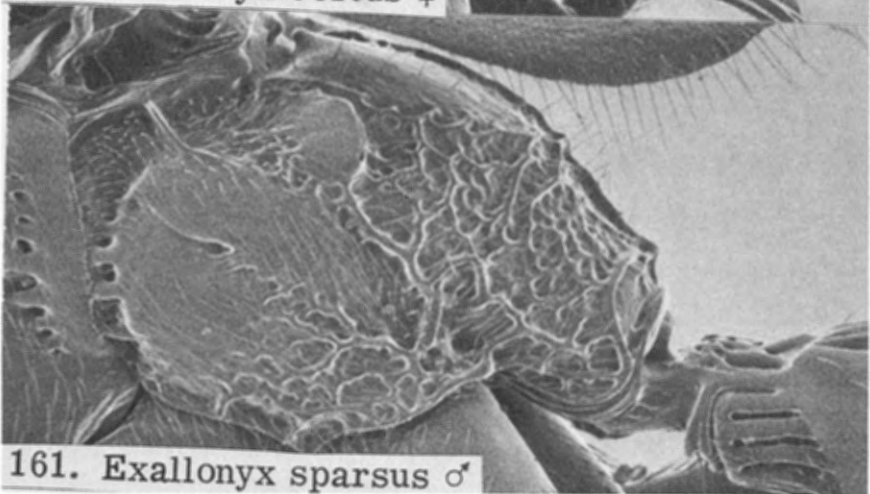
158. *Exallonyx longicornis* ♀



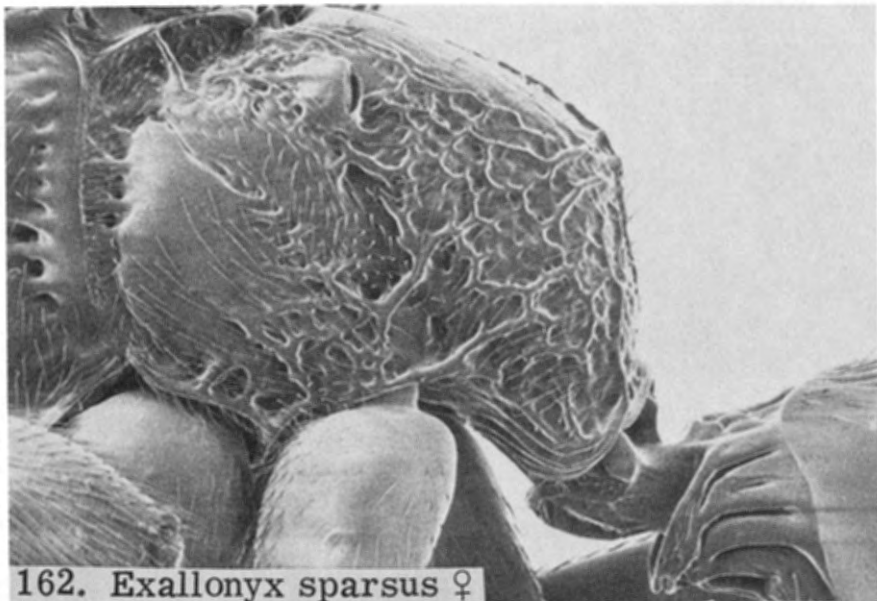
159. *Exallonyx certus* ♂



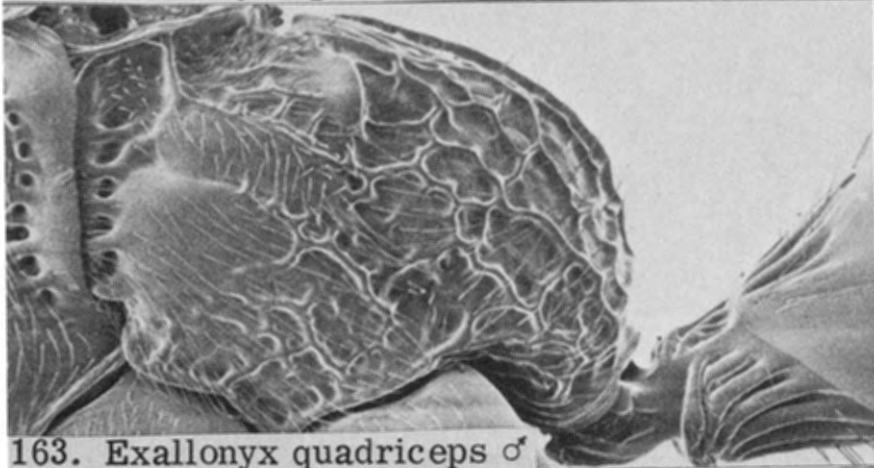
160. *Exallonyx certus* ♀



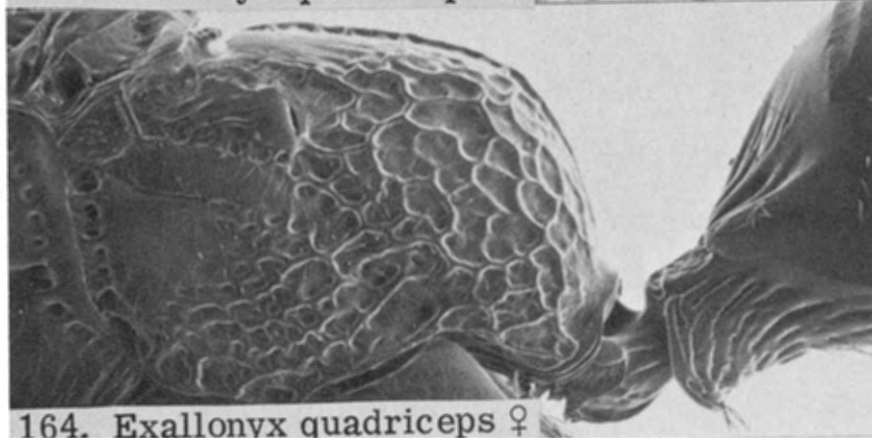
161. *Exallonyx sparsus* ♂



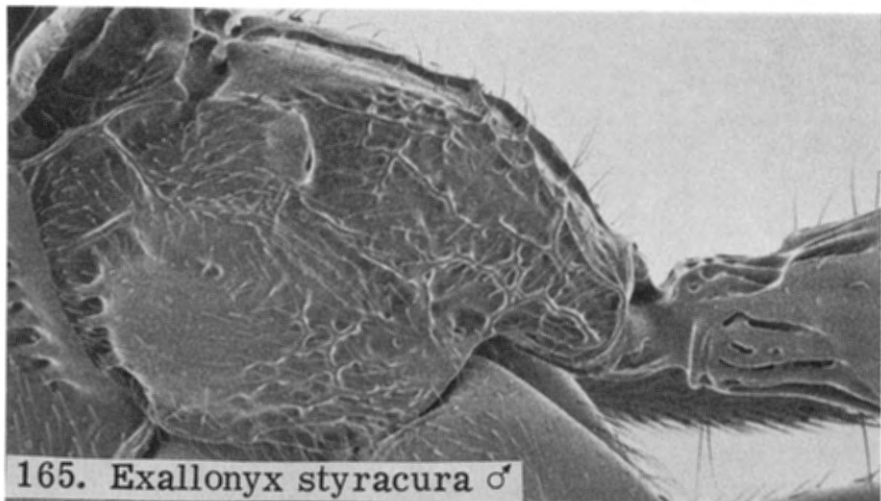
162. *Exallonyx sparsus* ♀



163. *Exallonyx quadriceps* ♂



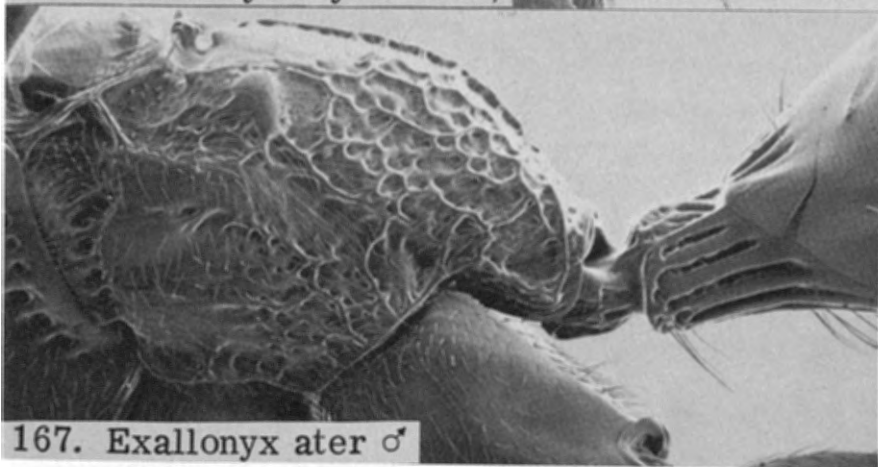
164. *Exallonyx quadriceps* ♀



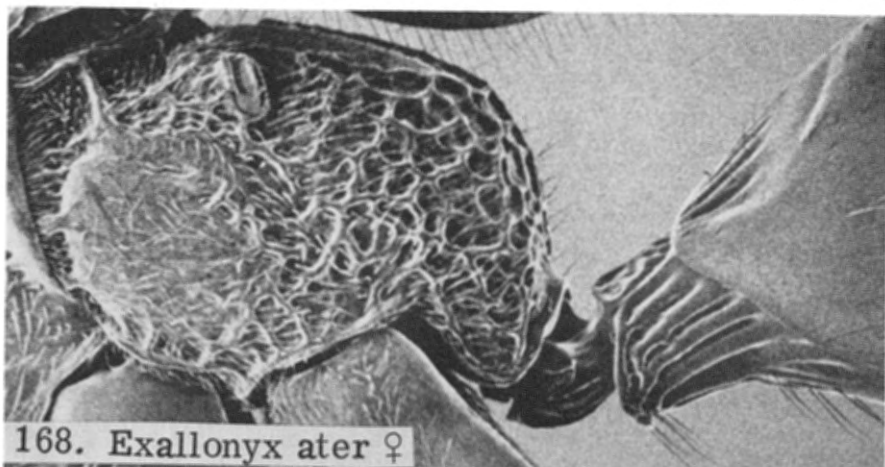
165. *Exallonyx styracura* ♂



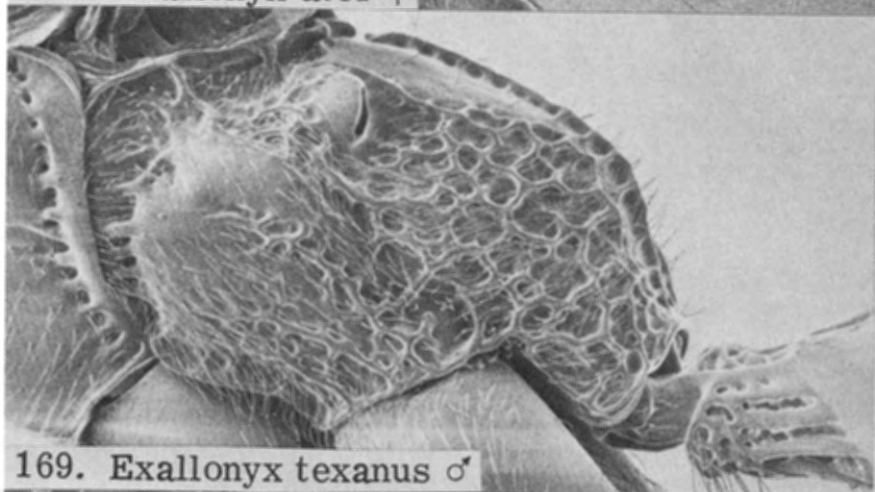
166. *Exallonyx styracura* ♀



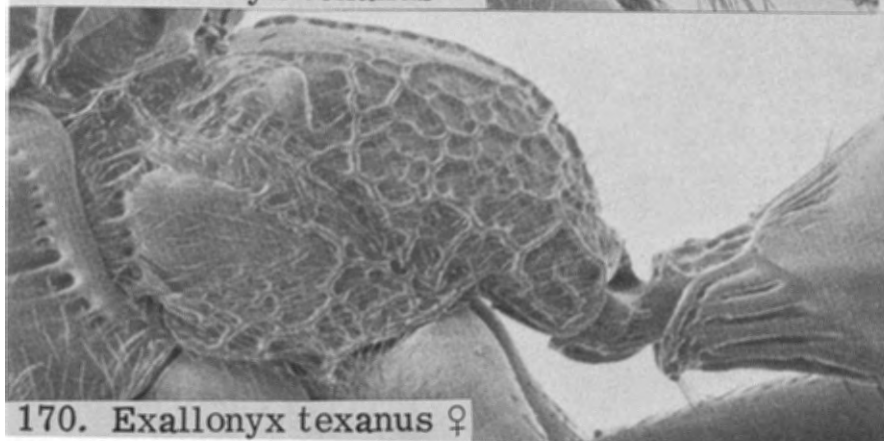
167. *Exallonyx ater* ♂



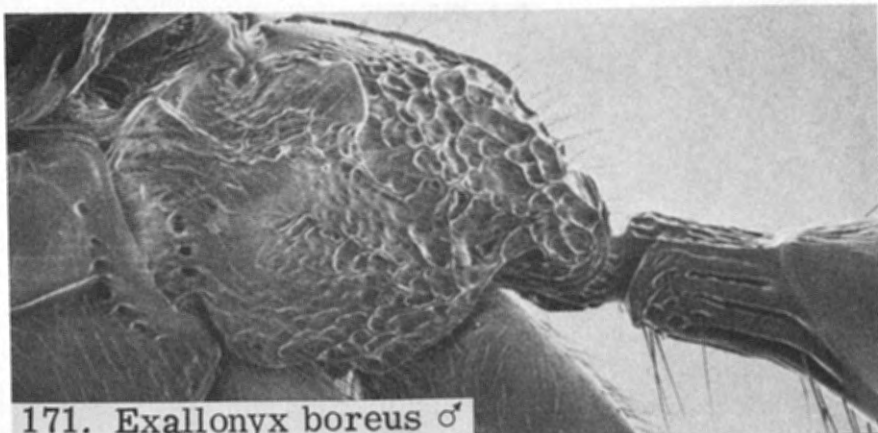
168. *Exallonyx ater* ♀



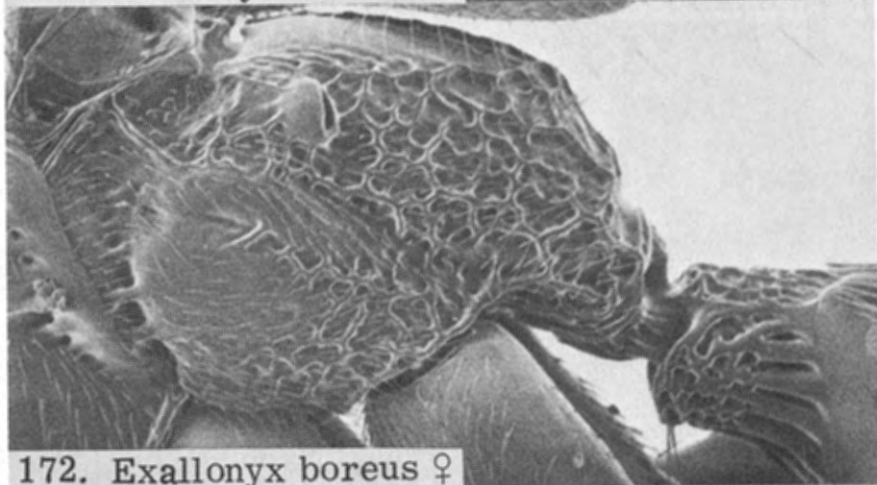
169. *Exallonyx texanus* ♂



170. *Exallonyx texanus* ♀



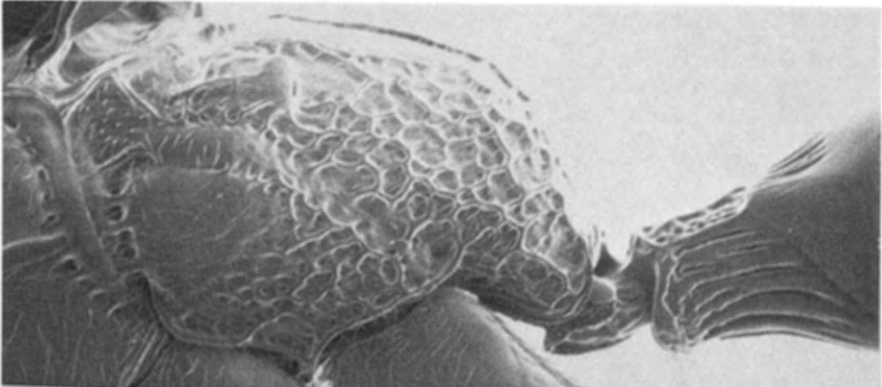
171. *Exallonyx boreus* ♂



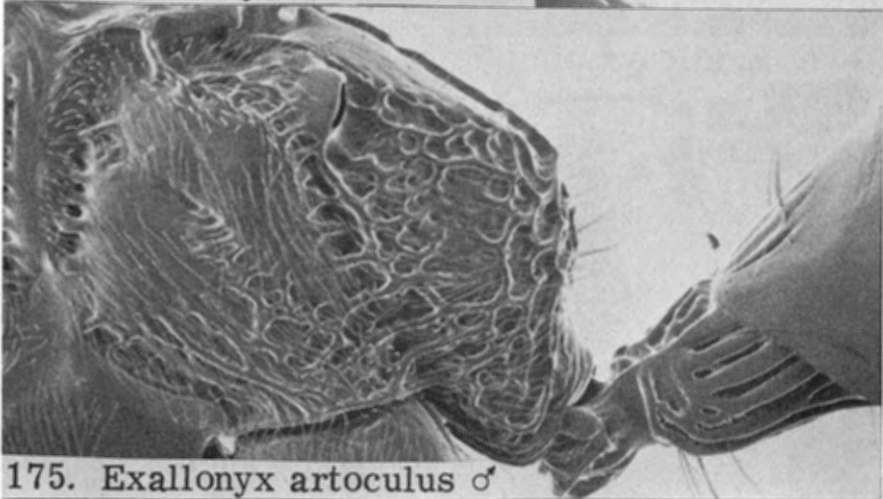
172. *Exallonyx boreus* ♀



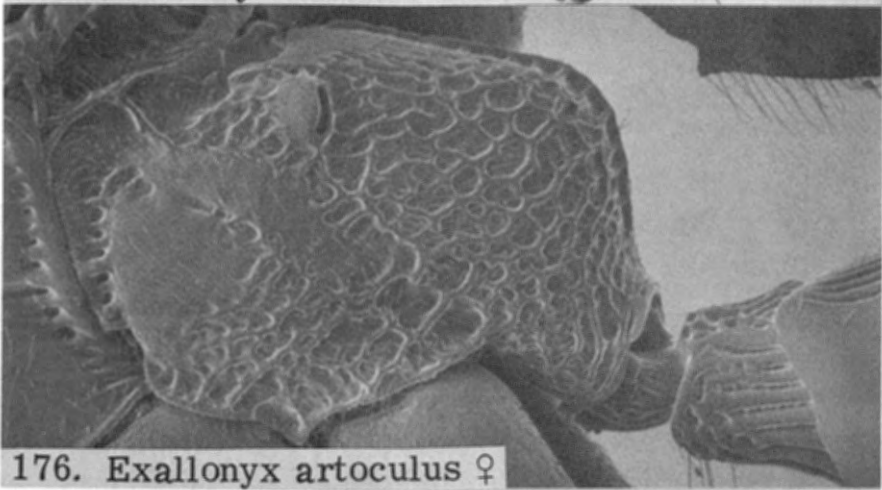
173. *Exallonyx nevadensis* ♂



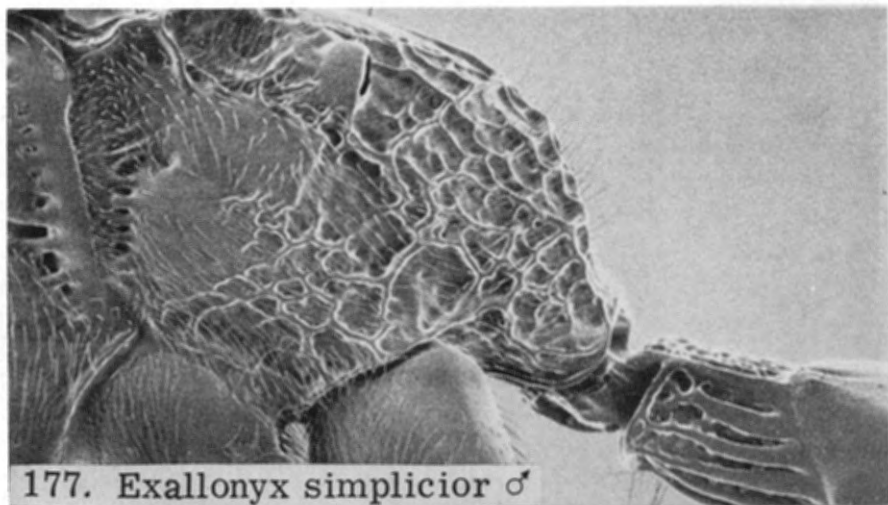
174. *Exallonyx nevadensis* ♀



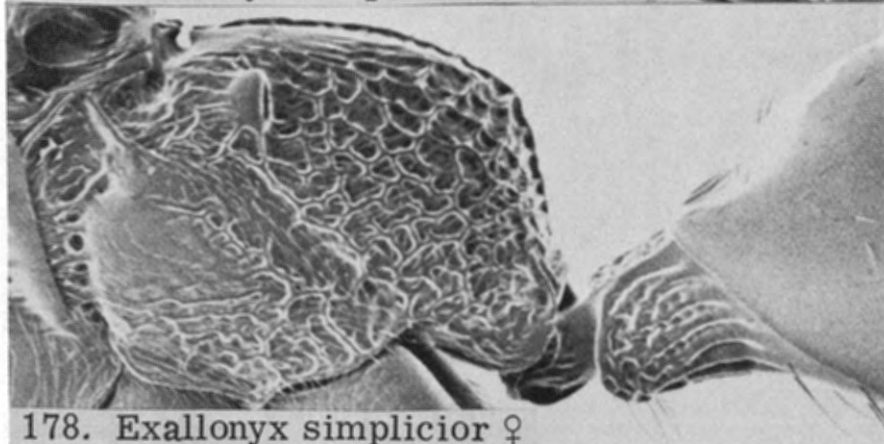
175. *Exallonyx artoculus* ♂



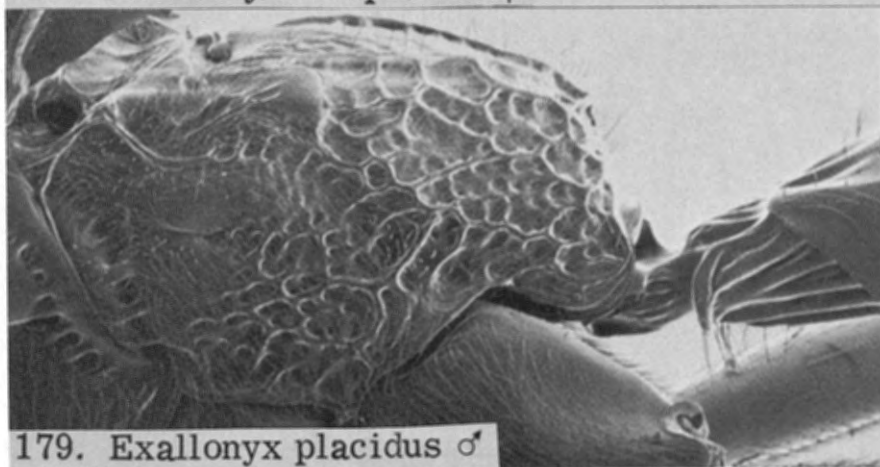
176. *Exallonyx artoculus* ♀



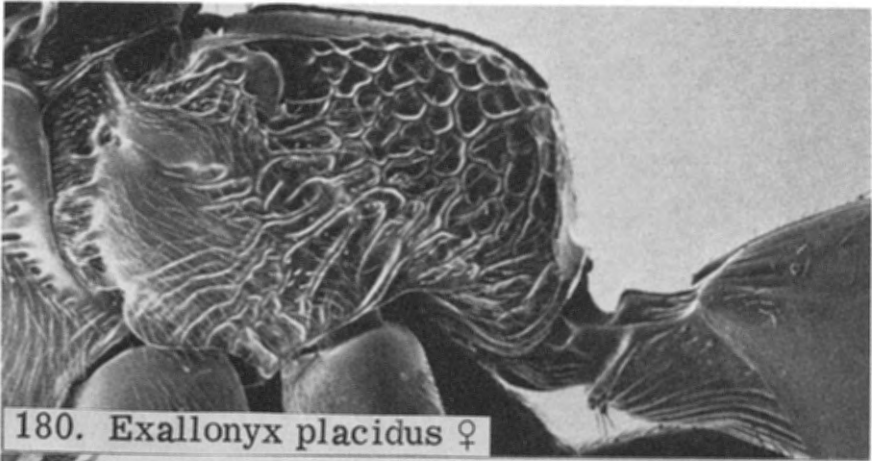
177. *Exallonyx simplicior* ♂



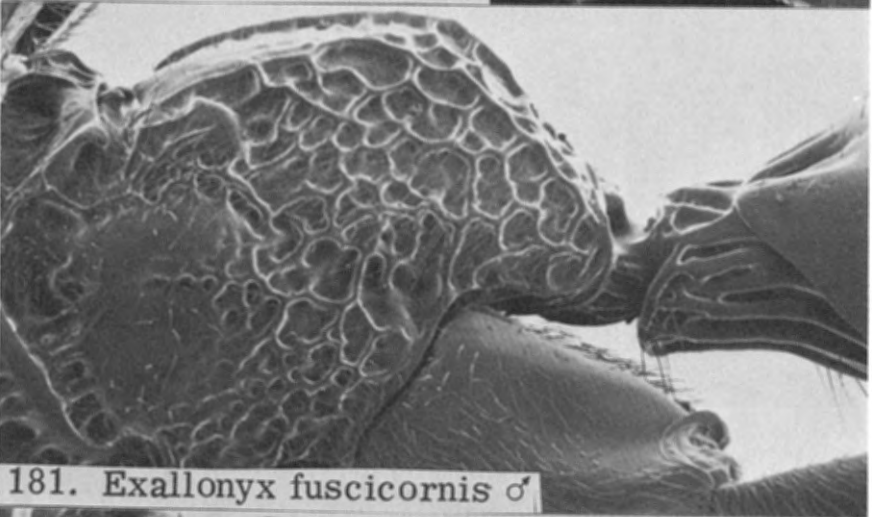
178. *Exallonyx simplicior* ♀



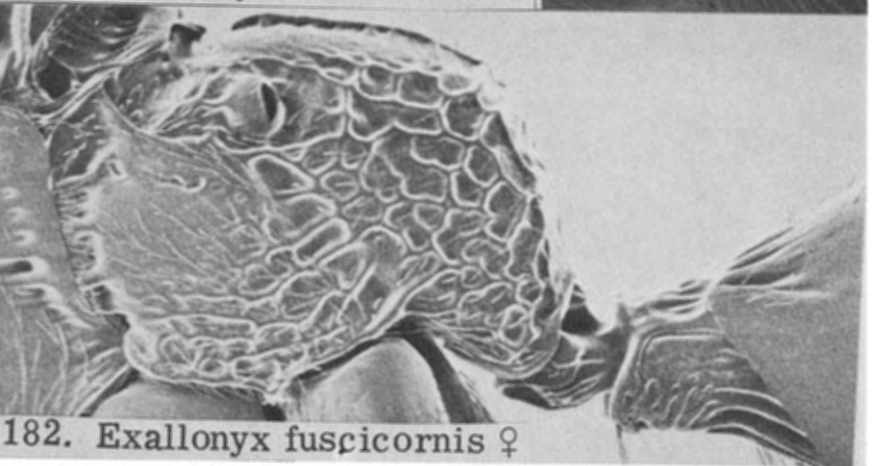
179. *Exallonyx placidus* ♂



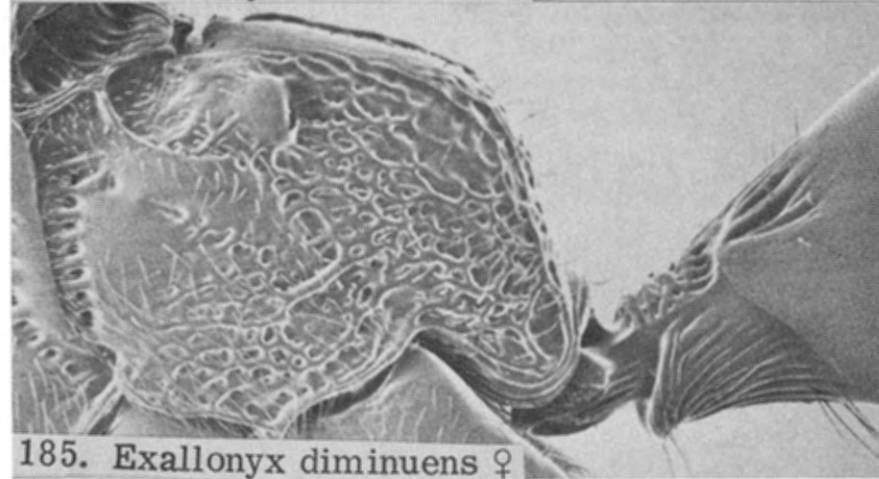
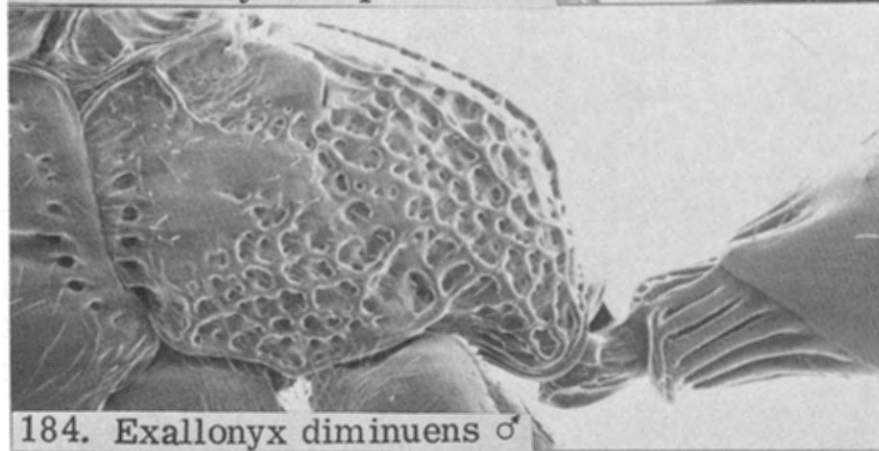
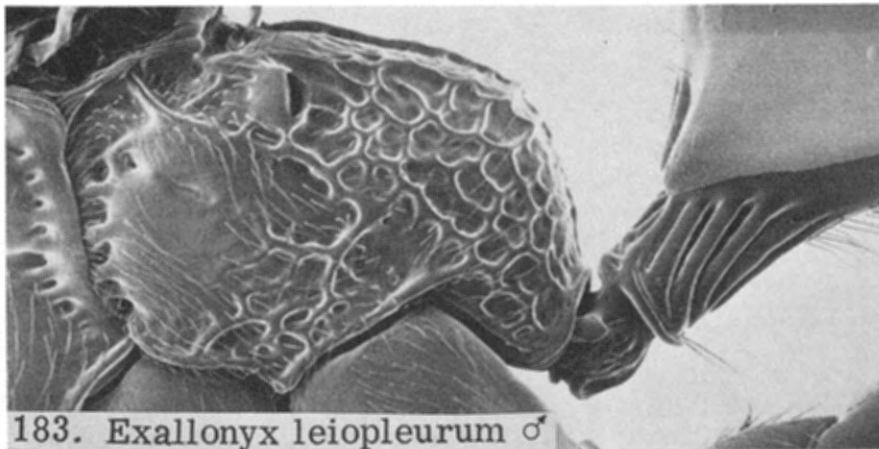
180. *Exallonyx placidus* ♀

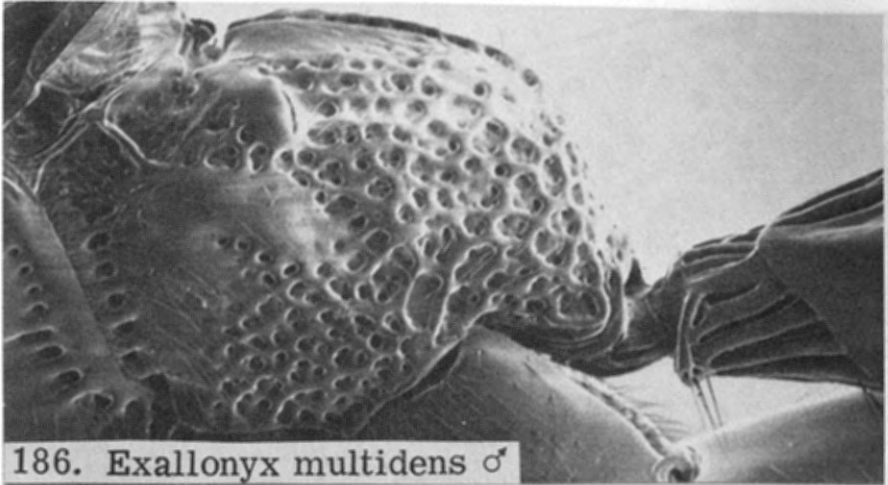


181. *Exallonyx fuscicornis* ♂

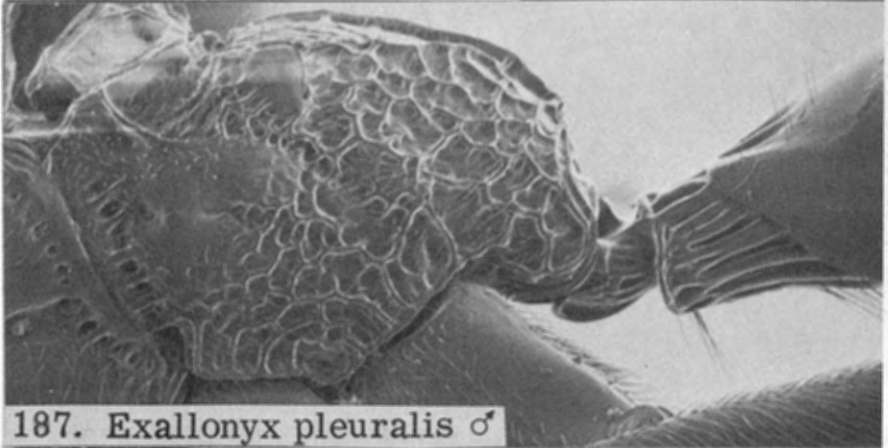


182. *Exallonyx fuscicornis* ♀

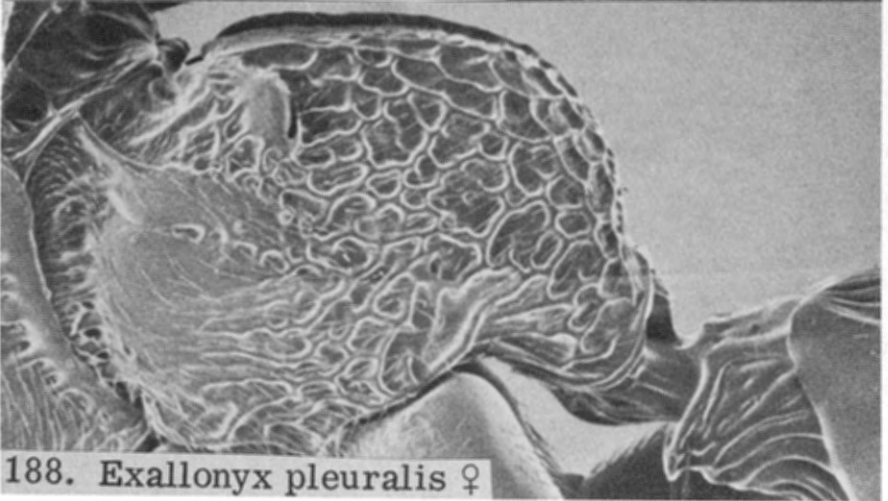




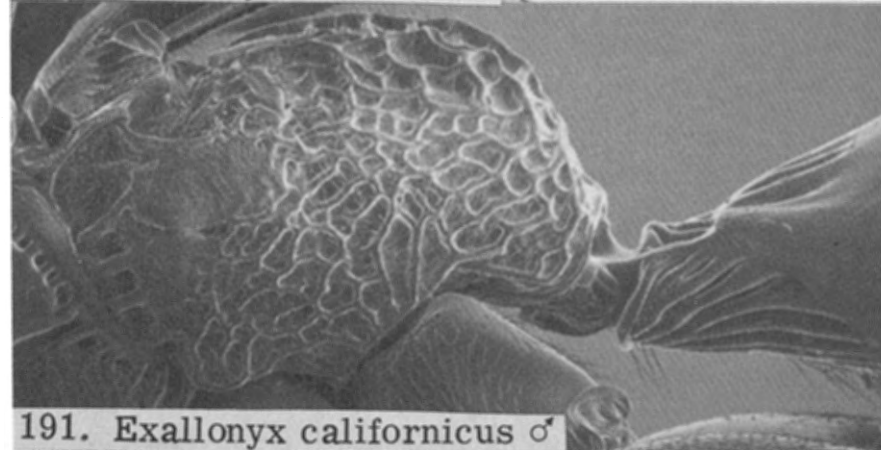
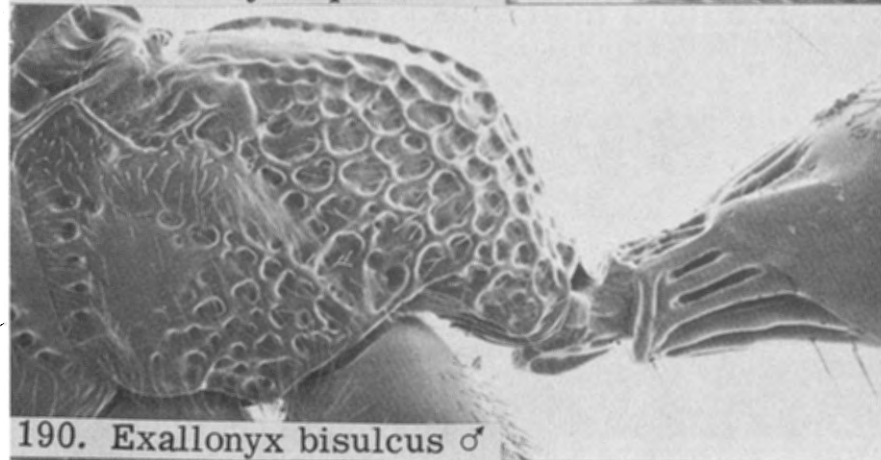
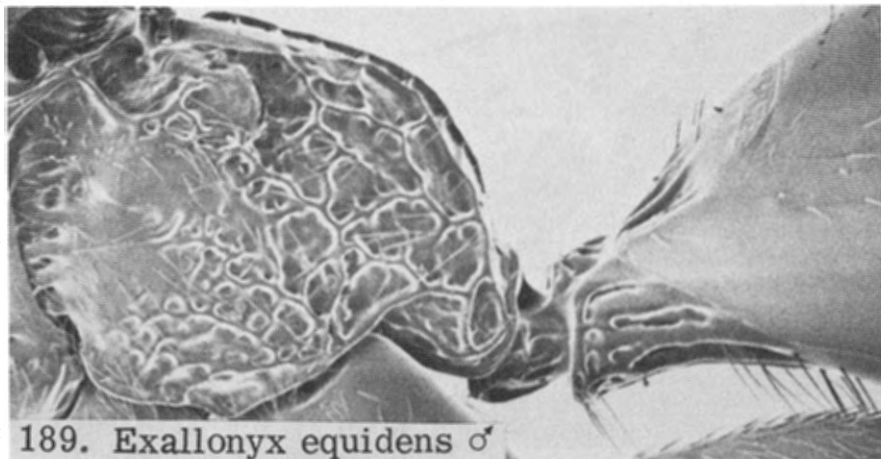
186. *Exallonyx multidens* ♂

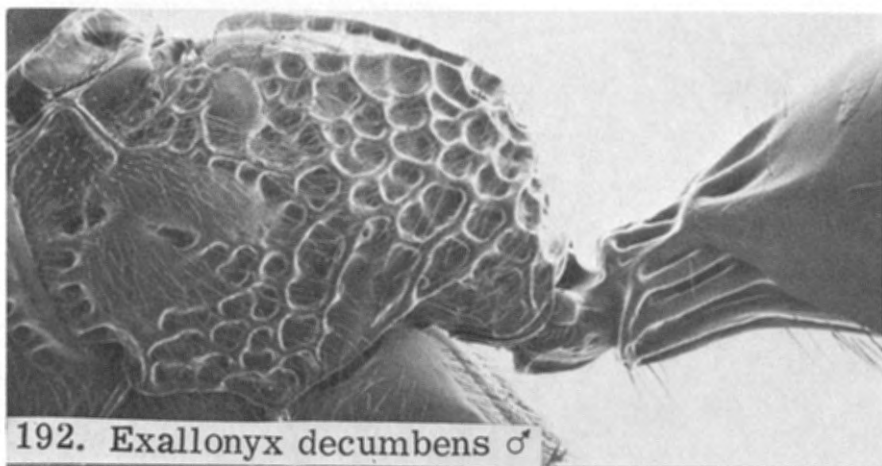


187. *Exallonyx pleuralis* ♂

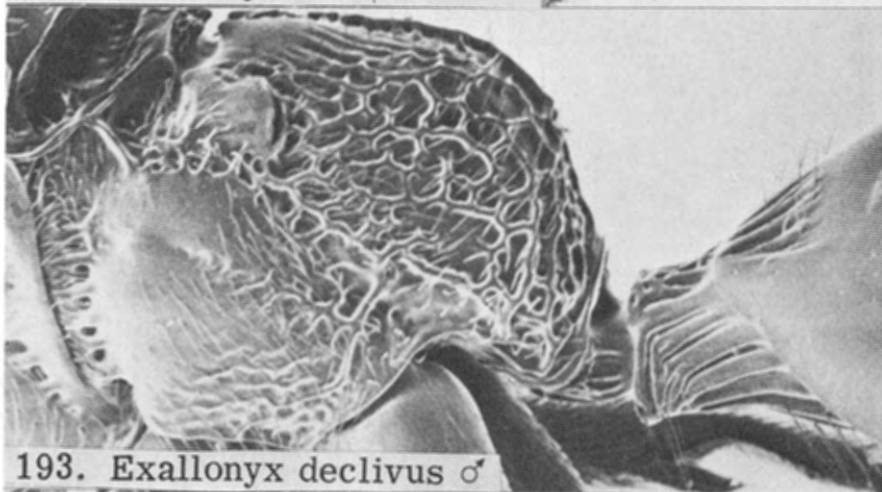


188. *Exallonyx pleuralis* ♀

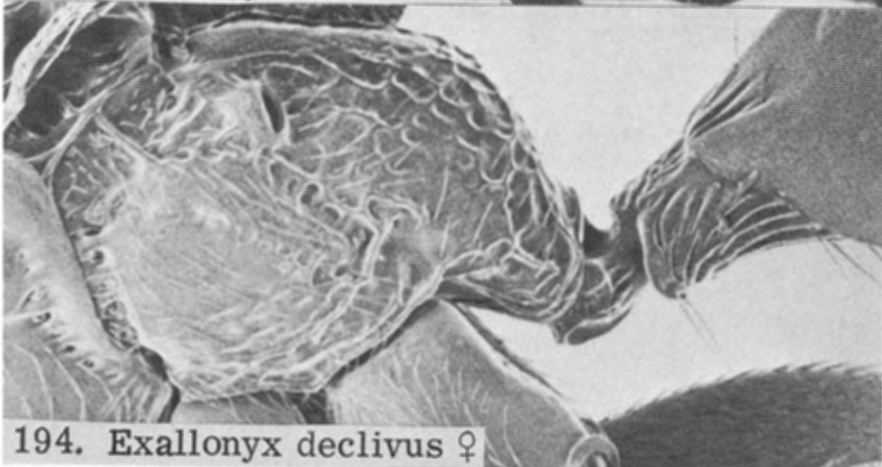




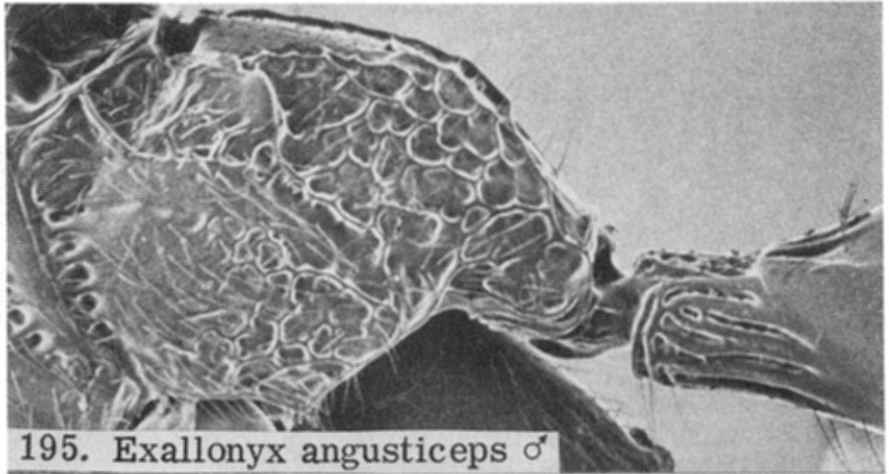
192. *Exallonyx decumbens* ♂



193. *Exallonyx declivus* ♂



194. *Exallonyx declivus* ♀



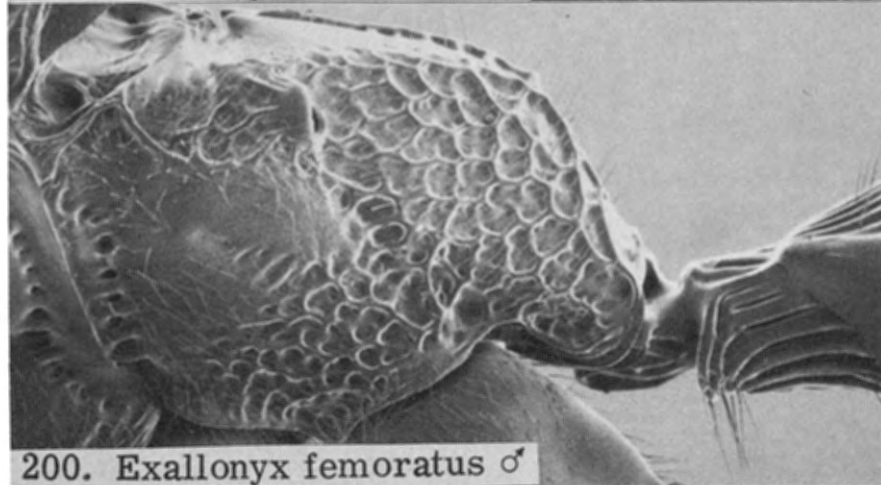
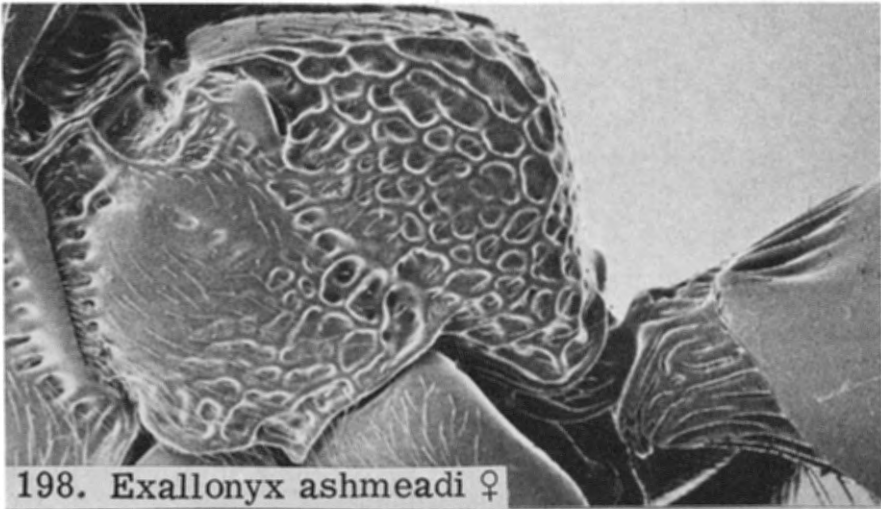
195. *Exallonyx angusticeps* ♂

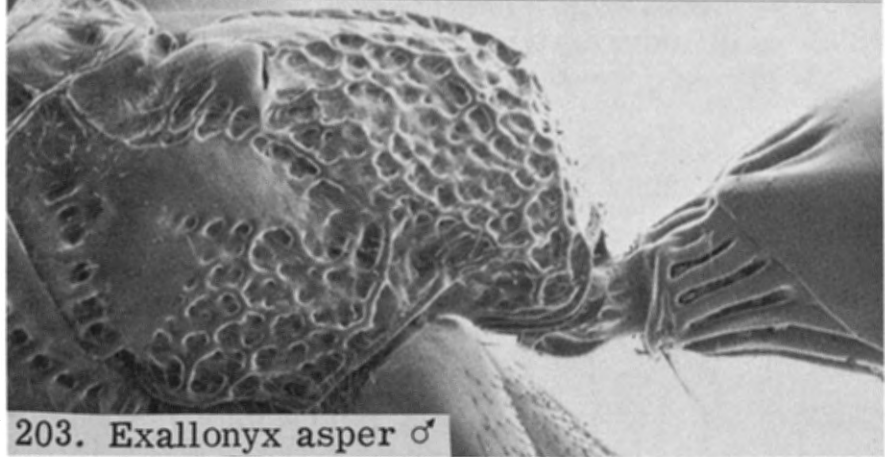
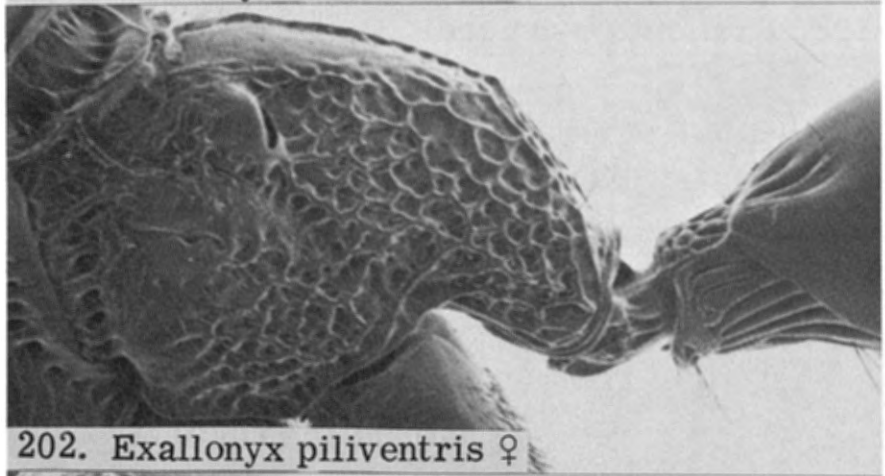
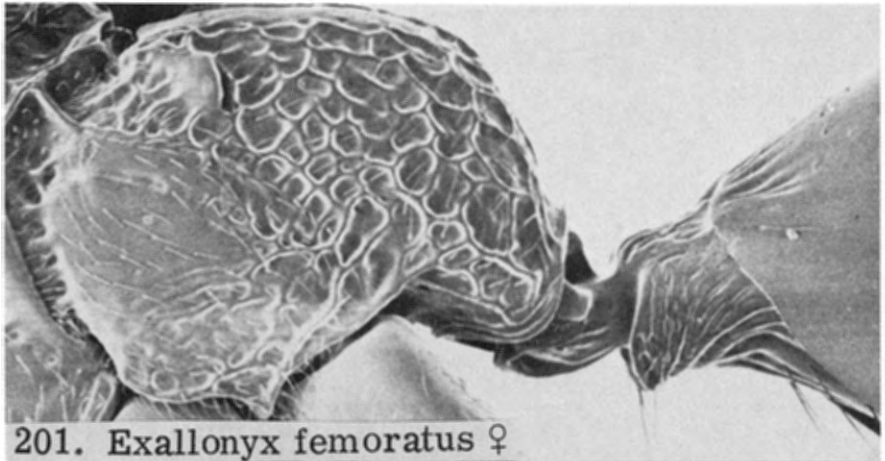


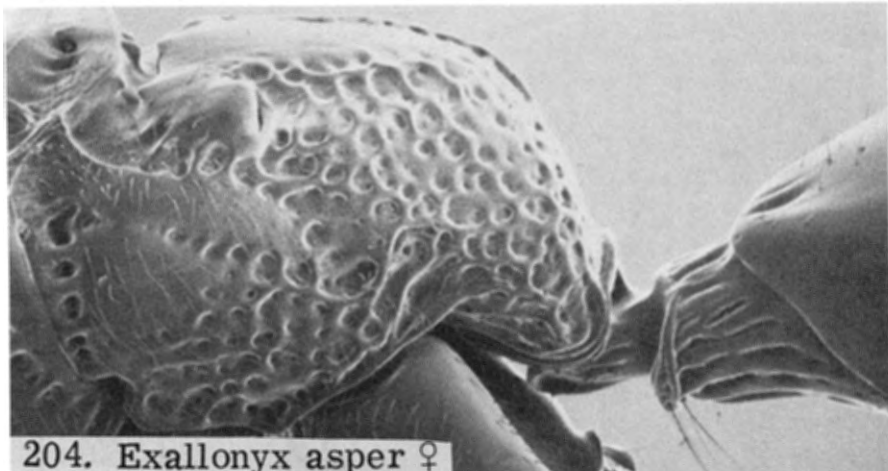
196. *Exallonyx angusticeps* ♀



197. *Exallonyx ashmeadi* ♂



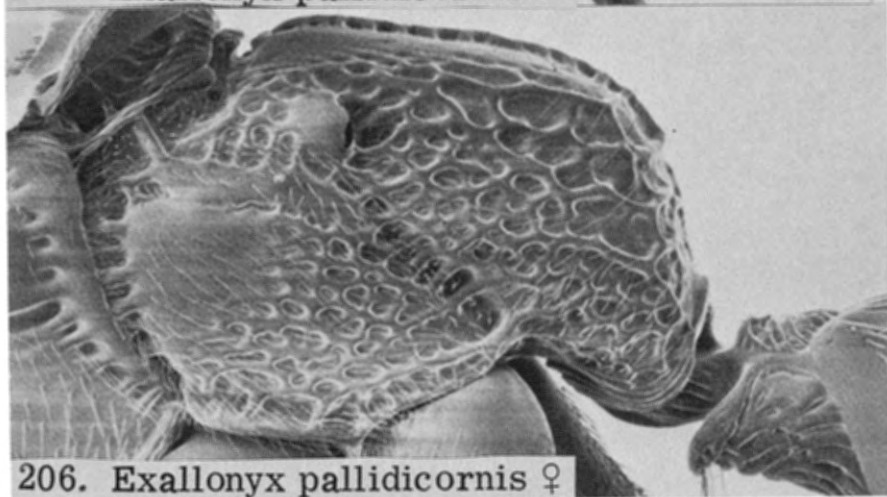




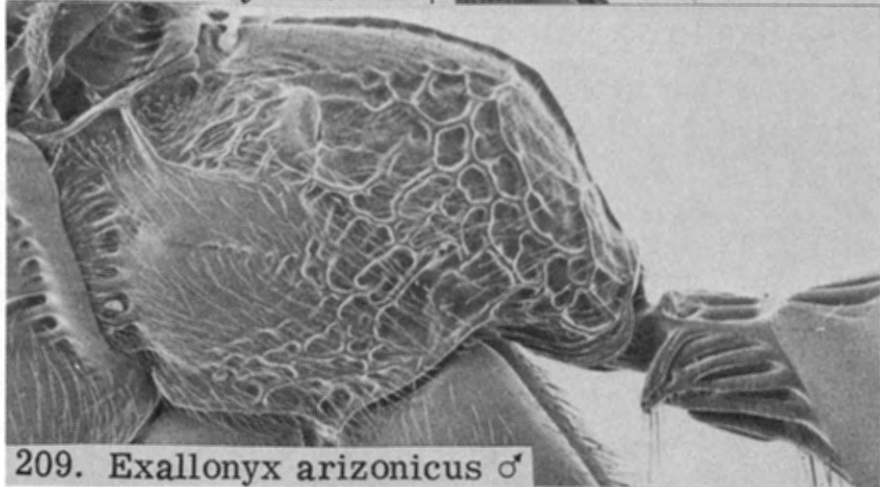
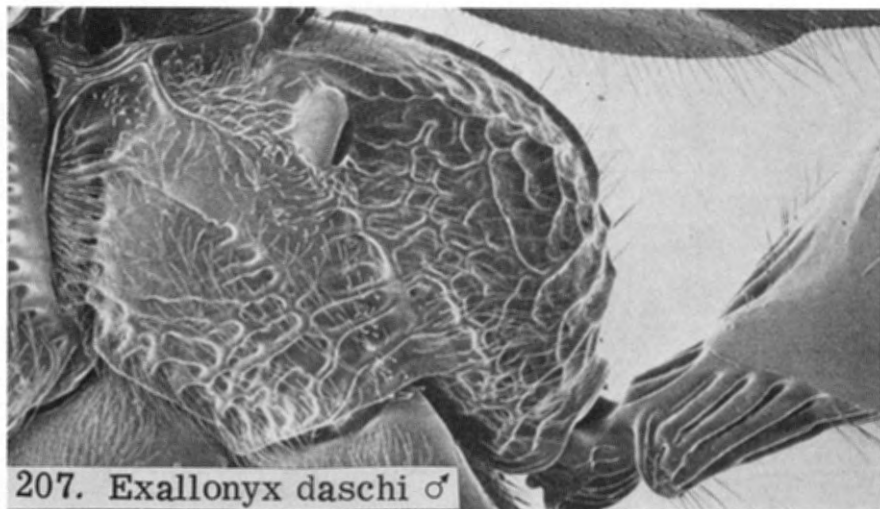
204. *Exallonyx asper* ♀

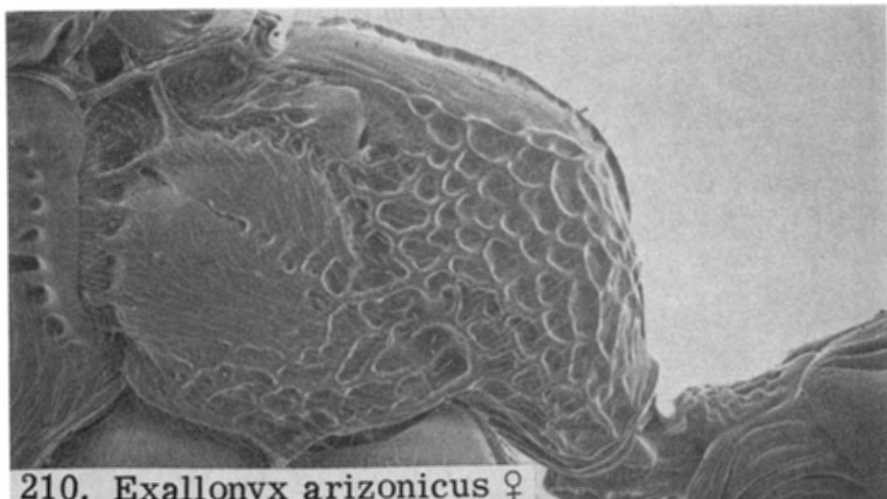


205. *Exallonyx pallidicornis* ♂

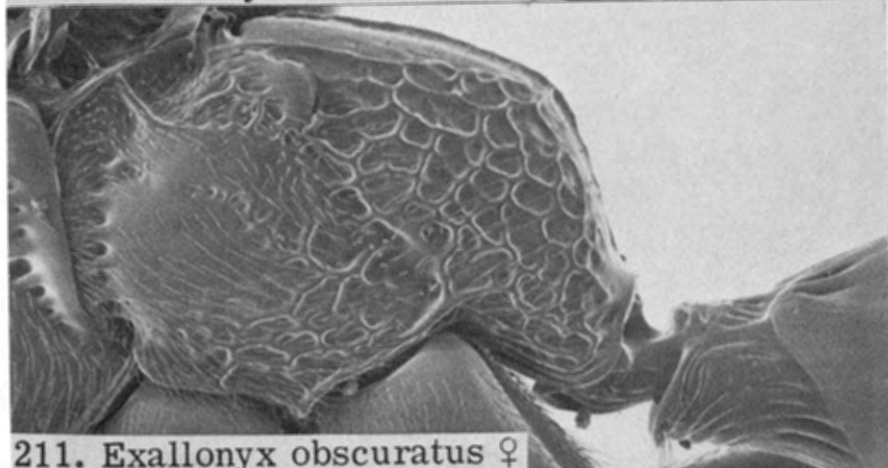


206. *Exallonyx pallidicornis* ♀

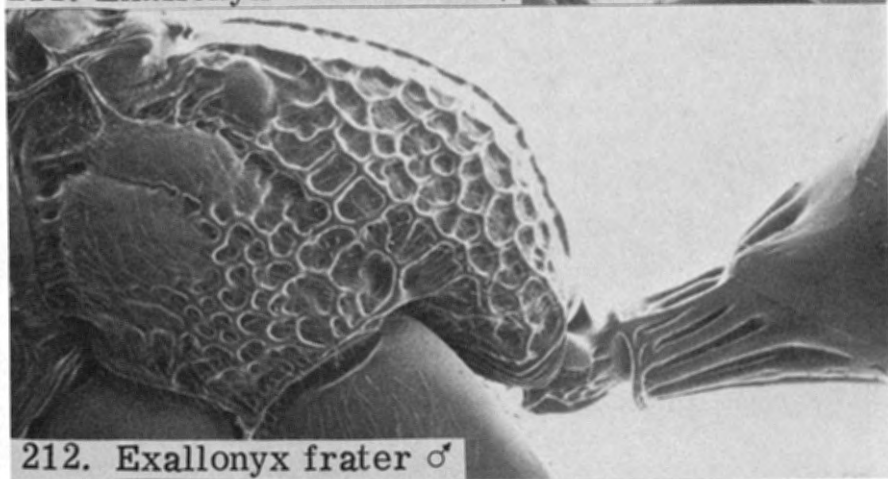




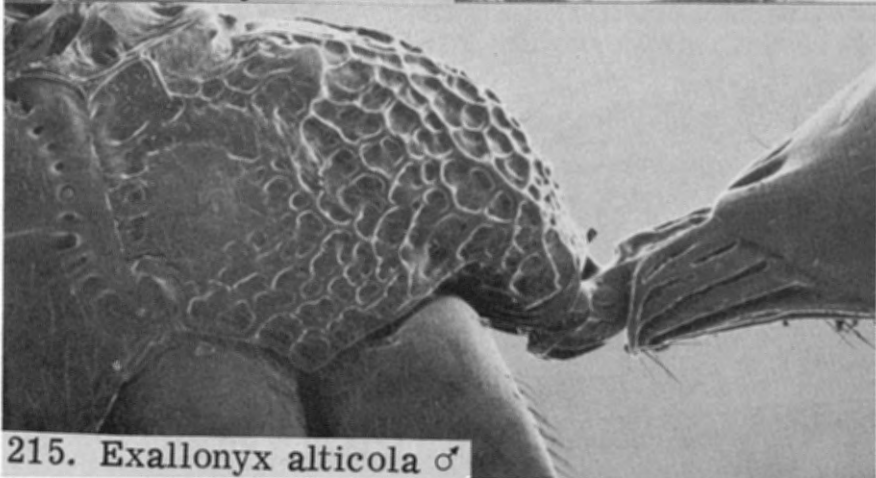
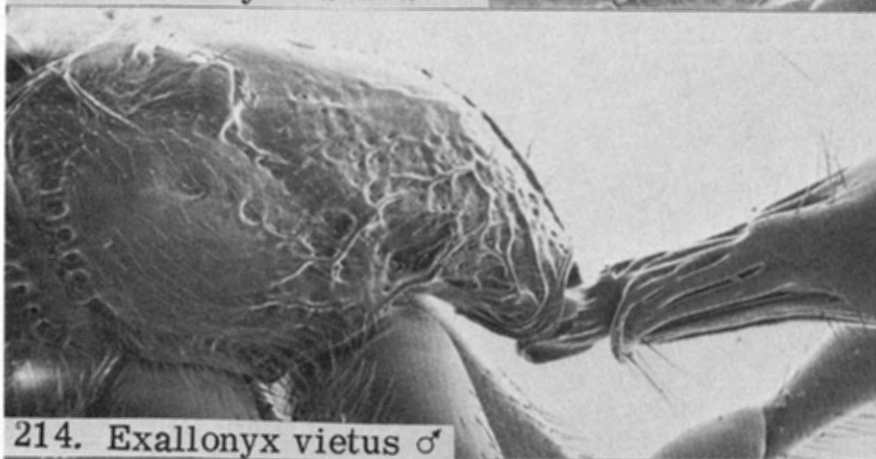
210. *Exallonyx arizonicus* ♀

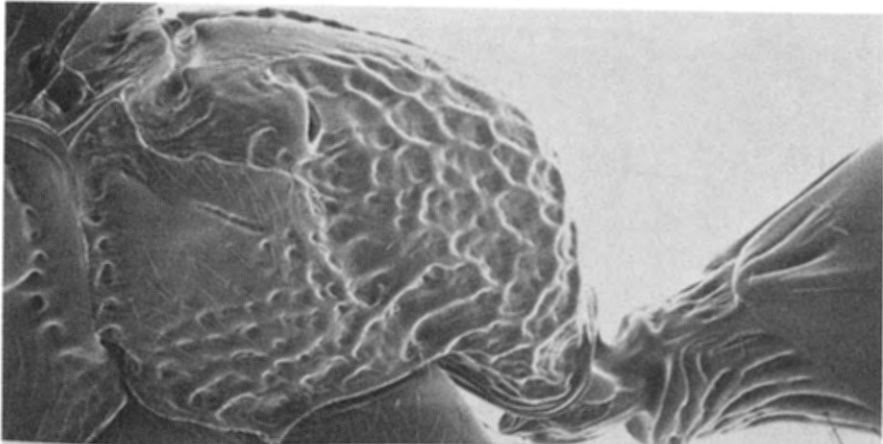


211. *Exallonyx obscuratus* ♀



212. *Exallonyx frater* ♂





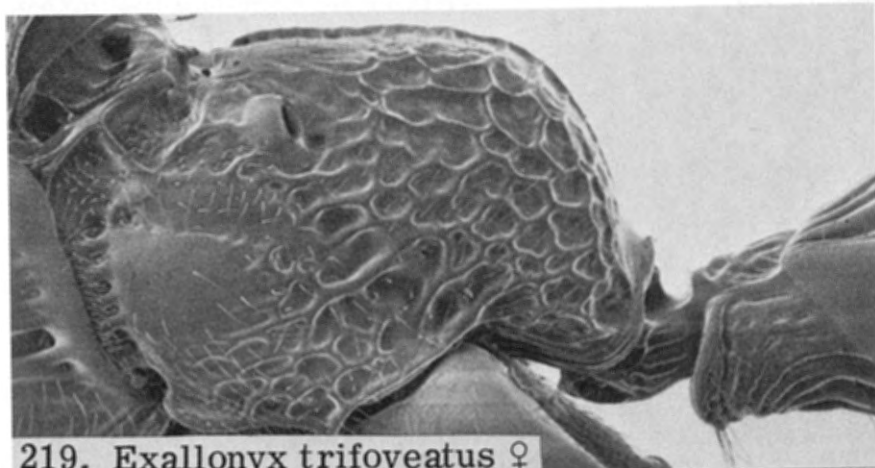
216. *Exallonyx formicarius* ♀



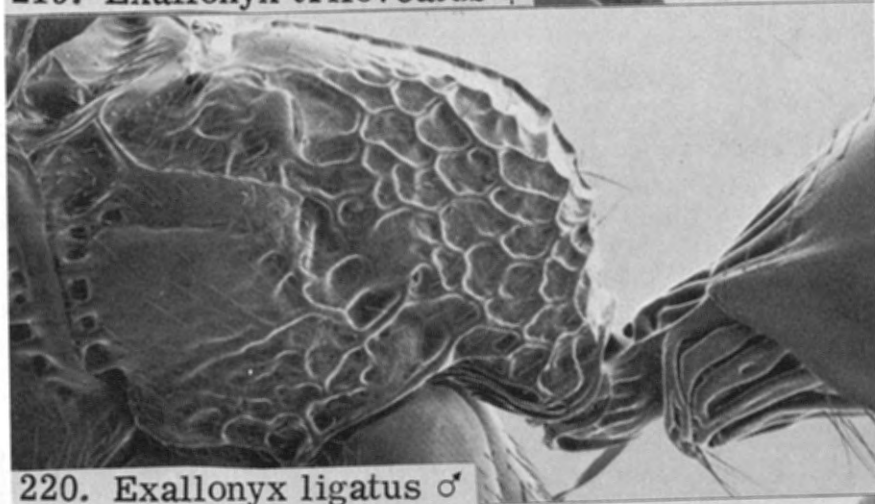
217. *Exallonyx microcerus* ♀



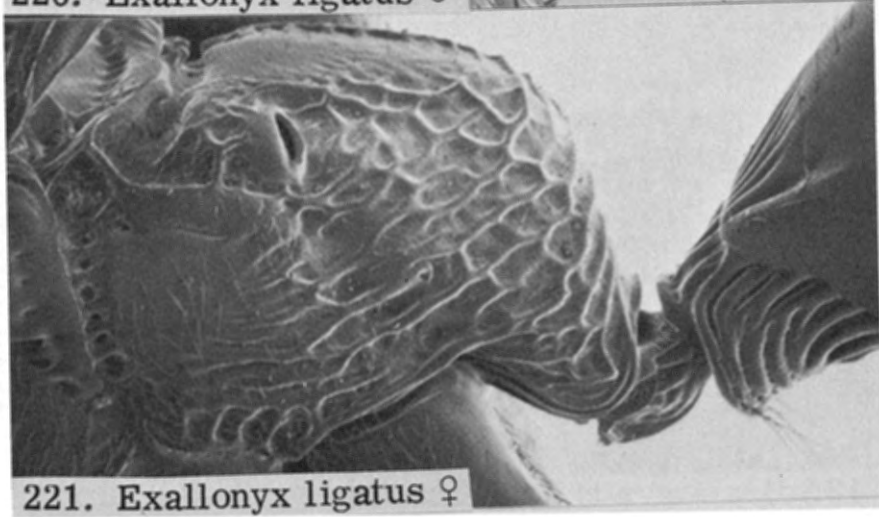
218. *Exallonyx trifoveatus* ♂



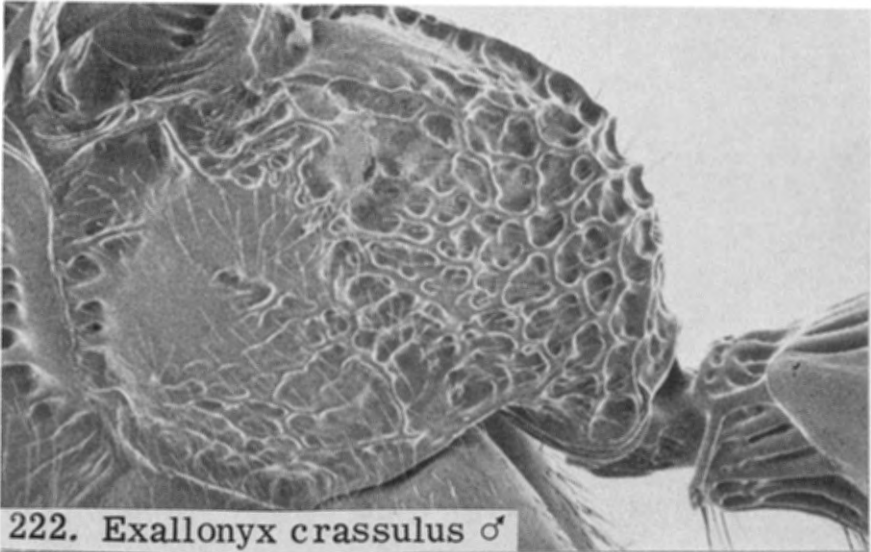
219. *Exallonyx trifoveatus* ♀



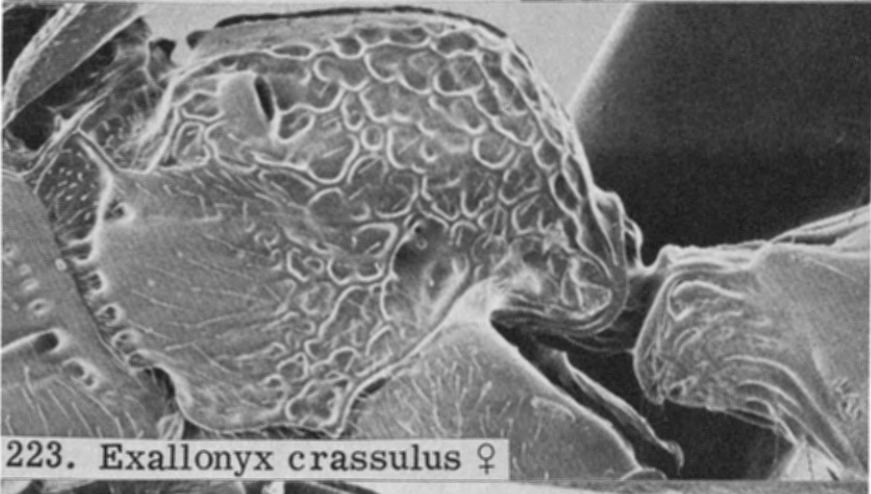
220. *Exallonyx ligatus* ♂



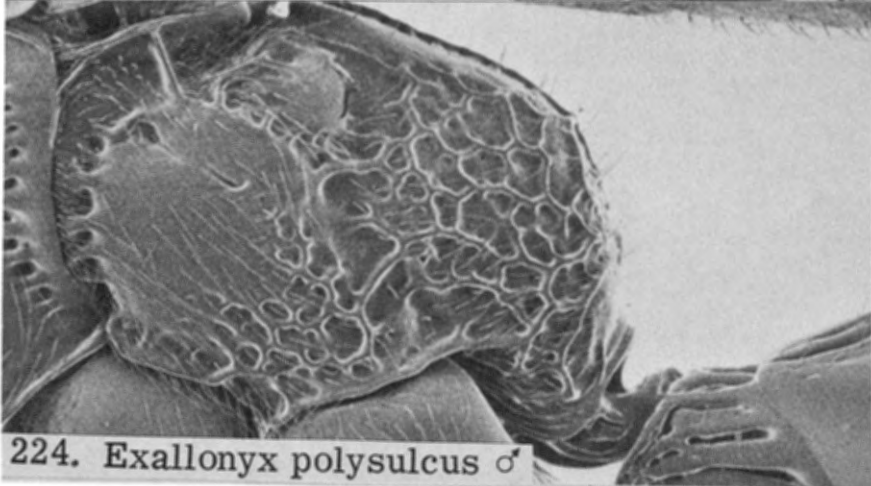
221. *Exallonyx ligatus* ♀



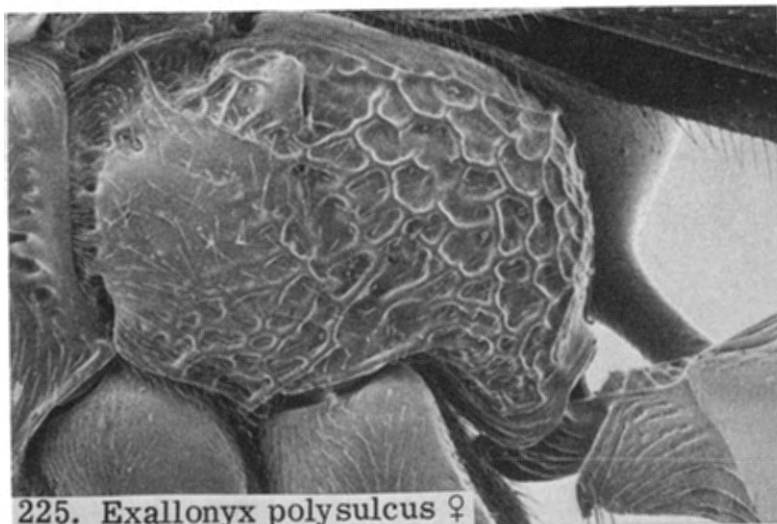
222. *Exallonyx crassulus* ♂



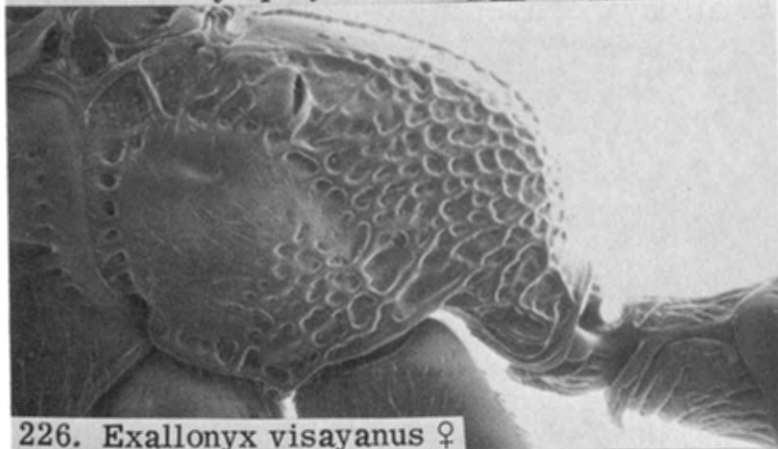
223. *Exallonyx crassulus* ♀



224. *Exallonyx polysulcus* ♂



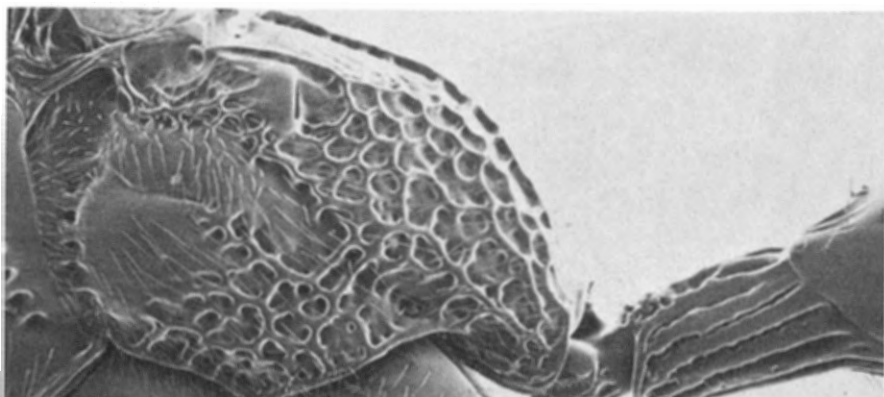
225. *Exallonyx polysulcus* ♀



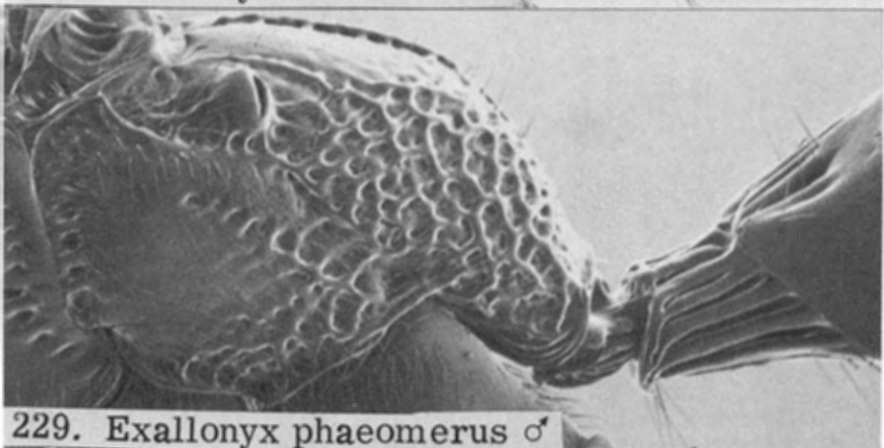
226. *Exallonyx visayanus* ♀



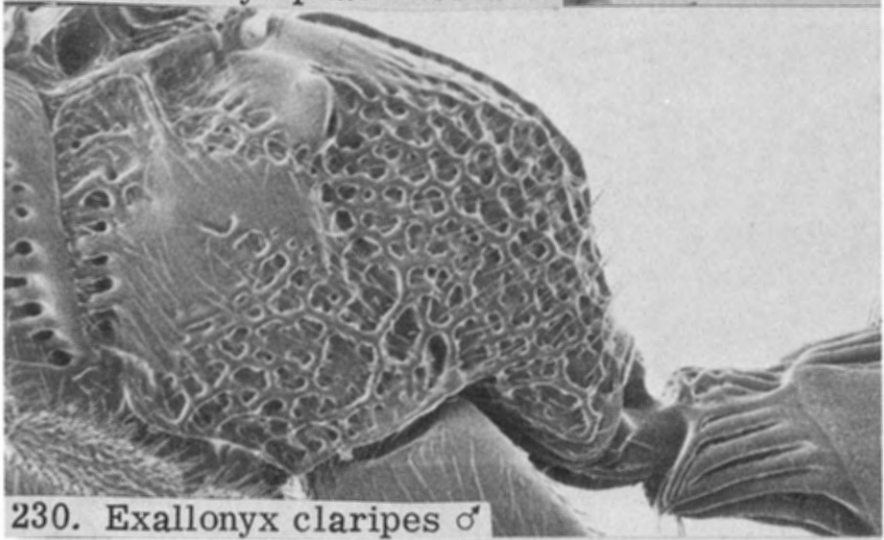
227. *Exallonyx luzonicus* ♂



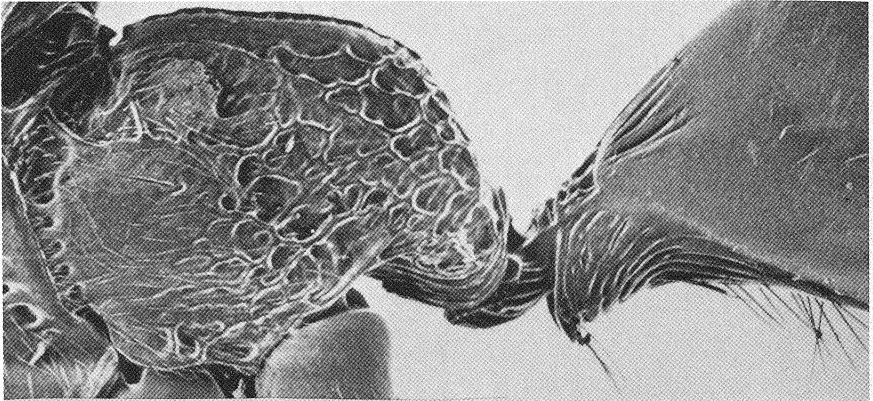
228. *Exallonyx latilabris* ♂



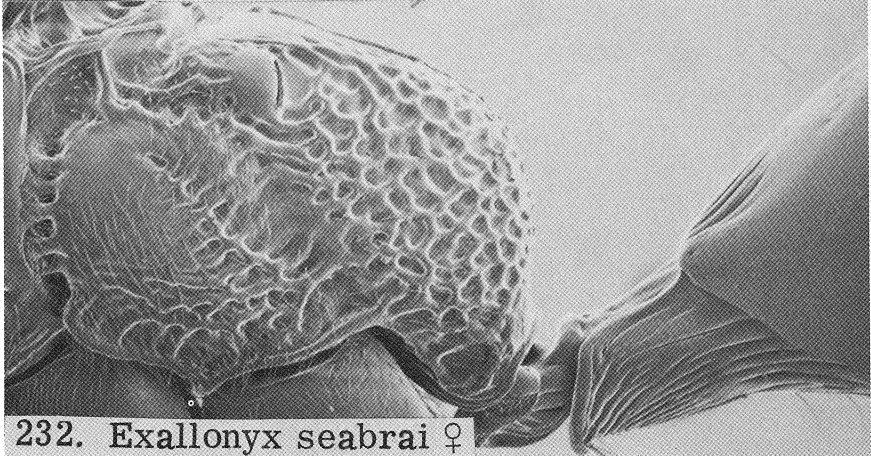
229. *Exallonyx phaeomerus* ♂



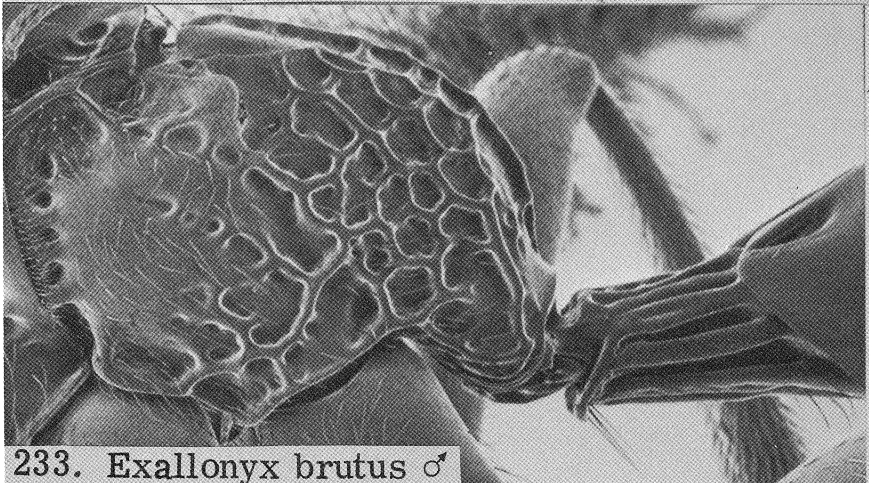
230. *Exallonyx claripes* ♂



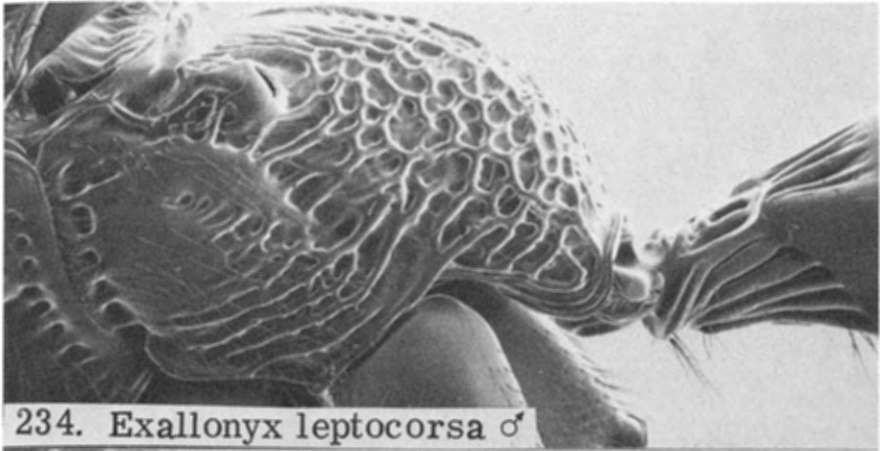
231. *Exallonyx angulatus* ♀



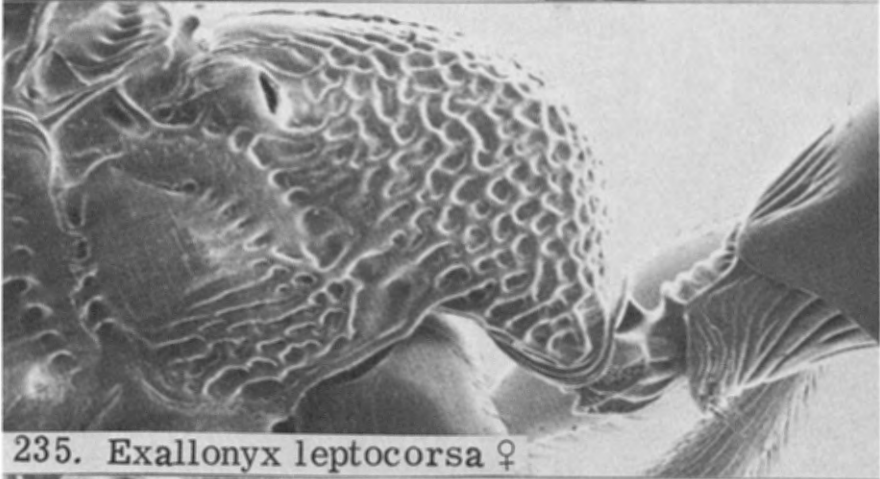
232. *Exallonyx seabrai* ♀



233. *Exallonyx brutus* ♂



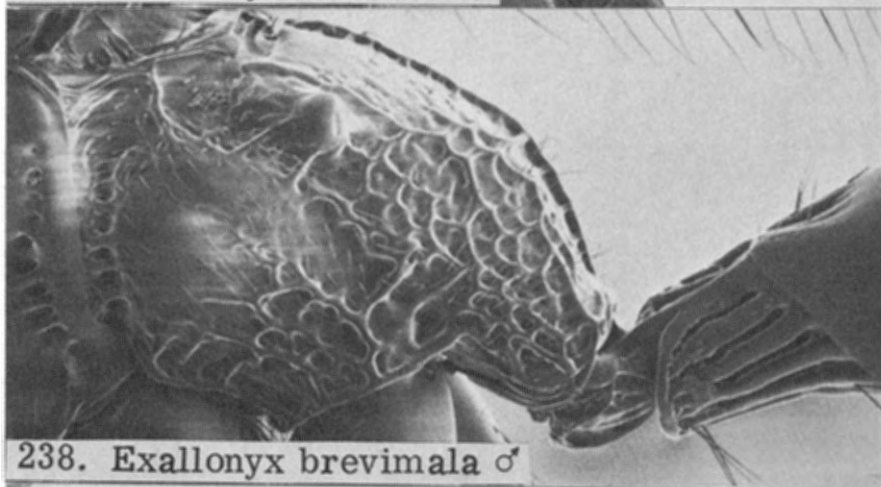
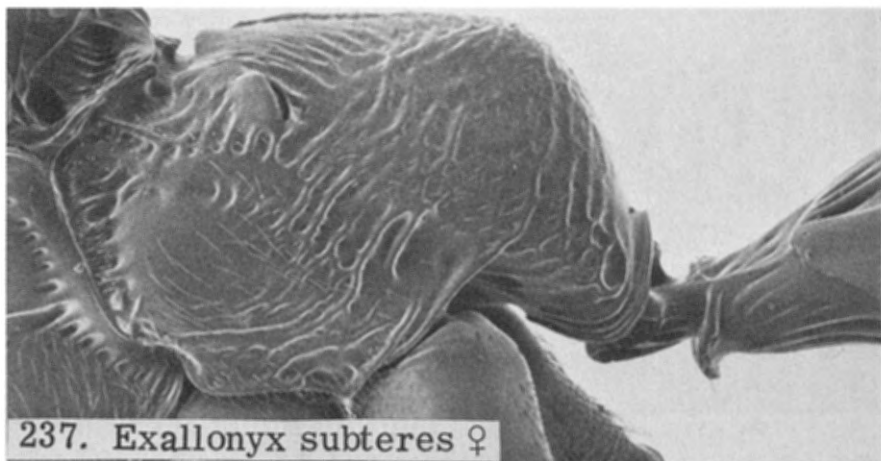
234. *Exallonyx leptocorsa* ♂

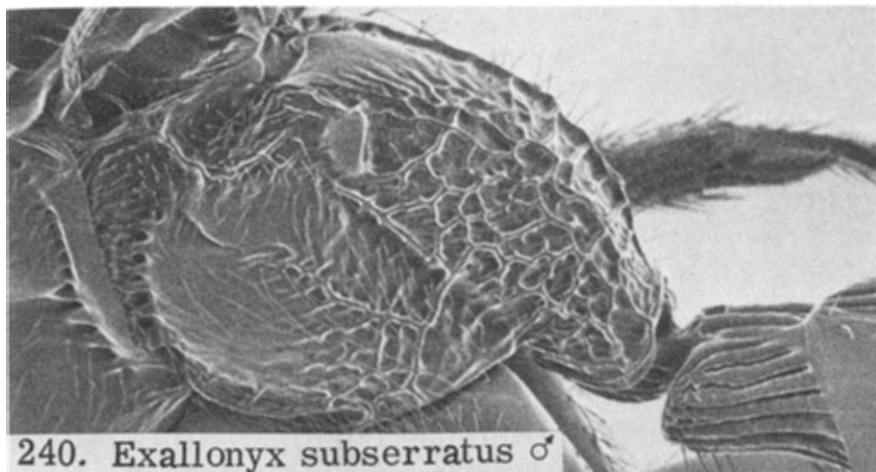


235. *Exallonyx leptocorsa* ♀

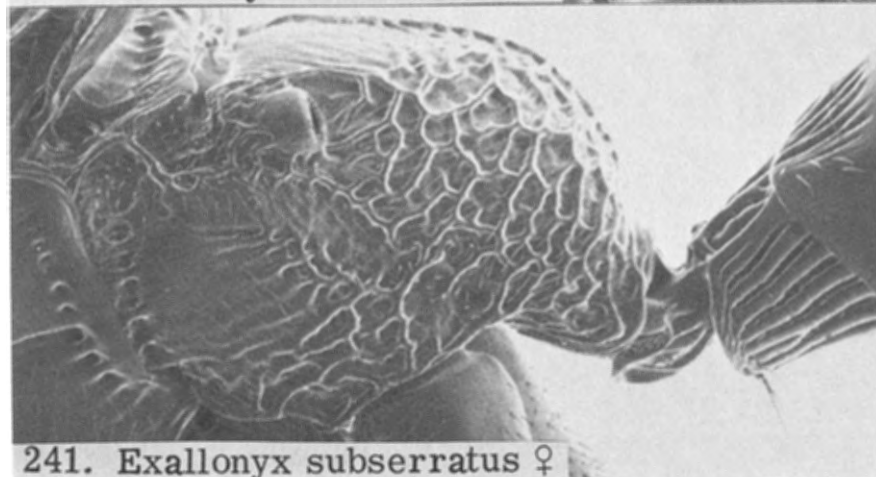


236. *Exallonyx subteres* ♂





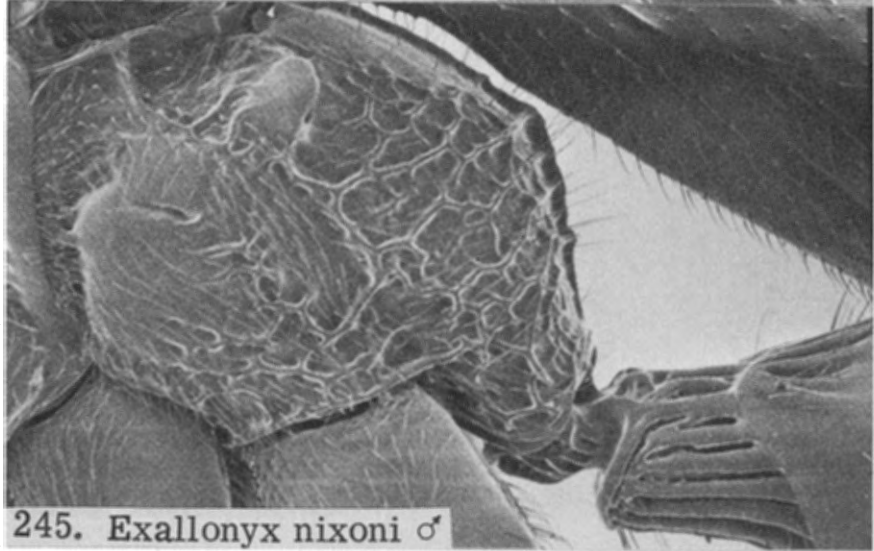
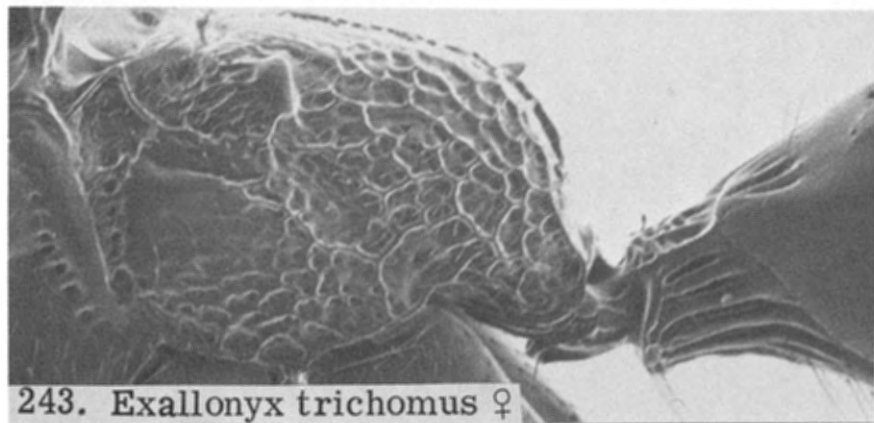
240. *Exallonyx subserratus* ♂

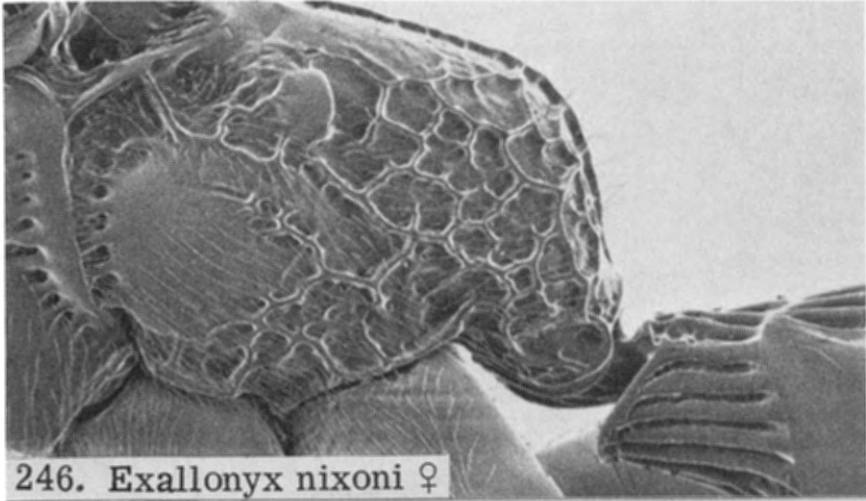


241. *Exallonyx subserratus* ♀



242. *Exallonyx trichomus* ♂





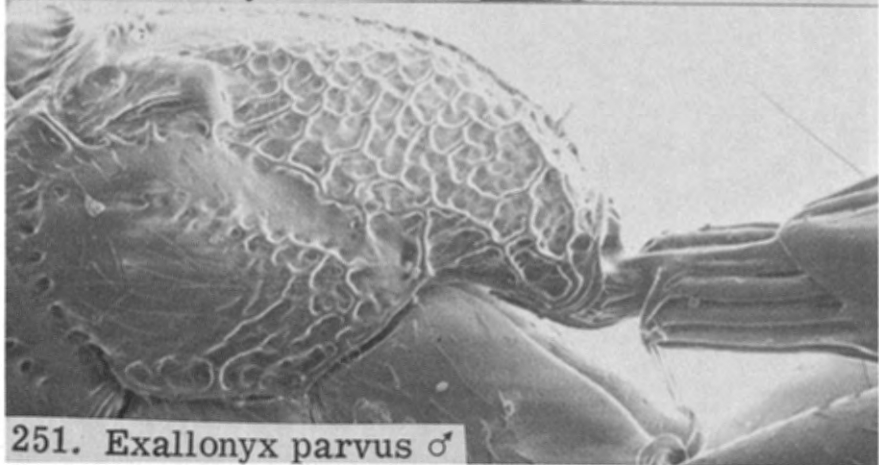
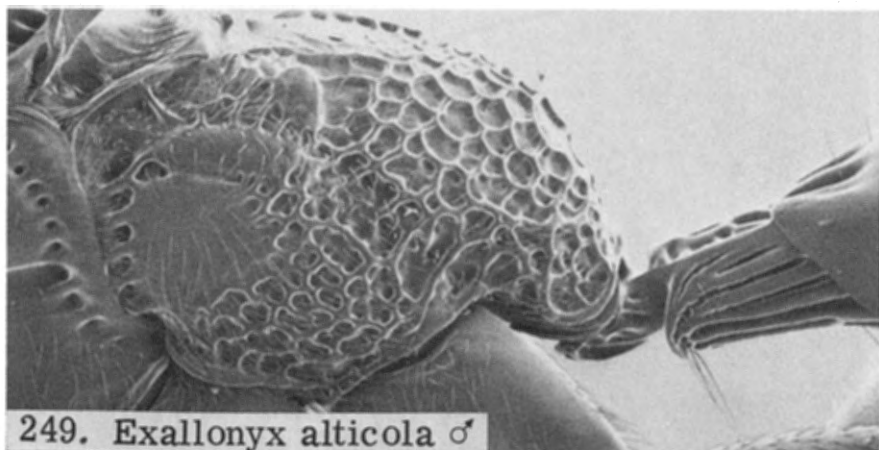
246. *Exallonyx nixonii* ♀

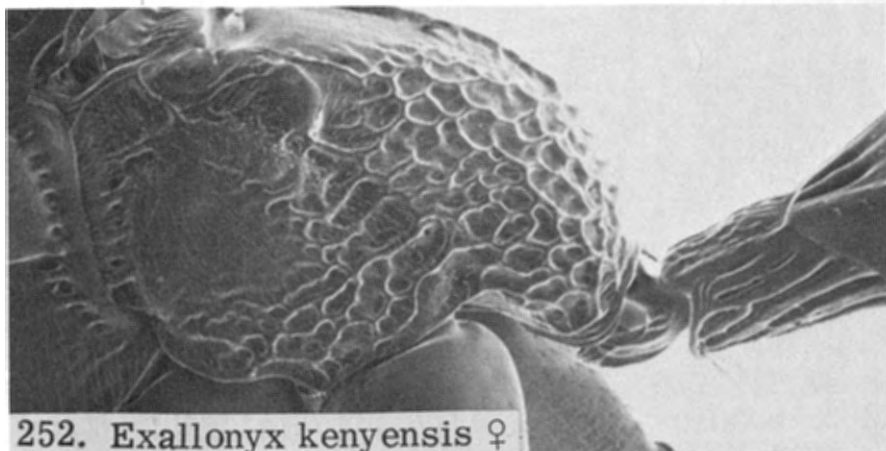


247. *Exallonyx minor* ♂



248. *Exallonyx minor* ♀





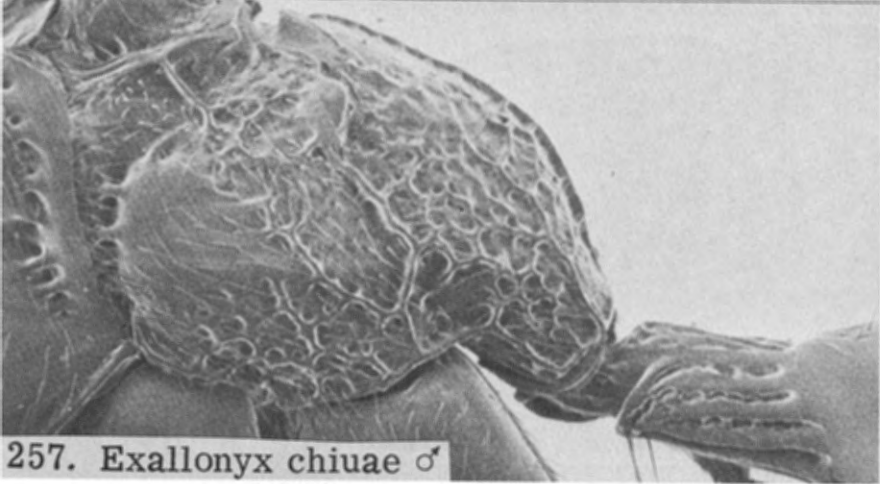
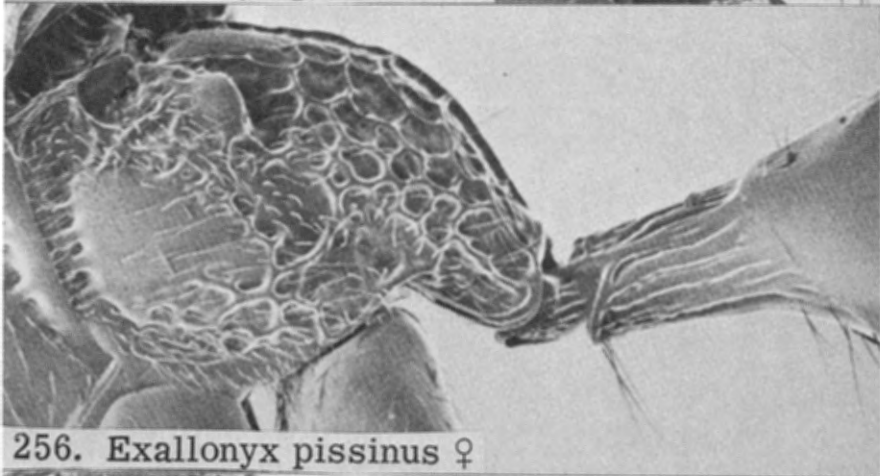
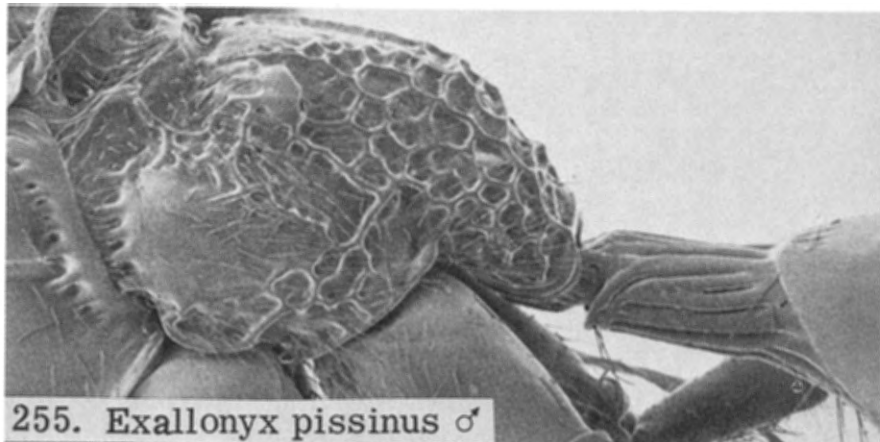
252. *Exallonyx kenyensis* ♀

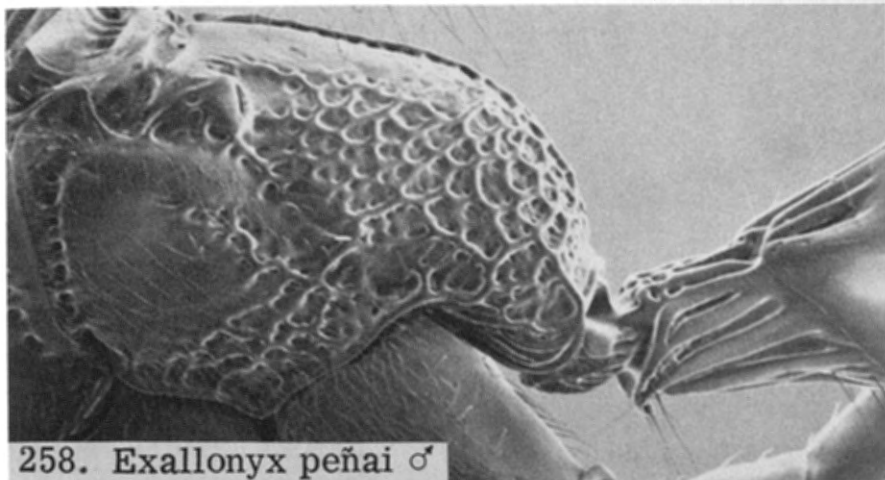


253. *Exallonyx siccatus* ♀



254. *Exallonyx monotrema* ♀

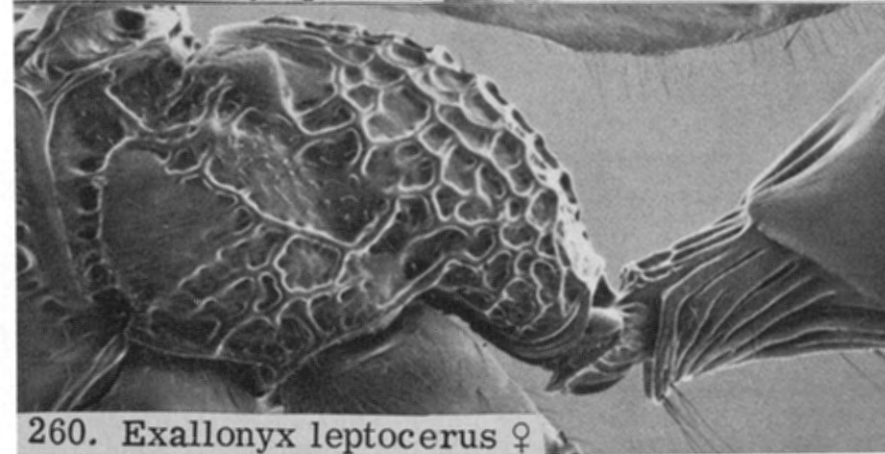




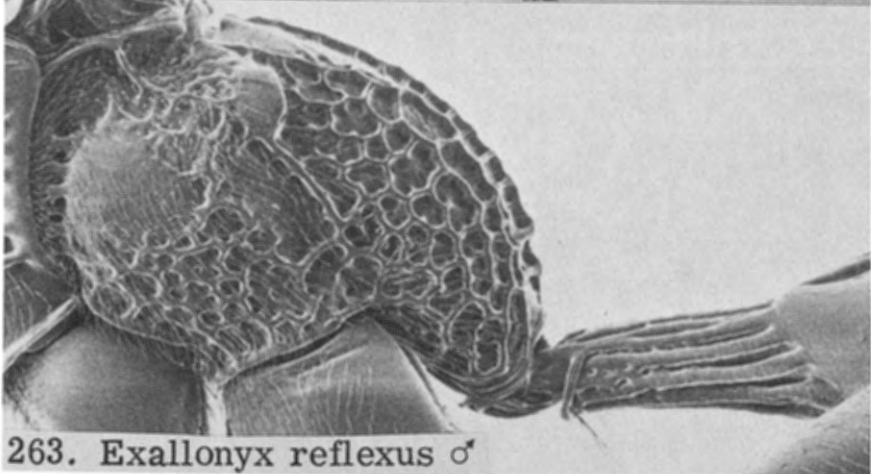
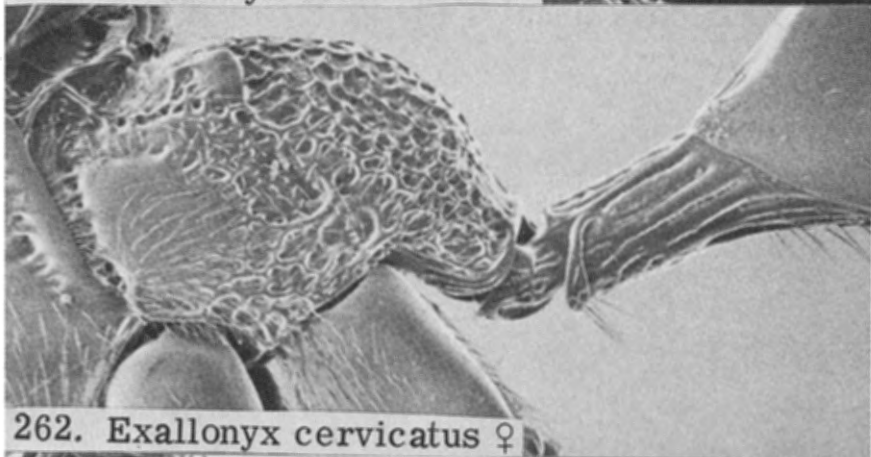
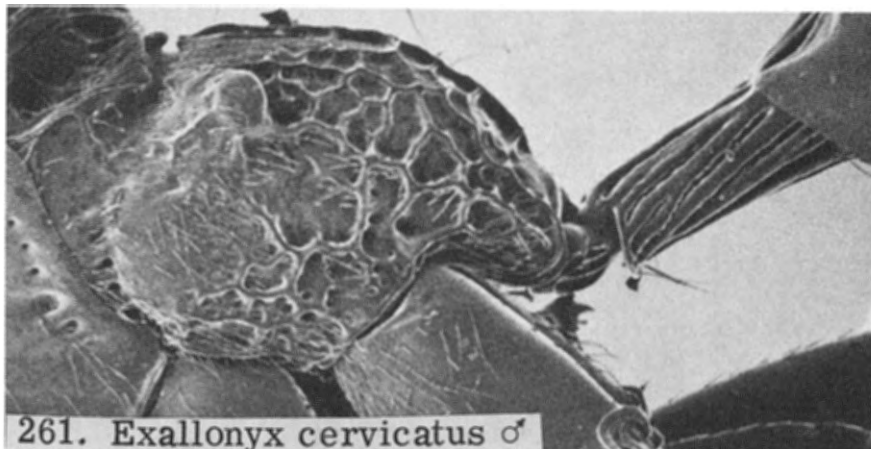
258. *Exallonyx peñai* ♂

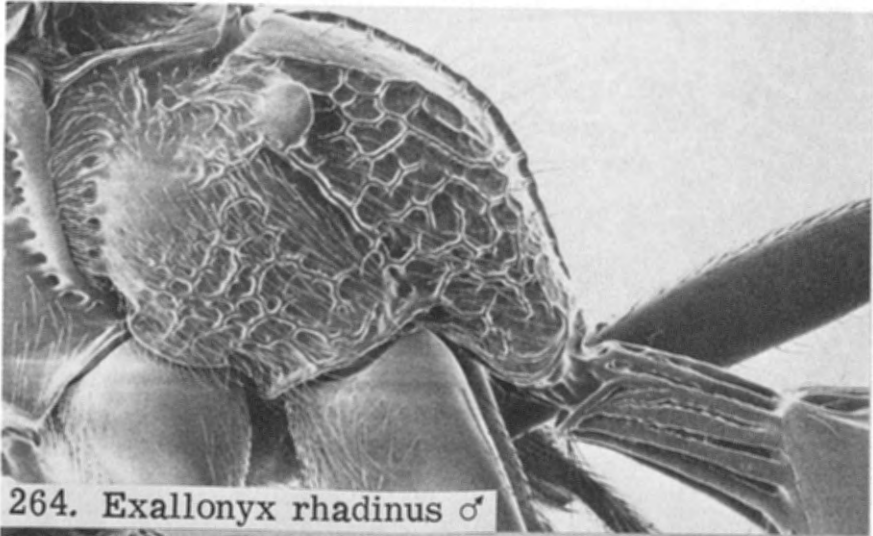


259. *Exallonyx peñai* ♀

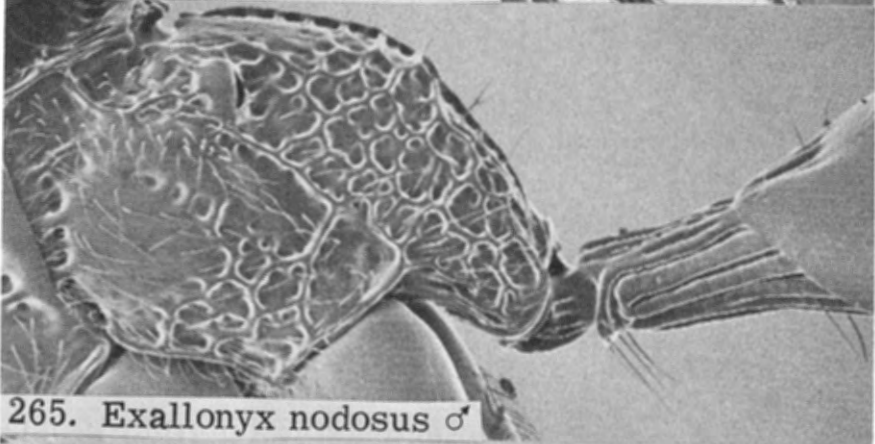


260. *Exallonyx leptocerus* ♀

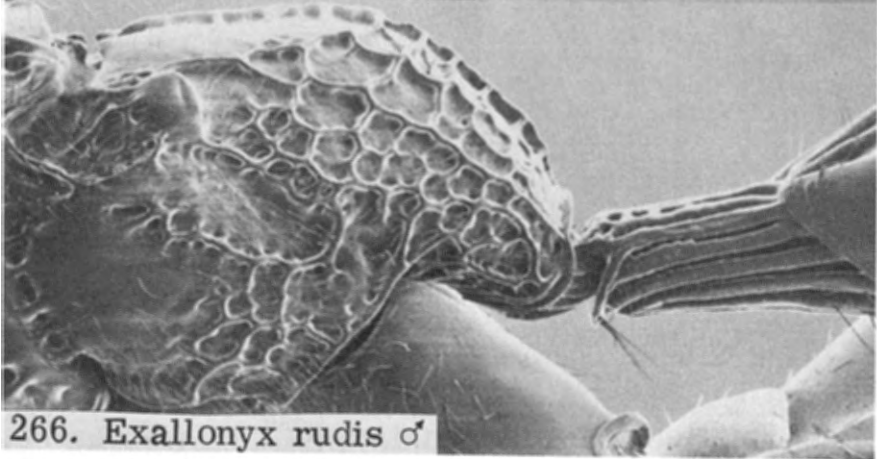




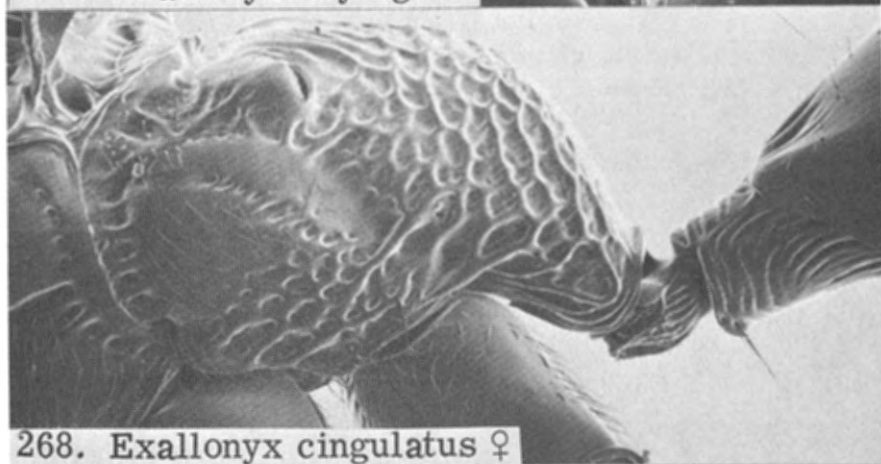
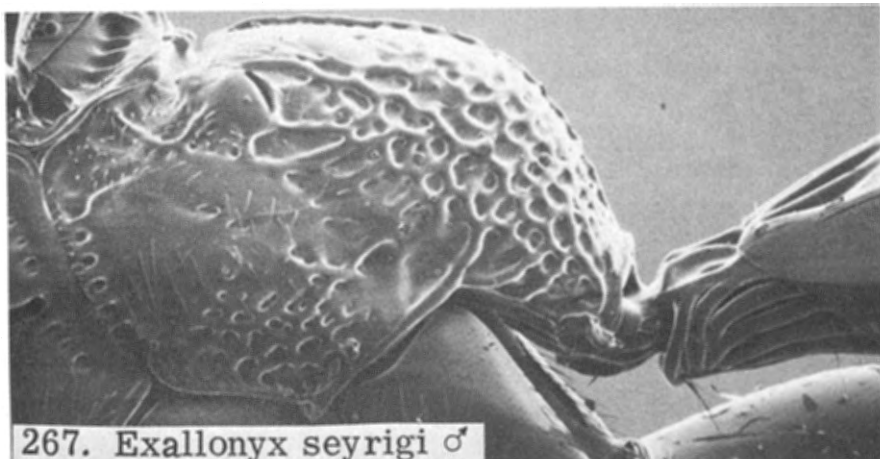
264. *Exallonyx rhadinus* ♂

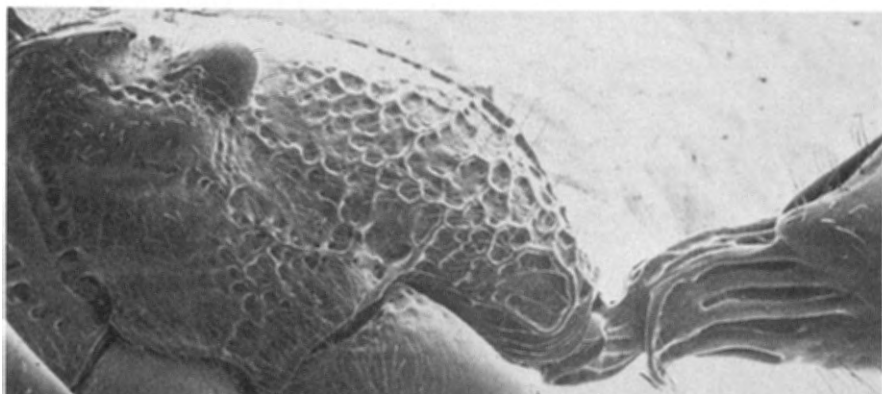


265. *Exallonyx nodosus* ♂

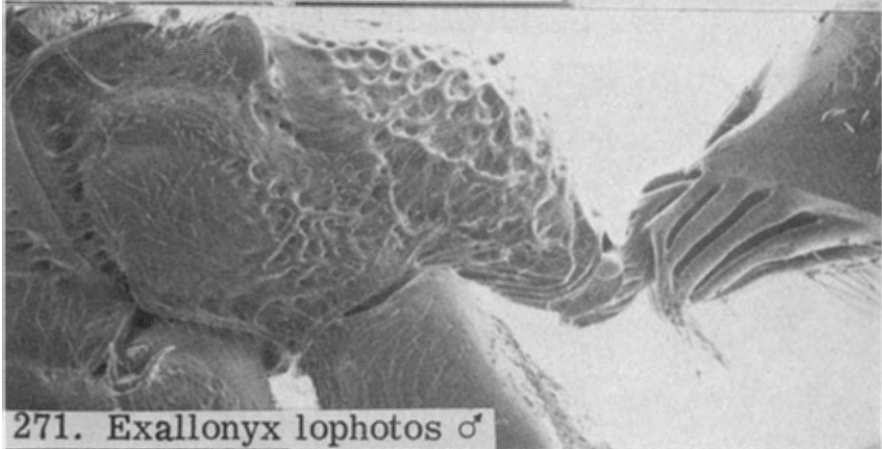


266. *Exallonyx rudis* ♂





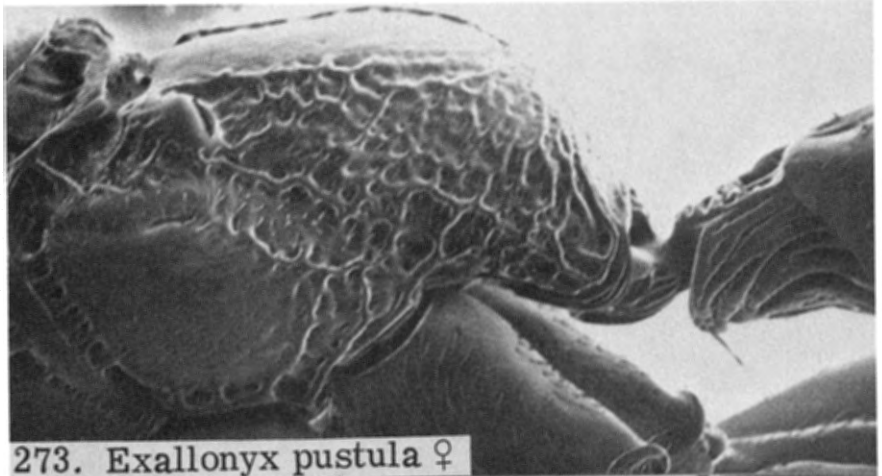
270. *Exallonyx amplipennis* ♂



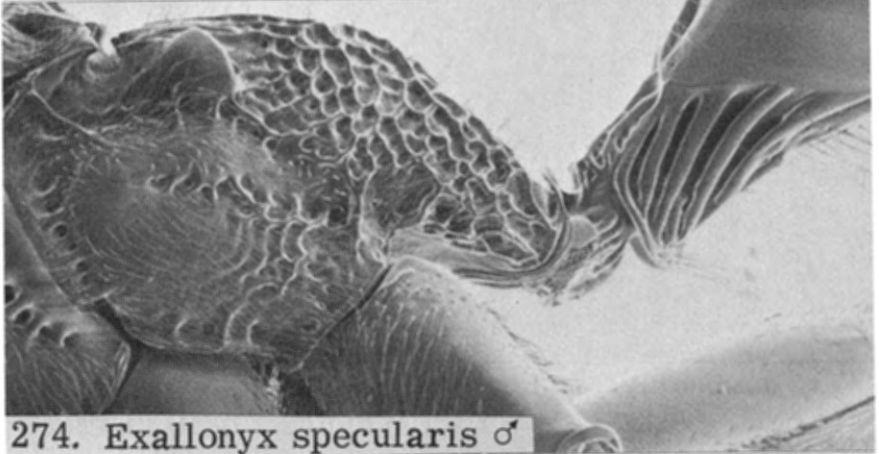
271. *Exallonyx lophotos* ♂



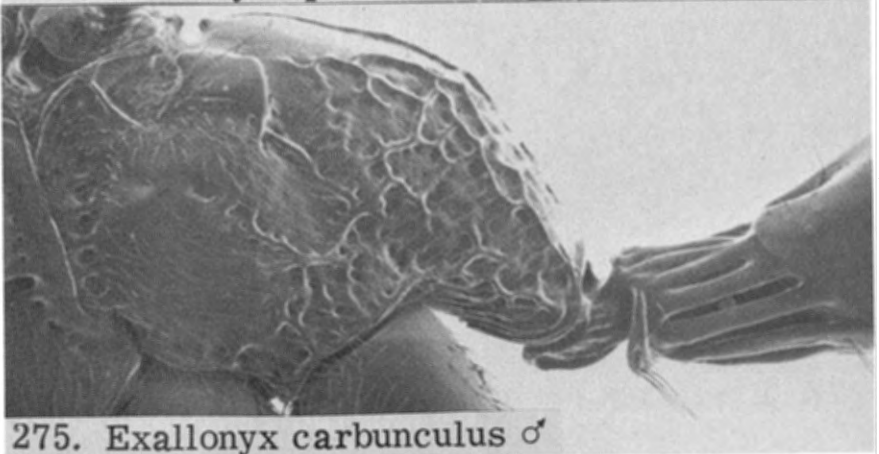
272. *Exallonyx pustula* ♂



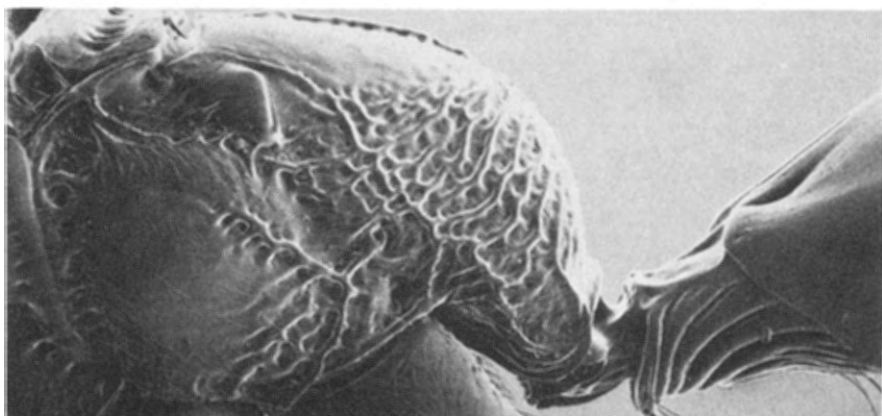
273. *Exallonyx pustula* ♀



274. *Exallonyx specularis* ♂



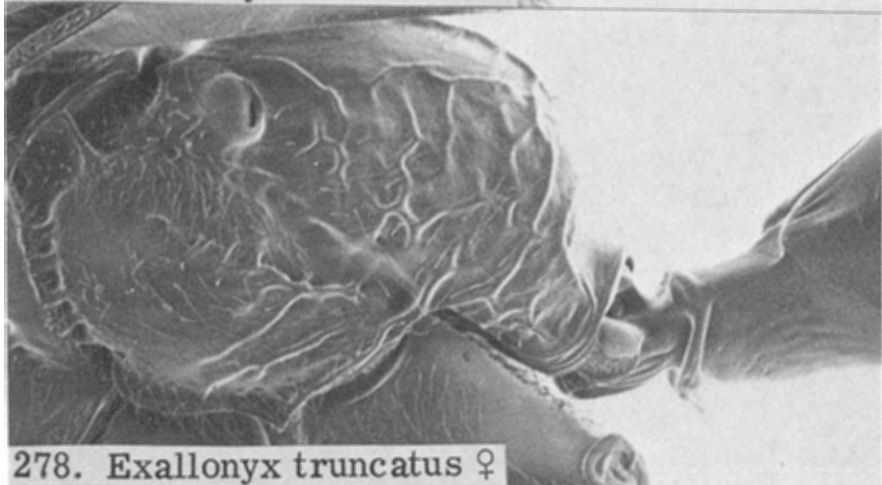
275. *Exallonyx carbunculus* ♂



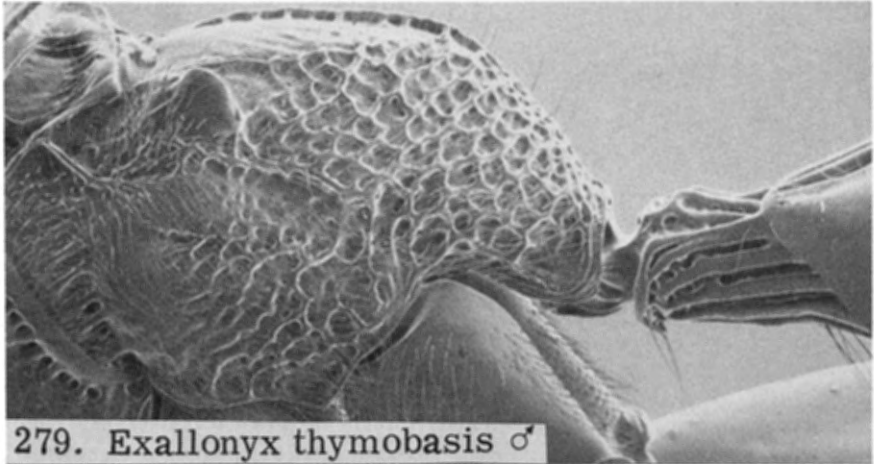
276. *Exallonyx carbunculus* ♀



277. *Exallonyx truncatus* ♂



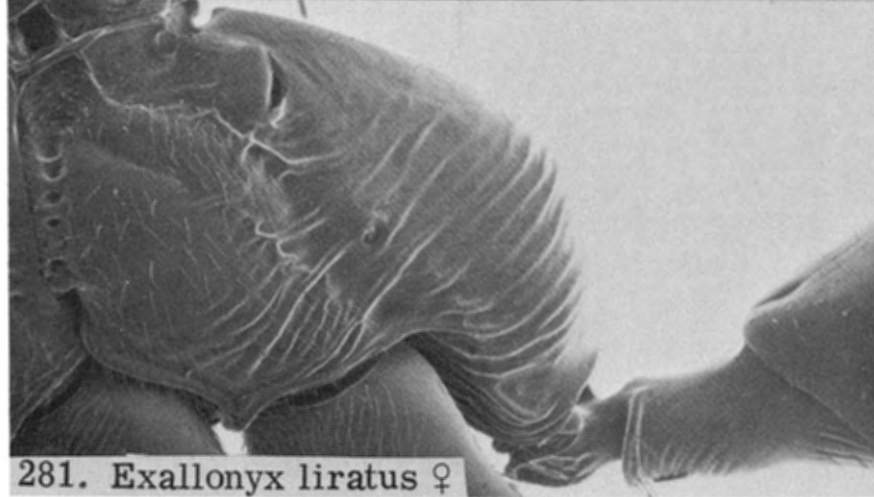
278. *Exallonyx truncatus* ♀



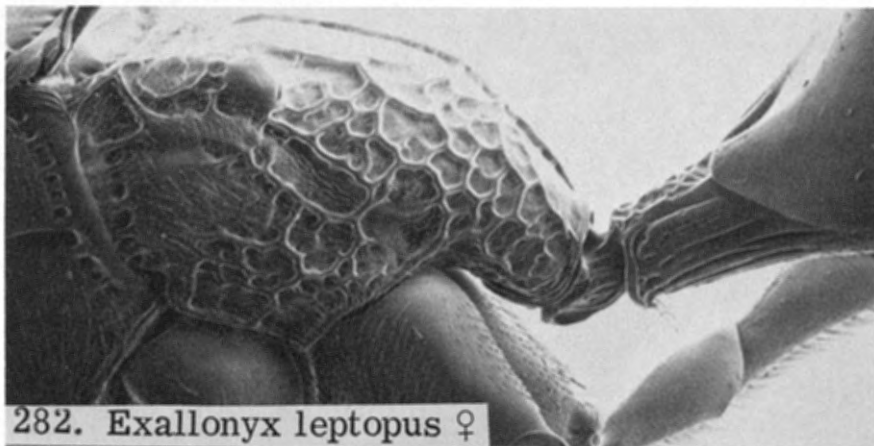
279. *Exallonyx thymobasis* ♂



280. *Exallonyx calvescens* ♂



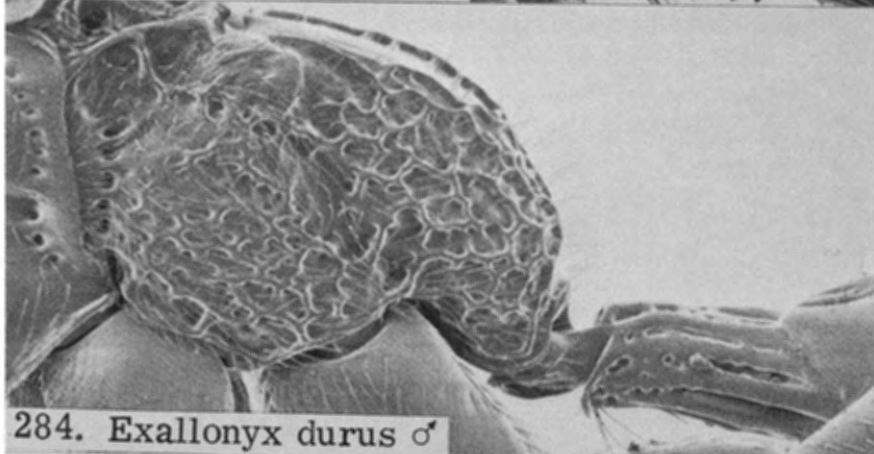
281. *Exallonyx liratus* ♀



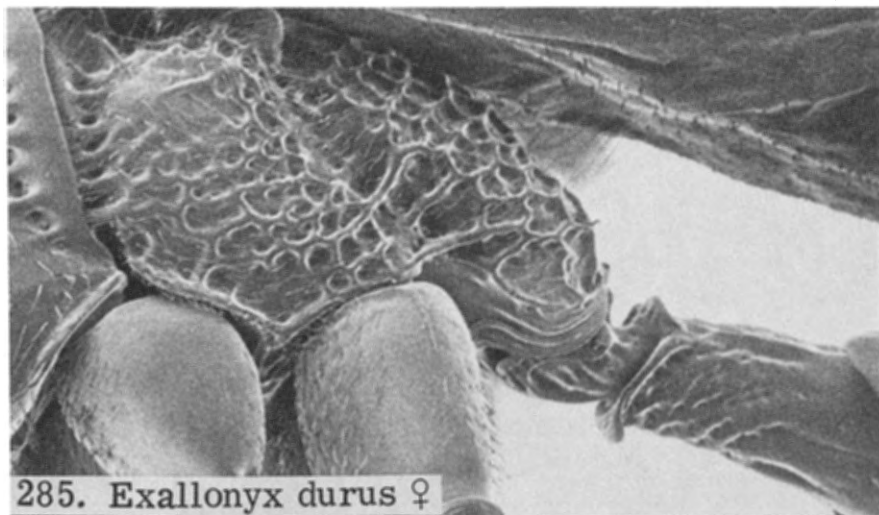
282. *Exallonyx leptopus* ♀



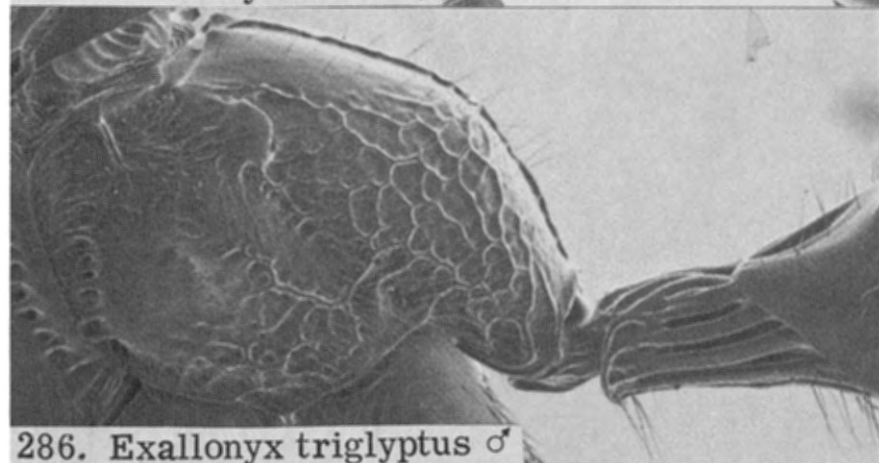
283. *Exallonyx enomus* ♀



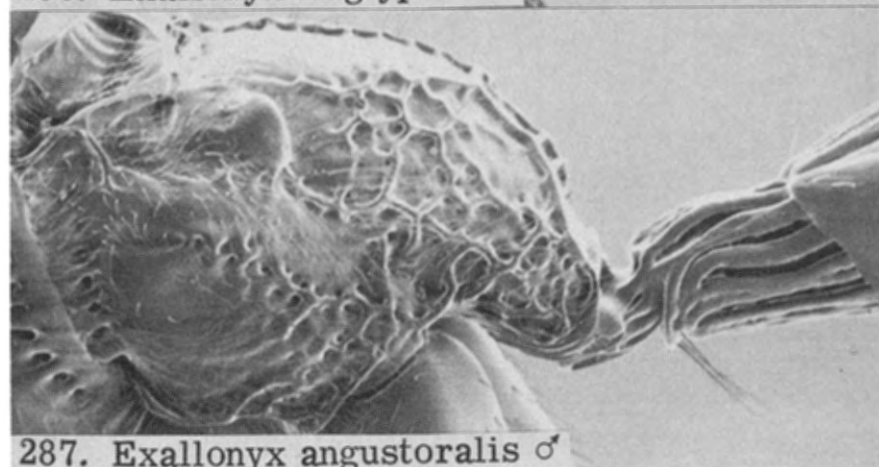
284. *Exallonyx durus* ♂



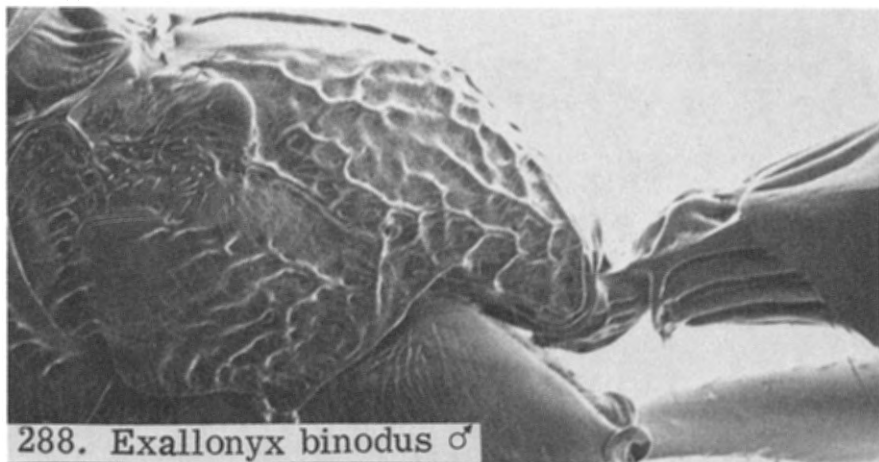
285. *Exallonyx durus* ♀



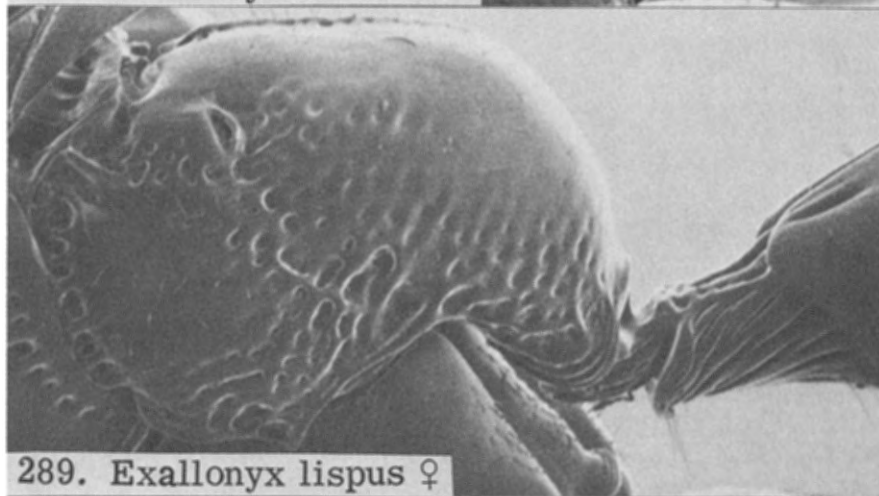
286. *Exallonyx triglyptus* ♂



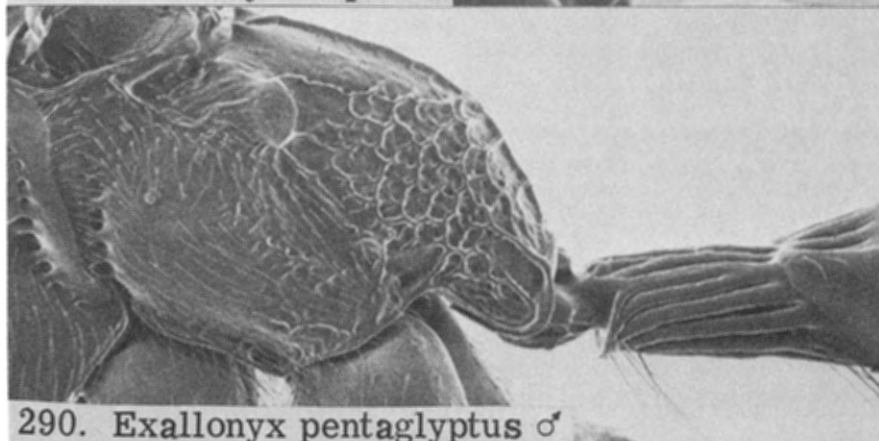
287. *Exallonyx angustoralis* ♂



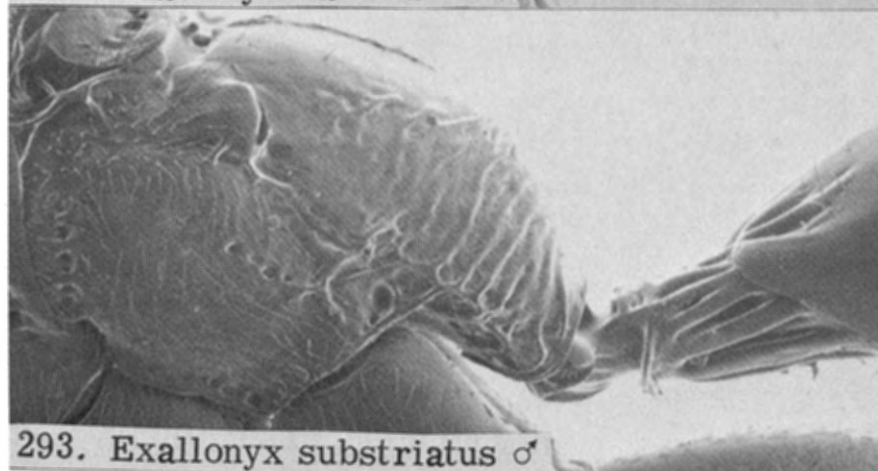
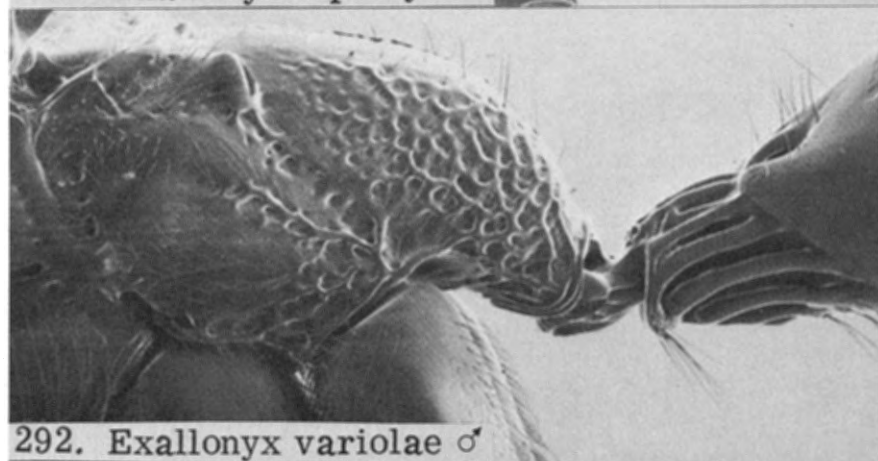
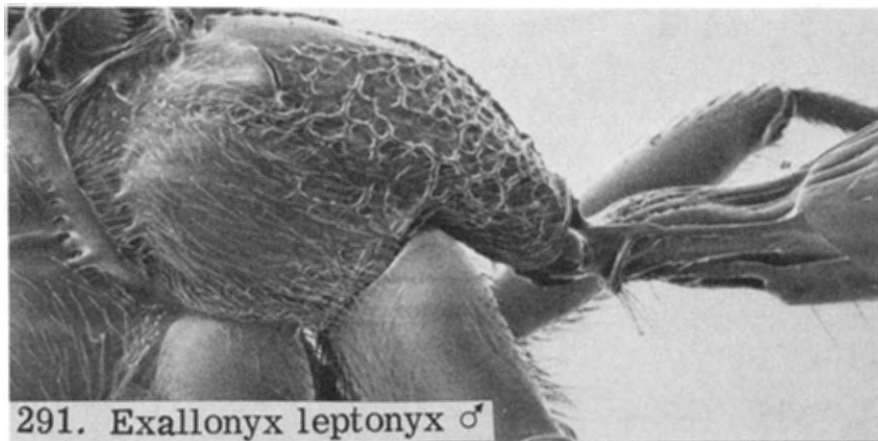
288. *Exallonyx binodus* ♂

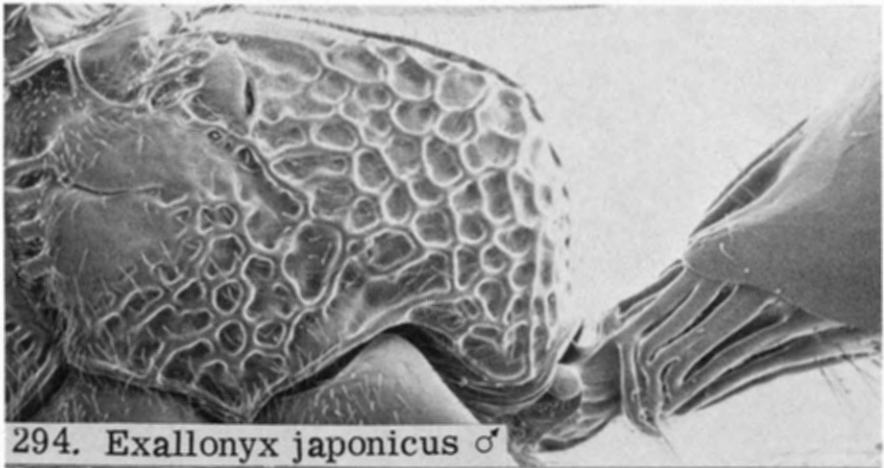


289. *Exallonyx lispus* ♀

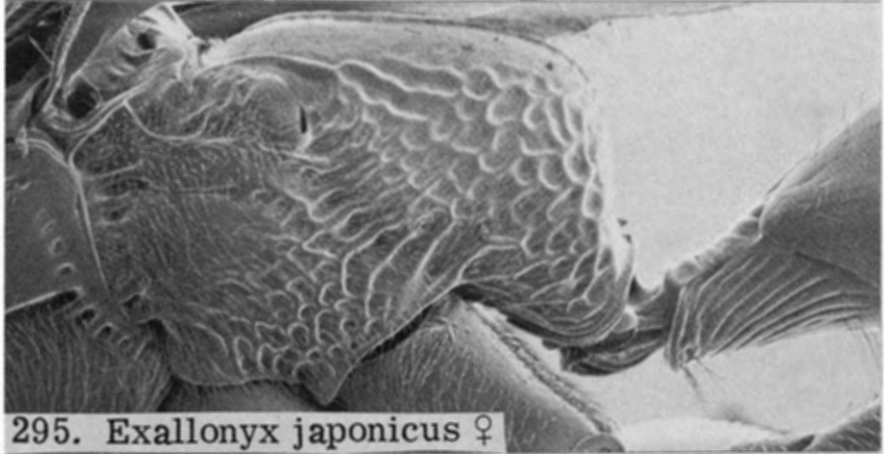


290. *Exallonyx pentaglyptus* ♂

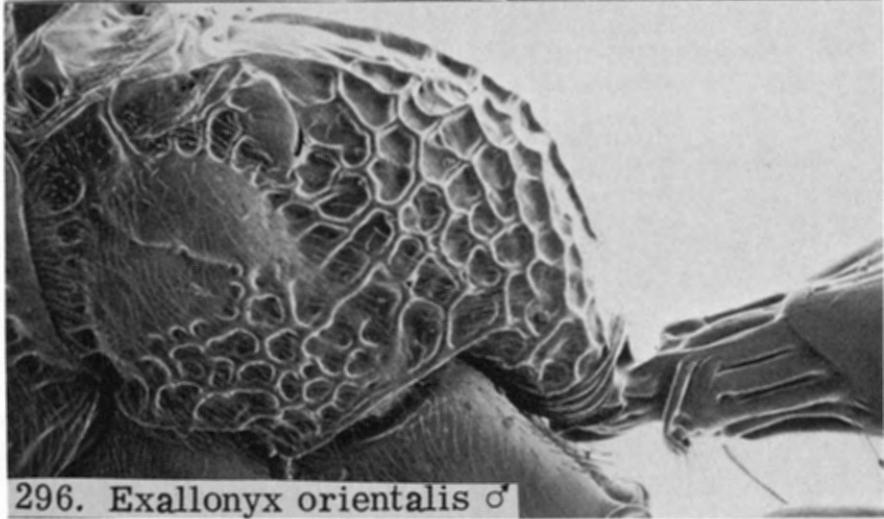




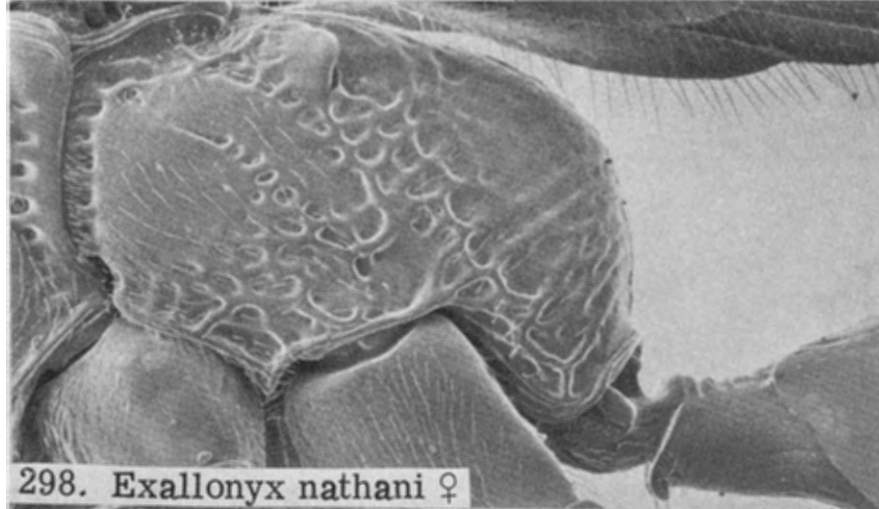
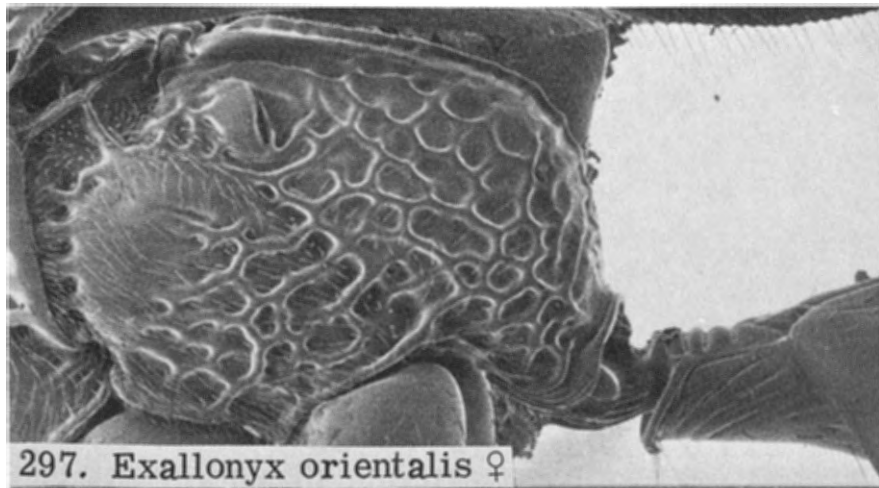
294. *Exallonyx japonicus* ♂

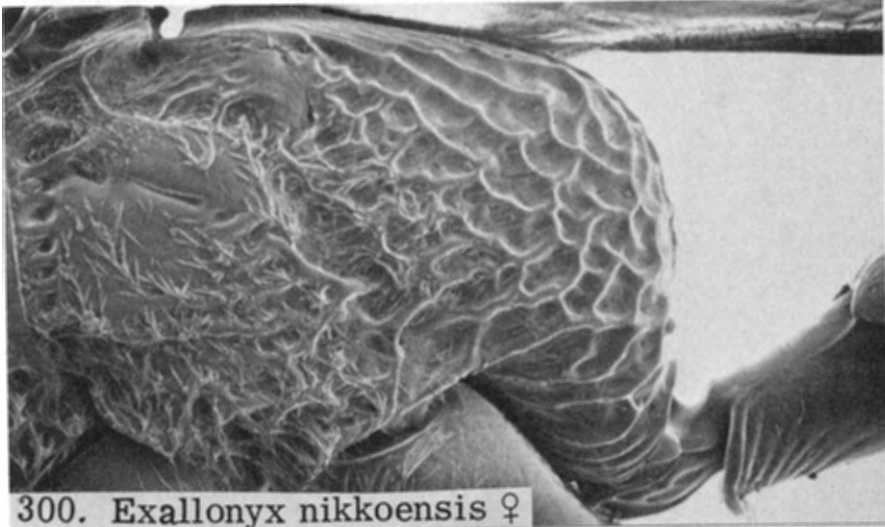


295. *Exallonyx japonicus* ♀

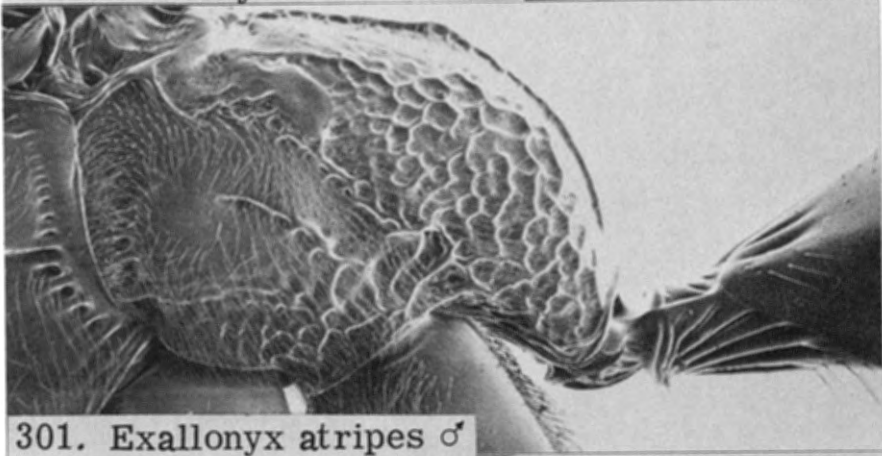


296. *Exallonyx orientalis* ♂

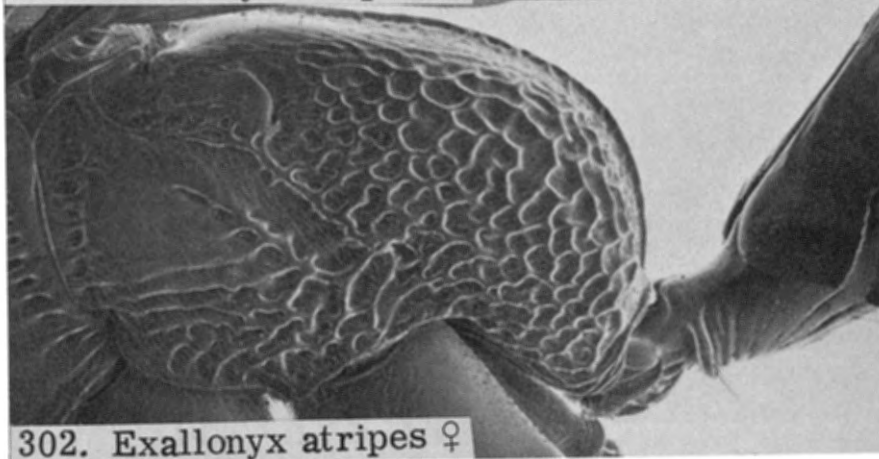




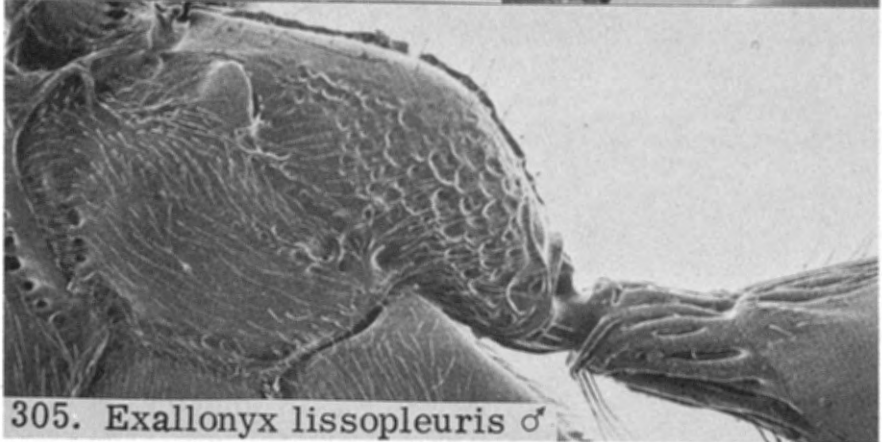
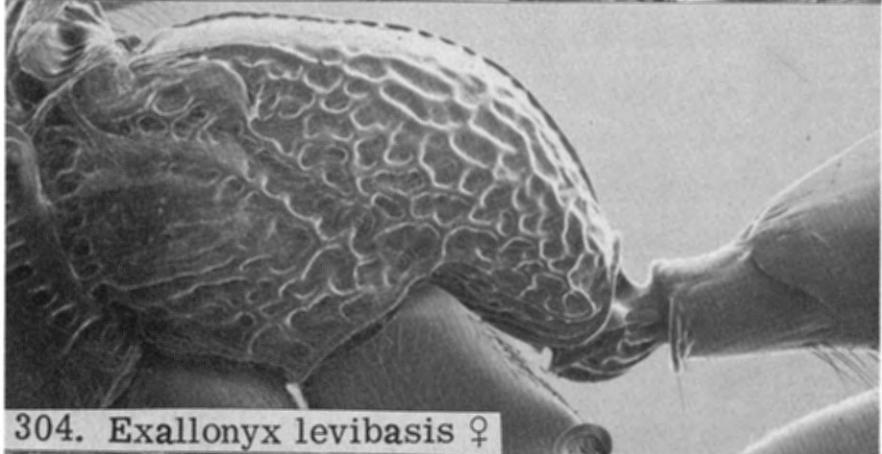
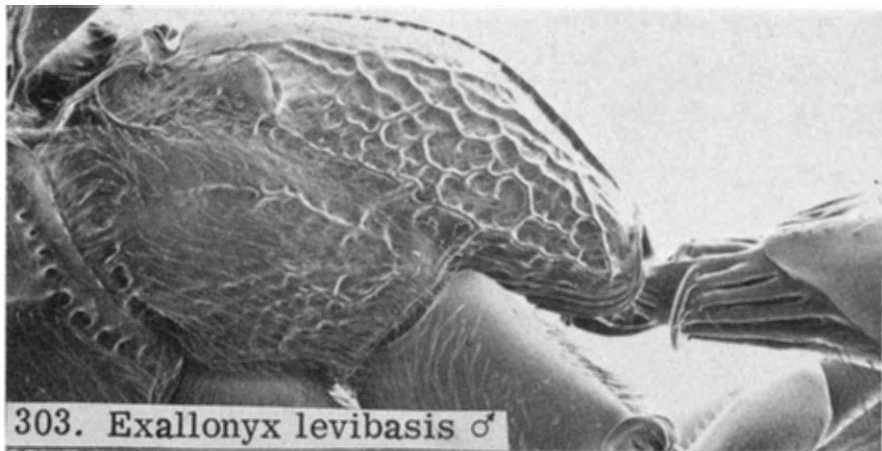
300. *Exallonyx nikkoensis* ♀



301. *Exallonyx atripes* ♂



302. *Exallonyx atripes* ♀

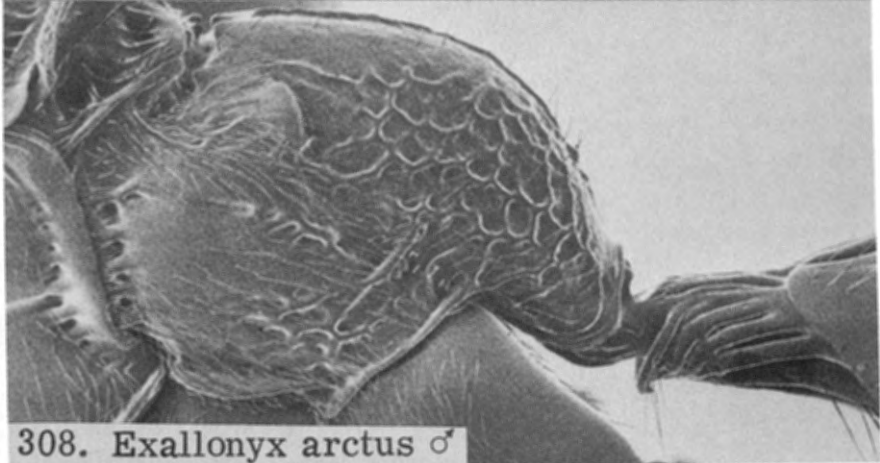




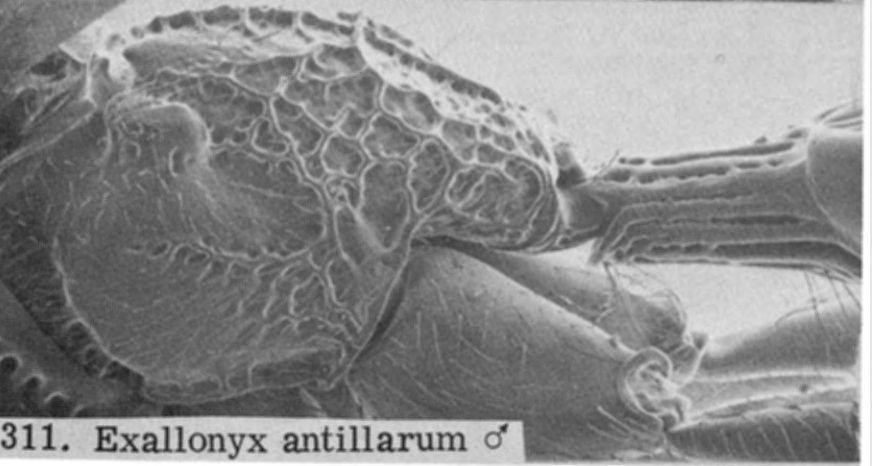
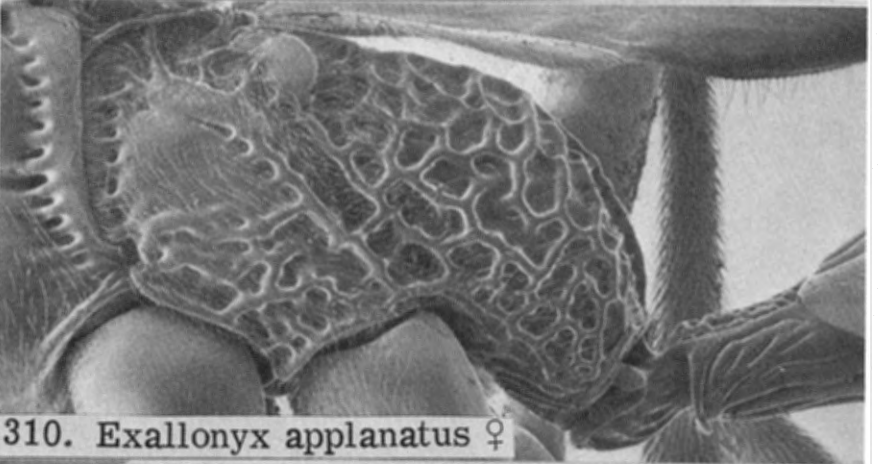
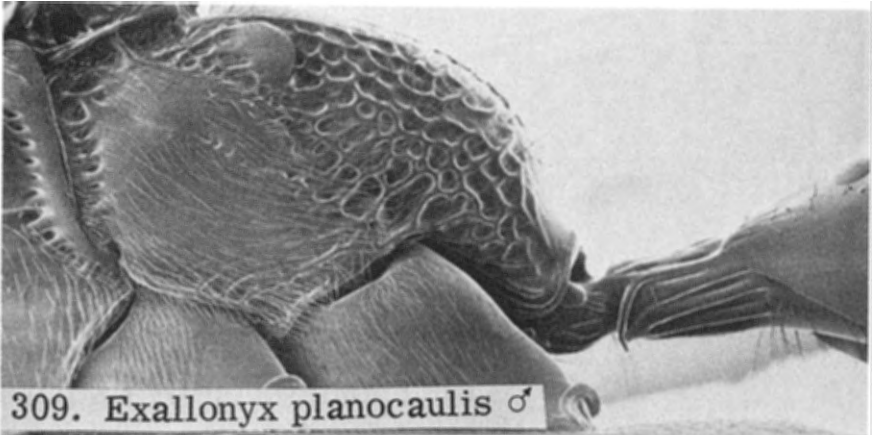
306. *Exallonyx masoni* ♂

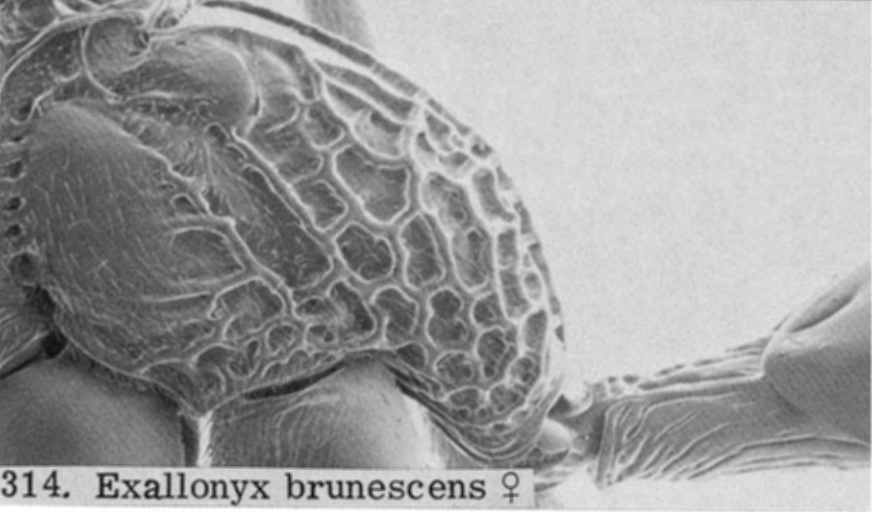
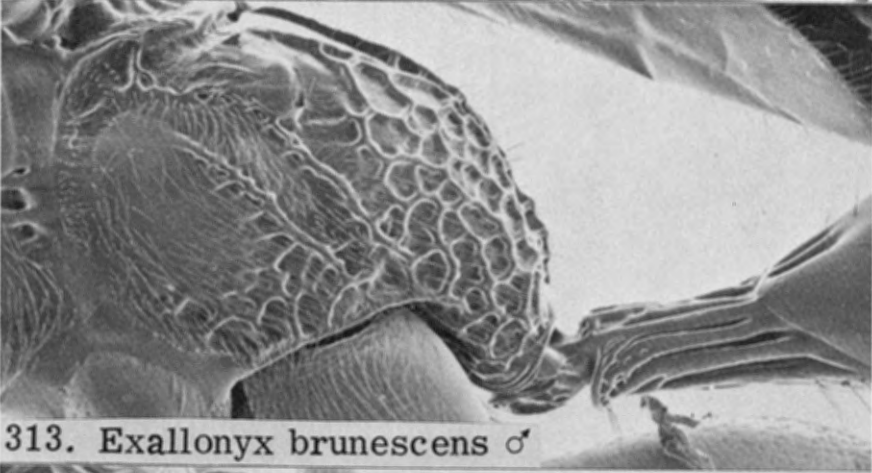
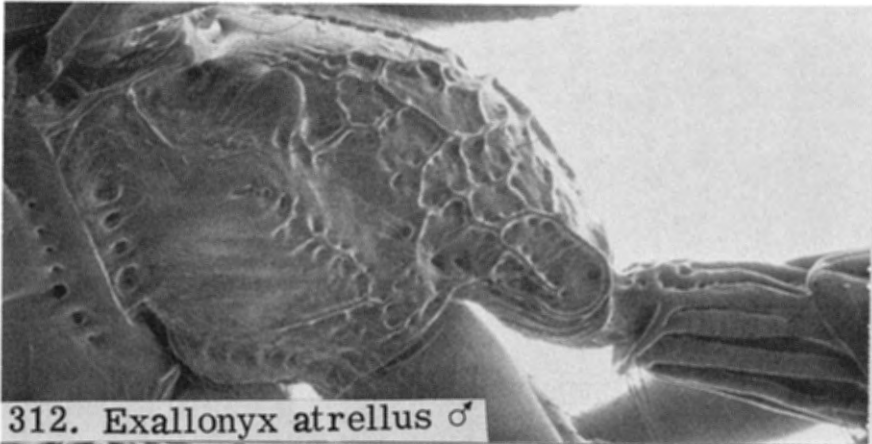


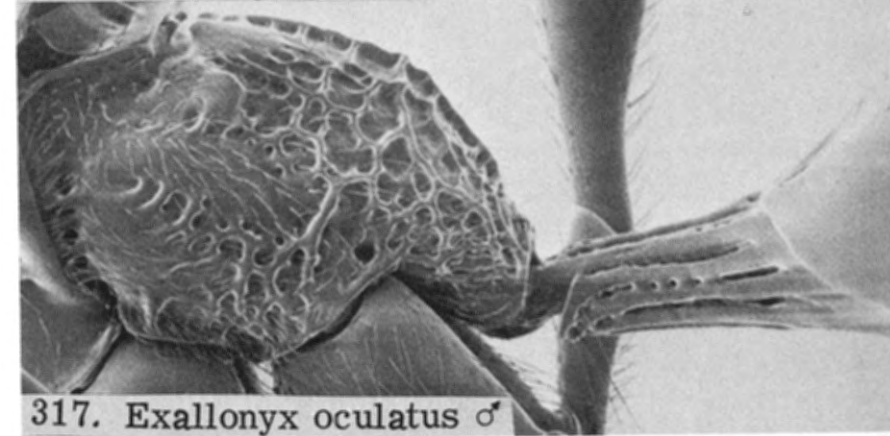
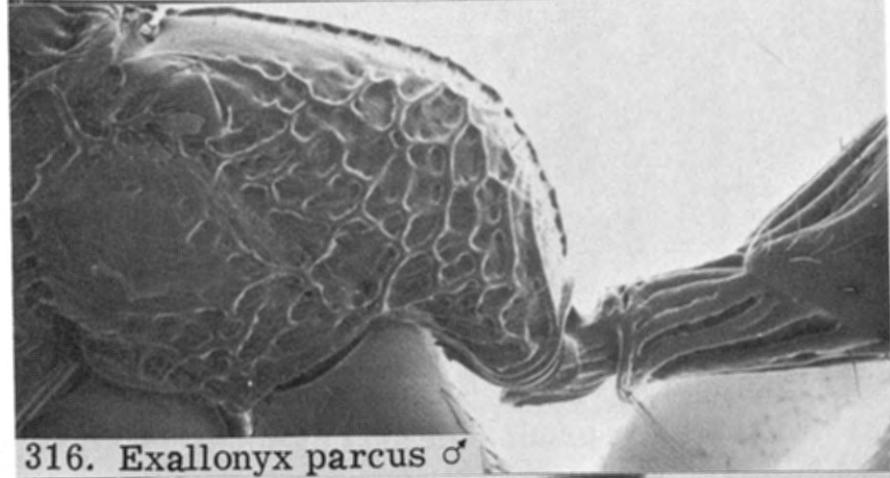
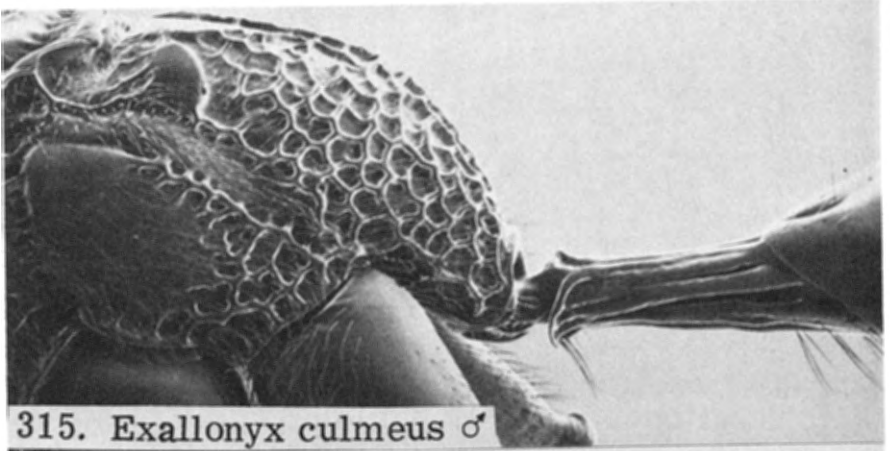
307. *Exallonyx masoni* ♀

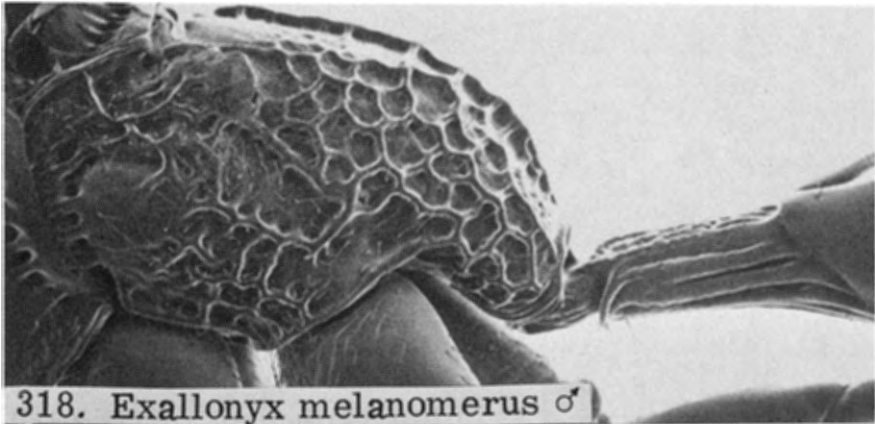


308. *Exallonyx arctus* ♂









318. *Exallonyx melanomerus* ♂



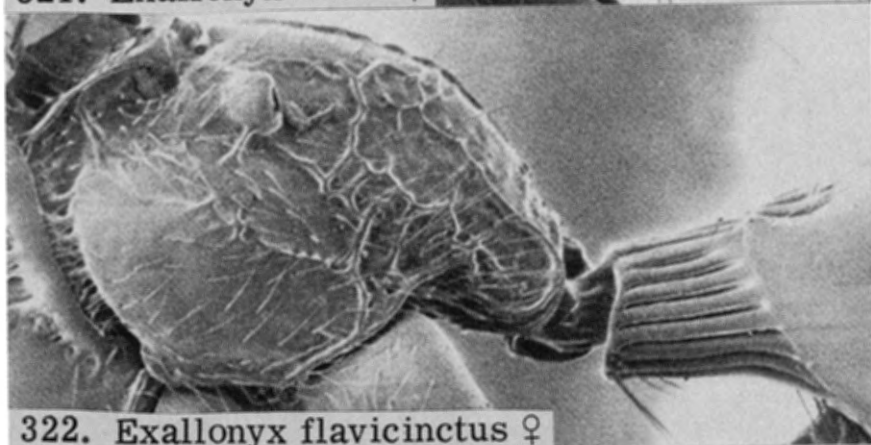
319. *Exallonyx trachodes* ♂



320. *Exallonyx datae* ♂



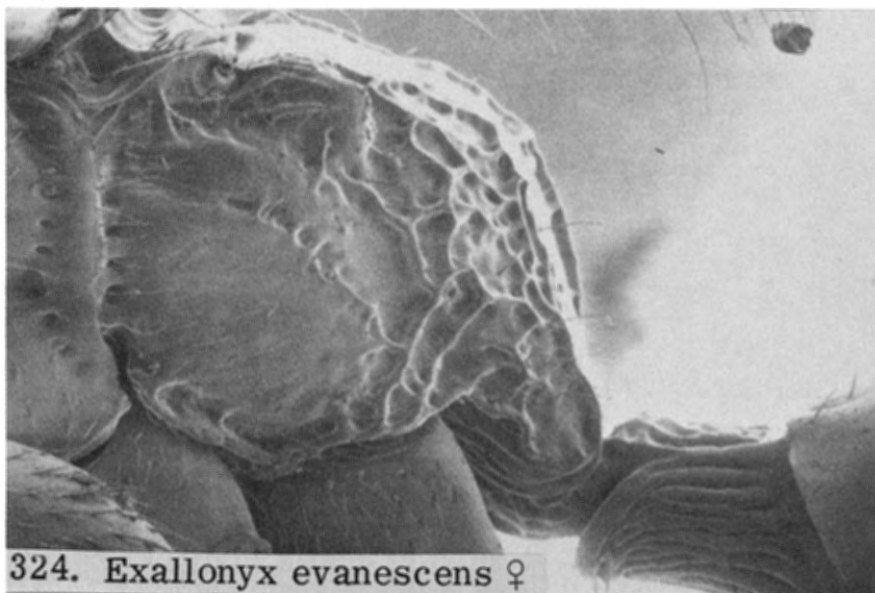
321. *Exallonyx datae* ♀



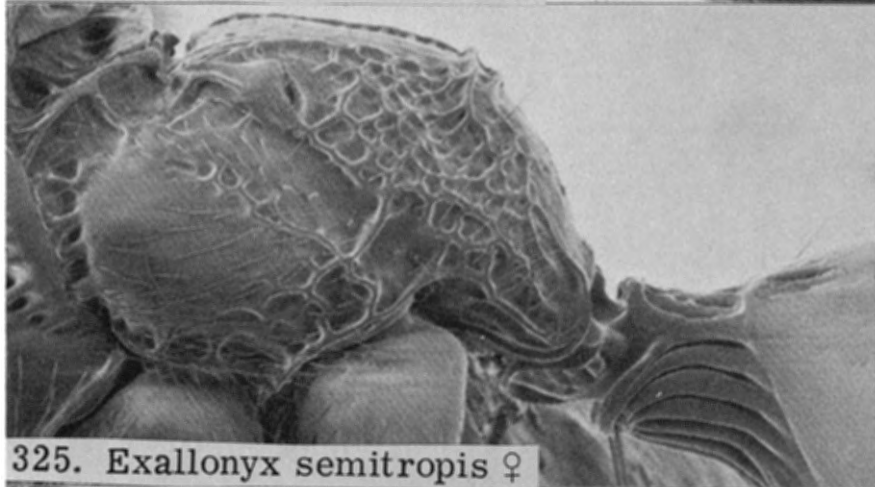
322. *Exallonyx flavicinctus* ♀



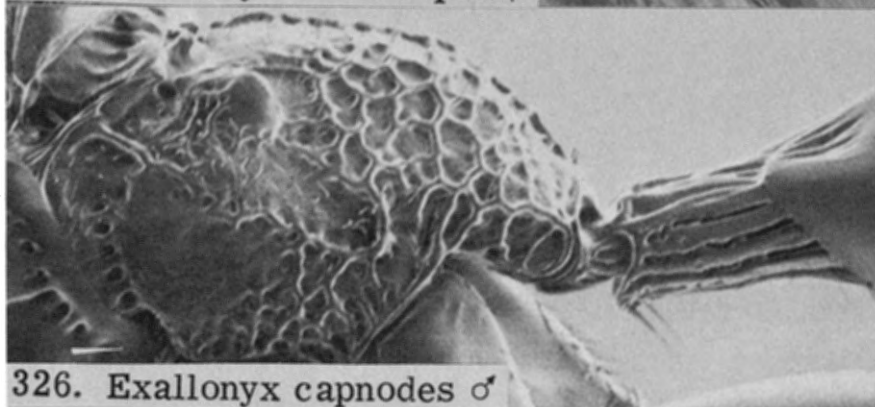
323. *Exallonyx evanescens* ♂



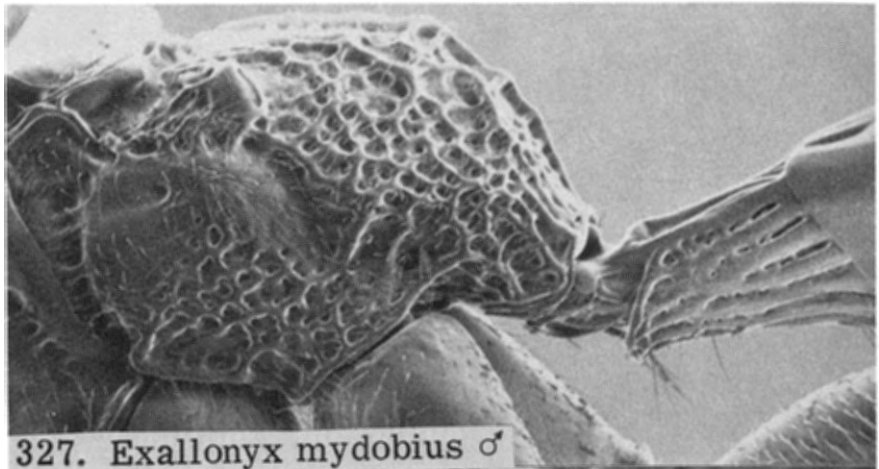
324. *Exallonyx evanescens* ♀



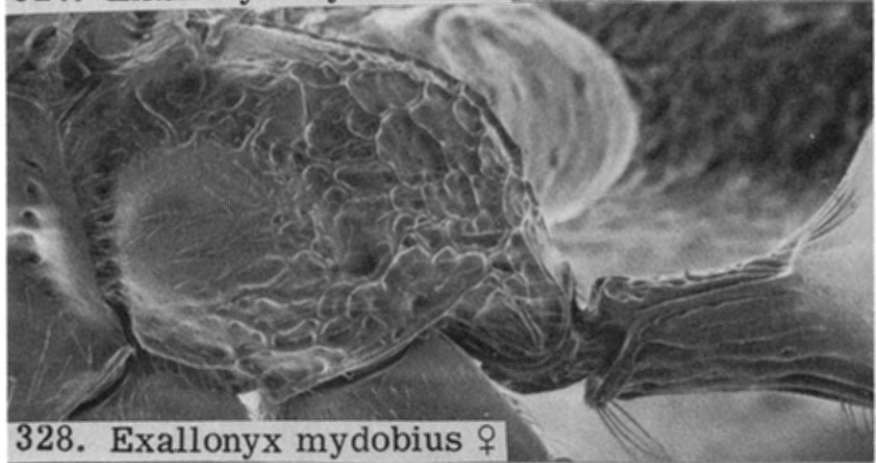
325. *Exallonyx semitropis* ♀



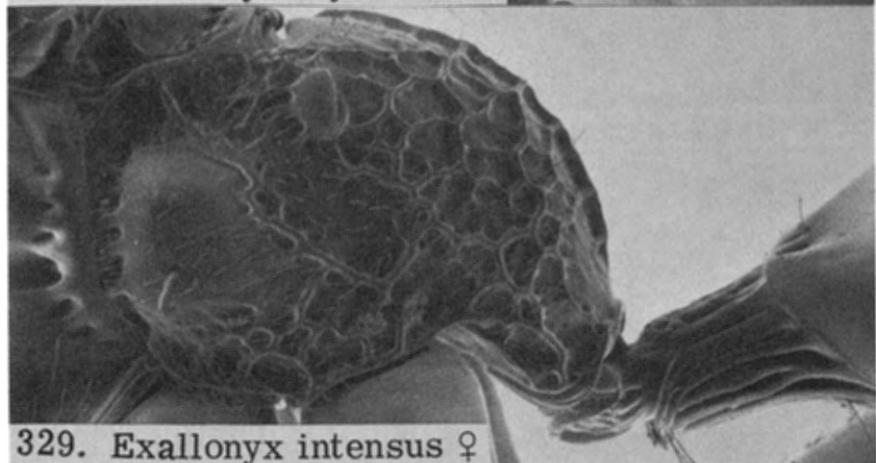
326. *Exallonyx capnodes* ♂



327. *Exallonyx mydobius* ♂



328. *Exallonyx mydobius* ♀



329. *Exallonyx intensus* ♀



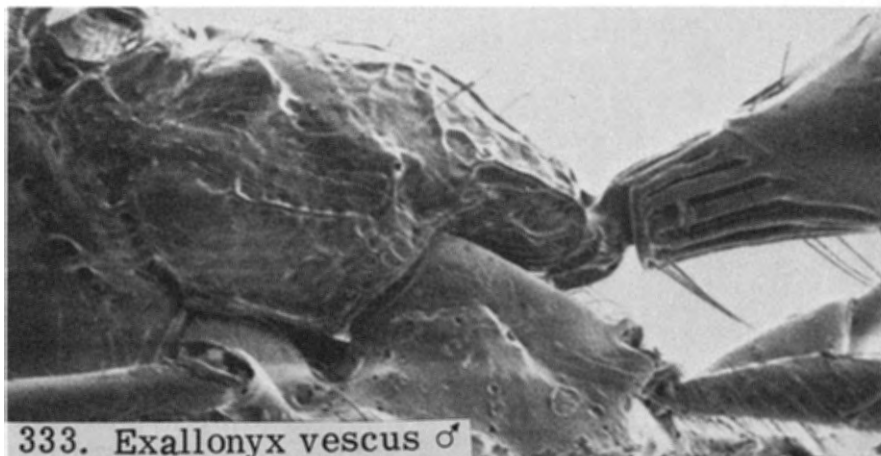
330. *Exallonyx trialbus* ♀



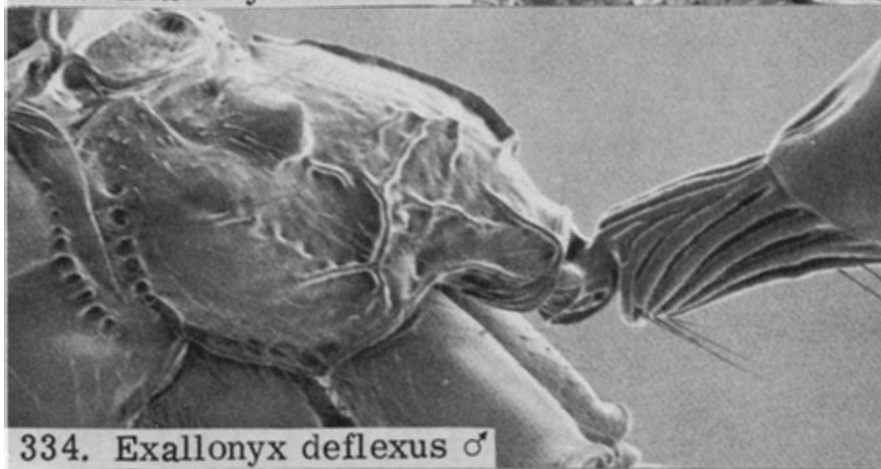
331. *Exallonyx castaneipes* ♂



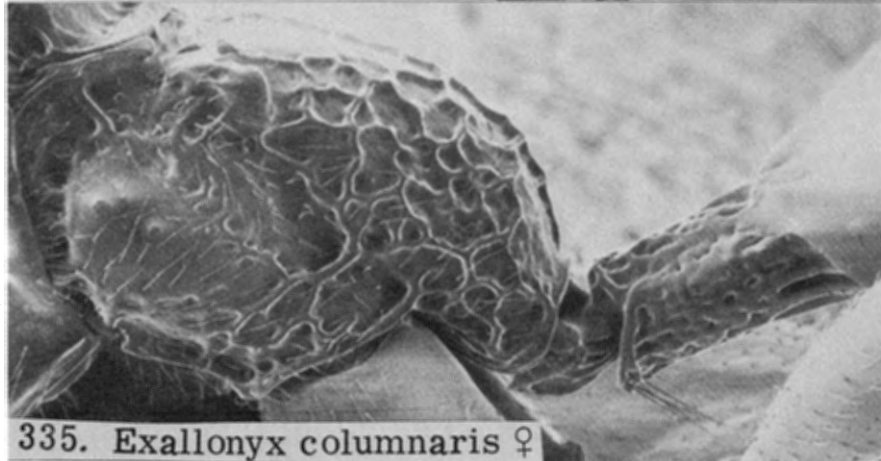
332. *Exallonyx parameces* ♂



333. *Exallonyx vescus* ♂



334. *Exallonyx deflexus* ♂



335. *Exallonyx columnaris* ♀



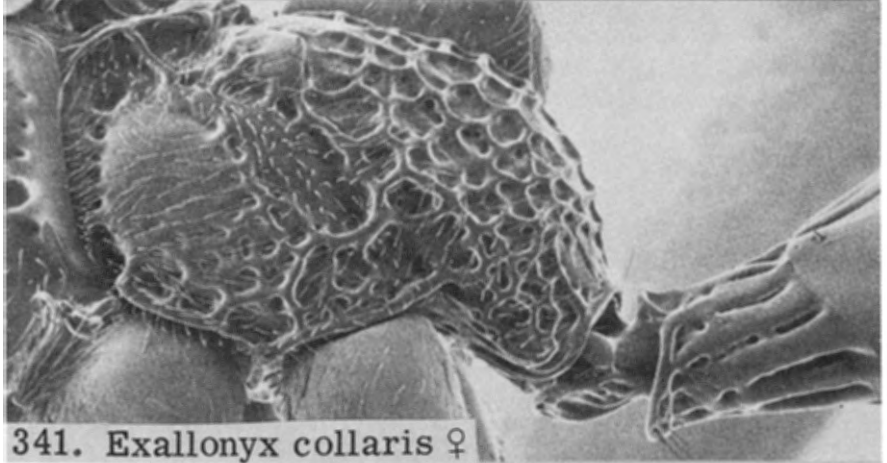
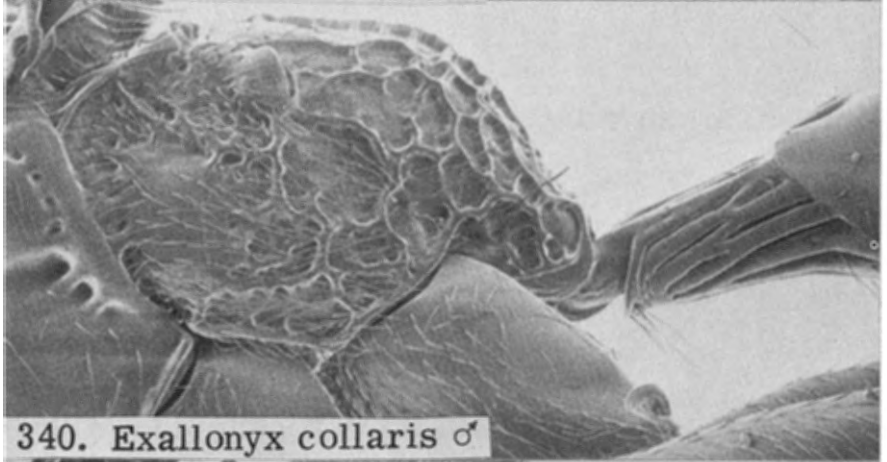
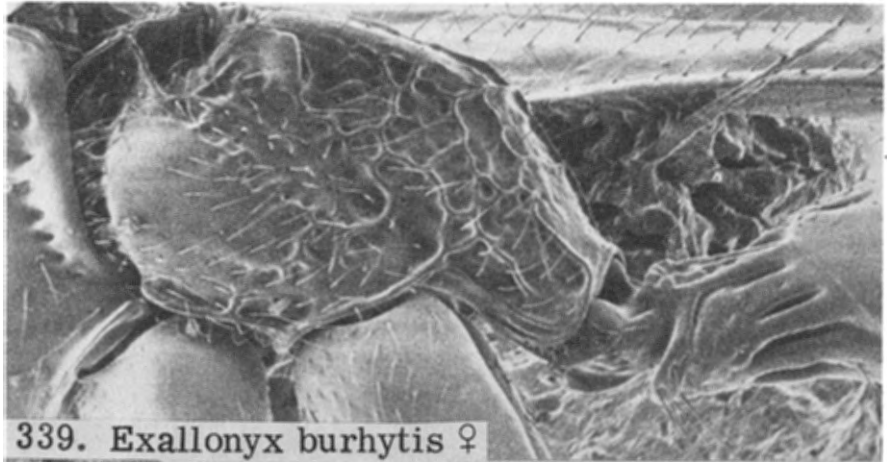
336. *Exallonyx antennalis* ♀

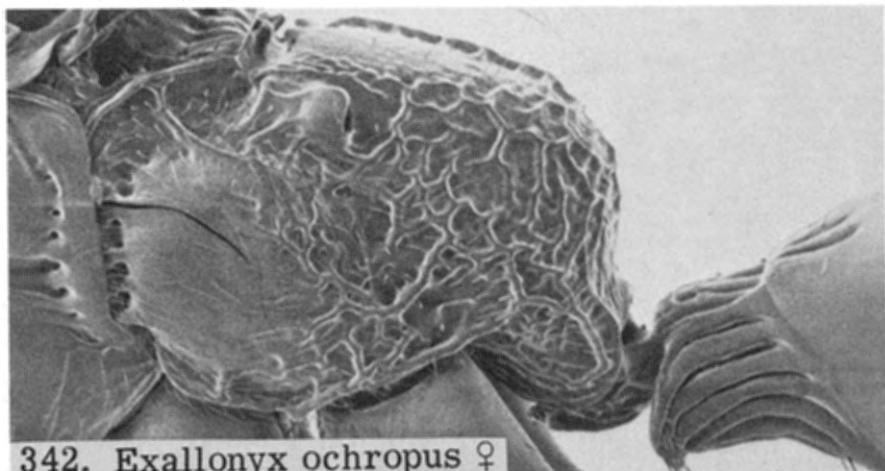


337. *Exallonyx stenostoma* ♂



338. *Exallonyx burhytis* ♂

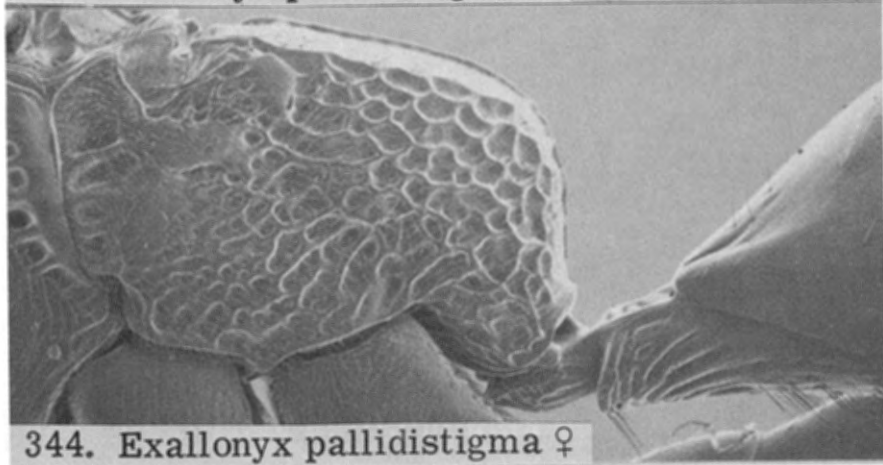




342. *Exallonyx ochropus* ♀



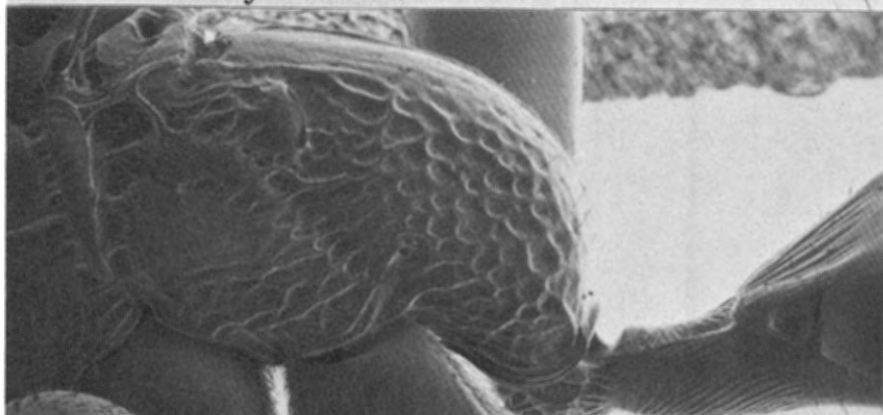
343. *Exallonyx pallidistigma* ♂



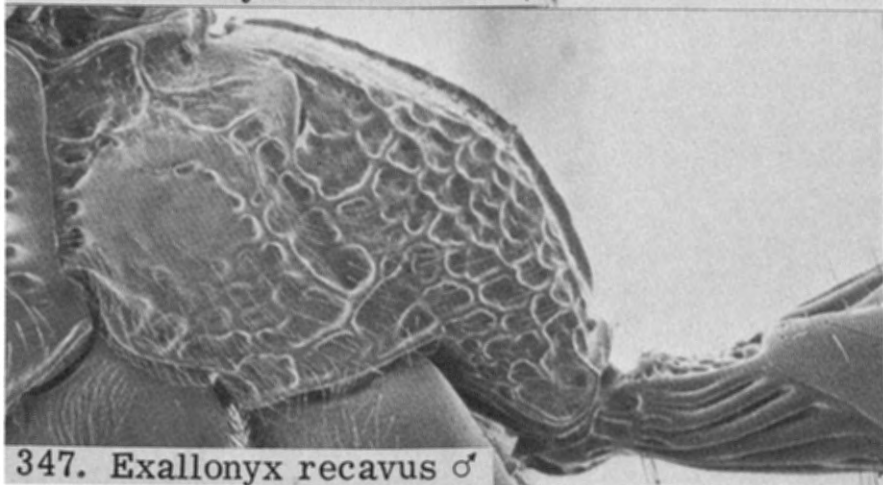
344. *Exallonyx pallidistigma* ♀



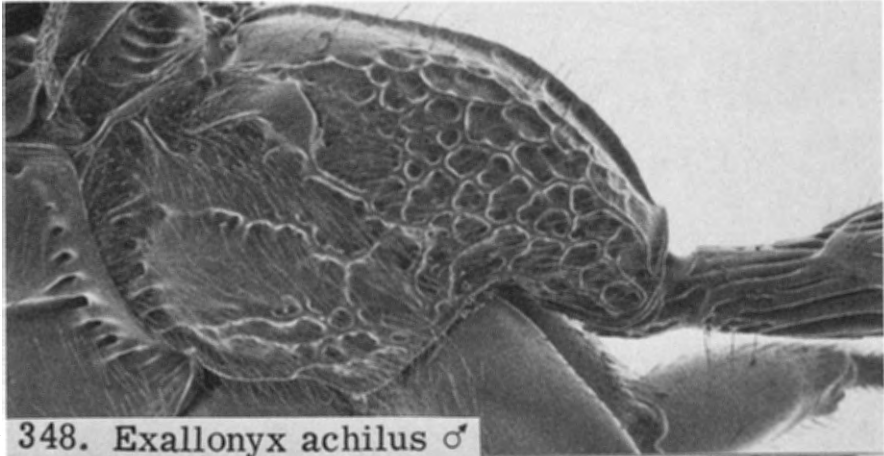
345. *Exallonyx crenicornis* ♂



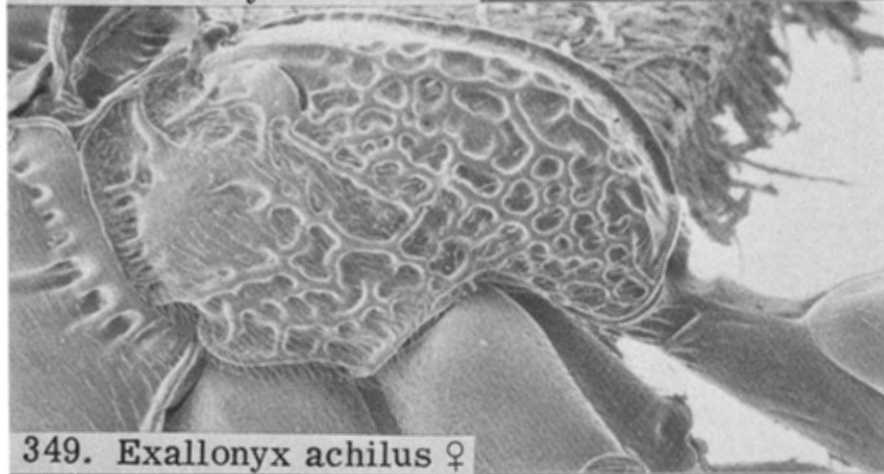
346. *Exallonyx crenicornis* ♀



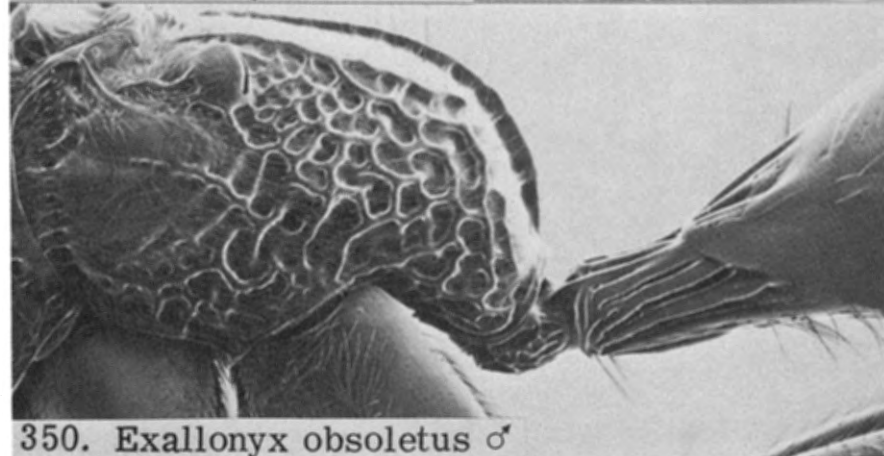
347. *Exallonyx recavus* ♂



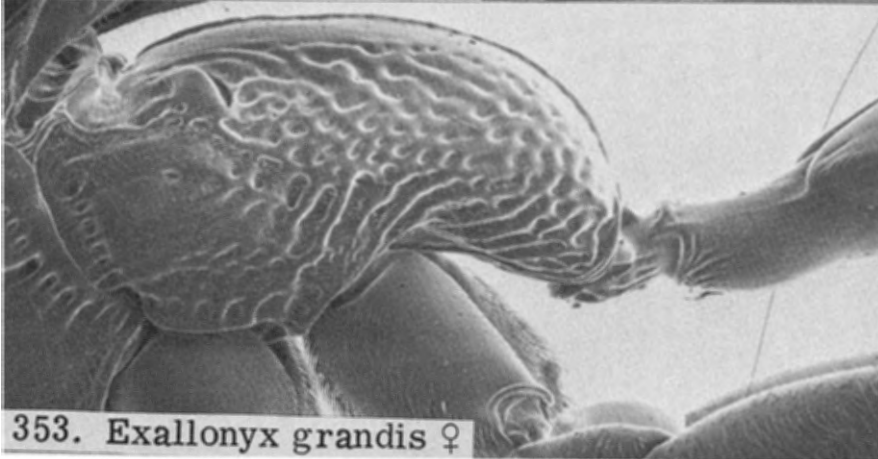
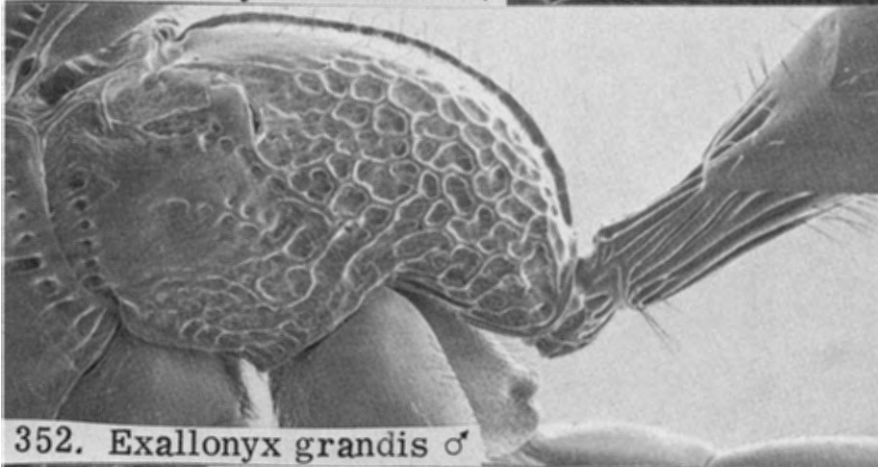
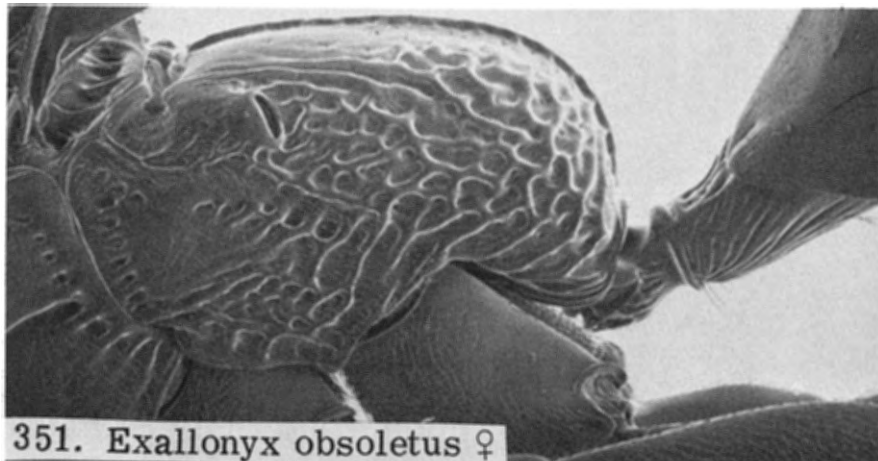
348. *Exallonyx achilus* ♂

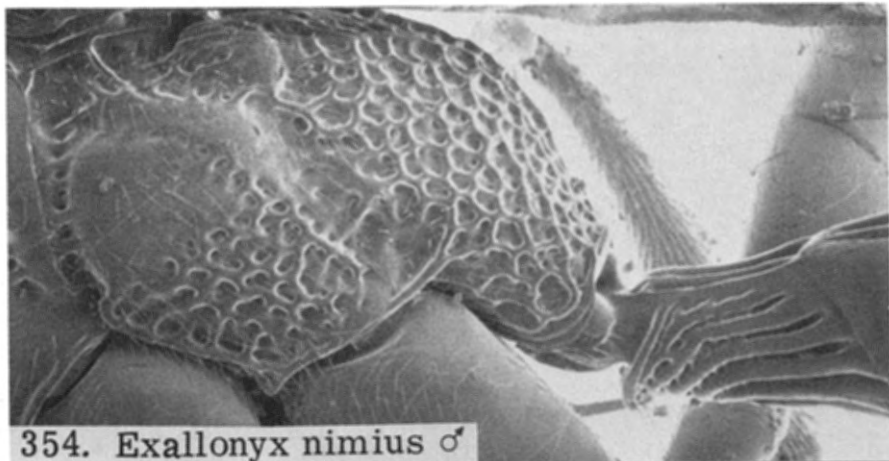


349. *Exallonyx achilus* ♀

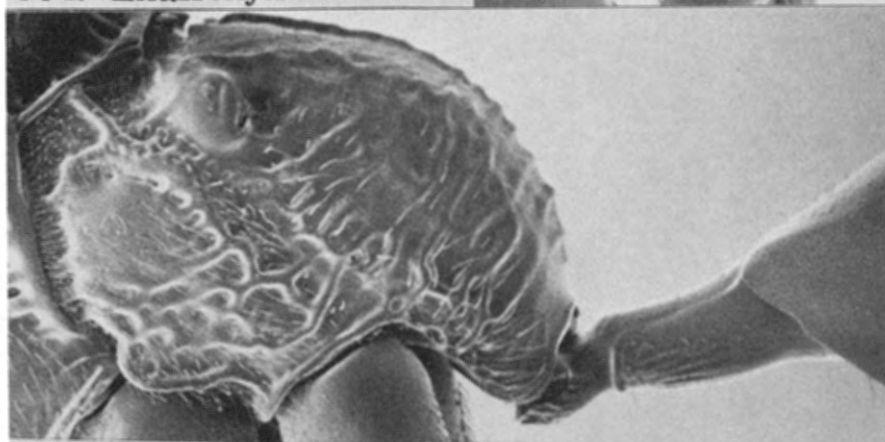


350. *Exallonyx obsoletus* ♂

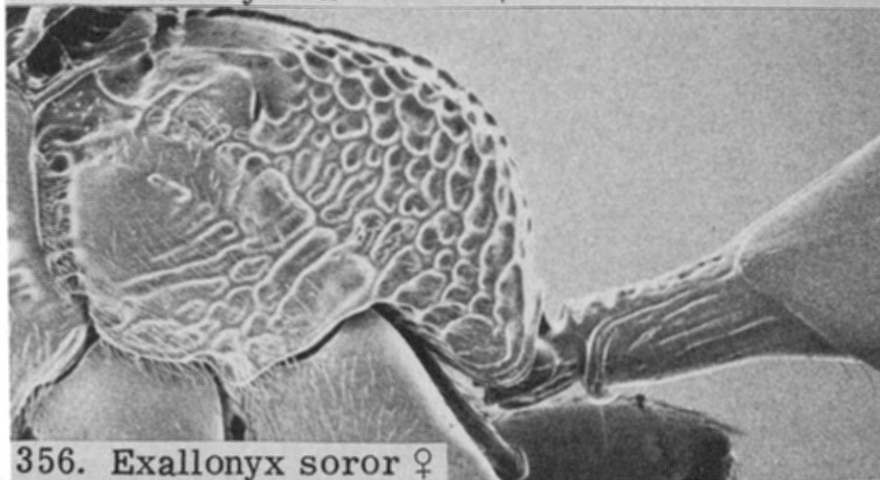




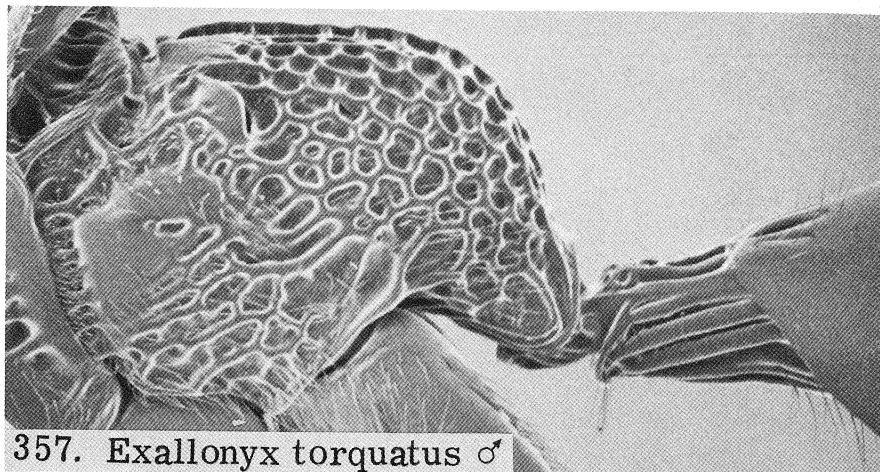
354. *Exallonyx nimius* ♂



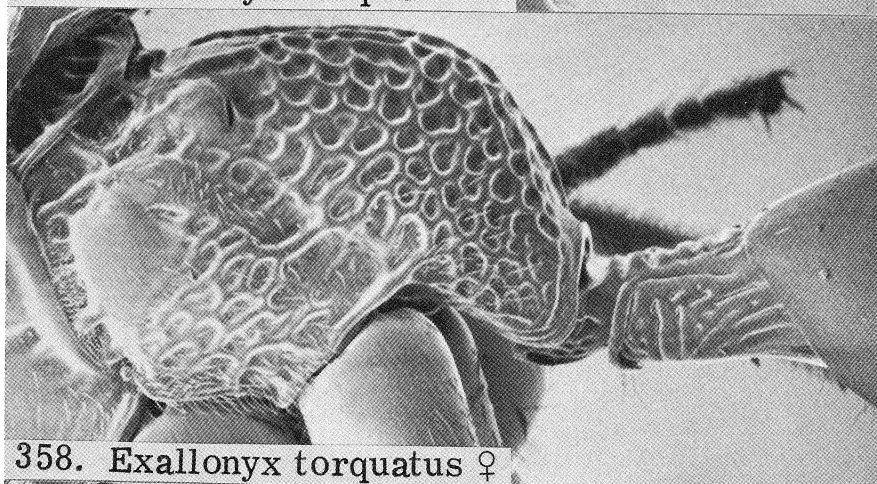
355. *Exallonyx camelinus* ♀



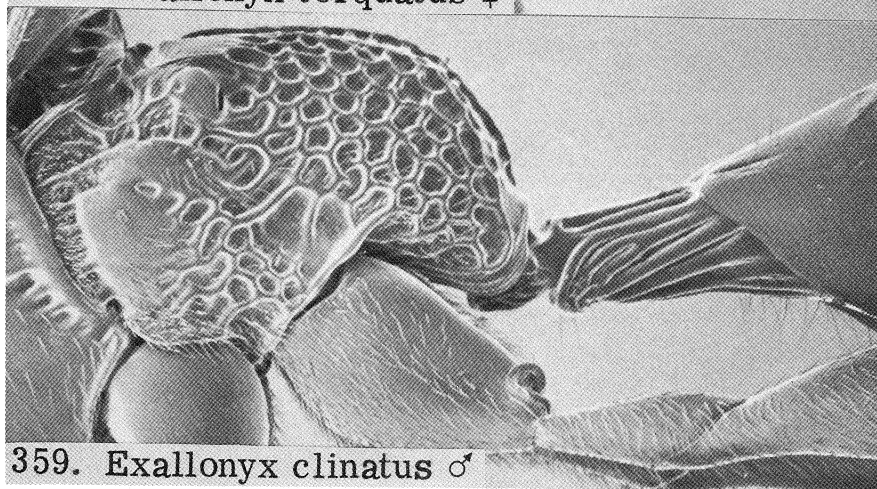
356. *Exallonyx soror* ♀



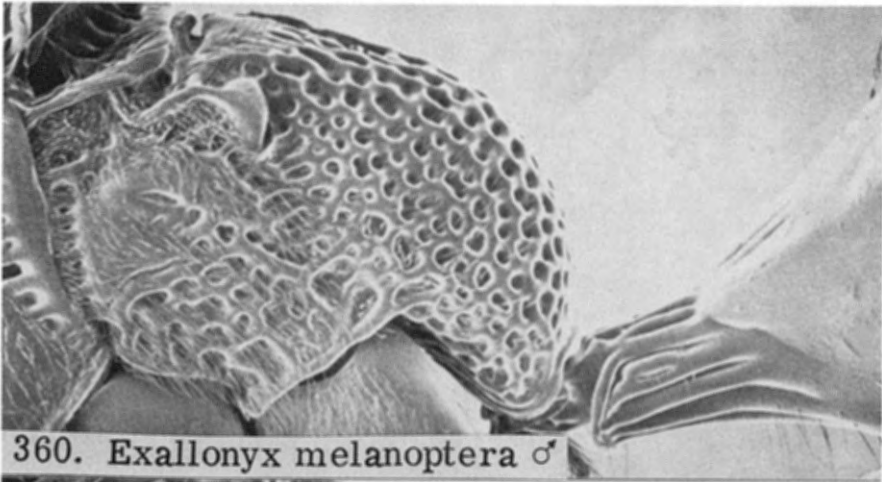
357. *Exallonyx torquatus* ♂



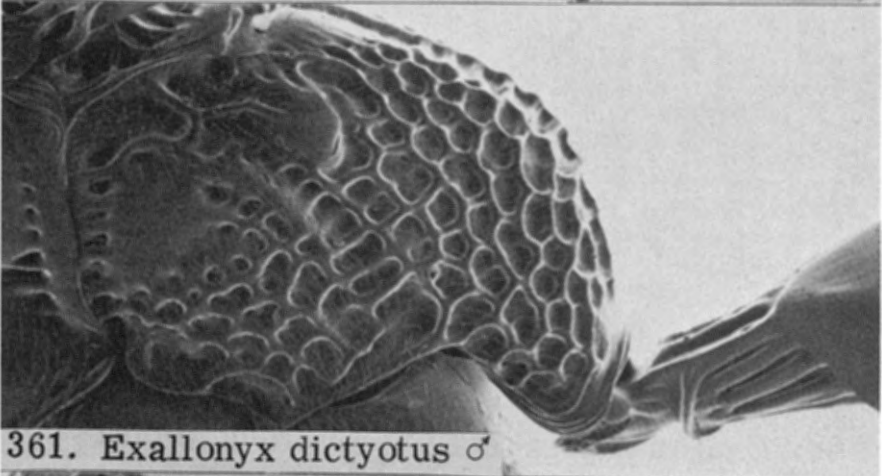
358. *Exallonyx torquatus* ♀



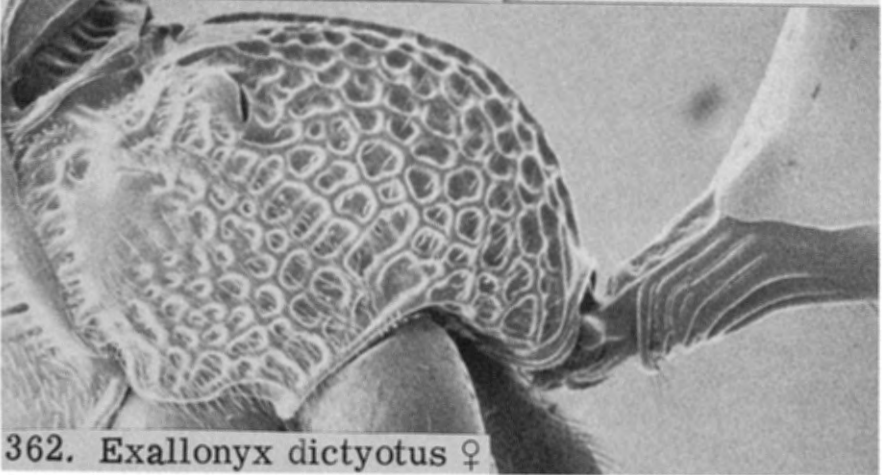
359. *Exallonyx clinatus* ♂



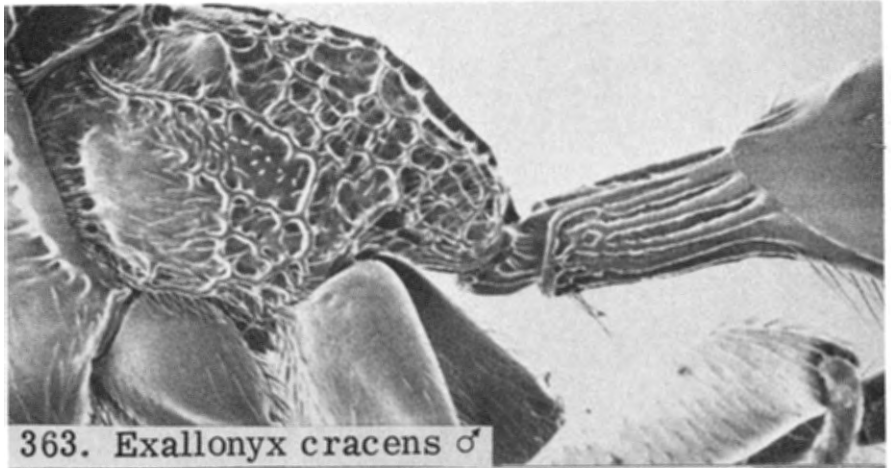
360. *Exallonyx melanoptera* ♂



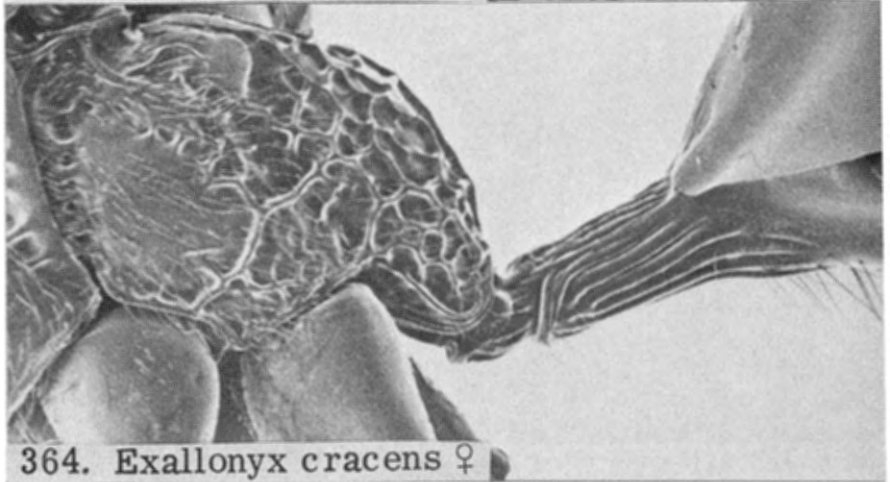
361. *Exallonyx dictyotus* ♂



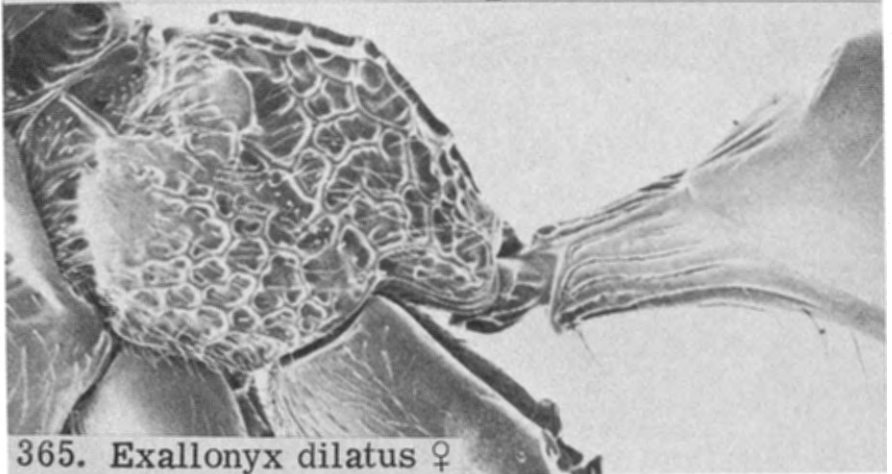
362. *Exallonyx dictyotus* ♀



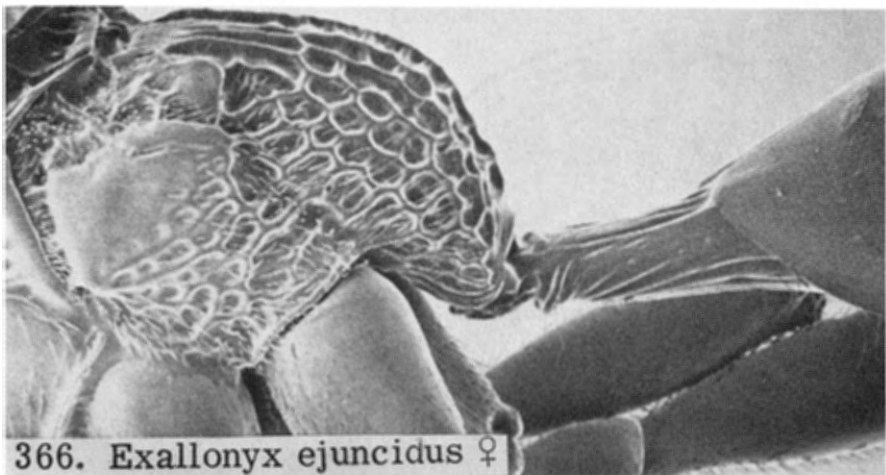
363. *Exallonyx cracens* ♂



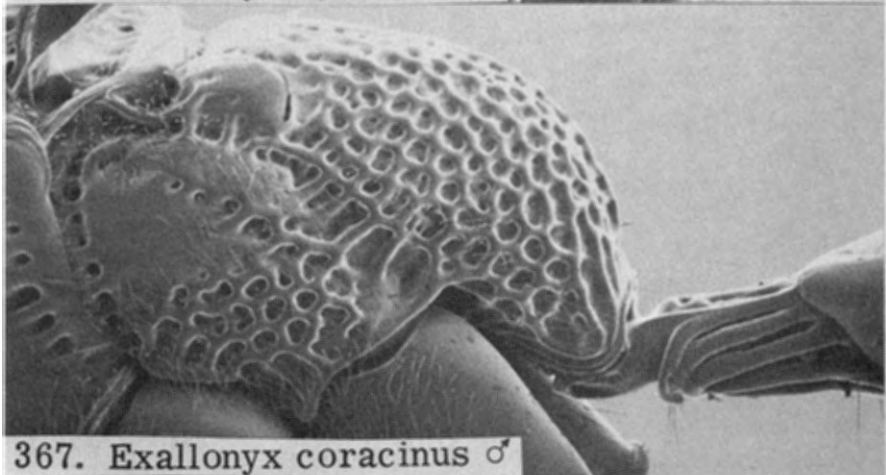
364. *Exallonyx cracens* ♀



365. *Exallonyx dilatus* ♀



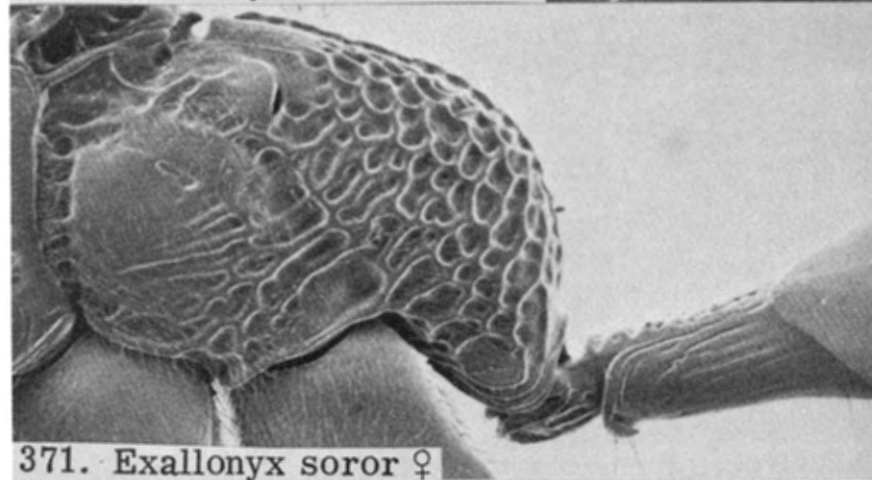
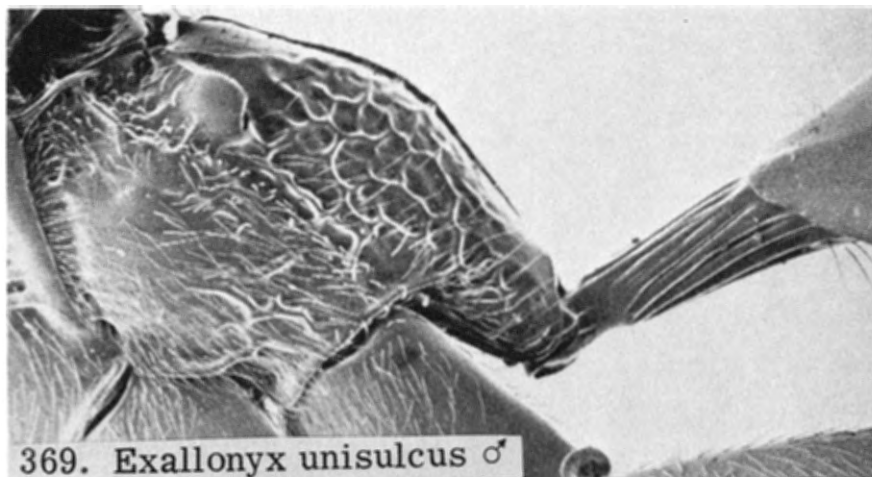
366. *Exallonyx ejuncidus* ♀

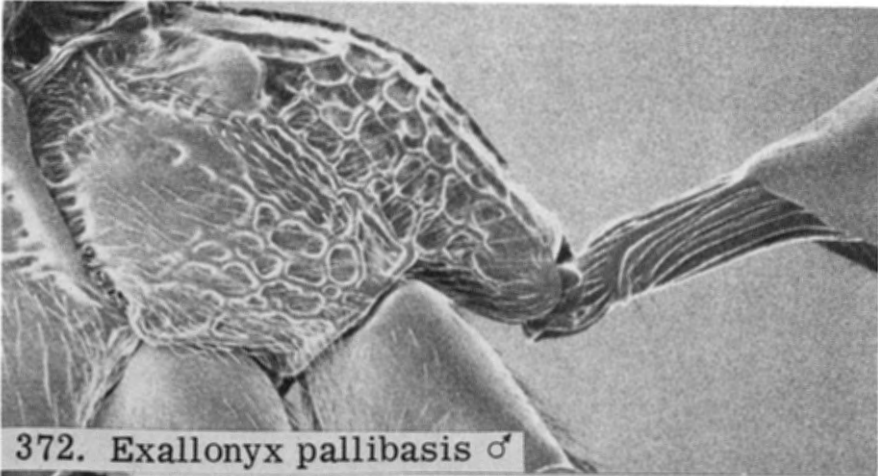


367. *Exallonyx coracinus* ♂

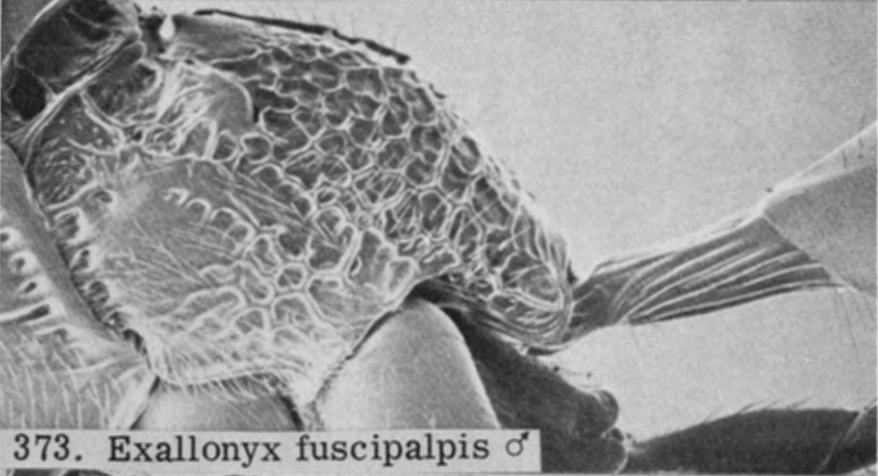


368. *Exallonyx coracinus* ♀

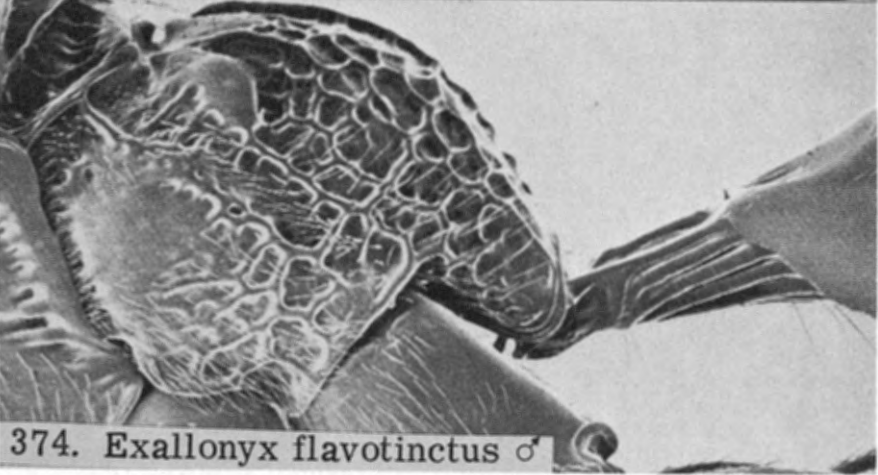




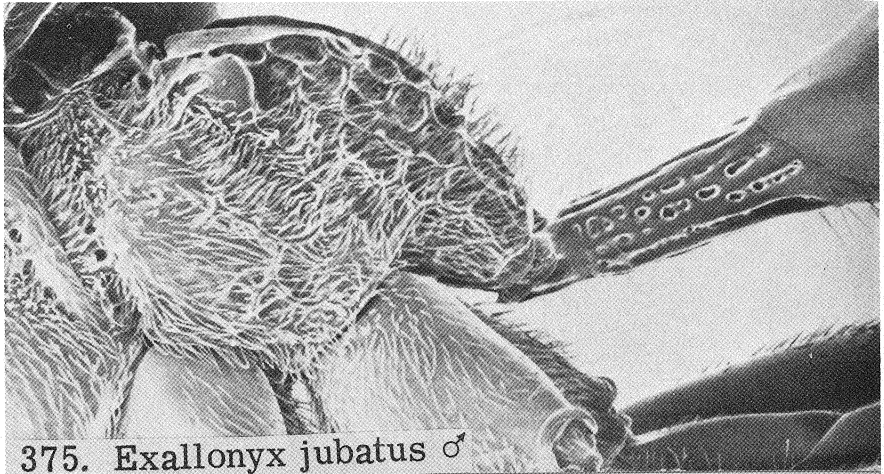
372. *Exallonyx pallibasis* ♂



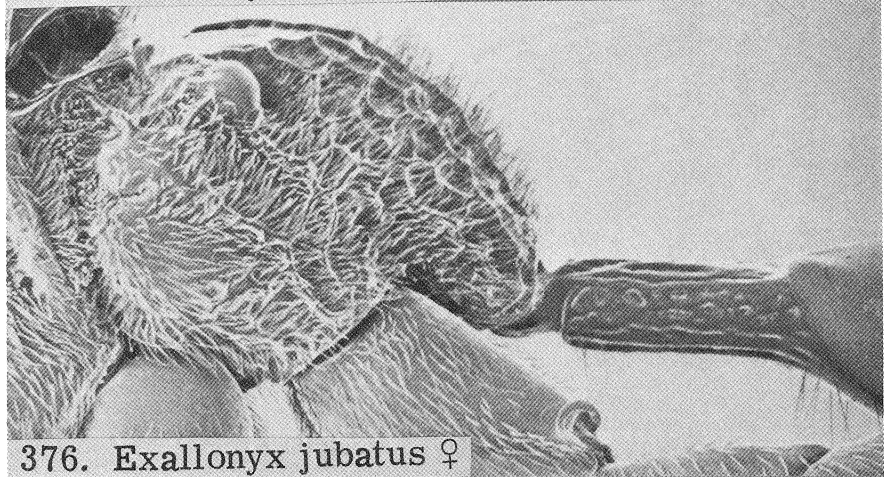
373. *Exallonyx fuscipalpis* ♂



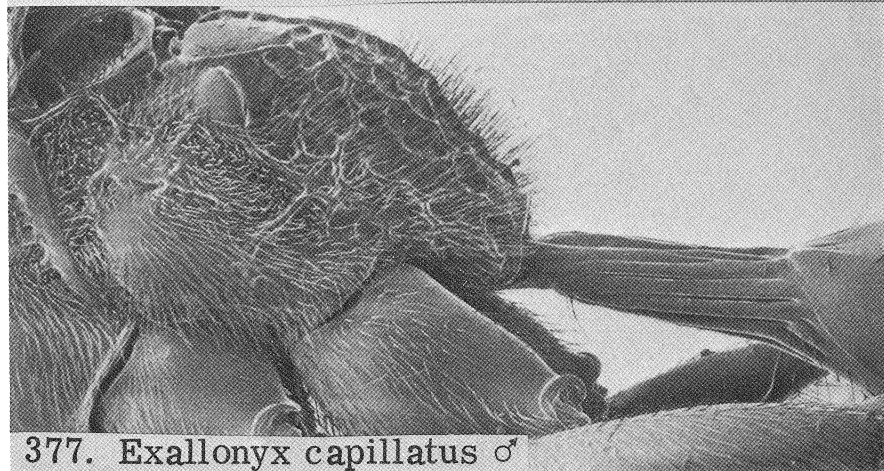
374. *Exallonyx flavotinctus* ♂



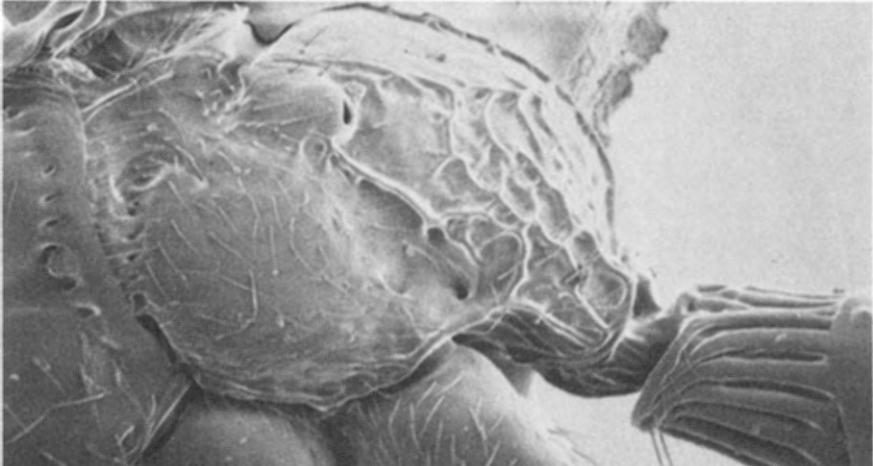
375. *Exallonyx jubatus* ♂



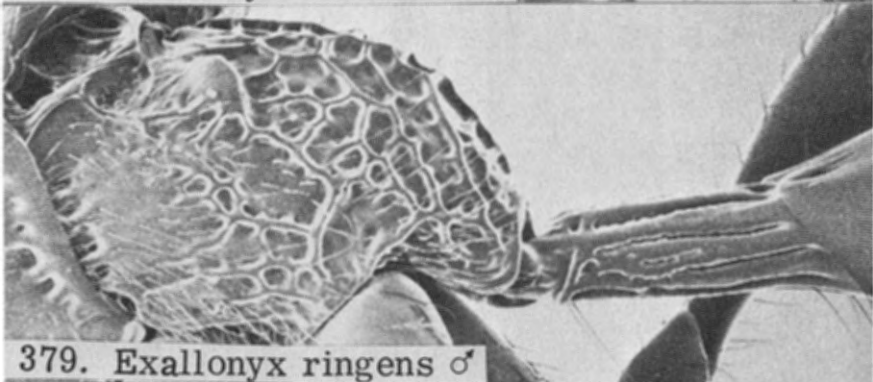
376. *Exallonyx jubatus* ♀



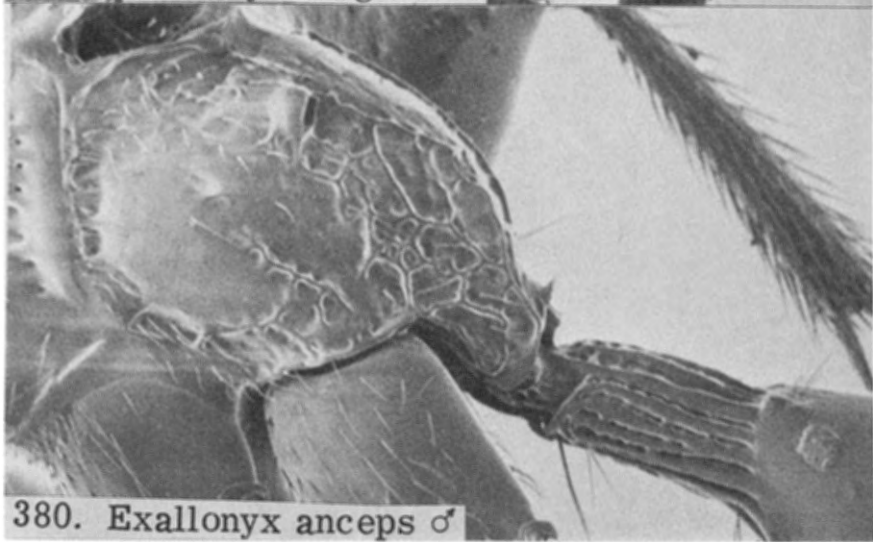
377. *Exallonyx capillatus* ♂



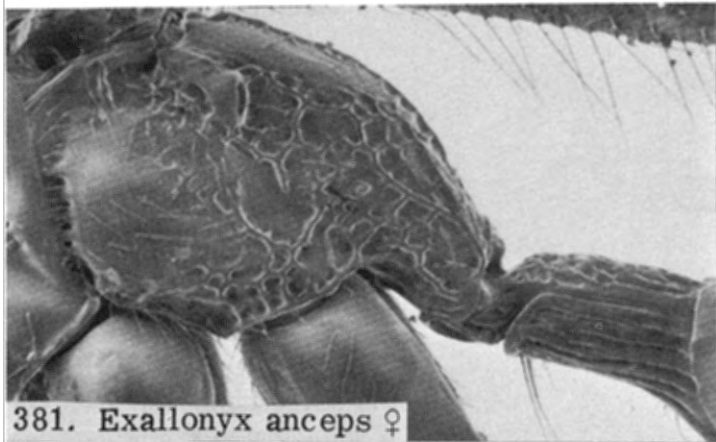
378. *Exallonyx wasmanni* ♀



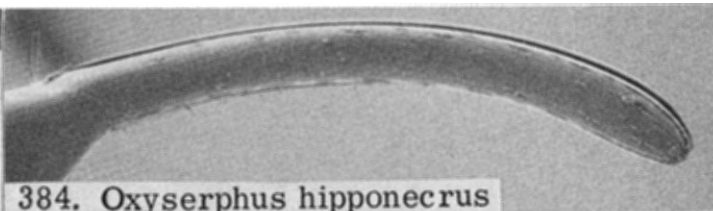
379. *Exallonyx ringens* ♂



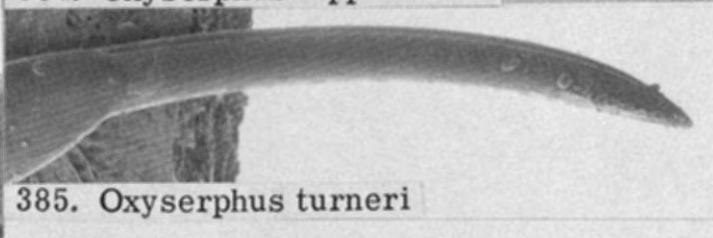
380. *Exallonyx anceps* ♂



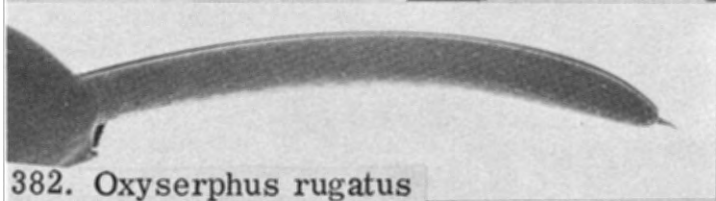
381. *Exallonyx anceps* ♀



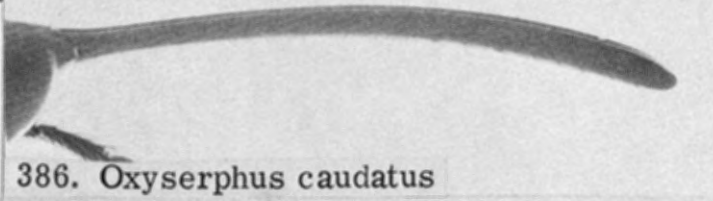
384. *Oxyserphus hipponecrus*



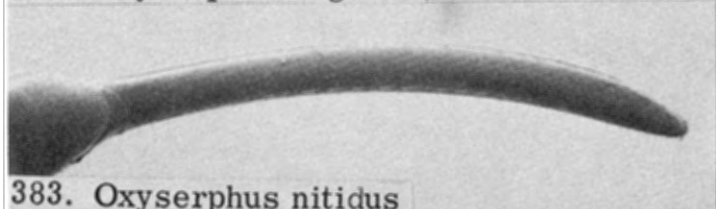
385. *Oxyserphus turneri*



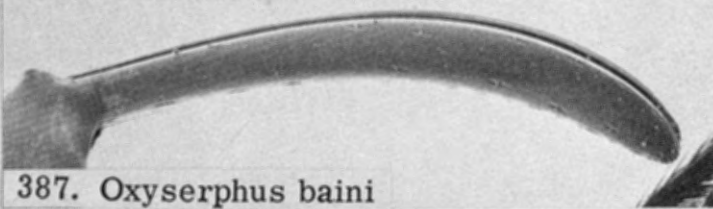
382. *Oxyserphus rugatus*



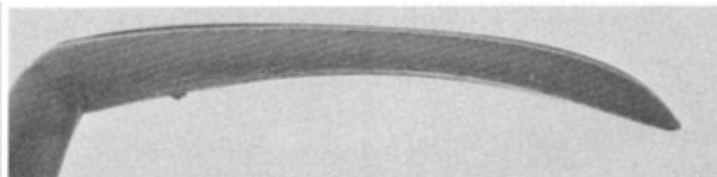
386. *Oxyserphus caudatus*



383. *Oxyserphus nitidus*



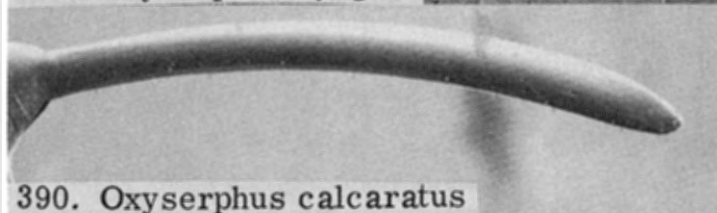
387. *Oxyserphus baini*



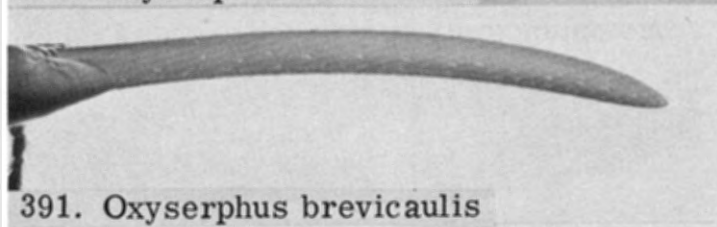
388. *Oxyserphus xanthura*



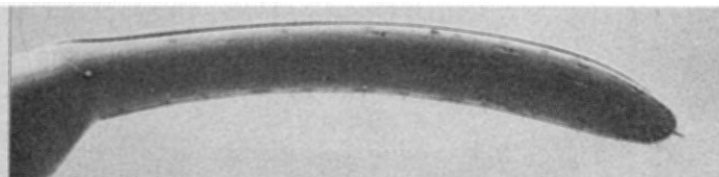
389. *Oxyserphus syagrii*



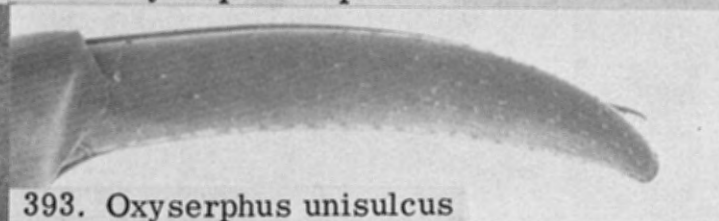
390. *Oxyserphus calcaratus*



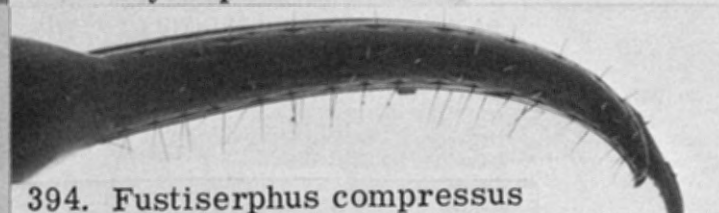
391. *Oxyserphus brevicaulis*



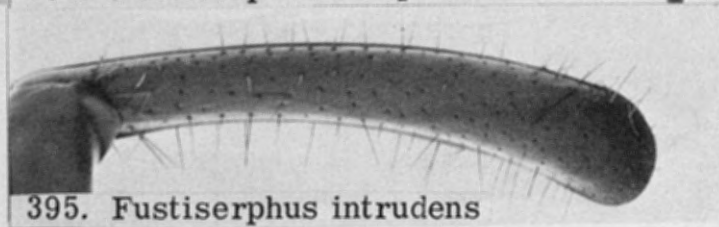
392. *Oxyserphus capitatus*



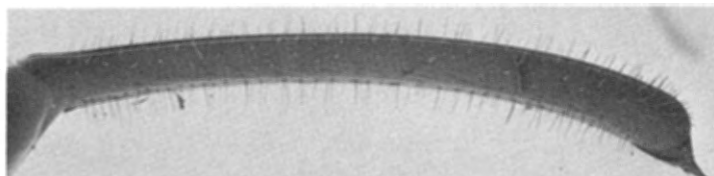
393. *Oxyserphus unisulcus*



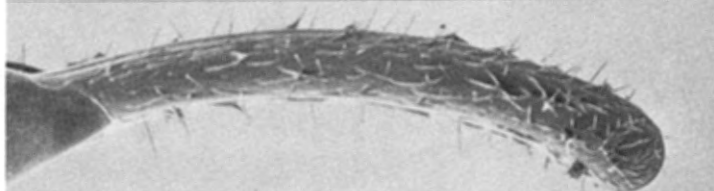
394. *Fustiserphus compressus*



395. *Fustiserphus intrudens*



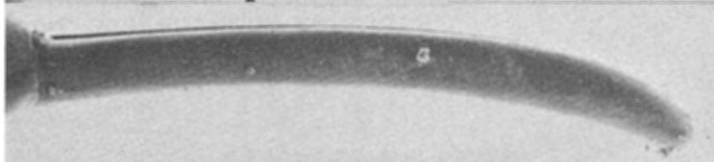
396. *Fustiserphus unidentatus unidentatus*



397. *Fustiserphus reticulatus reticulatus*



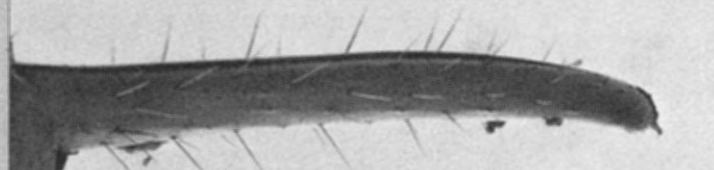
398. *Tretoserphus laricis*



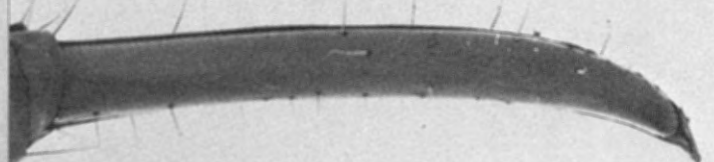
399. *Tretoserphus perkinsi*



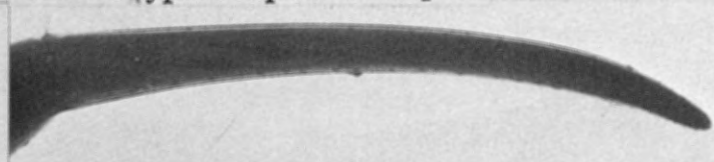
400. *Tretoserphus nudicauda*



401. *Tretoserphus foveolatus*



402. *Cryptoserphus flavipes*



403. *Cryptoserphus fortis*



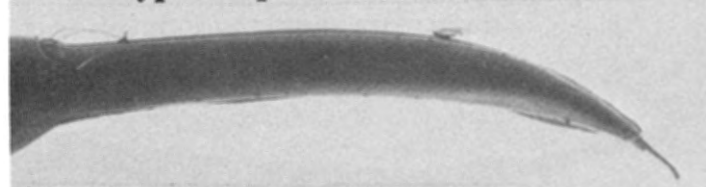
404. *Cryptoserphus occidentalis*



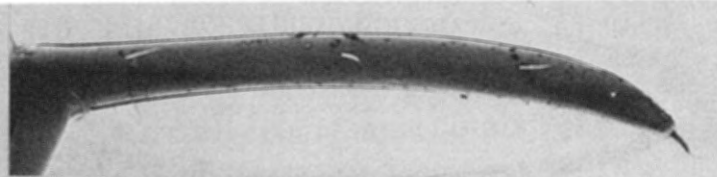
405. *Cryptoserphus medius*



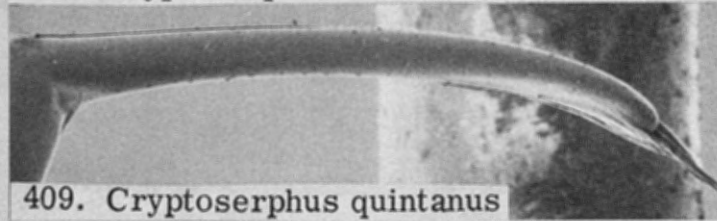
406. *Cryptoserphus dilatatus*



407. *Cryptoserphus hirtipennis*



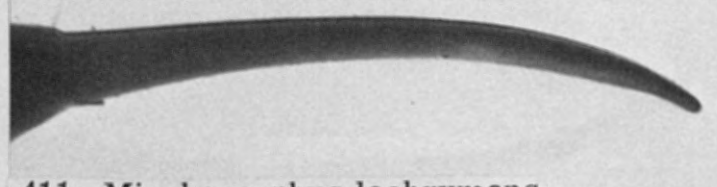
408. *Cryptoserphus aculeator*



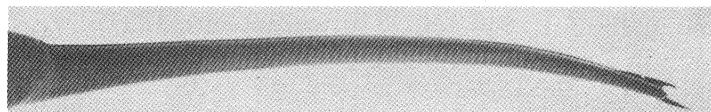
409. *Cryptoserphus quintanus*



410. *Cryptoserphus rostratus*



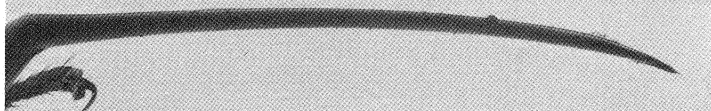
411. *Mischoserphus lachrymans*



412. *Mischoserphus alternans*



413. *Mischoserphus arcuator*



414. *Mischoserphus obesus*



415. *Mischoserphus alaskensis*



416. *Mischoserphus abbreviatus*



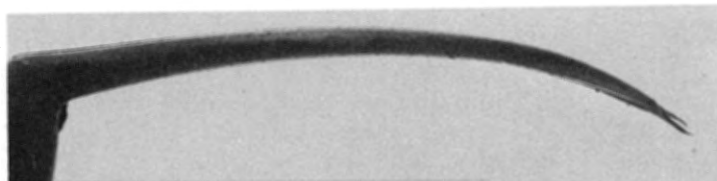
417. *Mischoserphus obscurus*



418. *Mischoserphus acomus*



419. *Mischoserphus comatus*



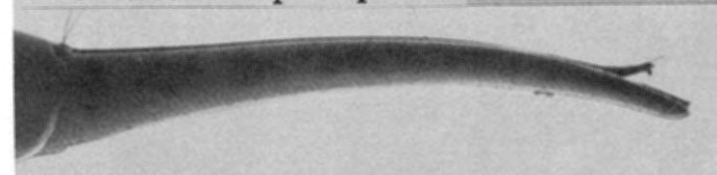
420. *Mischoserphus pileatus*



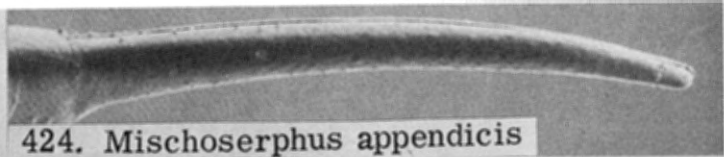
421. *Mischoserphus crassicornis*



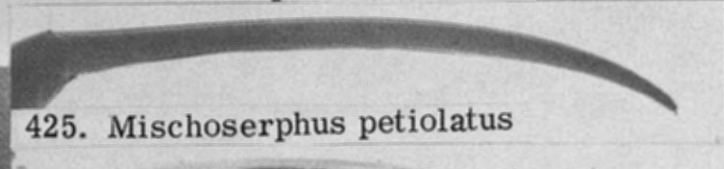
422. *Mischoserphus pictus*



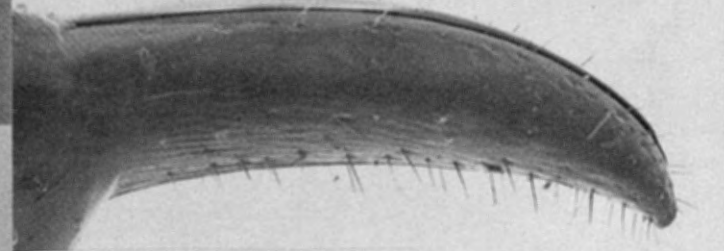
423. *Mischoserphus calvus*



424. *Mischoserphus appendicis*



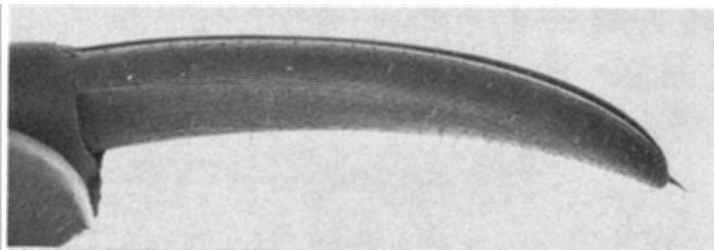
425. *Mischoserphus petiolatus*



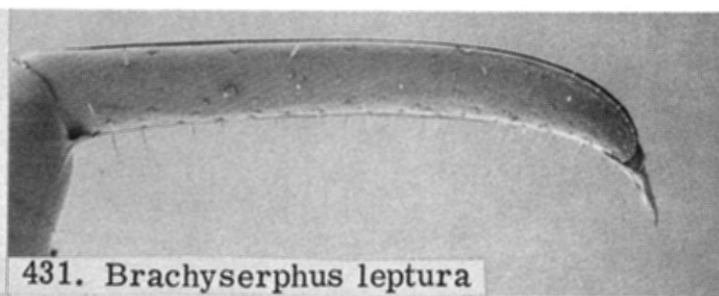
426. *Pschornia minora*



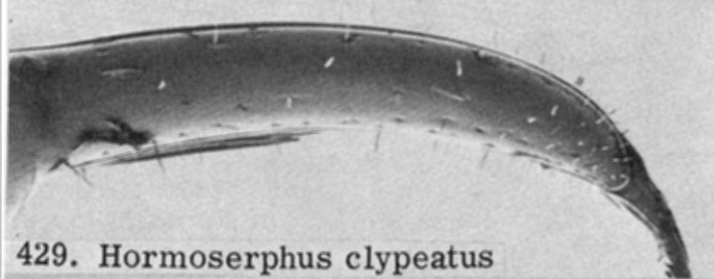
427. *Pschornia striata*



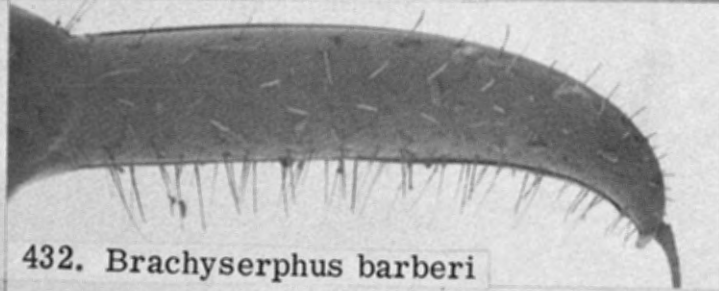
428. *Pschornia megaloura*



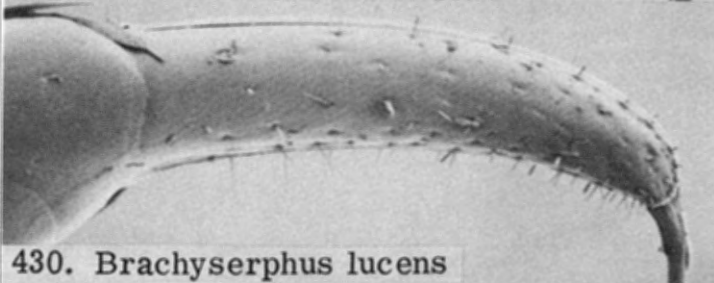
431. *Brachyserphus leptura*



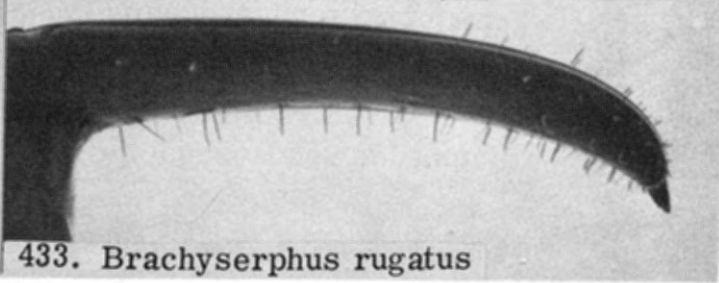
429. *Hormoserphus clypeatus*



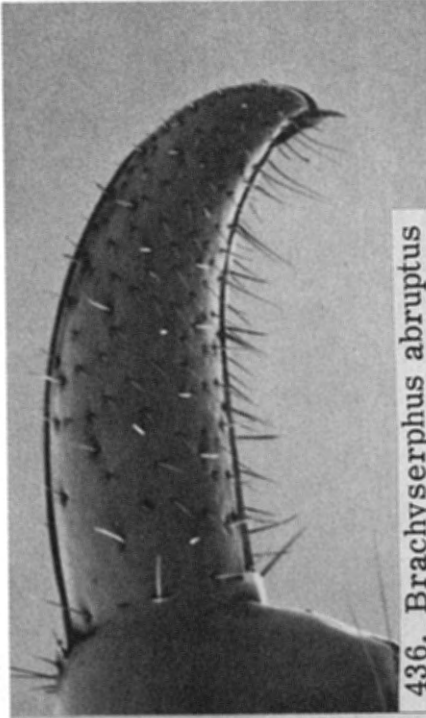
432. *Brachyserphus barberi*



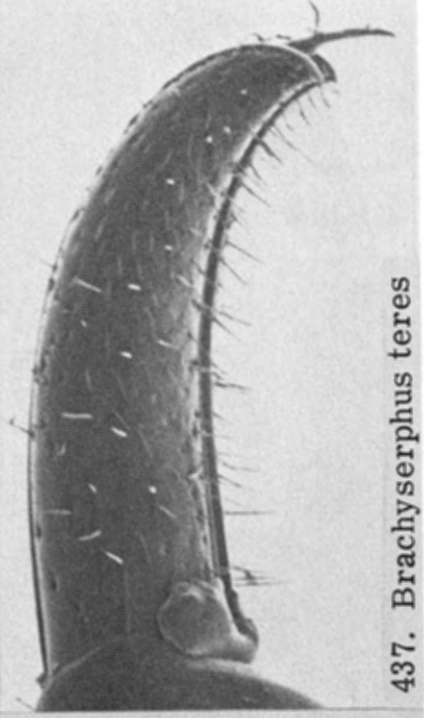
430. *Brachyserphus lucens*



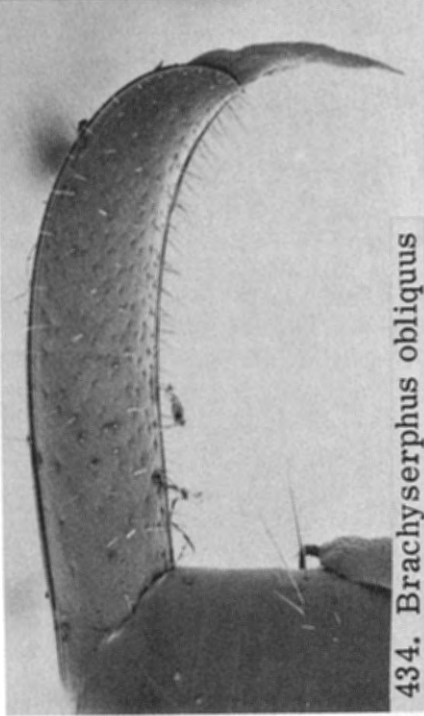
433. *Brachyserphus rugatus*



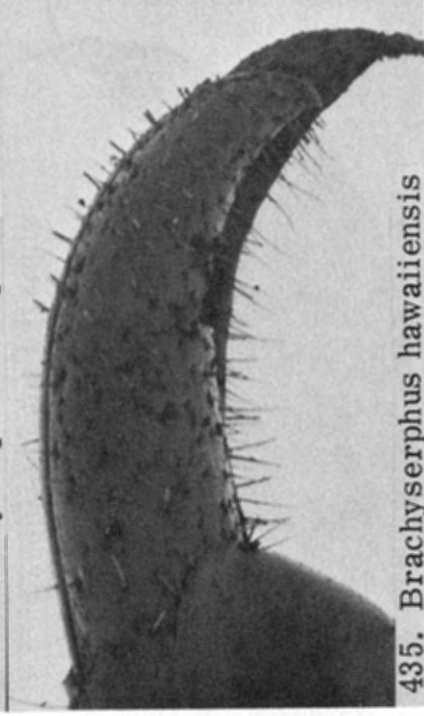
436. *Brachyserphus abruptus*



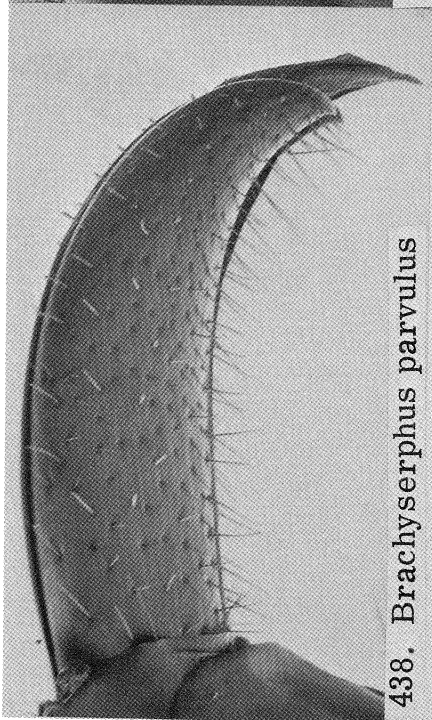
437. *Brachyserphus teres*



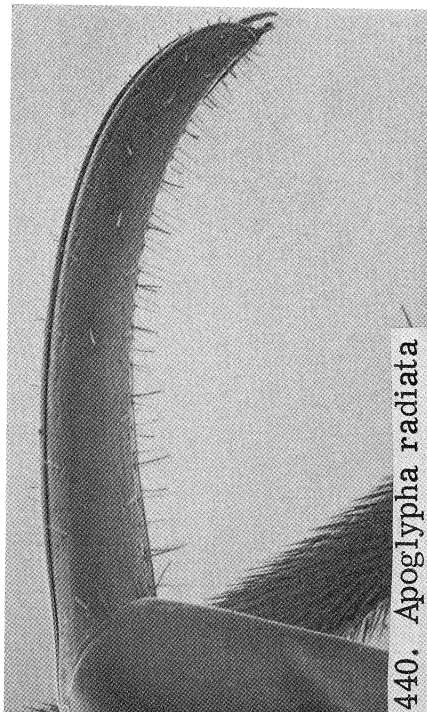
434. *Brachyserphus obliquus*



435. *Brachyserphus hawaiiensis*



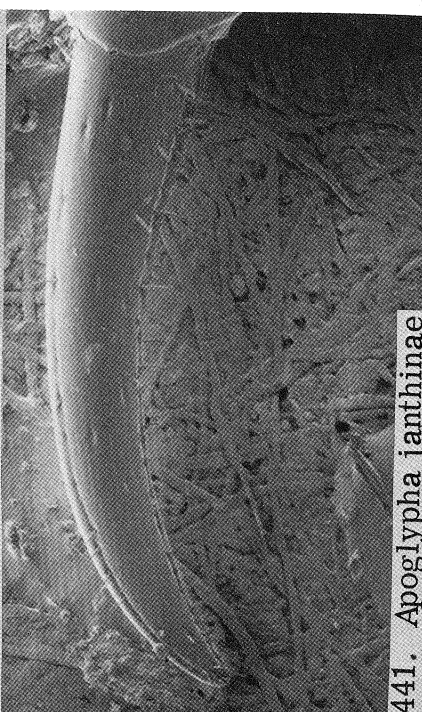
438. *Brachyserphus parvulus*



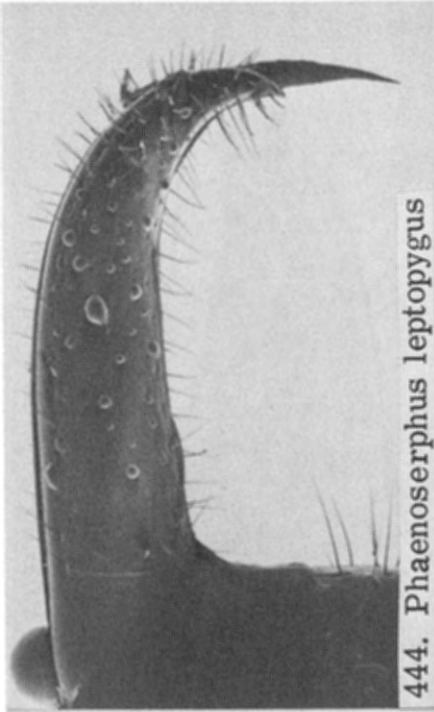
440. *Apoglypha radiata*



439. *Brachyserphus laeviceps*



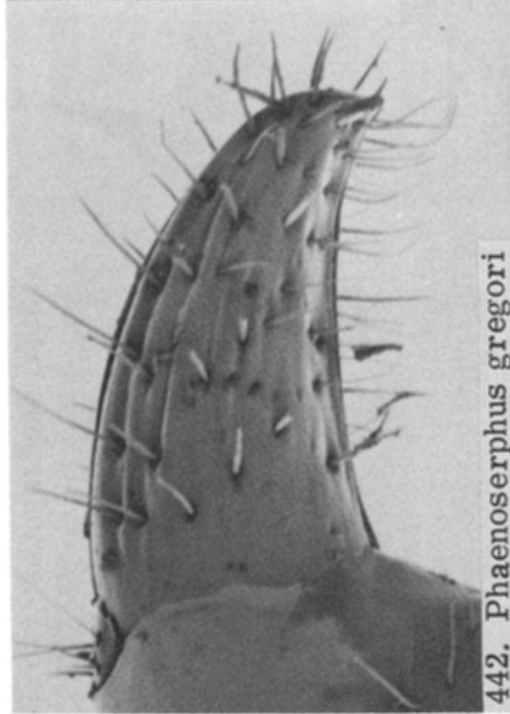
441. *Apoglypha janthinae*



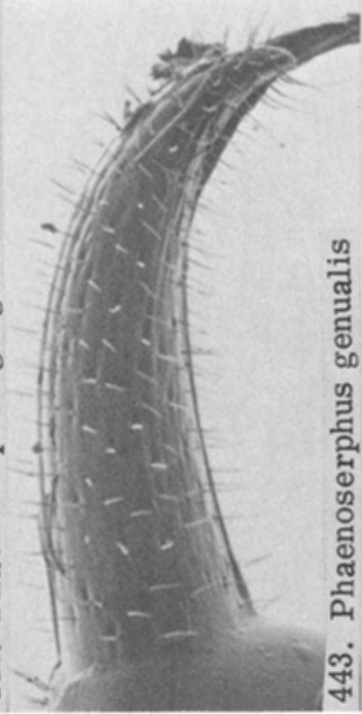
444. *Phaenoserphus leptopygus*



445. *Phaenoserphus nigripes*



442. *Phaenoserphus gregori*

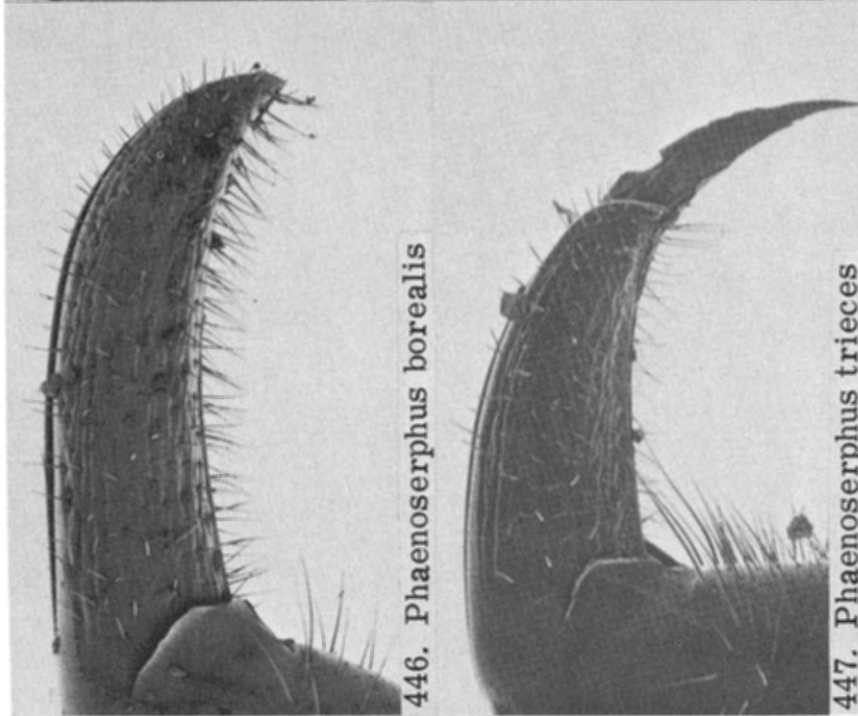


443. *Phaenoserphus genualis*



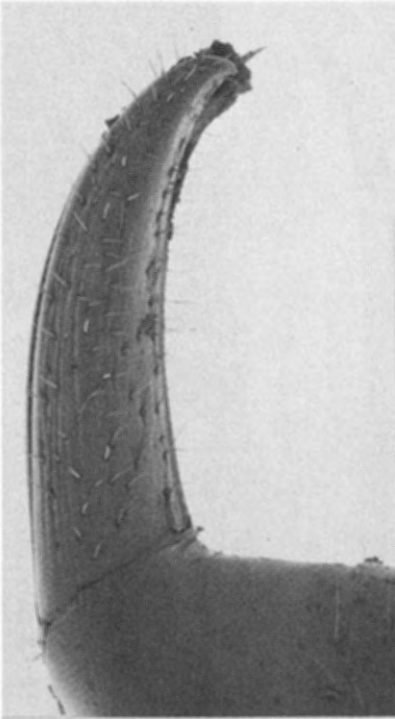
448. *Phaenoserphus granulatus*

449. *Phaenoserphus fuscipes*

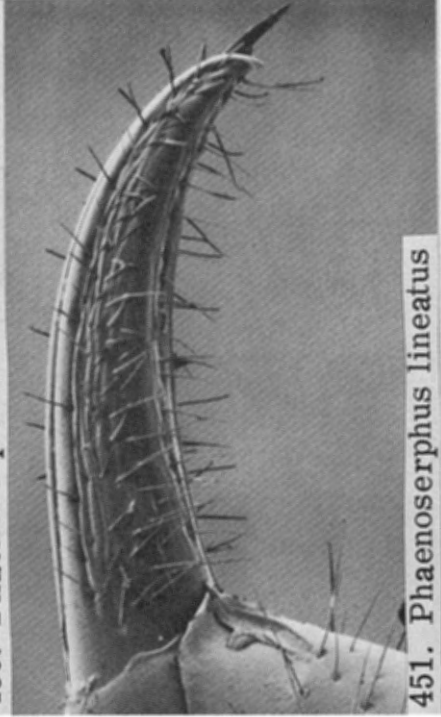


446. *Phaenoserphus borealis*

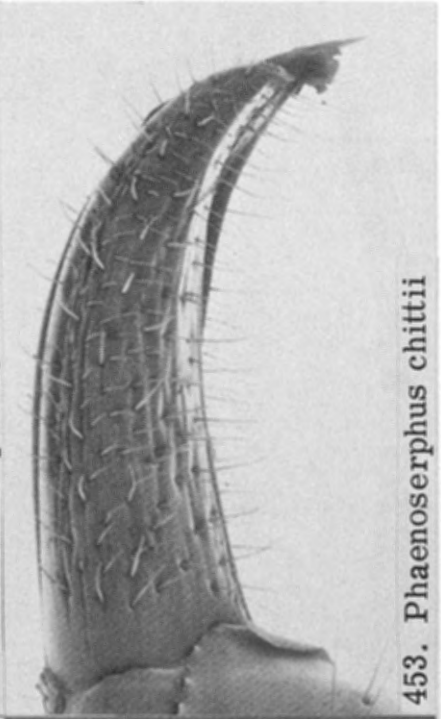
447. *Phaenoserphus trieces*



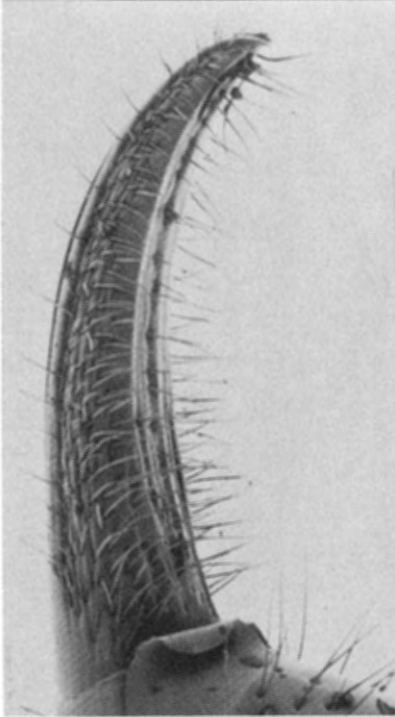
452. *Phaenoserphus glabratus*



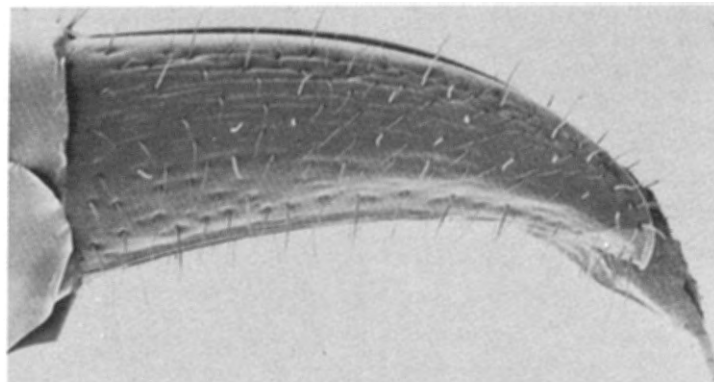
450. *Phaenoserphus melliventris*



453. *Phaenoserphus chittii*



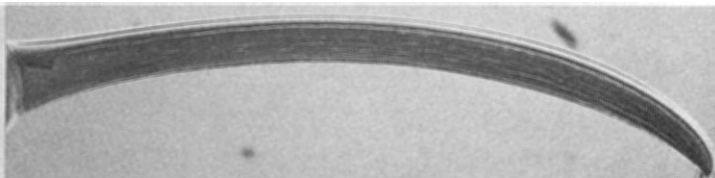
451. *Phaenoserphus lineatus*



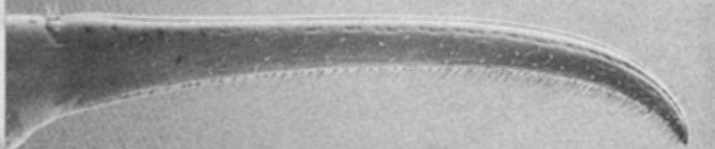
454. *Phaenoserphus viator*



455. *Phaenoserphus pallipes*



456. *Serphus caudatus*



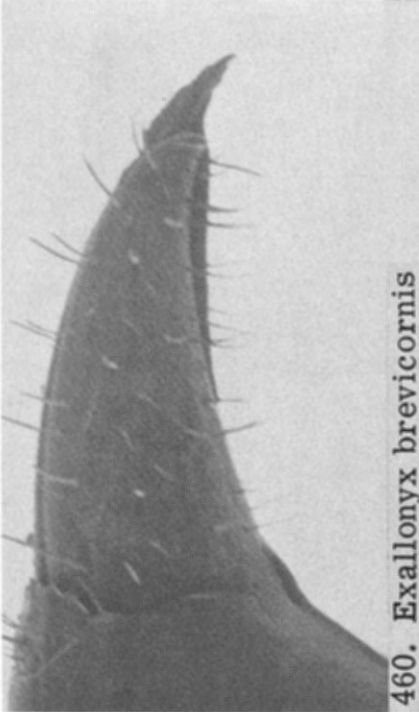
457. *Serphus pallidus*



458. *Serphus terminalis*



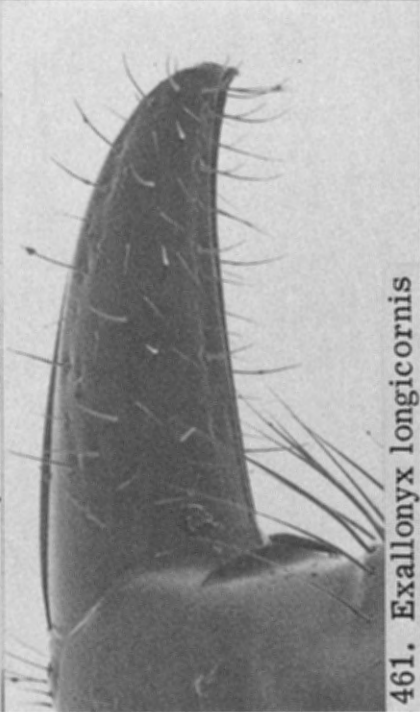
459. *Serphus bistriatus*



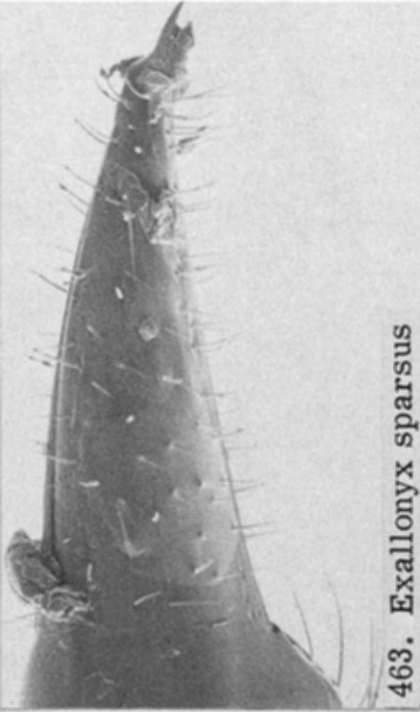
460. *Exallonyx brevicornis*



462. *Exallonyx certus*



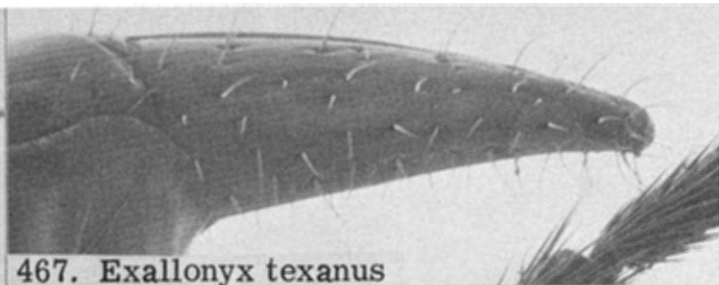
461. *Exallonyx longicornis*



463. *Exallonyx sparsus*



464. *Exallonyx quadriceps*



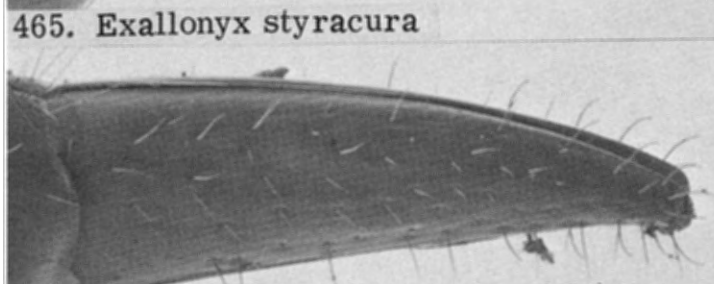
467. *Exallonyx texanus*



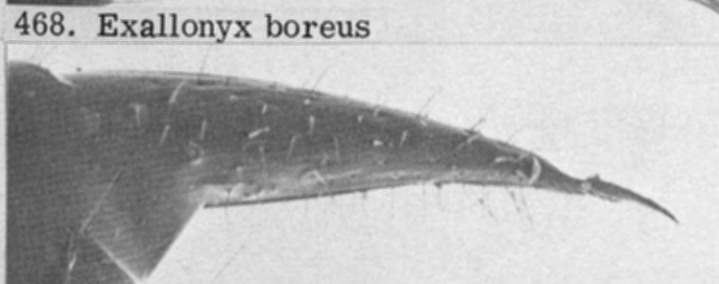
465. *Exallonyx styracura*



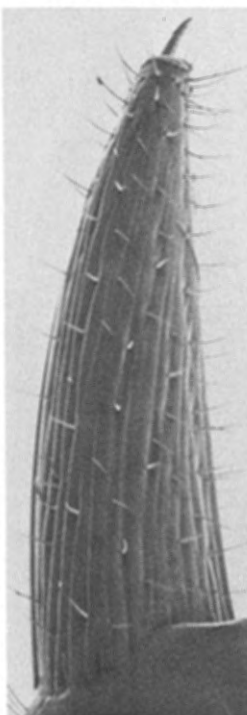
468. *Exallonyx boreus*



466. *Exallonyx ater*



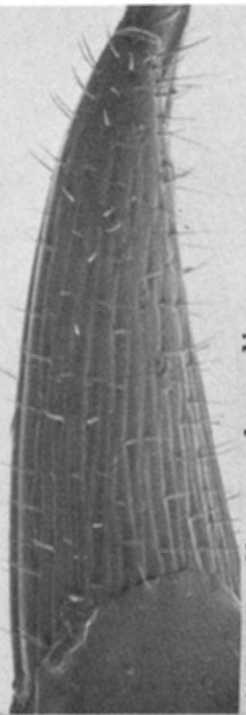
469. *Exallonyx nevadensis*



473. *Exallonyx fuscicornis*



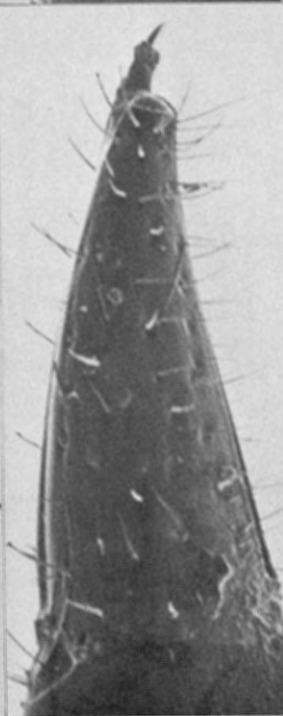
474. *Exallonyx diminuens*



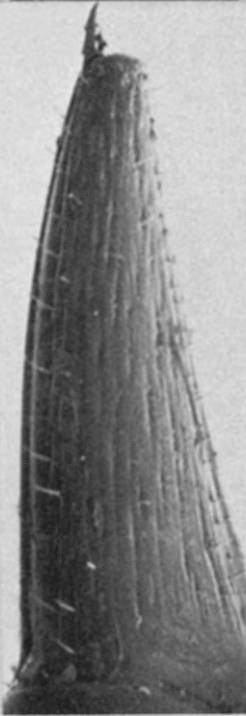
475. *Exallonyx pleuralis*



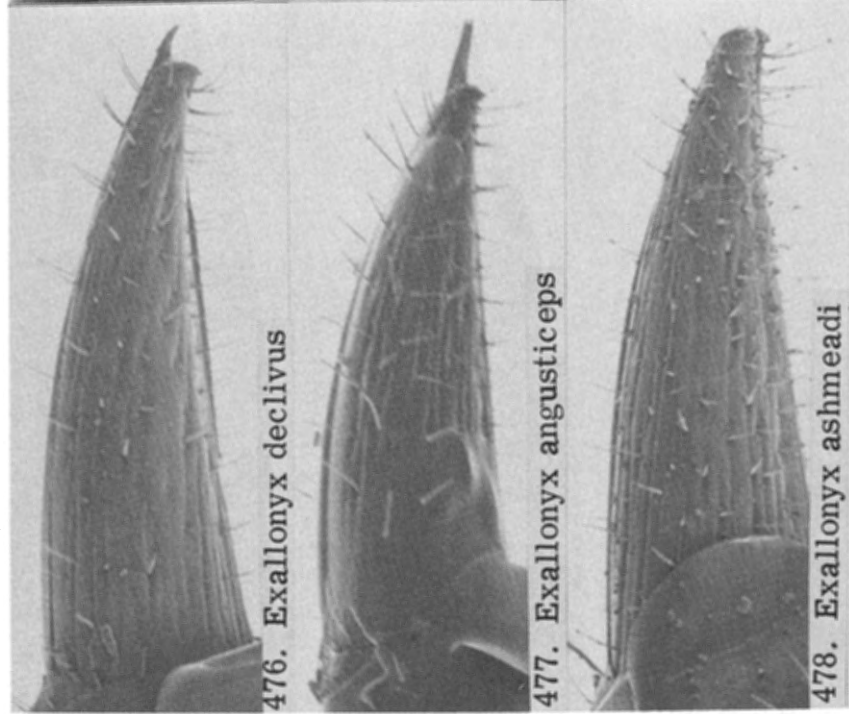
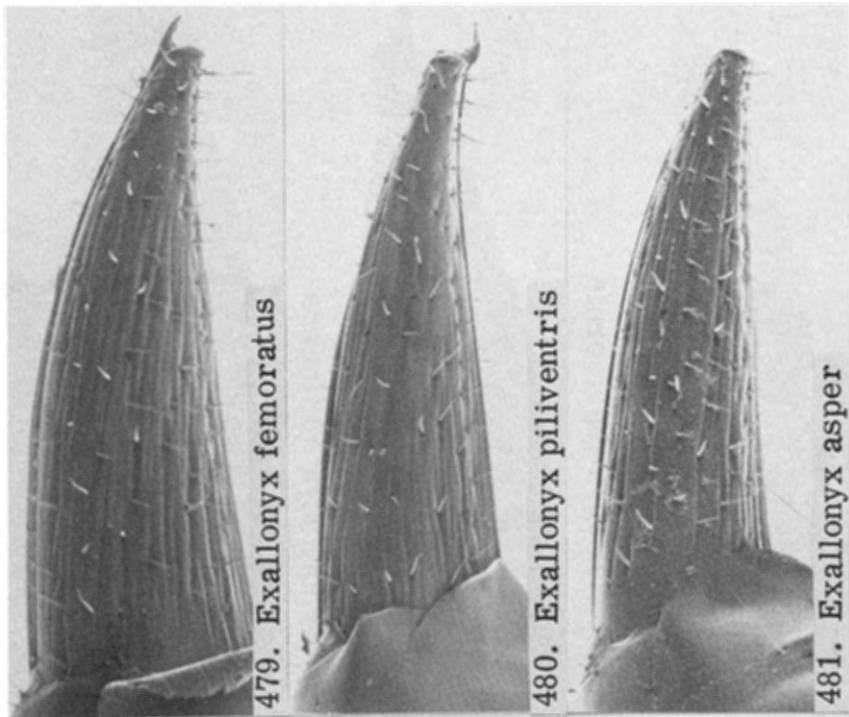
470. *Exallonyx artoculus*

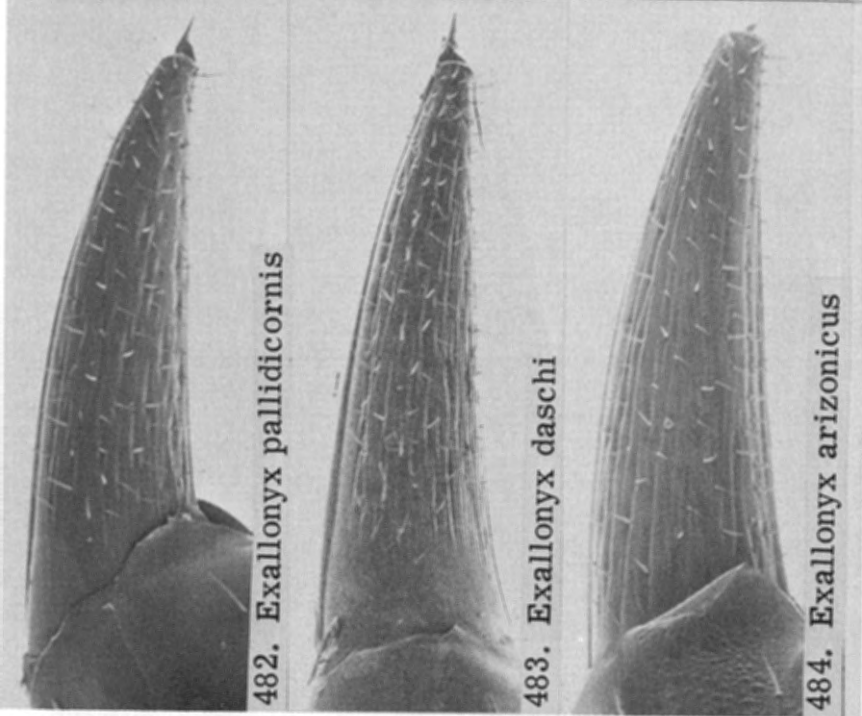
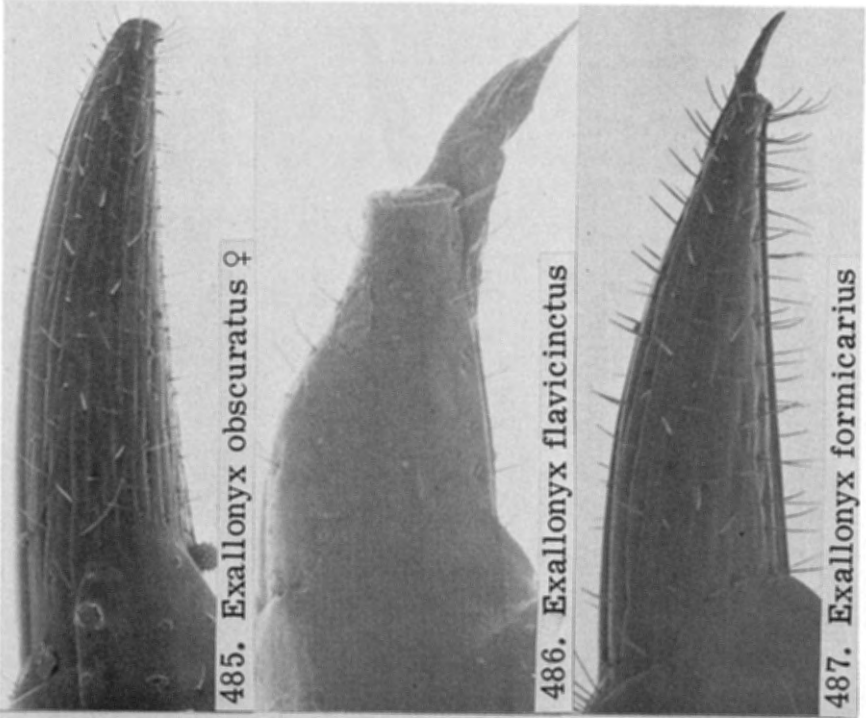


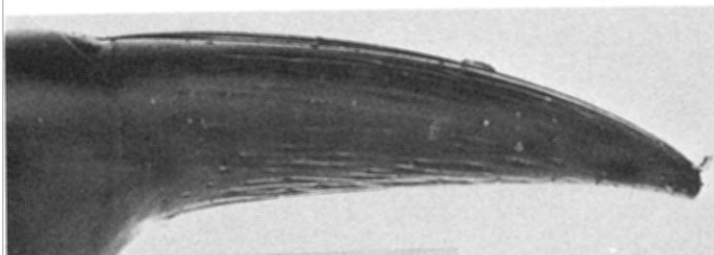
471. *Exallonyx simplicior*



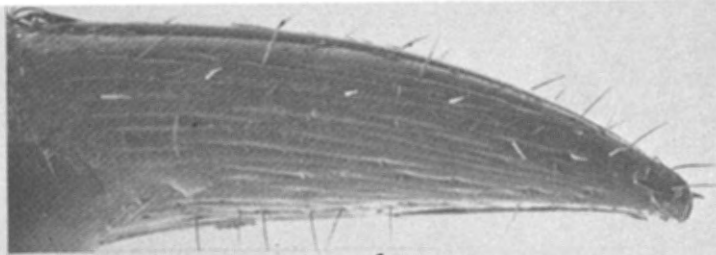
472. *Exallonyx placidus*



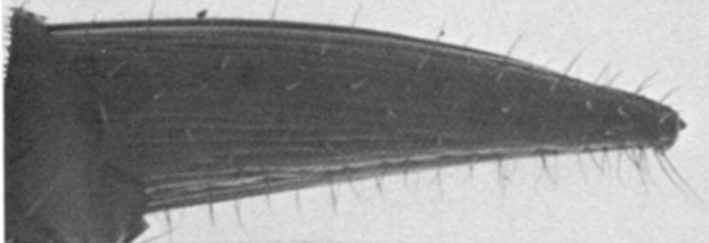




488. *Exallonyx microcerus*



491. *Exallonyx crassulus*



489. *Exallonyx trifoveatus*



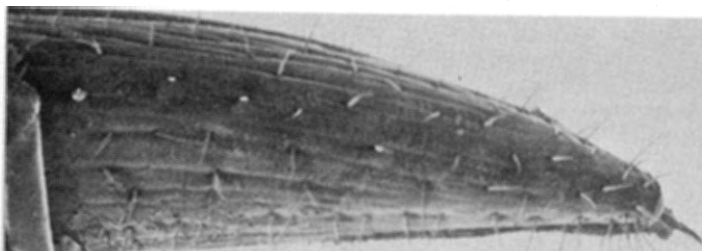
492. *Exallonyx polysulcus*



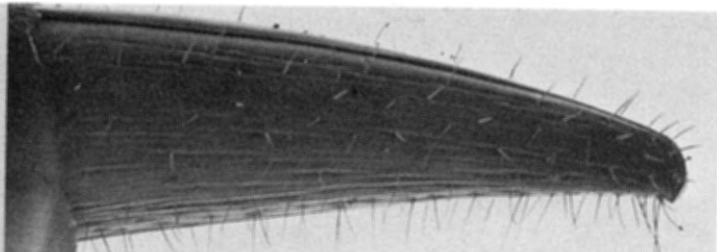
490. *Exallonyx ligatus*



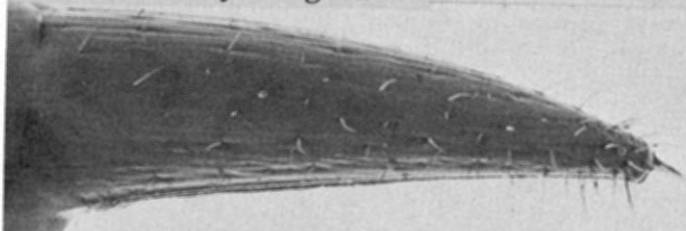
493. *Exallonyx visayanus*



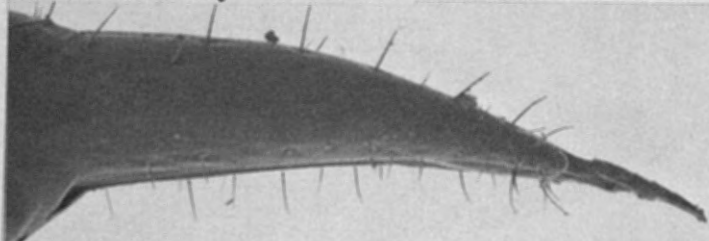
494. *Exallonyx angulatus*



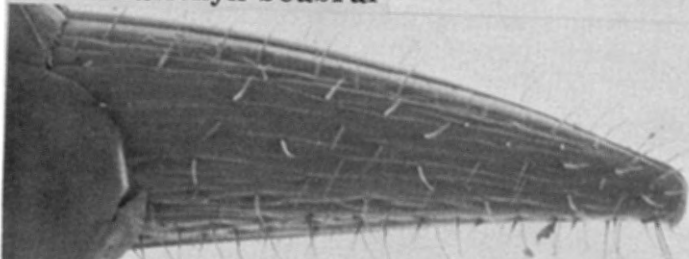
497. *Exallonyx subteres*



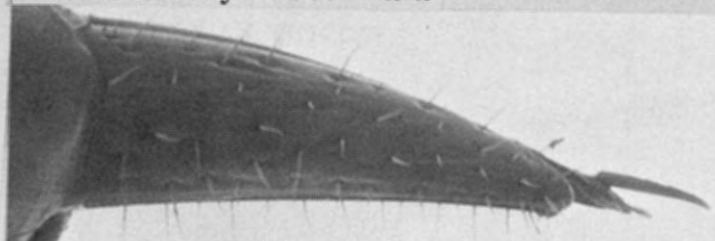
495. *Exallonyx seabrai*



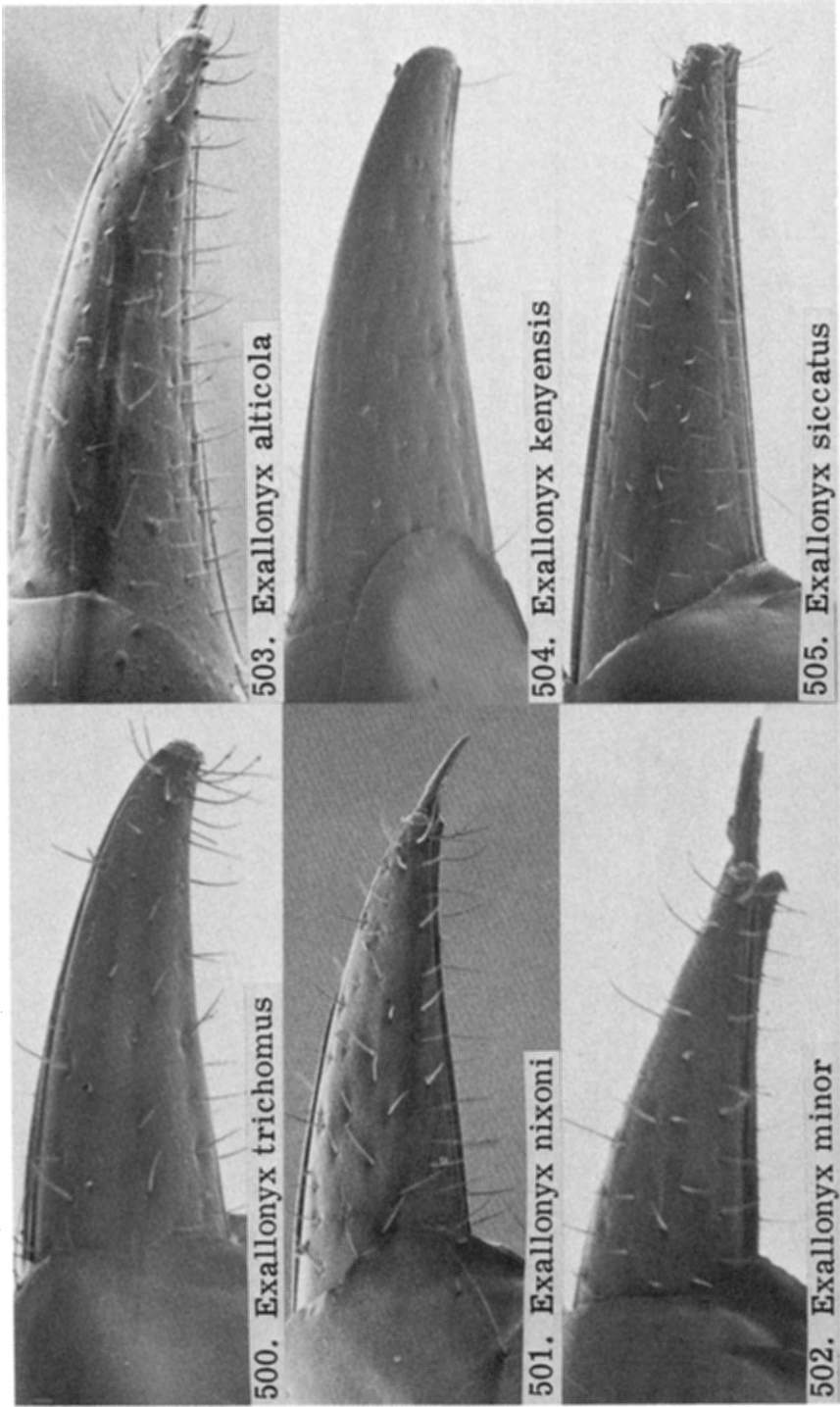
498. *Exallonyx brevimala*



496. *Exallonyx leptocorsa*



499. *Exallonyx subserratus*



500. *Exallonyx trichomus*

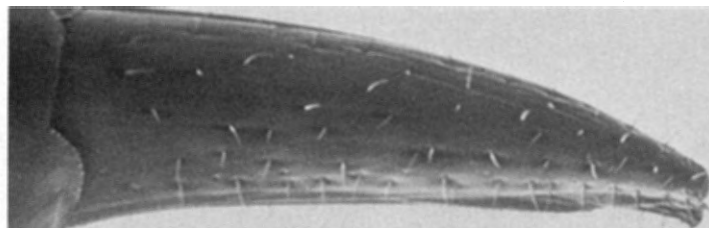
501. *Exallonyx nixonii*

502. *Exallonyx minor*

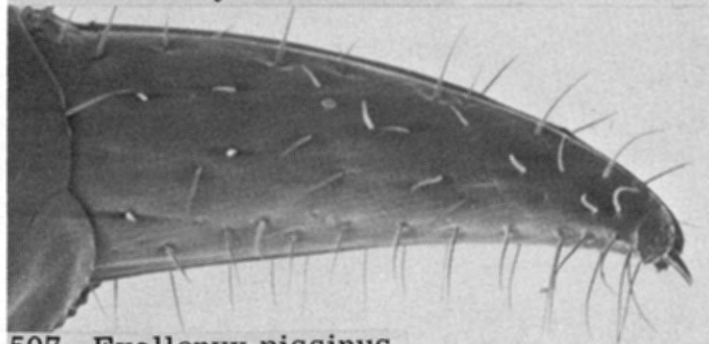
503. *Exallonyx alticola*

504. *Exallonyx kenyensis*

505. *Exallonyx siccatus*



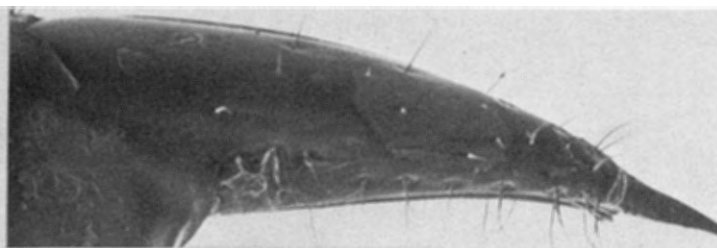
506. *Exallonyx monotrema*



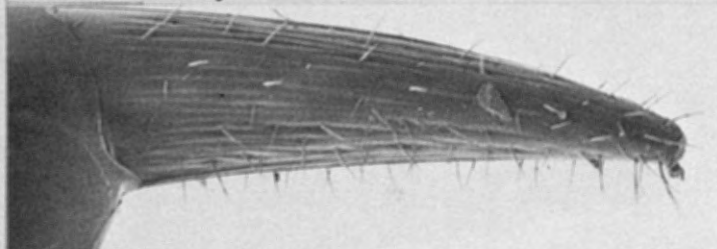
507. *Exallonyx pissinus*



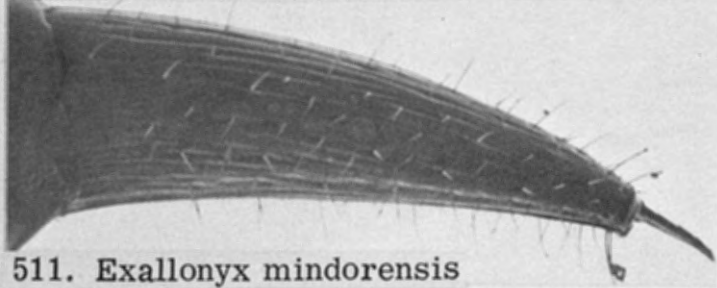
508. *Exallonyx penai*



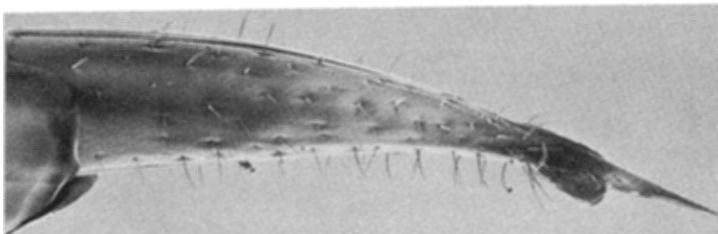
509. *Exallonyx cervicatus*



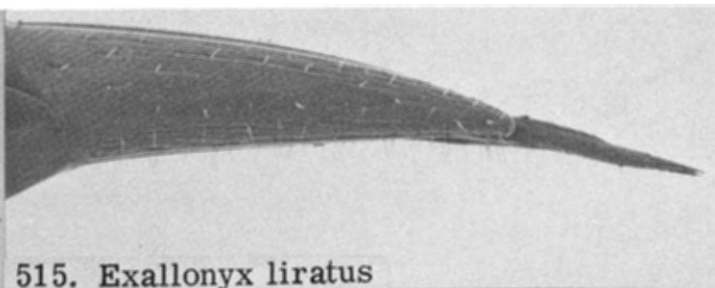
510. *Exallonyx cingulatus*



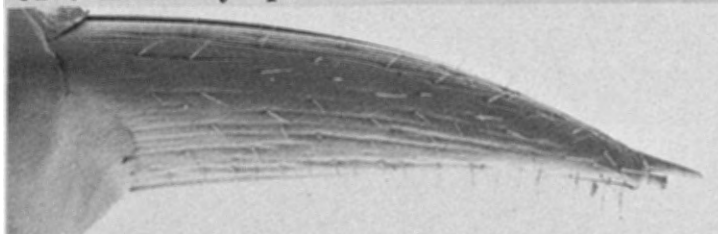
511. *Exallonyx mindorensis*



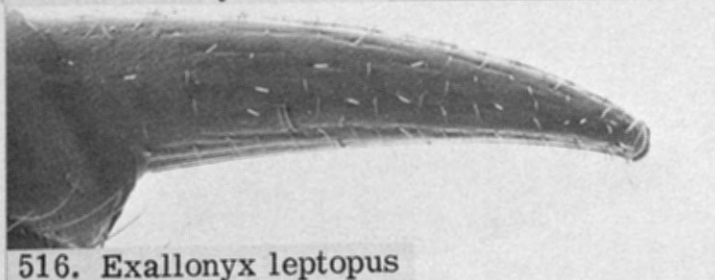
512. *Exallonyx pustula*



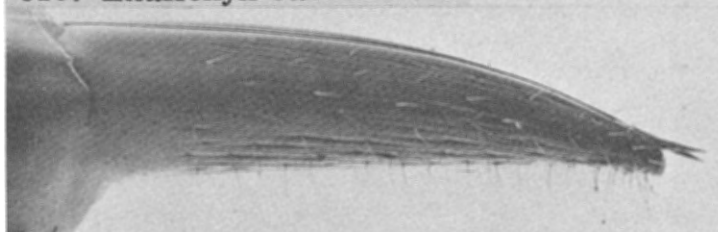
515. *Exallonyx liratus*



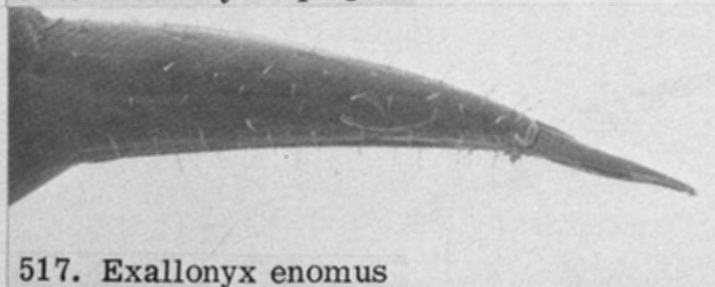
513. *Exallonyx carbunculus*



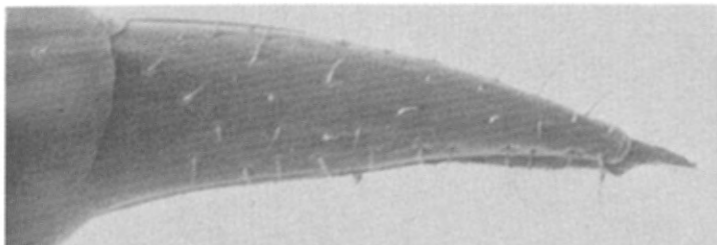
516. *Exallonyx leptopus*



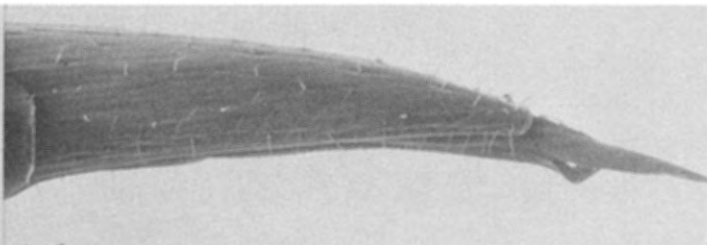
514. *Exallonyx truncatus*



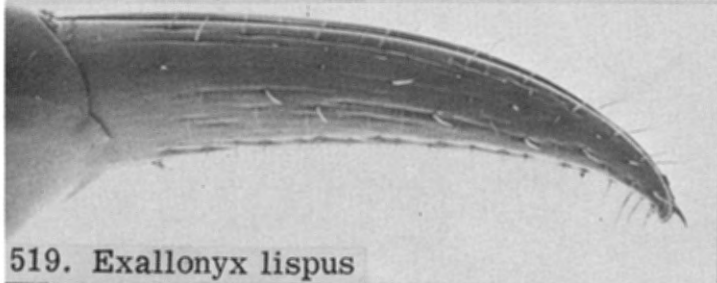
517. *Exallonyx enomus*



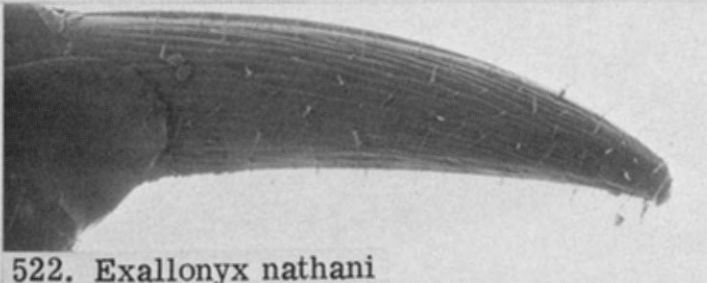
518. *Exallonyx durus*



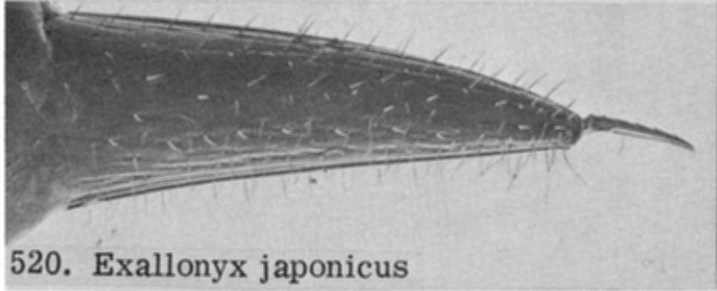
521. *Exallonyx orientalis*



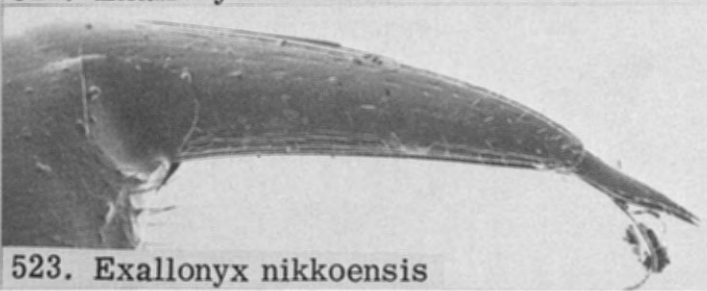
519. *Exallonyx lispus*



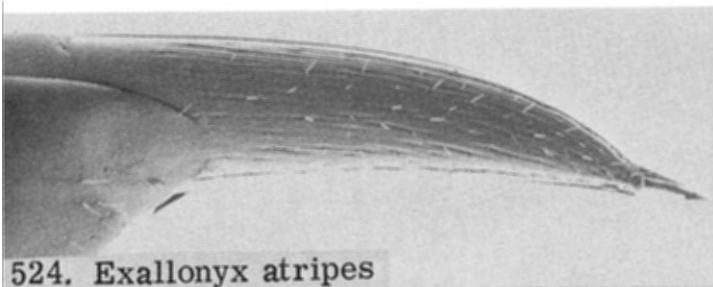
522. *Exallonyx nathani*



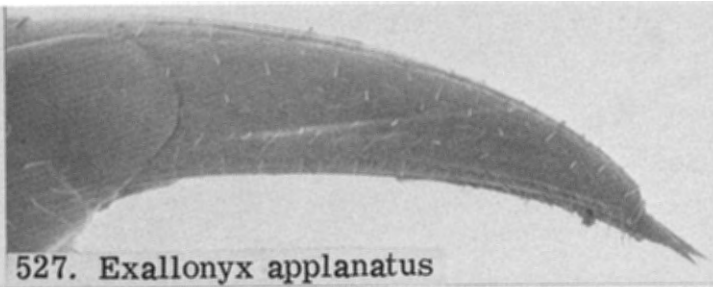
520. *Exallonyx japonicus*



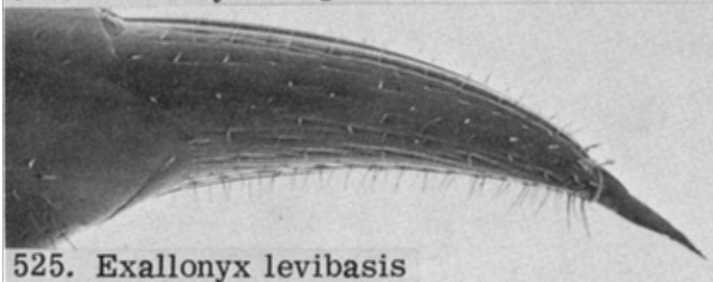
523. *Exallonyx nikkoensis*



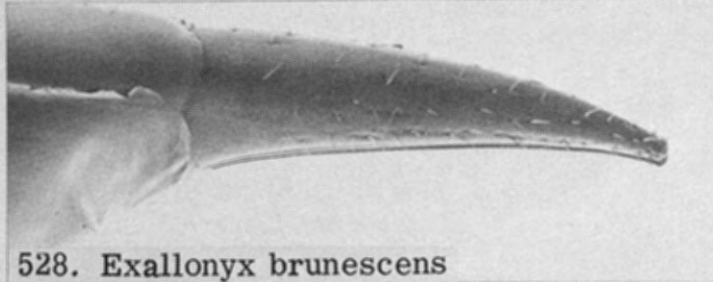
524. *Exallonyx atripes*



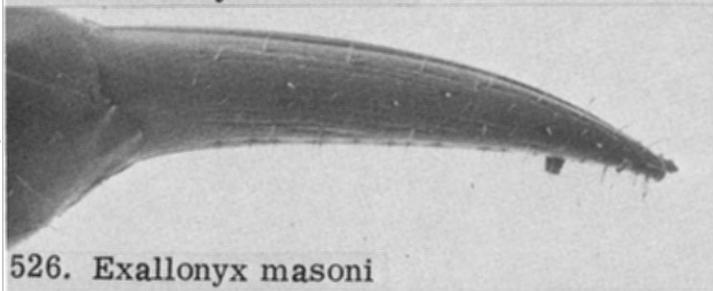
527. *Exallonyx applanatus*



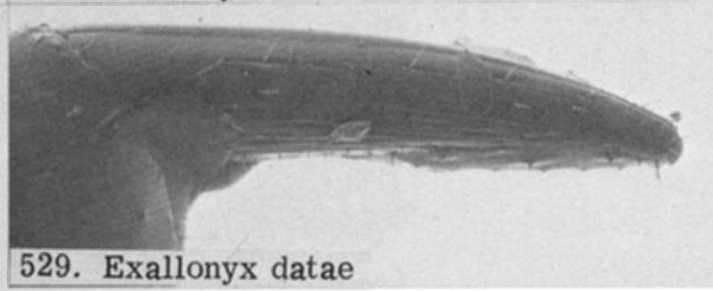
525. *Exallonyx levibasis*



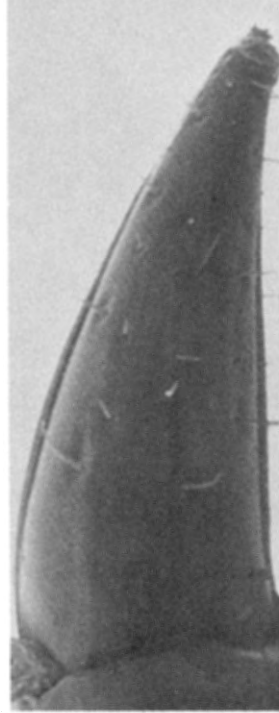
528. *Exallonyx brunescens*



526. *Exallonyx masoni*



529. *Exallonyx datae*



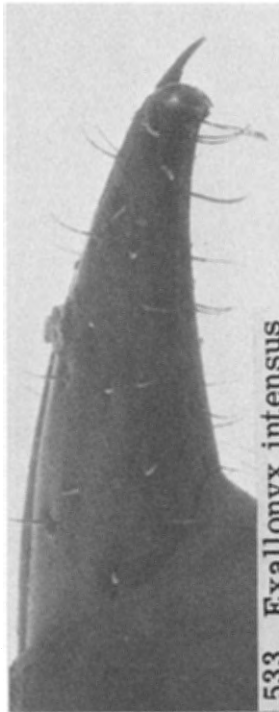
530. *Exallonyx evanescens*



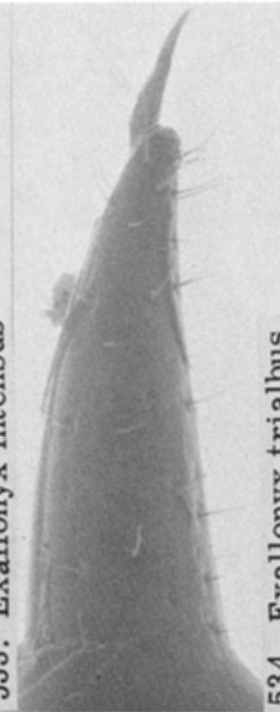
531. *Exallonyx semitropis*



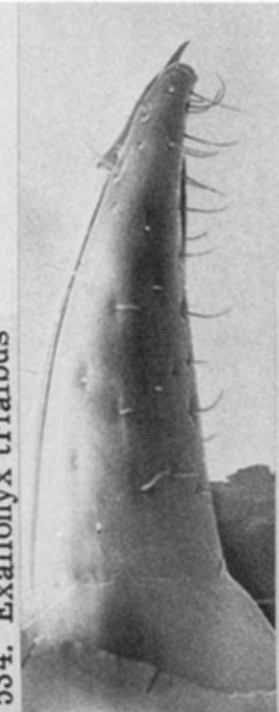
532. *Exallonyx mydobius*



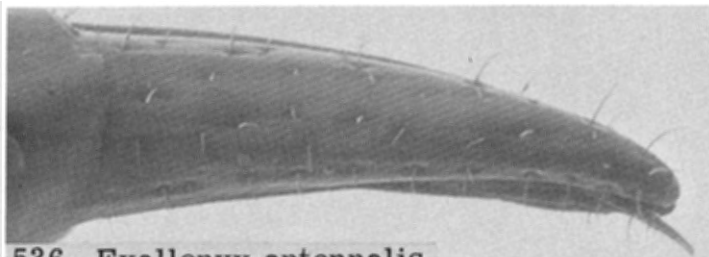
533. *Exallonyx intensus*



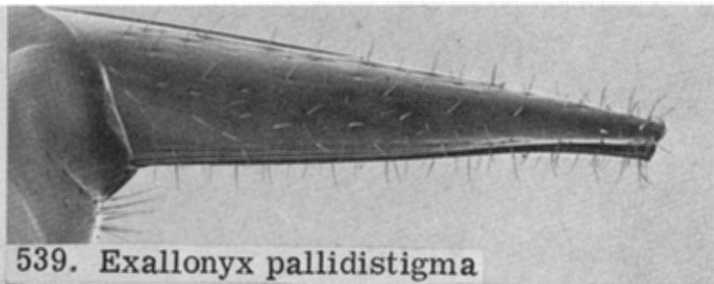
534. *Exallonyx trialbus*



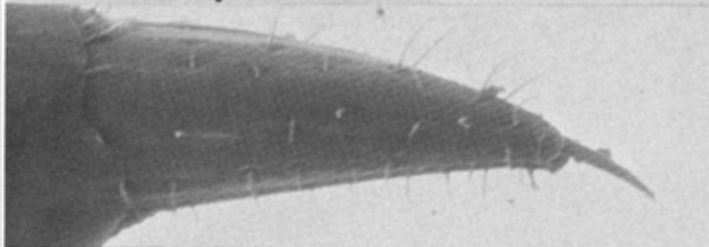
535. *Exallonyx columnaris*



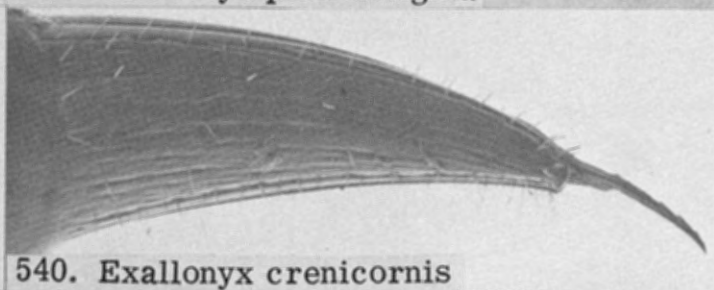
536. *Exallonyx antennalis*



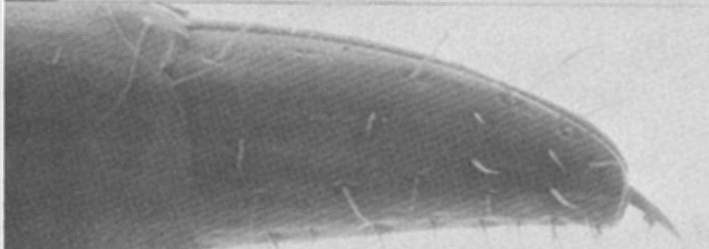
539. *Exallonyx pallidistigma*



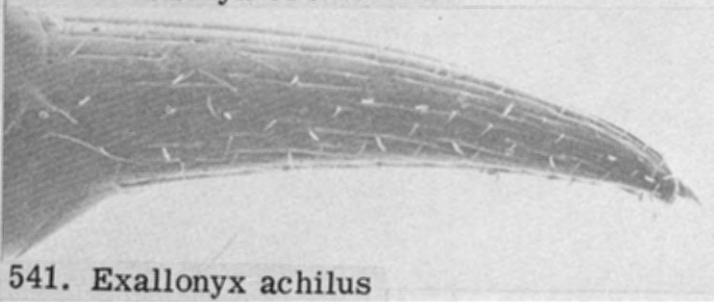
537. *Exallonyx burhytis*



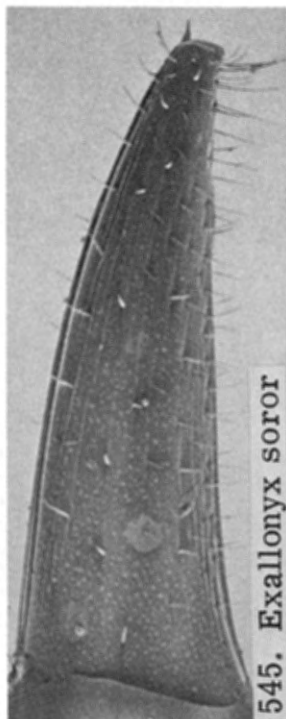
540. *Exallonyx crenicornis*



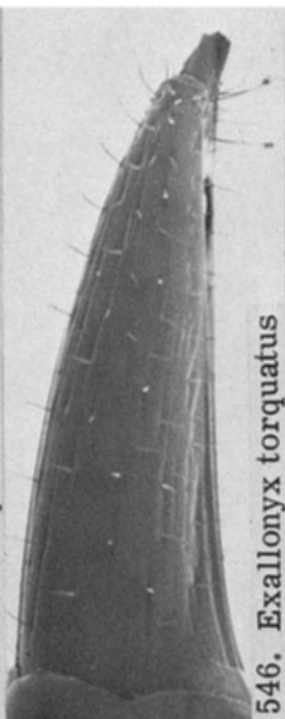
538. *Exallonyx collaris*



541. *Exallonyx achilus*



545. *Exallonyx soror*



546. *Exallonyx torquatus*



547. *Exallonyx dictyotus*



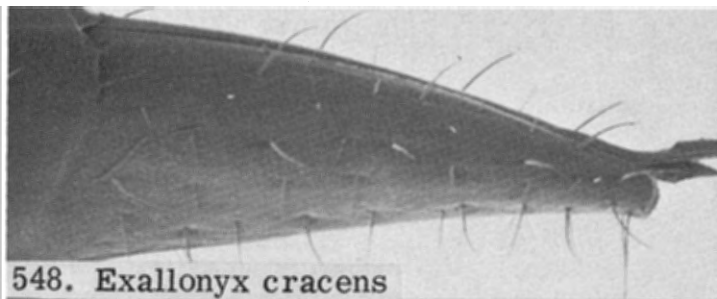
542. *Exallonyx obsoletus*



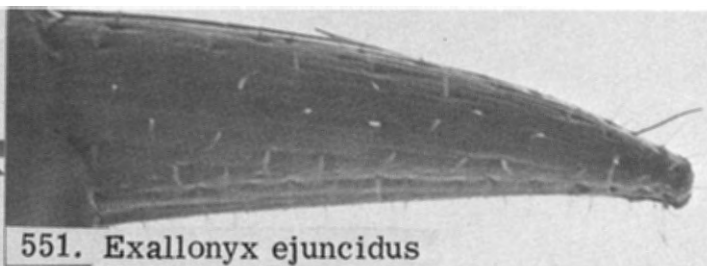
543. *Exallonyx grandis*



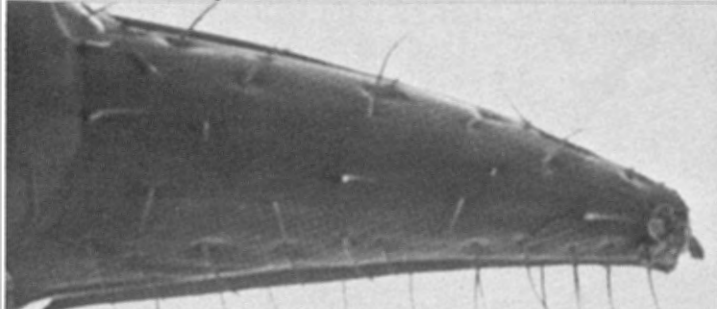
544. *Exallonyx camelinus*



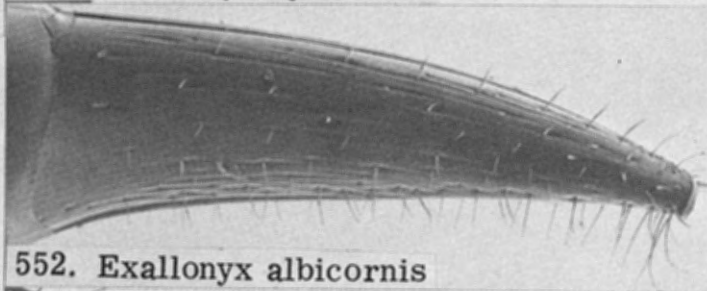
548. *Exallonyx cracens*



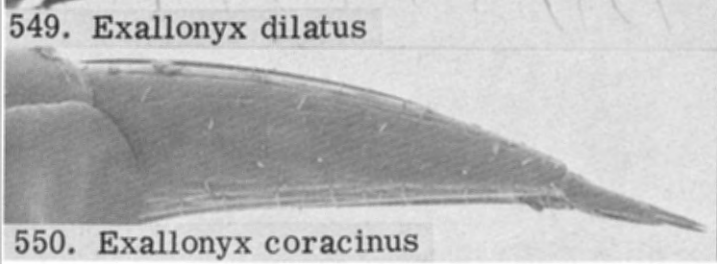
551. *Exallonyx ejuncidus*



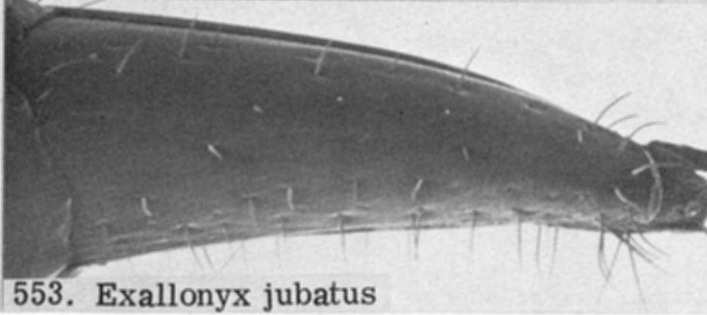
549. *Exallonyx dilatatus*



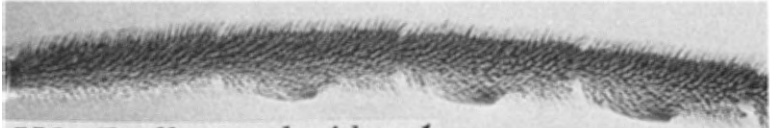
552. *Exallonyx albicornis*



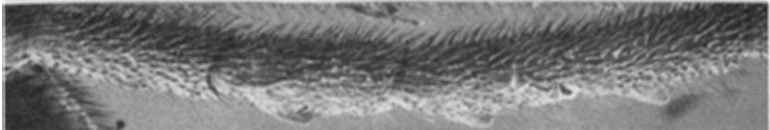
550. *Exallonyx coracinus*



553. *Exallonyx jubatus*



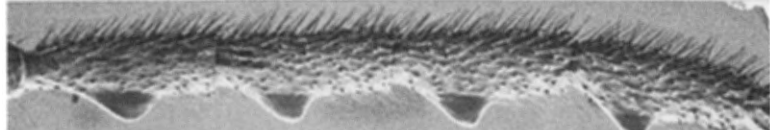
556. *Exallonyx placidus* ♂



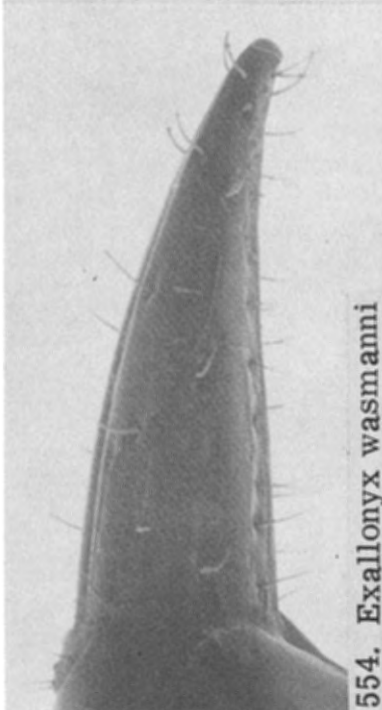
557. *Exallonyx fuscicornis* ♂



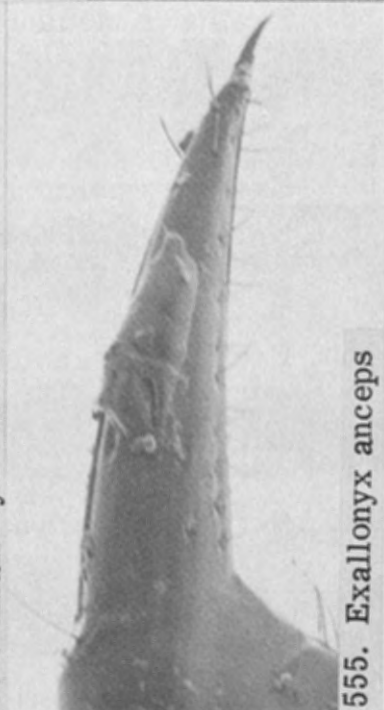
558. *Exallonyx leiopleurum* ♂



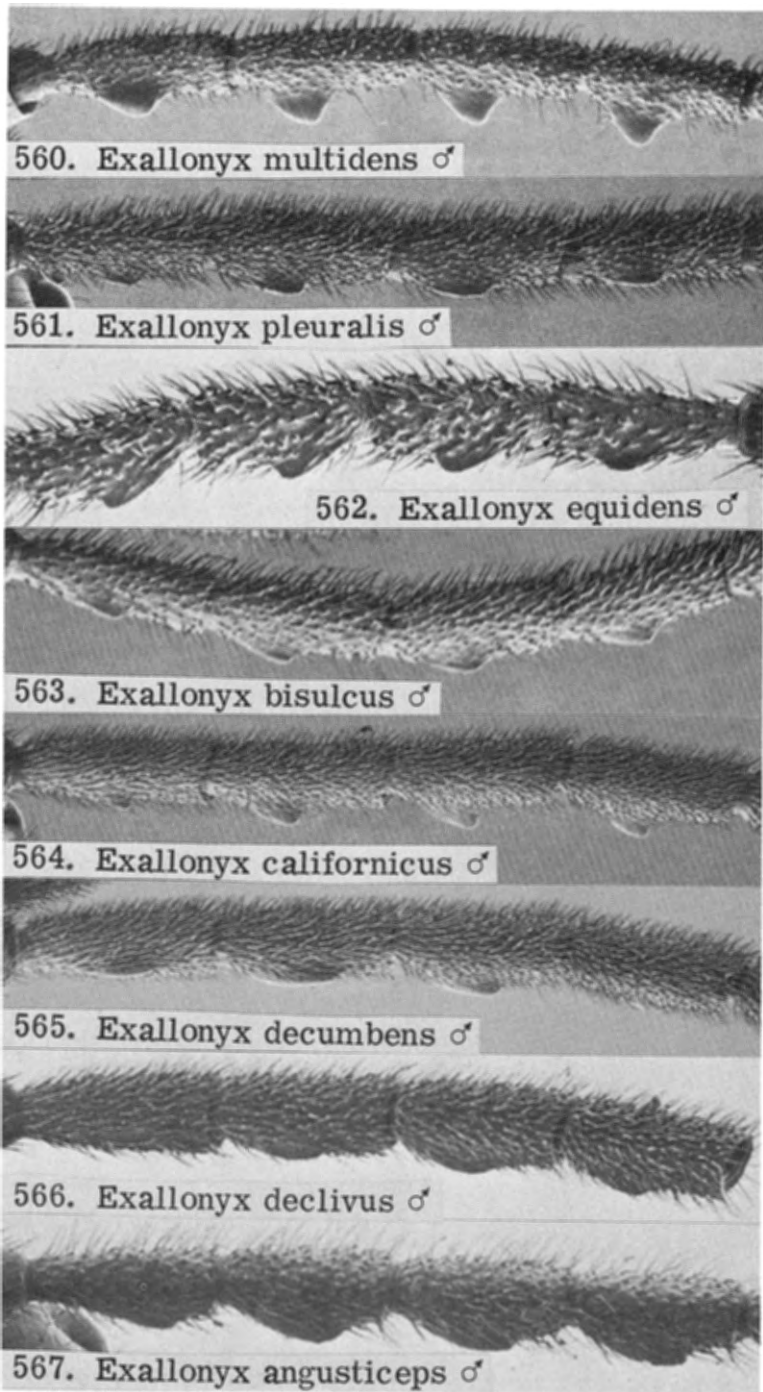
559. *Exallonyx diminuens* ♂

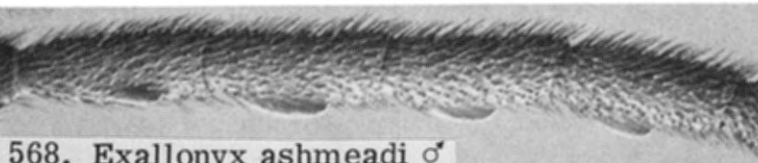


554. *Exallonyx wasmanni*

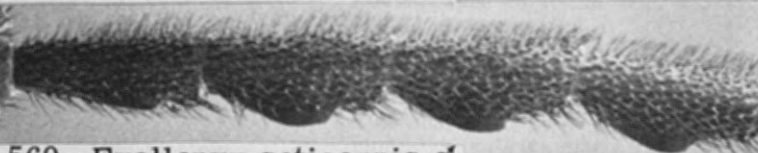


555. *Exallonyx anceps*

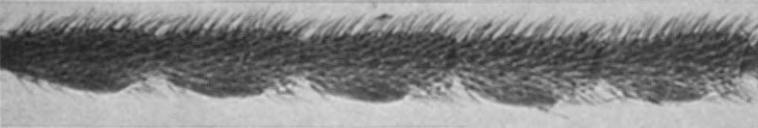




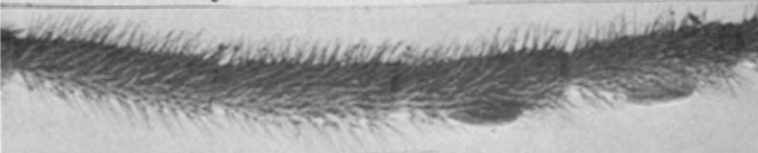
568. *Exallonyx ashmeadi* ♂



569. *Exallonyx seticornis* ♂



570. *Exallonyx femoratus* ♂



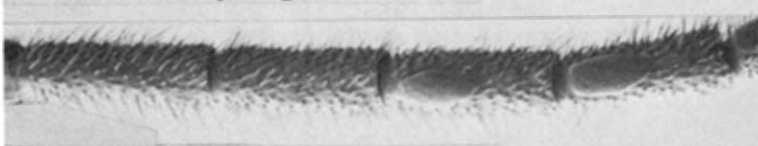
571. *Exallonyx lophotos* ♂



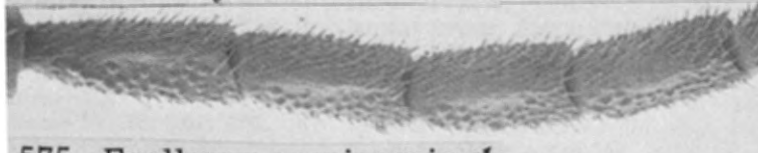
572. *Exallonyx pustula* ♂



573. *Exallonyx specularis* ♂



574. *Exallonyx carbunculus* ♂



575. *Exallonyx crenicornis* ♂

INDEX TO HOSTS

- admirabilis* (*Epilachna*) 65, 67
aeneus (*Meligethes*) 126, 195
aequus (*Scolopterus*) 33
aeruginosus (*Limonius*) 195
Agonum dorsale 142
Agriotes lineatus 195
Agriotes obscurus 192, 195
Agriotes sp. 195
albipes? (*Philonthus*) 279, 293
Aleochara bilineata 278
Amara apricaria 181
Amara bifrons 181
Amara carinata 188
Amara spp. 182
Anthribidae 7
Anthribus sp. 33
apricaria (*Amara*) 181
Armillaria mellea (host in) 84
ater (*Ocypus*) 357
Athous haemorrhoidalis 192
Athous sp. 195
- bifrons* (*Amara*) 181
biguttatus (*Notiophilus*) 137
bilineata (*Aleochara*) 278
Boletus (host in) 72, 91, 125
Bolitochara obliqua 199
Bolitophila hybrida 173, 179, 180
brevicollis (*Nebria*) 142, 160, 161, 162
Brevicornu griseicollis 141
buoliana (*Evetria*) 55
- Calathus fuscipes* 142
cameroni (*Nebria*) 168
Carabidae 7, 160, 174
Carabus granulatus 162
Carabus procerulus 162
Carabus scheidleri 162
Carabus splendens 161
Carabus violaceus 161
Carabus sp. 158
carinata (*Amara*) 188
cariniceps (*Hypocoelus*) 10
Cleridae 7
Coccinellidae 7, 68
contaminata (*Exechia*) 92
coruscus (*Phalacrus*) 126
Creophilus maxillosus 91, 93, 161, 220, 222
Ctenicera sp. 195
Curculionidae 7
Cynips kollari (host in) 179
- Diphyllus lunatus* 126
Diptera larvae 81
- Donisthorpea fuliginosa* (host in nest of) 206, 291, 379
dorcatomoides (*Scymnus*) 64
dorsale (*Agonum*) 142
- Elateridae* 7, 192
elongatus (*Zabrieus tenebrioides*) 174
Epilachna admirabilis 65, 67
Epilachna virgintioctopunctata 65, 67
Epilachninae 62
Erotylidae 7
Eucnemidae 7
Evetria buoliana 55
Exechia contaminata 92
- fomentarius* (*Fomes*, host in) 113
Fomes fomentarius (host in) 113
forficatus (*Lithobius*) 198
Fungivora fungorum 81, 82, 279, 383
Fungivora ruficollis 92
Fungivora sp. 91, 125
Fungivoridae 7, 95, 126, 180
fungorum (*Fungivora*) 81, 82, 279, 383
fungus beetles 126
fuscipes (*Calathus*) 142
- granulatus* (*Carabus*) 162
griseicollis (*Brevicornu*) 141
- haemorrhoidalis* (*Athous*) 192
Harpalus rufipes 174
Harpalus spp. 182
hybrida (*Bolitophila*) 173, 179, 180
Hypocoelus cariniceps 10
- Incentia nubila* 33
Irpex lacteus (host in) 120
Isorhipis ruficornis 11
- janthina* (*Thallis*) 131
- Lacon murinus* 181, 182
Lactarius (host in) 81
lacteus (*Irpex*, host in) 120
lasiophthalma (*Lonchaea*) 174
Leistus nitidus 161
lewisi (*Nebria*) 140
limbata (*Mycomya*) 173, 174
Limonius aeruginosus 195
linearis? (*Xantholinus*) 274, 279
lineatus (*Agriotes*) 195
Lithobiidae 7
Lithobius forficatus 198
Lithobius sp. 221
log (host in) 27, 29

- Lonchaea lasiophthalma* 174
lunatus (*Diphyllus*) 126
Lycoria spp. 29, 278
Lymantria monacha 179
- Macrocera maculata* 166
maculata (*Macrocera*) 166
madidus (*Pterostichus*) 162, 220
maxilloso (*Creophilus*) 91, 93, 161, 220, 222
Megaselia rufipes 290
melanarius (*Pterostichus*) 160
Melandryidae 7
Meligethes aeneus 126, 195
Meligethes sp. 126
mellea (*Armillaria*, host in) 84
micans (*Orchesia*) 126
mole (host in next of) 276, 278
monacha (*Lymantria*) 179
murinus (*Lacon*) 181, 182
Mycetophagus? 120
Mycomya limbata 173, 174
Myrmica laevinodis (host with) 272
Myrmica ruginodis (host with) 379
Myrmica scabrinodis (host with) 359
- Nebria brevicollis* 142, 160, 161, 162
Nebria cameroni 188
Nebria lewisi 140
Nebria psammodes 161
niger (*Pterostichus*) 31
nigrinus (*Scymnus*) 64
Nitidulidae 7
nitidus (*Leistus*) 161
Notiophilus biguttatus 137
Notiophilus rufipes 137
Notiophilus spp. 142
nubila (*Incentia*) 33
- obliqua* (*Bolitochara*) 199
obscurus (*Agriotes*) 192, 195
obscurus (*Protolobus*) 33
Ocypus ater 357
Ocypus olens 161, 221, 222
olens (*Ocypus*) 161
Orchesia micans 126
Oreocharis sp. 33
- Phalacridae* 7
Phalacrus corruscus 126
Philonthus albipes? 279, 293
Philonthus turbidus 276
Platydracus violaceus 363
procerulus (*Carabus*) 162
- Protolobus obscurus* 33
psammodes (*Nebria*) 161
Pterostichus madidus 162, 220
Pterostichus melanarius 160
Pterostichus niger 161
Pterostichus vulgaris 142, 162
Pterostichus? sp. 357
- Quedius simplicifrons* 199, 279
Quedius vexans 205, 206, 279
Quedius sp. 205, 217, 276, 278
- Rhipidandrus*? 120
ruficornis (*Isorhipis*) 11
ruficollis (*Fungivora*) 92
rufipes (*Harpalus*) 174
rufipes (*Megaselia*) 290
rufipes (*Notiophilus*) 137
- scheidleri* (*Carabus*) 162
Scolopterus aequus 33
Scymninae 62
Scymnus dorcatomoides 64
Scymnus nigrinus 64
Scymnus sp. 64
seaweed (host in) 217
simplicifrons (*Quedius*) 199, 279
splendens (*Carabus*) 161
Staphylinidae 7, 160, 165, 208
Staphylinus larva 360
Stelidota strigosa 123
strigosa (*Stelidota*) 123
Suillus granulatus (host in) 125
- Tachyporini larva* 274
Tachyporus sp. 279
Talpa europaea (host in nest) 276
Thallis janthina 131
Thanasimus sp. 112, 113
tree fungus (host in) 115
Triplax sp. 126
turbidus (*Philonthus*) 276
- vexans* (*Quedius*) 205, 206, 279
Vespa vulgaris (host in next of) 276
violaceus (*Carabus*) 161
violaceus (*Platydracus*) 363
virgintioctopunctata (*Epilachna*) 65, 67
vulgaris (*Pterostichus*) 142, 162
- Xantholinus* sp. 274
Xantholinus linearis? 274, 279
- Zabrius tenebrioides elongatus* 174

INDEX TO SERPHIDAE

*An asterisk marks a synonym, misspelling, or incorrect identification.

- abbreviatus (Mischoserphus) 97 (key), 102, 408 & 502 (figs.)
- abruptus (Brachyserphus, Proctotrupes, Proctotrypes, Phaenoserphus, Serphus, Cryptoserphus) 118 (key), 122, 397, 412, & 505 (figs.)
- *abruptus (Proctotrupes) 383
- Acanthoserphinae 9 (key), 14
- Acanthoserphus 14 (key), 15, 386 & 394 (figs.)
- achilus (Exallonyx (Exallonyx)) 355 & 356 (keys), 361, 487 & 524 (figs.)
- acomus (Mischoserphus) 97 (key), 105, 410 & 502 (figs.)
- aculeator (Cryptoserphus, Proctotrupes, Proctotrypes, Serphus) 4, 78 (key), 91, 408 & 501 (figs.)
- Aculeator Group (Cryptoserphus) 85
- adustus (Cryptoserphus) 78 (key), 90
- aequalis (Nothoserphus) 63 (key), 66, 407 (fig.)
- *aequator (Disogmus) 25
- afissae (Nothoserphus, Disogmus, Watanabeia) 63 (key), 65
- Afissae Group (Nothoserphus) 65
- Afroserphus 30 (key), 60, 388 & 396 (figs.)
- alaskensis (Mischoserphus) 96 (key), 102, 408 & 502 (figs.)
- albicornis (Exallonyx (Exallonyx)) 374 (key), 375, 494 & 526 (figs.)
- albicoxa (Acanthoserphus) 15 (key), 16
- *albigennis (Codrus, Paracodrus) 194
- albofasciatus (Austroserphus) 18, 397 & 394 (figs.)
- alternans (Mischoserphus) 96 (key), 99, 407 & 502 (figs.)
- alticola (Exallonyx (Exallonyx), Codrus) 234 & 242 (keys), 297, 442, 454, & 518 (figs.)
- alvarengai (Sminthoserphus) 57 (key), 58, 388 (fig.)
- amplipennis (Exallonyx (Exallonyx)) 309 (key), 311, 461 (fig.)
- anceps (Exallonyx (Exallonyx)) 379 (key), 381, 497 & 527 (figs.)
- angulatus (Exallonyx (Exallonyx)) 241 (key), 285, 448 & 517 (figs.)
- angusticeps (Exallonyx (Exallonyx), Proctotrypes, Codrus) 233 & 237 (keys), 257, 436, 514, & 529 (figs.)
- angustoralis (Exallonyx (Exallonyx)) 310 (key), 320, 466 (fig.)
- antennalis (Exallonyx (Exallonyx)) 344 (key), 351, 483 & 524 (figs.)
- *antennalis (Serphus gravidator) 181
- antillarum (Exallonyx (Exallonyx)) 326 (key), 337, 474 (fig.)
- Apoglypha 31 (key), 129, 391 & 398 (figs.)
- appendicis (Mischoserphus) 98 (key), 110, 409 & 503 (figs.)
- applanatus (Exallonyx (Exallonyx)) 327 (key), 336, 474 & 522 (figs.)
- *apteroginus (Paracodrus) 195
- *apterognus (Codrus) 194
- *apterogyne (Codrus) 194
- apterogynus (Paracodrus, Proctotrupes, Codrus) 194, 393 (fig.)
- arctus (Exallonyx (Exallonyx)) 326 (key), 335, 473 (fig.)
- arcuator (Mischoserphus, Cryptoserphus) 96 (key), 100, 397, 410, & 502 (figs.)
- areolator (Disogmus, Proctotrupes, Bethylus, Disogmus areolator, Cryptoserphus) 22 (key), 24, 387 & 395 (figs.)
- *areolatus (Serphus calcar, Phaenoserphus calcar) 198
- arizonicus (Exallonyx (Exallonyx)) 234 & 240 (keys), 269, 440, 441, & 515 (figs.)
- artoculus (Exallonyx (Exallonyx)) 215 & 216 (keys), 228, 429 & 513 (figs.)
- ashmeadii (Exallonyx (Exallonyx), Proctotrypes, Codrus) 233, 238, & 239 (keys), 259, 436, 437, 529, & 512 (figs.)
- asper (Exallonyx (Exallonyx)) 233, 234, & 238 (keys), 265, 438, 439 & 514 (figs.)
- ater (Exallonyx (Exallonyx), Codrus, Proctotrupes, Proctotrypes, Exallonyx, Serphus) 4, 214 & 215 (keys), 220, 426, 427, & 512 (figs.)
- *ater (Codrus, Proctotrupes, Proctotrypes, Exallonyx, Serphus) 91, 218
- Ater Group (Exallonyx (Exallonyx)) 211 (key), 213
- *aterimus (Exallonyx ater) 221
- *aterrimus (Proctotrypes, Phaenoserphus?, Exallonyx, Exallonyx ater) 220
- atrellus (Exallonyx (Exallonyx)) 326 (key), 337, 475 (fig.)

- atripes* (*Exallonyx* (*Exallonyx*)) 325 & 327 (keys), 331, 471 & 522 (figs.)
Atripes Group (*Exallonyx* (*Exallonyx*)) 212 (key), 324
australiae (*Mischoserphus*, *Proctotrupes*, *Serphus*, *Phaenoserphus*) 97 (key), 104, 409 (fig.)
Austrocodrus 14 (key), 17
Austroserphus 7, 14 (key), 18, 387 & 394 (figs.)
**azarbajdzhanicus* (*Serphus*) 174
baini (*Oxyserphus*) 35 (key), 42, 387, 402, & 498 (figs.)
barberi (*Brachyserphus*) 117 (key), 120, 504 (fig.)
basalis (*Disogmus*, *Proctotrupes*, *Proctotrupes*) 22 (key), 28
**belfragei* (*Proctotrupes*, *Phaenoserphus*, *Cryptoserphus*) 123
**bethyliformis* (*Paracodrus*) 194
**bicolor* (*Proctotrupes*, *Serphus*, *gladiator*, *Proctotrupes gladiator*) 173, 174
bicornis (*Afroserphus*) 61
bidens (*Acanthoserphus*) 15 (key), 386 & 394 (figs.)
**bimaculatus* (*Erodorus*, *Proctotrupes*) 172
binodus (*Exallonyx* (*Exallonyx*)) 310 (key), 320, 467 (fig.)
bistriatus (*Serphus*, *Proctotrupes*, *Proctotrupes*, *Disogmus*) 171 (key), 188, 392, 420, 422, & 510 (figs.)
bisulcus (*Exallonyx* (*Exallonyx*)) 232 & 238 (keys), 251, 434 & 528 (figs.)
boops (*Nothoserphus*, *Proctotrupes*, *Proctotrupes*, *Serphus*, *Phaenoserphus*, *Thomsonina*) 62 (key), 63
Boops Group (*Nothoserphus*) 63
borealis (*Phaenoserphus*) 145 (key), 150, 415 & 508 (figs.)
boreus (*Exallonyx* (*Exallonyx*)) 214 & 216 (keys), 225, 428 & 512 (figs.)
**borneanus* (*Proctotrupes*, *Codrus*) 275
brachypterus (*Serphus*, *Proctotrupes*, *Serphus divagator*) 170 (key), 172, 419 (figs.)
Brachypterus Group (*Serphus*) 171
Brachyserphus 32 (key), 116, 397 (fig.)
brevicaulis (*Oxyserphus*) 35 (key), 45, 404 & 499 (figs.)
brevicornis (*Exallonyx* (*Eocodrus*), *Proctotrupes*, *Proctotrupes*, *Exallonyx*, *Codrus*, *Codrus* (*Eocodrus*)) 204 (key), 205, 422, 423, & 511 (figs.)
brevimala (*Exallonyx* (*Exallonyx*)) 235 & 241 (keys), 289, 450 & 517 (figs.)
**brevimanus* (*Serphus*, *Cryptoserphus*, *Proctotrupes*) 81
**brevipennis* (*Proctotrupes*, *Oxyurus*, *Codrus*) 172, 173
brevistigma (*Phanoserphus*) 198 (key), 202, 418 (fig.)
brunescens (*Exallonyx* (*Exallonyx*)) 326 & 327 (keys), 338, 475 & 522 (figs.)
brutus (*Exallonyx* (*Exallonyx*)) 236 (key), 287, 448 (fig.)
**buccatus* (*Exallonyx*, *Brachyserphus*, *Cryptocodrus*) 112
**buccatus* (*Proctotrupes*, *Proctotrupes*, *Serphus*, *Phaenoserphus*) 192
burhytis (*Exallonyx* (*Exallonyx*)) 344 (key), 352, 483, 484, & 524 (figs.)
calcar (*Phanoserphus*, *Proctotrupes*, *Proctotrupes*, *Serphus*, *Phaenoserphus*) 197 (key, 198, 399 and 417 (figs.)
calcaratus (*Oxyserphus*) 35 (key), 45, 404 & 499 (figs.)
**calcaratus* (*Proctotrupes*, *Proctotrupes*) 198
californicus (*Exallonyx* (*Exallonyx*), *Proctotrupes*, *Proctotrupes*, *Exallonyx*, *Serphus*, *Codrus*) 232 & 238 (keys), 253, 434 & 528 (figs.)
**californicus* (*Proctotrupes*) 259
calvescens (*Exallonyx* (*Exallonyx*)) 310 (key), 316, 464 (fig.)
calvus (*Mischoserphus*) 98 (key), 109, 410 & 503 (figs.)
camelinus (*Exallonyx* (*Exallonyx*)) 366 (key), 368, 489 & 525 (figs.)
**campanulator* (*Ichneumon*, *Bassus*, *Proctotrupes*, *Codrus*) 172, 173, 179, 180
**canadensis* (*Disogmus*) 25
**canadensis* (*Proctotrupes*, *Exallonyx*, *Codrus*) 223
capillatus (*Exallonyx* (*Exallonyx*)) 377 (key), 378, 496 (fig.)
Capillatus Group (*Exallonyx* (*Exallonyx*)) 212 (key), 376
capitatus (*Oxyserphus*) 35 (key), 46, 404 & 499 (figs.)
capnodes (*Exallonyx* (*Exallonyx*)) 343 (key), 346, 479 (fig.)
**Carabiphagus* 143
carbunculus (*Exallonyx* (*Exallonyx*)) 309 & 311 (keys), 314, 462, 463, 520, & 529 (figs.)
**carinatus* (*Disogmus*) 25
**carinatus* (*Exallonyx*, *Codrus*) 229
**carolinensis* (*Proctotrupes*, *Phaenoserphus*, *Serphus*, *Codrus*) 362
castaneipes (*Exallonyx* (*Exallonyx*)) 344 (key), 349, 481 (fig.)
**castaneus* (*Cryptoserphus longicalcar*) 79

- *castaneus (Serphus, Phaenoserphus) 198
 castor (Heloriserphus) 13 (key), 394 (fig.)
 caudatus (Oxyserphus) 34 (key), 42, 402 & 498 (figs.)
 caudatus (Serphus, Proctotrupes, Proctotrypes) 171 (key), 176, 419, 421, & 510 (figs.)
 cellularis (Serphus) 384
 certus (Exallonyx (Eocodrus)) 204 (key), 209, 424 & 511 (figs.)
 cervicatus (Exallonyx (Exallonyx)) 236 & 242 (keys), 303, 458 & 519 (figs.)
 chittii (Phaenoserphus, Proctotrypes) 146 (key), 158, 392, 416, & 509 (figs.)
 chiuae (Exallonyx (Exallonyx)) 237 (key), 301, 456 (fig.)
 ciliatus (Codrus) 135 (key), 139, 414 (figs.)
 cingulatus (Exallonyx (Exallonyx)) 307 (key), 460 & 519 (figs.)
 Cingulatus Group (Exallonyx (Exallonyx)) 210 (key), 306
 claripes (Exallonyx (Exallonyx)) 235 (key), 285, 447 (fig.)
 *clavipes (Proctotrupes, Proctotrypes, Serphus, Phaenoserphus) 359
 clinatus (Exallonyx (Exallonyx)) 366 (key), 369, 490 (fig.)
 clypeatus (Hormoserphus, Proctotrypes, Phaenoserphus, Cryptoserphus, Serphus) 115 (key), 390, 397, & 504 (figs.)
 *cockerelli (Serphus, Phaenoserphus, Proctotrupes) 188
 Codrus 133 (key), 134, 391 & 398 (figs.)
 collaris (Exallonyx (Exallonyx)) 344 (key), 353, 484 & 524 (figs.)
 *collaris (Proctotrupes, Serphus gravidator, Serphus) 180
 *coloradicus (Proctotrypes, Proctotrupes) 178
 columbaris (Exallonyx (Exallonyx)) 344 (key), 351, 482 & 523 (figs.)
 comatus (Mischoserphus) 97 (key), 106, 410 & 502 (figs.)
 compressus (Fustiserphus) 49 (key), 50, 405 & 499 (figs.)
 confusus (Exallonyx (Exallonyx), Exallonyx ater, Codrus) 242 (key), 293, 452 (fig.)
 coracinus (Exallonyx (Exallonyx)) 366 & 367 (keys), 372, 493 & 526 (figs.)
 corvinus (Oxyserphus) 34 (key), 41, 402 (fig.)
 costatus (Disogmus) 22 (keys), 23
 *coxalis (Exallonyx ligatus) 220
 coxalis (Mischoserphus) 97 (key), 106, 409 (fig.)
 cracens (Exallonyx (Exallonyx)) 366 & 367 (keys), 371, 492 & 526 (figs.)
 *crassicornis (Exallonyx filicornis) 217
 crassicornis (Mischoserphus) 98 (key), 108, 409 & 503 (figs.)
 crassulus (Exallonyx (Exallonyx)) 235 & 241 (keys), 280, 445 & 516 (figs.)
 crenaticornis (Exallonyx (Exallonyx), Exallonyx, Codrus) 233 & 239 (keys), 261
 crenicornis (Exallonyx (Exallonyx), Codrus, Proctotrupes, Proctotrypes, Exallonyx) 355 & 356 (keys), 359, 486, 524, & 529 (figs.)
 *crenulatus (Proctotrupes) 176
 cristatus (Phanoserphus) 197 (key), 201, 418 (figs.)
 *Cryptocodrus 191
 Cryptoserphini 20 (key), 29
 Cryptoserphus 31 (key), 76, 389 & 396 (figs.)
 culmeus (Exallonyx (Exallonyx)) 326 (key), 339, 476 (fig.)
 *cumaeus (Cryptoserphus) 81
 curticornis (Brachyserphus) 117 (key), 122
 *curtigena (Exallonyx, Codrus) 290
 *curtipennis (Proctotrupes, Proctotrypes, Serphus, Phaenoserphus, Phaenoserphus viator) 160
 daschi (Exallonyx (Exallonyx)) 233 & 239 (keys), 268, 440 & 515 (figs.)
 datae (Exallonyx (Exallonyx)) 325 & 327 (keys), 342, 477, 478, & 522 (figs.)
 debilis (Nothoserphus) 63 (key), 66, 407 (fig.)
 *debilis (Serphus, Proctotrupes) 188
 declivus (Exallonyx (Exallonyx)) 233 (key), 256, 435, 514, & 528 (figs.)
 decumbens (Exallonyx (Exallonyx)) 232 (key), 255, 435 & 528 (figs.)
 deflexus (Exallonyx (Exallonyx)) 344 (key), 350, 482 (fig.)
 defricatus (Sminthoserphus) 57 (key)
 *dentaticornis (Exallonyx, Codrus) 253
 *deshii (Cryptoserphus) 92
 *devagator (Proctotrypes gravidator, Proctotrypes) 173, 174
 dictyotus (Exallonyx (Exallonyx)) 366 & 367 (keys), 370, 491 & 525 (figs.)
 Dictyotus Group (Exallonyx (Exallonyx)) 212 (key), 365
 dilatus (Cryptoserphus) 78 (key), 88, 501 (fig.)
 dilatus (Exallonyx (Exallonyx)) 367 (key), 371, 492 & 526 (figs.)
 diminuens (Exallonyx (Exallonyx)) 232 & 241 (keys), 246, 432, 513, & 527 (figs.)
 *discrepator (Disogmus) 24
 disjunctus (Phaenoserphus) 144 (key), 167, 417 (fig.)
 Disogmini 20 (key), 387 & 395 (figs.)

- Disogmus 21, 387 & 395 (figs.)
 *divagator (Ichneumon, Serphus) 172, 174
 *diversicornis (Disogmus) 25
 doddi (Oxyserphus, Proctotrupes) 34
 (key), 39
 *donisthorpei (Exallonyx fumipennis,
 Exallonyx, Codrus) 359
 *dubiosus (Phaenoserphus) 158
 durus (Exallonyx (Exallonyx)) 310 & 311
 (keys), 318, 465, 466, & 521 (figs.)

 ejuncidus (Exallonyx (Exallonyx)) 367
 (key), 372, 526 (fig.)
 *elegans (Proctotrupes, Disogmus) 25
 elongatus (Parthenocodrus, Proctotrupes,
 Proctotrypes, Serphus, Phaenoserphus)
 191 (key), 192, 392 & 399 (figs.)
 *emarciator (Ichneumon, Bassus,
 Proctotrupes, Codrus, Proctotrupes
 brevipennis, Proctotrypes, Phaeno-
 serphus) 172, 173, 174
 enomus (Exallonyx (Exallonyx)) 311 (key),
 318, 465 & 520 (figs.)
 Eocodrus (subgenus of Exallonyx) 204
 (key)
 *ephippium (Disogmus areolator) 25
 epilachnae (Nothoserphus, Watanabeia)
 63 (key), 67
 equidens (Exallonyx (Exallonyx)) 232 &
 239 (keys), 250, 434 & 538 (figs.)
 *Erodorus 169
 eucnemidarum (Vanhornia) 10 (key), 11,
 386 & 394 (figs.)
 evanescens (Exallonyx (Exallonyx)) 343
 (key), 345, 478, 479, & 523 (figs.)
 Evanescens Group (Exallonyx (Exallonyx))
 212 (key), 342
 Exallonyx 133 (key), 203, 393 & 399 (figs.)
 Exallonyx (Exallonyx) 204 (key), 210
 exhumatus (Proctotrypes, Serphus) 384

 *fallacicornis (Exallonyx, Exallonyx,
 Codrus) 263
 femoratus (Exallonyx (Exallonyx),
 Proctotrypes, Exallonyx, Codrus) 233
 & 239 (keys), 263, 437, 438, 514, &
 529 (figs.)
 *filicornis (Exallonyx, Serphus, Codrus)
 220
 flavicinctus (Exallonyx (Exallonyx)) 343
 (key), 344, 478 (fig.)
 flavipes (Cryptoserphus, Proctotrupes,
 Proctotrypes, Phaenoserphus,
 Serphus) 77 (key), 81, 389, 396 &
 500 (figs.)
 Flavipes Group (Cryptoserphus) 79
 flavotinctus (Exallonyx (Exallonyx)) 374
 (key), 376, 495 (fig.)
 *florissantensis (Proctotrypes, Serphus,
 Proctotrupes) 188, 384

 formicarius (Exallonyx (Exallonyx),
 Exallonyx, Codrus) 240 (key), 272,
 443 & 515 (figs.)
 Formicarius Group (Exallonyx
 (Exallonyx)) 211 & 212 (keys), 230
 fortis (Cryptoserphus) 77 (key), 85,
 500 (fig.)
 foveolatus (Tretoserphus, Proctotrupes,
 Phaenoserphus, Cryptoserphus) 70
 (key), 75, 500 (fig.)
 frater (Exallonyx (Exallonyx)) 236 (key),
 270, 441 (fig.)
 *fumipennis (Exallonyx) 359
 *fungorum (Cryptoserphus cumaeus) 81
 fuscicornis (Exallonyx (Exallonyx),
 Exallonyx, Codrus) 231 & 238 (keys),
 244, 431, 513, & 527 (figs.)
 fuscipalpus (Exallonyx (Exallonyx)) 374
 (key), 376, 495 (fig.)
 fuscipes (Phaenoserphus, Proctotrupes,
 Proctotrypes, Serphus) 145 (key),
 153, 416 & 508 (figs.)
 *fuscipennis (Phaenoserphus) 192
 *fuscitarsis (Disogmus carinatus,
 Disogmus) 28
 Fustiserphus 30 (key), 48, 388 & 395
 (figs.)

 genatus (Mischoserphus) 97 (key), 105
 genualis (Phaenoserphus) 144 (key),
 147, 415 & 507 (figs.)
 *glabratus (Disogmus) 25
 glabratus (Phaenoserphus) 146 (key),
 157, 416 & 509 (figs.)
 *gladiator (Proctotrupes, Serphus,
 Proctotrypes) 173, 174
 gracilis (Cryptoserphus) 383
 *gracilis (Exallonyx, Codrus) 221
 grandis (Exallonyx (Exallonyx), Codrus)
 355 & 356 (keys), 364, 488 & 525
 (figs.)
 granulatus (Phaenoserphus) 145 (key),
 152, 416 & 508 (figs.)
 *gravidator (Ichneumon) 179
 *gravidator (Proctotrupes) 173
 gravidator (Serphus, Ichneumon,
 Codrus, Proctotrupes, Proctotrypes)
 171 (key), 179, 399, 420, & 421
 (figs.)
 Gravidator Group (Serphus) 177
 *gravidatus (Ichneumon) 179
 gregori (Phaenoserphus, Phaenoserphus
 (Phaulloserphus)) 144 (key), 146,
 415 & 507 (figs.)
 grossus (Fustiserphus reticulatus) 49
 (key), 55, 388 & 500 (figs.)

 hamiferus (Cryptoserphus) 383
 hawaiiensis (Brachyserphus, Proctotrypes,
 Phaenoserphus, Serphus, Crypto-
 serphus) 117 (key), 121, 412 & 505 (figs.)

- Heloriserphus* 9 (key), 11, 386 (fig.)
hipponecrus (*Oxyserphus*) 34 (key), 40,
 401 & 498 (figs.)
hirtipennis (*Cryptoserphus*) 78 (key), 89,
 501 (fig.)
 **hofferi* (*Serphus*) 174
Hormoserphus 32 (key), 114, 390 & 397
 (figs.)
 **hyalinipennis* (*Exallonyx subserratus*)
 273
 **hyalinipennis* (*Proctotrupes*, *Codrus*)
 217

 **indivisus* (*Serphus gravidator*) 180
integer (*Disogmus*) 4, 382
intensus (*Exallonyx* (*Exallonyx*)) 343
 (key), 347, 480 & 523 (figs.)
intrudens (*Fustiserphus*, *Proctotrupes*,
Proctotrupes, *Phaenoserphus*) 49
 (key), 51, 395, 406, & 499 (figs.)
 **ione* (*Cryptoserphus*) 100

janthinae (*Apoglypha*, *Proctotrupes*,
Proctotrupes) 130 (key), 131, 410 &
 506 (figs.)
 **janthinae* (*Proctotrupes*) 132
japonicus (*Exallonyx* (*Exallonyx*),
Proctotrupes, *Phaenoserphus*, *Codrus*)
 325 & 327 (keys), 326, 469 & 521
 (figs.)
jubatus (*Exallonyx* (*Exallonyx*)) 377 (key),
 496 & 526 (figs.)

kenyensis (*Exallonyx* (*Exallonyx*)) 242
 (key), 299, 455 & 518 (figs.)

lacrymans (*Mischoserphus*) 96 (key), 98,
 408 & 501 (figs.)
laeviceps (*Brachyserphus*, *Proctotrupes*,
Proctotrupes, *Serphus*, *Cryptoserphus*)
 118 (key), 127, 506 (fig.)
laevicollis (*Parthenocodrus*) 191 (key),
193
 **laevifrons* (*Proctotrupes*, *Caribiphagus*)
 160
 **laeiventris* (*Exallonyx*) 382
laricis (*Tretoserphus*, *Proctotrupes*,
Proctotrupes, *Serphus*, *Crypto-*
serphus) 69 (key), 70, 389, 398, &
 500 (figs.)
latidens (*Cryptoserphus*) 77 (key), 84
latilabris (*Exallonyx* (*Exallonyx*)) 237
 (key), 284, 447 (fig.)
leileri (*Vanhornia*) 10 (key)
leiopleurum (*Exallonyx* (*Exallonyx*)) 231
 (key), 246, 432 & 527 (figs.)
leiopleurum (*Oxyserphus*) 35 (key), 44,
 403 (fig.)
leptocerus (*Exallonyx* (*Exallonyx*)) 242
 (key), 303, 457 (fig.)

leptocorsa (*Exallonyx* (*Exallonyx*)) 236 &
 241 (keys), 287, 449 & 517 (figs.)
leptonyx (*Exallonyx* (*Exallonyx*)) 310
 (key), 322, 468 (fig.)
Leptonyx Group (*Exallonyx* (*Exallonyx*))
 211 (key), 308
leptopus (*Exallonyx* (*Exallonyx*)) 311
 (key), 317, 465 & 520 (figs.)
leptopygus (*Phaenoserphus*) 144 (key),
149, 507 (fig.)
leptura (*Brachyserphus*) 117 (key), 119,
 504 (fig.)
levibasis (*Exallonyx* (*Exallonyx*)) 325 &
 327 (keys), 332, 472 & 522 (figs.)
 **leviceps* (*Proctotrupes*, *Serphus*) 128
 **levifrons* (*Proctotrupes*, *Serphus*,
Phaenoserphus) 160
leviventris (*Exallonyx*, *Codrus*, *Codrus*
(Eocodrus) 4, 382
ligatus (*Exallonyx* (*Exallonyx*), *Codrus*,
Proctotrupes, *Proctotrupes*, *Serphus*)
 234 & 240 (keys), 278, 444 & 516
 (figs.)
 **ligatus* (*Exallonyx*, *Proctotrupes*) 217,
 273, 276, 359, 383
 **lineata* (*Exallonyx brevicornis*) 205
lineatus (*Phaenoserphus*) 146 (key), 156,
 416 & 508 (figs.)
 **linellii* (*Proctotrupes*, *Serphus*,
Proctotrupes) 184
liratus (*Exallonyx* (*Exallonyx*)) 311 (key),
317, 464 & 520 (figs.)
lispus (*Exallonyx* (*Exallonyx*)) 311 (key),
321, 467 & 521 (figs.)
lissopleuris (*Exallonyx* (*Exallonyx*)) 325
 (key), 333, 472 (fig.)
 **longicalcar* (*Serphus*, *Cryptoserphus*,
Cryptoserphus longicalcar) 81
longiceps (*Fustiserphus*) 49 (key), 50,
 405 (fig.)
 **longiceps* (*Proctotrupes*, *Exallonyx*,
Serphus, *Codrus*) 362
longicornis (*Exallonyx* (*Eocodrus*),
Codrus, *Proctotrupes*, *Proctotrupes*,
Exallonyx, *Codrus* (*Eocodrus*)) 204
 (key), 207, 423 & 511 (figs.)
longipes (*Phaenoserphus*) 146 (key), 159,
 417 (fig.)
 **longipetiolatus* (*Codrus*) 298
longistigma (*Phanoserphus*) 197 (key),
201, 418 (fig.)
longitarsis (*Cryptoserphus*, *Proctotrupes*,
Proctotrupes, *Serphus*) 77 (key), 79
 **longiusculus* (*Proctotrupes*, *Serphus*,
Proctotrupes) 176
lophotos (*Exallonyx* (*Exallonyx*)) 309 (key),
312, 461, 462, & 529 (figs.)
lucens (*Brachyserphus*, *Megaspilus*,
Proctotrupes, *Phaenoserphus*, *Crypto-*
serphus) 117 (key), 118, 504 (fig.)

- luteipes* (*Exallonyx ligatus*) 4, 382
luzonicus (*Exallonyx* (*Exallonyx*)) 237
 (key), 283, 446 (fig.)
- maculipennis* (*Oxyserphus*, *Proctotrupes*,
Serphus, *Proctotrypes*) 33 (key), 36,
 400 (fig.)
- masoni* (*Exallonyx* (*Exallonyx*)) 325 & 327
 (keys), 334, 473 & 522 (figs.)
- maurus* (*Serphus*) 171 (key), 184
- medius* (*Cryptoserphus*) 78 (key), 87,
 501 (fig.)
- **medius* (*Proctotrypes*, *Exallonyx*,
Codrus) 362
- megaloura* (*Pschornia*) 112 (key), 113,
 397, 411, & 504 (figs.)
- **melanderi* (*Cryptoserphus*) 71
- melanomerus* (*Exallonyx* (*Exallonyx*)) 326
 (key), 340, 477 (fig.)
- melanoptera* (*Exallonyx* (*Exallonyx*)) 366
 (key), 370, 491 (fig.)
- melliventris* (*Phaenoserphus*,
Proctotrupes, *Proctotrypes*, *Serphus*)
 145 (key), 155, 416 & 509 (figs.)
- **meridionalis* (*Proctotrupes*, *Serphus*
gravidator) 179, 180
- microcerus* (*Exallonyx* (*Exallonyx*),
Codrus) 240 (key), 273, 443 & 516
 (figs.)
- **microptera* (*Serphus divigator*, *Serphus*)
 173, 174
- microstylus* (*Exallonyx*) 4, 383
- **micrurus* (*Serphus*, *Phaenoserphus*,
Proctotrypes) 207
- **milleri* (*Phaenoserphus*) 357
- mindorensis* (*Exallonyx* (*Exallonyx*)) 307
 (key), 308, 460 & 519 (figs.)
- minor* (*Exallonyx* (*Exallonyx*)) 235 & 242
 (keys), 295, 453 & 518 (figs.)
- minora* (*Pschornia*) 112 (key), 411 & 503
 (figs.)
- mirabilis* (*Nothoserphus*, *Notoserphus*)
 62 (key), 68, 396 & 407 (figs.)
- Mischoserphus* 31 (key), 95, 390 & 397
 (figs.)
- monotrema* (*Exallonyx* (*Exallonyx*)) 242
 (key), 300, 455 & 519 (figs.)
- multidens* (*Exallonyx* (*Exallonyx*)) 232
 (key), 247, 433 & 538 (figs.)
- mydobius* (*Exallonyx* (*Exallonyx*)) 343
 (key), 347, 480 & 523 (figs.)
- **myrmecophilus* (*Exallonyx*) 379
- nathani* (*Exallonyx* (*Exallonyx*)) 327 (key),
 330, 470 & 521 (figs.)
- nebrae* (*Codrus*, *Phaenoserphus*) 135
 (key), 139, 414 (figs.)
- nevadensis* (*Exallonyx* (*Exallonyx*),
Proctotrupes, *Serphus*, *Phaeno-*
serphus) 215 & 216 (keys), 226,
 428 & 429, & 512 (figs.)
- niger* (*Codrus*, *Proctotrupes*, *Oxyurus*,
Proctotrypes) 4, 135 (key), 140, 414
 (figs.)
- niger* (*Fustiserphus*) 49 (key), 54
- **niger* (*Proctotrupes*, *Exallonyx*, *Procto-*
trupes, *Codrus* (*Codrus*)) 160, 356
- **niger* (*Serphus gravidator*) 188
- nigerrimus* (*Serphonostus*, *Disogmus*)
 129, 391 & 398 (figs.)
- **nigra* (*Proctotrupes*!) 148
- **nigrescens* (*Serphus gravidator*) 180,
 181
- **nigricauda* (*Serphus*, *Cryptoserphus*) 71
- nigricornis* (*Disogmus*) 4, 382
- **nigripennis* (*Proctotrupes*, *Procto-*
trupes, *Disogmus*) 25
- nigripes* (*Phaenoserphus*, *Proctotrypes*)
 145 (key), 149, 415 & 507 (figs.)
- nigriscutum* (*Oxyserphus*, *Cryptoserphus*)
 35 (key), 47
- **nigrofemoratus* (*Phaenoserphus calcar*)
 199
- nikkoensis* (*Exallonyx* (*Exallonyx*),
Codrus) 325 & 327 (keys), 330, 470,
 471, & 521 (figs.)
- nimius* (*Exallonyx* (*Exallonyx*)) 365 (key),
 367, 489 (fig.)
- nitens* (*Apoglypha*, *Proctotrypes*,
Proctotrupes, *Cryptoserphus*) 130
 (key)
- nitidus* (*Oxyserphus*, *Cryptoserphus*) 34
 (key), 39, 401 & 498 (figs.)
- nixonii* (*Exallonyx* (*Exallonyx*)) 235 & 242
 (keys), 294, 452, 453, & 518 (figs.)
- nodosus* (*Exallonyx* (*Exallonyx*)) 236 (key),
 305, 459 (fig.)
- Nothoserphus* 31 (key), 61, 389 & 396
 (figs.)
- nudicauda* (*Tretoserphus*) 70 (key), 74,
 500 (fig.)
- oaxacae* (*Exallonyx* (*Exallonyx*)) 234
 (key), 271, 442 (fig.)
- obesus* (*Mischoserphus*) 96 (key), 101,
 390, 408, & 502 (figs.)
- obliquus* (*Brachyserphus*) 117 (key),
 121, 412 & 505 (figs.)
- **obliquus* (*Proctotrypes*, *Phaenoserphus*)
 51
- obscuratus* (*Exallonyx* (*Exallonyx*)) 240
 (key), 270, 441 & 515 (figs.)
- **obscuripes* (*Proctotrypes*, *Phaeno-*
serphus, *Exallonyx*, *Codrus*) 263
- obscurus* (*Mischoserphus*) 97 (key),
 103, 409 & 502 (figs.)
- obsolescens* (*Cryptoserphus*) 383
- obsoletus* (*Disogmus*, *Cryptoserphus*) 22
 (keys), 23
- obsoletus* (*Exallonyx* (*Exallonyx*),
Proctotrupes, *Phaenoserphus*) 355 &
 356 (keys), 362, 487, 488 & 525 (figs.)

- *obsoletus (Proctotrypes, Phaenoserphus, Serphus, Cryptoserphus) 123
 Obsoletus Group (Exallonyx (Exallonyx)) 213 (key), 354
 occidentalis (Cryptoserphus) 77 (key), 86, 408 & 501 (figs.)
 ochropus (Exallonyx (Exallonyx)) 344 (key), 354 485 (fig.)
 oculatus (Exallonyx (Exallonyx)) 326 (key), 340, 476 (fig.)
 orientalis (Exallonyx (Exallonyx), Codrus) 325 & 327 (keys), 329, 469, 470, & 521 (figs.)
 Oxyserphus 30 (key), 32, 387 & 395 (figs.)
 pallibasis (Exallonyx (Exallonyx)) 374 (key), 375, 495 (fig.)
 pallidicornis (Exallonyx (Exallonyx), Exallonyx, Codrus) 234, 239, & 241 (keys), 266, 439 & 515 (figs.)
 *pallidipes (Proctotrypes) 141, 161, 166
 pallidistigma (Exallonyx (Exallonyx), Exallonyx niger, Codrus niger) 355 & 356 (keys), 356, 485 & 524 (figs.)
 pallidus (Serphus, Codrus, Proctotrupes, Proctotrypes) 171 (key), 177, 420, 421, & 510 (figs.)
 *pallipes (Codrus, Proctotrupes, Serphus, Phaenoserphus) 137, 140, 141, 192, 356
 pallipes (Phaenoserphus, Codrus, Proctotrupes) 4, 146 (key), 165, 417 & 510 (figs.)
 pallipes (Sminthoserphus) 57 (key), 59
 Paracodrus 133 (key), 193, 393 (fig.)
 parameces (Exallonyx (Exallonyx)) 344 (key), 349, 481 (fig.)
 parvus (Exallonyx (Exallonyx)) 326 (key), 339, 476 (fig.)
 Parthenocodrus 133 (key), 191, 392 & 399 (figs.)
 partipes (Phaenoserphus, Proctotrupes gravidator, Serphus gravidator) 146 (key), 168
 parvulus (Brachyserphus, Codrus, Proctotrupes, Proctotrypes, Serphus, Cryptoserphus) 118 (key), 125, 412 & 506 (figs.)
 *parvulus (Exallonyx, Codrus) 276
 parvus (Exallonyx (Exallonyx), Exallonyx alticola, Codrus alticola) 235 (key), 299, 454 (fig.)
 patagonicus (Austrocodrus, Austrospherphus) 17
 pauciruga (Cryptoserphus) 77 (key), 84
 pediculatus (Oxyserphus) 33 (key), 36, 400 (fig.)
 peñai (Exallonyx (Exallonyx)) 236 & 241 (keys), 302, 457 & 519 (figs.)
 pentaglyptus (Exallonyx (Exallonyx)) 310 (key), 322, 467 (fig.)
 perkinsi (Tretoserphus, Cryptoserphus) 70 (key), 73, 500 (fig.)
 *perrisi (Serphus, Cryptoserphus) 91
 *petiolaris (Serphus gravidator, Proctotrupes gravidator) 180, 182
 petiolatus (Mischoserphus) 98 (key), 111, 409 & 503 (figs.)
 Phaenoserphus 134 (key), 143, 392 & 398 (figs.)
 phaeomerus (Exallonyx (Exallonyx)) 235 (key), 284, 447 (fig.)
 Phaneroserphus 133 (key), 196, 393 & 399 (figs.)
 *Phaulloserphus 143
 philippinus (Codrus) 135 (key), 136, 413 (figs.)
 *philonthiphagus (Exallonyx) 276
 piceipes (Sminthoserphus) 57 (key), 59
 picicornis (Codrus, Disogmus) 135 (key), 137, 413 (figs.)
 pictus (Mischoserphus) 98 (key), 109, 410 & 503 (figs.)
 pileatus (Mischoserphus) 98 (key), 108, 409 & 503 (figs.)
 piliventris (Exallonyx (Exallonyx)) 238 (key), 265, 438 & 514 (figs.)
 pinorum (Cryptoserphus) 383
 pissinus (Exallonyx (Exallonyx)) 237 & 242 (keys), 301, 456 & 519 (figs.)
 placidus (Exallonyx (Exallonyx), Proctotrypes, Phaenoserphus, Exallonyx, Codrus) 231 & 238 (keys), 243, 430, 431, 513, & 527 (figs.)
 planocaulis (Exallonyx (Exallonyx)) 326 (key), 336, 474 (fig.)
 pleuralis (Exallonyx (Exallonyx), Exallonyx, Codrus) 232 & 238 (keys), 248, 433, 513, & 538 (figs.)
 pollux (Heloriserphus) 13 (key)
 polysulcus (Exallonyx (Exallonyx)) 235 & 241 (keys), 282, 445, 446, & 516 (figs.)
 *Proctotropis 169
 *Proctotrupes 169
 *Proctotrypes 169
 *Proctotrypes 169
 Pschornia 31 (key), 111, 390 & 397 (figs.)
 *pubescens (Disogmus) 188
 punctatus (Phaenoserphus, Codrus) 146 (key), 167
 punctibasis (Phaneroserphus) 198 (key), 202, 418 (fig.)
 pustula (Exallonyx (Exallonyx)) 309 & 311 (keys), 313, 461, 520, & 529 (figs.)
 quadriiceps (Exallonyx (Exallonyx), Proctotrypes, Exallonyx, Codrus) 214 & 215 (keys), 217, 425 & 512 (figs.)
 quintanus (Cryptoserphus) 78 (key), 93, 408 & 501 (figs.)

- radiata* (*Apoglypha*) 130 (key), 131, 391, 398, 410, & 506 (figs.)
recavus (*Exallonyx* (*Exallonyx*)) 355 (key), 361, 486 (fig.)
reflexus (*Exallonyx* (*Exallonyx*)) 236 (key), 304, 458 (fig.)
**reicherti* (*Proctotrupes*, *Serphus*) 276
reticulatus (*Fustiserphus reticulatus*) 49 (key), 55, 388 & 500 (figs.)
rhadinus (*Exallonyx* (*Exallonyx*)) 236 (key), 305, 459 (fig.)
**riator* (*Proctotrupes*) 160
ringens (*Exallonyx* (*Exallonyx*)) 379 (key), 380, 497 (fig.)
rostratus (*Cryptoserphus*) 79 (key), 94, 408 & 501 (figs.)
rudis (*Exallonyx* (*Exallonyx*)) 236 (key), 306, 459 (fig.)
**ruficauda* (*Serphus* (*Cryptoserphus*) *longitarsis*, *Cryptoserphus*) 81
ruficeps (*Exallonyx* (*Eocodrus*), *Serphus* (*Phaenoserphus*), *Phaenoserphus*) 204 (key), 207
**ruficollis* (*Serphus gravidator*) 180, 181
**rufigaster* (*Proctotrupes*, *Proctotrypes*, *Serphus*) 180, 181
rufipes (*Fustiserphus unidentatus*) 49 (key), 54
**rufipes* (*Proctotrupes*, *Proctotrypes*) 165, 166
rugatus (*Brachyserphus*) 117 (key), 120, 412 & 504 (figs.)
rugatus (*Oxyserphus*) 34 (key), 38, 400 & 498 (figs.)

samurai (*Mischoserphus*, *Cryptoserphus*) 97 (key), 104, 409 (fig.)
scymni (*Nothoserphus*, *Proctotrypes*, *Phaenoserphus*, *Thomsonina*) 62 (key), 64, 389 & 407 (figs.)
seabrai (*Exallonyx* (*Exallonyx*)) 240 (key), 286, 448 & 517 (figs.)
segregatus (*Hormoserphus*) 115 (key)
semitropis (*Exallonyx* (*Exallonyx*)) 343 (key), 346, 479 & 523 (figs.)
**sequoiarum* (*Serphus*, *Proctotrupes*) 188
Serphinae 8 (key), 19
Serphini 20 (key), 132
Serphonostus 31 (key), 128, 391 & 398 (figs.)
Serphus 134 (key), 169, 392 & 399 (figs.)
**serricornis* (*Proctotrypes*, *Phaenoserphus*, *Exallonyx*, *Codrus*) 253
seticornis (*Exallonyx* (*Exallonyx*)) 233 & 239 (keys), 260, 437, 514, & 529 (figs.)
**seticornis* (*Proctotrupes*, *Proctotrypes*, *Serphus*, *Phaenoserphus*) 198
seyrigi (*Exallonyx* (*Exallonyx*)) 307 (key), 460 (fig.)

siccatus (*Exallonyx* (*Exallonyx*)) 241 (key), 300, 455 & 518 (figs.)
**similis* (*Exallonyx*, *Codrus*) 227
simplicior (*Exallonyx* (*Exallonyx*), *Proctotrypes*, *Phaenoserphus*, *Codrus*) 214 & 215 (keys), 229, 430 & 513 (figs.)
**simulans* (*Proctotrypes*, *Exallonyx*, *Codrus*) 223
**sixianus* (*Proctotrupes*, *Proctotrypes*, *Serphus*, *Phaenoserphus*, *Carabiphagus*) 160
Sminthoserphus 30 (key), 56, 388 & 395 (figs.)
**sociabilis* (*Exallonyx wasmanni*) 379
**socialis* (*Exallonyx wasmanni*, *Codrus wasmanni*) 379
soror (*Exallonyx* (*Exallonyx*)) 386 (key), 368, 489, 494, & 525 (figs.)
sparsus (*Exallonyx* (*Exallonyx*)) 213 & 215 (keys), 216, 424, 425, & 511 (figs.)
sparsus (*Sminthoserphus*) 57 (key), 58, 395 (fig.)
specularis (*Exallonyx* (*Exallonyx*)) 309 (key), 313, 462 & 529 (figs.)
splendidus (*Oxyserphus*, *Proctotrupes*) 33 (key), 37
stenostoma (*Exallonyx* (*Exallonyx*)) 344 (key), 352, 483 (fig.)
striata (*Pschornia*) 112 (key), 113, 390, 411, & 503 (figs.)
striatus (*Codrus*) 135 (key), 138, 413 (fig.)
striatus (*Exallonyx* (*Eocodrus*)) 204 (key), 210
styracura (*Exallonyx* (*Exallonyx*)) 214 & 215 (keys), 219, 426 & 512 (figs.)
**subclavatus* (*Phaenoserphus*) 137
**subcompressus* (*Phaenoserphus*) 137
subnervosus (*Exallonyx ligatus*) 4, 382
subserratus (*Exallonyx* (*Exallonyx*), *Codrus*) 236 & 241 (keys), 290, 451 & 517 (figs.)
substriatus (*Exallonyx* (*Exallonyx*)) 310 (key), 323, 468 (fig.)
subteres (*Exallonyx* (*Exallonyx*)) 235 & 241 (keys), 288, 449, 450, & 517 (figs.)
succinalis (*Cryptoserphus*) 384
sulcatus (*Oxyserphus*, *Cryptoserphus*) 35 (key), 47
**sulcatus* (*Serphus*) 173
**suzukii* (*Proctotrupes*) 180
syagrii (*Oxyserphus*, *Proctotrupes*) 35 (key), 44, 403 & 499 (figs.)
**syriacus* (*Exallonyx*) 220

**talpai* (*Exallonyx ligatus*) 275
teres (*Brachyserphus*) 118 (key), 125, 505 (fig.)

- terminalis (Serphus, Proctotrupes, Proctotrupes) 171 (key), 184, 420, 422, & 510 (figs.)
 tertiaris (Cryptoserphus) 384
 *testaceicornis (Phaenoserphus viator) 161, 166
 texanus (Exallonyx (Exallonyx), Proctotrupes, Phaenoserphus, Codrus) 214 & 215 (keys), 223, 427 & 512 (figs.)
 *Thomsonina 61
 thymbobasis (Exallonyx (Exallonyx)) 310 (key), 316, 464 (fig.)
 torquatus (Exallonyx (Exallonyx)) 366 & 367 (keys), 369, 490 & 525 (figs.)
 *torvus (Disogmus) 26
 trachodes (Exallonyx (Exallonyx)) 326 (key), 341, 477 (fig.)
 *transversalis (Serphus calcar, Phaenoserphus calcar) 198
 Tretoserphus 31 (key), 69, 389 & 396 (figs.)
 trialbus (Exallonyx (Exallonyx)) 343 (key), 348, 481 & 523 (figs.)
 trichomus (Exallonyx (Exallonyx)) 234 & 242 (keys), 292, 451, 452, & 518 (figs.)
 trichopleurum (Mischoserphus) 97 (key), 107, 410 (fig.)
 trieces (Phaenoserphus) 145 (key), 152, 415 & 508 (figs.)
 trifoveatus (Exallonyx (Exallonyx)), 234, 237, & 240 (keys), 275, 443, 444, & 516 (figs.)
 triglyptus (Exallonyx (Exallonyx)) 310 (key), 319, 466 (fig.)
 truncatus (Exallonyx (Exallonyx)) 310 & 311 (keys), 315, 463 & 520 (figs.)
 turneri (Oxyserphus, Proctotrupes, Cryptoserphus) 34 (key), 41, 401 & 498 (figs.)
 *ultonica (Phaenoserphus gregori) 147
 unidentatus (Fustiserphus unidentatus, Proctotrupes, Cryptoserphus) 49 (key), 53, 406 & 500 (figs.)
 unistria (Codrus) 135 (key), 413 (fig.)
 unisulcus (Exallonyx (Exallonyx)) 374 (key), 494 (fig.)
 unisulcus (Oxyserphus) 35 (key), 46, 405 & 393 (figs.)
 Unisulcus Group (Exallonyx (Exallonyx)) 213 (key), 373
 Vanhornia 9 (key), 10, 386 (fig.)
 Vanhorniinae 9 (key)
 variolae (Exallonyx (Exallonyx)) 310 (key), 323, 468 (fig.)
 vesus (Exallonyx (Exallonyx)) 344 (key), 350, 482 (fig.)
 *vexator (Phaenoserphus) 137
 viator (Phaenoserphus, Proctotrupes, Proctotrupes, Serphus) 4, 146 (key), 160, 398, 417 & 510 (figs.)
 vietus (Exallonyx (Exallonyx)) 234 (key), 271, 442 (fig.)
 visayanus (Exallonyx (Exallonyx)) 241 (key), 283, 446 & 516 (figs.)
 wasmanni (Exallonyx (Exallonyx), Exallonyx ater, Codrus) 379 (key), 497 & 527 (figs.)
 Wasmanni Group (Exallonyx (Exallonyx)) 211 (key), 378
 *Watanabeia 61
 *xanthocerus (Exallonyx) 220
 xanthura (Oxyserphus) 35 (key), 43, 395, 403, & 499 (figs.)
 *zabriskiei (Serphus, Proctotrupes) 181, 182