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AT HARVARD COLLEGE

Vol. 118, No. 3

STUDIES ON THE ANT FAUNA OF MELANESIA. I. THE
TRIBE LEPTOGENYINI. II. THE TRIBES
AMBLYOPONINI AND PLATYTHYREINI

BY E. O. WILSON

For Fr. J. J. McArahey
with the compliments of
E. O. Wilson

CAMBRIDGE, MASS., U. S. A.

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A T H A R V A R D C O L L E G E

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No. 3. — *Studies on the Ant Fauna of Melanesia*

I. *The Tribe Leptogenyini*

II. *The Tribes Amblyoponini and Platythyreini*

By E. O. WILSON

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I. THE TRIBE LEPTOGENYINI

The tribe Leptogenyini, principally composed of the large genus *Leptogenys*, is exceptionally well developed in the Melanesian region and in terms of individual species and colonies must be counted among the dominant ant groups there. During the present revisionary study three zoogeographic divisions have been recognized as feasible at the species or species-group level within Melanesia:

(1) The *Leptogenys* of western and central Melanesia, from New Guinea to the New Hebrides, containing at least six distinct species groups, most of which are precinctive or of recent Indo-malayan origin.

(2) The *Leptogenys* of the Fiji Islands, composed of a homogeneous group of six species, apparently all derived from the Papuan-based *L. bituberculata* stem.

(3) The *Leptogenys* and *Prionogenys* of New Caledonia, with four species representing at least three phyletic groups, two of which are apparently of Australian origin and the third with uncertain relationships.

These three faunal divisions have been accorded separate systematic treatment in the present paper. The fauna of the Moluccas has also been reviewed and an account of it included with the first section (western and central Melanesia). There are two reasons for this procedure. First, the Moluccan fauna is closely allied to that of New Guinea, so close in fact as to represent little more than a depauperate extension of it. Second, by taking all of the Moluccan species into account, there is a better chance of obtaining a complete coverage of the New Guinea fauna, since the Moluccas have been more intensively collected, and there are

undoubtedly many species and even genera of ants known at present only from the Moluccas that will eventually be found on New Guinea also.¹

DESCRIPTION OF COLLECTING STATIONS

Most of the material on which this revision is based was collected by the author during field work in Melanesia in 1954-55. In order to document more fully the distributions presented in this and future parts of a proposed review of the Melanesian ant fauna, a gazetteer of collecting stations is given below, including a brief ecological characterization of each locality. The classification of New Guinea forest types follows that of Lane-Poole (in P. W. Richards, *The Tropical Rain Forest*, Cambridge University Press, 1953).

NEW GUINEA

Bandong, upper Bunbok Valley, Northeast New Guinea (1100 meters). May 26, 1955. Disturbed foothills rain forest near the village, which is located approximately 12 kilometers north of Boana.

Bisianumu, near Sogeri, Papua (500 meters). March 15-20, 1954.

Field work at Bisianumu was conducted almost entirely in the second-growth foothills rain forest partly surrounding the Government experimental rubber plantation. A few accessions were made in similar forest several kilometers farther inland along the Kokoda Trail.

Boana, Bunbok Valley, Northeast New Guinea (1100 meters).

May 25, 1955. Partly disturbed foothills rain forest on the steep western slope of a hill rising just east of the Boana airstrip.

Brown River Road, 1.5 km. south of Karema, Papua. March 8-11, 1955. Most of the collecting at this locality was conducted in undisturbed lowland rain forest. Several accessions were made in an enclave of eucalyptus savanna several kilometers to the south.

¹ To cite an example, the aberrant formicine genus *Mesosena* was previously known only from a single specimen of *M. mistura* Fr. Smith from Batjan, collected by Wallace more than a century ago. A second species was recently discovered by the present author at Bisianumu, Papua.

Bubia, 12.5 km. northwest of Lae, Northeast New Guinea. March 26-27, May 18-19, 1955. Lowland rain forest, moderately disturbed.

Upper Bunbok Valley, southern slope of Saruwaged Range. May 27-June 1, 1955. The southern slope of the central portion of the Saruwaged Range was climbed to a point on the crest at approximately 4000 meters. Insect collections were made all along the altitudinal transect, and in all of the major vegetational belts, including mid-mountain forest, mossy forest, high mountain forest ("tree-line" zone), and alpine savanna. Ants diminished rapidly in the mid-mountain forest belt, above 1500 meters, and appeared to be altogether absent above the lowermost levels of the mossy forest, the last colonies being encountered in a clearing at approximately 2500 meters. In this connection it is interesting to note that Dr. J. J. H. Szent-Ivany and a party of native assistants were unable to turn up a single ant during several hours search in mossy forest at 2600 meters on the Asoro-Chimbu Divide, in the Central Highlands (Szent-Ivany, pers. commun.). All present evidence points to the complete absence of a high-alpine ant fauna in New Guinea.

Lower Busu River, near Lae (100-150 meters). March 27, April 28-May 17, 1955. Collecting was conducted principally between the Busu and Bupu Rivers in the area indicated in Figure 1. At the time of my visit this area was covered for the most part by primary lowland rain forest, which was in the process of being high-graded by the South Pacific Lumber Company. Through the courtesy of officials of the Company, I was able to reside for a period of three weeks in a camp on the forest border, and was thus presented with a superb opportunity to collect in the tops of the large trees as they were felled, in forest clearings at various stages of overgrowth, and in and around logs at all stages of decomposition. The ant fauna of the area proved exceptionally rich, and in one section of less than two square kilometers an estimated minimum of 170 species was collected. Several short excursions were also made into the extensive grassland fringing the western banks of the Busu River.

Didiman Creek, Lae, Northeast New Guinea. March 27, 29, May 8, June 3, 1955. Moderately disturbed lowland rain forest adjacent to the Government Botanical Gardens at the head of Didiman Creek. (See Figure 1.)

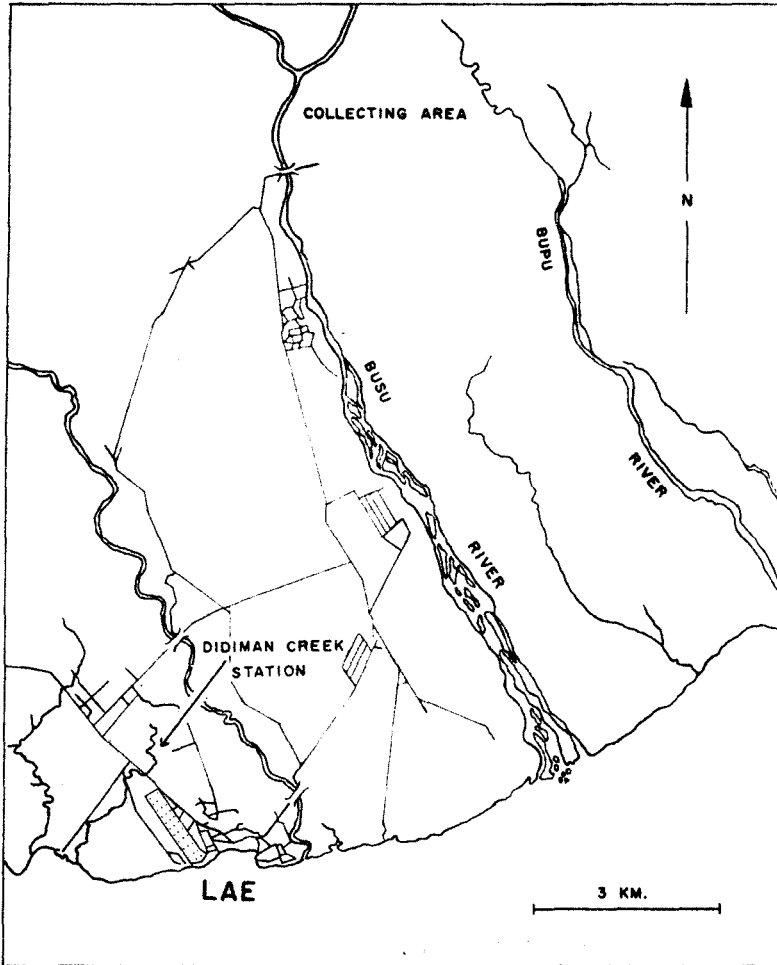


Fig. 1. The Lae area in 1955, showing the Didiman Creek and lower Busu River collecting stations.

Karema. See Brown River Road.

Laloki River, 16 km. northeast of Port Moresby, near Little Mt. Lawes, Papua. March 8, 1955. Collecting was limited to the terraced, forested floodplain of the Laloki.

Mongi-Mape Watersheds, eastern Huon Peninsula, Northeast New Guinea. April 2-23, 1955. In the company of Mr. Robert Curtis, of the Territorial Department of Agriculture, Stock, and Fisheries, the author made a three-week collecting trip through the mountainous country of the Dedua and Hube districts, embracing the headwaters of the Mongi and Mape (Go) rivers. The route of this trip is shown in Figure 2; the localities indicated are villages, the elevations of which range from sea level to 1800 meters. Collecting was conducted in the forests and clearings along native foot trails.

Nadzab, Markham Valley, Northeast New Guinea. May 20-22, 1955. The collecting station was a plantation managed by Mr. Keith Smith, located at the southwestern corner of the old wartime Nadzab airstrip, 1.5 km. east of the junction of the Markham and Erap rivers. Most accessions were made in dry broadleaf evergreen forest, marked by dense undergrowth, open canopy, and prevalence of palms in all stories. At the time of the author's visit, the area was suffering from a record drought, not having received rain in over two months. On the forest floor leaf litter and mold were thin and dry, while the interiors of the larger rotting logs were generally moist.

*Port Moresby, Papua. March 5-7, 1955. Collecting was conducted in open *Eucalyptus* woodland in and around Port Moresby, and in *Eucalyptus* woodland and dense second-growth monsoon forest on the summit of Kini-Kini, a 250-meter-high hill on the southeastern outskirts of the town.*

Saruwaged Range. See Bunbok Valley.

NEW HEBRIDES

Eight kilometers north of Luganville, Espiritu Santo (100-150 meters). January 10, 1955. Second-growth rain forest.

Aubert Ratard Plantation, 8 km. southwest of Luganville. January 7-13, 1955. Collecting was limited to the border and in-

terior of primary lowland rain forest in the western section of the Ratard Plantation.

FIJI ISLANDS

Eight miles west of Korovau, on King's Road, Viti Levu. December 3, 1954. Second-growth rain forest.

Nadala, near Nadarivatu, Viti Levu. December 1-2, 1954. Partly disturbed rain forest on the slope of a steep hill just north of Nadala. The soil was clayey, with numerous fragments of volcanic rock at the surface, and covered by fairly thick leaf

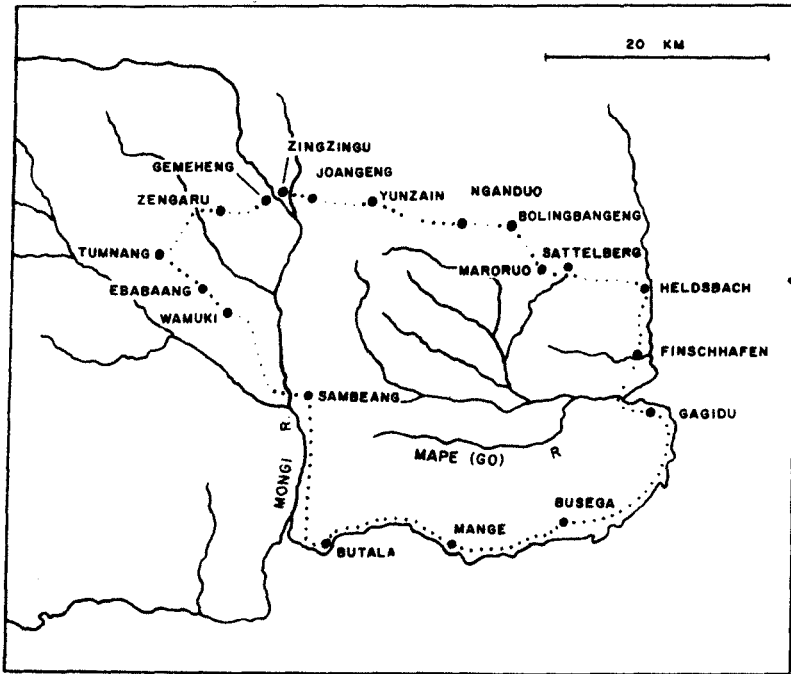


Fig. 2. Southeastern part of the Huon Peninsula, showing the itinerary of a collecting trip in the region of the Mongi-Mape watersheds in April, 1955.

litter. The canopy was open, due to native lumbering operations, and the undergrowth was moderately to very dense. Despite the obviously disturbed condition of the forest, the

local ant fauna was almost entirely endemic in composition, and a large percentage of the known Viti Levu species was encountered during the course of only two days' work.

NEW CALEDONIA

Anse Vata, Nouméa. December 4, 15, 1954. Most collecting was conducted in open *Melaleuca* and *Santalum* woods within several hundred meters distance of the Anse Vata beach. A few accessions were made in *Ficus* groves on the beach itself.

Le Chapeau Gendarme, near Yahoué. December 5-7, 1954. Most of the hills in the area immediately to the north of Nouméa are covered by open *Melaleuca* woodland, occupied chiefly by introduced ant species, but along the stream running down the southern slope of Chapeau Gendarme there was during the time of the author's visit a section of rich, semi-deciduous angiosperm forest that yielded many of the New Caledonian endemic ants. The forest contained two strata—an upper, discontinuous stratum exceeding twelve meters in height, and a lower, denser stratum of small trees and shrubs ranging mostly three to seven meters in height. Much of the forest floor was covered by bracken, and the leaf litter was generally thin, patchy, and dry. (See Figure 3.)

Ciu, near Mt. Canala. December 21, 1954; December 31, 1954-January 3, 1955. Field work was conducted at three stations in the vicinity of Ciu. (1) On the property of Mr. D. Féré, on the west bank of the Canala River at 300 meters elevation, collections were made in an isolated section of broadleaf evergreen forest completely surrounded by pastures. The floor of this woodlot had been badly disturbed by cattle, but many of the endemic New Caledonian ant species were found nesting under deep-set rocks and in the occasional stable accumulations of leaf litter. (2) On the east bank of the Canala River, only several hundred meters from the Féré woodlot, was the start of an extensive stretch of relatively undisturbed broadleaf evergreen forest that was made the second site of intensive collecting. The more remote sections of the forest probably approached a mature (primary?) condition and resembled the Chapeau Gendarme forest in being two-storied. Epiphytes and lianas were uncommon. The floor was well

insolated and covered in most parts by moist leaf litter up to a meter in depth. Rocks and rotting logs were everywhere common on the ground. (3) The third collecting station was two kilometers southwest of the Ciu Falls, on the trail to

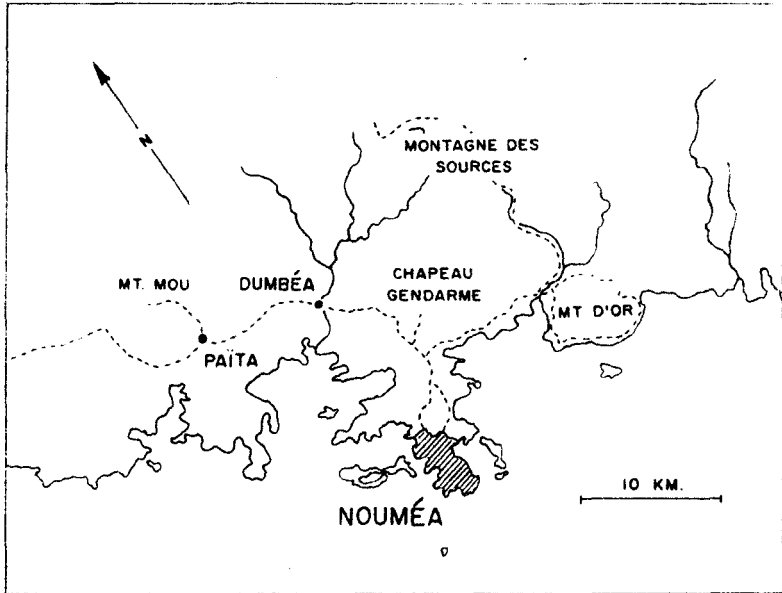


Fig. 3. The Nouméa area, southwestern New Caledonia, showing the route followed during collecting in December, 1954, and January, 1955.

Koindé, at an elevation of 500 meters. The forest here was limited to deep stream valleys and was similar in form and composition to that at the second station, apparently differing only in being somewhat denser and moister.

Koh (ca. 500 meters). December 20, 1954. This locality is on the eastern slope of the central New Caledonian massif. Collections were made in moist broadleaf evergreen forest along a steep stream course crossing the main La Foa-Canala road.

Montagne des Sources. December 17, 1954. Collections were made at two stations in this montane area: at 800 meters, mixed *Araucaria-Agathis*-angiosperm forest on the steep val-

ley walls at the head of the Dumbéa River; at 1000 meters, a pure stand of second-growth *Araucaria* forest.
Mt. Mou (180-1200 meters). December 10-12, 1955. At lower elevations collecting was conducted near the Bourdinat residence in valley-pocket forest very similar to that on Chapeau

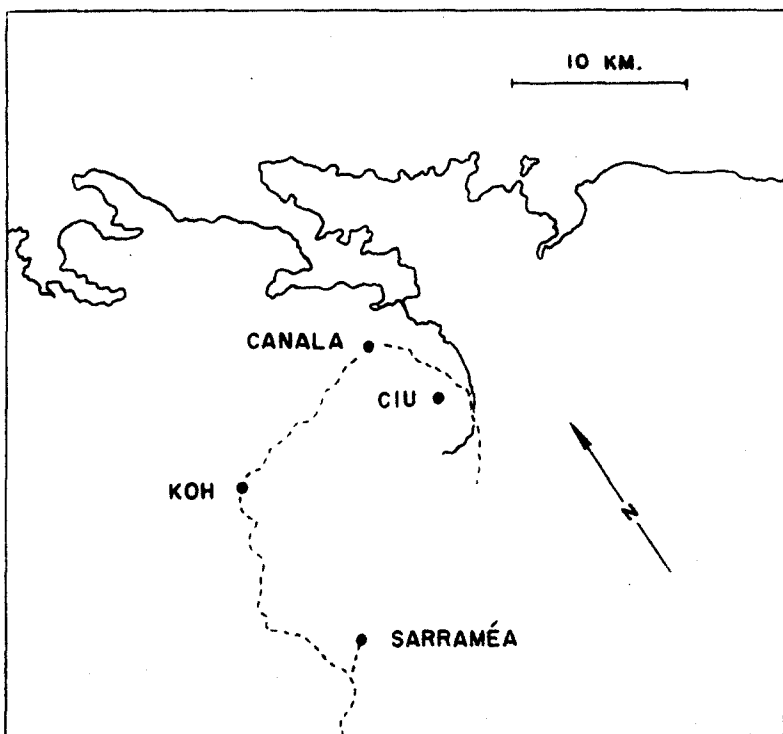


Fig. 4. The Canala area, north-central New Caledonia, showing the route followed during collecting in 1954-55.

Gendarme. On December 12 an ascent was made of Mt. Mou to a point on the summit ridge at about 1200 meters. Between approximately 300 and 700 meters the trail led through dense bracken scrub, toward the latter elevation passing into a belt of scattered, low, shrubby trees. Beyond this marginal zone

the summit cloud forest was encountered, dominated by large *Araucaria* and *Podocarpus*, and with abundant ground moss and epiphytes. Somewhat higher the cloud forest gave way to true mossy forest, consisting of gnarled, twisted trees averaging only eight to ten meters in height and bearing thick layers of mosses and other epiphytes. Ants were present but relatively scarce in both the cloud and mossy forest zones.

Nouméa. See *Anse Vata*.

Sarraméa (160 meters). December 22, 1954. Most of the accessions came from under rocks in moist, well shaded pastureland in the rich farming country around Sarraméa. Several stands of second-growth broadleaf evergreen forest were also visited and proved to contain most of the same ant species as the surrounding cultivated land.

Yahoué. See *Chapeau Gendarme*.

REFERENCE COLLECTIONS

Most of the available study material of Melanesian ants, both in original and duplicated series, is currently housed in the Museum of Comparative Zoology, Harvard University (MCZ). Below are listed other principal collections from which material has been drawn for the present study; these are preceded in each case by the abbreviation by which they are cited in the formal synonymies of the systematic section to follow.

(Bishop Museum)	B. P. Bishop Museum, Honolulu
(BMNH)	British Museum (Natural History), London
(CAS)	California Academy of Sciences, San Francisco
(Emery Coll.)	Emery Collection, Museo Civico di Storia Naturale, Genoa
(Forel Coll.)	Forel Collection, Museum d'Histoire Naturelle, Geneva
(OUM)	Hope Department of Entomology, Oxford University Museum, Oxford, England
(Paris Museum)	Museum National d'Histoire Naturelle, Paris

- (USNM) United States National Museum, Washington, D. C.
 (Yasumatsu Coll.) Collection of Dr. Keizô Yasumatsu, University of Kyushu, Japan

ACKNOWLEDGEMENTS

The author is indebted to Dr. W. L. Brown and Mrs. Eleanor Lowenthal for preparing a large part of his Melanesian collections and shipping them to him for advance study in Europe on his return from the Pacific in 1955. Dr. Brown also supplied a set of preliminary taxonomic notes and inquiries that proved most helpful during examination of type material in the major European collections. As a result of this cooperation, the author was able to firmly identify many of the little known and critical Melanesian forms, as well as settle a number of pressing nomenclatural problems pertaining to other parts of the world fauna.

Appreciation is also expressed to the following individuals for their help in assembling the study collection and granting access to type material: Mr. J. Auber (Paris Museum), Dr. Ch. Ferrière (Forel Coll.), Dr. H. Gisin (Forel Coll.), Dr. J. L. Gressitt (Bishop Mus.), Dott. Delfa Guiglia (Emery Coll.), Mr. G. E. J. Nixon (BMNH), Dr. E. S. Ross (CAS), Dr. M. R. Smith (USNM), Dr. K. Yasumatsu (Yasumatsu Coll.).

Finally, the author wishes to express his gratitude to the following persons for material aid supplied him during the course of field work in Melanesia: Rev. G. Bergmann, Mr. François Cohic, Mr. Robert Curtis, Mr. L. J. Dumbleton, Mr. Arnold Himson, Mr. Jacques Rageau, Mr. Aubert Ratard, Mrs. Suzanne Ratard, Mr. Keith Smith, Mr. G. A. V. Stanley, Dr. J. J. H. Szent-Ivany. Their help greatly increased the amount of collecting and field study that could be accomplished during my brief stay in the South Pacific.

MEASUREMENTS

Measurements in the present study follow the conventions already adopted by the author and W. L. Brown in previous taxonomic work.¹ The dimension *head length*, over which there

¹ See W. L. Brown, 1953, *Amer. Midl. Nat.*, 50, p. 7; or E. O. Wilson, 1955, *Bull. Mus. Comp. Zool.*, 113, p. 22.

has been some disagreement in the past, is taken as follows: maximum length of the head, measured from a transverse through the posteriormost point or points along the occipital border to a transverse through the anteriormost point or points on the anterior clypeal border (after Brown, 1953).

THE LEPTOGENYINI OF THE MOLUCCAS AND WESTERN MELANESIA

In the area extending from the Moluccas to the New Hebrides, six species groups of *Leptogenys* are currently recognizable. These are listed below, along with their constituent species and attendant new synonymy.

Group of *L. caeciliae* Viehmeyer

caeciliae Viehmeyer
optica Viehmeyer

Group of *L. chinensis* Mayr

bituberculata Emery
drepanon Wilson
hebrideana Wilson
indagatrix Wilson
papuana Emery
triloba Emery

Group of *L. diminuta* (Fr. Smith)

diminuta (Fr. Smith)
= *Ponera simillima* Fr. Smith
= *Ponera ferox* Fr. Smith
= *Leptogenys diminuta* var. *bismarckensis* Forel
= *Leptogenys diminuta* subsp. *santschii* Mann
= *Leptogenys diminuta* var. *stitsi* Viehmeyer
= *Leptogenys diminuta fruhstorferi* var. *amboinensis* Karawajew
= *Leptogenys diminuta fruhstorferi* var. *buruensis* Karawajew
nitens Donisthorpe
oresbia Wilson
purpurea Emery
violacea Donisthorpe

Group of *L. emeryi* Forel

emeryi Forel
foreli Mann
 = *walkeri* Donisthorpe
truncatus Mann

Group of *L. keysseri* Viehmeyer

keysseri Viehmeyer

Group of *L. processionalis* (Jerdon)

breviceps Viehmeyer
 = *Pseudoponera lubbocki* Donisthorpe
 = *Euponera niger* Donisthorpe

Key to the species, based on the worker caste

1. When the mandibles are in a closed position, there is a gap between the point where their inner borders overlap and the midpoint of the anterior clypeal border which is at least as wide as the width of the individual mandibles at their insertions; mandibles linear and with no more than a single tooth besides the apical..... 2
 When the mandibles are in a closed position, there is little or no gap between the point of overlap of their inner borders and the midpoint of the anterior clypeal border; mandibles varying in shape among species and frequently, but not always, bearing numerous teeth in addition to the apical..... 9
2. Alitrunk completely lacking standing hairs; entire body surface opaquely sculptured and covered with pruinose pubescence (Polynesia; possibly occurring also in Melanesia as a tramp species).... *insularis* Fr. Smith
 Alitrunk with abundant standing hairs; body surface smooth and shining at least in part, and lacking pruinose pubescence..... 3
3. Smaller species, the pronotal width 1.14 mm or less; almost all of the head and alitrunk densely foveate-punctate and subopaque to opaque. . 4
 Larger species, the pronotal width 1.30 mm or more; almost all of the head and a large part of the alitrunk smooth and shining..... 6
4. Dorsal face of propodeum only slightly longer than the posterior face (New Britain)..... *emeryi* Forel
 Dorsal face of propodeum about twice as long as the posterior face . . . 5

5. Median anterior clypeal projection nearly twice as broad as long (Santa Cruz Islands) *truncata* Mann
 Median anterior clypeal projection as long as broad or longer (widely distributed, New Guinea to New Hebrides) *foreli* Mann

6. When the mandibles are in a closed position, the gap between the point of intersection of their inner borders and the midpoint of the anterior clypeal border is approximately three times the maximum mandible width *triloba* Emery
 When the mandibles are in a closed position, the gap described above is about equal to the maximum mandible width or a little less 7

7. The petiolar node about $1.1 \times$ longer than broad, its dorsal surface distinctly tuberculate *indagatrix* Wilson
 The petiolar node at least $1.3 \times$ longer than broad, its dorsal surface smooth or at most bearing shallow foveae 8

8. Petiolar node about $1.3 \times$ longer than broad; its width measured just behind the anterior margin $0.7-0.8 \times$ the maximum width, which is located just in front of the posterior border; body surface showing bluish reflections *papuana* Emery
 Petiolar node about $1.5 \times$ longer than broad; its width measured just behind the anterior border only about $0.5 \times$ the maximum width; body lacking bluish reflections *drepanon* Wilson

9. Petiolar node compressed antero-posteriorly, forming a narrow, transverse dorsal crest; head nearly as broad as long; dark brown, robust, small-eyed species *breviceps* Viehmeyer
 Petiolar node not compressed antero-posteriorly, its crest longitudinally oriented; head much longer than broad; mostly, but not all, jet-black, slender species with moderately large eyes 10

10. Very small, slender species, the pronotal width not exceeding 0.79 mm; the petiolar node strongly compressed laterally and seen from above strongly tapered in an anterior direction 11
 Larger species, the pronotal width 0.82 mm or greater, and if approaching the smaller size class (pronotal width 0.82-1.17 mm) then the petiolar node is neither markedly compressed laterally nor strongly tapered in an anterior direction 12

11. Head almost entirely smooth and shining (New Guinea)
bituberculata Emery
 Entire head foveate-punctate and opaque (New Hebrides)
hebrideana Wilson

12. Showing the following combination of characters: medium-sized (pronotal width 1.06-1.23 mm), most of the body surface showing strong

- steel-blue or violaceous reflections, the entire head surface finely and densely striate..... 13
 Not showing all of the above characters..... 14
13. Entire alitrunk covered with long erect hairs; bluish-violaceous reflections absent or very weakly developed on the gaster and appendages (New Guinea mainland)..... *purpurea* Emery
 Alitruncal pilosity limited to a few short hairs on the declivitous faces of the propodeum; bluish-violaceous reflections well developed on the first several gastric tergites and on the appendages (Waigeo).....
violacea Donisthorpe
14. Smaller species, the pronotal width not exceeding 1.02 mm. Showing in addition the following combination of characters: petiolar node seen from above shaped like a half-ellipse; sculpturing of the head limited almost entirely to longitudinal striation; the lower halves of the sides of the propodeum longitudinally striate, the upper halves mostly or entirely smooth..... 15
 Larger species, the pronotal width at least 1.17 mm. Not showing all of the additional characters given above..... 17
15. The area between the posterior margin of the eye and the occipital corner at least partly striate and feebly shining to subopaque.....
diminuta (Fr. Smith)
 Cephalic area described above lacking striae, completely smooth and shining..... 16
16. Longitudinal striae just mesad of the eye extending for a short distance posterior to the level of the posterior margin of the eye; head proportionately longer, cephalic index 71; scapes proportionately longer, scape index 138-145 (Netherlands New Guinea and Waigeo).....
nitens Donisthorpe
 Longitudinal striae just mesad of the eye not surpassing the level of the posterior margin of the eye; cephalic index 76; scape index 121-125 (Solomons)..... *oresbia* Wilson
17. Distance from the posterior margin of the eye to the posterior margin of the head only slightly greater than the maximum eye length; circumocular sulcus lacking; entire body smooth and shining.....
keysseri Viehmeyer
 Distance from the posterior margin of the eye to the posterior margin of the head more than twice the maximum eye length; the eye mostly or entirely surrounded by a shallow but distinct sulcus; body in large part sculptured and opaque..... 18

18. In full face view, the eyes do not quite reach the lateral margins of the head; the eyes are completely surrounded by the circumocular sulcus . . .

caeciliae Viehmeyer

In full face view, the eyes slightly surpass the lateral margins of the head; the circumocular sulcus does not extend around the anterior margin of the eye *optica* Viehmeyer

LEPTOGENYS BITUBERCULATA Emery

(Figure 5)

Leptogenys bituberculata Emery, 1902, Természetr. Füz., 25: 160, worker.

Original localities: Tamara I., Oudemaine I., and Sattelberg, N.-E. New Guinea. (Syntype examined — Emery Coll.)

Material examined. PAPUA: Dobodura (P. J. Darlington); Bisianumu, 500 m. (Wilson, nos. 637, 640, 663).

Taxonomic notes. The Dobodura specimens were compared with a syntype in the Emery Collection and found to be nearly identical. The series from Bisianumu, however, differ in their slightly larger size and more rounded propodeum, and may prove to belong to a distinct species. For descriptive data on *bituberculata*, see under the comparative descriptions of *L. hebrideana* Wilson and *L. sagaris* Wilson.

Ecological note. At Bisianumu, a colony containing about 300 workers and a quantity of brood was found nesting in and under loose leaf litter on the floor of second-growth foothills rain forest.

LEPTOGENYS BREVICEPS Viehmeyer

(Figure 5)

Leptogenys (Lobopelta) breviceps Viehmeyer, 1914, Arch. Naturgesch., 79A(12): 30, fig. 4, worker. Type locality: Wareo, N.-E. New Guinea.

Pseudoponera lubbocki Donisthorpe, 1938, Ann. Mag. Nat. Hist., (11)1: 593, 596, fig., worker. Type locality: Mt. Lina, Cyclops Mts., Neth. New Guinea. (Syntype examined — MCZ). NEW SYNONYMY.

Euponera (Brachyponera) niger Donisthorpe, 1949, Ann. Mag. Nat. Hist., (12)2: 405, male. Type locality: Maffin Bay, Neth. New Guinea. (Holotype examined — CAS). NEW SYNONYMY.

Material examined. N.-E. NEW GUINEA: lower Busu River (Wilson, no. 873); Boana, upper Bunbok Valley, 1100 m. (Wil-

son, no. 1116). NETH. NEW GUINEA: Mt. Lina, Cyclops Mts., 160 m. (*Pseudoponera lubbocki* Donisthorpe syntype); Maffin Bay (*Euponera niger* Donisthorpe holotype).

Taxonomic notes. This is the only known Papuan member of the *L. processionalis* group, the species of which are predominantly Indomalayan in distribution. The series collected by myself and a single syntype of *Pseudoponera lubbocki* Donisthorpe agree well with Viehmeyer's description of *breviceps*, except in slight color characters. Viehmeyer states that *breviceps* is colored similarly to *L. processionalis*, whereas the series examined by me are slightly darker than *processionalis*, as I conceive that species, and show metallescent reflections not exhibited by *processionalis*. There is a good possibility that this difficulty may be resolved by the fact that Viehmeyer was using as his standard some species of the taxonomically difficult *processionalis* group other than *processionalis*, e.g. *L. iridescens* (Fr. Smith). The holotype of *Euponera niger* Donisthorpe, on loan from the California Academy of Sciences, has been compared with a male of *breviceps* from the Busu River and found to be nearly identical.

Ecological notes. At Boana a large colony was found nesting in open soil in a partial clearing in second-growth rain forest. The nest was marked externally by a low, irregular pile of excavated earth about a meter in diameter and bearing multiple entrance holes. At the Busu River a group of workers were found foraging in leaf litter during the day. The workers are unusually aggressive when disturbed and capable of delivering a powerful, shocking sting. No observations were made to determine whether *breviceps* conducts raids on termite nests as do other members of the *processionalis* group. A male determined as *breviceps* was taken at light at the Busu River on May 13, 1955.

LEPTOGENYS CAECILIAE Viehmeyer

Leptogenys (Lobopelta) caeciliae Viehmeyer, 1912, Abh. Zool.-anthrop.-ethn. Mus. Dresden, 14: 6, figs. 5, 5a, worker. Type locality: Torricelli Mts., N.-E. New Guinea.

This large and striking species is known only from the single type worker. As indicated in the key, it is closely allied to *L. optica* Viehmeyer.

LEPTOGENYS DIMINUTA (Fr. Smith)

- Ponera diminuta* Fr. Smith, 1857, J. Linn. Soc. Zool., 2: 69, worker. Type locality: Sarawak.
- Leptogenys diminuta*, Mayr, 1867, Tijdschr. Ent., 10: 57, worker, distribution.
- Ponera simillima* Fr. Smith, 1860, J. Linn. Soc. Zool., 5 (suppl.): 104, worker. Type locality: Batjan. NEW SYNONYMY (provisional). *Nec Ponera simillima* Fr. Smith, *op. cit.*, p. 105 (= *Prionopelta majuscula* Emery).
Leptogenys (Lobopelta) simillima, Donisthorpe, 1932, Ann. Mag. Nat. Hist., (10)10: 462.
- Ponera ferox* Fr. Smith, 1865, J. Linn. Soc. Zool., 8: 70, worker. Type locality: Salawati. NEW SYNONYMY (provisional).
- Leptogenys (Lobopelta) ferox*, Donisthorpe, 1932, Ann. Mag. Nat. Hist., (10)10: 472.
- Leptogenys (Lobopelta) diminuta* var. *bismarckensis* Forel, 1901, Mitt. Zool. Mus. Berlin, 2(1,b): 7, worker. Type locality: Muarlin, New Britain. (Syntype examined — Emery Coll.). NEW SYNONYMY.
- Leptogenys (Lobopelta) diminuta* var. *papuana* Stitz, 1912, Sitzber. Ges. Naturf. Freunde Berlin, no. 9: 498, fig. 1, worker. *Nec Leptogenys papuana* Emery 1897; see *L. diminuta* var. *stitzi* Viehmeyer 1924.
- Leptogenys (Lobopelta) diminuta* subsp. *santschi* [!] Mann, 1919, Bull. Mus. Comp. Zool., 63: 299, worker, ergatogyne, male. Type locality: Malapaina I., Three Sisters Group, Solomons. (Syntypes examined — MCZ). NEW SYNONYMY.
- Leptogenys (Lobopelta) diminuta* var. *stitzi* Viehmeyer, 1924, Ent. Mitt., 13: 310, nom. pro *L. diminuta* var. *papuana* Stitz. NEW SYNONYMY (provisional).
- Leptogenys (Lobopelta) diminuta* subsp. *fruhstorferi*, Karawajew, 1925, Konowia, 4: 276.
- Leptogenys (Lobopelta) diminuta fruhstorferi* var. *amboinensis* Karawajew, 1925, *ibid.*, p. 277, worker. Type locality: Amboina. NEW SYNONYMY.
- Leptogenys (Lobopelta) diminuta fruhstorferi* var. *huruensis* [!] Karawajew, 1925, *ibid.*, p. 278, worker. Type locality: Tifu, Buru. NEW SYNONYMY.

Material examined. This abundant ponerine species ranges from Ceylon and India east to Botel Tobago and south through Indonesia to New Guinea, the Solomons, and Queensland. Below are listed the records from Melanesia that have been verified during the present study.

WAIGEO: Camp Nok, 800 m. (L. E. Cheesman). N.-E. NEW GUINEA: Nadzab, Markham Valley (Wilson, nos. 1087, 1106,

1107); Bubia (Wilson, no. 1059); lower Busu River (Wilson, nos. 934, 940); Mongi River at Sambeang (Wilson). PAPUA: Karema, Brown River (Wilson, no. 539); Bisianumu, 500 m. (Wilson, nos. 608, 644, 659). SOLOMONS: Wai-ai, San Cristoval (W. M. Mann).

Significant literature records include Amboina and Buru (Karawajew, 1925); Muarlin, New Britain (Forel, 1901); and Malapaina and Ugi, Solomons (Mann, 1919).

Taxonomic notes. The status of *diminuta* is complicated by the existence of at least four closely related species that occupy restricted distributions within its range. On Negros Oriental and Luzon, Philippines, there is a species, apparently undescribed, which is distinguished from *diminuta* by its denser, heavier body sculpturing. A second species occurs in northern Borneo and Sarawak and is distinguished from sympatric samples of *diminuta* by much feebler body sculpturing and smaller size; this species may well be Frederick Smith's *Ponera laeviceps*. A third species, *L. nitens* Donisthorpe, is widespread in Netherlands New Guinea, while a fourth, *L. oresbia* Wilson, occurs in the Solomons. The possibility exists that sibling species additional to *L. nitens* occur with *diminuta* on New Guinea. A single stray worker (or ergatogyne?) from Bisianumu, Papua (acc. no. 644) appears identical with other workers from the same locality except for a much thinner petiolar node; it has been treated tentatively as a pathological specimen of *diminuta* but may represent a distinct species.

The single definitely associated ergatogyne collected in New Guinea (Nadzab; acc. no. 1106) is distinguished from connidal workers by its slightly larger size, proportionately thinner petiolar node, and proportionately much larger gaster. The alitrunk is worker-like. Lateral ocelli are developed but the median ocellus is represented only by an empty pit.

Geographic variation in the worker caste of *L. diminuta* is most conspicuous in body sculpturing. In this character at least three separate surface areas show independent variation. In the accompanying table I have indicated the records of the species that I have personally verified or that are adequately described in the literature, and I have attempted to indicate by means of a crude classification of sculpturing form and relative sculpturing density the geographic variation in the three body areas. Most

GEOGRAPHIC VARIATION IN LEPTOGENYS DIMINUTA

Locality	Postocular Cephalic Surface	Lateral Pronotal Surface	Mesopleural Surface
Lengoo, Kwangtung Prov., China	heavily striate	feebly punctate-striate	heavily striate
Botel Tobago	heavily striate	completely smooth	heavily striate
Misamari, Assam	feebly striate	smooth to feebly striate	feebly shagreened
Rangoon, Burma	heavily striate	feebly punctate-striate	feebly punctate-striate
Walajanagar, E. Madras Prov., India	feebly striate	completely smooth	feebly shagreened
Kandy, Ceylon	feebly striate	completely smooth	feebly shagreened
Batu Caves, Kuala Lumpur, Malaya	heavily striate	feebly striate	feebly striate
Pang Mop, Sumatra	heavily striate	feebly striate	feebly striate
North Borneo and Sarawak	heavily striate	feebly striate with smooth patches	moderately striate
Pemalang, Java	heavily striate	feebly striate with smooth patches	feebly striate
Bali	heavily striate	moderately striate	heavily striate

Locality	Postocular Cephalic Surface	Lateral Pronotal Surface	Mesopleural Surface
Binaluan, n. Palawan	heavily striate	feebly punctate-striate	feebly striate
Zamboanga, Mindinao, P. I.	heavily striate	feebly punctate-striate	moderately striate
Cebu and Limay, Luzon	heavily striate	feebly punctate-striate	heavily striate
Buru (after Karawajew, 1925)	heavily striate	smooth to feebly striate	†
Waigeo	heavily striate	completely smooth	heavily striate
New Guinea	heavily striate	smooth to feebly striate	moderately to heavily striate
Wai-ai, Solomons	feebly striate	completely smooth	heavily striate
Kuranda, Queensland	heavily striate	moderately punctate-striate	moderately striate

of the records involve single nest series. This is only a preliminary sketch and will serve merely to indicate the extensive nature of the variation and the marked discordance between the independent areas.

L. diminuta should prove in the future one of the most satisfactory of all ant species for the detailed study of geographic variation. However, the unfortunate circumstance prevails that even the most elementary analysis will be hampered by the large number of infraspecific names that have been attached to this species during its long taxonomic history. In the present treatment I have accounted for only those names applied to material

originating from Melanesia and the Moluccas. Some of the names placed in synonymy, such as Karawajew's Moluccan varieties and subsp. *santschii* Mann from the Solomons, are clearly geographic variants or less and do not need further comment. Several other names, however, present more complex problems and, in the absence of type material, have been placed in provisional synonymy. Their cases are treated individually below.

Ponera simillima Fr. Smith. In the original description this species was compared with *Ponera laeviceps* Fr. Smith, in such a way as to suggest its probable identity with *L. diminuta*. There is no clue in the descriptions of either *laeviceps* or *simillima* as to any character by which the latter can be separated from *diminuta*.

Ponera ferox Fr. Smith. In the original description this species was stated to differ from *diminuta* by its larger size and weaker sculpturing. The present author made a special attempt to locate the type of *ferox* during a recent visit to the British Museum (Natural History) and Hope Department of Entomology, but was not successful.

Leptogenys diminuta var. *stitzi* Viehmeyer. This form was described as differing from "typical" *diminuta* by (1) larger size, (2) somewhat more elongate alitrunk, and (3) less flattened petiolar node. In my opinion the *stitzi* types probably fall within the extreme range of the New Guinea *diminuta* population in the first two characters. I have seen no specimens with the precise petiolar node form shown by Stitz in his figure, but an exceptionally large worker from Sambeang approaches it, and if the node of this specimen is turned slightly so as to be seen from a posterior-oblique view, the outline actually corresponds well to that in Stitz's figure. Until a species is defined which corresponds with Stitz's characterization, it will probably be best to leave this form in provisional synonymy.

Ecological notes. *Leptogenys diminuta* has been found in a variety of habitats in New Guinea, from dry evergreen forest at Nadzab to primary lowland rain forest at the Busu River and foothills rain forest at Bisianumu. It seems to favor forest borders and partial forest clearings. Nest sites are variable, from logs of various degrees of decomposition to cavities in open leaf litter.

The following estimates of colony size and composition were made:

1. *Acc. no. 1087*. May 20-22, 1955. 70 to 80 workers, 10 males, and an undetermined amount of brood, consisting of larvae, one-quarter to full grown, and cocoons, the latter predominating.

2. *Acc. no. 1106*. May 20-22, 1955. One ergatogyne, about 150 workers, 10 males, and an undetermined amount of brood, consisting of larvae, one-half to full grown, and cocoons, the latter predominating.

3. *Acc. no. 539*. March 9, 1955. Somewhat in excess of 300 workers; brood not examined.

4. *Acc. no. 608*. March 15-20, 1955. About 200 workers and several males; brood not examined.

The ethology of *L. diminuta* has already been described in some detail in another paper.¹ The species shows what I have considered to be true legionary behavior, involving both frequent colony movement between temporary nests and the tendency of the workers to forage in groups. The following prey were recorded in New Guinea: a large adult millipede (Karema), 2 small pentatomid bugs (Nadzab), and a large passalid larva (Nadzab).

LEPTOGENYS DREPANON Wilson, n. sp.

(Figure 5)

Diagnosis (worker). A large member of the *chinensis* group, with almost completely smooth and shining body surface and elongate, non-tuberculate petiolar node.

Holotype worker. HW 1.49 mm, HL 2.15 mm, SL 2.68 mm, ML 0.50 mm, CI 69, SI 179, EL 0.38 mm, PW 1.30 mm, petiolar node length 1.03 mm, petiolar node height 0.94 mm, dorsal petiole width 0.69 mm. Mandibles linear, their maximum width (at the level of the junction of the apical and basal segments of the masticatory border) 0.29 mm. Apical tooth narrow but blunt; apical segment of masticatory border 0.40 mm in length, concave, meeting the basal segment in an obtuse, rounded angle. When the mandibles are in a closed position the distance between the point of overlap of the masticatory borders of the two mandibles

¹ Wilson, E. O., 1958, The beginnings of nomadic and group-predatory behavior in the ponerine ants, *Evolution*, in press.

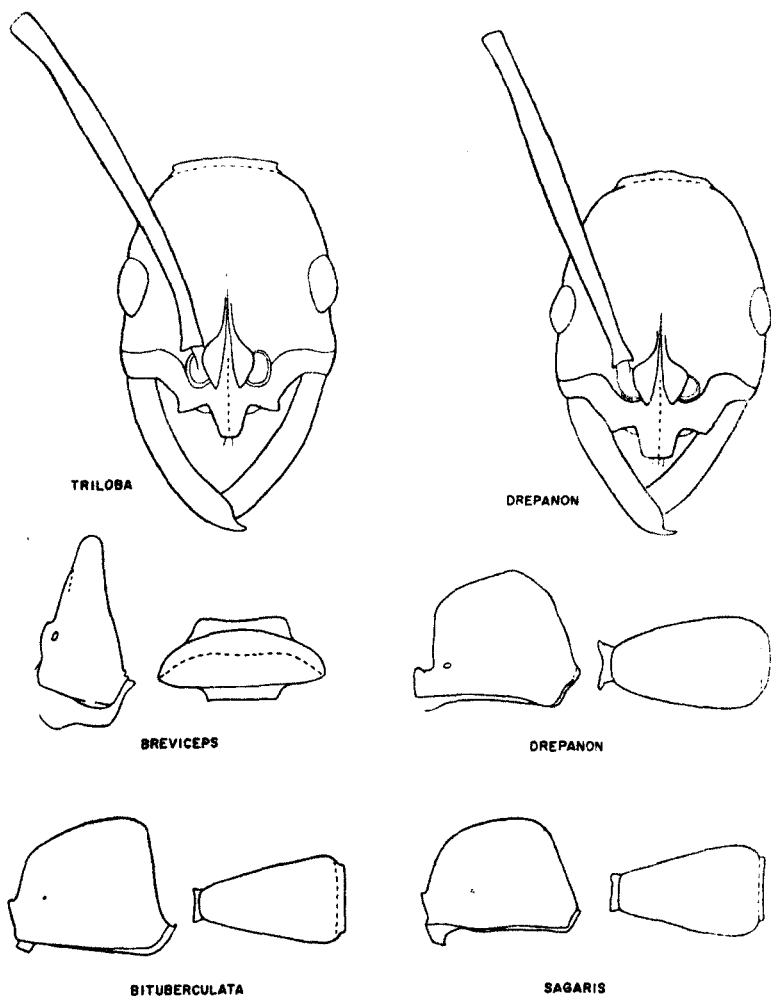


Fig. 5. Heads and petiolar nodes of the workers of selected species of *Leptogenys*. *L. triloba* Emery, worker from Bandung, N.-E. New Guinea; *L. drepanon* Wilson, worker holotype; *L. breviceps* Vishmeyer, drawn from syntype worker of the synonymous *Pseudoponera lubbocki* Donisthorpe; *L. bituberculata* Emery, worker from Dobodura, Papua; *L. sagaris* Wilson, holotype worker.

and the anterior clypeal projection is 0.32 mm. Eyes well developed, completely surrounded by a narrow sulcus, their outer margins extending well beyond the lateral margins of the head when the latter is viewed in full face. Median anterior clypeal projection 0.19 mm in length, trapezoidal, tapering slightly anteriorly, bearing three stout bristles 0.04 to 0.05 mm in length on its anterior border. Anterior clypeal border bearing on each side of the median projection a smaller, triangular projection the apex of which forms an angle of slightly more than 90° . Between the median and lateral projections the clypeal border is strongly convex. Posterior margin of head evenly rounded, grading into the lateral margins through a continuous curve. Head broadening anteriorly, so that its maximum width is just posterior to the mandibular insertions. Petiolar node as shown in Figure 5.

Entire body, including gula and appendages, covered by abundant, long, coarse, predominantly erect hairs. Scapes covered by predominantly oblique hairs, the longest of which are 0.14 mm in length, or more than 0.7 X the maximum scape width, which is 0.19 mm. The longest hairs of the posterior lateral margins of the head are 0.23 mm; those on the gula are 0.40 mm; those on the pronotum are 0.44 mm; and those on the petiolar node are 0.22 mm in length. As in *L. triloba* Emery, the body surface is almost entirely free of underlying pubescence; the scapes are also bare, but the funiculi and remainder of the appendages bear variably abundant appressed pubescence.

Mandibles feebly and irregularly striate; occiput bearing scattered small, low tubercles; remainder of the head almost entirely smooth and moderately to strongly shining. Entire pronotum, mesonotum, and propodeum (except the posterior propodeal face) smooth and shining. Upper one-fifth of episternum covered by rugae oriented transversely to the long axis of the body; lower four-fifths of episternum and entire metapleuron covered by obliquely oriented, anteriorly descending rugae. Basal two-thirds of posterior propodeal face covered by transverse costulae. Petiolar node nearly smooth and moderately shining, bearing broad, extremely shallow, indistinct, contiguous depressions which give it a very feebly wavy outline when viewed from the side. Gastric tergites completely smooth and shining.

Entire body, except mandibles and apical gastric segments, jet-black. Coxae also jet-black. Antennae, apical gastric segments, and leg segments distal to the coxae medium to dark brown.

Material examined. N.-E. NEW GUINEA: Bialowat, Morobe District (H. Stevens); a single worker.

Taxonomic notes. *L. drepanon* is closely related to *L. indagatrix* Wilson and can be distinguished by the characters given in the comparative description of that species. It is also close to *L. papuana* Emery, from which it can be distinguished by its more slender, tapering petiolar node, and lack of bluish surface reflections. From the more distantly related *L. triloba* Emery it differs by its smaller size, shorter mandibles, different clypeal outline, and longer and denser pilosity.

LEPTOGENYS EMERYI Forel

Leptogenys (Leptogenys) Emeryi Forel, 1901, Mitt. Zool. Mus. Berlin, 2(1,b): 7, worker. Type locality: Lowon Valley, near Ralum, New Britain.

Known from the holotype worker only. This species is closely related to *L. foreli* Mann, a species widely distributed in western and central Melanesia, but should be easily distinguished by the distinctive propodeal proportions as given by Forel in his original description.

LEPTOGENYS FORELI Mann

Leptogenys (Leptogenys) foreli Mann, 1919, Bull. Mus. Comp. Zool., 63: 297, fig. 9 (*nec* fig. 10, which is labelled as this species but is actually *L. truncata*), worker, male. Type locality: Malapaina I., Solomons. (Syntypes examined — USNM).

Leptogenys (Leptogenys) walkeri Donisthorpe, 1942, Ann. Mag. Nat. Hist., (11)9: 704, worker. Type locality: Vila, Efate, New Hebrides. (Holotype examined — BMNH). NEW SYNONYMY.

Material examined. NETH. NEW GUINEA: Maffin Bay (E. S. Ross). SOLOMONS: Malapaina (type locality). NEW HEBRIDES: Vila, Efate (*walkeri* holotype); Aubert Ratard Plantation, Espiritu Santo (Wilson, no. 237). Mann (1919) also records *foreli* from Auki and Simoli, in the Solomons.

Taxonomic notes. The Maffin Bay series differs from the *foreli* types and New Hebrides series in having slightly longer anterior genal teeth and sparser appendage pilosity.

Ecological notes. Ross (unpublished notes) found the Maffin Bay colony nesting in a sago palm trunk. The colony that I found on Espiritu Santo was nesting in a large rotting log, partly elevated off the ground, in primary lowland rain forest. It contained approximately 25 workers, which were extremely timid and agile.

LEPTOGENYS HEBRIDEANA Wilson, n. sp.

Diagnosis (worker). Closely resembling *L. bituberculata* Emery of New Guinea, showing the following principal differences:

(1) The entire surface of the head is coarsely sculptured and opaque (as opposed to completely smooth and shining in *bituberculata*), with the sculpturing showing the distinctive pattern described herewith: All of the clypeus but the central raised portion is longitudinally costulate. Posteriorly the costulae extend onto the frons, where they turn into rugae, which in turn form into a rugoreticulum in the area between the eye and antennal insertion. At about the level of the posterior margin of the eye, the rugoreticulum gives way to flat, shallow foveae, 0.02 to 0.05 mm in diameter and separated from one another by distances of about the same magnitude as the diameters. The bottoms of the foveae are densely punctate, whereas the interfoveal spaces are sparsely punctate to smooth. The entire gular area is covered by similar foveae. At the dorsal occipital zone the foveae are crowded together and the interfoveal spaces form a rugoreticulum.

(2) In *hebrideana* the anterior half of the pronotum and entire dorsal surfaces of the mesonotum and propodeum are irregularly pitted and furrowed, while in *bituberculata* the same area is completely smooth and shining. In *hebrideana* the entire lateral surface of the alitrunk is coarsely sculptured, with oblique rugae predominating, whereas in *bituberculata* sculpturing is limited to the immediate vicinities of the metapleural-propodeal suture and metapleural gland.

(3) Both appendage and body pilosity are much denser in *hebrideana*.

(4) The petiolar node is proportionately shorter in *hebrideana*.

Holotype worker. HW 0.86 mm, HL 1.40 mm, SL 1.58 mm, CI 61, SI 184, EL 0.34 mm, PW 0.75 mm, petiole node length 0.74 mm, petiole node height 0.45 mm, dorsal petiole width 0.41 mm.

Paratype worker. HW 0.90 mm, HL 1.43 mm, SL 1.61 mm, CI 63, SI 179, PW 0.76 mm.

Material examined. NEW HEBRIDES: A. Ratard Plantation, near Luganville, Espiritu Santo (Wilson, no. 348; 2 workers).

Taxonomic notes. *L. hebrideana* also bears a close resemblance to *L. foveopunctata* Mann, *L. humiliata* Mann, and *L. navua* Mann, all of the Fiji Islands. The Fijian species have foveate head surfaces as in *hebrideana*, but *humiliata* and *navua* are considerably smaller in size and have nearly smooth alitruncal dorsa, while *foveopunctata* is larger than *hebrideana* and is further distinguished from all other members of the *bituberculata* complex by its coarsely sculptured petiolar node. There are other characters but the above should suffice for diagnostic purposes.

Ecological note. The two type workers of *hebrideana* were taken as strays foraging on the floor of undisturbed lowland rain forest.

LEPTOGENYS INDAGATRIX Wilson, n. sp.

Diagnosis (worker). Closely related to *L. papuana* Emery and *L. drepanon* Wilson, but easily distinguished from these two species by the following characters:

- (1) Smaller size (see measurements of holotype worker).
- (2) The petiolar node is proportionately shorter.
- (3) The surface of the petiole is covered by relatively small, non-contiguous, rounded tubercles; the intermediate areas are feebly and irregularly shagreened and their surfaces only feebly shining.

(4) The head surface, but no other part of the body, bears very faint bluish reflections. *L. drepanon* completely lacks surface reflections, while they are prominently developed on the body (and head also?) of *papuana*.

The following additional difference between *indagatrix* and *drepanon* is noteworthy: in *indagatrix* the pilosity of the dorsal propodeal and petiolar node surfaces is predominantly oblique, the individual hairs set at an angle at about 45° from the cuticular surface, whereas in *drepanon* the pilosity is predominantly erect, the individual hairs set at an angle of about 70°; the comparison cannot be extended to *papuana* in the absence of material belonging to that species.

Holotype worker. HW 1.44 mm, HL 2.02 mm, SL 2.48 mm, CI 71, SI 172, EL 0.41 mm, PW 1.26 mm, petiolar node length 1.06 mm, petiolar node height 1.00 mm, dorsal petiole width 0.86 mm.

Worker paratype variation. HW 1.38-1.43 mm, HL 1.94-2.00 mm, SL 2.40-2.46 mm, CI 71-72, SI 171-175.

Material examined. PAPUA: Bisianumu, 500 m. (Wilson, no. 661); holotype and six paratype workers.

Ecological note. The types were collected together from the floor of somewhat disturbed foothills rain forest.

LEPTOGENYS INSULARIS Fr. Smith

Leptogenys insularis Fr. Smith, 1879, J. Linn. Soc. Zool., 14: 675, worker.

Type locality: Oahu, Hawaii.

Although this distinctive tropicopolitan tramp species has not yet been recorded from Melanesia, it has been included in the key and mention made of it here on the basis of the high order of probability that it does occur somewhere in the area.

LEPTOGENYS KEYSSEI Viehmeyer

Leptogenys (Lobopelta) keysseri Viehmeyer, 1913, Arch. Naturgesch., 79A(12): 29, fig. 3, worker. Type locality: Sattelberg, N.-E. New Guinea.

Known from type material only.

LEPTOGENYS NITENS Donisthorpe

Leptogenys (Lobopelta) nitens Donisthorpe, 1943, Ann. Mag. Nat. Hist., (11)9: 169, worker. Type locality: Camp Nok, Waigeo, Neth. New Guinea. (Syntypes examined — MCZ). *Ibid.*, pp. 444-445, male, doubtfully associated.

Material examined. WAIGEO: Camp Nok (lectotype). NETH. NEW GUINEA: Maffin Bay (E. S. Ross).

Taxonomic notes. One of two syntype workers deposited in the Museum of Comparative Zoology belongs to the typical Papuan form of *L. diminuta*. The other belongs to a distinct, related species to which the name *L. nitens* is correctly applied. In order to stabilize the nomenclature, the latter specimen is hereby designated the lectotype of *nitens*. This species resembles *L. oresbia* Wilson of the Solomons in its reduced cephalic sculpturing but is easily distinguished by the fact that the longitudinal striae mesad of the eye extend well beyond the level of the posterior margin of the eye, whereas in *oresbia* they just attain the level of the posterior margin. *Nitens* further differs from *oresbia*, and resembles *diminuta*, in its smaller size, distinctly lower cephalic index, and proportionately longer scapes. The lectotype has the following cephalic proportions: HW 1.23 mm, HL 1.72 mm, SL 1.70 mm, CI 71, SI 138. The largest of four workers examined from the Maffin Bay series has the following cephalic proportions: HW 1.26 mm, HL 1.78 mm, SL 1.83 mm, CI 71, SI 145.

LEPTOGENYS OPTICA Viehmeyer, new status

Leptogenys (Lobopelta) caeciliae var. *optica* Viehmeyer, 1914, Zool. Jahr. Syst., 37: 609, worker. Type locality: Wareo, N.-E. New Guinea. (Syntype examined — Forel Coll.).

Material examined. N.-E. NEW GUINEA: Wareo (syntype); lower Busu River (Wilson, no. 927); Zingzingu, Mongi Watershed, 1200 m. (Wilson, no. 761).

Taxonomic notes. Workers from the Busu River differ from the syntype in the Forel Collection in the following manner: in the type, the sculpturing of the occipital region consists of transverse rugae, whereas in the Busu specimens it consists of an irregular rugoreticulum with no tendency toward a transverse orientation.

In addition to the characters given in couplet 18 of the key, *L. optica* can be distinguished from the closely related *L. caeciliae* by the following characters: eyes larger and more convex, petiolar node lower, first gastric tergite more densely punctate.

Ecological notes. At the Busu River a small colony of this remarkable ant was found nesting in and under a large, partly buried "Zoraptera-stage" log on the floor of primary lowland rain forest. Workers and brood occupied several large galleries in the lower part of the log itself, as well as several smaller galleries that passed laterally from the bottom of the log into the soil. At Zingzingu a single worker was found in late afternoon crossing a foot trail that led through a clearing in second-growth midmountain forest. The workers are unusually sluggish and timid for *Leptogenys*.

LEPTOGENYS ORESBIA Wilson, n. sp.

Leptogenys (Lobopelta) diminuta var. *laeviceps*, Mann, 1919, Bull. Mus. Comp. Zool., 63: 300. *Nec Ponera laeviceps* Fr. Smith.

Diagnosis (worker). Closely related to *L. diminuta* (Fr. Smith), *L. nitens* Donisthorpe, and the writer's present conception of *L. laeviceps* (Fr. Smith),¹ but differing in the following characters:

(1) Larger size. The HW of a series of *diminuta* from Wai-ai, San Cristoval, ranges 1.10-1.18 mm; the maximum HW of a large number of individuals of *diminuta* measured from all over its range is 1.26 mm. The HW of the two available series of *nitens* varies 1.23-1.26 mm, while the HW of the putative Bornean *laeviceps* varies 1.02-1.08 mm.

(2) The body sculpturing is finer and less extensive. Dorsal cephalic sculpturing consists almost entirely of longitudinal striae, and these are limited to the lateral portions of the clypeus, to the area bordered by the eyes, antennal insertion, and mandibular bases, to a restricted area just ventral to the eye, and to the gula. In the gular area the striae are relatively feebly developed and wavy. All of the remainder of the head is completely smooth and shining. Sculpturing is distributed on the

¹ Two series from northern Borneo and Sarawak in the Museum of Comparative Zoology have been tentatively determined as *laeviceps*. As noted under the discussion of *diminuta*, these specimens evidently represent a distinct sibling species that occurs sympatrically with *diminuta* on Borneo.

alitrunk as follows: a thin area at the base of the pronotal "neck" is covered by transverse striae; the episternum is covered by arcuate striae running parallel to the long axis of the sclerite; the metapleuron and lateral face of the propodeum below the level of the propodeal spiracle are covered by moderately wavy, longitudinally oriented striae; and the posterior face of the propodeum below the level of the dorsal margin of the metapleural gland bulla is covered by transverse striae. All the rest of the dorsal and lateral surfaces of the alitrunk, as well as the entire surfaces of the petiolar node and gastric tergites, are completely smooth and shining.

Holotype worker. HW 1.29 mm, HL 1.69 mm, SL 1.56 mm, CI 76, SI 121, PW 0.95 mm.

Paratype worker. HW 1.29 mm, HL 1.67 mm, SL 1.59 mm, CI 77, SI 123, PW 0.95 mm.

Paratype ergatogyne. HW 1.18 mm, HL 1.56 mm, SL 1.48 mm, CI 76, SI 125, PW 0.83 mm. This specimen is distinguished externally from the two associated workers by its smaller head and alitrunk, thinner petiolar node, and much larger gaster. The alitrunk is worker-like in form.

Material examined. SOLOMONS: near Fourafi, in the mountainous interior of Malaita (W. M. Mann); 2 workers, 1 ergatogyne. Nidotypes are on deposit in the United States National Museum.

Ecological note. According to Mann (1919), the types were taken running in file across a foot trail in montane forest. The presence of an ergatogyne in this series suggests that the colony may have been in the process of migration.

LEPTOGENYS PAPUANA Emery

Leptogenys papuana Emery, 1897, Ann. Mus. Civ. Stor. Nat. Genova, 38: 556, pl. 1, figs. 5, 6, worker. Type locality: "N. Guinea Mer."

Known from the holotype only.

LEPTOGENYS PURPUREA Emery, new status

(Figure 6)

Leptogenys Kitteli var. *purpurea* Emery, 1887, Ann. Mus. Civ. Stor. Nat. Genova, (2)5: 433, worker. Type locality: Andai, Neth. New Guinea. (Holotype examined — Emery Coll.).

Material examined. NETH. NEW GUINEA: Andai, near Manokwari (holotype); Maffin Bay (E. S. Ross). N.-E. NEW GUINEA: Gemeheng, Mongi Watershed, 1300 m. (Wilson, no. 781); Tumnang, Mongi Watershed, 1500 m. (Wilson, no. 803); Ebabaang, Mongi Watershed, 1300-1400 m. (Wilson, no. 828); Wamuki, Mongi Watershed, 800 m. (Wilson, no. 849); Finsch Harbor (N. G. L. Wagner). In eastern New Guinea, at least, this species is most abundant at intermediate elevations in the

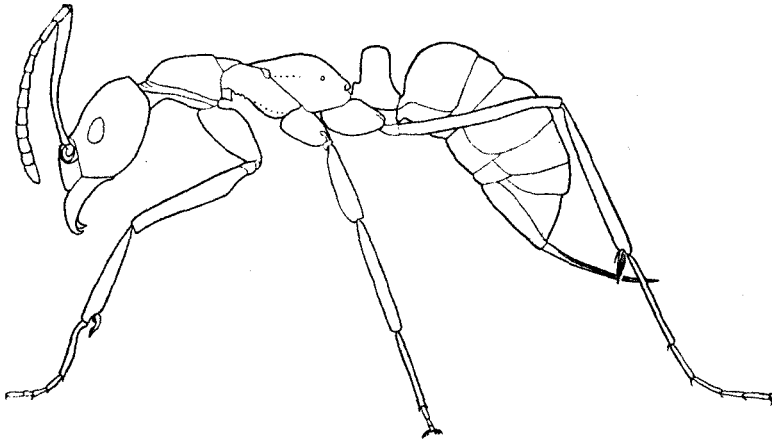


Fig. 6. Worker of *Leptogenys purpurea* Emery from Gemeheng, N.-E. New Guinea.

mountains. It was never encountered by the author during intensive collecting in the lowlands around Lae and Gagidu.

Taxonomic notes. Three species, *L. kitteli* Forel of the Asian mainland and Indonesia, *L. violacea* Donisthorpe of Waigeo, and *L. purpurea* Emery, together form what may be provisionally termed the *kitteli* superspecies. They are obviously closely inter-related, replace one another geographically, and yet seem too well marked to be considered as mere geographic variants of the same species.

L. purpurea can be distinguished from *L. kitteli* on the basis of the following set of worker characters: (1) purpurescent reflections common over most of the body surface of *purpurea*,

as opposed to none in *kitteli*; (2) cephalic striae finer and denser in *purpurea* than in *kitteli*; (3) most of the lateral surfaces of the pronotum of *purpurea* smooth and shining, as opposed to this surface striate and subopaque in *kitteli*; (4) petiolar node somewhat thicker in side view in *purpurea*. *L. purpurea* can be separated from *L. violacea* by means of the characters given in couplet 13 of the key.

Ecological notes. In the mountains of the Huon Peninsula, *L. purpurea* inhabits both clearings and the interior of undisturbed forests. Its behavior has already been described in some detail in another paper (cited on p. 123). Like the related species *L. diminuta*, it has marked legionary habits, employing group-foraging to prey on large arthropods not ordinarily vulnerable to ants that forage solitarily.

LEPTOGENYS TRILOBA Emery

(Figure 5)

Leptogenys triloba Emery, 1902, Természetr. Füzet., 25: 159, worker. Type locality: Sattelberg, N.-E. New Guinea.

Material examined. N.-E. NEW GUINEA: Tumnang, Mongi Watershed, 1500-1600 m. (Wilson, no. 811); 1.5 km. north of Bandong, upper Bunbok Valley, 1300 m. (Wilson, no. 1131).

Taxonomic notes. The Bandong worker agrees with Emery's description in having the gaster reddish and contrasting with the remainder of the body, which is jet black. The Tumnang worker differs, in that its gaster is as darkly colored as the remainder of the body. Both specimens agree well with the remainder of Emery's description. I have tentatively determined as this species a single male collected at light during the April, 1955, trip in the mountainous portion of the Huon Peninsula.

Ecological notes. Near Tumnang, in undisturbed midmountain forest, a worker was found at about 9 a.m. running along the top of a large rotting log, with a dead oniscoid isopod in its mandibles. Near Bandong another lone worker was found during the morning foraging on a native foot trail in midmountain forest.

LEPTOGENYS TRUNCATA Mann

Leptogenys (Leptogenys) truncatus Mann, 1919, Bull. Mus. Comp. Zool.,

63: 296, fig. 10 (*see* fig. 9, which is labelled as this species but is actually *L. foreli*), worker. Type locality: Graciosa Bay, Santa Cruz I.

Known from the holotype worker only.

LEPTOGENYS VIOLACEA Donisthorpe

Leptogenys (Lobopelta) violacea Donisthorpe, 1942, Ann. Mag. Nat. Hist., (11)9: 705, worker. Type locality: Camp Nok, Waigeo, 800 m. (Syn-type examined — MCZ).

Known from type material only.

THE LEPTOGENYINI OF THE FIJI ISLANDS

Nothing has been published on the Fijian *Leptogenys* since Mann's pioneering monograph on the Fijian ant fauna (W. M. Mann, 1921, Bull. Mus. Comp. Zool., 64: 401-499). In this publication all six of the currently known species were described for the first time: *foveopunctata*, *fugax*, *humiliata*, *letilae*, *navua*, and *vitiensis*. A recent re-examination of the types of all of these species, with the exception of *L. foveopunctata*, has led me to the tentative conclusion that all are closely interrelated and even possibly derived from the same parental species. They are members of the *L. chinensis* Mayr group, which is represented by a large number of species in the Indo-Australian region, and their closest Melanesian relatives within the *chinensis* group are *bituberculata* Emery of New Guinea, *hebrideana* Wilson of the New Hebrides, and *sagaris* Wilson of New Caledonia. On the basis of morphological evidence it appears likely that *bituberculata*, *hebrideana*, and most or all of the Fijian species were derived from a single ancestral stock, while *sagaris* has been derived independently from near the related, possibly cognate Australian species *anitae* Forel. *Bituberculata*, *hebrideana*, *sagaris*, *navua*, and *humiliata* have undergone little change, while *foveopunctata*, *fugax*, *letilae*, and *vitiensis* have diverged along several independent morphoclines. The reason why this species complex has radiated so extensively on the proportionately tiny land mass of the Fiji Islands, while remaining restricted and conservative elsewhere, is perhaps that in the Fijis it faced relatively little competition from the depauperate endemic ponerine-myrmicine fauna and hence had more evolutionary "opportunity" than elsewhere.

THE LEPTOGENYINI OF NEW CALEDONIA

The four known New Caledonian species represent at least three, and possibly four, distinct species groups. Three of the species have obvious affinities with the fauna of tropical Queensland, while the fourth, (*Leptogenys punctata*) is of uncertain position.

Key to the species, based on the worker caste

1. Large species, head width exceeding 1.5 mm; mandibles exceptionally long, their length measured from insertion to tip exceeding the head width. *Prionogenys rouxi* Emery
Smaller species, head width never exceeding 1.2 mm; mandibles shorter, their length much less than the head width. 2
2. Head entirely covered by coarse punctures, subopaque to opaque. *Leptogenys punctata* Emery
Head entirely smooth and shining. 3
3. Larger species, head width not less than 0.90 mm; posterior corners of petiolar node seen from directly above forming distinct angles of 45-50° *Leptogenys acutangula* Emery
Smaller species, head width not exceeding 0.75 mm; posterior corners of petiolar node seen from directly above thick and broadly rounded *Leptogenys sagaris* Wilson

LEPTOGENYS ACUTANGULA Emery

Leptogenys (Lobopelta) acutangula Emery, 1914, Nova Caledonia, 1: 398-399, pl. 13, fig. 2a, worker. Original localities: Vallée de la Ngoï, 200 m.; Yaté. (Syntype examined — Emery Coll.)

Leptogenys (Lobopelta) acutangula var. *brevinoda* Emery, *ibid.*, p. 399, pl. 13, fig. 2b, ergatogyne. Type locality: Vallée de la Ngoï. NEW SYNONYMY.

Material examined. NEW CALEDONIA: Ciu, 300 m. (Wilson, acc. nos. 196, 197, 198, 199, 227, 230, 237, 282).

Taxonomic notes. As Emery suggested in his original description of var. *brevinoda*, this form is nothing more than the ergatogyne of *acutangula*. Individuals were taken by the present author on three occasions in association with typical *acutangula* workers (acc. nos. 198, 199, 282).

L. acutangula is clearly a member of the Australian *conigera* group. Of all the Indo-Australian species examined during the

present study, it is most closely approached by an undescribed species of the *conigera* group represented by a single series in the Museum of Comparative Zoology from Mt. Carbine, Queensland (P. J. Darlington). The two species share, among other characters, the angulate posterior petiolar corners in the worker caste.

Ecological notes. This species was one of the most abundant ants encountered in the isolated woodlot on the Fère property at Ciu. Colonies were found occupying well formed chambers and galleries in the soil beneath rocks. Three colonies removed entire and examined consisted in each case of a single ergatogyne and approximately fifty workers. Callow males were found in one nest, on December 21, 1954. In the less disturbed forest near the Ciu Falls only a single colony was encountered; this was nesting in a small rotting log buried in thick leaf litter.

LEPTOGENYS PUNCTATA Emery

Leptogenys (Lobopelta) punctata Emery, 1914, Nova Caledonia, 1: 398, worker. Type locality: Coné, New Caledonia. (Syntype examined — Emery Coll.)

Material examined. NEW CALEDONIA: Coné (syntype); Ciu, 300 m. (Wilson, acc. nos. 228, 262).

Taxonomic notes. The Ciu specimens have distinctly lighter body sculpturing than the syntype but are otherwise nearly identical to this specimen. *L. punctata* is not closely related to any other Australian or Melanesian species known to me. Its worker caste is very similar to that of *L. punctiventris* Mayr, a widespread Indomalayan species, but the males of the two species are quite different, particularly in genitalic structure.

Ecological notes. One colony was collected in the Fère woodlot and one in the forest east of the Canala River. Each was nesting in the soil beneath a rock and contained probably less than a hundred workers. Males were found in the Canala River nest, on December 31, 1954.

LEPTOGENYS SAGARIS Wilson, n. sp.

(Figure 5)

Diagnosis (worker). Closely resembling *L. anitae* Forel of Queensland, differing principally in the following characters:

(1) Distinctly smaller in size. Head width of *sagaris* types 0.64-0.69 mm; head width in two nest series of *anitae* examined not less than 0.82 mm.

(2) Eyes proportionately smaller in size. In *sagaris* there are only five to six ommatidia along the maximum length of the eye, while in *anitae* there are approximately twelve to sixteen ommatidia along the same line of measurement.

(3) Petiolar node proportionately shorter in *sagaris*.

The above diagnosis will also serve to distinguish *L. sagaris* from its nearest Melanesian relative, *L. bituberculata* Emery. The latter species is further distinguished from both *sagaris* and *anitae* by the following characters: body pilosity proportionately longer; head tapering more posteriorly when viewed in full face; dorsal border of petiolar node viewed from the side descending more abruptly in an anterior direction.

Holotype worker. HW 0.67 mm, HL 0.97 mm, SL 0.83 mm, CI 69, SI 124, EL 0.12 mm, PW 0.53 mm, petiolar node height 0.69 mm, petiolar node length 0.56 mm, dorsal petiole width 0.35 mm.

Paratype worker variation. HW 0.64-0.69 mm (encompassed by a single nest series, acc. no. 240). The paratype series shows very little variation in external morphology.

Ergatogyne. HW 0.64 mm, HL 0.89 mm, SL 0.73 mm, CI 72, SI 114, EL 0.12 mm, PW 0.48 mm, petiolar node height 0.41 mm, petiolar node length 0.38 mm, dorsal petiole width 0.40 mm. The single individual examined (acc. no. 272) is very worker-like. The head is very similar to that of a small worker, lacking ocelli and showing no enlargement of the compound eyes. The alitrunk is smaller proportionate to the head than in the worker. A distinct metanotal groove is present which is lacking in the worker. The petiolar node is much shorter and broader than in the worker; seen from the side it approximates an isosceles triangle in outline, with a broadly rounded dorsal border. The gaster is large, its volume exceeding by 1.5 X that of a large worker.

Material examined. NEW CALEDONIA: Ciu, 300 m.; holotype nest series, Wilson acc. no. 272, one ergatogyne and 9 workers; acc. no. 230, one worker; acc. no. 240, 9 workers. Chapeau Gendarme, one worker.

Ecological notes. My accession no. 240 consisted of a colony found nesting under a rock on the floor of the Fèré woodlot. It contained an estimated 50-75 adult workers. The holotype nest series (no. 272) was taken from a colony nesting in a small rotting log buried in leaf litter in the Canala River forest. It contained an ergatogyne and an undetermined number of workers. As in the related species *L. bituberculata* and *L. hebrideana*, the workers of *sagaris* are relatively timid and fast, and scatter quickly when the nest is opened.

PRIONOGENYS ROUXI Emery

Prionogenys rouxi Emery, 1914, Nova Caledonia, 1: 399-400, pl. 13, fig. 3, worker. Type locality: Mt. Canala, 700 m., New Caledonia.

Material examined. NEW CALEDONIA: Fèré woodlot, Ciu, 300 m. (Wilson, acc. nos. 189, 303, 304).

Taxonomic notes. This species appears to be distinguished from the species of *Leptogenys* solely by its aberrant head form. In particular, the mandibles are extremely elongate, their length measured from insertion to tip nearly as great as the head length (standard measure); the masticatory borders are lined with distinctive stiff sensory hairs that project out at 60° and criss-cross when the mandibles are closed; and the eyes are placed far forward on the head, their anterior margins being less than maximum-eye-length distance from the mandibular insertions.

As far as I have been able to ascertain, *P. rouxi* is not marked by any other characters, in external morphology, that might be construed to be of generic magnitude. In fact, it bears a particular resemblance in body structure to *Leptogenys acutangula* and other members of the *L. conigera* group. The ergatogyne, collected for the first time during the present study, differs from the worker caste in the same manner already indicated by Emery for *L. acutangula*, i.e., ocelli lacking, head size about that of a small worker, alitrunk proportionately smaller relative to head size than in the worker, gaster approaching twice the volume of that of connidal workers, metanotal groove better developed, the petiolar node much shorter and broader.

The male of *P. rouxi*, also collected for the first time in 1954-55, shows no truly remarkable characteristics. Compared with *Leptogenys acutangula*, only two differences seem noteworthy: in

P. rouxi, the notaulices are better developed, and the subgenital plate is much shorter and lacks the paired posterior marginal hooks that are present in *L. acutangula*. Both of these structures, however, are extremely variable within *Leptogenys* and do not at the present time seem to offer much opportunity for generic divisions.

The precise relationships of *P. rouxi* are in need of further study. As noted already, the species bears a distinct resemblance to *L. acutangula*, appearing closer to this species than to any other known Melanesian species, and indeed may have been derived phylogenetically from *acutangula*, a common ancestral species, or a related Australian member of the *conigera* group.

Account must also be taken of the relationship of *P. rouxi* to the generitype *P. podenzanai* Emery of Queensland. The two species resemble each other, at least superficially, in several important features, including the peculiarly elongate mandibles, forward position of the eyes, and *conigera*-type structure of the petiolar node. But *podenzanai* differs strikingly from *rouxi* in the possession of well developed mandibular teeth, which are completely lacking in *rouxi*. There is an excellent possibility that further study will show that the *Prionogenys* diagnostic characters were evolved independently in the two species, in which case *Prionogenys* will have to be placed in the synonymy of *Leptogenys*, or else a separate monotypic genus erected to receive *rouxi*.

Ecological notes. All three of the colonies of *P. rouxi* found at Ciu were in the Fèré woodlot. Each was nesting under a flat rock embedded in the soil. The nest of colony no. 189, discovered on December 21, 1954, consisted principally of a flat, irregular chamber about 10 centimeters in maximum diameter; a lateral gallery led for a short distance to the base of a small stump adjacent to the covering rock, and then descended vertically to a depth of approximately 12 centimeters. The colony contained an estimated 55 workers, 25 worker cocoons, 20 larvae at various stages of development, and an undetermined number of eggs. The ergatogyne, if present, was not recovered.

Colony no. 303, collected on January 3, 1955, was lodged in a single gallery, approximately 2.5 cm. in diameter and 10 cm. in length, that led from beneath a rock into the soil at one side.

It contained a single ergatogyne and an estimated 30 workers, 6 callow males, 20 cocoons of undetermined caste, and an undetermined number of larvae at various stages of development.

Colony no. 304, also collected on January 3, occupied a nest very similar to that of no. 303. It contained an ergatogyne and an estimated 40 workers, 6 callow males, and an undetermined quantity of brood.

Prionogenys rouxi is a very shy, timid species, and the colonies scatter swiftly when their nest is exposed. When captured and handled, the workers open their mandibles to a 90° angle in a threatening posture and are capable of inflicting a painful sting. The central nest chamber of colony no. 189 was partially filled with the chitinous remains of isopods and earwigs. Both types of arthropods are a prominent part of the cryptofauna at Ciu and are assumed to serve as the chief, if not exclusive, prey of the *Prionogenys*. It is probable that the workers are primarily nocturnal in habit, since they were never found foraging above ground in the vicinity of the nests during the day.

II. THE TRIBES AMBLYOPONINI AND PLATYTHYREINI

This section deals with five genera, *Amblyopone*, *Myopopone*, *Prionopelta*, *Mystrium*, and *Platythyrea*, represented by a small number of species mostly limited within Melanesia to New Guinea, the Bismarek Archipelago, and Solomon Islands. No member of these genera has yet been recorded from the Fiji Islands, while New Caledonia is known to harbor only two endemic species: *Amblyopone australis* Erichson, which is widespread in other parts of Melanesia as well as in Australia and Tasmania, and *Prionopelta brocha* n. sp., a remarkable relict form with primitive features reminiscent of *Amblyopone*. Western Melanesia contains a zoogeographic mixture, including old endemics (*Amblyopone celata*, *Prionopelta majuscula*), probable Indo-Malayan immigrants (*Myopopone castanea*, *Platythyrea* spp.), and a single probable Australian immigrant (*Amblyopone australis*). Certain species, e.g. *Myopopone castanea* and *Platythyrea parallela*, are widely distributed over the islands and are among the dominant ants in the lowland rain forests there.

AMBLYOPONE Erichson

Key to the species, based on the worker caste

- Frontal carinae separated by a wide space; larger species, head width never less than 1.32 mm (widespread in Melanesia)..... *australis* Erichson
 Frontal carinae contiguous; smaller species, head width not exceeding 0.64 mm (Solomons)..... *celata* Mann

AMBLYOPONE AUSTRALIS Erichson

- Amblyopone australis* Erichson, 1841, Arch. Naturgesch., 8: 261, pl. 5, fig. 7, worker. Type locality: Woolnorth, Tasmania.
Amblyopone laevidens Emery, 1887, Ann. Mus. Civ. Stor. Nat. Genova, 25: 447 worker. Type locality: Hatam, Arfak Mts., Neth. New Guinea. NEW SYNONYMY.
Amblyopone levidens, Mann, 1919, Bull. Mus. Comp. Zool. 63: 281.
Amblyopone australis subsp. *levidens*, Wheeler, 1927, Proc. Amer. Acad. Arts Sci., 62: 12.
Amblyopone nana Emery, 1914, Nova Caledonia, 1: 394-395, worker, queen. Original localities: Mt. Panié, 500 m., and Mt. Canala, 700 m., New Caledonia. NEW SYNONYMY.
Amblyopone australis subsp. *nana*, Wheeler, 1927, *op. cit.*, 16.

Material examined. N.-E. NEW GUINEA: Joangeng, 1500 m. (E. O. Wilson, no. 752); Ebabaang, 1400 m. (Wilson, no. 819). NEW HEBRIDES: Tanna (L. E. Cheesman). Mann (1919) records this species from near Fourafi, in the mountainous interior of Malaita, Solomon Islands. Outside western and central Melanesia, *A. australis* is widespread in Australia and occurs on Tasmania, New Caledonia, Norfolk I., Lord Howe I., and New Zealand. According to W. L. Brown (pers. commun.), the New Zealand population was probably introduced by man from Australia and is currently limited to the vicinity of cities and towns on North Island.

Taxonomic notes. In the present review I have followed Wheeler (1927) in considering *laevidens* and *nana* as no more than geographic forms of the widespread and highly variable *australis*. The New Guinea workers examined (*laevidens*) are relatively large, darkly colored, and with smooth dorsal mandibular surfaces. In these characters they most closely resemble material from Queensland and New Zealand. In contrast, the Tanna, New Hebrides, workers (*nana*) are small, light colored, and with heavily striate dorsal mandibular surfaces. They most

closely resemble specimens from New Caledonia (*vide* Emery's description of the *nana* types) and southeastern Australia.

Ecological notes. At Ebabaang workers were found scattered under the bark of a large "Zoraptera-stage" rotting log in second-growth midmountain rain forest. At Joangeng a lone dealate queen was found under the bark of a log in a forest clearing. It is noteworthy that the western Melanesian collections, including that of the *laevidens* type and Mann's Solomons collection, were all made at higher elevations in cool forest zones. If this is indicative of its true distribution, *A. australis* makes only limited contact with its closest ecological equivalent in this area, *Myopopone castanea*, a predominantly lowland species.

AMBLYOPONE CELATA (Mann)

Stigmatomma (Fulakora) celata Mann, 1919, Bull. Mus. Comp. Zool., 63: 279-281, fig. 2, worker. Type locality: Fulakora, Santa Isabel, Solomons. (Syntypes examined — MCZ.)

Known from type material only. In his original description Mann records this species from additional Solomons localities: Auki, Malaita; Tulagi, Florida; Wai-ai, San Cristoval. He found it nesting in small colonies under rocks on the floor of lowland rain forests.

MYOPOPONE ROGER

Key to the species, based on the worker caste

Dorsal surface of petiole bearing only scattered piligerous foveae, the extensive interspaces completely smooth and shining (Moluccas to Solomons) *castanea* (Fr. Smith)
 Dorsal surface of petiole longitudinally rugulose and subopaque (Moluccas only) *beccarii* Emery

MYOPOPONE BECCARII Emery

Myopopone Beccarii Emery, 1887, Ann. Mus. Civ. Stor. Nat. Genova, (2)5: 447-448, worker. Type locality: Ternate.

Known from type material only. According to Emery, this species differs from *M. castanea* principally in the following characters: mesonotum and petiole longitudinally rugulose, cephalic "striation" more extensive, and propodeal and dorsal petiolar foveae elongated into weak sulci.

MYOPOPONE CASTANEA (Fr. Smith)

- Amblyopone castaneus* Fr. Smith, 1860, J. Linn. Soc. Zool., 5 (suppl.): 105, pl. 1, fig. 6, worker. Type locality: Batjan. (Holotype examined — Oxford University Museum).
- Myopopone rufula* Roger, 1861, Berl. Ent. Z., 5: 52, worker. Type locality: Batjan.
- Myopopone castanea*, Forel, 1901, Mitt. Zool. Mus. Berl., 2: 5.
- Myopopone castanea*, Mann, 1919, Bull. Mus. Comp. Zool. 63: 281, distribution.
- Myopopone moelleri*, Santschi, 1932, Mém. Mus. Nat. Hist. Belg., 4: 11. *Nec M. moelleri* Bingham.
- Myopopone picea* Donisthorpe, 1938, Ann. Mag. Nat. Hist., (11)2: 493, worker. Type locality: Mt. Dulit, Sarawak. (Holotype examined — BMNH). NEW SYNONYMY.
- Myopopone wollastoni* Donisthorpe, 1942, Ent. Mon. Mag., 78: 29, queen. Type locality: Mimika River, Neth. New Guinea. (Holotype examined — BMNH). NEW SYNONYMY.
- Myopopone smithi* Donisthorpe, 1946, Ann. Mag. Nat. Hist., (11)13: 577, queen. Type locality: Nadzab, Markham Valley, N.-E. New Guinea. NEW SYNONYMY (provisional).
- Myopopone rossi* Donisthorpe, 1947, Ann. Mag. Nat. Hist., (11)14: 297-299, worker. Type locality: Finschhafen, N.-E. New Guinea. (Holotype examined — CAS). NEW SYNONYMY.
- Myopopone similis* Donisthorpe, 1949, Ann. Mag. Nat. Hist., (12)1: 488, queen. Type locality: Maffin Bay, Neth. New Guinea. (Holotype examined — CAS). NEW SYNONYMY.

Material examined. MOLUCCAS: Batjan (*castanea* holotype). NETH. NEW GUINEA: Maffin Bay (*similis* holotype). N.-E. NEW GUINEA: Finschhafen (*rossi* holotype); Tor River. PAPUA: Karema, Brown River (Wilson, no. 566); Bisianumu, 500 m. (Wilson, no. 652). SOLOMONS: Tenaru River, Guadalcanal (G. E. Bohart); Simba Mission, Bougainville (E. J. Ford, Jr.); Tulagi, Florida (W. M. Mann); Siota, Florida (Bohart); Fulakora, Santa Isabel (Mann); Lambeti, New Georgia (Mann); Star Harbor, Wai-ai, San Cristoval (Mann). In addition to the material listed above, I have seen series from Hainan, Sumatra, Borneo, Philippines, and North Queensland.

Taxonomic notes. This species shows considerable geographic variation in at least four independent characters, as indicated in the accompanying table. It is the author's present view that

GEOGRAPHIC VARIATION IN MYOPOPONE CASTANEA

Locality	Subpetiolar Process (Side View)	Cephalic Sculpturing	Sculpturing of Dorsal Surface of Petiolar Node	Sculpturing of First Two Gastric Tergites
Hainan	about as long as broad; apex posteriorly acute	feebly rugose	sparsely punctate; post.-central area non-striolate	finely punctate
Labuan I., N. Borneo	twice as long as broad; apex rounded	shallowly furrowed and punctate	sparsely punctate; post.-central area non-striolate	smooth and shining
Sindanglaja, Java	?	moderately rugose	moderately punctate; post.-central area non-striolate	densely punctate
Engano I., near Sumatra	about as long as broad; apex rounded	moderately rugose	moderately punctate; post.-central area non-striolate	densely punctate
N. Palawan (var. <i>proxima</i> Stitz syntype)	about 1.5 × longer than broad; apex rounded	shallowly furrowed and punctate	moderately punctate; post.-central area non-striolate	feebly shagreened
Philippine Islands — various localities	about 1.5 × longer than broad; apex rounded	shallowly furrowed and punctate	moderately punctate; post.-central area non-striolate	first tergite feebly shagreened, second smooth
Bisanumu, Papua	distinctly shorter than broad; apex rounded	moderately rugose	sparsely foveate; post.-central area non-striolate	smooth and shining
Finschhafen, N.-E. New Guinea	distinctly shorter than broad; apex rounded	moderately rugose	sparsely foveate; post.-central area striolate	feebly shagreened
Tor R., Neth. New Guinea	distinctly shorter than broad; apex rounded	moderately rugose	sparsely foveate; post.-central area striolate	feebly shagreened
Various Solomons localities	distinctly shorter than broad; apex rounded	moderately rugose	sparsely foveate; post.-central area striolate	feebly shagreened
McIlwraith Range, N. Queensland	distinctly shorter than broad; apex rounded	moderately rugose	sparsely foveate; post.-central area striolate	feebly shagreened

all of the Melanesian material examined, including the types of the several included Donisthorpe species, belongs to the single species *M. castanea*. The Philippine series,¹ on the other hand, appear sufficiently divergent to rank as a separate species and may be considered so by future revisers of *Myopopone*. The queen of *castanea* differs strikingly from the worker in its much larger size, darker color, and more extensive and deeper cephalic sculpturing. This circumstance has led to taxonomic confusion in the past and was undoubtedly the principal source of inspiration for the numerous new names proposed by Donisthorpe.

Ecological notes. Both the Karema and Bisianumu collections consisted of workers found under the thick bark of large rotting logs on the floor of rain forests. At Bisianumu workers were clustered with larvae around two large, freshly killed cerambycid larvae on the same log. Since the beetle larvae were well separated from one another, and appeared to be too large for the ants to transport through the preformed galleries under the bark, it is inferred that the ants had transferred their own larvae to feed on the prey after the latter had been attacked and killed. The *Myopopone* are singularly clumsy and shy ants, and immediately commence searching for cover when exposed to light, abandoning their brood in the process. When handled, however, they are capable of inflicting a painful sting.

PRIONOPELTA Mayr

Key to the species, based on the worker caste

1. Larger species, head width of single known specimen 0.64 mm; genal teeth strongly developed, at least 0.03 mm in length (New Caledonia) *brocha* Wilson
 Smaller species, head width not exceeding 0.54 mm; genal teeth feebly developed, not exceeding 0.01 mm in length (New Guinea) 2
2. Cephalic and thoracic dorsa finely punctate and feebly shining; larger species, head width at least 0.48 mm *majuscula* Emery
 Cephalic and thoracic dorsa densely and coarsely punctate and opaque; smaller species, head width not exceeding 0.42 mm *opaca* Emery

¹ Including a syntype worker of *M. castanea* var. *prootima* Stits (MCZ).

PRIONOPELTA BROCHA Wilson, n. sp.

(Figure 7)

Diagnosis. Distinguished in the worker caste from all other known members of the genus by several apparently primitive characters, including exceptionally large size, strongly developed genal teeth, and *Amblyopone*-like head shape. Two features of head shape are considered to be more typical of *Amblyopone* than of *Prionopelta*—the head is broadest near its anterior end, and the lateral borders are relatively straight. *Brocha* is thus seen to be a species intermediate in position between the remainder of *Prionopelta* and the presumably more primitive *Amblyopone*. It has been placed in *Prionopelta* primarily because of its mandible form, which is typical for that genus.

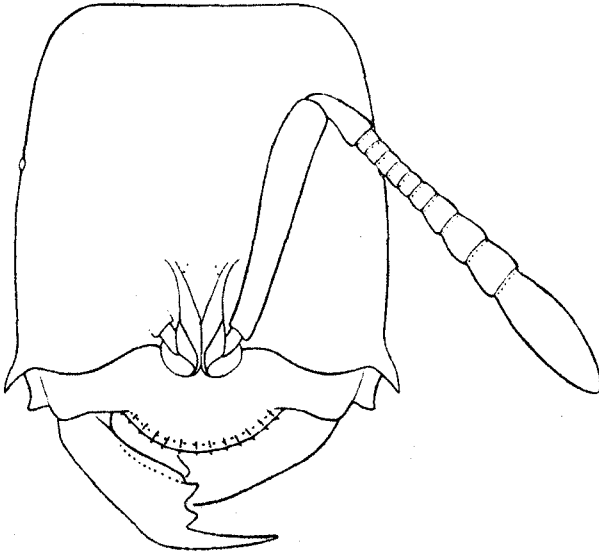


Fig. 7. *Prionopelta brocha* n. sp., head of holotype worker. Drawing by Mrs. Nancy Buffer.

Holotype worker. HW (exclusive of genal teeth) 0.64 mm, HL 0.79 mm, ML 0.16 mm, SL 0.45 mm, CI 81, SI 70, PW 0.43

mm, alitrunk length (maximum) 1.05 mm, dorsal petiole width 0.38 mm, petiolar node length (exclusive of ventral lobe) 0.42 mm, width of first gastric tergite 0.52 mm. Head as shown in Figure 7. Remainder of body similar to that of other *Prionopelta*, including the relatively large *majuscula* Emery.

Dorsal surfaces of mandibles finely and longitudinally striolate, and shining. Central portion of clypeus smooth and shining. Remainder of head covered by coarse, contiguous punctures, its surface for the most part completely opaque. Body posterior to the head sparsely punctate, its surface almost entirely feebly shining.

Pilosity very similar to that of most other *Prionopelta*, including *majuscula*. Abundant standing hairs present on most body and appendage surfaces, nearly or completely absent from posterior propodeal face, anterior and ventral surfaces of petiolar node, and most of extensor surfaces of legs; everywhere grading into equally abundant, predominantly oblique underlying pubescence.

Body uniformly light ferruginous, appendages clear to very light reddish yellow.

Material examined. NEW CALEDONIA: Mt. Mou, 180 m., December 12, 1954, a single worker (E. O. Wilson). This specimen was collected by means of a Berlese funnel from leaf litter on the floor of dry, semi-deciduous native forest.

PRIONOPELTA MAJUSCULA Emery

Ponera simillima Fr. Smith, 1860, J. Linn. Soc. Zool., 5 (suppl.): 105, worker.
Nec *Ponera simillima* Fr. Smith, *ibid.*, p. 104 (= *Ponera diminuta* Fr. Smith).

Prionopelta majuscula Emery, 1897, Természetr. Füz., 20: 595, worker, queen. Type locality: Beliao I., near Friedrich-Wilhelmshafen (= Madang), N.-E. New Guinea.

?*Rhopalopone simillima*, Emery, 1911, Gen. Ins., 118: 35. (Generic re-allocation for *Ponera simillima* Fr. Smith, 1860, p. 105).

Prionopelta poultoni Donisthorpe, 1932, Ann. Mag. Nat. Hist., (10)10: 462, nom. pro *Ponera simillima* Fr. Smith, 1860, p. 105. Synonymy by Brown, 1953, Breviora, no. 11: 12.

Renea testacea Donisthorpe, 1947, Ann. Mag. Nat. Hist., (11)14: 183-186, fig., worker, queen. Type locality: Maffin Bay, Neth. New Guinea. Synonymy by Brown, *loc. cit.* (Syntypes examined — CAS).

Examblyopone churchilli Donisthorpe, 1949, Ann. Mag. Nat. Hist., (12)2: 401-402, queen. Type locality: Maffin Bay, Neth. New Guinea. Synonymy by Brown, *loc. cit.* (Holotype examined — CAS).

Taxonomic note. Through the courtesy of Dr. E. S. Ross, I have been able to re-examine the type series of *Renea testacea* Donisthorpe and *Examblyopone churchilli* Donisthorpe and to confirm the earlier opinion of Brown that these two forms are unqualified synonyms of *P. majuscula*.

PRIONOPELTA OPACA Emery

Prionopelta opaca Emery, 1897, Természetr. Füz., 20: 596, pl. 15, figs. 44-45, worker, queen, male. Type locality: N.-E. New Guinea.

Prionopelta Mocsáryi Forel, 1907, Ann. Mus. Nat. Hungar., 5: 1, worker. Type locality: Asunción, Paraguay (Anisits leg.). NEW SYNONYMY (provisional; see below).

Material examined. N.-E. NEW GUINEA: Nadzab (Wilson, no. 1089); Bubia (Wilson, no. 687); lower Busu River (Wilson, nos 899, 963, 978); Wamuki, 800 m. (Wilson, no. 846). PAPUA: Karema (Wilson, nos. 563, 573, 575); Bisianumu, 500 m. (Wilson, no. 636). This species also occurs in Micronesia.

Taxonomic notes. A single worker collected in the mountains near Wamuki is slightly larger than all of the other specimens examined, including those from nearby localities in the lowlands (head width 0.39 mm as opposed to maximum head width in other material measured of 0.38 mm).

Dr. W. L. Brown has transmitted the following unpublished note concerning the status of *Prionopelta mocsaryi*: "A worker type of *P. mocsaryi* received from the Hungarian National Museum can not be distinguished from *P. opaca* samples from New Guinea (Wilson, Biró leg.) in any character, after long and careful examination and comparison. Since the original Biró New Guinea collections were housed in the Hungarian National Museum, and since some of this New Guinea material is known to have been included in the series sent Forel for his 1907 study, it seems likely that the label 'Paraguay/Anisits'

is misplaced. No specimen of *Prionopelta* anything like this one has been reported a second time from the Americas, although other species of the genus have all been collected repeatedly in tropical America. My conclusion is that *P. mocsaryi* should be added to the synonymy of *P. opaca*."

Ecological notes. This species was found in a wide range of major habitats in New Guinea: dry, open tropical evergreen forest at Nadzab, foothills rain forest at Bisianumu and Wamuki, and primary lowland rain forest at the Busu River. Stray workers were very common on the forest floor, and could easily be secured by tapping loose material from the bottoms of small pieces of rotting wood buried in leaf litter. They also turned up frequently in leaf-litter berlesates. A single colony found at Karema was nesting in a rotting section of tree branch on the forest floor. It contained between 15 and 20 workers and a small quantity of brood.

MYSTRIMUM Roger

MYSTRIMUM CAMILLAE Emery

Mystrium Camillae Emery, 1889, Ann. Mus. Civ. Stor. Nat. Genova, 27: 491, pl. 10, figs. 1-3, worker, queen. Type locality: Bhamo, Burma. Wheeler and Chapman, 1925, Philippine J. Sci., 28: 55, dist. Karawajew, 1925, Konowia, 4: 73, dist. Brown, 1952, Psyche, 59: 25, dist.

A single male, collected by E. S. Ross at Maffin Bay, Neth. New Guinea, in July, 1944, has been tentatively determined as this species. Although this is the first time *Mystrium* has been recorded from Melanesia, its occurrence there is not surprising, since *M. camillae* was already known from the Philippines (Wheeler and Chapman, 1925), Java (Karawajew, 1925), and Northern Territory, Australia (Brown, 1952).

PLATYTHYREA Roger

Seen from above, the posterior border of the petiolar node is deeply concave, and its posterior corners are drawn out into long, flattened, blunt processes . . .

..... *quadridenta* Donisthorpe

Seen from above, the posterior border of the petiolar node is sinuate, while its posterior corners are not drawn out into processes *parallela* (Fr. Smith)

PLATYTHREA PARALLELA (Fr. Smith)

- Ponera parallela* Fr. Smith, 1859, J. Linn. Soc. Zool., 3: 143, worker. Type locality: Aru. Donisthorpe, 1932, Ann. Mag. Nat. Hist., (10)10: 454, worker. *Ibid.*, 1943, (11)10: 434-435, male, doubtfully associated. (Holotype examined — Oxford University Museum).
- Pachycondyla melancholica* Fr. Smith, 1865, J. Linn. Soc. Zool., 8: 71, worker. Type locality: Morotai. NEW SYNONYMY (provisional).
- Platythyrea pusilla* Emery, 1893, Rev. Suisse Zool., 1: 188-189, worker. Type locality: Amboina. (Holotype examined — Emery Coll.). NEW SYNONYMY.
- Platythyrea coxalis* Emery, 1893, *ibid.*, p. 189, nota, worker. Type locality: Perak, Malaya. (Holotype examined — Emery Coll.). NEW SYNONYMY.
- Platythyrea melancholica* var. *aruana* Karawajew, 1925, Konowia, 4: 75, worker. Type locality: Wammar I., Aru Archipelago. NEW SYNONYMY (provisional).

Material examined. MOLUCCAS: Kalam I., Halmahera (C. S. Banks); Amboina (*pusilla* holotype). NETH. NEW GUINEA: Maffin Bay (E. S. Ross). N.-E. NEW GUINEA: Nadzab (Wilson, nos. 1086, 1090, 1097); Lae (N. L. H. Krauss); Bubia (Wilson, no. 683); Finschhafen (Ross). PAPUA: Bisianumu, 500 m. (Wilson, nos. 617, 644, 655, 659, 660). ARU: (holotype).

Taxonomic notes. This species shows non-geographic variation in several characters, notably total size, proportions of the petiolar node, form and placement of the petiolar teeth, sculpturing, and color, which is of similar magnitude to the differences separating many related species in other ponerine groups. Nevertheless, in an analysis of the sizable collections of material in the Museum of Comparative Zoology and Museo Civico di Storia Naturale, Genoa, I have been unable to detect any constant differences that might be construed as partitions along species lines. Variation in two of the characters, total size and relative thickness of the petiolar node, is indicated in the plot of petiolar length times width given in Figure 8. It can be seen that these data are distributed along a single regression zone. The other characters examined show a similar pattern of variation.

The form *melancholica* is placed in provisional synonymy here because of its inadequate definition in previous literature. The holotype is probably lost, since neither Donisthorpe (1932) nor the present author (in 1955) were able to find it among the

extant Frederick Smith types. The chances are very remote that this specimen represented anything more than a variant of *P. parallela*.

Ecological notes. All of the author's collections consisted of stray workers found in leaf litter and rotting logs. At Nadzab a worker was found carrying a small moth larva in its mandibles.

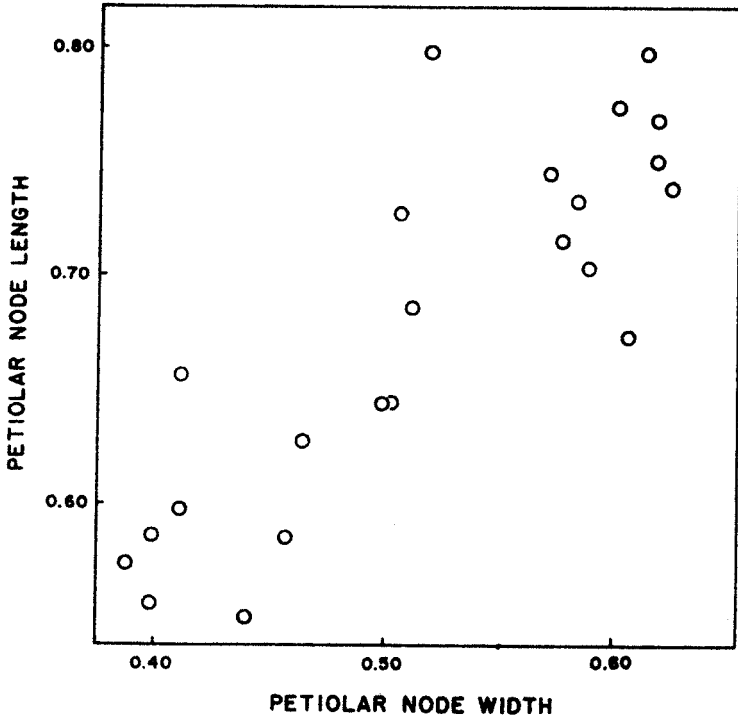


Fig. 8. Variation in petiolar node proportions in Indo-Papuan material of *Platythyrea parallela*. No more than two workers were measured from each nest series.

PLATYTHYREA QUADRIDENTA Donisthorpe

Platythyrea quadridenta Donisthorpe, 1941, Ann. Mag. Nat. Hist., (11)7: 134, worker. Type locality: Wharton Range, Kokoda, Papua. (Syntype examined — BMNH).

Material examined. PAPUA: Wharton Range (syntype);

Karema, Brown River (Wilson, nos. 550, 570); Bisianumu, 500 m. (Wilson, no. 642).

Taxonomic note. *P. quadridenta* is closely related to the Indo-Malayan species *P. sagei* Forel, but can be easily separated by its smaller size, thicker petiolar node, and unique possession of abundant, short, erect hairs over most of the dorsal surface of the body.

Ecological note. At Karema a colony consisting of approximately 50 workers and an undetermined quantity of brood was found nesting under the bark of a large, "Zoraptera-stage" log on the forest floor.