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Preliminary study on pleural morphology,
clypeus and some antennal sensilla of Gryonini
(Hym. Proctotrupoidea, Scelionidae)

The importance of investigation of the pleural region has recently been shown in the Scelionidae (MASNER, 1979). Apart from the distribution of some sensilla in certain species of Telenomini (BIN, 1981), little information is available on the sensillary system of the antennae. So far as the clypeus is concerned, a supraspecific-level examination of this morphological region is required.

This study(*) was motivated by the need to acquire further diagnostic elements of the above-mentioned morphological regions in Gryonini, with the aim of more clearly defining the supraspecific categories.

MATERIAL AND METHOD

The species studied and the characters examined are listed in table 1. The specimens used for this study belonged to the collection of the Istituto di Entomologia agraria - Palermo. The observations on pleural morphology were made by stereoscopic microscope; the clypeus and the plate sensilla were directly examined by a SUPER III A IS SEM, according to the previously reported procedure (MINEO & VILLA, 1982, *in press*).

In the present paper the sequence of the basiconic-type sensilla present in the middle of the ventral surface of some antennomeres of the clava (= plate sensilla *sensu* BIN, 1981), follows that proposed by BIN (1981), i.e. the first number refers to the number of the « plate sensilla » located in A12, the second to the number placed in A11, and so on. Throughout the paper the clava is interpreted following RIEK (1973) and RICHARDS (1977).

(*) Paper n. XVI « Studies on the Scelionidae - Hym. Proctotrupoidea » of the senior author.

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*Estratto dal Bollettino
del Laboratorio di Entomologia Agraria
« Filippo Silvestri » di Portici
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OBSERVATIONS

charon group — The clava is composed of seven antennomeres and the sequence of the above-mentioned sensilla is: 1, 2, 2, 2, 2, 2, 0. The epomia and the mesopleural carina are complete (Fig. III); the latter runs parallel to the acetabular carina, in a straight line from its base to the anterior margin of the mesopleuron suture.

floridanum group — The clava consists of six antennomeres. The basiconic-type sensilla are elongated, transversally corrugated and are located in large, deep sockets (Fig. XLIX); their sequence is: 1, 2, 2, 2, 2, 0 (Fig. XLVII). The clypeus is conspicuous, with antero-lateral blunt corners (Fig. XXVI). The epomia is incomplete; the mesopleural carina is complete in both sexes (Figs. I, II) and its path is the same as that described for the *charon*-group.

muscaeformis-group — The clava consists of six antennomeres (Fig. XLV); the shape of the basiconic-type sensilla which lie on the ventral surface of the clava, apart from those of *G. leptocorisae*, resembles that of those observed in *G. pennsylvanicum* (Figs. LI, LIII) and their sequence is the same as that of the latter. The antero-lateral corners of the clypeus are slightly rounded (Figs. XXVII-XXIX), with the exception of *G. leptocorisae* where they are sharp (Fig. XXX). The epomia is incomplete in all the species examined, apart from *G. leptocorisae* in which it is strongly reduced. The mesopleural carina, running parallel to the acetabular carina, is also incomplete in both sexes (Figs. IV-VII), being separated from the anterior margin of the mesopleuron suture by a dense and coriaceous sculpture.

bicolor-group — The clava and the basiconic-type sensilla sequence are similar to those of the *muscaeformis*-group. The clypeus is similar to that of *G. leptocorisae* (cfr. Figs. XXX, XXXI); the epomia also is extremely reduced, as in the latter species (cfr. Figs. VII, VIII). The mesopleural carina is reduced in both sexes (Fig. VIII).

pubescens-group — The clava, the sequence and the shape of the basiconic-type sensilla are similar to those observed in the preceding three groups (Fig. LIV). The clypeus, more conspicuous in *G. rugulosum*, has sub-obtuse antero-lateral corners in this species and in *G. saxatile* (Figs. XXXII, XXXIII); in *Gryon* sp. (*e*) it has a different shape (Fig. XXXIV). The epomia is incomplete; the mesopleural carina is also incomplete in both sexes and its path is similar to that observed in the *muscaeformis*-group.

G. hungaricum — As mentioned in a previous paper (MINEO & VILLA, 1982, *l.c.*) this species probably belongs to the *myrmecophilum*-group. The clava is composed of five antennomeres and the sequence of the basiconic-type sensilla in the middle of the ventral surface of the antennomeres A12-A8 is: 1, 2, 2, 2, 0. The clypeus is prominent with divergent antero-lateral corners (Fig. XXXV). The epomia is absent; the mesopleural carina is complete, running very far from the acetabular carina, and its path is not perfectly straight (Fig. XV).

TABLE 1

Species	n° specimens	n° antennae	n° clypeus		n° pleurae	
			♀	♂	♀	♂
<i>charon</i> -group						
Gryon charon (Nixon)	12	4	—	—	10	2
Gryon sp. (b)	18	4	—	—	16	2
<i>floridanum</i> -group						
Gryon pennsylvanicum (Ashmead)	74	6	2	1	37	37
<i>muscaeformis</i> -group						
Gryon bolivari (Giard)	43	2	1	—	17	26
Gryon bosellii Mineo & Szabò	72	2	3	1	48	24
Gryon leptocorisae (Howard)	73	4	1	—	48	25
Gryon muscaeformis (Nees)	81	2	1	—	46	35
<i>bicolor</i> -group						
Gryon sp. (d)	121	2	1	—	40	81
<i>pubescens</i> -group						
Gryon rugulosum (Fouts)	50	4	1	1	42	8
Gryon saxatile (Kieffer)	125	4	2	—	69	56
Gryon sp. (c)	102	2	2	—	67	35
Gryon (= Pannongryon) hungaricum (Szabò)	66	4	2	—	13	53
<i>subfasciatum</i> -group						
Gryon laraichii Mineo	10	2	1	—	5	5
<i>misellum</i> -group						
Gryon misellum Haliday	10	4	1	—	6	4
Gryon hospes (Kieffer)	7	2	1	—	3	4
Gryon nitens (Szabò)	8	2	3	—	5	3
Hadronotoides sp.	1	2	—	—	1	—
Encyrtoscelio sp.	5	—	—	1	3	2
Breviscelio crenatus Sundho'm	69	2	1	—	47	22
Eremioscelio cydnoides Priesner	137	2	2	—	22	116
Mirotelenomus sp.	4	2	2	—	2	2

subfasciatum-group — The number of the antennomeres of the clava and the sequence of the basiconic-type sensilla are the same as those observed in *G. hungaricum*; the morphology of one sensillum located in A11 is shown in Fig. LII. The clypeus (Fig. XXXVI) is similar, but more conspicuous, than that of *G. hungaricum*; the epomia is absent and the mesopleural carina is reduced to its basal stump in both sexes (Fig. XVI).

misellum-group — The sequence of the basiconic-type sensilla in *G. misellum* and in *G. nitens* is: 1, 2, 2, 1, 0; and is: 1, 2, 2, 0 in *G. hospes*. The shape

of one of these sensilla of A11 in *G. hospes* is shown in Fig. L and resembles that of *G. laraichii* (cfr. Fig. LII). In all the three species examined the prominent clypeus (Figs. XXXVII-XXXIX) is similar to that observed in *G. hungaricum* and in *G. laraichii* (cfr. Figs. XXXV, XXXVI). The striation of the cheeks is another characteristic feature observed in all five species. The epomia is absent, the mesopleural carina is reduced in both sexes to the two basal and distal stumps (Figs. XVII-XIX).

Hadronotoides sp. — The series of the basiconic-type sensilla is the same as that of the *charon*-group, i.e. 1, 2, 2, 2, 2, 0. The epomia is incomplete and the mesopleural carina is similar to that observed in *G. pennsylvanicum*.

Encyrtoscelio sp. — In the specimens examined it was not possible to clearly establish the series of the basiconic-type sensilla located in the middle of the ventral surface of the clava for technical reasons; however, since the last of them is located in A8, the clava presumably consists of six antennomeres. The prominent clypeus, quite unlike all others observed here, has blunt antero-lateral corners (Fig. XLII). The epomia is absent and the mesopleural carina is stump-like (Fig. XXIV).

Breviscelio crenatus — The antennomeres forming the clava and the sequence of the basiconic-type sensilla are the same as those referred for *G. hungaricum* and *G. laraichii*. The prominent clypeus has divergent antero-lateral corners (Fig. XLI); the epomia is absent and the mesopleural carina is reduced to its basal portion (Figs. XXII, XXIII) in both sexes.

Eremioscelio cydnoides — The clava consists of five antennomeres and the series of the sensilla is like that of *B. crenatus*, i.e. 1, 2, 2, 2, 0 (Fig. XLVIII); the clypeus also resembles that of this species (Fig. XL). The epomia and the mesopleural carina are absent (Figs. XX, XXI).

Mirotelenomus sp. — The clava is of six antennomeres. The basiconic-type sensilla are not in register (Fig. XLVI) and their sequence is: 0, 2, 2, 2, 1, 0; the shape of the sensilla located in A8, A9 is shown in Fig. LV. The clypeus is receding (Fig. XLIII) and the epomia is absent. The mesopleural carina is thick and complete; the mesopleural depression is more accentuated and the mesepimeron is wider than in all other material so far examined (Fig. XXV).

DISCUSSION

The observations previously referred confirm that species of the same group have an identical morphological expression. In fact in the species belonging to the *muscaeformis* and *pubescens* groups, apart from other previously reported common characters (MINEO, 1980; 1981), the following similarities are encountered: the same antennal shape and the same sequence of basiconic-type sensilla on the ventral surface of the clava, identically-shaped clypeus, the same development and path for the epomia and the mesopleural carina.

However in *G. leptocorisae*, so far included in the *muscaeformis*-group, differences in the shape of the basiconic-type sensilla and clypeus and in the development of the epomia have been observed. It should be noted, in relation to the latter characters, that they show, together with the morphology of the back of the head and the ratio between the lengths of the marginal and the post marginal veins of the wings, that *G. leptocorisae* strongly converges with *Gryon* sp. (d) of the *bicolor*-group.

Within the *pubescens*-group, *Gryon* sp. (c) differs from *G. rugulosum* and *G. saxatile* in the shape of the clypeus.

The species of the *charon*-group are, so far as the characters considered in this study are concerned, similar to *Hadronotoides* sp.; *G. charon*, *Gryon* sp. (b) and *Hadronotoides* sp. together with *G. pennsylvanicum*, show the same path and development of the mesopleural carina.

Moreover, the morphological elements of *Hadronotoides* sp. examined here, together with other previously reported data (such as the structure of the back of the head), support the previously expressed hypothesis (MINEO & VILLA, 1982, *l.c.*) that this genus should be included in *Gryon* Haliday.

G. hungaricum, *G. laraichii* and *E. cydnoides* show similarities in the following characters: the sequence of the basiconic-type sensilla, the shape of the clypeus, the cheek striations and the absence of the epomia; this convergence is further strengthened by the morphological similarities of the back of the head.

Of all the species examined, *B. crenatus* most closely resembles the three species mentioned above, and, among these, is *E. cydnoides*.

In relation to the characters considered in this study, *G. misellum*, *G. nitens* and *G. hospes* converge into the same supraspecific entity, but it should be noted that the latter species presents a clava of four antennomeres instead of five as in the first two. In our opinion this morphological valency should be interpreted as a characteristic of group rather than of supraspecific category, as has been shown to occur in other species examined in the course of this study. In this sense *G. misellum*, *G. nitens* and *G. hospes*, like *G. austrfricanum* Mineo, of which no material could be examined because, apart from the holotype, there is no other available material elsewhere, could be considered leader species of independent groups.

The absence of the basiconic-type sensilla on the ventral surface of A12 in *Mirotelenomus* sp., if widely confirmed in this genus, should define a divergence with respect to the other supraspecific categories of the tribe so far examined.

The taxonomic value to attribute to the mesopleural carina should, from the observations reported, be considered at the group rather than at the specific level. This also applies to the epomia.

ACKNOWLEDGMENTS

The authors wish to thank Mr. Arturo Genduso, Mr. Angelo Corsino (Istituto di Entomologia agraria, Università di Palermo) and Mr. Giuseppe Miceli (Istituto di Zoologia, Università di Palermo) for their technical assistance. We also thank to Dr. L. Masner (Biosystematics Research Institute, Agriculture Canada) for his reading of the manuscript.

SUMMARY

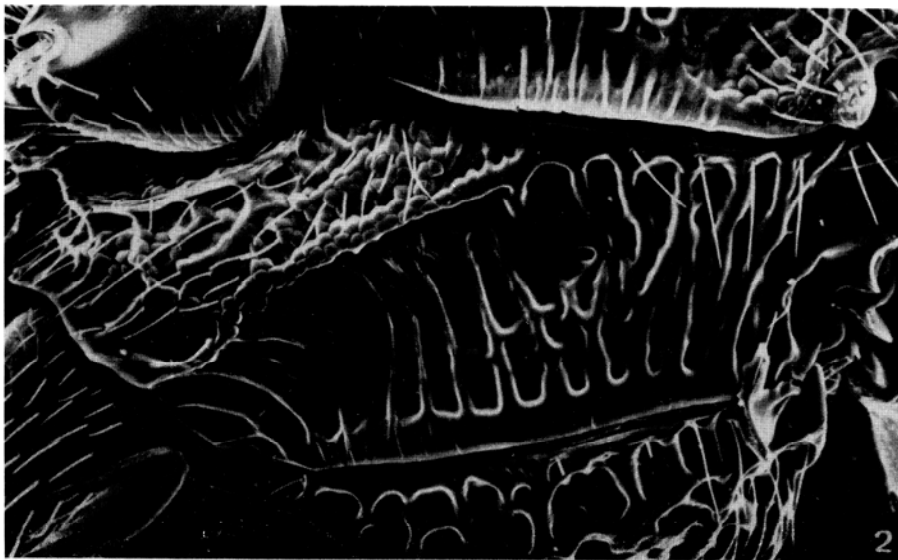
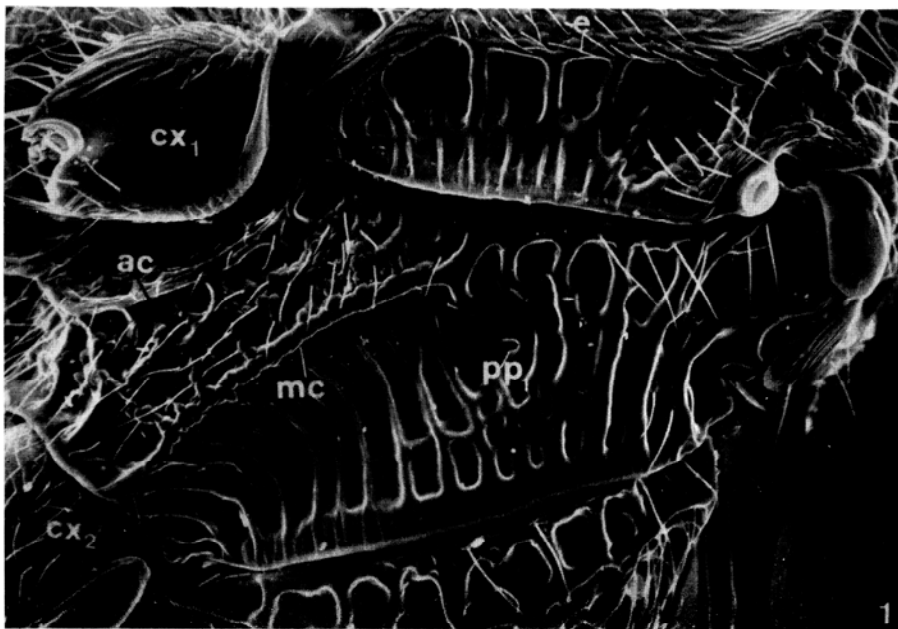
Four characters (the series of basiconic-type sensilla lying in the ventral surface of the female antenna; the shape of the clypeus; the development and the path of the epomia and of the mesopleural carina) are reviewed in 21 species belonging to several genera of Gryonini (Hym. Proctotrupoidea, Scelionidae). The morphological data collected suggest that the proposed characters be used only at species group level.

RIASSUNTO

Sono stati esaminati quattro caratteri (la sequenza dei sensilli di tipo basiconico giacenti sulla faccia ventrale della clava della femmina; la forma del clipeo; lo sviluppo e il decorso dell'epomia e della carena mesopleurale) in 21 specie appartenenti a parecchi generi di Gryonini (Hym. Proctotrupoidea, Scelionidae). I reperti morfologici emersi suggeriscono di adoperare i predetti caratteri soltanto a livello di specie-gruppo.

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FIGS. I and II. - *Gryon pennsylvanicum* (Ashmead). - Pro-mesopleurae viewed in lateral aspect (Fig. I, ♀; × 195 - Fig. II, ♂; × 187). ac = acetabular carina; cx₁ = fore coxa; cx₂ = mid-coxa; e = epomia; mc = mesopleural carina; pp₁ = pleural pit (mesepisternum).

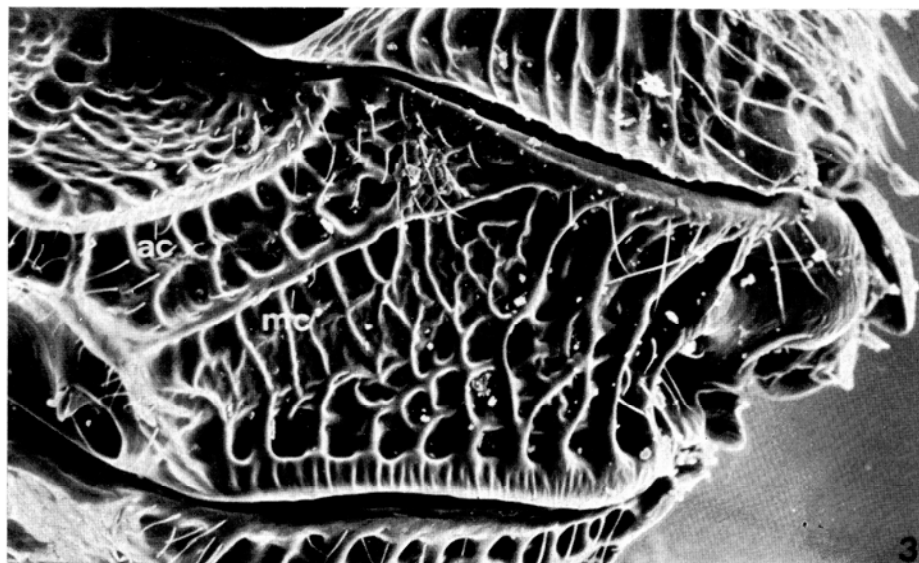


FIG. III. - *Gryon* sp. (b) (♀; × 165).

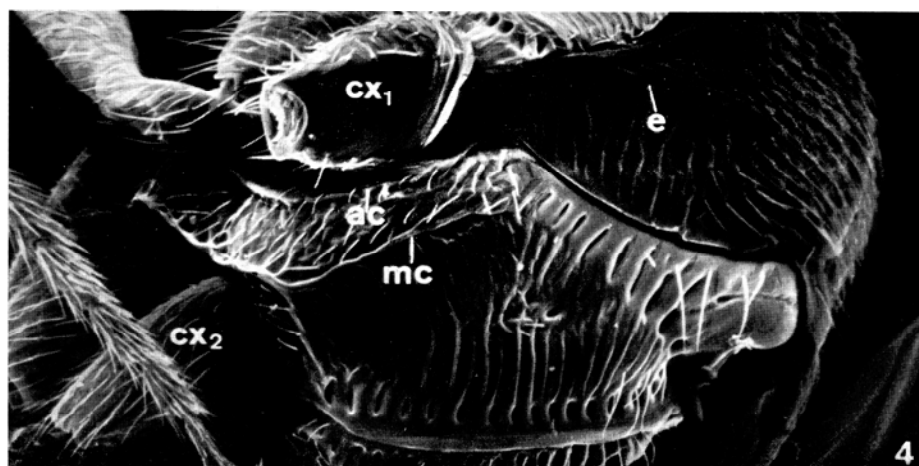


FIG. IV. - *Gryon bolivari* (Giard) (♂; × 184).

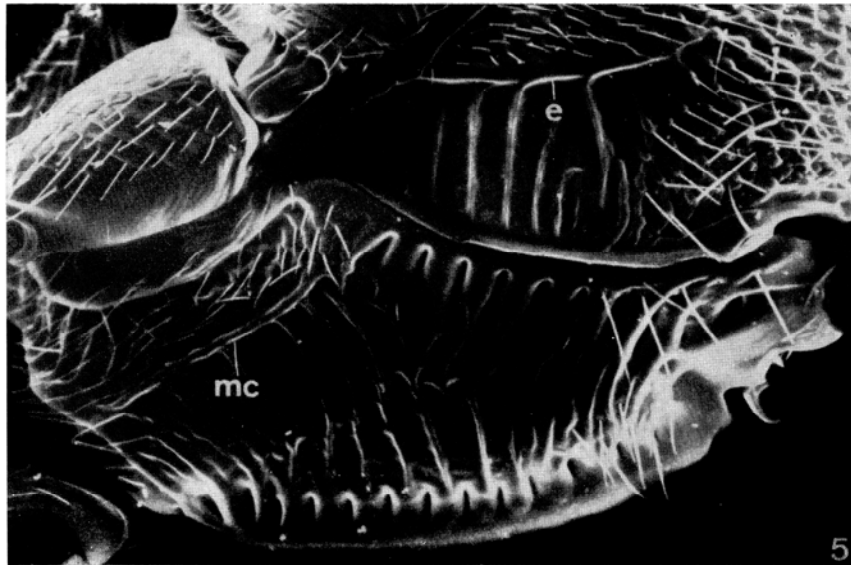


FIG. V. - *Gryon bosellii* Mineo & Szabò (♂; $\times 191$).

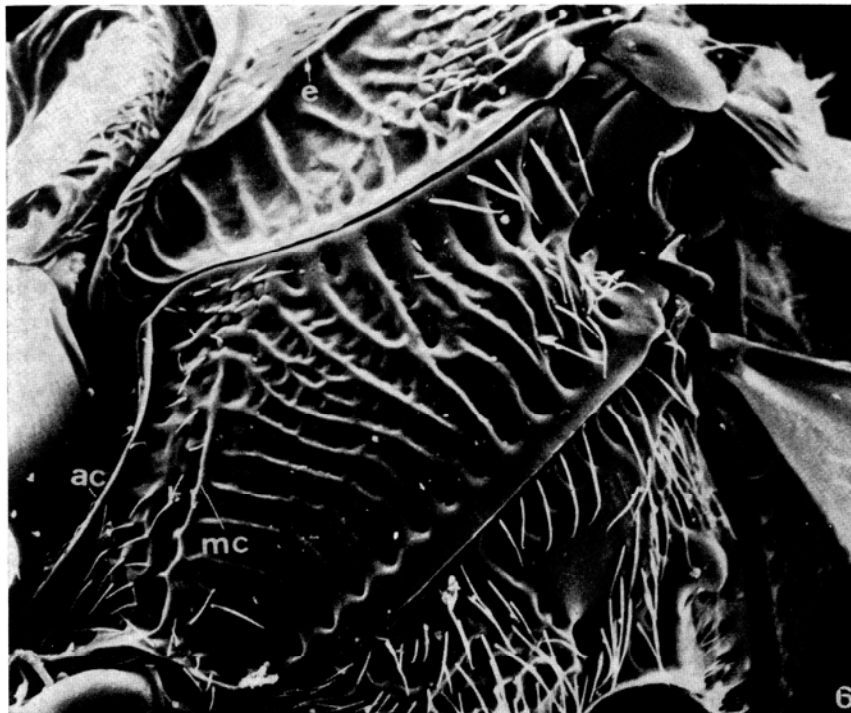


FIG. VI. - *Gryon muscaeformis* (Nees) (♀; $\times 195$).

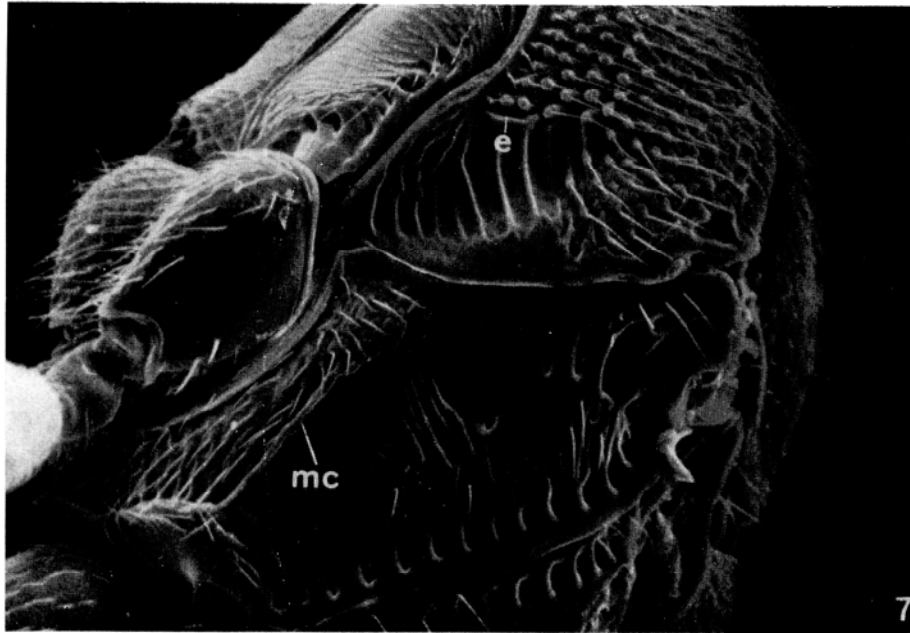


FIG. VII. - *Gryon leptocorisae* (Howard) (♀; × 195).

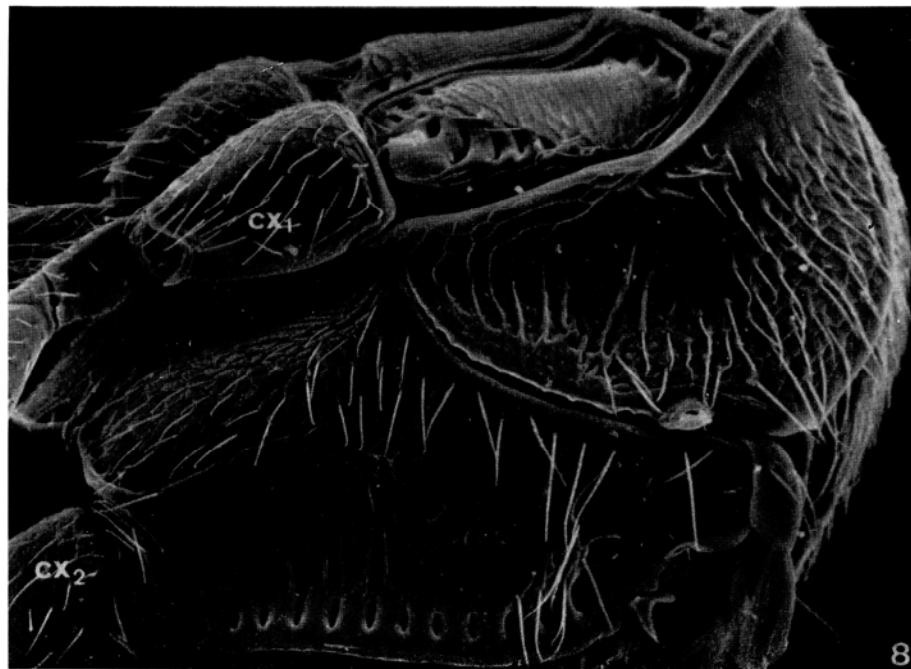
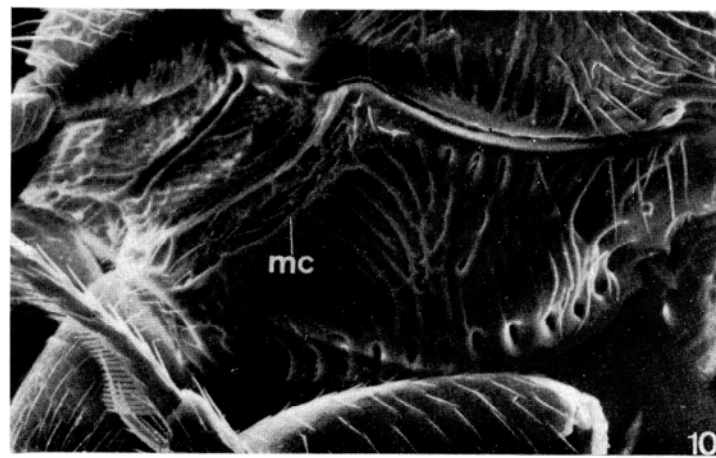
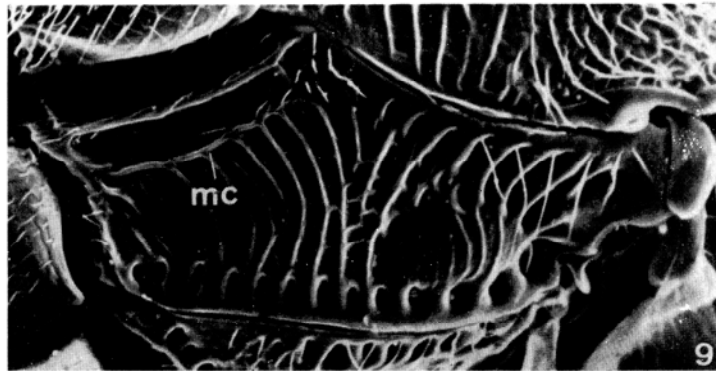


FIG. VIII. - *Gryon* sp. (d) (♀; × 244).



FIGS. IX and X. - *Gryon saxatile* (Kieffer) (♀; × 195 - Fig. X, ♂; × 195).

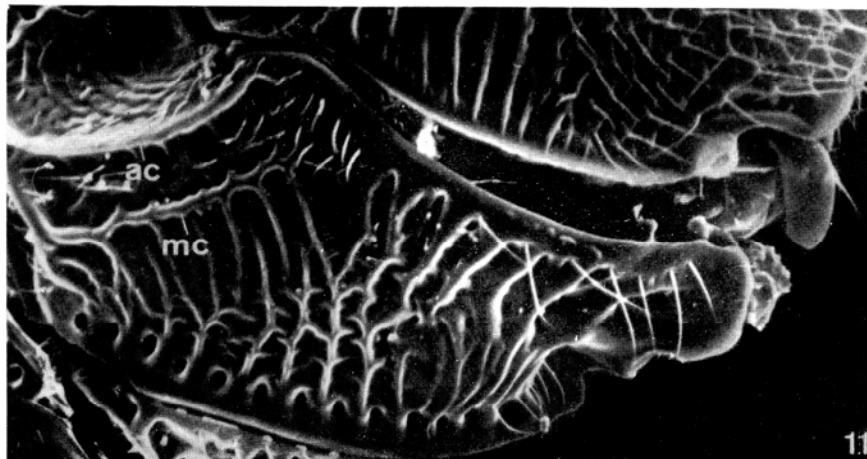


FIG. XI. - *Gryon rugulosum* (Fouts) (♀; × 195).

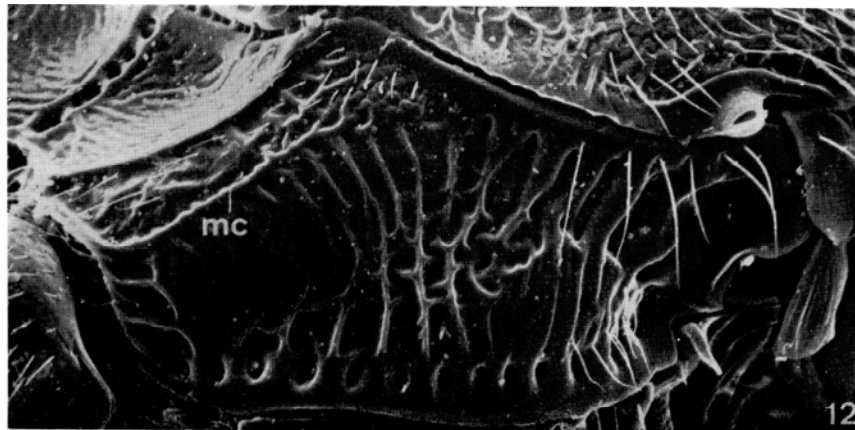


FIG. XII. - *G. rugulosum* (♂; × 195).



FIGS. XIII and XIV. - *Gryon* sp. (e) (♀; × 195; XIV, ♂, × 195).

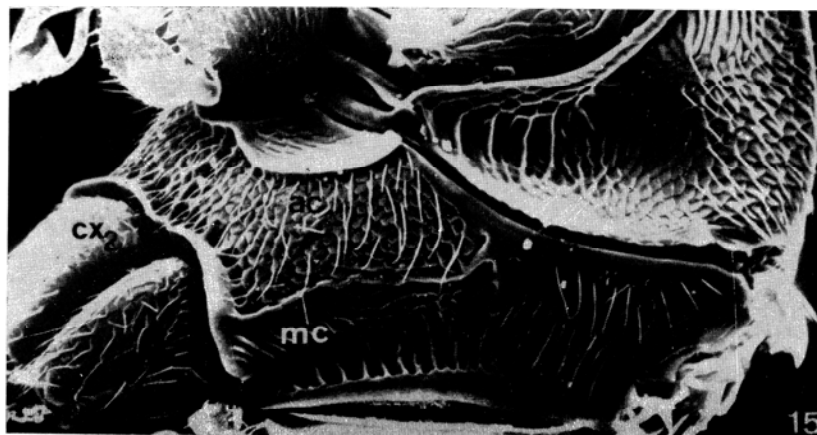


FIG. XV. - *Gryon hungaricum* (Szabò) (♀; × 195).



FIG. XVI. - *Gryon laraichii* Mineo (♀; × 210).

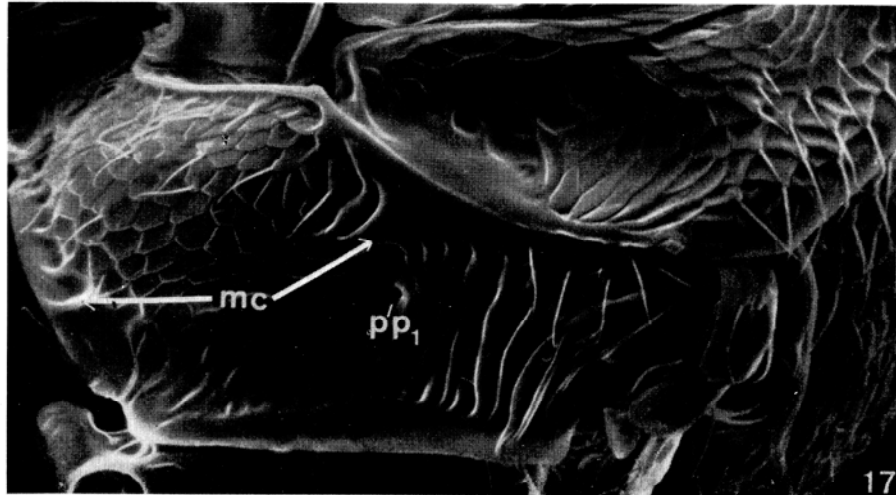


FIG. XVII. - *Gryon misellum* Haliday (♀; × 368).

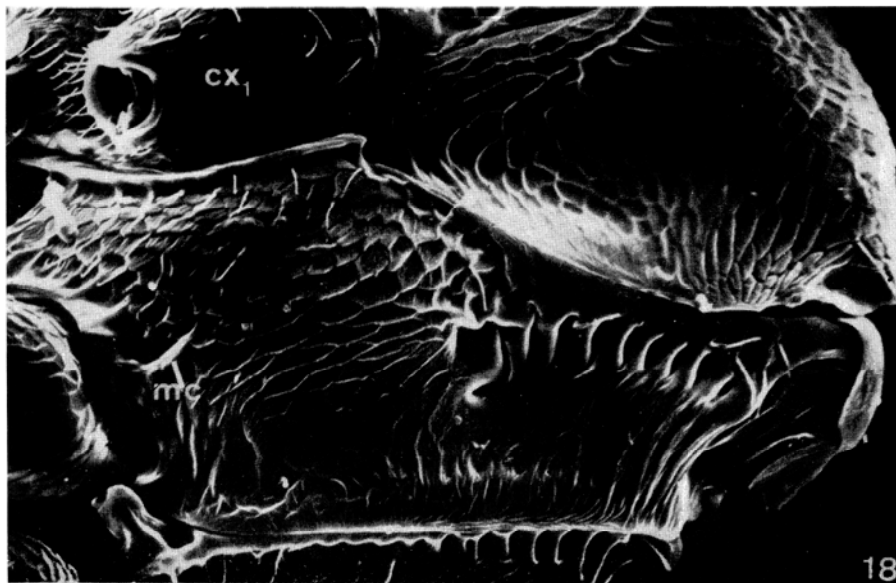


FIG. XVIII. - *Gryon nitens* (Szabò) (♀; × 331).

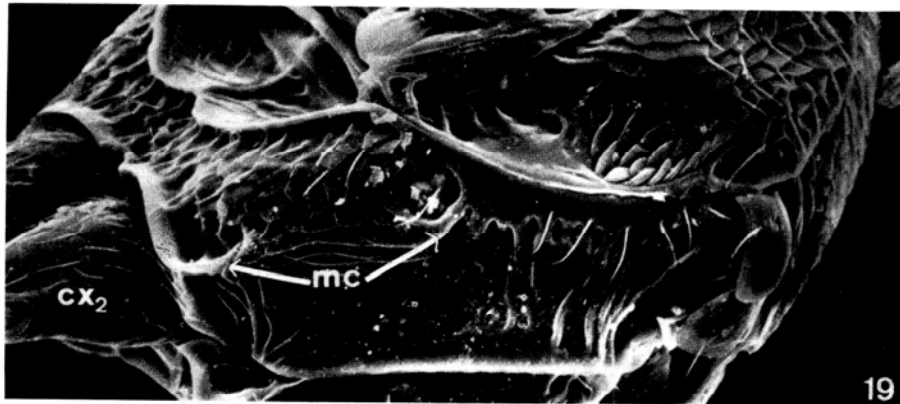
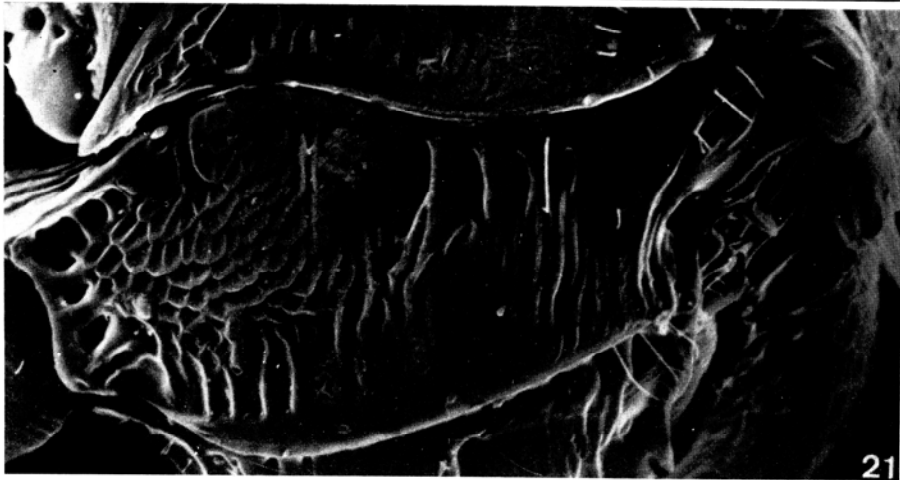
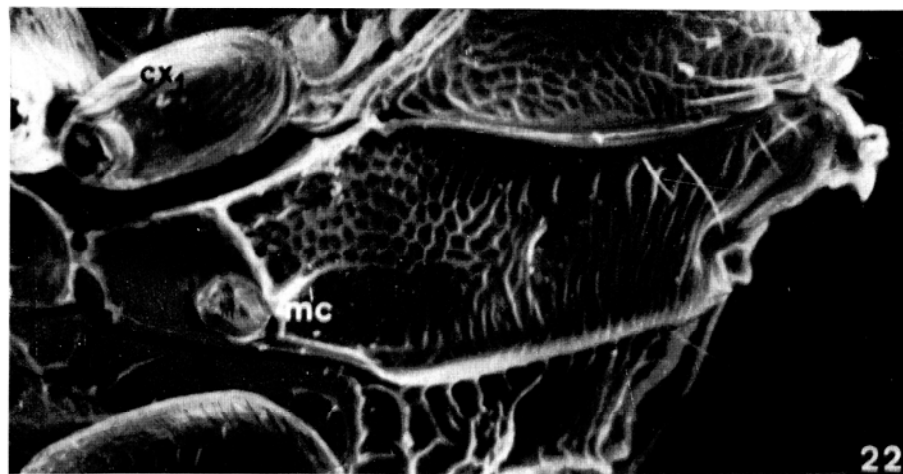


FIG. XIX. - *Gryon hospes* (Kieffer) (♀; × 300).



FIGS. XX and XXI. - *Eremioscelio cydnoides* Priesner (Fig. XX, ♀; × 243- Fig. XXI, ♂; × 244).



FIGS. XXII and XXIII. - *Breviscelio crenatus* Sundholm (♀; × 243 - ♂; × 244).



FIG. XXIV. - *Encyrtoscelio* sp. (♀; × 368).

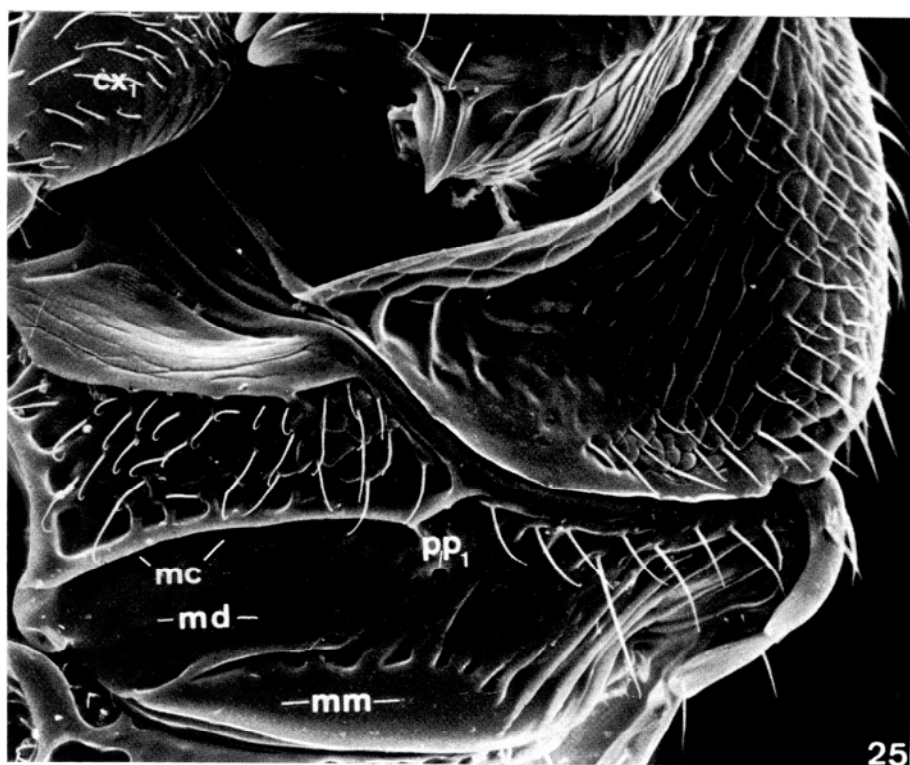


FIG. XXV. - *Mirotelenomus* sp. (♀; × 368); md = mesopleural depression; mm = mesepimeron.



FIG. XXVI. - *G. pennsylvanicum* (♂; × 250).

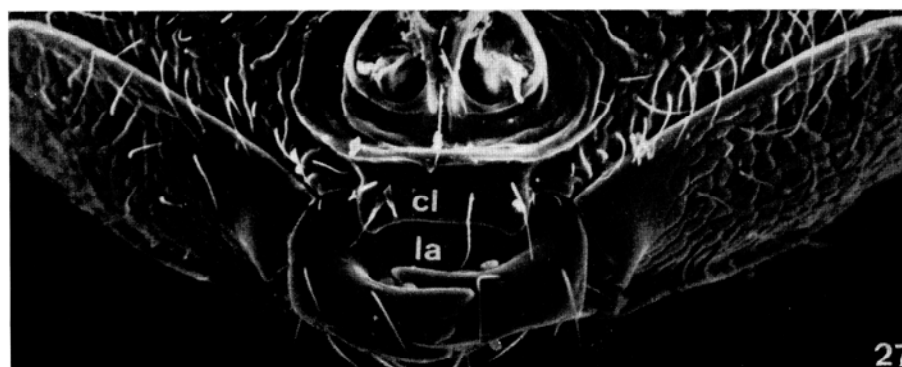


FIG. XXVII. - *G. bolivari* (♀; × 250).

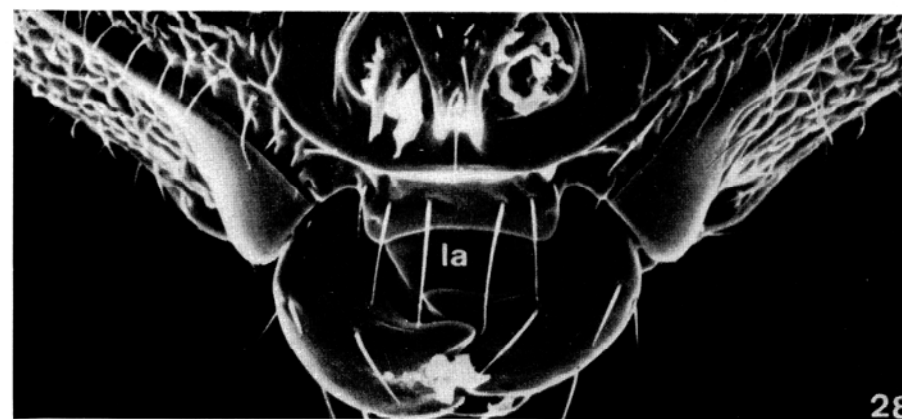


FIG. XXVIII. - *G. bosellii* (♀; × 250) - Morphology of the clypeus in frontal aspect;
cl = clypeus; la = labrum.

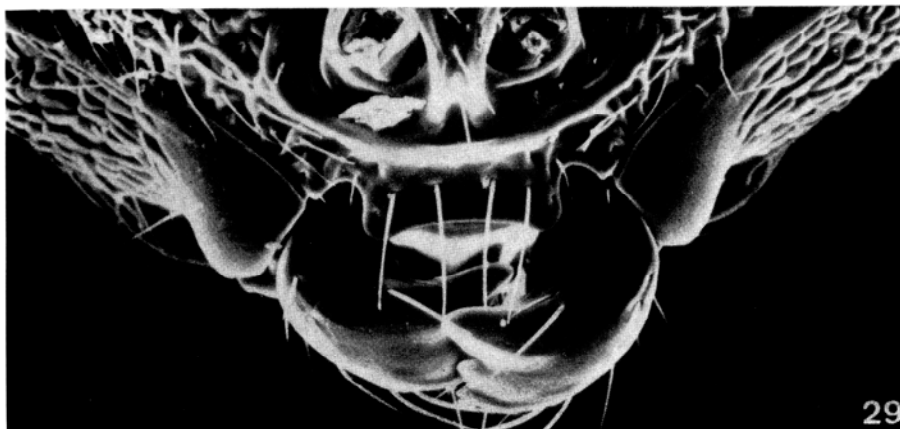


FIG. XXIX. - *G. muscaeformis* (♀; × 250).



FIG. XXX. - *G. leptocorisae* (♀; × 250).



FIG. XXXI. - *Gryon* sp. (d) (♀; × 400).

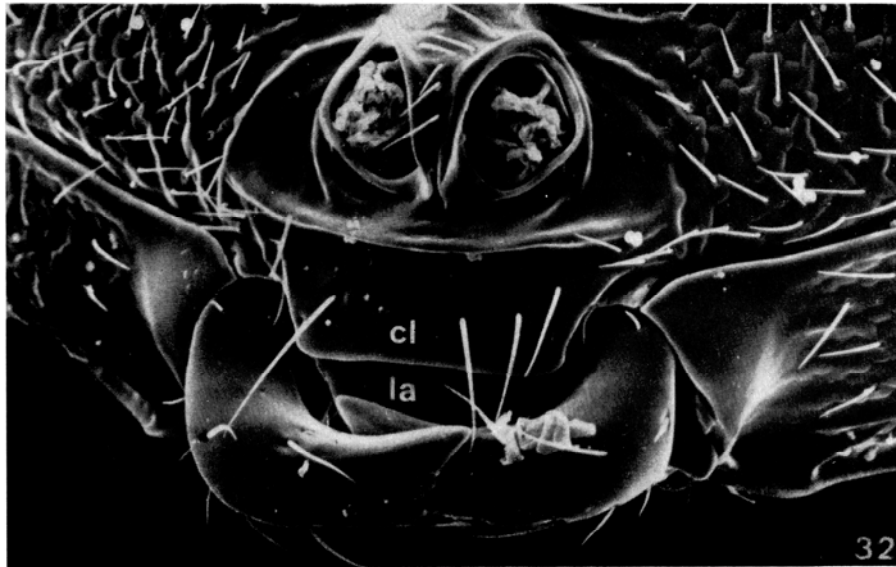


FIG. XXXII. - *G. rugulosum* (♀; × 250).

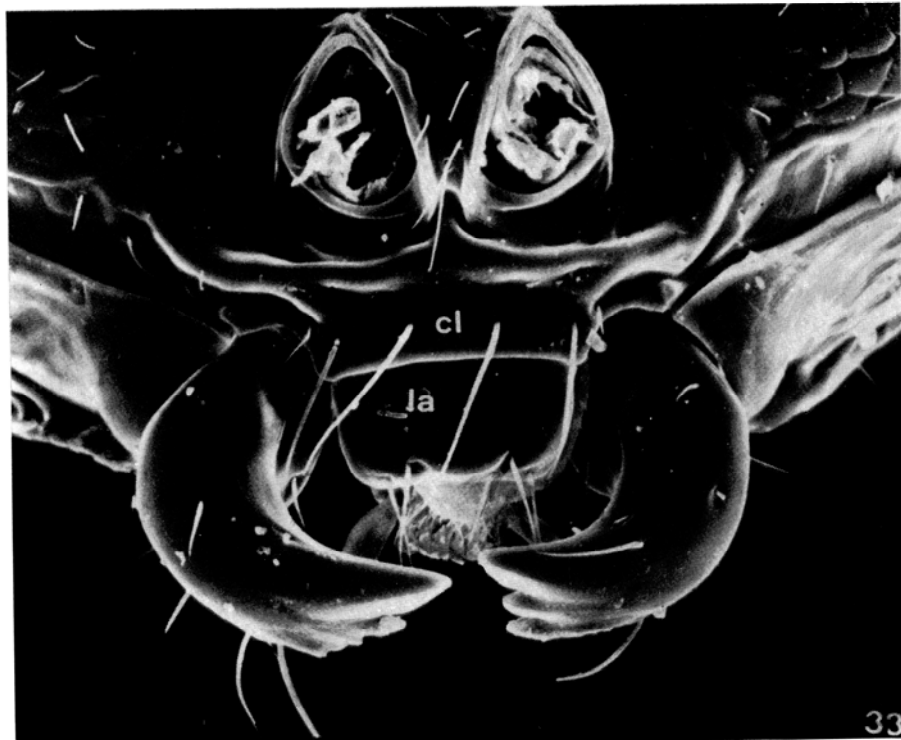


FIG. XXXIII. - *G. saxatile* (♀; × 400).

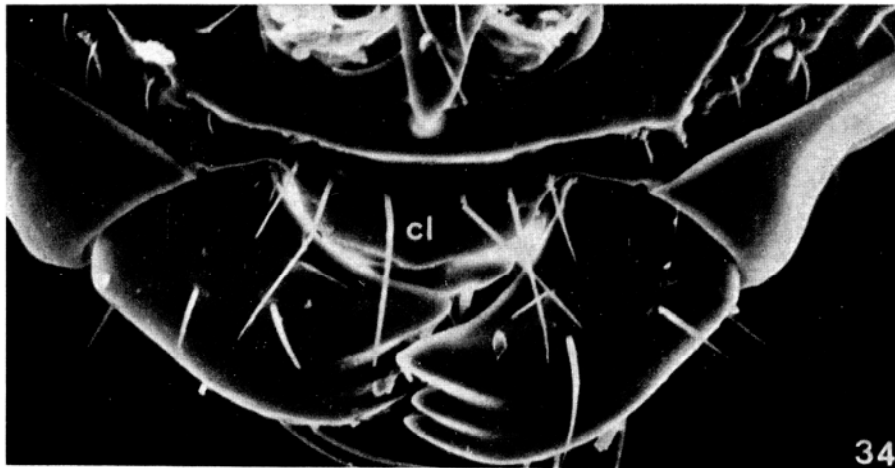


FIG. XXXIV. - *Gryon* sp. (e) (♀; × 400).



FIG. XXXV. - *G. hungaricum* (♀; × 250).

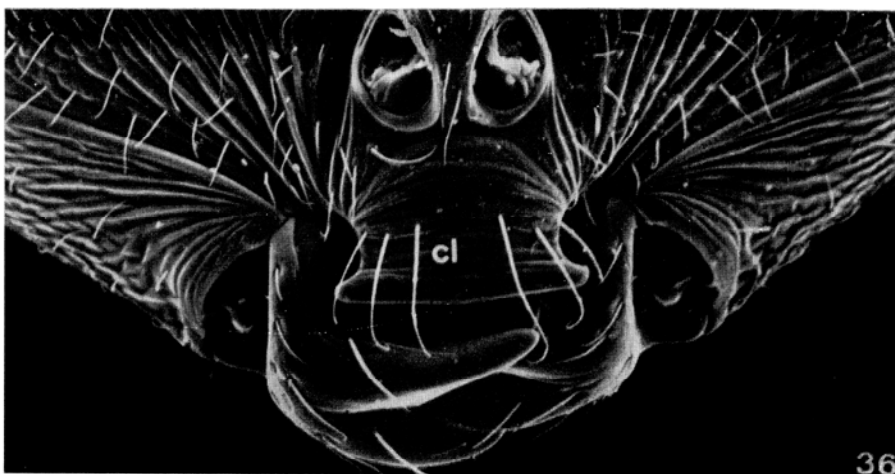


FIG. XXXVI. - *G. laraichii* (♀; × 250).



FIG. XXXVII. - *G. misellum* ♀; $\times 500$).

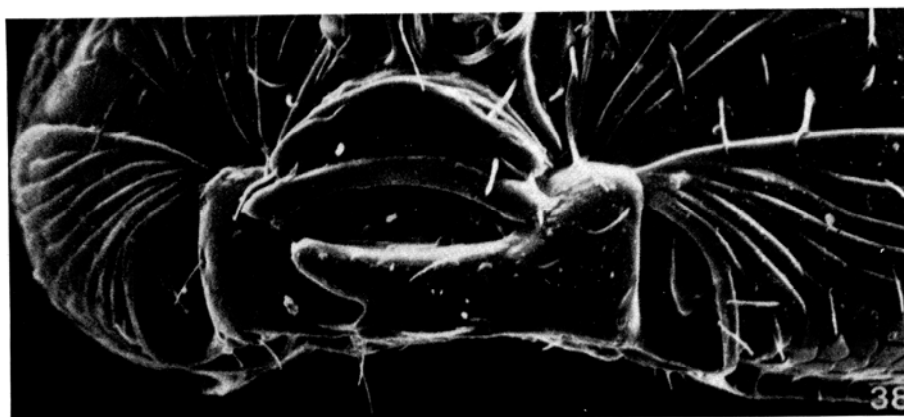


FIG. XXXVIII. - *G. hospes* (♀; $\times 500$).



FIG. XXXIX. - *G. nitens* (♀; $\times 500$).

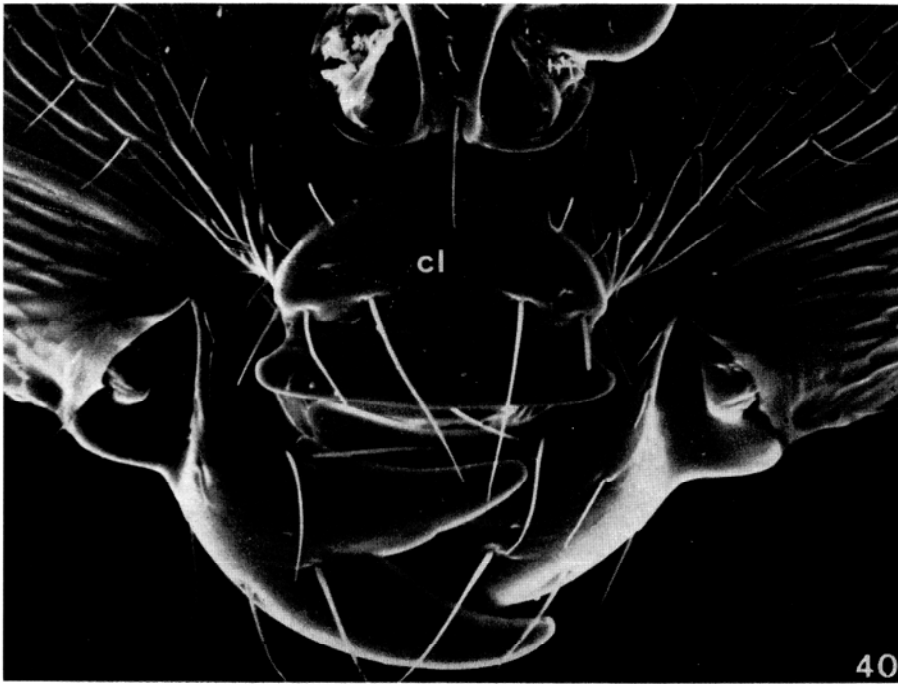


FIG. XL. - *E. cydnoides* (♀; × 400).

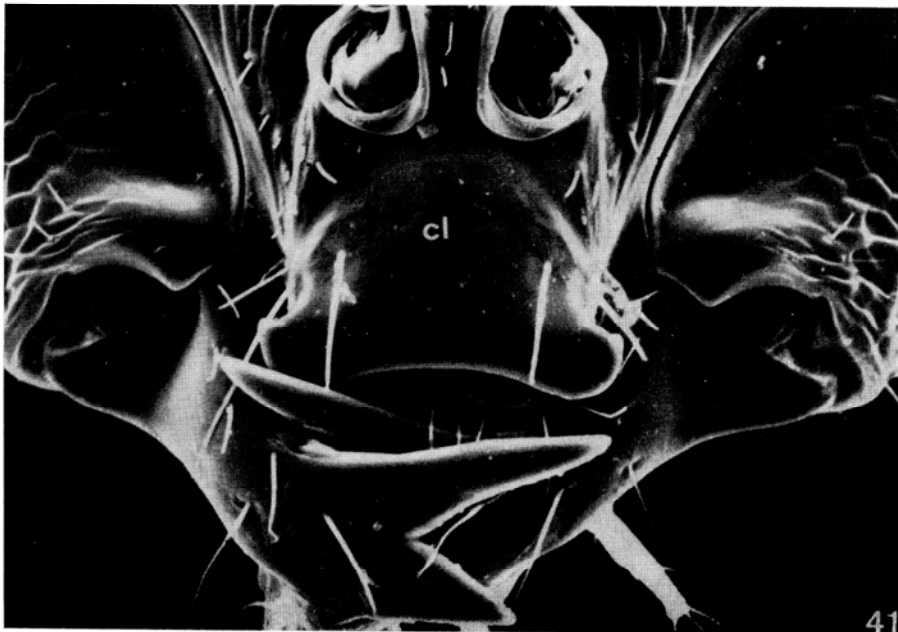


FIG. XLI. - *B. crenatus* (♀; × 400).



FIG. XLII. - *Encyrtoscelio* sp. (♀; × 250).

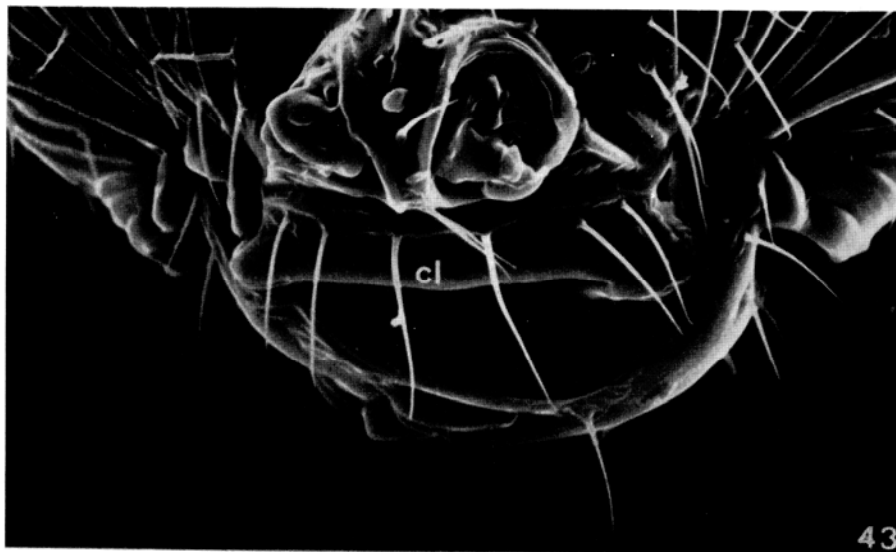


FIG. XLIII. - *Mirotelenomus* sp. (♀; × 500).



FIG. XLIV. - *Hadronotoides* sp. (♀; × 125).

FIG. XLV. - *G. bosellii* (♀; × 140).

FIG. XLVI. - *Mirotelenomus* sp. (♀; × 56). The arrows indicate the sequence of the basiconic-type sensilla on the ventral surface of some antennomeres of the clava.

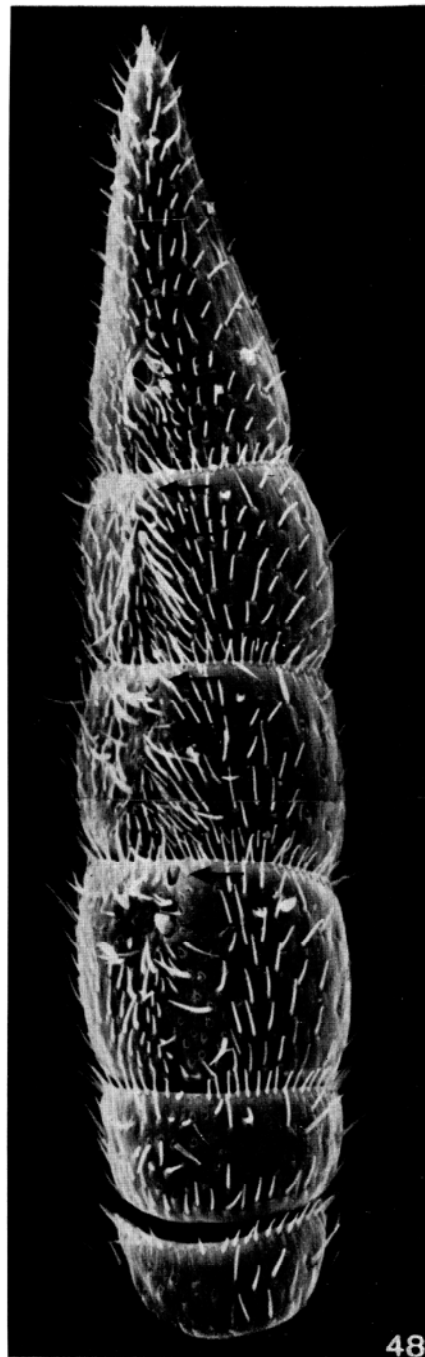
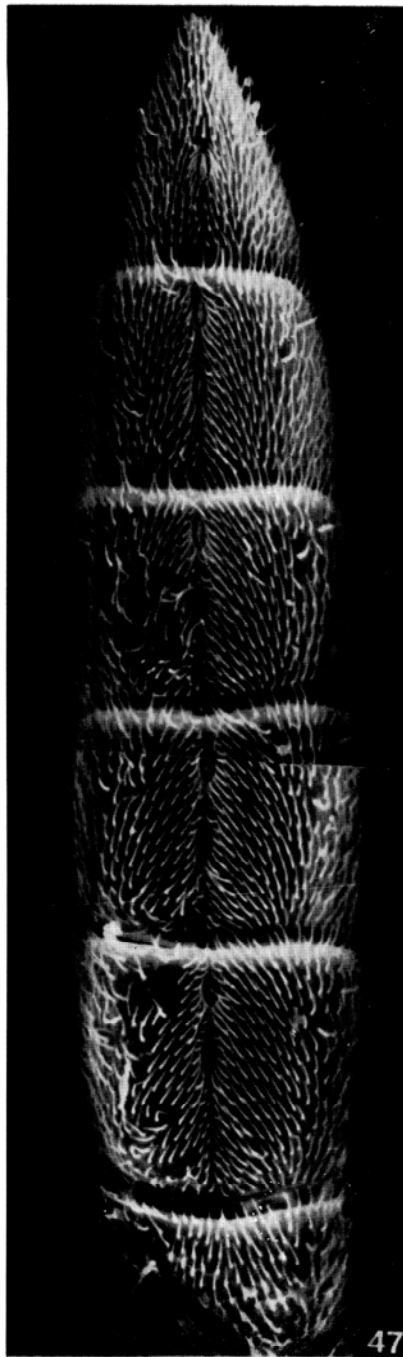


FIG. XLVII. - *G. pennsylvanicum* (♀; × 294).
 FIG. XLVIII. - *E. cydnoides* (♀; × 700). Ventral view of the clava

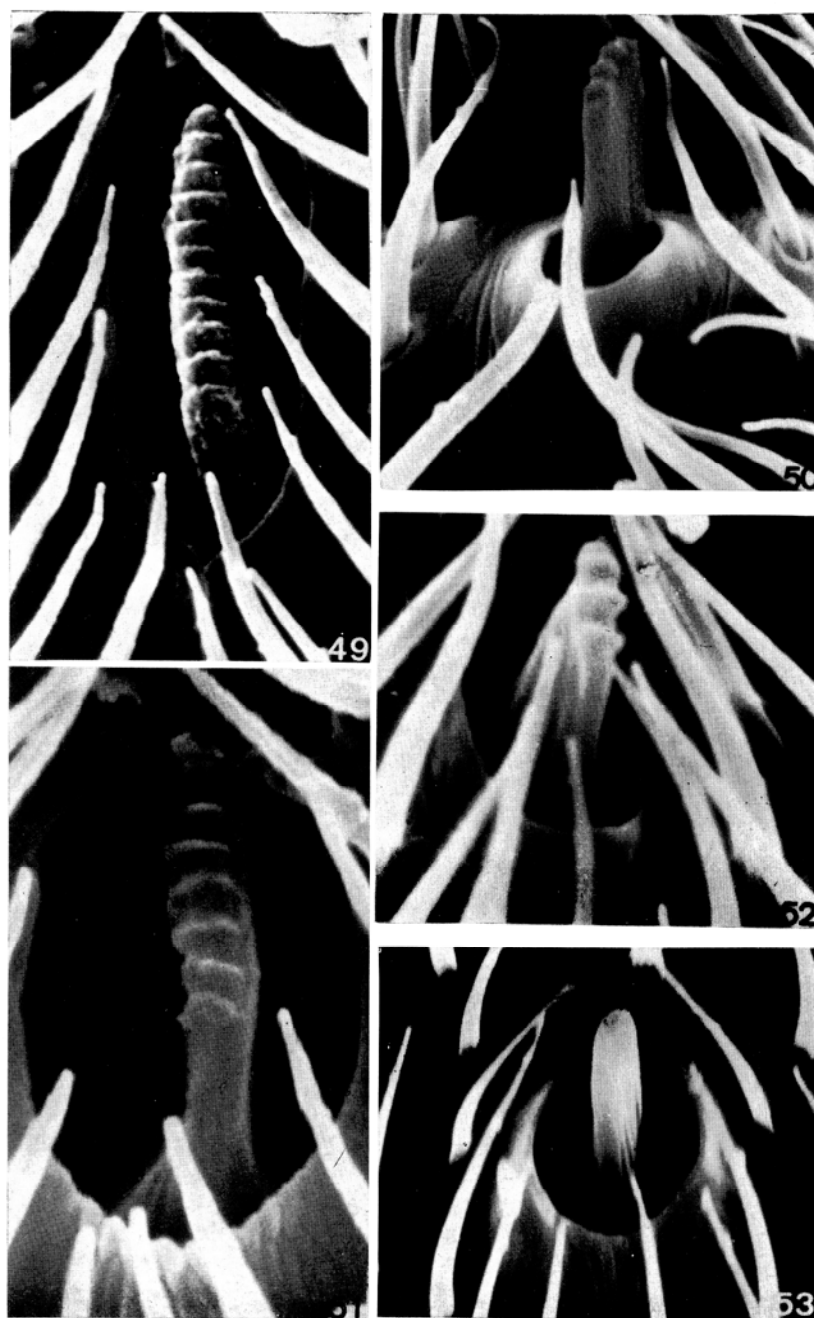


FIG. XLIX. - *G. pennsylvanicum* (♀; × 7,300).

FIG. L. - *G. hospes* (♀; × 7,400).

FIG. LI. - *G. bosellii* (♀; × 10,000).

FIG. LII. - *G. laraichii* (♀; × 9,800).

FIG. LIII. - *G. leptocorisae* (♀; × 4,800). Magnification of one of the basiconic-type sensillum located respectively in A11, A11, A10, A11, A12.

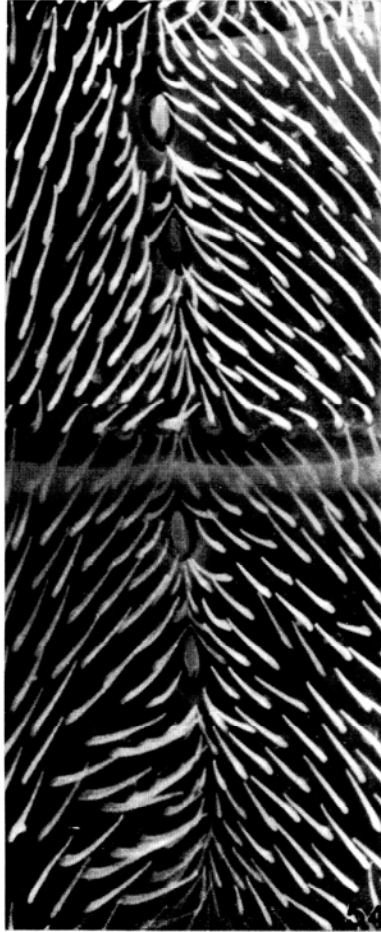


FIG. LIV. - *G. rugulosum* (♀; $\times 1,200$).
 FIG. LV. - *Mirotelenomus* sp. (♀; $\times 2,280$). Detail of the ventral surface of A9-A8;
 the basiconic-type sensillum on A8 of *Mirotelenomus* sp. is not in register.