

## STUDIES IN NEOTROPICAL MALLOPHAGA XII (PART 3)

### LICE OF THE TINAMOUS

by

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#### RESUMEN

*ESTUDIOS DE MALLOPHAGA NEOTROPICALES XII (PART 3). LOS PIOJOS DE LOS TINAMIDAE.* El autor trata detalladamente los géneros *Physconella* PAYNE, *Megaginus* CARRIKER y *Nothocotus* CARRIKER y cita los Tinamidae que hospedan las distintas especies de cada uno. Describe por primera vez las siguientes especies y subespecies: *Physconella nothocercae julia*, *P. hamata cinerea*, *P. emersoni*, *Megaginus emarginatus caquetensis*, *M. sordidus felisae*, *M. tessellatus*, *M. tataupensis*, *Nothocotus parvithorax centralis*, *N. genitalis* y *N. distinctus*.

#### FAMILY PHYSCONELLIDAE

#### GENUS *PHYSCONELLA* PAINE

Specimens of this interesting genus are very rare, so that our knowledge of it is not as complete as in many other genera of the Tinamou lice.

At the present time but five species and subspecies of it have been described, the genotype by PAINE in 1913 and the other four by the author in 1936.

The host for *P. kelloggi* PAINE (the genotype) was given by PAINE as *Chamaepelia rufipennis*, collected on the Canal Zone of Panama, which was in error, and in 1936 (p. 94) I stated that its true host was probably *Crypturellus soui panamensis*, since specimens equal to or close to it had been taken on various races of *Crypturellus soui*.

Additional material now at hand, taken on *Crypturellus soui harterti*, at Acandí, Colombia (on the Panama frontier) substantiate my previous conjecture as to the true host of the species (*P. kelloggi* PAINE).

A male specimen taken at Acandí is practically the same as the description and figure given by PAINE for *kelloggi* (♂). There are slight discrepancies in the measurements, but not beyond the maximum of individual variation. A careful study of all the material now before me shows previously unrecorded characters more or less developed in all of the known species of the genus except *nothocercae* CARRIKER and *P. n. julia* n. subsp. (described in this paper).

These characters are the presence of rows of slightly raised papillae, somewhat similar to those found on the pleurites and tergites of *Pectenosoma*, except that in *Physconella* they are but faintly chitinized, and are present not only on the pleurites but in the head in the form of large, oblong papillae extending from the base of the antennary sinus backward to the deeply colored incassation at the posterior margin of the temples.

There is also, sometimes, a row of such papillae (less well developed) across the front of the head just in front of the bucal cavity. The rows of papillae on the pleurites are just outside, and parallel to, the heavy, deeply colored bars that bear the hooks, on segments II to VI, while on I they are along the outer margin of this bar, adjoining the hyaline margin. These papillae are not always well developed or sharply defined, but seem to be more evident in *kelloggi* and *subsimilis*. There is no trace of them in *nothocercae*.

### ***Physconella kelloggi* PAINE.**

*Ancistrocephalus kelloggi* PAINE, Psyche, Oct. 1913, p. 158 (Host: *Chamaepelia rufipennis* (equals: *Crypturellus soui panamensis*), Río Indio, Canal Zone, Panama, Mar. 3, 1911.).

*Physconella kelloggi* PAINE, Psyche, Nov. 1914 (*Nom. nov.* for *Ancistrocephalus* PAINE, 1913). A re-examination of all the material in my collection shows that this species is found on several races of *Crypturellus soui* in Colombia, as well as on *panamensis*.

A single male from *C. s. harterti*, collected at Acaudí, Chocó, is undoubtedly true *kelloggi*, while a female form *C. s. caucacae*, taken at Tarazá, Antioquia is the same thing.

One male and four females taken on *C. s. mustelinus*, in the Dept. of Magdalena, show a slight tendency towards *subsimilis*, having the abdominal hooks slightly more developed, but in all other respects (including size) they are very close to true *kelloggi*.

On the other hand, a single female taken on *C. s. caquetacae*, at Pto. Venecia, Int. de Caquetá, Colombia, cannot be distinguished from *P. k. subsimilis* from Bolivia, of which I have 3 ♂♂ and 3 ♀♀ paratypes. A single pair (♂♀), taken on *C. s. meserythrus* at Cerro Tuxtla, Vera Cruz, Mexico, cannot be distinguished from paratypes of *subsimilis*.

### ***Physconella kelloggi subsimilis* CARRIKER.**

This is not a strongly differentiated race, and I think that on some races of *Crypturellus soui* specimens of it will be found that are intermediates and difficult of allocation.

However, the bolivian specimens from *C. s. inconspicuous* may be distinguished by the greater development of the abdominal hooks on pleurites III to V, smaller size of insect, longer frontal hooks, and larger first antennal segment.

The single female from *C. s. caquetacae* has the pleural and frontal hooks even more strongly developed than in typical *subsimilis* from Bolivia, but in all other respects it is the same. The scarcity of specimens, especially the males, makes the genus a very difficult one to study, since the male genitalia differ strongly in the different species. The genitalia of *kelloggi* and *subsimilis* are identical, but those of *hamata* and *genitalis* are quite different.

Unquestionably *P. k. kelloggi* and *P. kelloggi subsimilis* are confined to the various races of *Crypturellus soui*, while *hamata* and its races are apparently found on the larger species of *Crypturellus*.

### **Physconella nothocerae** CARRIKER.

Stud. in Neotr. Mall. I, 1936, p. 97 (Host: *Nothocercus nigricapillus*).

This species was described from a single female, which is not now available for study. However, I do still have the two females referred to in the original description, collected at Huacapistana, Peru, and in addition, two ♀♀ taken on a skin of *Nothocercus nigricapillus* from Bolivia, kindly loaned to me by Lt. Col K. C. EMERSON, and in addition four ♀♀ from *Nothocercus bonapartei*, three from the Sierra Perijá (referred to in my 1944 report, p. 123), and one from Río Samaná, Dept. Caldas, Colombia, taken in June 1951.

The male sex of this species is still unknown, and until examination of the genitalia can be made, its relationships with other species cannot be fully determined.

The species may be recognized by the strongly convex *frons*, long frontal hooks; quadrangular prothorax (side straight, but divergent); straight or slightly concave lateral margins on abdominal segment I; medium-sized pleural hooks; entire absence of rows of papillae on pleurites or head; and especially by the well-marked patches of rather long setae on the mesonotum, a character absent on all other known species of the genus excepting *P. n. julia*, described below.

It will be very interesting to see what type of male genitalia is possessed by this species, but it will probably be found to be similar to that of *P. n. julia* (see fig.).

### **Physconella nothocerae julia** n. subsp.

Plate I, figs. 1 and 2; Plate II, fig. 3

Type, male adult, from *Nothocercus j. julius* (BONAPARTE), collected by the author above Bucaramanga, Colombia, Aug. 22, 1949 (in coll. of author).

*Diagnosis:* This form seems to be conspecific with *nothocerae*, but cannot be properly compared with it until the male of *nothocerae* is secured, or the female of *julia* (preferably the former). It agrees with *nothocerae* in the shape of the head, but has the *frons* more strongly arched. The antennae are quite different,

and present a type hitherto not found in this genus. Segment 1 is much enlarged, with 2 short and thick; 3 short and slightly hooked at distal end, while 4 and 5 are of the normal shape and length for the genus. It may well be that this species (as well as *nothocercae*) has slightly dimorphic antennae, and that the female of *julia* will have the same type of antennae as in *nothocercae* (♀).

The incrassations at the occipital margin of head are the same as in *nothocercae*, but the head is longer and narrower (.303 x .355 against .28 by .38). The prothorax is of same shape and size (.105 x .26 against .108 x .27). The posterior margin of abdominal segment I is different (see fig.), being uniformly convex (inside of pleurite), while in *nothocercae* each side of this margin is practically straight, and angulated medially.

The lateral margins of abdominal segment I to V have a rather wide hyaline margin, present only on segment I in *nothocercae*. The abdominal hooks on pleurite II (none on I) are small, straight and pointed, those on III, IV and V are strongly developed and bent inwards, almost as in *hamata*, except that they are thicker and their supporting bands wider (see fig.); the hook on VI is thick, bluntly pointed and almost straight.

The male genitalia is very different from any other known species of the genus, and needs no additional description (see fig.). The species is known only from the male holotype. (Measurements of type follow the next species).

### ***Physconella hamata cinerea* n. subsp.**

Plate II, figs. 2 and 4; Pl. III, f. 1

Type, male adult, from *Crypturellus c. cinereus* (GMELIN), collected by the author at Pto. Venecia, Int. de Caquetá, Colombia, June 14, 1952 (In U.S. Nat. Mus.)

*Diagnosis.*—There are very few differences in the measurements between *P. h. hamata*, *P. hamata genitalis* and the present race. The measurements, as a whole, are very close to those of *P. h. genitalis*, except that the total length is greater (.98 against .94) and the abdomen is shorter and much narrower (.575 x .597 against .617 x .67), in this respect being much nearer to the

nominate race, which is .585 x .617, while the total length is also close to *hamata* (.98 against 1.00).

The pleurites are wider and the abdominal hooks are *all* heavier, with their points more recurving upward on segments III to V, while the hooks on II and VI are much thicker, II noticeably curving and VI long, with sharply recurved tip.

The rows of papillae are poorly developed and difficult to see on the pleurites, but there are double rows of large papillae across the anterior edge of tergites I to VI. There is a single row of large papillae extending from the antennary fossae to the occipital incrustation and a double row across the front of the head. The long pustulated hairs are present at posterior edge of tergites II, III and IV, as in *hamata* (lacking on IV in *genitalis*).

The sides of the prothorax are more rounded and the lateral angles bear a strong hair, more protruding, while the hair itself is longer, and thicker basally.

The genital armature resembles very much that of *hamata*, but the paramers are longer and thicker medially and the endomerale plate is larger, with thickened lateral margins; the basal plate also differs slightly in shape (see fig.). Known only from the ♂ holotype.

Measurements follow the next species.

### ***Physconella emersoni* n. species**

Plate I, fig. 3; Pl. II, figs. 1 and 5

Types, male and female adults, from *Crypturellus undulatus adpersus* (TEMMINCK), collected from museum skin in Germany by Lt. Col. K. C. EMERSON in 1952 (type in EMERSON coll.)

*Diagnosis*.—Nearest in some characters to *P. h. hamata*, but differs radically from *hamata* and all other known species of the genus in the structure of the pleural bands and their corresponding hooks. It is also considerably larger.

The *frons* is narrow and almost transverse, with basal portion of frontal hooks much thickened and extending beyond line of *frons*, while the hooks themselves are rather slender and much

shorter than in *hamata*. The antennal bands are wide and curve backwards around the antennary fossae to join the large ocular blotch, thus forming a continuous band from the outer, posterior corner of the antennary fossae to the frons, but which is less strongly chitinized back of antennary fossae. The incrassations on occipital margins of head differ from those of *hamata* (see fig.) as well as the prothoracic bands.

There are lines of papillae from the antennary fossae to the occipital blotches, more clearly defined in the female than the male, but there are no papillae across the front of head or on the tergites. The prothorax is similar to that of *hamata*; the margin of abdominal segment I is broadly hyaline, with obsolete papillae along inner edge of hyaline band; the posterior margin of segment I (inside the pleurites) has the sides flatly convex and median portion broadly rounded.

Abdominal pleurites II to VI have a unique structure. There is the usual heavy, outer marginal band and the diagonal band bearing at its posterior end the hook, but this latter band is of unusual shape, being narrow at anterior end, widening medially and then narrowing again where the hook joins, but with another short band diverging from the inner side of the base of the hook (see fig.) The portion of the pleurites not occupied by the two bands has a "tessellated" appearance, seemingly covered with densely pecked, slightly raised papillae. The points of the hooks are short, sharply bent inward, and hollowed out on the inner side on III and IV (see fig.) .

The entire chaetotaxy is unusually short and rather slender, but not otherwise distinctive. The long pustulated hair on tergite IV is wanting. The male genitalia are also quite distinctive, in shape of basal plate, paramers and endomera (see fig.).

Described from ♂ holotype, ♀ allotype, 1 adult ♂ paratype and 1 nymph.

A single male, slightly immature, from skin of *Crypturellus u. undulatus* (TEMMINCK), also collected by Col. EMERSON on a

german museum skin, is apparently the same thing, but while the structure of the abdominal hooks is somewhat different, I believe this to be due to immaturity, these hooks being obsolete in the earlier instars, and not fully developed until the insect is completely adult.

Measurements of *P. nothocercae julia* (♂); *P. hamata cinerea* (♂) and *P. emersoni* (♂ ♀).

	♂		♂		♂		♀	
	length	width	length	width	length	width	length	width
Body	1.05	—	.98	—	1.10	—	1.09	—
Head	<i>frons</i>	—	.293	—	.25	—	.288	—
	<i>temples</i>	.282	.355	.24	.335	.25	.34	.245
	<i>occiput</i>	.303	—	.27	—	.255	—	.26
Prothorax	.105	.26	.103	.25	.119	.24	.12	.248
Pterothorax	.163	.337	.152	.34	.152	.347	.162	.358
Abdomen	.61	.635	.575	.597	.65	.72	.695	.78
Antennae	.26	.05	.27	.042	.265	.043	.25	.045
Basal plate	.195	.065	.24	.077	.26	.076		
Paramers	.11	.084	.056	.04	.056	.038		
Endomera	.108	.032	.051	.031	.051	.028		

#### GENUS *MEGAGINUS* CARRIKER

Like *Physconella*, specimens of this genus are seldom encountered, but when present, sometimes as many as 10 to 13 have been taken by the author on a single individual of various races of *Crypturellus soui*, which are the hosts upon which it is most often found. The males are not often taken and four of the ten known forms are known only from the females. The male genitalia in the six known species are very similar in structure and rudimentary in type, but there are always some slight differences in detail.

The abdominal structure has not previously been clearly described. The sclerites consist of tergites and pleurites, there being no clearly defined sclerotized sternites except a large genital plate in the male, which lies exactly underneath segment seven but is considerably longer than tergite VII, about one fourth of its length being exposed and extending to the posterior edge of



segment IV. This sternite is weakly sclerotized and is not always clearly visible.

Tergites I and VI are entire in both sexes, while in the female the median anterior margin of VII is fused to VI, with the suture invisible, while II to V are divided medially, with rounded ends almost touching in the female, but more widely separated in the male, both medially and longitudinally.

The pleurites are entirely ventral and the lateral incassations, sharply defined in most species, consist of a longitudinal bar across the pleurite and a transverse band on the tergite, the latter usually somewhat curved and extending more or less from the anterior outer corner to the inner margin of the pleurite, or beyond this margin, but in at least two cases they are short and transverse. What appears to be a third, transverse band across the posterior portion of the pleurite is, in reality, merely the broad overlapping of the tergites.

Most all of the known forms have at least a portion of the surface of the tergites and pleurites strongly rugose, giving an appearance of "hammered" brass, the surface being covered with minute dents, the raised portion being on the outside of the sclerites. When present, this rugosity covers the whole of the pleurites and sometimes most of the tergites (excepting the portion inside of the pleurites), but is usually confined to the lateral portion, that is, the portion over the pleurites. The shape and position of these bars on tergites and pleurites, as well as the presence or amount of rugosity on them varies considerably in the different species and are good diagnostic characters, taken in connection with the shape of the head and prothorax.

These insects are so small that characters differing between species are often so minute that they seem of little importance, while the same characters, having the same degree of difference in larger species would be easily recognized.

There follows a brief diagnosis of each of the six previously described species and subspecies, and more complete descriptions of the four new forms.

**M. e. emarginatus** CARRIKER.

Plate IV, fig. 1

Hosts: *Crypturellus obsoletus punicensis*, *C. o. ochraceiventris* and *C. o. crucis*.

The head forms an equilateral triangle, with whole side from tip of *frons* to middle of temple straight; the *frons* narrow, with tips rounded, of medium size and emargination *small*; dorsal clypeal bands heavily chitinized on posterior half, but narrow basally and expanding anteriorly and gradually disappearing, except for a narrow, less heavily chitinized margin which extends to the tips of the *frons*, but is much less developed than in *excavatus*. Prothorax with sides more divergent and with anterior portion constricted laterally.

Tergite I in ♀ wider medially than in other races and tergites II and III are joined medially for the posterior third of their width, but in ♂ all tergites are separated medially except I and VI and all are more tapering towards inner ends, leaving considerably wider hyaline areas between them, especially segment III to VI (This difference between the sexes is present in a varying degree in all species).

Pleural band well developed, lying near inner edge of sclerite, but tergal band obsolete in male and short and wide in female, extending only a short distance beyond each margin of pleural bar.

**M. emarginatus excavatus** CARRIKER.

Plate IV, fig. 2

Host: *Crypturellus soui inconspicuus*.

Head short, temples large and expanded laterally; pre-antennary area constricted medially, with strongly defined marginal clypeal bands extending to edge of frontal emargination, which has the tips rounded on the outer side and *concave* on the inner.

The longitudinal bands on pleurites are wide, sharply marked, are in median portion of sclerite and extend from one end to other. The transverse bands on tergites also wide and sharply defined, extending from outer anterior corner to inner margin of pleurite, only.

**M. emarginatus dissimilis** CARRIKER.

Plate IV, fig. 3

Host: *Crypturellus soui nigriceps*.

Head longer, temples slightly expanded laterally and preantennary area larger, with sides strongly and uniformly concave (not constricted and angulated medially as in *excavatus*). Marginal clypeal band obsolete on anterior third of preantennary margin and tips of *frons* uniformly rounded on both sides. Longitudinal bands on pleurites also wide and long (as in *excavatus*), but they lie close to the inner edge of pleurite; transverse bands *wide*, with a conspicuous dusky median line, and beginning just outside of longitudinal bar they extend for some distance *inside* of pleurite, especially on II to IV.

**M. laticlypeus** CARRIKER.

Plate IV, fig. 5

Host: *Crypturellus soui meserythrus*.

Head narrow, temples little expanded laterally; preantennary area wider, with almost straight sides; *frons* with emargination very narrow and shallow; clypeal bands ending at middle of clypeus. Abdominal pleural and tergal bands practically the same as in *excavatus*.

(*Note*.—All species have the inner, posterior corner of pleurites II to IV (sometimes V) produced to a slender point extending backward some distance beyond the anterior end of succeeding pleurite.)

**M. quadrithorax** CARRIKER.

Plate IV, fig. 4

Host: *Tinamus major fuscipennis*, originally given incorrectly as *T. m. robustus*.

The original figure of the prothorax in this species is not entirely correct, the sides being more divergent than shown in that figure, being almost identical in this respect with *M. c. excavatus* and *dissimilis*, except that the segment is longer in *quadrithorax* and the postero-lateral angles less rounded.

The head is shaped much as in *emarginatus* but the clypeal bands are different and the prothorax (see figs. of six previously described species). The clypeal bands are wider anteriorly, with

two narrow sutures leading to bases of setae, while the frontal emargination is larger and *frons* wider. The occipital bands are wider than usual, but not strongly chitinized; the pleurites are unusually small, with longitudinal bands well developed, slightly curving, and in middle of sclerite; the transverse bands are short and wide, extending from anterior outer corner to inner edge of pleurite.

**M. s. sordidus** CARRIKER

Plate IV, fig. 6

Host: *Crypturellus cinereus berlepschi*.

Head rather large with short preantennary area, wide *frons* with small emargination and broadly rounded tips; temples much expanded, with a diagonal line across postero-lateral portion, with the margin outside of this line *depressed* and with a strong, pustulated hair set in each end of this depression (dorsally). The dorsal clypeal bands are narrow and faintly chitinized, and obsolete on anterior third of clypeus.

The pleurites are narrow and faintly chitinized. In the types there are *no* tergal or pleural bands and the tergites and pleurites are poorly chitinized, although the ventral clypeal and occipital bands of head are strongly colored, as well as the prothoracic bands and acetabular bars. Tergites II and III in female are fused medially at posterior third.

A single female from Ecuador (from same host) is very similar to the type, excepting the frontal emargination is somewhat shallower and the depression across the temples less pronounced. The pleurites are the same (narrow), poorly chitinized, as well as the tergites, but there are faintly developed longitudinal pleural bars on segments I to III.

**Megaginus emarginatus caquetensis** n. subsp.

Plate IV, fig. 7 and figs. 8a, b, c, and d

Types, male and female adults, from *Crypturellus soui caquetae* (CHAPMANN), collected by the author at Pto. Venecia, Int. Caquetá, Colombia, June 21, 1952 (In U.S. Nat. Museum).

*Diagnosis*.—This subspecies is closest to *M. e. cecaratus* CARRIKER, differing from that race in the shape of the frontal emargi-

nation, the shape of the head, the terminal abdominal segments in the female and slightly in the male genitalia. Its affinities with *excavatus* are logical, since the host of that species is *C. soui inconspicuus* of eastern Bolivia.

The head is considerably narrower than in *excavatus* ( $\sigma$ : .37 x .51 against .37 x .55): the prothorax is smaller, the pterothorax slightly longer and the abdomen smaller and shorter, being wider than long in both sexes ( $\sigma$ : .467 x .50 against .54 x .54).

Segment VII in the female is much longer and of distinct shape and the incrassations of the tergites and pleurites are of a different pattern from both *emarginatus* and *excavatus*, resembling more those of *laticlypeatus*.

The male genital armature differs from that of *excavatus* in having a shorter basal plate, slightly shorter paramers, and in the structure of the endomera (see fig.)

The type series consists of  $\sigma$  holotype,  $\text{♀}$  allotype, 3  $\sigma$   $\sigma$  and 9  $\sigma$   $\sigma$  paratypes. Measurements follow succeeding species of this genus.

### ***Megaginus sordidus felisae* n. subsp.**

Plate III, fig. 3; Pl. V, fig. 4

Type, female adult, from *Crypturellus c. cinereus* (GMELIN), collected by the author at Pto. Venecia, Int. Caquetá, Colombia, June 14, 1952 (in coll. U.S. Nat. Mus.)

*Diagnosis.*—Clearly allied to *M. s. sordidus*, agreeing with that species in the shape of the head, size and shape of the frontal emargination, faintly developed pleural and tergal incrassations, and the setae-bearing depression across the latero-posterior portion of the temples.

It differs from *sordidus* in smaller size of head, markings of the head, smaller frontal emargination; more strongly developed incrassations on abdomen and in having well-marked rugosity on outer portion of pleurites, resembling, in a lesser degree, this character as found in *M. tessellatus* (described on subsequent page).

Described from a single female, the male being unknown.

Measurements of the types of *M. e. caquetensis* (♂ ♀) and of *M. sordidus felisae* (♀).

	♂		♀		♀		
	length	width	length	width	length	width	
Body	.97	—	1.15	—	1.14	—	
Head {	at <i>coni</i>	—	.365	—	.358	—	
	temples	.39	.51	.402	.52	.37	.531
	occiput	.38	—	.398	—	.38	—
Prothorax	.09	.26	.108	.282	.12	.293	
Pterothorax	.205	.36	.23	.39	.23	.40	
Abdomen	.467	.50	.62	.586	.63	.564	
Antennae	.16	—	.185	—	.152	.03	
Basal plate	.14	.055					
Paramers	.087	.05					
Endomera	.067	.026					

### **Megaginus tessellatus** n. species.

Plate III, fig. 2

Types, male and female adults, from *Crypturellus t. tataupa* (TEMMINCK), coll-ANDUZE at Sta. Elena, Gran Sabana, Venezuela, June 1946 (type in Dept. Higiene, Caracas, Venezuela).

*Diagnosis.*—One of the larger species of the genus, with very wide head both at *coni* and temples (.456 and .634), and with abdomen as wide as long (.673); the sides of the preantennary area are deeply concave, the occiput very strongly convex, the frontal emargination wide and deep but with the tips of *frons* rounded (not pointed); temples much expanded and uniformly circular; abdominal incassations weakly chitinized, consisting of the longitudinal, pleural bar near the inner edge of that sclerite and the short, transverse tergal bar, having the appearance of three parallel lines, beginning just outside of pleural bar and extending inward slightly over inner edge of pleurite.

The entire surface of the pleurites, outside of the longitudinal bar is strongly rugose, with some trace of rugosity inside this bar. Measurements follow next species.

The type series consists of the ♀ holotype and 3 ♀ ♀ paratypes, the male being unknown.

**Megaginus tataupensis** n. species.

Plate III, figs. 4a, b and c.

Types, male and female adults, from *Crypturellus t. tataupa* (TEMMINCK), collected by the author at Rio Lipeo, S. frontier of Bolivia, Aug. 9, 1936 (In coll. of the author).

*Diagnosis.*—Size and shape of head very much like *M. s. sor-didus*, but differs from that species as follows: Temples somewhat smaller; margin of preantennary area almost straight; frontal emargination smaller, with tips narrower and whole *frons* narrower; clypeal bands (dorsal) rather strongly chitinized and extending to tips of *frons*, similar to those of *excavatus*; occipital bands well chitinized and a prominent, rather deeply colored band paralleling occiput; occipital signature *round* and unusually prominent.

Prothorax short, with sides straight and divergent, and slightly wider than both *excavatus* and *dissimilis*. The abdomen in male is wider than long, in female longer than wide. The pleurites are narrow, with long slender points at inner, posterior angles; the longitudinal bars are well developed, curving in shape and extend the full length of the pleurites; the tergal bars are short, transverse, expanded at outer end, just outside longitudinal bar, and do not reach to inner edge of pleurite. Segment VII of female is wider than usual, with sides strongly divergent from the narrow, fused, anterior end, while posteriorly it extends much beyond tips of segment VI (see figs.).

The male genitalia is typical of the genus, but the paramers are uniformly thickened apically, as in *quadrithorax*. The endomerical plate is partially covered by extraneous matter and cannot be properly drawn in all details. Described from ♂ holotype and ♀ allotype.

Measurements of the types of *M. tessellatus* (♀) and *M. tataupensis* (♂ ♀).

	♀		♂		♀		
	length	width	length	width	length	width	
Body	1.31	—	1.09	—	1.19	—	
Head {	<i>coni</i>	—	.456	—	.41	—	
	temples	.436	.634	.413	.597	.415	.62
	occiput	.456	—	.41	—	.415	—
Prothorax	.15	.326	.098	.302	.115	.31	
Pterothorax	.240	.442	.207	.41	.228	.434	
Abdomen	.673	.673	.564	.595	.65	.63	
Antennae	.217	.033	.19	.034	.185	.035	
Basal plate			.185	.075			
Paramers			.11	.065			
Endomera			.076	.03			

### GENUS *NOTHOCOTUS* CARRIKER

This, also, is a genus of few known species, of small size, and confined to the avian genus *Nothocercus*, having now been taken on six species and sub-species of it.

After the publication of my 1944 report on this genus (p. 133) additional paratypes of *N. p. parvithorax* were discovered in my collection, 3 ♂♂ and 3 ♀♀, with another ♀ remaining from the type series. There is also a series of 7 ♂♂ and 14 ♀♀ taken on various individuals of the type host (*Nothocercus b. bonapartei*) in the Sierra Perijá of Colombia.

*N. parvithorax subsimilis* is represented by one female from the type host collected also at Leimabamba, Perú; one female from *Nothocercus n. nigricapillus* (intermediate with *N. n. cadwaladeri*), collected at Santo Domingo, S. Peru, and 2 ♂♂ and 2 ♀♀ from a bird shot at Huacapistana, Peru (also an intermediate). I have also received from Col. Emerson a series of 2 ♂♂ and 3 ♀♀ of what is clearly *subsimilis*, taken on a skin of *Nothocercus n. nigricapillus* in a W. Germany museum, which was collected in Bolivia.

In addition to the above there is the material treated on subsequent pages, from which three new forms of the genus are described, one strikingly distinct new species from Costa Rica.

After a careful examination of this material it is clear that certain errors and omissions were made by me in the original description of the genus and species (1936), which I shall now try to rectify. In the 1944 report (pps. 131 and 133) new figures were



given of the head and male genitalia of *parvithorax*, drawn from Colombian material, which now proves to be identical with the later discovered paratypes from Venezuela, and so may be considered correct.

The original description of the pterothorax is not entirely correct. Excepting for a short suture at each side the meso and metathorax are completely fused into a typical pterothorax, which is deeply imbedded within abdominal segment I and *completely fused* with that segment along the median portion of its posterior margin (see fig. of *distinctus*).

The abdominal structure was also not properly described. The arrangement of the tergites and pleurites is precisely the same as in *Megaginus*, as explained previously in this paper, the short diagonal bar being on the *ventrally placed* pleurite and the transverse bands on the tergites which, unlike *Megaginus*, extend unbroken across the abdomen. Pleurites II to V are also furnished with the same slender point at inner posterior corner, less pronounced on V, but unlike *Megaginus*, each is furnished with a stout seta, short in the male and much longer in the female (as long as pleurite on III and IV); Another seta of about the same length is set at the middle of posterior margin of pleurites II to V (also absent in *Megaginus*). Tergite VII in the female is not fused medially with VI, (as in *Megaginus*) while there is present a large genital sternite covering all of tergite VII and extending to anterior edge of tergite VI. There is also in the male sex a large genital sternite, narrower than tergite VII, which extends from tip of abdomen to middle of tergite V. In the females the tergites almost fill the segments in II to VI, but in the male there is a considerable hyaline space between them, increasing in width posteriorly.

### ***Nothocotus parvithorax centralis* n. subsp.**

Plate VI, figs. 1a, 1b, and 2

Types, male and female adults, from *Nothocercus b. bonapartei* (G. R. GRAY), collected by the author on the Rio Samaná, Dept. Caldas, Colombia, May 12, 1951 (in U.S. Nat. Mus.)

*Diagnosis.*—Very close to *parvithorax* in size, but differs decidedly in the head bands. There is a deeply colored internal clypeal

band, joined basally with the marginal clypeal band and encircling the hyaline bucal cavity and ending at the posterior margin of the wide band which encircles the *frons*. The conspicuous blotches on the marginal (dorsal) clypeal band in *parrithorax* are but faintly indicated. The pre-antennary margin of the head is *strongly concave*, not slightly to strongly convex as in the other species of the genus.

The male genitalia is of the same type as in *subsimilis*, the paramers extending backwards almost to the ends of the internal bands of the basal plate, but encircled latterly on their basal third by extensions of the basal plate. The endomeral plate seems to be similar to that of *parrithorax* but differs in detail.

A careful re-examination was made of the genitalia of three male paratypes of *parrithorax* (from La Cumbre de Valencia, Venezuela) and one male from the Sierra Perijá, Colombia. All of these specimens had been cleared to the point where the more delicate, poorly chitinized parts of the endomera are scarcely visible. However, in one specimen there are faintly visible the lateral prongs at the tip of the endomera (see fig. of genitalia of *centralis*). I strongly suspect that properly treated specimens of *parrithorax* will show the endomeral plate quite similar to that of *centralis*.

The type series consist of the ♂ holotype, ♀ allotype, 4 ♂♂ and 12 ♀♀ paratypes. Two ♂♂ from *Nothocercus bonapartei intercedens*, collected above Frontino, Antioquia, and one ♀ from *N. b. bonapartei* from Belen, Dept. Huila, are all exactly like the type series from *N. b. bonapartei*, although taken on individuals collected at great distances from each other. Measurements follow the next species.

### **Nothocotus genitalis** n. species.

Pl. V, fig. 3 and Pl. VI, figs. 3a, b.

Types, male and female adults, from *Nothocercus j. julius* (BONAPARTE), collected by the author at Alto del Pozo, Dept. Santander N, Colombia, Sept. 17, 1946 (In coll. of author).

*Diagnosis*.—In size this species is close to *parrithorax*, with the exception of the head of the female, which is wider, and the abdomen in both sexes is longer and wider.

The head bands are the same as in *parrithorax* but the incrasations of the paratergals are quite different (see fig.) The apical segment of the abdomen in the male is much larger, angulated on posterior portion, and extends far beyond VI.

The male genitalia is of a somewhat different type, and is the best character for separating the species. The basal plate is shorter and wider, the paramers slightly longer, but much wider and of distinct shape, while the endomeral plate is of an unusual pattern and quite complicated (see fig.).

The type series consists of the ♂ holotype, ♀ allotype and 2 ♂♂ and 2 ♀♀ paratypes, also 5 ♂♂ and 1 ♀ from the type host collected near Bucaramanga, Dept. Santander, Colombia, August 22, 1949.

Measurements of *Nothocotus parrithorax centralis* and *N. genitalis*.

	♂		♀		♂		♀	
	length	width	length	width	length	width	length	width
Body	1.22	—	1.41	—	1.18	—	1.48	—
Head	.42	.445	.43	.467	.41	.465	.435	.52
Prothorax	.13	.30	.14	.303	.13	.303	.14	.314
Pterothorax	.19	.37	.217	.39	.217	.38	.25	.40
Abdomen	.64	.586	.69	.66	.716	.66	.865	.705
Antennae	.217	.054	.195	.032	.217	.05	.175	.043
Basal plate	.23	.09			.24	.135		
Paramers	.14	.094			.16	.13		
Endomera	.105	.06			.13	.11		

### *Nothocotus distinctus* n. species.

Pl. V, figs. 1, 2; Pl. VI, figs. 4, 5

Type, male adult, from *Nothocercus bonapartei frantzii* (LAWRENCE), taken on a skin in a W. Germany museum by Col. K. C. EMERSON, which was collected in Costa Rica (In EMERSON coll.)

*Diagnosis*.—Head of a strikingly different shape from all other known species of the genus. The pre-antennary area is much shortened, nearly as wide as temples, with sides flatly convex, *frons* broadly rounded and *coni* large. First segment of antennae larger than in *parrithorax* but otherwise similar; antennary fossae large

and deep; sides of temples nearly straight, and but slightly divergent, with posterior portion circular to edge of deeply concave occiput.

Dorsal incrassations of clypeal band similar to those of *parvithorax*, but the ventral bands more like those of *centralis*; pharyngeal sclerite and gland large but occipital signature apparently wanting. Prothorax rather large, with convex sides, rounded posterior angles and postero-dorsal margin concave. The pterothorax as in *parvithorax*, but shorter, with exposed sides rounded and the usual three dorsal hairs, two at angle and one inside.

Abdomen very similar to that of *parvithorax* in shape but with lateral incrassations somewhat different and pleurite VI much larger, nearly as large as V. Segment VII is rather deeply emarginate dorsally on posterior margin, but ventral margin convex; genital sternal plate similar to that of *parvithorax*, extending slightly beneath segment V, but is narrower posteriorly than tergite VII.

The male genitalia is strikingly different from all other known forms of this genus, being very large, short and wide, with strongly curving paramers and a complicated endomera (see fig.). Described from a single male, the holotype.

	length <sup>♂</sup>	width
Body	1.38	—
Head	{ at <i>coni</i>	.37
	{ temples	.423
	{ occiput	—
Prothorax	.14	.33
Pterothorax	.195	.434
Abdomen	.676	.694
Antennae	.28	.06
Basal plate	.28	.155
Paramers	.20	.155
Endomera	.145	.115

## EXPLANATION OF PLATES

### PLATE I

- Fig. 1. — *Physconella nothocerae julia* n. subsp. ♂. Head, thorax and segments I and II of abdomen.
- Fig. 2. — *Physconella nothocerae julia* n. subsp. ♂. Genitalia and segment VII.
- Fig. 3. — *Physconella emersoni* n. sp. ♀.

### PLATE II

- Fig. 1. — *Physconella emersoni* n. sp. ♂. Pleurites III to VI.
- Fig. 2. — *Physconella hamata cinerea* n. subsp. ♂. Pleurites III to V.
- Fig. 3. — *Physconella nothocerae julia* n. subsp. ♂. Pleurites III to V.
- Fig. 4. — *Physconella hamata cinerea* n. subsp. ♂. Genitalia.
- Fig. 5. — *Physconella emersoni* n. sp. ♂. Genitalia and parts of segments VI to VII.

### PLATE III

- Fig. 1. — *Physconella hamata cinerea* n. subsp. ♂. Head, thorax and abdominal segments I and II.
- Fig. 2. — *Megaginus tessellatus* n. sp. ♀.
- Fig. 3. — *Megaginus sordidus felisae* n. subsp. ♀.
- Fig. 4. — *Megaginus tataupensis* n. sp.
- a) ♀. Head, thorax and abdominal segment I.
- b) ♀. Abdominal segments V to VII.
- c) ♂. Genitalia and abdominal segment VII.

### PLATE IV

- Fig. 1. — *Megaginus emarginatus emarginatus* CARRIKER. ♀. Head and prothorax.
- Fig. 2. — *Megaginus emarginatus excavatus* CARRIKER. ♀. Head and prothorax.

- Fig. 3. — *Megaginus emarginatus dissimilis* CARRIKER. ♀. Head and prothorax.
- Fig. 4. — *Megaginus quadrithorax* CARRIKER. ♀. Head and prothorax.
- Fig. 5. — *Megaginus laticlypeus* CARRIKER. ♀. Head and prothorax.
- Fig. 6. — *Megaginus sordidus sordidus* CARRIKER. ♀. Head and prothorax.
- Fig. 7. — *Megaginus emarginatus caquetensis* n. subsp. ♀. Tergites and pleurites I to IV (pleurites shaded in I and II, tergites in III and IV).
- Fig. 8. — *Megaginus emarginatus caquetensis* n. subsp.
- a) ♂. Head and prothorax.
  - b) ♂. Tip of abdomen.
  - c) ♀. Tip of abdomen.
  - d) ♂. Genitalia.

## P L A T E V

- Fig. 1. — *Nothocotus distinctus* n. sp. ♂. Head, thorax and abdominal segment I.
- Fig. 2. — *Nothocotus distinctus* n. sp. ♂. Genitalia.
- Fig. 3. — *Nothocotus genitalis* n. sp. ♂. Genitalia.
- Fig. 4. — *Megaginus sordidus felisae* n. subsp. ♀. Tergites and pleurites I to IV.

## P L A T E V I

- Fig. 1. — *Nothocotus parvithorax centralis* n. subsp. ♂.
- a) Head.
  - b) Tip of abdomen.
- Fig. 2. — *Nothocotus parvithorax centralis* n. subsp. ♂. Genitalia.
- Fig. 3. — *Nothocotus genitalis* n. sp.
- a) ♂. Tip of abdomen.
  - b) ♀. Abdomen.
- Fig. 4. — *Nothocotus distinctus* n. sp. ♂. Abdominal segments II and III.
- Fig. 5. — *Nothocotus distinctus* n. sp. ♂. Tip of abdomen.

3

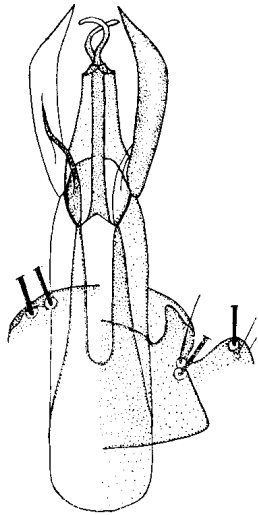
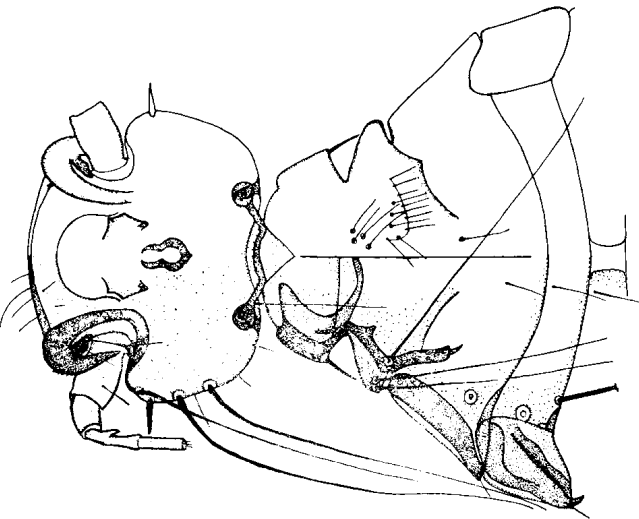
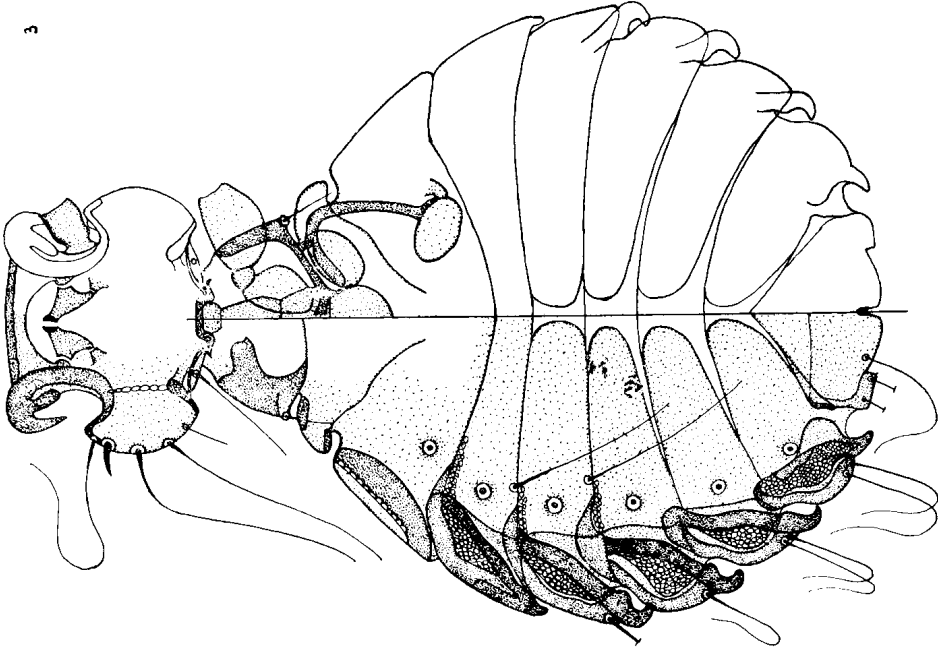


PLATE 1

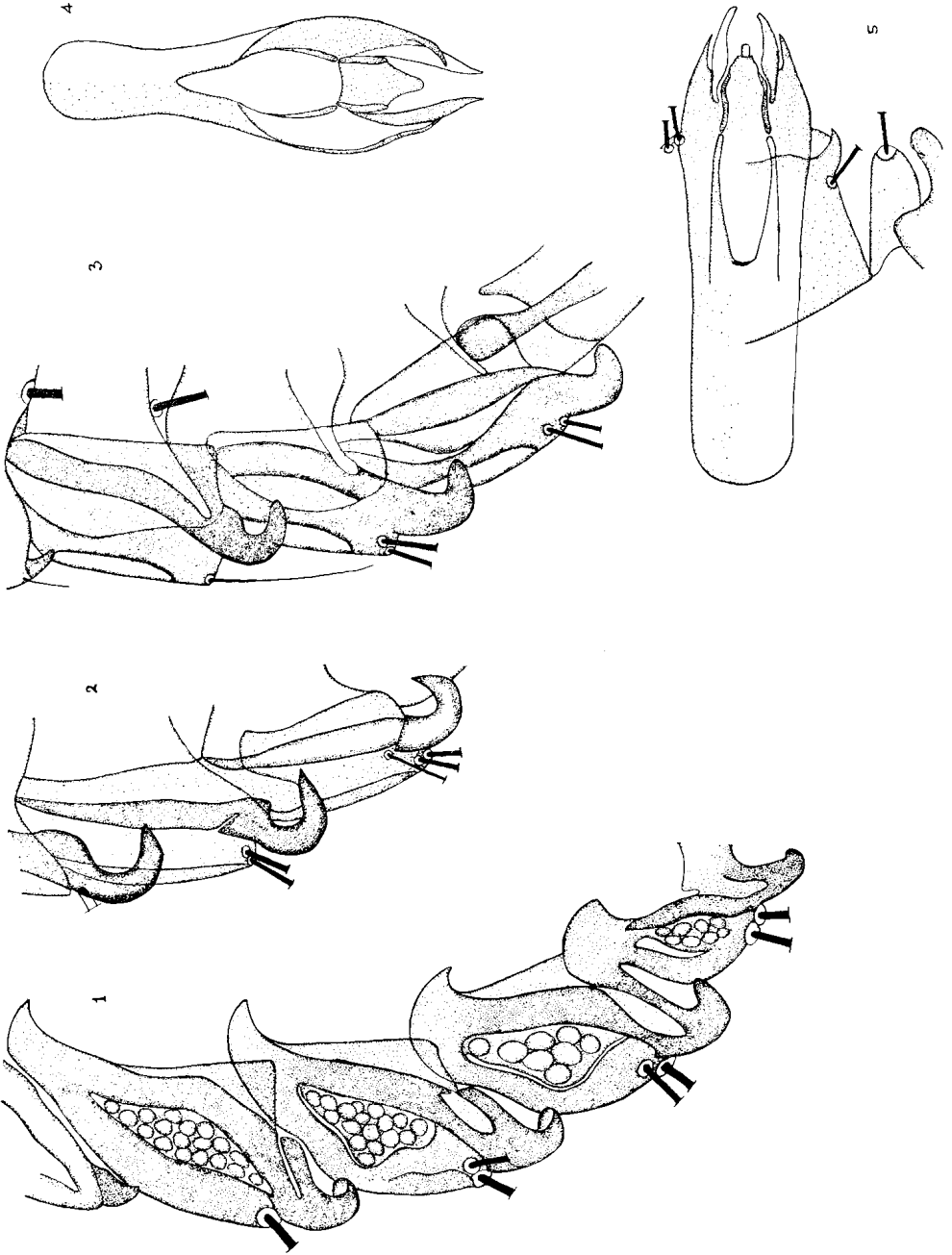
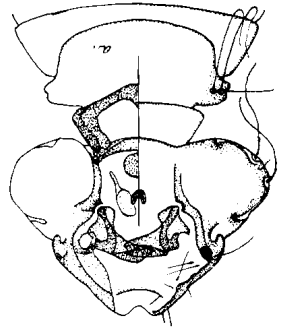
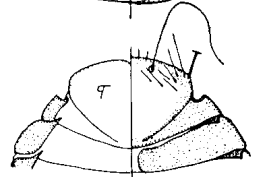
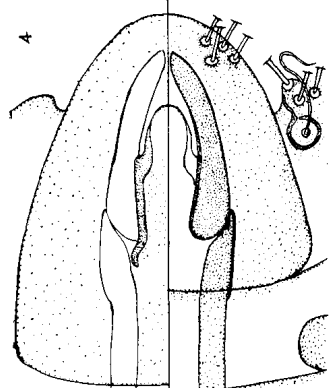
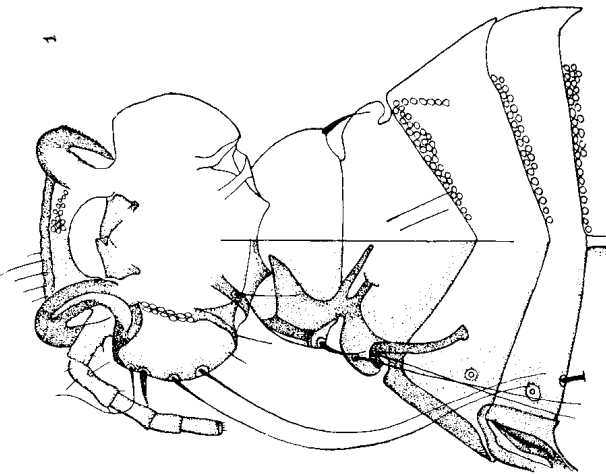
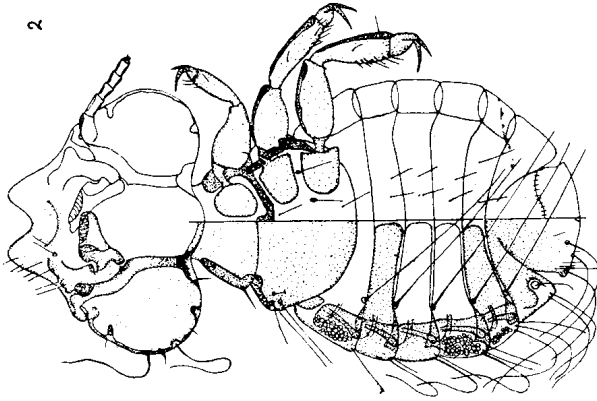
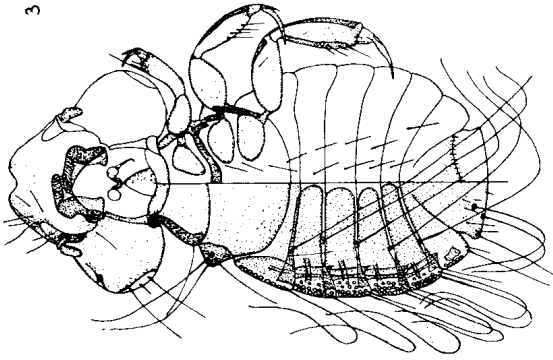


PLATE II





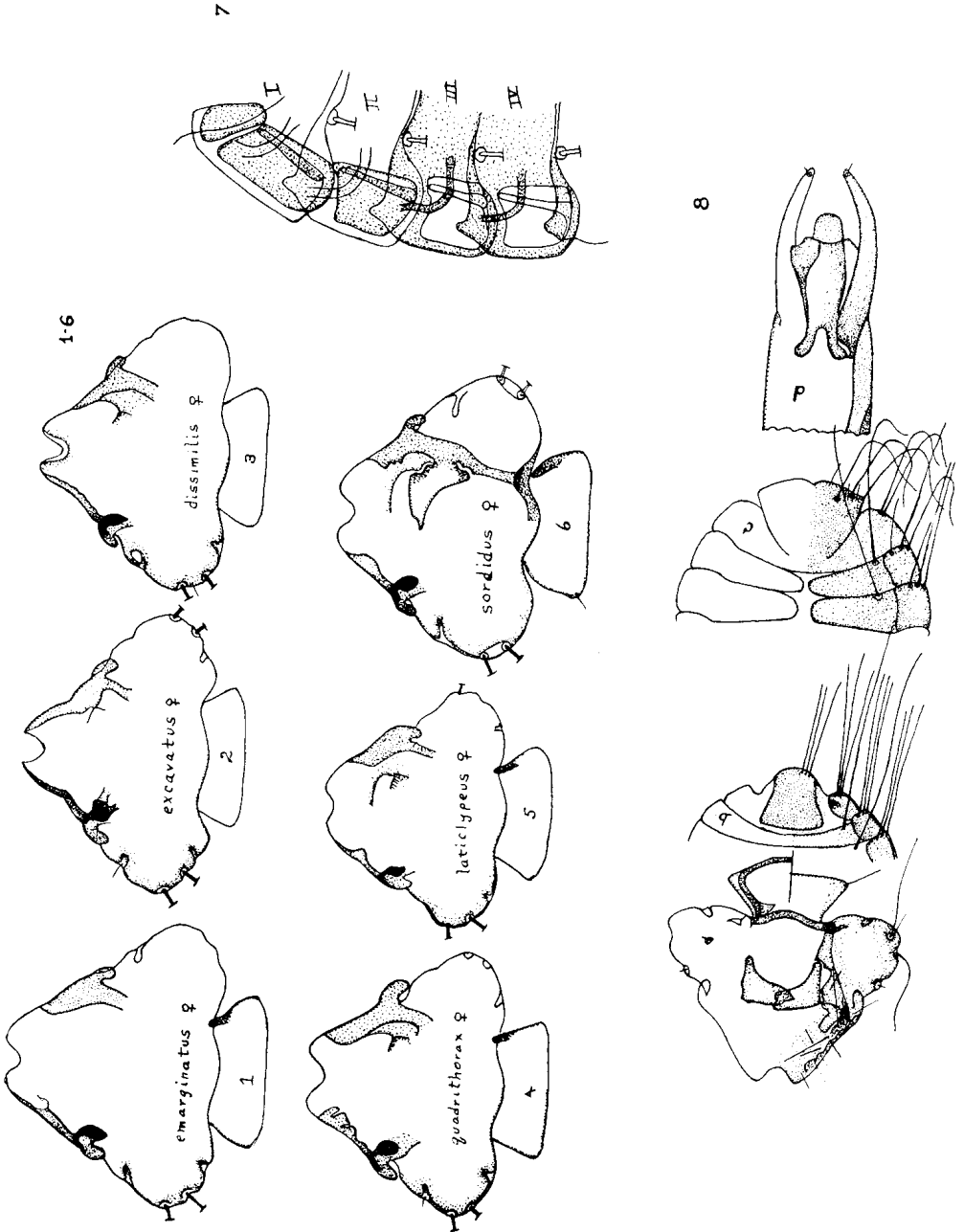


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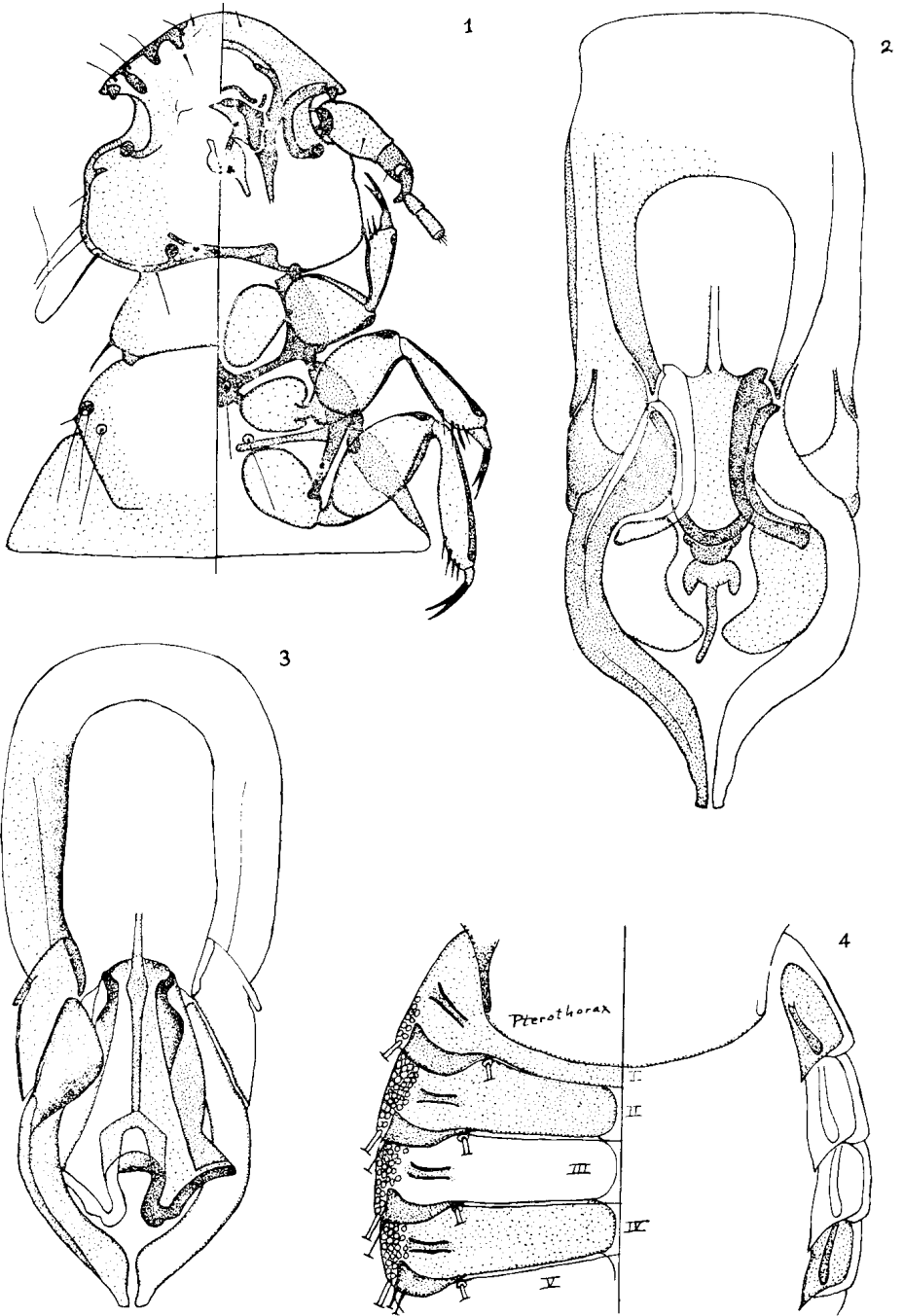


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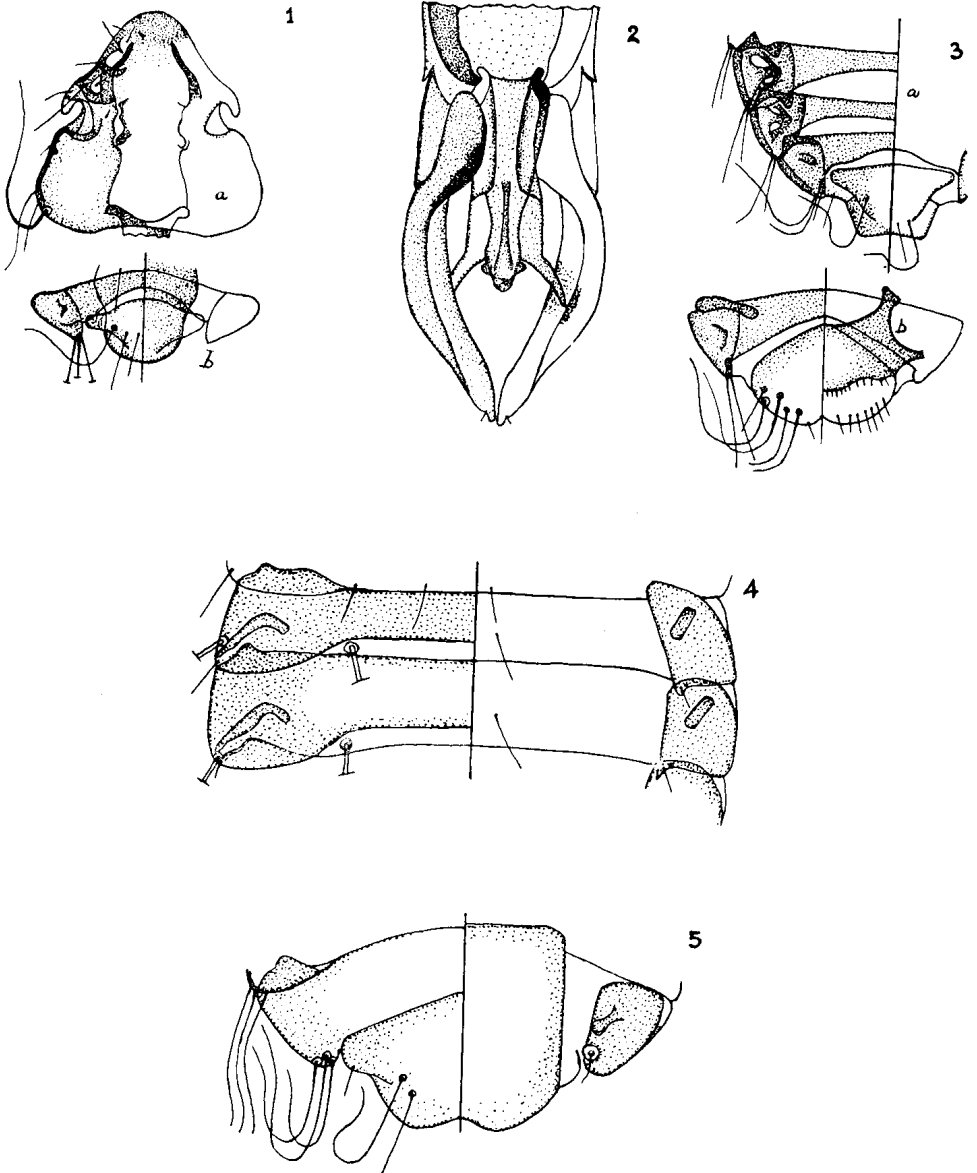


PLATE VI