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Studies in Neotropical Mallophaga,
Part I.—Lice of the Tinamous

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STUDIES IN NEOTROPICAL MALLOPHAGA,
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INTRODUCTION

The first Mallophaga from the Tinamous (Tinamidae) of which we have any knowledge, were those described by Nitzsch in 1866, when he described four species in the same paper, viz: *Goniocotes* (= *Kelloggia*) *agonus*, *Goniodes* (= *Rhopaloceras*) *oniscus*, *Goniodes* (= *Strongylocotes*) *lipogonus*, and *Goniodes aliceps* (= *Rhopaloceras oniscus*).

Giebel followed with four others in the same year: *Goniocotes* (= *Heterogoniodes*) *clypeiceps*, *Goniocotes* (= *Strongylocotes*) *alienus*, *Goniocotes longipes*, and *Menopon brachygaster*. Harrison makes *Goniocotes longipes* a synonym of *Rhopaloceras oniscus*, but I rather doubt the correctness of that assumption. As for *Menopon brachygaster*, I believe it to be a straggler from some unknown host, and have placed it in the hypothetical list.

In 1870, Rudow described six more species, two of which have been re-described and substantiated by subsequent authors, viz: *Goniodes* (= *Hep-tapsogaster*) *dilatatus* and *Goniocotes* (= *Tinamicola*) *rotundatus*. Of the remainder, I find that *Nirmus crassiceps* is synonym of *Strongylocotes lipogonus* (Nitzsch); that *Nirmus tinnami* and *N. ansatus* are undoubtedly the ♂ and ♀ of the same species, and belong to the genus *Strongylocotes*. The remaining species by Rudow, *Trinoton biguttatum*, is, at present, impossible to allocate. It is probably some undescribed genus, if it actually came from a Tinamou, since obviously it is not *Trinoton*. I have seen nothing resembling the remarkable thoracic structure described for this species, and it must remain incognito until material from *Nothura boraquira* is available.

Following Rudow, we have quite a number of species described by Piaget in his "Les Pediculines" and Supplement, fifteen in all, one of which (*Goniocotes aculeatus*) he has attributed wrongly to the host *Momotus lessoni*. I am positive that this is the female of some species of *Trichodopeostus*, and probably came from *Nothocercus julius*. His species *Menopon arctifasciatum* I have taken from the same host, but it is a *Menacanthus*, not *Menopon*. *Lipeurus* (= *Columbicola*) *longisetaceus* is a straggler from some species of pigeon, and we are not at present concerned with it. His *Lipeurus appendiculatus* is, I think, from a Megapode, not a Tinamou (see text). The remainder of Piaget's species are all correctly attributed to the Tinamous, and nearly all are amply described and figured

for their identification, although every species must be placed in other genera than those in which they were originally allocated. I have refigured all of Piaget's species which I have been able to secure, in order to show to better advantage some of the finer details, and especially the genital armature.

After Piaget, the next worker in Mallophaga to describe new forms from the Tinamous was Taschenberg, 1882, in his "Die Mallophagen", where he describes *Goniodes* (= *Heptarthrogaster*) *parvulus*, *Goniocotes* (= *Pectenosoma*) *verrucosus*, and *Strongylocotes* (= *Hypocryptus*) *coniceps*. He attempted a revision of most of the Tinamou infesting species, some of his conclusions being correct, and which have been followed in the present revision, but others must be disregarded.

No other work was done in this group until 1903, when the author published descriptions of two new genera and five new species from Costa Rica, viz: *Ornicholax robustus*, *Kelloggia brevipes*, *Goniodes* (= *Pterocotes*) *aberrans*, *Lipeurus* (= *Pseudolipeurus*) *longipes tinami*, and *Goniodes* (= *Heptarthrogaster*) *minutus*. Later Paine described his remarkable new genus and species, *Physconella kelloggi* (incorrectly attributed to a "Ground Dove", but in reality from *Crypturellus soui panamensis*). Shortly after, Paine and Mann described *Goniodes* (= *Rhopaloceras*) *pennaticeps*, which was also wrongly attributed to *Anthus lutescens*, its true host being *Crypturellus tataupa*.

I have attempted in this paper to make a complete revision of all the known species and genera parasitic on the Tinamous. My own collection combined with that of the Academy of Natural Sciences, consists of more than one thousand specimens of Mallophaga from the Tinamous, while I have had, in addition, all the material from the collections of the U. S. National Museum, the U. S. Dept. of Agriculture, and of Harold S. Peters.

The wealth of new and strange forms contained in this collection is almost beyond belief. The fact that most of the Tinamou lice possess but seven abdominal segments (the first two being completely fused), a fact hitherto overlooked or disregarded, makes necessary the erection of a new family for their reception, as well as many new genera, not only for the known species, but for many of those herewith described.

I have endeavored to make all generic characterizations full and complete, in order that there may be no confusion concerning them. During the progress of the present work it has become necessary to revise somewhat my previous ideas regarding generic characters, and it might be well to briefly outline my conclusions in this respect. It should be clearly understood, however, that these conclusions are based solely on a study of the Ischnocera, and chiefly to the families Philopteridae and Heptapsogastridae, and may not be applicable in their entirety to other groups.

Generic characters may be summarized as follows: Unusual sexual dimorphism in the structure of the antennae, shape of head or abdomen; thoracic structure, such as partial or complete fusion of meso- and metathorax, or complete separation, or with the metathorax entire or bilobed; presence or absence of specialized structures, such as abnormal "combs" or spines, or peculiar, deeply pigmented incassations on the thoracic or abdominal plates. Of lesser importance, but of generic significance, when combined with other characters, may be classed: shape of head, thorax and abdomen; presence or absence of eyes; chaetotaxy and genital armature.

In some cases an entirely unique type of male genital armature might alone be sufficient to separate generically certain forms, but I prefer to have it combined with one or more secondary characters. Such genera as *Pterocotes*, *Megapeostus*, *Heptapsus*, and *Trichodopeostus* would fall into this category. However there can be no hard and fast rules laid down to govern some of these so-called generic characters. A certain character may be considered of primary significance in one group and of less than secondary importance in others. For example: Sexual dimorphism in the antennae. This character has always been considered to be of primary generic importance, but it falls down completely in the genera *Rhopaloceras* and *Pseudolipeurus*, in which genera most of the species have highly dimorphic antennae, but at least one species in *Pseudolipeurus* and two in *Rhopaloceras* have the antennae almost the same in the sexes. Other similar characters might be mentioned.

As to what may or may not be classed as of specific or subspecific importance will always remain controversial, while the Mallophaga present special problems of their own along these lines. Many are so minute that great care must be taken not to overlook differences which in themselves seem small, but would be very apparent were the insect larger in size. I think that some authors have confused individual variation with subspecific differences in many cases. Small differences in size and proportion of body segments and genital armature, and degree of chitinization and pigmentation may be classed as of subspecific value when the parasite comes from a *different host*, but not when taken from different individuals of the same species of host. When these differences are greater, and more apparent, they may be classed as specific, especially when combined with a decidedly different male genital armature or differently shaped apical segment in the abdomen of the female.

The older workers on Mallophaga placed little or no importance on the type and structure of the genital armature, but we now know that it presents one of the most stable characters we have denoting specific and subspecific difference, and in many cases generic. This is particularly true of the genera *Rhopaloceras*, *Hypocryptus*, and *Physconella*.

It would seem that certain types have remained, to all outward appearance, almost unchanged over an exceedingly long period of time, even while their hosts have become differentiated into numerous species, but when the genital armature of such forms is carefully studied, most remarkable differences will sometimes be found.

I have tried in all cases to be conservative, never describing new genera and species unless there seemed ample grounds for doing so, but nevertheless I feel that no object is to be gained by placing a heterogeneous collection of species under one genus, of which there has been entirely too much in the past. The Mallophaga of the Tinamous form the most extraordinary group of these curious parasites of which we have any knowledge. The great generic differences and extremes are beyond belief, and can be explained on but one hypothesis, that is, the great age of the host family.

Next to the struthious birds, the Tinamous are the oldest living family of birds left on the earth, and it would seem logical to suppose that their Mallophagan parasites must have been derived from some very primitive type of insect, but here again we encounter contradictions, for which, however, there may be satisfactory explanation.

It is generally conceded that the immediate ancestors of the Mallophaga are the Psocids, the most commonly known form of which is the common book louse (*Troctes divinatoria*). It has nine abdominal segments, free five segmented antennae and a true pterothorax (meso- and metathorax completely fused), and the eye is reduced to three facets. In many Amblycerous Mallophaga the eye is double, but in all Tinamou lice the eye is single, vestigial or absent. In fact we have but one species, which we are fairly certain is parasitic on the Tinamous, that belongs to the suborder Amblycera, all are Ischnocera.

Upon comparing Tinamou lice with the book louse, we find that there are but two genera (*Lipeurus* and *Esthiopterum*) which have nine abdominal segments and a perfect pterothorax, and these genera are very likely more recent acquisitions by the Tinamous, since they are both uncommon, and contain but few species. There are other allied genera more abundantly represented, with the same style of thorax, but with only eight abdominal segments (*Pseudolipeurus*, *Cuclotogaster*, and *Pseudophilopterus*).

The great majority of the genera found on Tinamous belong, however, to a very different group, the family Heptapsogastridae, where the abdominal segments have been reduced to seven in number by the complete fusion of the pleural plates of the 1st. and 2nd. segments, leaving the first pair of spiracles in this long, first segment. In this family the thorax is of many different types, ranging from three completely separated, articulated segments to a complete pterothorax. The only explanation I have to offer for this greatly diversified structure in the Tinamou lice, is the great length of time which the Mallophaga have been parasitic on this particular family

of birds, with no chance for interbreeding due to the solitary habits of the hosts. It may be that they have reached a stage in their development analogous to what took place among the Trilobites. The Trilobites were of very simple structure in their earlier development, but during the period prior to their disappearance they developed a most bizarre and extraordinary diversity.

I am further convinced that the genera *Philopterus*, *Degeeriella*, *Menopon*, *Goniodes*, and *Goniocotes*, while recorded from the Tinamou, are not normally parasitic upon them, and that those species which have been reported were all stragglers, acquired after the death of the host, from some bird placed in close proximity by the collector. All species originally described under *Goniodes* and *Goniocotes* prove to belong to the family Heptapsogastridae.

I am not yet fully convinced that *Lipeurus* and *Esthiopterum* are normal parasites of this avian family, since I have seen but a single specimen of the two species representing these genera, but which I have not as yet been able to trace to any other host. Much careful collecting of the Mallophagan parasites of this family still remain to be done before we can definitely solve these problems, some of which I hope to carry out during the next few years.

The anatomical terminology used throughout this report does not entirely conform to the latest interpretations as used by Dr. Snodgrass, since I have hesitated in adapting some of his terms. I have used the term "pleural plates" for the plates along the lateral margin of the abdominal segments, rather than "paratergal" or "lateral tergal", as used by Dr. Snodgrass, employing the term "tergal plates" for those plates on the dorsal surface of the abdomen which lie between the pleural plates, and "sternal plates" for those on the ventral surface. The term "acetabular bar" has been employed for the heavily chitinized and pigmented sclerites on the ventral surface of the thoracic segments to which are attached or articulated the coxal joints of the legs, and which also serve in some cases as additional attachments between the thoracic segments. A partial glossary of the descriptive terms employed in this paper will be found on a subsequent page.

All of the illustrations appearing in this report were drawn by the author with the greatest care as to detail and exact measurement of parts. A series of uniform scales was used, and the magnification of the figures on the printed plates may be explained as follows. For the larger forms, 32 diameters; for slightly smaller species, 48 diameters; and for still smaller, 64 and 96 diameters. Most figures of the genital armature and other minute parts have been enlarged 154 diameters, but some of the smaller types as much as 308.

The staff artist has given assistance in inking in the lines of the drawings, but most of the shading has been done by the author.

All types of Mallophaga described in this revision, from Costa Rica, Venezuela and Colombia, are, unless otherwise specified, in the collection of the author. All of those from Peru and Bolivia are in the Academy of Natural Sciences of Philadelphia. All bird hosts and Mallophaga, unless otherwise specified, were collected by the author, and all hosts from Costa Rica, Venezuela and Colombia are in the collection of the Carnegie Museum of Pittsburgh, while those from Peru and Bolivia were collected during the four Peruvian and one Bolivian expeditions made by the Academy of Natural Sciences of Philadelphia from 1929 to 1935, under the leadership of the author, and are deposited in the collection of the Academy.

During the preparation of this report I have received valuable assistance from Dr. Dwight L. Pierce on certain anatomical problems and matters of nomenclature; also from Dr. Witmer Stone and James A. G. Rehn, of the Academy staff. My especial acknowledgments are due to Dr. H. E. Ewing, of the U. S. National Museum for his aid and helpful criticism as the work progressed. He has examined with me most of the new forms and I am gratified to say that in almost all cases his opinions have been similar to my own. My thanks are also due to Gordon B. Thompson, of the British Museum, for information concerning some of Piaget's types, deposited there.

Partial Glossary of Descriptive Terms Employed.

- Acetabular bar:* The thickened, heavily pigmented sclerites on the ventral surface of the thorax to which are attached or articulated the coxal joints.
- Antennal band:* The heavily pigmented bands running from the base of the antennae (base of clypeal bands) diagonally backward towards the mandibles.
- Antennary fossae:* The emarginations on the sides of the head in which are set the antennae.
- Basal plate:* The chitinized plate to which are attached the working parts of the male genital armature.
- Bristle:* A hair which is thickened basally but which is longer and more slender than a spine.
- Chitinized:* Any portion of the exoskeletal portion of the insect. A plate or sclerite may be heavily chitinized, but *not* strongly pigmented.
- Clavicle:* A term proposed by Cummings for an internal brace or strut connecting the dorsal and ventral integument of the thorax.
- Clypeal band:* The heavily pigmented bands along the sides or entirely around the margin of the preantennary area.
- Denticles:* Minute depressions in the integument which cause a rugose appearance (usually on the dorsal surface).
- Endomeres (or Endomerical plates):* The thickened sclerites between and at the base of the parameres which support the penis and accessory parts.

- Genital armature:* The entire chitinized (and usually strongly pigmented) supporting structure of the genital organs.
- Genital plate or blotch:* The ventral sclerite in the female which lies under the genital organs, over the median portion of last two or three abdominal segments.
- Incrassations:* The thickened and heavily pigmented portions of the thoracic and abdominal sclerites commonly known as the "markings" or "band", when they appear internally and form designs, sometimes of very complicated pattern.
- Integument:* The chitinized covering or "skin" of the insect, referring equally to sclerites or their connecting tissue.
- Mesonotum:* The dorsal plate of the mesothorax.
- Mesosternum:* The median ventral plate of the mesothorax.
- Metanotum:* The median dorsal plate of the metathorax or pterothorax.
- Metasternum:* The median ventral plate of the metathorax or pterothorax.
- Occipital bands:* The deeply pigmented bands running forward from each side of the occiput to the sides of mandibles.
- Parameres:* The outer, longer plates of the genital armature which enclose the endomerical plates and serve to open the genital aperture of the female during copulation.
- Pharyngeal sclerite and gland:* Just behind the mandibles.
- Pigmented:* More or less impregnated with coloring matter.
- Pleural plates:* Sclerites along the sides of the abdominal segments, often spoken of by older authors at the "lateral bands". Called by Snodgrass, Paratergal, or lateral tergal plates.
- Postantennary area:* Portion of the head posterior to antennary fossae.
- Preantennary area:* Portion of head in front of antennary fossae.
- Prosternum:* Median ventral sclerite of prothorax.
- Setae:* Used only for short, very fine hairs.
- Spine:* A short stiff hair, thickened basally and pointed at tip.
- Sternal plates:* The median ventral plates of the abdominal segments.
- Sternum:* The whole sternal plate of the thorax, covering all three segments.
- Temples:* The posterior, lateral portions of the head, usually from eye around to sides of the occiput.
- Temporal bands:* The deeply pigmented (or hyaline) bands around the margin of the temples.
- Tergal plates:* The dorsal sclerites of the abdominal segments, lying between the pleural plates.
- Tessellated:* Where the integument of all or a portion of the body resembles fine mosaic, like minute hexagonal tile.
- Trabecular tubercles:* A small, ovoid or pointed, projection at the anterior angle of the antennary fossae, where the trabeculae are found when present.

Relative Distribution of Species and Genera

The Tinamous not only possess the most diversified and bizarre collection of genera and species of the known Mallophaga, but the family, as a whole, will undoubtedly take first rank in the number of species and genera found on a single host species and individual. A glance at the appended Host List will bear out this statement. The occurrence of six to eight

species and genera on a single host species or individual is common, while on three hosts ten species have been recorded, belonging to seven, eight and nine genera respectively, while two host species have a record of twelve species and eleven genera.

Some of the waterfowl (especially the sea birds) have yielded a large number of species, but none approach this record in number of genera.

In spite of the fact that so many genera and species have been taken from a single host individual, I have seen no birds that might truly be said to be heavily infested with lice, each species being represented by comparatively few individuals, especially the larger genera. The only forms as yet noted on the wing quills have been *Pseudolipeurus* and *Strongylocotes*, the latter nowhere else, but the former also taken on the body.

Apparently very few species are normally found on the head and neck, in life, which is due, I suspect, to the character of the plumage on these parts, the feathers being mostly very short and sparse (except on the pileum). Many species will crawl up towards the head after the death of the host, but others are never found there and must be carefully searched for among the body plumage, especially on the chest and breast. The very minute forms, such as *Physconella*, *Megaginus*, and *Discocorpus* are difficult to find and are rarely, if ever, abundant. I have no record of the total number of individuals taken on a single bird, but I doubt if it would ever pass one hundred, and usually very much less than that number.

Concerning Some Previously Unknown Abdominal Glands

During the study of the material incorporated in the present report a most unexpected discovery was made, viz., the presence of certain glands located on the abdominal pleural plates, some on the male only and others on both sexes. There are several very distinct types of these glands, two of which were most commonly found.

The most obvious type, found only on the male, and also one of the most abundant, is situated at the inner, posterior margin of the pleural plate on segment five, and the inner margin of the ventral portion of the plate is always incised to receive it. The gland is globular in shape, with a short tubular outlet at the inner side. Unquestionably the gland lies on the inner side of the body integument, with the tubular outlet reaching through to the surface.

This gland resembles very much in shape and structure "Gilson's Gland", found on the abdomen of Trichoptera larvae. As a rule there are present but one pair of these glands (only on the 5th. segment), but in *Heptarthrogaster parvulus* (Taschenberg) there are two pairs, on the 4th. and 5th. segments, with those on the 4th. segment the smaller. In *Heptarthrogaster minutus* Carriker, the male resembles very much the male of *H. parvulus*, but the female is very different from the female of that species.

It is a pertinent fact that in this species the gland is found only on the 5th. segment, and is of a very different type, being merely a minute rudimentary sac, without visible outlet.

On *Heptapsogaster temporalis* is found the most striking type of gland, a type not as yet found on any other species. There are, moreover, two pairs, situated on the 4th. and 5th. segments, and are without question on the ventral surface of the sclerite, but not subcutaneous. They occupy the inner portion of the pleural plate, but not at its edge, and resemble nothing so much as a flat flower, with a large, raised, granular centre, and with the surrounding petals coalescing into a continuous, flaring border. In *H. temporalis femininus* these glands are very large, covering the whole longitudinal width of the plate, even projecting slightly over into the succeeding anterior sclerite.

There is another type consisting of an oval or crescent shaped disc, which also seems to be on the surface of the ventral integument, but they lack entirely the surrounding "corolla".

In the genera *Megaginus*, *Discocorpus*, *Physconella*, *Tinamicola*, *Kelloggia*, and *Strongylocotes* there seems to be a very different sort of gland located in the pleural plate of the 6th. segment, which is present in both sexes. There is what appears to be a small subcutaneous gland, on top of which is a shallow, circular pit, from the centre of which arises a long, very delicate, flat filament, like a slender blade of grass. The filament is distinctly flat, not round like a hair, and while the pit in which it is set resembles somewhat the pustules of ordinary hairs, there is never present under the hair pustules any subcutaneous gland.

I am not positive that these filamented pustules or pits, with their accompanying subcutaneous sac, are really glands, and I have no idea as to what their function might be, but I am convinced that the other types of gland, located on the 4th. and 5th. segments, whether they be cutaneous or subcutaneous, are true glands, and have a secondary sexual function, which is most probably the secretion of some olfactory substance which attracts the female, and are what are termed by Berles as glands "de seduzione".

Analogous glands are found in many forms of Orthoptera, and other insects, but have never before been recorded from Mallophaga.

List of Species described prior to the present Revision, with their Synonymy and Hosts

Nitzsch, 1866

<i>Goniocotes agonus</i>	= <i>Kelloggia agona</i> (<i>Tinamus tao</i>)
<i>Goniodes oniscus</i>	= <i>Rhopaloceras oniscus</i> ♀ (<i>Tinamus tao</i>)

<i>Goniodes aliceps</i>	= <i>Rhopaloceras oniscus</i> ♂ (<i>Tinamus tao</i>)
" <i>lipogonus</i>	= <i>Strongylocotes lipogonus</i> (<i>Rhynchotus rufescens</i>)
	Giebel, 1866
<i>Menopon brachygaster</i>	(a straggler)
<i>Goniocotes clypeiceps</i>	= <i>Heterogoniodes clypeiceps</i> (<i>Crypturellus cinereus</i>)
" <i>alienus</i>	= <i>Strongylocotes alienus</i> (<i>Crypturus macrourus</i>)
" <i>longipes</i>	= <i>Rhopaloceras oniscus</i> (Nit.) (fide Harrison)
	Rudow, 1870
<i>Nirmus crassiceps</i>	= <i>Strongylocotes lipogonus</i> (Nit.) (<i>Rhynchotus rufescens</i>)
" <i>tinnami</i>	= <i>Strongylocotes tinnami</i> ♀ (<i>Nothura boraquira</i>)
" <i>ansatus</i>	= <i>Strongylocotes tinnami</i> ♂ (<i>Nothura boraquira</i>)
<i>Trinoton biguttatum</i>	= (impossible to identify)
<i>Goniocotes rotundatus</i>	= <i>Tinamicola rotundata</i> (<i>Rhynchotus rufescens</i>)
<i>Goniodes dilatatus</i>	= <i>Heptapsogaster dilatatus</i> (<i>Rhynchotus rufescens</i>)
	Piaget, 1880 and 1885
<i>Menopon arctifasciatum</i>	= <i>Menacanthus arctifasciatus</i> (<i>Rhynchotus rufescens</i>)
<i>Lipeurus longipes</i>	= <i>Pseudolipeurus longipes</i> (<i>Crypturellus obsoletus</i>)
" <i>longisetaceus</i>	= (<i>Columbicola longisetacea</i> , straggler)
" <i>appendiculatus</i>	(straggler from a Megapode)
<i>Goniocotes sexsetosus</i>	= <i>Docophorocotes sexsetosus</i> (<i>Rhynchotus rufescens</i>)
" <i>alatofasciatum</i>	= <i>Tinamicola alatofasciata</i> (<i>Rhynchotus rufescens</i>)
" <i>coxatus</i>	= <i>Tinamicola coxata</i> (<i>Tinamus solitarius</i>)
<i>Goniodes complantus</i>	= <i>Strongylocotes complantus</i> (<i>Crypturellus obsoletus</i>)
" <i>spinosus</i>	= <i>Strongylocotes spinosus</i> (<i>Nothocercus julius</i>)
" <i>setosus</i>	= <i>Strongylocotes lipogonus setosus</i> (<i>Crypturellus variegatus</i>)
" <i>laticeps</i>	= <i>Rhopaloceras laticeps</i> (<i>Nothocercus julius</i>)
" <i>aculeatus</i>	= <i>Trichodopeostus aculeatus</i> (<i>Nothocercus julius?</i>)

<i>Goniodes sexpunctatus</i>	= <i>Rhynchothura sexpunctata</i> (<i>Rhynchotus rufescens</i>)
" <i>subdilatatum</i>	= <i>Heptapsogaster subdilatatus</i> (<i>Crypturellus variegatus</i>)
" <i>excavatus</i>	= <i>Heptagoniodes excavatus</i> (<i>Tinamus canus</i>)
	Taschenberg, 1882
<i>Goniodes parvulus</i>	= <i>Heptarthrogaster parvulus</i> (<i>Tinamus major fuscipennis</i>)
" <i>verrucosus</i>	= <i>Pectenosoma verrucosa</i> (<i>Crypturellus variegatus</i>)
<i>Lepidophorus coniceps</i>	= <i>Hypocryptus coniceps</i> (<i>Crypturellus variegatus</i>)
	Carriker, 1903
<i>Ornicholax robustus</i>	= <i>Ornicholax robustus</i> (<i>Tinamus major castaneiceps</i>)
<i>Kelloggia brevipes</i>	= <i>Kelloggia brevipes</i> (<i>Tinamus major castaneiceps</i>)
<i>Lipeurus longipes tinami</i>	= <i>Pseudolipeurus tinami</i> (<i>Tinamus major castaneiceps</i>)
<i>Goniodes aberrans</i>	= <i>Pterocotes aberrans</i> (<i>Tinamus major castaneiceps</i>)
" <i>minutus</i>	= <i>Heptarthrogaster minutus</i> (<i>Tinamus major castaneiceps</i>)
	Paine, and Paine and Mann, 1913
<i>Physconella kelloggi</i>	= <i>Physconella kelloggi</i>
<i>Goniodes pennaticeps</i>	= <i>Rhopaloceras pennaticeps</i>

To the present time 36 species have been described as parasitic on Tinamous. To this number must be added three species which were recorded erroneously from hosts belonging to other avian families and three species subtracted for the same reason, leaving the same number, 36. Of these 36 species, 4 are synonyms, and 4 more are at present unrecognizable, leaving 28 valid, recognizable species, of which I have specimens of 20 or 21, while for the remainder we have ample descriptions and figures for their proper generic allocation.

Out of these 28 valid species but three may remain in the genera in which they were originally placed, viz.: *Ornicholax robustus* Carriker, *Kelloggia brevipes* Carriker, and *Physconella kelloggi* Paine. However other genera have been erected by later authors for the reception of some of the others, viz.: *Strongylocotes* and *Rhopaloceras* of Taschenberg, *Pterocotes* and *Pectenosoma* of Ewing and *Menacanthus* of Neumann.

Genera and Species described as New in the present Paper
With Their Hosts

Family PHILOPTERIDAE Burmeister

<i>Lipeurus</i> Nitzsch.	
<i>rhynchoti</i> , sp. nov.	(<i>Rhynchotus r. rufescens</i>)
<i>Esthiopterum</i> Harrison	
<i>tataupa</i> , sp. nov.	(<i>Crypturellus t. tataupa</i>)
<i>Cuclotogaster</i> , gen. nov.	
<i>laticorpus</i> , sp. nov.	(<i>Crypturellus s. soui</i>)
<i>Pseudolipeurus</i> , gen. nov.	
<i>taoi</i> , sp. nov.	(<i>Tinamus t. tao</i>)
<i>genitalis</i> , sp. nov.	(<i>Crypturellus u. undulatus</i>)
<i>subsimilis</i> , sp. nov.	(" <i>soui inconspicuus</i>)
<i>grandis</i> , sp. nov.	(<i>Nothocercus n. nigricapillus</i>)
<i>Pseudophilopterus</i> , gen. nov.	
<i>hirsutus hirsutus</i> , sp. nov.	(<i>Crypturellus undulatus yapura</i>)
" <i>obsoletus</i> , subsp. nov.	(" <i>obsoletus punensis</i>)

Family HEPTAPSOGASTRIDAE, familia nova

Subfamily STRONGYLOCOTINAE, subfamilia nova

<i>Nirmocotes</i> gen. nov.	
<i>nirmoides</i> , sp. nov.	(<i>Crypturellus obsoletus punensis</i>)
<i>glabrous</i> , sp. nov.	(" <i>t. tataupa</i>)
<i>cordiceps</i> , sp. nov.	(<i>Tinamus m. major</i>)
<i>orbicularis</i> , sp. nov.	(<i>Crypturellus t. tataupa</i>)
<i>Strongylocotes</i> Taschenberg.	
<i>complantus interruptus</i> ,	(<i>Crypturellus atrocapillus</i>)
subsp. nov.	
" <i>variegatus</i> ,	(" <i>variegatus salvini</i>)
subsp. nov.	
<i>abdominalis</i> , sp. nov.	(<i>Crypturellus cinereus cinerascens</i>)
<i>subconiceps</i> , sp. nov.	(" <i>soui inconspicuus</i>)
<i>subspinosus</i> , sp. nov.	(<i>Nothocercus n. nigrocapillus</i>)
<i>angulocapitis</i> , sp. nov.	(<i>Tinamus s. serratus</i>)

Subfamily PHYSCONELLINAE, subfamilia nova

<i>Physconella</i> Paine.	
<i>kelloggi subsimilis</i> , subsp. nov.	(<i>Crypturellus soui inconspicuus</i>)
<i>hamatus hamatus</i> , sp. nov.	(" <i>obsoletus punensis</i>)
" <i>genitalis</i> , subsp. nov.	(" <i>atrocapillus</i>)
<i>nothocercae</i> , sp. nov.	(<i>Nothocercus n. nigrocapillus</i>)
<i>Megaginus</i> , gen. nov.	
<i>emarginatus</i> , sp. nov.	(<i>Crypturellus obsoletus punensis</i>)
" <i>sordidus</i> , subsp. nov.	(" <i>b. berlepschi</i>)
<i>quadrithorax</i>	(<i>Tinamus major robustus</i>)
<i>Cuclotocephalus</i> , gen. novum	
<i>extraneus</i> , sp. nov.	(<i>Nothoprocta branickii</i>)
<i>secundus</i> , sp. nov.	(" <i>pentlandi</i>)

<i>Nothocotus</i> , gen. nov.	
<i>parvithorax</i> , sp. nov.	(<i>Nothocercus bonaparti</i>)
<i>subsimilis</i> , sp. nov.	(" <i>nigricapillus cadwaladeri</i>)

Subfamily HEPTAPSOGASTRINAE, subfamilia nova

<i>Rhopaloceras</i> Taschenberg.	
<i>laticeps abbreviatus</i> , subsp. nov.	(<i>Nothocercus nigrocapillus cadwaladeri</i>)
<i>genitalis genitalis</i> , sp. nov.	(<i>Tinamus major ruficeps</i>)
" <i>simplex</i> , subsp. nov.	(" " <i>castaneiceps</i>)
<i>brevitemporalis</i> , sp. nov.	(<i>Crypturellus obsoletus punensis</i>)
<i>rudimentarius</i> , sp. nov.	(" <i>soui nigriceps</i>)
<i>Heptapsogaster</i> , gen. nov.	
<i>platycephalus platycephalus</i> ,	
sp. nov.	(<i>Crypturellus soui inconspicuus</i>)
" <i>soui</i> , subsp. nov.	(" <i>soui soui</i>)
<i>temporalis temporalis</i> , sp. nov.	(<i>Crypturellus u. undulatus</i>)
" <i>femininus</i> , sp. nov.	(" <i>cinereus cinerascens</i>)
" <i>chiñirii</i> , subsp. nov.	(" <i>atrocapillus</i>)
<i>mandibularis</i> , sp. nov.	(" <i>t. tataupa</i>)
<i>petersi</i> , sp. nov.	(" " ")
<i>tesselatus tesselatus</i> , sp. nov.	(<i>Nothoprocta curvirostris</i>)
" <i>truncatus</i> , subsp. nov.	(" <i>branickii</i>)
<i>Rhynchothura</i> , gen. nov.	
<i>crenulata</i> , sp. nov.	(<i>Rhynchotus rufescens maculicollis</i>)
<i>lunulata</i> , sp. nov.	(" " " ")
<i>minuta</i> , sp. nov.	(<i>Nothura maculosa nigroguttata</i>)
<i>Heptarthrogaster</i> , gen. nov.	
<i>grandis</i> , sp. nov.	(<i>Tinamus s. serratus</i>)
<i>Trichodopeostus</i> , gen. nov.	
<i>spinosus</i> , sp. nov.	(<i>Nothocercus n. nigrocapillus</i>)
<i>incertus</i> , sp. nov.	(" <i>n. cadwaladeri</i>)
<i>Megapeostus</i> , gen. nov.	
<i>asymmetricus asymmetricus</i> ,	(<i>Crypturellus u. undulatus</i>)
sp. nov.	
" <i>parvigenitalis</i> ,	(" <i>atrocapillus</i>)
subsp. nov.	
<i>Heterogoniodes</i> , gen. nov.	
<i>heterurus</i> , sp. nov.	(" <i>berlepschi</i>)
<i>Discocorpus</i> , gen. nov.	
<i>cephalosus</i> , sp. nov.	(" <i>atrocapillus</i>)
<i>microgenitalis</i> , sp. nov.	(" <i>t. tataupa</i>)
<i>Lamprocorpus</i> , gen. nov.	
<i>hirsutus</i> , sp. nov.	(<i>Nothoprocta branickii</i>)
<i>spinosus</i> , sp. nov.	(" <i>pentlandi</i>)
<i>Heptapsus</i> , gen. nov.	
<i>nothocercae</i> , sp. nov.	(<i>Nothocercus bonaparti</i>)
<i>tergalis</i> , sp. nov.	(" <i>n. nigrocapillus</i>)
<i>Pterocotes</i> Ewing.	
<i>aberrans taoi</i> , subsp. nov.	(<i>Tinamus tao kleci</i>)

- Tinamicola*, gen. nov.
- latithorax*, sp. nov. (*Rhynchotus r. rufescens*)
- Pectenosoma* Ewing.
- verrucosa parva*, subsp. nov. (*Crypturellus t. tataupa*)
- " *angusta*, subsp. nov. (" *atrocapillus*)
- Docophorocotes*, gen. nov.
- sexsetosus* (Piaget) (*Rhynchotus r. rufescens*)

Subfamily ORNICHOLACINAE, subfamilia nova

- Heptagoniodes*, gen. nov.
- mirabilis*, sp. nov. (*Tinamus t. tao*)
- Ornicholax* Carriker.
- robustus taoi*, subsp. nov. (*Tinamus t. tao*)
- Kelloggia* Carriker.
- latithorax*, sp. nov. (*Crypturellus atrocapillus*)
- Austrokelloggia*, gen. nov.
- intermedia*, sp. nov. (*Nothocercus nigrocapillus*)
- Hypocryptus*, gen. nov.
- coniceps heterurus*, subsp. nov. (*Crypturellus cinereus cinerascens*)
- " *inconspicuus*, subsp. nov. (" *soui inconspicuus*)
- " *undulatus*, subsp. nov. (" *u. undulatus*)
- " *nigriceps*, subsp. nov. (" *soui nigriceps*)
- " *obsoletus*, subsp. nov. (" *obsoletus punensis*)
- genitalis*, sp. nov. (" *t. tataupa*)

Key to the Genera of ISCHNOCERA infesting Tinamous.

- A. Abdomen with at least eight segments in both sexes (sometimes nine); the spiracles present in segments 2 to 7 (inclusive); meso- and metathorax always fused into a perfect pterothorax.
 - a. Coxae of 2nd. and 3rd. pair of legs always largely exposed and outside of pterothorax, with trochanter well developed and on anterior side of leg, and with the tibiae turned outward.
 - b. Front of head rounded (not trapezoidal or pointed); antennae dimorphic; clypeal suture entirely absent and clypeal band usually entire; trabeculae minute or absent.
 - c. Abdomen long and slender; pterothorax rectangular, about as long as wide. LIPEURUS Nitzsch.
 - cc. Abdomen broadly oval; pterothorax short and wide, with sides strongly divergent; tergal plates divided medially, and separated by a wide hyaline area. CUCLOTOGASTER, gen. nov.
 - bb. Front of head not rounded; clypeal suture, plate and signature always present.
 - c. Trabeculae strongly developed, longer than 1st. segment of antennae in the female.
 - d. Antennae strongly dimorphic (except in *P. longipes*); abdomen long and slender; front of head trapezoidal; temples not broadly expanded. PSEUDOLIPEURUS, gen. nov.
 - dd. Antennae similar in the sexes; abdomen small; head typical of *Philopterus*, with narrow, emarginate clypeus and broadly expanded temples; legs large and typical of division a. PSEUDOPHILOPTERUS, gen. nov.

- cc. Trabeculae minute or absent; antennae strongly dimorphic; abdomen usually long and slender. . . . ESTHIOPTERUM Harrison.
- B. Abdomen but with seven segments in both sexes (a small tubercle or aborted segment between the 6th. and 7th. in the ♂ of some genera, and in the ♀ of *Nirmocotes*); 1st. segment almost always the longest; spiracle always present in segments 1 to 6.
 - a. Meso- and metathorax separated by a distinct suture, the metathorax either bilobed or entire.
 - b. Metathorax deeply imbedded *within* the first abdominal segment, not overlapping it in the form of an apron (as in *Strongylocotes*).
 - c. Metathorax completely separated into two distinct lobes by a longitudinal suture.
 - d. Antennae strongly dimorphic, and set at extreme front of head; with front of head flatly convex; trabeculae absent; sides of head either deeply emarginate or deeply incised; temples either expanded and truncate posteriorly or else rounded; ♀ with head very differently shaped from ♂. HEPTAGONIODES, gen. nov.
 - dd. Antennae simple and similar in the sexes.
 - e. Trabeculae strongly developed; preantennary area long and rounded, with temples more or less parallel-sided and with the angle rounded; antennae set in middle of head. ORNICHOLAX Carriker.
 - ee. Trabeculae absent; preantennary area short and narrow and flatly rounded in front; temples expanded laterally, with bifurcated sides; antennae set near front of head. KELLOGGIA Carriker.
 - cc. Metathorax entire (not bilobed), but separated from the mesothorax by a distinct suture; trabeculae present; antennae similar in the sexes.
 - d. Head somewhat conical in shape, with rounded front and expanded temples; temples but slightly bifurcated; metathorax much wider than long, somewhat quadrilateral in shape, with the meso-metathoracic suture merely sinuate. HYPOCRYPTUS, gen. nov.
 - dd. Head with front narrower and rounded, sides somewhat constricted at antennae and with temples strongly expanded laterally and posteriorly, and strongly bifurcated on lateral margins; metathorax with the shape of a butterfly with expanded wings, the mesothorax penetrating deeply into the metathorax; well-developed trabeculae. AUSTROKELLOGGIA, gen. nov.
 - bb. Metathorax, while distinct from mesothorax, is in the form of an apron-like flap, overlapping the 1st. abdominal segment, and with the mesothorax angulated medially; antennae similar in the sexes; small, fixed trabeculae present; head and mesothorax of various shapes. STRONGYLOCOTES Taschenberg.
 - aa. Meso- and metathorax more or less completely fused into a single segment, but some genera with this fusion quite complete (with no visible intersegmental suture on the sides), and others with the suture

clearly visible on the sides, at least as far in as the acetabular bars, and often far inside of these bars.

b. Meso- and metathorax completely fused; intersegmental suture completely lost, or with only the faintest indication on each side; antennae always similar in the sexes, and with either small, fixed trabeculae or else a tubercular process at site of trabeculae.

c. Pterothorax with lateral margins and posterior angles entirely exposed, and with strong hairs on each side of the posterior margin (resembling *Degeeriella*); antennae long, but similar in the sexes; front of head more or less rounded, with a continuous clypeal band, and temples but slightly expanded.

NIRMOCOTES, gen. nov.

cc. Pterothorax with posterior portion deeply imbedded within the first abdominal segment with sides convergent and without posterior angles; head of distinct shapes, but all with antennae similar in the sexes.

d. Front of head flat, with a long, strong hook bending backward from each side, with its tip under the 1st. segment of the antennae, in a deep sinus; abdomen nearly round; pterothorax reaching far backward and with its posterior margin more or less fused with the abdominal integument.

PHYSCONELLA Paine.

dd. Front of head not flat, and never with any sort of hook; abdomen oval to round, never long and slender.

e. Head circular, with the short, simple antennae set in the middle of the head; pterothorax narrow, but deeply imbedded and sides converging and short posterior margin nearly straight; abdomen oval.

CUCLOTOCEPHALUS, gen. nov.

ee. Head with front narrowly conical and tip deeply emarginate; temples much expanded laterally and round; pterothorax broad, sides curving and long posterior margin flatly convex; abdomen round.

MEGAGINUS, gen. nov.

bb. Meso- and metathorax fused only medially, the suture always visible on each side, often far inside the acetabular bars; metathorax always narrower than mesothorax, and almost (if not wholly) imbedded within the first abdominal segment.

c. Antennae similar in the sexes.

d. Thorax and abdomen with double rows of round papillae on dorsal surface, deeply colored and very prominent.

PECTENOSOMA Ewing.

dd. Thorax and abdomen without such papillae.

e. Head broadly conical, with front rounded; temples rounded and not reaching backward to the line of the occiput; mesothorax much narrower than temples; mandibles not unusually heavy and abdomen oval.

DOCOPHOROCOTES, gen. nov.

ee. Head much wider than long, with front flattened and slightly emarginate medially, or else transverse; mandibles massive; small trabecular tubercles (not trabe-

culae) present; mesothorax very short and nearly as wide as temples; abdomen round, with intricate markings on the pleural plates. . . . DISCOCORPUS, gen. nov.

eee. Head with front rounded; temples expanded, with rounded tips extending backwards nearly to middle of prothorax; abdomen oval. . . . TINAMICOLA, gen. nov.

cc. Antennae more or less strongly dimorphic, or else with strong combs on posterior margins of ventral surface of pleural plates; head and abdomen of many different shapes and genital armature highly diversified.

d. Temples more or less expanded laterally, but *never* with a long attenuated tip, and not extending backward much beyond the occipital margin; head often of different shape in the sexes.

e. Head somewhat conical in shape, with narrowly rounded front and rounded lateral temporal angles, which are decidedly in front of the occipital margin; and metathorax much narrower than head with the sides of metathorax convergent and posterior margin transverse; size medium. . . . NOTHOCOTUS, gen. nov.

ee. Head not conical; front broadly and flatly rounded; sides of head nearly straight in ♂ (convex in ♀), temples not expanded; meso- and metathorax as wide as head, with posterior margin of metathorax circular from side to side, or with posterior portion flatly convex; size minute to medium; head very differently shaped in sexes. . . . HEPTARTHROGASTER, gen. nov.

dd. Temples much expanded, sometimes long and pointed, or long and truncate, or else with sharp angles; sometimes extending but little beyond the occipital margin, but again reaching to the lateral angles of the prothorax.

e. Ventral surface of abdominal pleural plates 1 to 5 with heavy comb-like processes on the posterior margin, with the number of teeth decreasing from 1st. to 5th.; antennae not strongly dimorphic in all species; temples broad and wing-like. . . . RHOPALOCERAS Taschenberg.

ee. Never with combs on the abdominal pleural plates.

f. Temples long and narrow, either pointed or truncated.

g. Temples sharply truncated, size large, head much wider than abdomen; sides of metathorax exposed, with the area between the lateral margins and the acetabular bars transparent; meso- and metasternum with many long strong hairs, also posterior margin of metathorax; tergal plates with numerous hairs and sternal plates with hairs or short spines. . . . LAMPROCORPUS, gen. nov.

gg. Temples long and narrow, but not truncated, either pointed or rounded at tip.

h. Male genital armature strongly asymmetrical, the parameres either long, narrow, semicircular and parallel, or else very long and heavy, with one much longer than the other.

- i. Parameres slender and semicircular; size medium; 3 or 4 spines on dorsal surface of most of pleural plates.

TRICHODOPEOSTUS, gen. nov.

- ii. Parameres massive, sinuate, with one much longer than the other; size large; never more than one spine on the pleural plates.

MEGAPEOSTUS, gen. nov.

- hh. Male genital armature never asymmetrical.

- i. Size large, much resembling *Megaepostus*, except for genital armature and presence on meso- and metasternum of from 6 to 8 strong hairs; eye prominent and clypeal band without internal projections.

HETEROGONIODES, gen. nov.

- ii. Size medium; meso- and metasternum never with more than four hairs on each, usually but two.

- j. Pleural plates always present and with suture between them and tergal plates always visible; pleural plates with or without darker markings.

- k. Pleural plates always with more or less strongly marked, deeply pigmented markings or incrassations.

HEPTAPSOGASTER, gen. nov.

- kk. Pleural plates never with darker internal markings or incrassations; temples not always elongated posteriorly, but always pointed.

RHYNCHOTHURA, gen. nov.

- jj. Pleural plates entirely absent, the tergal plates extending across the entire width of the abdominal segments and overlapping under the sides; prothorax short and very wide; abdomen rather long and slender.

- k. Sides of head (in ♂) deeply emarginate behind eye; abdomen long and pointed, with pseudopenis as long as parameres, slender, and produced to a needle-like point; ♀ with an elliptical body protruding from the tip of abdomen. PTEROCOTES Ewing.

- kk. Sides of head (in ♂) straight from antennary fossae to tip of temples; abdomen long, but rounded apically (not pointed); parameres short, thick, and almost uncolored, with tips truncated or bifurcated; ♀ with tip of abdomen broadly rounded, without protuberant body. HEPTAPSUS, gen. nov.

Suborder AMBLYCERA Kellogg

MENOPONIDAE Mjöberg

Menacanthus arctifasciatus (Piaget).

Menopon arctifasciatum Piaget, Les Pediculines, Suppl., 1886, p. 112, pl. XII, fig. 4 (*Rhynchotus rufescens*).

I have before me 1 ♂ and 1 ♀ of what is apparently this species. The ♂ was taken from a freshly killed specimen of *Rhynchotus r. rufescens*, collected near Reyes, Dept. Beni, Bolivia, while the ♀ is from *R. rufescens maculicollis*, collected at Sandillani, Dept. La Paz, Bolivia.

The only tangible difference I can detect between my ♀ and Piaget's description and figure is that the temples are a little more rounded. The chaetotaxy seems to be the same and the genital armature of a similar type. The presence of well-developed spinous processes pointing backward from near the mandibular condyles, identifies this species as belonging to the genus *Menacanthus* instead of *Menopon*.

Suborder ISCHNOCERA Kellogg

PHILOPTERIDAE Burmeister

Lipeurus rhynchoti, species novum. Text-plate I, figs. 1, 1a.

Type, ♂ adult, from *Rhynchotus r. rufescens*, collected near Reyes, Dept. Beni, Bolivia, September 28, 1934.

Shape of head very similar to that of *L. caponis* (Linn.), type of the genus, but trabeculae very short and 1st. antennal segment much smaller than in *caponis*.

Description of the species: Head twice as long as wide, with the antennae set in the middle, and the front uniformly circular; sides of head (back of trabeculae) deeply emarginate; eye very prominent and protruding; temples, just back of eye, equal to width of front of head, but converging posteriorly; occipital margin deeply emarginate; trabeculae very short and inconspicuous; 1st. segment of antennae only moderately enlarged; 3rd. segment somewhat semicircular in shape, and its articulation with segment 2 not at the end of that segment, but somewhat laterally; clypeal band entire, completely encircling the front, with outer edge more deeply pigmented than the inner; antennal bands wide, extending to base of mandible and pitch black in color; a smaller, pitchy band encircles the eye (temporal band); occipital bands form two large, oval, pitch-black patches at each side of occipital margin; antennae margined with conspicuous brown bands on all segments.

Prothorax small, somewhat rounded, with all angles rounded and lateral bands and acetabular bars conspicuous. Pterothorax much larger than prothorax, quadrilateral in shape, with front transverse, sides slightly concave and divergent and posterior margin slightly convex; acetabular bars narrow, deeply colored, and projecting beyond posterior margin, to rest on 3rd. pair of coxae; a large, elongated, median, ventral patch of pale brown (the sternal plate).

Abdomen of typical shape, although wider than many species, and narrowest at the suture between the 2nd. and 3rd. segments; widest at 5th. segment; pleural plates narrow, pitchy black in color; tergal plates broad, clear brown, and separated from pleural plates by a hyaline area, and from each other by hyaline sutures; 8th. segment long, tapering posteriorly and tip deeply emarginate, forming two rounded lobes at end.

Chaetotaxy: Clypeal margin with 6 short, marginal hairs on each side; posterior portion of temples with one short spine and one hair. Prothorax apparently without hairs. Pterothorax with one short marginal hair forward of posterior angle and four long, strong, pustulated hairs internally across each side, within the acetabular bars, and which extend backward almost to posterior margin of the 4th. abdominal segment.

Abdomen with a pair of short dorsal hairs in medial portion, near posterior margin of tergal plates on segments 1 to 7; segments 3 and 4 with one hair in lateral angle; No. 5 with two hairs; Nos. 6 and 7 with three hairs, and the 8th. with four hairs on lateral margin in anterior portion and four more at the constricted portion, and numerous short dorsal hairs in latero-median portion.

Genital armature: Whole apparatus short and wide, with basal plate uncolored except for a narrow, heavily pigmented band on each side; parameres well developed, widest in median portion, and not deeply colored, except at base; dorsal endomerteral plates short, with anterior ends pointed and curving sharply outward across the end of basal plate, and lying on top of the basal portion of the well developed pseudopenis, which nearly fills the space between the parameres.

Measurements: ♂	length	width
body	2.58 mm.	
head	.60	.41 mm.
prothorax	.24	.30
pterothorax	.33	.42
abdomen	1.54	.47
antennae	.44	.08 (1st. segment)

Lipeurus appendiculatus var. *major* Piaget.

Les Pediculines, 1880, p. 357 (*Tinamus canus*, = *T. tao*).

Regarding this form Piaget says: "On a *Tinamus canus* in the Leiden Museum, identical with our species (*appendiculatus*) except for dimensions, which are considerably larger." I am convinced that this so-called variety of *appendiculatus* was not taken on any species of *Tinamus*, and that there must have been some error as to their actual host. Piaget says that the specimens of *appendiculatus* were collected on different varieties of *Megapodius* (viz: *bernsteini* and *gilberti*) and it seems logical to suppose that the females which he attributed to *Tinamus canus* (?) came from one of the species of *Megapodius*, from which no males were recorded. It is hardly conceivable that this type of *Lipeurus* is found on any Tinamou, since I have many species of Lipeuroid Mallophaga from many species and several genera of Tinamous, and nothing has been found as yet remotely resembling this type of *Lipeurus*.

The only species of true *Lipeurus* thus far seen by me from any Tinamou, is *L. rhynchoti*, described in this paper from *Rhynchotus rufescens*, and it is of a decidedly different type, having very little in common with *L. appendiculatus* Piaget. Furthermore my new *L. rhynchoti* was described from a single male, and I am not yet fully convinced that *Rhynchotus rufescens* is its true host, although no others have been taken from any other host, or was there any possibility of it having straggled.

Columbicola longisetacea (Piaget).

Lipeurus longisetaceus Piaget, Les Pediculines, Suppl., 1882, p. 57, pl. VI, fig. 4 (*Tinamus solitarius*); Carriker, Univ. Nebr. Stud., Vol. III, No. 2, p. 25 (*Tinamus robustus*, Costa Rica).

After a careful examination of all the evidence relative to the two records above, there seems to be no doubt that *L. longisetaceus* Piaget is a true *Columbicola*, and was a straggler from some species of pigeon. A re-examination of my specimen which was listed as *longisetaceus*, from *Tinamus robustus*, also proves it to be *Columbicola*, but from what species of pigeon it is now impossible to determine with any certainty.

The genus *Columbicola*, parasitic only on pigeons, is easily recognized by the two pairs of fleshy spines on the front of the clypeus, one pair, the longer, pointing forward, and the shorter pair erect.

Genus *ESTHIOPTERUM* Harrison

Genotype, *Lipeurus (h)ebraeus* Nitzsch.

Piaget's excellent description and figure of *L. ebraeus* leave no doubt as to the structure of the antennae and absence of trabeculae. He says: "The head approaches that of *Docophorus* in its conical form; clypeus clear, short, flatly rounded in front (not truncated as per Giebel)", etc. "The angle of the antennal sinus acute; antennae of male well developed and with hairs; the first segment long and thick, with some hairs and a very sharp, blackish appendage; the 2nd. shorter, cylindrical, with four hairs; the 3rd. very short, with a deeply colored, powerful hook-shaped appendage; the last two very slender. Antennae of female about half the size."

Like *Lipeurus* and *Pseudolipeurus*, the genus *Esthiopterum* has the 2nd. and 3rd. pair of legs with the coxae attached at the sides of the pterothorax, the one at the front and the other at the rear of that segment; the trochanter on the anterior side of leg and the tibiae turned outward. It also has the same type of movable acetabular bars; long, pustulated hairs on each side of posterior margin of the pterothorax and long, slender abdomen. The abdominal segments are apparently nine in number, with the six pairs of spiracles in segments 2 to 7.

I have a single female from *Crypturellus tataupa*, which, I believe, must be placed in this genus. It appears to be undescribed, and its diagnosis is given below.

Esthiopterum tataupa, species novum. Text-plate I, fig. 3.

Type, ♀ adult, from *Crypturellus t. tataupa*, collected at Sta. Ana, Rio Coroico, Bolivia, on July 20, 1934.

Description of type: Head narrowly conical, with preantennary area longer than postantennary; front flatly rounded and bordered by a narrow hyaline flap; clypeal plate short and rounded posteriorly and encircled by a narrow hyaline suture, and with the hyaline frontal flap passing around the sides and joining the margin of the head behind this clypeal suture; clypeal bands wide, deeply pigmented and with the inner margin undulating; trabeculae very small and hyaline; antennae of medium length, rather thick, with 2nd. segment the longest and the whole deeply pigmented; eye vestigial, wholly covered by pigment, but with seta; temples evenly rounded and occiput slightly concave; pharyngeal sclerite and gland small.

Prothorax quadrilateral, with front concave, sides convex and parallel and with all angles rounded, a minute hair in the posterior angles.

Pterothorax small, sides slightly undulating and divergent; acetabular bars wide, with the tips sharply curved inward and extending backward even with the median angle of the posterior margin of the pterothorax; five long, pustulated hairs on each side of the posterior margin and a short bristle in the posterior angle; lateral portions of segment deeply pigmented.

Abdomen somewhat expanded and widest at the 5th. segment; pleural plates rather narrow, deeply pigmented, with anterior portion strongly overlapped by the next segment; lateral angles strongly projecting and rounded, without hairs in segments 1 to 3; segment 4 with one hair and 5 to 8 with two hairs; 9th. segment small, with emarginate tip and without setae; the spiracles at the inner edge of the pleural plates in segments 2 to 7; tergal plates nearly covering the whole space between the pleural plates, being only slightly broken medially in the anterior portion on segments 2 to 6.

Legs short and stout; 1st. femur much thicker than tibia, 2nd. less thickened and 3rd. but little thicker and longer than tibia; all segments deeply pigmented and with darker marginal bands, especially on 2nd. and 3rd. pairs of femora and tibiae; tarsi well developed, claws short, thick and curving.

Measurements: ♀	length	width
body	2.01 mm.	
head	.52	.37 mm.
prothorax	.19	.27
pterothorax	.24	.35
abdomen	1.25	.47
antennae	.26	
3rd. femur	.26	.08

Known only from the type, a female. Without the male it is not possible to be quite certain of the generic position of this species, but I feel sure that it belongs here. Although but one specimen was taken, it was collected under circumstances which almost entirely preclude any possibility of straggling.

CUCLOTOGASTER, genus novum

Genotype, *Cuclotogaster laticorpus*, sp. nov.

This is rather a remarkable genus in its wide divergence from the genus to which it is nearest related, viz., *Lipeurus*. Unfortunately the male of the genotype is still unknown, and without that sex the proper characterization of the genus is impossible, although there is no question as to its relationships. The type of legs and presence of apparently movable acetabular bars on the pterothorax, taken in connection with the shape and structure of the head leave no doubt but that it is closely related to *Lipeurus*, but the shape of the thorax and abdomen make its allocation in that genus impossible.

Diagnosis: Size large, head small, thorax much shortened and widened and abdomen large and broadly oval in shape. Front of head rounded, without trace of clypeal suture, plate or signature; trabeculae minute, hyaline; eye prominent with an unusually long, strong hair; mandibles rather slender and delicately constructed; temples but little expanded. Prothorax small, sides divergent; pterothorax very much shortened, with sides broadly divergent and posterior margin not angulated and with several strong hairs on each side.

Abdomen very large, broadly oval, with nine segments and spiracles present in segments 2 to 7; lateral angles sharp and projecting; pleural plates very narrow and tergal plates wide, separated medially by a large hyaline area.

Legs very short and thick, with large coxae and trochanters on the 2nd. and 3rd. pairs, which are articulated as in *Lipeurus*.

Cuclotogaster laticorpus, species novum. Text-plate I, fig. 2.

Type, ♀ adult, from *Crypturellus soui soui*, collected near El Callao, Venezuela, May 19, 1910.

Description of type: Head longer than wide; preantennary margin elliptical; antennary sinus very shallow; very small, triangular, uncolored trabeculae; antennae of medium length and thickness, second segment the longest, the 3rd. and 4th. subequal and shortest; eye prominent, clear, and with an unusually long hair; head widest just behind the eye, with temples flatly convex and convergent, with the posterior angles rounded; occiput emarginate and straight; whole margin of head (except occiput) surrounded by a narrow marginal band, pitchy black from trabeculae to occiput, paling along the sides of clypeus, and palest and widest across the front; mandibles rather large, but slender and delicately constructed; a dark, narrow band extends inward from before eye, then curves backward almost to the anterior angle of the prothorax; a small occipital signature and pharyngeal sclerite well developed; a few short hairs on dorso-frontal area, a short hair behind eye, and two long, pustulated hairs on temples.

Prothorax small, wider than long, sides convex and divergent; 1st. pair of coxae small, with acetabular bars well within prothorax (instead of on posterior margin); prothoracic spiracles prominent; a long, pustulated hair on dorsal surface, beside the spiracles.

Pterothorax wider than head, but very short, scarcely longer than prothorax; anterior angles nearly square, with sides straight to root of acetabular bars, then flaring out abruptly in a curve to the posterior angle; posterior margin but slightly convex; with two pairs of pustulated hairs on each side, within the acetabular bars, which are strongly curved and extend well beyond the posterior margin of the segment, with the tips resting on the 3rd. pair of coxae.

Abdomen very large, oval, and twice the width of the pterothorax, with lateral angles of segments strongly projecting; pleural plates very narrow and closely fused with tergal plates, which have the inner margins straight and sharply delineated, and with a wide hyaline area between them; interior of abdomen clear, with sutures almost invisible; a short, wide, brown blotch along posterior margin of sternal plates; 8th. segment short, rather wide, and 9th. small and short, with indented tip; lateral angles of segments 3 to 5 with one hair; 6th. with two hairs; 7th. with four, and 8th. with two long and two short hairs on each side; 9th. segment without hairs; tergal plates on segments 1 and 2 with seven short, pustulated hairs across inner, posterior portion; 3 to 5 with four such hairs, and 6 and 7 with three hairs; one long hair on posterior margin of tergal plate, back of spiracle, on segments 2 to 6. On the ventral surface of segments 1 to 7 are series of short hairs across the median portion.

Legs short and stout, femora and tibiae about equal in length; claws short and thick.

Measurements: ♀	length	width
body	2.74 mm.	
head	.64	.56 mm.
prothorax	.22	.40
pterothorax	.24	.61
abdomen	1.80	1.30
antennae	.30	
3rd. femur	.29	
" tibia	.24	

Another female, identical with the type, was taken on *Crypturellis soui modestus*, collected on the Rio Sicsola, Costa Rica, March 23, 1904.

PSEUDOLIPEURUS, genus novum

Genotype, *Lipeurus tinami* Carriker.

Similar to the genus *Esthiopterum* of Harrison in the general appearance and structure of the head, but differing radically from that genus in the presence of long, fixed trabeculae and in the absence of any sort of hook or appendage on the first segment of the antennae in the male. The preantennary area of the head somewhat trapezoidal in shape, with clypeal suture strongly marked and clypeal plate and signature always present, and with the frontal margin of the head with a narrow hyaline border. Eye prominent, hyaline, and with hair; pharyngeal sclerite present. Antennae usually (but not always) strongly dimorphic, with the first segment in the male swollen and elongated and the third with lateral hook more or

less strongly developed, but never to the extent usually found in *Esthiopterum* or *Lipeurus*, and with the 4th. segment attached at the end of 3rd. (never on the outside, in the middle of the segment); 4th. and 5th. segments strongly developed, longer than 3rd. Prothorax and pterothorax more or less quadrilateral and quadrangular, the latter with sides never strongly divergent and with usually four strong pustulated hairs on each side of the posterior margin; prothorax with spiracles present near posterior angles. Acetabular bars of pterothorax lie nearly parallel with sides of that segment, and like *Esthiopterum* and *Lipeurus*, are not fixed, but are articulated at the anterior end and slightly movable, with the posterior end projecting beyond the margin of the pterothorax and resting on or attached to the coxae of the 3rd. pair of legs. (This type of acetabular bar seems to be universal in the old genus *Lipeurus* and all genera since split off from it, while the fact that it is not fixed but slightly movable, seems to have been overlooked completely.)¹

Abdomen with eight segments in both sexes (*Lipeurus* and *Esthiopterum* seem to have nine segments as a rule), long and slender, but wider in female than in male; spiracles present in segments 2 to 7.

The point of attachment and articulation of the 2nd. and 3rd. pairs of legs in this genus, as well as *Esthiopterum* and *Lipeurus*, are unusual. More than half of the coxal joint projects beyond the margin of the pterothorax and abdomen, and they are not attached to the sternum, but outside of it. The trochanter is well developed and lies on the *anterior* side of the leg, while the tibiae turn *outward* from the femur, not inward as is usually the case. The 2nd. and 3rd. pair of legs are very long, at least twice the length of the 1st. pair. The genital armature is variable in size, the degree of specialization being in direct ratio to the amount of dimorphism in the antennae. The basal plate is short, wider than the parameres, which are strongly thickened, at least basally, sometimes nearly straight and again incurved at the tips; the endomerale plate is very strongly developed and of complicated structure; penis apparently absent or vestigial.

Has been recorded thus far only from the avian genera *Tinamus*, *Crypturellus*, and *Nothocercus*, all woodland or forest inhabiting forms.

Pseudolipeurus tinami Carriker. Text-plate II, figs. 2, 2a.

Lipeurus longipes tinami Carriker, Uni. Nebr. Studies, Vol. III, No. 2, p. 24, 1903, pl. III, fig. 3 (*Tinamus robustus*; error, should be *Tinamus major castaneiceps*, M. A. C., Jr.; Pozo Azul, Costa Rica).

Esthiopterum tinami, Harrison, Gen. and Species of Mall., 1916, p. 143.

In the original description of this species it was distinguished from *P. longipes* Piaget chiefly by the size and shape of the head. In addition to these characters, however, the antennae in the two species are very different. In *P. tinami* they are strongly dimorphic in the sexes, while in *longipes* they are very similar in the sexes, the only difference being a slightly longer

¹ See figure 1a on Text-plate III, illustrating fully the thoracic structure of this genus.

1st. segment in the male, while in *tinami* the 1st. segment is not only longer and thicker, but the 3rd. has a decided distal hook (entirely absent in *longipes*). The genital armature is also different in the two species, as may be seen from the figures given. The clypeal signature is also of distinct shape, and the head is very similar in shape in the two sexes, while in *longipes* the head of the male is much narrower through the temples than that of the female, which is much as in both sexes of *tinami*.

Measurements:	♂		♀	
	length	width	length	width
body	1.68 mm.		1.82 mm.	
head	.45	.37 mm.	.48	.39 mm.
prothorax	.18	.27	.18	.27
pterothorax	.25	.37	.24	.38
abdomen	.98	.34	1.11	.32
antennae	.37		.35	
3rd. femur	.42	.11		
basal plate	.16	.10		
parameres	.12	.09		

Pseudolipeurus taoi, species novum. Text-plate III, fig. 3.

Types, ♂ and ♀ adult, from *Tinamus tao tao*, collected at La Cumbre de Valencia, Venezuela, Sept. 24, 1910.

Diagnosis: Most nearly related to *P. tinami*, in shape and proportions of head, antennae, trabeculae and type of genital armature, but differs from that species as follows:

Size smaller, in almost all proportions, except the 3rd. femur and the head, which has the whole preantennary area shorter, but of almost the same width; prothorax and pterothorax very much smaller, being especially narrower; the abdomen is slightly shorter, but very much narrower, and both pterothorax and abdomen are much narrower than the head (in *P. tinami* the pterothorax equals the head in width, with the abdomen slightly narrower (.34 against .37 mm.); the pterothorax has the anterior angles sharp and quite square, while the sides are quite parallel (not divergent), and the acetabular bars are but half the width of those in *tinami*. Both species have the abdomen the widest at the 4th. segment, and in *tinami* it narrows gradually to the 8th.; each segment with parallel sides and abruptly narrower than the preceding one, while in *taoi* the abdomen tapers much more rapidly towards the tip, and each segment is wider at anterior edge than the posterior, so that the break in width at the suture is much less noticeable; the 3rd. femur is almost the same size as in *tinami* (.40 by .11 against .42 by .11 mm.). The genital armature resembles that of *tinami*, but the parameres are more slender, the basal plate longer and narrower, and the endomeral plate of decidedly different shape (see fig.).

Measurements:	♂		♀	
	length	width	length	width
body	1.57 mm.		1.66 mm.	
head	.42	.34	.43	.35 mm.

Measurements (cont.)

prothorax	.14	.21	.11	.22
pterothorax	.21	.28	.23	.31
abdomen	.92	.26	1.00	.34
antennae	.32		.29	
3rd. femur	.40	.11		
basal plate	.16	.08		
parameres	.16	.09		

2 ♂♂ and 1 ♀ (including the types) were taken from the same host, while a second ♀ was taken from *T. tao kleei*, at La Pampa, Dept. Puno, Peru, July, 1931.

Pseudolipeurus genitilis, species novum. Text-plate II, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Crypturellus u. undulatus*, collected at Rurenabaque, Rio Beni, Bolivia, September 11, 1934. ♂ Para. Cyp. U.S.N.M.

Diagnosis: Nearest to *P. tinami* in general appearance, but differs from it as follows: Size considerably larger, with longer and thicker 1st. segment of antennae and longer, heavier trabeculae; head narrower across the temples; prothorax decidedly concave on the lateral margins; pterothorax longer in proportion to the width; last abdominal segment of both sexes of decidedly different shape, markings and chaetotaxy; genital armature very different, being twice the length and of decidedly different shape. The parameres are thicker and nearly straight along the inner margin (not converging), while their attachment to the basal plate is different; the endomeral plate is also of distinct shape (see figures).

The male may be distinguished at once from all other species of the genus by the genital armature, but is closest to *P. subsimilis* in that respect, while the female differs from all others of the genus in the shape of the last abdominal segment, which ends in a small, rounded tip (not emarginate), which may possibly be a remnant of the ninth segment.

Measurements:	♂		♀	
	length	width	length	width
body	1.98 mm.		2.11 mm.	
head	.46	.33 mm.	.48	.36 mm.
prothorax	.17	.22	.175	.235
pterothorax	.26	.33	.30	.34
abdomen	1.18	.34	1.32	.46
antennae	.38		.30	

Pseudolipeurus subsimilis, species novum. Text-plate II, figs. 3, 3a, 3b.

Type, ♂ adult, from *Crypturellus soui inconspicuus*, collected at Chiñiri, Rio Kaka, Bolivia, September 3, 1934. The ♀ holotype is from the same host, taken at Shapaja, Rio Huallaga, Peru, collected November, 1933.

Diagnosis: Nearest to *P. genitilis* in general appearance and genital armature, but differs from that species as follows:

The head is more conical in shape, with wider, shorter and more expanded temples; the clypeal signature is decidedly different in shape, having the posterior margin flatly rounded (instead of drawn out into a long point

which reaches back to the mandibles); the hyaline frontal margin of the clypeus seems to be in the form of two lateral lobes, instead of a strip across the front; the trabeculae are shorter, more as in *tinami*; the last abdominal segment is also of very different shape and chaetotaxy in both sexes (see figures). The genital armature resembles closely that of *genitalis* in the shape and size of the basal plate and the parameres, but the endomerical plate is of a much more complex construction. The genital plate in the female is distinct and is bordered along the posterior margin by a row of short, thick spines, in addition to the fringe of short, fine setae, also present in *genitalis*.

Measurements:	♂		♀	
	length	width	length	width
body	1.80 mm.		1.96 mm.	
head	.22	.32 mm.	.42	.36
prothorax	.16	.21	.14	.24
pterothorax	.28	.31	.26	.38
abdomen	1.10	.34	1.27	.46
antennae	.34		.30	
basal plate	.26	.18		
parameres	.21	.12		

Pseudolipeurus longipes (Piaget). Text-plate III, figs. 2, 2a, 2b.

Lipeurus longipes Piaget, Les Pediculines, 1880, p. 329, pl. XXVIII, f. 3 (*Tinamus*)

Crypturellus obsoletus.

Esthiopterum longipes, Harrison, Gen. and Species of Mall., 1916, p. 137.

The type of the species very likely was secured from a Brazilian specimen of *Crypturellus obsoletus*, which would be the nominate form, and not the race of *obsoletus* from which my specimens were secured. There would undoubtedly be some small differences between my specimens and Piaget's type, but as near as I can determine from the description and figure, these differences are insignificant.

I have the following material, all taken on freshly killed specimens of *Crypturellus obsoletus punensis*, which I have referred to this species: 1 ♂ and 1 ♀ from La Oroya, Dept. Puno, Peru; 1 ♂ from Calabatea, Rio Coroico, Bolivia; and 1 ♂ and 1 ♀ from Sandillani, Dept. La Paz, Bolivia.

The species is easily distinguished from all others of the genus by the character of the antennae, which are scarcely different in the sexes, the first segment in the male being slightly longer than in the female, but no thicker, while the lateral hook at the end of the third segment is entirely absent. The genital armature is also decidedly different (see fig.).

The temples are narrow, the front of head rather wide, with the sides of the preantennary area convex; the sides of the prothorax and pterothorax are straight, not divergent; the 3rd pair of legs are very long.

The female differs from the male in shape of head and body more than any other species of the genus. The head has the temples much expanded.

very much as the female of *subsimilis*, while the prothorax, pterothorax and abdomen are very much wider than in the male.

Measurements:	♂		♀	
	length	width	length	width
body	1.80 mm.		1.86 mm.	
head	.43	.31 mm.	.49	.39 mm.
prothorax	.16	.20	.18	.25
pterothorax	.26	.28	.26	.38
abdomen	1.08	.28	1.14	.45
antennae	.31		.32	
basal plate	.18	.09		
parameres	.18	.10		
3rd. femur	.38	.09	.40	.10

Pseudolipeurus grandis, species novum. Text-plate III, figs. 1, 1a.

Type, ♀ adult, from *Nothocercus n. nigrocapillus*, collected at Sandillani, Dept. La Paz, Bolivia, November 23, 1934.

Diagnosis: Similar to the female of *P. longipes* in the shape of the clypeal plate, head markings, shape of trabeculae and general chaetotaxy, but differs chiefly in the much greater size, shorter femora on 3rd. pair of legs and in the differently shaped genital plate and its chaetotaxy. The genital plate covers the whole of the penultimate segment and half of the last, is sharply outlined along the sides, with the posterior margin circular and the sides deeply concave. Around the posterior margin is a double row of short spines and a line of fine setae in the median portion. The tip of the last segment is emarginate. There are also narrow lateral bands on the last segment, with two dark spots at the tip, both absent in *longipes*.

Measurements:	♀	
	length	width
body	2.70 mm.	
head	.58	.46 mm.
prothorax	.22	.29
pterothorax	.38	.46
abdomen	1.64	.54
antennae	.38	
3rd. femur	.52	.12

The male of this species is unknown, and while the female is close to that of *longipes* (except in size), the fact that it is parasitic on a different genus of Tinamou, leads me to make it a distinct species. I am confident that when the male is discovered, that it will prove to have strongly distinguishing characters, especially the genital armature.

PSEUDOPHILOPTERUS, genus novum

Genotype, *Pseudophilopterus hirsutus hirsutus*, sp. nov.

This genus contains a most remarkable combination of generic characters, having the head typically that of *Philopterus*, or nearly so; with

the 2nd. and 3rd. pairs of legs having exactly the type of articulation and style of coxae as in *Lipeurus*, *Esthiopterum*, and *Pseudolipeurus*, viz.: the coxae are not attached to the sternum, but far away from it, the 2nd. pair at the sides of the anterior edge of the pterothorax and the 3rd. pair at the sides of the posterior margin, and with both pairs extending considerably beyond the margin of the body; the trochanter is large, placed on the anterior side of the leg and the tibiae turn outward. Both prothorax and pterothorax are much wider than long, the latter no longer than the former, but much wider, and with a series of very long, pustulated hairs on each side of the posterior margin. Abdomen small in both sexes, scarcely longer in the female than the combined head and thorax. Pleural plates sharply outlined, with internal longitudinal bands; tergal plates broken medially and heavily pigmented; abdomen of eight segments, the spiracles present in segments 2 to 7; prothorax also with a pair of spiracles.

Trabeculae strongly developed, but apparently not movable; antennae similar in the sexes; eyes prominent, with a hair; pharyngeal sclerite and gland large. Genital armature rather large, basal plate longer than parameres, which are thickened and sharply bent apically; endomeral plate well developed, but penis apparently absent.

Represented by two subspecies, taken from two species of the avian genus *Crypturellus*.

Pseudophilopterus hirsutus hirsutus, species novum. Text-plate IV, figs. 1, 1a.

Types, ♂ and ♀ adult, from *Crypturellus undulatus yapura*, collected at Shapaja, Rio Huallaga, Peru, November 18, 1933.

Description of type: Head very large and deeply pigmented, with temples broad and rounded; preantennary area sharply conical, with front of clypeus narrow and emarginate; trabeculae small and slender; antennae large and thick, similar in the sexes, and deeply pigmented, with darker margins; eye rather large, protruding, with a strong hair; mandibles massive; pharyngeal sclerite and gland well developed; clypeal bands rather broad, deeply colored, broken at the suture, and not reaching to the tip of clypeus; internal bands, within clypeal bands, curving in a flat arc backward from the tip of clypeus to near base of clypeal bands; clypeal signature (or plate) large, the pointed tip reaching to the mandibles; antennal bands running diagonally backward from base of clypeal bands and reaching occiput at sides of prothorax; occipital signature (or gular plate) small; six short hairs on each side of clypeus and two long and one short hair set in median portion of clypeal band; two longish hairs on temples.

Prothorax rather short, but wider than occiput, and extending well beneath the head; sides convex, slightly divergent, without angles and with one longish hair in posterior portion; lateral bands and acetabular bars deeply pigmented. Pterothorax wider than prothorax, but shorter, with rounded, divergent sides, slightly constricted in anterior portion; posterior margin nearly straight (slightly produced medially), and with six extremely long, thick, pustulated hairs on each side, which reach back to end of 6th.

abdominal segment; posterior angle with one long hair; coxae of 2nd. and 3rd. pairs of legs largely outside of pterothorax, the latter completely outside as in *Pseudolipeurus*.

Abdomen very small, elongated, with sides slightly swollen at the 4th. to 6th. segments, and tip broadly rounded; segments short, subequal in length, except the 8th., which is longest; pleural plates of medium width, strongly chitinized and deeply pigmented, and with well marked spiracles near outer edge in segments two to seven; tergal plates rather deeply pigmented, broken medially, with the colored sternites showing through between them; a clear space along the sutures; a large sternal plate covering the median portion of segments six and seven; one long, strong hair in lateral angles of segments 3 to 6 (inclusive); several shorter hairs on 7th. segment, but 8th. with hairs few and short; posterior margins of pleural plates on segments 4 to 7 with two to four hairs on dorsal surface; eight to ten hairs across middle of tergal plates 2 to 4, lesser number on 5th. and 6th.

Legs deeply colored, long and stout, especially 2nd. and 3rd. pairs, which have the tibiae longer than the femora but of equal thickness; a few slender hairs on femora and tibiae; tarsi large, but claws very short and stout; trochanter strongly developed in 2nd. and 3rd. pair and placed on the outer (anterior) side of leg, and with the tibiae turned outward, as in *Pseudolipeurus*; coxae of 2nd. pair of legs partly, and of 3rd. pair wholly outside of body, while those of 1st. pair lie in the normal position, under the prothorax.

Genital armature in male large, extending from tip of abdomen back to anterior margin of 5th. abdominal segment. Basal plate as wide as parameres, with sides convex and heavily chitinized along the border; parameres long and thick at base, tapering towards tips which are sharply bent inward; endomeral plates half as long as parameres, the upper pair rather slender and lying alongside of the wide ventral plate, which fills the broad space between the parameres.

Female very similar to the male, except the abdomen larger, but the apical segment of the same shape; head and thorax almost the same size; markings and chaetotaxy similar.

Known only from the two types.

Measurements:	♂		♀	
	length	width	length	width
body	1.25 mm.		1.38 mm.	
head	.46	.44 mm.	.46	.47 mm.
prothorax	.13	.24	.15	.25
pterothorax	.11	.30	.12	.29
abdomen	.64	.35	.88	.41
antennae	.23		.24	

Pseudophilopterus hirsutus obsoletus, subsp. novum. Text-plate IV, figs. 2, 2a.

Types, ♂ and ♀ adult, from *Crypturellus obsoletus punensis*, collected at Calabatea, Dept. La Paz, Bolivia, November 15, 1934.

Diagnosis: Similar to *P. h. hirsutus* in general appearance, but slightly larger, less deeply pigmented, with narrower and more flattened temples, much larger trabeculae, and heavier antennae; narrower and longer pro-

thorax and narrower pterothorax, and with only four (instead of six) long hairs on each side of posterior margin; clypeal signature and frontal emargination slightly different. Except for the long hairs on the pterothorax, the chaetotaxy is similar to that of *hirsutus*, only the hairs on the preantennary area are all much longer. The 1st. and 3rd. pair of legs have the femora and tibiae of equal length, but the 2nd. pair has the tibiae longer than the femora.

The genital armature is similar in pattern, but considerably smaller, with much shorter parameres, and with the endomeres proportionately longer. One ♂ and two ♀♀ (including the types) taken on the same host.

Measurements:

	♂		♀	
	length	width	length	width
body	1.30 mm.		1.56 mm.	
head	.46	.44 mm.	.46	.47
prothorax	.13	.24	.15	.25
pterothorax	.11	.30	.12	.29
abdomen	.64	.35	.88	.41
antennae	.23		.24	

HEPTAPSOGASTRIDAE, familia nova

Distinguished from all other families of the Order by having the number of segments in the abdomen reduced to seven in both sexes, through the complete loss of the first segment, or the complete fusion of the 1st. and 2nd. segments, and with the first pair of abdominal spiracles present in the 1st. segment (normally the 2nd. in other families).

In some cases two pairs of tergal plates have remained within the long first segment (genus *Nirmocotes*), but in most cases there has remained but one pair. In many instances a small fragment of the old 1st. pleural plate remains under the anterior portion of the present 1st. plate.

Antennae may be either similar in the sexes or highly dimorphic; the head and body of widely differing shapes and proportions. The mesothorax is sometimes completely separated from the metathorax by a distinct suture; sometimes it is fused medially, and again the two segments may be completely fused into a perfect pterothorax, but in nearly all genera the metathorax or the posterior portion of the pterothorax is deeply imbedded within the long first abdominal segment.

This family is subdivided into four subfamilies, based on the thoracic structure entirely. It may be necessary to further subdivide the family, since it contains an extremely heterogenous group of genera.

Subfamily HEPTAPSOGASTRINAE, subfamilia nova

This section of the family is based on the genus *Heptapsogaster* (from which the family takes its name), and will contain those species described under *Goniodes* which have not been allocated to other genera, as well as many new species.

The subfamily is based on the meso-metathoracic structure, which consists in the partial fusion of those two thoracic segments. In this group the metathorax is always narrower than the mesothorax and the two segments are divided by a distinct suture in the lateral portion only, the whole of the median portion of the two segments being completely fused and the suture entirely lost. The lateral suture usually ends at the acetabular bar, but sometimes extends inside that bar for a short distance, and when this takes place there is usually a strong dorsal hair at the end of the suture. The antennae may be either similar in the sexes or dimorphic, the head is of many shapes, as well as the thorax and abdomen, but all the genera have the same type of meso-metathoracic structure.

ORNICHOLACINAE, subfamilia nova

Based on the genus *Ornicholax* of Carriker, and contains those genera which have the meso- and metathorax completely separated by a more or less transverse suture. This group of genera contains two distinct types of structure. In *Ornicholax*, *Kelloggia*, *Heptagoniodes* the metathorax is not only separated from the mesothorax by a distinct suture, but is divided into two distinct, lateral lobes by a median, longitudinal suture.

The other group contains *Hypocryptus* and *Austrokelloggia*, which also have the metathorax separated, but with that segment entire, not bilobed.

This subfamily also contains genera widely differing in other characters, such as antennal dimorphism, shape of head, presence or absence of trabeculae, etc.

PHYSCONELLINAE, subfamilia nova

Based on the genus *Physconella* of Paine, and contains in addition the genera *Megaginus*, *Cuclotocephalus*, and *Nothocotus* (the last not quite typical, since there is a trace of the lateral suture between meso- and metathorax). The genera of this subfamily have the meso- and metathorax completely fused into a pterothorax, but which has the posterior portion much expanded, rounded and deeply imbedded within the 1st. abdominal segment, in *Physconella* the median portion of the posterior margin of the pterothorax even being fused with the 1st. abdominal segment.

STRONGYLOCOTINAE, subfamilia nova

Based on the genus *Strongylocotes* of Taschenberg, which has the meso- and metathorax also completely fused into a perfect pterothorax, even more completely fused than in the *Physconellinae*, and of the type of *Lipeurus*, *Esthiopterum*, *Degeeriella* and *Pseudolipeurus*, but differing from all other genera of the family in having the metathorax more or less angulated posteriorly and not at all imbedded within the 1st. abdominal segment. In addition there is another striking difference in the genus *Strongylocotes*, which has an apron-like appendage to the pterothorax which overlaps the 1st. abdominal segment. It is usually very thin and sometimes difficult to distinguish.

I have placed the genus *Nirmocotes* in this subfamily also, but it lacks completely this metathoracic apron, but in every other generic character is exactly like *Strongylocotes*.

The divisions as above outlined are tentative efforts to bring some kind of order out of the chaos in which I have found the Mallophaga of the Tinamous, and doubtless further work upon them will make many points clear which are now obscure and permit a more intelligent subdivision of the genera, based on other relationships as well as thoracic structure.

Subfamily STRONGYLOCOTINAE

NIRMOCOTES, genus novum

Genotype, *Nirmocotes orbicularis*, species novum.

Closely related to the *lipogonus* section of the genus *Strongylocotes*, with which it agrees in most generic characters, and it seems to form a connecting link between that genus and true *Degeeriella* (the circumfasciate forms).

Front more or less rounded, without clypeal signature or signatural plate, and with clypeal band more or less continuous around the frontal margin. Small, pointed (apparently) movable trabeculae; antennae similar in the sexes, long and slender, with 2nd. segment the longest and 4th. the shortest; mandibles large, but delicately constructed. Eye absent, but seta present. Pharyngeal sclerite and gland present. Temples more or less rounded and but slightly expanded.

Prothorax large, nearly as wide as long and more or less quadrilateral in shape, but anterior angles not always present. Acetabular bars placed far forward in the segment and transverse (not diagonal), and with the 2nd. pair of coxae located directly under the suture between the prothorax and pterothorax (not under front of pterothorax as is usually the case); prothoracic spiracles prominent. Abdomen elongate oval, with pleural plates well developed, but poorly pigmented and without darker internal markings of any kind or incassations; 1st. segment very long and containing two pairs of tergal(?) sclerites (may possibly be sternal), the first pair occupying the position (more or less) of the metathoracic apron in *Strongylocotes*, and with the first pair of spiracles located between the second pair of tergal plates and the pleural plate, with the remaining spiracles in segments 2 to 6 occupying the same position. Between the 6th. and 7th. (apical) segments, in both sexes, is a tubercular body, long and slender in the ♀ and expanded in the ♂. It is apparently free from both adjoining segments, and curves around the 7th. segment in the ♀, but not meeting behind it. Chaetotaxy of whole body very similar to that of *Strongylocotes*. Legs rather long and stout, tibiae thickened and nearly as long as the femora; trochanter unusually well developed on all three pairs of legs. Male genital armature small and apparently simple and rudimentary. (Impossible to see it clearly in the only available male.)

Although I have four species which must be allocated to this genus, all the known specimens but one are females, with perhaps the exception of the single specimen (type) of *N. cordiceps*, which is, unfortunately, very

immature. The head and thorax seem to be well chitinized and fairly well pigmented, but the abdomen is very much undeveloped, so much so that the sutures are invisible, as well as any outline of pleural or tergal plates. However it has the tip of the abdomen of different shape from the other three species, with the tubercular bodies between the 6th. and 7th. segments absent, and replaced by a complete segment, while the last segment is small and with a double tip, which character is more in keeping with females than with males.

It seems that the parent stock of this genus originally possessed nine segments in the abdomen. The pleural plates of the first two have become completely fused into a single long segment, while the tergal plates have remained separate. The original 8th. segment has become aborted, there only remaining two isolated lobes, while the original 9th. segment is here designated as the 7th., and the aborted 8th. as a tubercular body lying between the 6th. and 7th. In all the species of the genus may be seen a large fragment of the old 1st. pleural plate, lying under the anterior portion of the present long plate, which leaves no doubt of what has taken place.

Nirmocotes orbicularis, species novum. Text-plate V, figs. 1, 1a.

Types, ♂ and ♀ adult, from *Crypturellus tataupa*, collected at Marajo, Brazil (Coll. U. S. Nat. Mus.). *U.S.N.M.*

This species resembles very much the type of *Strongylocotes lipogonus*, except for the absence of the metathoracic apron and the position of the acetabular bars in the prothorax and situation of the 2nd. pair of coxae.

Preantennary area rather long, considerably narrower than the temples, with sides and front flatly convex. The trabeculae articulated well within the margin of the head (a characteristic of the genus); side of head expanded behind the shallow antennary fossae, but not greatly divergent behind eye. Temples rounded, with barely an indication of an angle, on which is set a longish hair. Posterior margin of head slightly sinuate. Whole head rather deeply and uniformly pigmented. A short seta at position where eye should be (if present) and a short spine on posterior margin of temples. Prothorax wider than long, quadrangular, with frontal margin somewhat conical and extending considerably under occiput. Sides concave, not divergent, and the four angles rather sharp, the posterior pair with a slender spine. Pterothorax longer than prothorax, with sides nearly straight and strongly divergent. Posterior angles rounded, set with four submarginal, long hairs. Posterior margin rather sharply angulated over abdomen and with sides concave. Pterothorax considerably wider than 1st. abdominal segment. Acetabular bars rather heavy, longitudinal, and extending far back under the first pair of tergal sclerites.

Abdomen oval, widest at the 2nd. segment, with angles on first three segments scarcely protruding. Fifth segment very short and abruptly narrower than 4th. The 6th. segment wide at side but narrow medially, being compressed by the 7th., which extends forward beyond the postero-lateral angles of the 5th. Seventh segment small, longer than wide, with the two lobes of the aborted (original 8th.) segment extending beyond it posteriorly.

The aborted segmental lobes are almost as large as the lateral portions of the 6th. segment, but do not extend back to the anterior margin of the 7th. Pleural plates very wide on segments 1 to 5, and strongly overlapping at the sutures. In the male of this species the tergal plates corresponding to the 6th. segment are not divided, but entire across the segment, while the remainder are separated by wide median and inter-segmental hyaline areas. Segment 1 with two strong bristles at lateral angles; 2nd. and 3rd. with three such bristles; 4th. and 5th. with three bristles and two slender hairs; 6th. with three bristles and four hairs; 7th. with three short bristles on each side, and the aborted lobes with about 13 slender hairs on each. A longish, slender hair at the inner, posterior corner of pleural plates 1 to 5, and a pair of median hairs on tergal plates four and five. Legs rather long and stout, with tibiae thickened and bearing a few spines, the most on the 3rd. pair.

Female considerably smaller than the male, has the head shorter and with wider preantennary area, bearing numerous short setae (these may be missing in the male). The prothorax is of quite distinct shape, the anterior angles being absent, with that portion rounded and with sides slightly divergent. Pterothorax and abdomen very similar, except that the tergal plates of the 6th. segment are divided like the others, the aborted segmental lobes are long and narrow and the 7th. segment much wider. It is wider than long, with the anterior margin somewhat conical, with the sides sinuate and the posterior margin with two short, rounded, median points. The chaetotaxy is the same except for the aborted tubercles and the 7th. segment, the former bearing four hairs each, and the latter four on each side, beside two median setae.

The male genital armature is partly obscured by a patch of foreign matter, but seems to be somewhat of the type of *Strongylocotes*.

The hairs of the abdomen in the female are longer, less spine-like in character and fewer in number.

Measurements:	♂		♀	
	length	width	length	width
body	2.20 mm.		1.90 mm.	
head	.65	.57 mm.	.51	.48 mm.
prothorax	.29	.45	.26	.38
pterothorax	.48	.68	.34	.58
abdomen	1.23	.98	1.04	.82

The slide containing the types of this species also contains three other females. The females are so different from the single male that I hesitated to consider them conspecific, or even congeneric. The male is very similar to *Strongylocotes*, were it not for the absence of the metathoracic apron and the position of the 2nd. pair of coxae, while the females are typical of the other species of *Nirmocotes*. However, I now feel certain that they are male and female of the same species.

Nirmocotes nirmoides, species novum. Text-plate IV, fig. 3.

Type, ♀ adult, from *Crypturellus obsoletus punensis*, collected at La Oroya, Dept. Puno, Peru, June 6, 1931.

Description of type: Head longer than wide, with front uniformly rounded and margined by a narrow, deeply pigmented band which widens at the base of the trabeculae; trabeculae of medium size, nearly hyaline, triangular in shape and sharply pointed; antennal fossae shallow; antennae long and slender, with 1st. segment thickened and short, 2nd. the longest, 4th. the shortest, and 3rd. and 5th. subequal; all segments with narrow marginal bands; postantennary area parallel sided, with temples evenly rounded and occiput concave; mandibles unusually large, with heavy tips, thin lateral wings and with one tip notched and the other pointed; a small occipital signature, or gular plate.

Prothorax large, almost square, with front attenuated and margin concave; sides very slightly divergent and posterior margin straight; anterior angle rounded and posterior pointed, with a short bristle; lateral bands heavy, but not deeply pigmented; acetabular bars short and transverse, with only tip bent backward and situated far forward of the posterior margin; 1st. pair of coxae small, with 2nd. pair the largest and placed directly under the prothoracic suture, so that the anterior half of the coxae are under the prothorax and the posterior half under the pterothorax.

Pterothorax much wider than head, with anterior angles round, sides strongly divergent and straight; posterior angles rounded but with a slight protuberance, on which is set a spine; acetabular bars heavy, nearly straight and almost parallel and extending slightly beyond the posterior margin of the segment.

Abdomen oval, widest at 3rd. segment;² pleural plates wide, sharply outlined and overlapping considerably at the sutures, but weakly pigmented and without internal markings; 1st. segment as long as 2nd., 3rd. and 4th. combined, and with the margin roughly serrated; succeeding segments uniformly graduated in length; last segment somewhat oval in shape, with lateral lobes and median tip slightly bifurcated (for detailed description of abdominal segments see generic characterization); two rows of tergal plates (slightly less pigmented than pleural plates) along the median portion of the abdomen, widely separated from the pleural plates and from each other by hyaline areas. There are two pairs of tergal plates within the long 1st. segment, and one pair corresponding to segments 2 to 6; spiracles in an oval slit between pleural and tergal plates.

Legs rather long and strong, tibiae thickened and with 4 to 6 spines; claws short and thick at base, one twice as long and much thicker than the other; tibiae with marginal bands.

Chaetotaxy: Head: 8 short hairs on each side along the clypeal band; 1 between mandibles and trabeculae; 2 short, submarginal setae on sides of head and two short marginal spines; a long, strong hair in middle of temples and 2 short spines behind it. Prothorax: A short, submarginal bristle at anterior angles and a stronger one in posterior angle.

²The type specimen seems to have the abdomen flattened and expanded both laterally and longitudinally, so that the pleural plates are somewhat separated from each other, and the interspaces between them and the tergal plates are doubtless greater than they normally are. In the drawing I have made allowances for this condition and drawn the abdomen as I think it would normally be (as in the type of *N. glabrous*).

The measurements given for the abdomen are those taken from the actual specimen, and not as is shown in the drawing.

Pterothorax: A short, stout spine in posterior angle, with a slender hair in front of it; 3 long, strong, pustulated hairs set transversely inside the posterior angle; a short bristle on each side of the posterior margin. Abdomen: 1 short, thick hair in lateral angles of segments, 1, 2 and 3; 2 long, strong hairs and 1 short, slender hair in No. 4 and 5; two long and three short hairs on the 6th; 2 long and 1 short on the tip of the tubercular process between 6 and 7; five long, strong hairs on the lateral lobes of the 7th, 3 marginal and 2 submarginal.

Measurements:	♀	
	length	width
body	2.14 mm.	
head	.56	.50 mm.
prothorax	.30	.37
pterothorax	.32	.56
abdomen	1.21	.94
antennae	.34	

An additional female taken with the type is the same, but the posterior portion of the abdomen is badly mutilated and the various plates in confusion.

Nirmocotes glabrous, species novum. Text-plate V, fig. 3.

Type (and only specimen), ♀ adult, from *Crypturellus tataupa*, collected at Vicosá, Brazil, by E. J. Hambleton, June 15, 1933 (Coll. U. S. Bureau of Entomology, Washington). U. S. N. P. 7.

Diagnosis: Very similar to *nirmoides* in general appearance, except for the head, which has the pre-antennary area differently shaped, the front and sides being decidedly flattened, giving it a trapezoidal shape, rather than rounded, the shallow antennary fossae have the anterior margin drawn out into a sharp point, and with its raised posterior margin running inward and backward around the base of the movable trabeculae giving the appearance of a double trabecula; clypeal band narrower and less deeply pigmented and not expanded at the base; rest of head and the chaetotaxy the same as in *nirmoides*, except that the sides of the head are more rounded.

Prothorax the same, except narrower at anterior end and wider behind, thus being more divergent; 2nd. pair of coxae very small and almost entirely under the prothorax. Pterothorax decidedly narrower, but of the same length, with the lateral angles less projecting beyond the sides of the abdomen; chaetotaxy the same.

Abdomen about as long as in *nirmoides*, but not so wide and more parallel sided, and with the margin of the 1st. segment slightly concave, also roughly serrated; pleural plates the same, but tergal plates larger, and more nearly filling the interpleural area; shape of the apical segments the same, but more setae on the tip of the tubercular body between 6th. and 7th. segments. Legs smaller, middle tibiae same size as 1st. pair and femora smaller.

Measurements:	♀	
	length	width
body	2.15 mm.	
head	.60	.53 mm.
prothorax	.32	.42
pterothorax	.35	.63
abdomen	1.06	.72
antennae	.34	

Nirmocotes cordiceps, species novum. Text-plate V, fig. 2.

Type, ♀ immature, from *Tinamus major major*, collected at Kartabo, Brit. Guiana, January 29, 1925, by O. L. Austin, Jr. (Type in coll. H. S. Peters).

Diagnosis: Head and thorax resembling somewhat those of *N. nirmoides*, except that the front of head is more pointed, with the sides of head slightly divergent, straight, and with the temples slightly angulated, while the occiput is uniformly rounded from temple to temple. The prothorax is more that of *N. glabrous*, while the pterothorax is different from both *nirmoides* and *glabrous*, having the sides nearly parallel, and slightly convex.

The clypeal band is wide and deeply pigmented at the base, tapering to a point on each side of the front, with a paler band across the front; trabeculae, antennae and mandibles about as in *nirmoides*, but chaetotaxy of head different from both of the other species. The whole front of the head seems to be completely without setae of any kind; four short, fine hairs on the side of head, one very long, strong, pustulated hair at the temporal angle and two short setae on posterior margin. The prothorax has a long, strong, pustulated hair at the posterior angles. Acetabular bars like those of *nirmoides*, with 1st. and 2nd. pairs of coxae similarly located.

The pterothorax has the anterior, lateral angles rounded, but well marked, the anterior edge of that segment being transverse for a short distance out from prothorax. Chaetotaxy very different, there being one very long, strong, pustulated hair in the posterior angle and another, longer, similar hair on posterior margin inside the acetabular bars.

The abdomen insufficiently developed so no adequate description of it can be given. I am not even certain of the sex of this specimen, but the apical segment of abdomen seems to be of the female type, and no trace of genital armature is visible. Also there seems to be nine segments, in view of the arrangements of the marginal setae, but of this I cannot be certain. At the posterior margin of the penultimate segment, on the dorsal surface, are four exceedingly long hairs, two on each side, the inner one set in a large pustule.

Measurements:	♀	
	length	width
body	1.46 mm.	
head	.50	.45 mm.
prothorax	.23	.33
pterothorax	.27	.44
abdomen	.78	.43
antennae	.35	

Genus **STRONGYLOCOTES** Taschenberg

Nova Acta, Halle, XLIV, 1882, p. 54. Genotype, *Goniodes complantus* Piaget.

Medium to large in size (2.5 to 3.5 in length) and usually heavily chitinized with pitchy brown markings on head and abdomen.

Antennae long, filiform, and the same in both sexes, with the second segment the longest (twice as long as the first). Head of varying shapes, but always longer than wide, always wider at the temples than at the antennae, and with the distance from the antennae to frontal margin never less than one third the length of head. Front of head rounded, flattened, or somewhat pointed; temples rounded or bluntly angulated, but never extending backward much beyond the sides of the occiput; trabeculae (apparently fixed) always present, but of only medium size.

Prothorax more or less quadrilateral, smaller than mesothorax. Mesothorax usually as wide or wider than head at temples, but not always, and with the sides ranging from slightly to strongly divergent; posterior margin always more or less angulated, with the sides concave, and with the meso-metathoracic suture always clearly visible across the whole segment. Metathorax consists of a smaller, apron-like flap, which is always much narrower than the mesothorax or the first abdominal segment (and apparently overlaps the 1st. abdominal segment, not imbedded within it). Its outline is usually circular on the sides and flat to flatly rounded posteriorly, and is often very difficult to trace.

Abdomen oval to ovoid, with but seven segments and with the first pair of spiracles in the first segment; more or less heavy pleural plates always present, some with markings of extremely intricate design; tergal plates broken medially, always present; lateral angles sometimes small and scarcely protruding, in others strongly developed; seventh segment always differing in shape in the sexes. Legs stout and of more than medium length. Male genital armature small and of simple design, but basal plate always long and slender, reaching upward to posterior margin of first abdominal segment or even further. Female smaller than the male in some species, an exceedingly unusual condition.

Strongylocotes complantus complantus (Piaget). Text-plate VI, figs. 2, 2a, 2b.

Goniodes complantus Piaget, Les Pediculines, 1880, p. 262, pl. XXI, f. 8 (Host: [*Tinamus*] *Crypturellus obsoletus*, Zoological Gardens of Rotterdam).

The description and figure by Piaget is quite clear, and the specimens which I have examined agree very closely with both, although taken on what are probably different host subspecies, from Peru and Bolivia. Doubtless Piaget's type come from the nominate form of *C. obsoletus*, found in Brazil, which would much more likely be found in the Zoological Garden of Rotterdam than one of the interior races of *obsoletus*.

Unfortunately I have not been able to examine specimens of *S. complantus* from typical *C. obsoletus*, but the ones under discussion here are so near to the description and figure that I do not hesitate in identifying them as typical *complantus*.

The sexes are not quite alike in this species, and as Piaget did not possess the male, I have given a figure of it, together with the abdomen and thorax

of the female, to illustrate the differences, which consist chiefly in the shape of the abdomen and the structure of the four last segments, and in the shape of the temples, which are not flattened in the male, as in the female, but rounded (Piaget's figure of the head of the female is very good).

The specimens examined from *Crypturellus obsoletus ochraceiventris* are closer to Piaget's type than those from *C. o. punensis*, having the prothorax exactly the same, with the angle in front and the notch behind it, while those from *punensis* have both front and rear angles more rounded, while both have the mesothorax with the sides slightly less diverging and the posterior margin more sharply angulated medially. Those from *C. o. ochraceiventris* have the head a little shorter in proportion to the width. In the male the first antennal segment is slightly thicker and longer than in the female, but the remaining segments are the same.

	♀ from <i>C. o. ochraceiventris</i>		♀ on <i>C. o. punensis</i>	
	length	width	length	width
body	2.72		2.71	
head	.72	.64	.76	.64
prothorax	.38	.48	.40	.51
mesothorax	.50	.71	.50	.73
metathoracic apron	.28	.50	.28	.53
abdomen	1.53	1.20	1.49	1.26
antennae	.40		.40	
front of head		.28		.29
length of whole thorax (Piaget)	.86			

The length of thorax given by Piaget does not include the metathoracic apron, and the corresponding length of the above measured specimens would be .88 and .90 mm.

Material examined:

- 2 ♂♂ and 4 ♀♀ from *Crypturellus obsoletus ochraceiventris*, collected at Eneñas, Dept. Junin, Peru, March 12, 1930.
 5 ♂♂ and 5 ♀♀ from *C. obsoletus punensis*, collected at Calabatea and Sandillani, Dept. La Paz, Bolivia, November, 1934.
 5 ♂♂ and 5 ♀♀ from *C. t. tataupa*, collected at Sta. Ana, Rio Coroico, Bolivia, July 23, 1934.
 2 ♂♂ from the same host, collected at Vicosá, Brazil, and 2 ♂♂ and 2 ♀♀ from the same host taken at Marajo, Brazil (these last four specimens are of the same lot as recorded by Paine and Mann from this host: Mallophaga from Brazilian Birds, Psyche, Vol. XX, No. 1913, p. 15).

There is a certain amount of individual variation in this series, but all are referable to *S. c. complantus*.

Strongylocotes complantus interruptus, subsp. novum. Text-plate VII, figs. 1, 1a.

Types, ♂ and ♀ adult, from *Crypturellus atrocapillus*, collected at Chiniiri, Rio Kaka, Bolivia, by M. R. Carriker on August 24, 1934.

Paratypes - U.S.N.M.

Diagnosis: Size smaller (length of ♀ 2.66 against 2.72 mm.); head narrower at the temples, front nearly equal; prothorax slightly larger; mesothorax narrower and metathoracic apron wider; trabeculae shorter, blunter, and with the frontal edge more convex; occipital signature narrower (elongate instead of circular); temples less rounded, more angulate; occipital margin nearly transverse, with narrower, less convex occiput; sides of mesothorax less convex (nearly straight), less divergent, and lateral angles less rounded and with the posterior margin less concave and the median angle sharp, but obtuse (not acute); abdomen not so wide, less globular, with the posterior segments of the female much the same as in *complantus*, but very different in the male. In the male the 6th. and 7th. abdominal segments are much constricted laterally, there being an abrupt break of considerable width between the 5th. and 6th. segments, more noticeable than in *complantus*, and with these two segments much narrower laterally, while the 7th. segment is also of different shape.

Measurements:	♂		♀	
	length	width	length	width
body	2.42		2.66	
head (front)	.69	.27	.70	.26
" (temples)		.58		.545
prothorax	.37	.48	.40	.50
mesothorax	.48	.68	.52	.68
metathoracic apron	.25	.50	.28	.54
abdomen	1.34	1.06	1.50	1.10
antennae	.40		.38	

5 ♂♂ and 2 ♀♀ (including the types) were taken on the same bird.

2 ♂♂ and 1 ♀ from *Crypturellus u. undulatus*, collected at Rurrenabaque, Rio Beni, Bolivia, Sept. 11, 1934.

It is rather unusual to find the same parasite on two birds as distinct as *C. atricapillus* and *undulatus*, but the parasites are so near alike that they cannot be separated.

Strongylocotes complantus variegatus, subsp. novum. Text-plate VII, figs. 3, 3a.

Types, ♂ and ♀ adult, from *Crypturellus variegatus salvini*, collected at Puerto Yessup, Dept. Junin, Peru, on February 16, 1930.

Diagnosis: This form is almost exactly like *S. c. complantus* in the size and shape of the body as a whole, but differs decidedly in the chaetotaxy of the abdomen in both sexes, as will be seen at a glance by comparing the figures of the two races.

In *complantus* the ♂ has the hairs on segments 5, 6 and 7 much longer than in *variegatus*, especially so on the lateral lobes of the 7th, where they are four times as long as in *variegatus*. The basal plate of the ♂ genitalia is also more slender in the new race. In the female of *variegatus* the hairs on the lateral angles of all the segments are somewhat longer, but the principal difference lies in the presence of a complicated series of fine, short curving hairs on the sternal plate of the 6th. abdominal segment, arranged in two series, one vertical and one horizontal on each side of the segment.

6 ♂♂ and 8 ♀♀ were taken on the same individual host (including the types. Also I have examined 2 ♀♀ taken on *Crypturellus v. variegatus*, collected at Kartabo, British Guiana, by O. L. Austin, July 25, 1925, which are in the collection of H. S. Peters. These two ♀♀ are exactly like the type series.

Strongylocotes abdominalis, species novum. Text-plate VII, figs. 2, 2a.

Types, ♂ and ♀ adult, from *Crypturellus cinereus cinerascens*, collected at Chiniiri, Rio Kaka, Bolivia, on September 6, 1934. Paratypes, U.S.N.M.

Description of types: Quite different from any other known species of the genus. The head is of the type of *S. complantus*, with flattened front and temples, and a median branch running backward from the front of the clypeal band, but is very much shorter and proportionately broader; prothorax similar to *complantus*, but sides straight and slightly divergent; mesothorax considerably wider than abdomen, sides but slightly convex, and widely divergent (somewhat after the type of *S. spinosus*, but narrower); the posterior margin with the sides deeply concave, the angulation shorter and the point rounded. The metathoracic apron is of the same shape as in *complantus* but shorter.

Abdomen with segments 3 to 6 much shortened, with the lateral portion bent sharply backward, and broadly overlapping the succeeding segment. Seventh segment of unusual shape, having the lateral lobes very long and projecting beyond the remainder of the segment by more than half their length, while the median portion of the segment is unusually small. The spines on the lateral angles of segments 2 to 6 are short and very much thickened basally, being shaped almost like a long slender spear-head; the hairs on the lateral lobes of the 7th. segment are long and heavy, with no intermixed short, fine hairs. In the female the abdomen is very similar to that of *complantus*.

On the front of the head are four short, marginal hairs and another just in front of the trabeculae; just back of the eye is a short, very stout spine; on the anterior portion of the temples are two very short marginal hairs, while in the middle of each temple is a longish, stout, pustulated hair and a short, stout spine just behind it. A short, stout, curving, spine-like hair on the postero-lateral angle of the prothorax; three short, stout hairs on the dorsal surface, just within the lateral angles of the mesothorax. A few short hairs on the femora and at the distal end of the tibiae.

The male genital armature is of the usual type of the genus. In size, this species is close to *spinosus*, and forms the connecting link between that species and *complantus*, in shape and proportion of the thorax and in the abdomen of the male, while the head and metathoracic apron are nearer to *complantus*. The 7th. abdominal segment is almost exactly like that of *spinosus*, but segments 3 to 6 are differently shaped.

Measurements:	♂		♀	
	length	width	length	width
body	2.48 mm.		2.24 mm.	
head (front)	.72	.31 mm.	.62	.25 mm.
" (temples)		.65		.60
prothorax	.40	.52	.34	.44

mesothorax	.48	.82	.42	.66
metathoracic apron	.21	.52	.23	.46
abdomen	1.36	1.03	1.30	1.02
antennae	.38		.36	

Strongylocotes spinosus (Piaget). Text-plate VII, fig. 4.

Goniodes spinosus Piaget, Les Pedicelines, 1880, p. 261, pl. XXI, fig. 7. Host. [Tinamus] *Nothocercus julius*.

Strongylocotes spinosus, Taschenberg, Die Mallophaga, 1882, p.

This species was described by Piaget from a single male taken on *Nothocercus julius*, from which host no specimens are available for study.

I have, however, two females taken on *Nothocercus nigrocapillus*, collected at Huacapistana, Dept. Junin, Peru, on April 3, 1930, which are so nearly like Piaget's description and figure of *spinosus* that I do not hesitate in identifying them as such, although without the male it is rather risky to do so. The shape of the head and thorax is very characteristic in this species, having the front narrow, but rounded, and temples broad and angulated, giving the head a decidedly conical appearance. The clypeal band is entire, without the median branch (like *subspinosus* and *angulocapitis*); the prothorax is quadrangular, with the front and rear angles sharply defined and sides concave. The pterothorax has the sides nearly straight, but widely divergent, and is much wider than the first abdominal segment. This is one of the most striking characters which separates it from *subspinosus*, its nearest relative, although the abdomen also differs much in general shape and style of lateral bands.

The figure given by Piaget of the male is quite clear in most details. The genital armature in this genus is of very little value in separating the species, so that our lack of knowledge of its exact character is of slight consequence.

The female differs from the male in the shape of the abdomen only, especially in the 7th. segment, which is large, with a tapering, deeply bifurcated tip. The bifurcation is partially covered by two thin ventral plates, which extend beyond the tip of the segment and over the sides of the genital opening. The tergal plates are widely separated by a median hyaline area in both sexes:

Measurements:	♂ (as per Piaget)		♀	
	length	width	length	width
body	2.50 mm.		2.90 mm.	
head	.77	.75 mm.	.85	.78 mm.
prothorax	} .58	.80	.23	.51
pterothorax			.36	.85
abdomen	1.30	1.00	1.52	1.12
antennae	.41		.45	

Strongylocotes subspinosus, species novum. Text-plate VIII, figs. 2, 2a.

Types, ♂ and ♀ adult, from *Nothocercus n. nigrocapillus*, collected at Sandillani, Dept. La Paz, Bolivia, November 23, 1934.

Diagnosis: Closely related to *S. spinosus* (Piaget), from *Nothocercus julius*, agreeing with that species in the general shape of the head, absence of the median spur on the clypeal band, heavy spine on temples and uniformly rounded posterior margin of the metathoracic apron, but differs from it as follows:

The prothorax and mesothorax, both with sides less divergent, especially the latter, which is narrower than the head (wider than head in *spinosus*); posterior margin of mesothorax with sides more deeply concave, entering further forward than the lateral angles; sides of mesothorax convex (not concave) and with a well-marked emargination just forward of the posterior lateral angles, from which spring two long hairs; the acetabular bars are nearer to the lateral margins in the mesothorax; abdominal segments not crenulated, with the lateral angles sharp and overlapping closely the succeeding segment (except on the 6th.); 7th. segment of different shape, scarcely protruding, and with the lateral lobes much smaller and shorter; chaetotaxy of abdomen quite different, as may be seen from the figure given.

The female of *spinosus* was unknown to Piaget, but I have two specimens, both females, and we find that in the female of *subspinosus* the abdomen is very similar to it, with the bifurcated tip on the 7th. segment, but *spinosus* lacks the lateral, diagonal bars on that segment (see figures).

The females of *subspinosus* and *spinosus* have the 7th. abdominal segment very differently shaped from any other known species of the genus. It is separated from the 6th. segment by a deep cleft; the sides are angulated, the angle even with the 6th. segment, but the median portion of the segment projects sharply, with slightly convex, converging sides and ends in a deeply cleft tip (of the type of many species of *Esthiopterum* and allied forms).

Measurements:	♂		♀	
	length	width	length	width
body	2.51 mm.		2.86 mm.	
head (front)	} .78	{ .23 mm. }	} .87	{ .23 mm. }
" (temples)				
prothorax	.30	.49	.30	.51
mesothorax	.37	.70	.38	.76
metathoracic apron	.16	.48	.20	.52
abdomen	1.34	.84	1.60	1.05
antennae	.42		.46	

In addition to the types, 2 ♂♂ and 3 ♀♀ were taken on the type host.

Strongylocotes angulocapitis, species novum. Text-plate VIII, fig. 3.

Type, ♀ adult, from *Tinamus s. serratus*, collected at Sta. Ana, Rio Coroico, Bolivia, July 26, 1934.

Diagnosis: Most closely related to *S. spinosus* and *subspinosus*, in general shape of head, absence of internal projection from front of clypeal band, and the short, rounded metathoracic apron. It differs from *spinosus* in the narrow mesothorax (narrower than head) and differently shaped temples. It agrees with *subspinosus* in the narrow mesothorax, with emargination near the posterior angle (lateral), but differs from that species in the shape of the temples; sides of prothorax decidedly convex, with the anterior lateral angles entirely wanting; emargination in front of lateral mesothoracic angles wider and deeper; but it especially differs in the shape of the abdominal segments 2 to 7, especially the 7th. and in the chaetotaxy of that segment. It is also longer than *subspinosus* and with longer antennae.

Measurements:	♀ (type)	
	length	width
body	3.03 mm.	
head (front)	.89	.21 mm.
“ (temples)		
prothorax	.30	.56
mesothorax	.56	.78
metathoracic apron	.26	.56
abdomen	1.66	1.10
antennae	.52	

Material examined:

- 2 ♀ ♀ adult and 1 ♀ imm. (including the type) from *Tinamus s. serratus*, taken at Sta. Ana and Chiñiri, Rio Kaka, Bolivia, August, 1934.
2 ♀ ♀ from *Tinamus tao tao*, collected at Lagunita de Aroa, Venezuela, December 30, 1910.

No apparent differences between the four adult females.

Strongylocotes subconiceps, species novum. Text-plate VIII, figs. 1, 1a.

Types, ♂ and ♀ adult, from *Crypturellus soui inconspicuus*, collected at Chiñiri, Rio Kaka, Bolivia, September 3, 1934.

Diagnosis: Nearest to *S. complantus* in general characters of head and thorax and the presence of the long, median branch of the clypeal band, but differing from that species in having the head narrowly cone-shaped, with the front narrow and flatly rounded in both sexes (not flattened); the temples are even more flattened in the female than in the female of *complantus*, but in the male they are uniformly rounded. It differs chiefly, however, in the entirely different character of the last four abdominal segments in the male, which are constricted laterally and much elongated.

Prothorax unusually large, with sides concave and but slightly divergent, and with a slight notch just behind the anterior angle.

The mesothorax is unusually narrow and elongated, with sides straight and but slightly divergent, posterior angles rounded and posterior portion the same width as the anterior end of the first abdominal segment (a very unusual character and the only known species of the genus with this peculiarity); posterior margin deeply concave on the sides, with the median portion long and sharply angulated. The metathoracic apron is also of

different shape, having the sides almost straight (slightly convex) and the posterior margin almost transverse.

Abdomen with sides of 1st. segment almost straight (not concave); segments 2 to 5 of almost uniform length, with slightly protruding, rounded angles and with the whole abdomen unusually elongated and narrow; it is abruptly constricted at the 6th. segment, which has the pleural plate narrow and but faintly pigmented; the 7th. segment is very large, much resembling this segment in the females of the other species. It is but faintly pigmented, extends upward within the 6th. segment even with the lateral angles of the 5th., and has the posterior margin broadly rounded with a deep median emargination. The legs are characteristic of the genus.

Male genital armature of the usual type, but with the basal plate weaker, narrower and very faintly chitinized on the anterior portion.

Chaetotaxy: Four short hairs on the front of the head and two on each side of the clypeus, with a third at the base of the trabeculae and a fourth just in front of it; a short hair at posterior margin of the eye, followed by a short spine; another short spine on the widest part of the temples followed by a long, strong hair just behind it; two short spines on each side of the occipital margin; a short, stout hair in the posterior angle of the prothorax; two long and two short hairs just within the lateral angles of the mesothorax, on the dorsal surface; first abdominal segment with four long hairs in lateral angle; 2nd. with two spine-like and one slender hair; 3rd. with three shorter, thicker spine-like hairs; 4th. with four similar hairs; 5th. with four short, more slender hairs; 6th. with about seven longer, slender hairs; 7th. with 18 to 20 slender hairs, a few short, but mostly as long as the segment; all tibiae with three to four spines on distal portion and third pair with four more similar spines along the side.

Measurements:	♂		♀	
	length	width	length	width
body	2.82		2.60	
head (front)	.79	.25	.73	.23
“ (temples)				
prothorax	.43	.56	.38	.45
mesothorax	.56	.74	.46	.58
metathoracic apron	.28	.52	.27	—
abdomen	1.57	1.00	1.43	1.06
antennae	.38		.38	

Material examined:

4. ♂ ♂ and 2 ♀ ♀ from *Crypturellus soui modestus*, Rio Sixola, Costa Rica, March 23, 1904.
3. ♂ ♂ from *C. soui soui*, collected at Peru Mine, Venezuela, May 17, 1910.
1. ♂ and 1 ♀ from *C. s. nigriceps*, Tamborapa, Dept. Cajamarca, Peru, July 14, 1933.
5. ♂ ♂ and 11 ♀ ♀ from *C. s. inconspicuus*, Sta. Ana and Teoponte, Bolivia, July, 1934, and 2 ♂ ♂ and 2 ♀ ♀ from the same host from Shapaja, Rio Huallaga, Peru.
1. ♂ from *C. obsoletus punensis*, Calabatea, Rio Coroico, Bolivia, Nov., 1934.

Strongylocotes lipogonus lipogonus (Nitzsch). Text-plate VI, figs. 1, 1a, 1b.

Goniodes lipogonus Nitzsch, in Giebel, Zeit. f. ges. Nat., XXVIII, 1866, p. 388; Giebel, Insecta Epizoa, 1874, p. 203, pl. XIII, fig. 5 (*Rhynchotus rufescens*).

Nirmus crassiceps Rudow, Zeit. f. ges. Nat., XXXV, 1870, p. 473 (*Rhynchotus rufescens*).

Strongylocotes lipogonus, Taschenberg, Nova Acta, Halle (Die Mallophagen) 1882, p. 57, pl. I, fig. 9 (*Rhynchotus rufescens*).

Ornicholax lipogonus (Nitzsch), Harrison, Gen. and Species of Mall., 1916, p. 86.

This species may be distinguished at once from all the preceding ones by the short, rather cordate head; narrow mesothorax with rounded sides; faintly pigmented pleural plates on the abdomen, and by the short blackish bands along the sutures between the pleural plates. The figure given by Taschenberg is essentially correct in most details but he shows the head too wide in front and fails to show the angulated posterior margin of the mesothorax and makes the metathoracic apron too narrow. He is perfectly justified in his statement that *lipogonus* is closely related to *setosus* of Piaget, the latter being, in my opinion, conspecific with it, but subspecifically distinct. I have given complete figures of this interesting species, showing all details. I have examined the following material of the species: 2 ♂♂ and 5 ♀♀ from *Rhynchotus rufescens rufescens*, collected at Reyes, Dept. Beni, Bolivia, September 28, 1934; 5 ♂♂ and 12 ♀♀ from *Rhynchotus rufescens maculicollis*, taken at Sandillani, Dept. La Paz, Bolivia, December 11, 1934, by M. R. Carriker.

Measurements:	♂		♀	
	length	width	length	width
body	3.28 mm.		3.50 mm.	
head	.93	.88 mm.	.96	.93
prothorax	.39	.64	.38	.64
mesothorax	.50	.91	.52	.94
metathoracic apron	.40	.78	.36	.80
abdomen	1.86	1.28	2.06	1.43
antennae	.51		.44	

Strongylocotes lipogonus setosus³ (Piaget).

Goniodes setosus Piaget, Les Pediculines, 1880, p. 263, pl. XXI, fig. 9 (*Crypturellus [Tinamus] variegatus*).

Strongylocotes setosus, Taschenberg, Die Mallophagen, p. 55.

Ornicholax setosus (Piag.), Harrison, Gen. and Species of Mall., 1916, p. 86.

The description and figure given by Piaget for this species are ample for identification. It may be distinguished from *S. lipogonus* (Nit.) by the following characters: The front of head wider and more flattened; the occipital margin sinuate, the occiput convex (instead of whole occipital margin concave); the mesothorax slightly narrower and with rounded sides (not divergent and convex posteriorly on sides); the posterior margin of

³ The previous use of the name *setosus* on page 257 (Les Pediculines), for a subspecies of *Goniodes minor*, does not invalidate its use for this species of *Strongylocotes*.

the mesothorax with sides concave and median angle sharper (sides straight in *lipogonus*); prothorax with sides concave, not straight or very nearly so); and lastly by the different structure and markings of the 6th. and 7th. abdominal segments in the female.

This form is very close to *lipogonus*, in fact I consider them to be conspecific, but sufficiently distinct to be retained as a subspecies of *lipogonus*.

However I strongly suspect that *Crypturellus variegatus* is not the true host for this parasite. I have examined two females of a *Strongylocotes* taken on *Crypturellus variegatus* in British Guiana, and I find them to be practically typical *complantus*. There may have been a mistake in the identification of the host (a skin in the Leiden Museum), or some error impossible to be determined at this time. I would prefer to think that the true host of *setosus* was some species of *Rhynchotus* or *Nothura*.

Measurements (from Piaget):

	♀	
	length	width
body	3.70 mm.	
head	.93	.92 mm.
thorax	.70	.68
abdomen	2.15	1.35
antennae	.36	

Strongylocotes alienus (Giebel).

Gonicotes alienus Giebel, Zeit. f. ges. Naturw., 1866, vol. XXVIII, p. 389 (*Crypturus macrurus*).

Strongylocotes alienus, Taschenberg, Nova Acta, Halle, 1882, p. 59.

Taschenberg examined the type of this species, which he says was in several pieces, and he could not give an exact description of it. However he states conclusively that it is a species of *Strongylocotes*, and both Giebel's description and his own bear out this statement.

I have not been able to identify any of my material as belonging to this species, but it is undoubtedly close to *S. lipogonus*, at least of that general type. The name of the host is also apparently incorrect, since I have been unable to find the specific name of *macrurus* used for any form of *Tinamidae*.

Strongylocotes tinnami (Rudow).

Nirmus tinnami Rudow, Zeit. f. ges. Naturwiss., vol. XXV, 1870, p. 473 (female). (*Tinamus bannaquira*, equals *Northura boraquira*).

Nirmus ansatus Rudow, citation as above, p. 474, (male). (*Tinamus bannaquira*).

A careful analysis of Rudow's descriptions of these two forms shows that they are both undoubtedly species of *Strongylocotes*, and the two sexes of one and the same thing, since both are from the same host, and the sexes very often differ strongly in this genus.

I have seen no specimens of *Strongylocotes*, or any other genus from this host, so that I cannot say that the genus does or does not occur on it.

Subfamily PHYSCONELLINAE

Genus PHYSCONELLA Paine

Ancistrocephalus Paine, Psyche, Vol. XX, 1913, p. 158, genotype, *A. kelloggi* Paine.
Physconella Paine, Psyche, Vol. XXI, 1914, p. 23; nomen novum for *Ancistrocephalus* Paine (nec Monticello), genotype, *P. kelloggi*, Paine.

The characterization of this genus by Paine is rather incomplete and incorrect in some details, and it may be described as follows:

Size minute; antennae very large, almost identical in the sexes, and without appendages; head with a strong, heavily chitinized hook at the anterior angle of the deep antennary fossae, which curves sharply backward, with the point beneath the first antennal segment; front of head more or less transverse (between the hooks); temples broader than front, squarish; pharyngeal sclerite and gland present. Prothorax rather large, wider than long; meso- and metathorax completely fused into a single segment, the pterothorax, which is large, more or less the width of temples, but long and with the greater part imbedded within the first abdominal segment, reaching nearly to its posterior margin, where the two segments are completely fused and the suture invisible. Abdomen almost round, sometimes longer than broad and sometimes wider than long, composed of but seven segments, and with the spiracles located in segments 1 to 6; a small tubercular body present on each side of segment seven (in the male only), similar to several other genera infesting the Tinamous; 7th. segment in male rather small and rounded, in the female twice as wide as long and quadrilateral in shape and posterior margin almost transverse. Lateral angles of segments 2 to 6 produced into heavy, curving hooks, most strongly hooked on segments 3 to 5, and curving inward and downward under the succeeding segment. Legs rather large, with small coxae, strongly developed trochanter, thickened femora and slender tibiae and unusually long tarsi, with short thickened claws. The hairs of head and body most unusually long, resembling in this respect the new genus *Megaginus* (described in this paper). Genital armature small and of unusual construction, with parameres short and slender, endomeral plate small, with a well-developed penis, and basal plate very complicated in structure in some species.

***Physconella kelloggi kelloggi* Paine.**

Ancistrocephalus kelloggi Paine, Psyche, XX, 1913, p. 158, fig. 1. [*Chamaepelia rufipennis*. Probably a straggler from *Crypturellus soui panamensis*. M. A. C., Jr.]

I have not been able to examine the type specimen of this interesting species, but have six males and 10 females representing the genus, all from Peru and Bolivia and taken on the following hosts: *Crypturellus soui nigriceps*; *C. s. inconspicuus*; *C. obsoletus punensis*; *C. atrocapillus*; *Nothocercus n. nigrocapillus* and *N. n. cadwaladeri*. Of all these specimens there is but one female (from *Crypturellus soui nigriceps*) which agrees closely with Paine's description and figure of *kelloggi*. Its measurements are almost exactly the same as given by Paine, although the females run slightly larger than the males in the rest of the series. The shape of the head and thorax is the same and the hooks on the abdominal segments are exactly the same, while in the remainder of the series they are different, being much more

strongly curved on segments 3, 4 and 5. The others of the series differ so materially from this one specimen that I am forced to describe them as distinct species and subspecies. The males taken from different hosts all differ in the genital armature, but it is impossible to say just what their relation may be to that of typical *kelloggi*. Paine's meagre statement concerning the genital armature helps very little. He says: "Genitalia with long slender external appendages, not heavily chitinized." It is possible that the "slender external appendages" to which he refers are the chitinized bands along the sides of the swollen base of the basal plate in the males from *Crypturellus soui inconspicuus*, and this hypothesis is strengthened by the fact that the female which so closely resembles *kelloggi* is from another subspecies of *C. soui* (viz., *nigriceps*). However the males from *C. s. inconspicuus* are very much smaller than *kelloggi*, and have the abdominal hooks much more strongly curved, sufficient differences to give them subspecific rank. For the time being I will, therefore, allocate to *P. kelloggi* only the single female from *Crypturellus soui nigriceps*.

***Physconella kelloggi subsimilis*, subsp. novum. Text-plate IX, figs. 1, 1a.**

Types, ♂ and ♀ adult, from *Crypturellus soui inconspicuus*, collected at Teoponte, Rio Kaka, August 20, and at Chiñiri, Rio Kaka, Bolivia, September 3, 1934. ♀ paratype U.S.N.M.

Diagnosis: Nearest to *P. k. kelloggi*, from which it differs in smaller size and in the shape of the lateral hooks on abdominal segments 3, 4 and 5, which are much more decidedly curved; the first segment of the antennae is thicker and the lateral hooks on front of head a little longer; the heavy, bar-like incrustation on the ventral side of the pleural plates, which bear the lateral hooks at their ends, are much narrower and not so thick, and run upward across the segment more nearly parallel to the sides of the abdomen and not diagonally across it; the pleural plates are also narrower; the prothorax has the sides much more divergent, the anterior side being proportionately narrower than in *kelloggi*.

Measurements:	♂		♀		<i>kelloggi</i> ♂	
	length	width	length	width	length	width
body	.86 mm.		.93 mm.		1.00 mm.	
head	.22	.30 mm.	.23	.32 mm.	.246	.344 mm.
prothorax	.10	.25	.10	.26	.100	.278
pterothorax	.18	.33	.22	.33	.196	.360
abdomen	.52	.64	.55	.69	.623	.754
antennae	.22		.23			(2 segments missing)

Material examined: 4 ♀ ♀ from *Crypturellus soui inconspicuus*, collected at Sta. Ana, Rio Coroico, Bolivia, July 30; 1 ♂ and 2 ♀ ♀ from same host, taken at Chiñiri, Rio Kaka, Sept. 3; and 1 ♂ (the type) from the same host, taken at Teoponte, Rio Kaka, Bolivia, August 20, 1934.

Physconella hamata hamata, species novum. Text-plate IX, figs. 2, 2a.

Type (and only specimen), ♂ adult, from *Crypturellus obsoletus punensis*, collected at Calabatea, Rio Coroico, Bolivia, Nov. 15, 1934.

Diagnosis: Does not differ in any striking degree from *P. kelloggi subsimilis*, except in the genital armature, which is of a decidedly different shape, especially the shape of the basal plate, the shape of the parameres and the location of the endomeral plates. The abdominal hooks on segments 3 to 5 are long and sharply recurved, while the bar-like incrassations which bear all the hooks are broad as in *kelloggi*, but do not cross the segments in so diagonal a manner as in *kelloggi*. Unfortunately I do not possess the female of this form, and it may present other differentiating characters. In size it is intermediate between *kelloggi* and *subsimilis* but has the prothorax and pterothorax narrower than either; the head is of the same length as *subsimilis* and *kelloggi*, but much narrower than the former; the abdomen is slightly longer, but considerably narrower than in *subsimilis*; the head and body hairs are shorter, while the 4th. abdominal tergal plate has a long hair on the posterior margin absent in the races of *kelloggi*.

Measurements:	♂	
	length	width
body	.92 mm.	
head	.235	.29 mm.
prothorax	.09	.22
pterothorax	.21	.30
abdomen	.54	.57
antennae	.24	

Physconella hamata genitalis, subsp. novum. Text-plate X, fig. 2.

Type, ♂ adult, from *Crypturellus atrocapillus*, collected by M. R. Carriker at Chiñiri, Rio Kaka, Bolivia, August 24, 1934.

Diagnosis: Close to *hamata* in size, but abdomen slightly larger; the hooks at the front of the head extend further beyond the frontal margin; prothorax slightly smaller and with sides more strongly convex; abdominal hooks about the same; the 2nd. abdominal segment lacks the angulated median portion on the posterior margin, the whole margin being nearly transverse, with no indication of angulation at the middle; the 7th. abdominal segment is wider and more flatly rounded posteriorly; the long pustulated hair is absent on the 5th. abdominal tergal plate, being replaced by a small seta, as in *kelloggi*.

The genital armature, while of the same type, differs in various details as may be seen from the figures. In addition to the type, an additional ♂ was secured from the same individual host.

Measurements:	♂	
	length	width
body	.91 mm.	
head	.23	.31 mm.
prothorax	.10	.23
pterothorax	.18	.31
abdomen	.57	.62
antennae	.25	

Physconella nothocercae, species novum. Text-plate X, figs. 1, 1a.

Type, ♀ adult, from *Nothocercus n. nigrocapillus*, collected at Sandilani, Dept. La Paz, Bolivia, November 23, 1934.

Diagnosis: This species, while only known from the female, differs more radically from *P. kelloggi* than any of the other forms. When the male is secured it will undoubtedly be found to possess decidedly distinct genital armature.

The more striking differences are the very wide, round temples, longer hooks at front of head; quadrangular prothorax; concave lateral margin on 1st. abdominal segment; transverse anterior margin on 7th. abdominal segment (instead of conical); and lastly the presence of two patches of strong setae on the sternum. The tarsi are also decidedly longer on the 3rd. pair of legs, while the tibiae are much smaller in both 2nd. and 3rd. pairs. The markings of the head are also quite different, the occipital blotches do not extend laterally to the margin, but run straight backward and are connected by a deeply pigmented band running across the front of the prothorax. The occiput is also deeply concave, not convex, with a slight protuberance on either side. The chaetotaxy of the abdomen is also different in some respects from both *kelloggi* and *subsimilis*, but is like *kelloggi* in that there are but two long hairs on the abdominal tergites (absent on the 4th.). The patches of setae on the sternum contain 5 on each side, along the inner end of the acetabular bar at the suture between the pro- and pterothorax, and about 15 on each side, along the posterior margin of the 2nd. pair of coxae.

Measurements:	♀	
	length	width
body	1.03 mm.	
head	.26	.35 mm.
prothorax	.10	.25
pterothorax	.21	.31
abdomen	.63	.63
antennae	.23	

In addition to the type, two other females were taken on a specimen of *Nothocercus nigrocapillus*, which is intermediate between the nominate form and the race *cadwaladeri*, specimen collected by the author on April 3, 1930, at Huacapistana, Dept. Junin, Peru. The only difference of any importance between these two Huacapistana females and the type, is that they have the hooks on the head slightly shorter, but nevertheless longer than in any of the other forms.

MEGAGINUS, genus novum

Genotype, *Megaginus emarginatus*, species novum.

Diagnosis: Size small (♀ not more than 1.20 mm.); head very large, much wider than long, with broadly expanded and rounded temples and preantennary area conical and front emarginate; antennae of medium size, equal in the sexes; trabeculae replaced by well-developed tubercles; man-

dibles massive, one with tip broad and rounded (but notched), the other with two sharp points, one longer than the other; pharyngeal gland and sclerite present.

Prothorax short, much wider than long. Meso- and metathorax fused, but suture clearly visible far inside the acetabular bars; metathorax narrower than mesothorax, broadly rounded on posterior margin and almost completely imbedded within the first abdominal segment.

Abdomen oval, of seven segments, with spiracles in segments 1 to 6, and the whole not wider than head and scarcely longer than head and thorax combined; pleurites of medium width, sharply delineated, and with intricate interior markings. Hairs of body and temples very long and strong. Legs large and stout, tibiae nearly as thick as femora.

Male genital armature rather large, half the length of abdomen; basal plate wider at the tip than at base and faintly pigmented; parameres rather long and heavy and but slightly bent inward at the tips; endomeres small but telameron well developed; seventh abdominal segment of decidedly different shape in the two sexes.

There are present in this genus the same peculiar glands on the abdominal pleural plates in the male sex which are found in *Heptasus*, some species of *Heptapsogaster*, *Discocorpus*, and other genera.

In this case, however, they are located on the 6th. segment instead of 4th. or 5th., at the inner edge of the pleural sclerite, and are of quite a distinct type. There is an oval disc, margined on the inner side by a thickened ridge; the disc is granulated on the surface, but contains a circular pit in its centre, from which rises a long, very thin, hair-like structure, resembling a slender blade of grass in general shape, not round like a hair.

Megaginus emarginatus emarginatus, species novum. Text-plate X, figs. 3, 3a, 3b, 3c.

Types, ♂ and ♀ adult, from *Crypturellus obsoletus punensis*, collected at Sandillani, Dept. La Paz, Bolivia, November 25, 1934. U. S. N. P.

Description of species: Head uniformly and deeply pigmented about the same shade as the abdominal pleurites; depressed cordate in shape, much wider than long, with broadly rounded temples, sinuate occipital margin and pretantennary area sharply conical, with the sides concave and the front deeply emarginate; clypeal bands entire, although there is a faint indication of a clypeal suture; antennal bands reduced to an oval patch at base of clypeal bands; trabecular tubercles strongly developed, longer than wide; temples completely encircled by a narrow marginal band; occipital bands strongly developed (as in *Phlopterus*), extending from the posterior mandibular condyle to the sides of occiput, which is strongly convex; mandibles unusual, extremely massive, deeply pigmented, one with broad, toothed end, the other with a double point, and with the anterior edges heavily scored with black, concentric lines; antennae simple, similar in the sexes, thickened, and with the second segment the longest.

Five marginal hairs on each side of the preantennary area and three longer ones within the clypeal bands; a short hair at posterior angle of the eye, which is very large and hyaline; temples with two very long, pustulated hairs and two short bristles.

Prothorax of normal size, wider than long, front concave, sides rounded and divergent and with posterior margin transverse; posterior angles rounded, with one short hair; acetabular bars heavy and deeply pigmented and extending far into the mesothorax. Mesothorax short, wider than prothorax, sides convex and divergent, with angles blunt; one short and one very long, pustulated hair in the lateral angle and another on the meso-metathoracic suture inside the acetabular bars, which are broken into two pieces.

Abdomen rounded oval (more oval in ♀), with seven segments; lateral angles rounded and scarcely projecting; pleurites rather wide, not deeply pigmented, but with a complicated arrangement of internal, more deeply pigmented, longitudinal and transverse bands (see figure); spiracles small, situated at the inner edge of the pleurites on segments 1 to 6; tergal plates faintly pigmented but apparently entire, reaching across the whole segment from pleurite to pleurite, but separated one from another by wide hyaline bands along the sutures (wider posteriorly). Lateral angles of segment one with 1 long hair; 2nd. and 3rd. segments with 1 long and one short hair; 4th. and 5th. with 2 long and 1 short hairs; 6th. with 3 long and 1 short, and 7th. with three long ones on each side. Segments 1 to 5 with very long postulated hairs on the posterior margin of the tergal plates just inside the spiracles; on the 3rd. sternal plate are two median hairs, on the 4th. are 4 hairs and on the 6th. six hairs.

Legs large and stout, with tibiae but little longer than femora, but almost as thick, and with several stout spines on the apical portion on the inside.

Genital armature large. Basal plate wide, with expanded apical portion, and but faintly pigmented. Basal portion thickened and divided into two prongs to receive the parameres which are rather heavy, but slightly bent inward at the tip and faintly pigmented; endomerall plate long and slender, tipped by what is apparently a short, thick penis.

Female very similar to the male, except slightly larger, abdomen larger and more oval (less round), and with the 7th. segment very long and broad, with flatly rounded posterior margin set with three strong, long hairs on each side and several short ones. On the sternal plate there is a fringe of short, fine hairs across the median portion.

7 ♂♂ and 7 ♀♀ (including the types) taken from the same individual host as the types; 4 ♂♂ and 1 ♀ taken from the same host, collected at La Oroya, Dept. Puno, Peru, June 6, 1931.

Measurements:	♂		♀	
	length	width	length	width
body	1.10 mm.		1.16 mm.	
head	.40	.54 mm.	.41	.54 mm.
prothorax	.095	.28	.10	.285
pterothorax	.20	.37	.21	.39
abdomen	.57	.57	.63	.57
antennae	.19		.18	

Megaginus emarginatus sordidus, subsp. novum.

Types, ♂ and ♀ adult, from *Crypturellus b. berlepschi*, collected at Potedó, Rio San Juan, Chocó, Colombia, May 5, 1918.

Diagnosis: Resembling *emarginatus* in shape of prothorax, but nearer to *quadrithorax* in the color pattern of the pleural plates, but differs from both in having the head shorter and wider and pterothorax wider, but principally differs in having the pleural plates very narrow and entirely immaculate, with no trace of the prominent internal markings which are so characteristic of *emarginatus*. The male genital armature is very close to that of *quadrithorax*, but the 7th. abdominal segment in the female is quite different from that of *emarginatus* (♀ of *quadrithorax* unknown).

The "scent organ" is of the type of *quadrithorax*, but with longer hair-like appendage.

Measurements:	♂		♀	
	length	width	length	width
body	1.14 mm.		1.20 mm.	
head	.39	.56 mm.	.39	.57 mm.
prothorax	.11	.29	.11	.30
pterothorax	.21	.40	.22	.42
abdomen	.58	.59	.63	.60
antennae	.22		.20	

Megaginus quadrithorax, species novum. Text-plate X, figs. 4, 4a.

Type, ♂ adult, from *Tinamus major robustus*, collected at Rio Siesola, Costa Rica, October 28, 1904.

Diagnosis: Much resembling *emarginatus* in general appearance, but differs radically in several characters, the principal ones being the shape of the prothorax and the different style of marking on the pleural plates.

The pterothorax is somewhat longer, about the same width, but is decidedly rectangular in shape, the sides being nearly parallel and slightly concave, instead of strongly divergent and convex. The whole body seems to be less deeply pigmented, but this may be due to excessive clearing. The pleural plates are less deeply pigmented and uniform in color throughout, except for a slightly darker, longitudinal band along the inner side of the sclerite, almost touching the edge. There is no indication of the deeply pigmented band along the outer border of the pleurite, with its median transverse branch crossing the longitudinal band. Chaetotaxy very similar, but male genital armature somewhat different.

The "scent organ" is slightly different, lacking the raised marginal ridge on inner side. It is larger and somewhat saucer-shaped, with the surface smoother and the hair-like appendage slightly narrower and shorter

Measurements:	♂	
	length	width
body	1.12 mm.	
head	.40	.52 mm.
prothorax	.12	.27
pterothorax	.21	.36
abdomen	.58	.54
antennae	.21	

A series of 4 ♂♂ and 12 ♀♀ from *Crypturellus soui inconspicuus*, collected at Sta. Ana and Chiñiri, Bolivia, are very close to *emarginatus*, but

are uniformly much smaller, especially the head and abdomen, but the markings of the pleural plates are almost identical. I have not thought it advisable to separate these specimens from *emarginatus*, with no distinguishing characters other than size. The "scent organ" is not quite the same shape, but very close, the encircling ridge on the inner side being less developed.

2 ♀♀ from *Crypturellus soui nigriceps*, Tamborapa, Peru, are also close to the above, there being but a slight variation in the pattern of the markings on the pleural plates.

CUCLOTOCEPHALUS, genus novum

Genotype, *Cuclotocephalus extraneus*, sp. nov.

The characters of this genus, composed, at present, of but two closely allied species, must rest solely on the female, the male being still unknown. Taken thus far only on the avian genus *Nothoprocta*.

Diagnosis: Size small (less than 2 mm. in length); head almost circular, with a short, blunt trabecular process; antennary sinus shallow; eye large, protruding, clear, and bearing a long hair; antennae of medium size and simple, 1st., 2nd. and 5th. segments subequal; mandibles rather large, but delicately constructed and set in middle of head; pharyngeal sclerite and gland strongly developed.

Prothorax of medium size, without lateral angles. Meso- and meta-thorax completely fused into a pterothorax, the suture but faintly indicated in lateral portion. Pterothorax very small, much narrower than head, and but little wider than prothorax, and with posterior portion deeply imbedded within the first abdominal segment.

Abdomen large, elliptical, with seven segments and with the spiracles present in segments one to six; pleurites narrow and not strongly chitinized, but are distinct from the faintly chitinized tergites; no distinctive abdominal markings. Head markings small and inconspicuous. Chaetotaxy normal. Legs rather small, femora and tibiae subequal in length.

Cuclotocephalus extraneus, species novum. Text-plate XI, figs. 1, 1a.

Type, ♀ adult, from *Nothoprocta branickii*, collected at Desaguadero, Lake Titicaca, Peru, May 4, 1931.

Description of type: Head almost circular, a shade wider than long, and the greater portion rather deeply colored; antennary sinus rather long, sharply defined, but shallow, and occiput slightly concave; clypeal band narrow, continuous; antennal bands short (merely an oval spot) and deeply colored; another deeply colored spot just in front of eye; mandibles large, but slender, and set in middle of head; faintly shaded area in front of mandibles large; about seven short dorsal hairs on each side of clypeal area; two long and one short hair at base of trabecular tubercle, and one within the ocular blotch. Eye large, clear, and with a long, strong hair; temples with two long, strong, pustulated hairs in the median portion and three short bristles; the greater part of the dorsal integument of head with small, closely set, shallow depressions, giving the appearance of hammered

brass; antennae of medium length, rather stout, with segments 2 to 5 of about equal thickness, and with dark colored borders.

Prothorax small, extending rather far under the head; front concave, sides slightly convex and lateral angles rounded, the posterior pair with one short bristle. Two strong hairs on prosternum and mesosternum.

Pterothorax small and narrow, narrower than head, and but little wider than prothorax; sides slightly convex, divergent, with sides short and lateral angles broadly rounded, with two long and one short hair and one spine; two strong, pustulated hairs on dorsal surface; posterior portion of segment with sides converging and posterior margin flattened.

Abdomen elliptical, of seven segments, with first the longest; spiracles in segments 1 to 6, inside of pleurites; pleurites narrow, but clearly outlined and more deeply colored than the tergites, which are broken medially, and with clear spaces between them; 7th. segment broad and rounded; pleurites, tergites and dorsal integument of posterior portion of pterothorax rugose, like the head. Lateral angles of 1st. segment with long hair; 2nd. with one long hair and two short bristles; 3rd. and 4th. with two hairs and one bristle; 5th. and 6th. with three long and one short hairs; 7th. with one long and several short hairs on each side on margin and two long dorsal hairs; four rather long dorsal hairs in medium portion of posterior margin of segments 1 to 5, and two on No. 6; one strong, short, pustulated hair on posterior margins of segments 1 to 3, just within the pleurites, and one smaller hair in same position on segments 4 and 5; two to five hairs in middle of posterior margin of sternites 1 to 5.

Legs of medium size, femora and tibiae subequal in length with the 2nd. and 3rd. pair of tibiae unusually slender, with a few short spines; claws short and heavy.

Measurements:	♀	
	length	width
body	1.82 mm.	
head	.48	.49 mm.
prothorax	.18	.30
pterothorax	.32	.39
abdomen	1.13	.74
antennae	.21	

In addition to the type, four other females were taken from the same individual host. Male unknown.

Cuclotocephalus secundus, species novum. Text-plate XI, fig. 2.

Type, ♀ adult, from *Nothoprocta pentlandi*, collected at Canta, Dept. of Lima, Peru, November 18, 1929.

Diagnosis: Quite similar to *C. extraneus* in general appearance, but decidedly smaller; head slightly longer than wide, with occiput transverse (instead of concave) and temples proportionately wider, so that the head does not form as nearly a perfect circle as in *C. extraneus*; markings of head similar, but whole head paler, and less heavily pigmented; chaetotaxy the same as in *extraneus*; integument of head, thorax and abdomen perfectly smooth (not rugose, with the appearance of hammered brass. It is possible, however, that the type specimen is an individual not fully adult,

or is one which has recently shed its integument, and for this reason the rugose appearance of the integument has not yet developed. However to all outward appearances, the type is fully adult).

Thorax of the same shape and chaetotaxy, but smaller than in *extraneus*. Abdomen also similar in shape and chaetotaxy, but pleurites less heavily pigmented and less sharply delineated. Legs similiar but smaller.

Measurements:	♀	
	length	width
body	1.56 mm.	
head	.42	.39 mm.
prothorax	.14	.24
pterothorax	.25	.31
abdomen	.86	.62
antennae	.18	

Known only from the type specimen.

NOTHOCOTUS, genus novum

Genotype *Nothocotus parvithorax*, species novum.

Diagnosis: Superficially much resembling *Docophorocotes* in the shape of head, style of thorax and abdomen, but differing radically in the character of the antennae, which are strongly dimorphic. The first segment in the male is much swollen and elongated; the second segment small and the third with a strong lateral hook at the distal end, while in the female the antennae are filiform and simple. Head triangular, with rounded conical front and convex sides; temples rounded and not extending behind occiput; antennary fossa deep in the male, but nearly absent in the female; trabeculae replaced by a small tubercular process, as in *Heptapsogaster*. Male genital armature rather heavy, with short basal plate; well developed thickened parameres and large telomeron and small endomeres.

Prothorax wider than long, with divergent sides; meso- and metathorax almost completely fused, with the latter almost as wide as the former in the anterior portion, the suture visible only in lateral portion, outside of the acetabular bars; metathorax longer than mesothorax, with sides convergent, and the entire segment deeply imbedded within the first abdominal segment; at least one pair of long, strong hairs on meso- and metasternum.

Abdomen short and broadly oval, of seven segments, the first the longest; pleural plates sharply delineated, of medium width, rather heavily pigmented, with darker interior markings; spiracles present in segments 1 to 6. Legs of unequal length and size, the first pair small, the second medium and third pair quite large, with long tibiae, those of 2nd. and 3rd pair bearing a few spines.

There is a small remnant of the pleural plate of the original first abdominal segment, which lies under the second (now called the first) at its anterior end. It is not entirely overlapped by the second, a narrow margin extending beyond at the front. No trace of sternal or tergal plates of the old first segment.

Nothocotus parvithorax, species novum. Text-plate XI, figs. 3, 3a, 3b.

Types, ♂ and ♀ adult, from *Nothocercus bonaparti*, collected at La Cumbre de Valencia, Venezuela, September 12, 1910.

Description of type: Except for the antennae, this species much resembles *Docophorocotes saxetosus* (Piaget) in the shape of the head and body and in the markings.

Clypeal margin conical, with sides slightly concave and front bluntly rounded; antennary fossae rather deep, with a small tubercular process at the anterior angle; temples expanded, with both lateral and posterior margins slightly convex and lateral angle bluntly rounded; occiput truncate and slightly emarginate; antennae strongly dimorphic, the first segment elongated and swollen, the 2nd. small, the 3rd. also short, but with a well-developed lateral hook at the distal end and with the 4th. segment jointed at its end (not in the middle as in *Heptapsogaster*); 4th. segment small, but 5th. longer, about as long as the 2nd.; mandibles heavy, strongly chitinized and pigmented, and with a series of fine, concentric lines etched around the tips; pharyngeal sclerite and gland well developed. Clypeal band poorly chitinized and absent on front of head, but with two, deeply colored, rounded projections on the inner edge; antennal bands short, deeply pigmented, and reaching but half way to base of mandibles; temples with a narrow, dark, marginal band, extending from sides of prothorax to antennary fossa, where it bends inward and ends; another dark spot on each side of the occiput, at anterior angle of the prothorax.

Prothorax short, twice as wide as long, with convex, divergent sides and blunt posterior angles set with a short spine; frontal edge concealed beneath occiput and posterior margin slightly concave. Mesothorax but little wider than prothorax, sides convex, but very little expanded and not extending forward beyond the prothoracic suture; lateral angles rounded and set with two long, thickened hairs, with a third on the posterior margin of the segment, just within the edge of metathorax.

Metathorax longer than mesothorax, and almost as wide in front; convergent and slightly concave, with posterior margin transverse; whole segment imbedded within the 1st. abdominal segment, nearly reaching its posterior margin; a pair of strong hairs on both meso- and metasternum.

Abdomen oval, consisting of seven segments, the first the longest, the remainder subequal, the 7th. rather wide and with flatly rounded tip; pleural plates of medium width, sharply delineated but not deeply pigmented; they overlap at the sutures, causing a darker band across the segment at that point; there is a darker, narrow marginal band on one to four, wide on segment one and very narrow on four; there is a darker, undulating, internal blotch across the middle of pleurites 2 to 6, while the 7th. is almost uncolored. Lateral angles of segments 1 to 4 with one hair; segments 5 and 6 with two hairs, these hairs being short on 1st. and longest on 6th.; 7th. segment with sides constricted and median portion rounded and bearing six hairs of medium length set within the margin; also several small hairs along the margin; a few short hairs along the posterior margins of the pleural plates in segments 3 to 5, and several short hairs in the median portion of the tergal plates. Legs of medium length, but stout, especially the tibiae, which are longer than the femora, and with the third pair of legs much the largest; claws strong and equal in length on each leg, 3rd. pair the longest; several stout spines on the tibiae.

Male genital armature small, with basal plate very poorly developed and poorly chitinized; parameres rather long and thickened and apparently fused to the inside of the apical portion of the basal plate, where it is thickened and slightly swollen; parameres not sharply curved, grooved on the inner side; endomeral plates almost wholly inside the end of basal plate, lying along the inner side of the parameres; telameron well developed, with a small slender penis at end, which reaches nearly to the tips of the parameres.

Female with head and thorax similar to the male, but abdomen larger and more elongate oval; antennae simple, the 1st. segment somewhat globular but slightly thicker than the second, which is the longest; antennary fossae obsolete, with head markings and chaetotaxy like the male. Abdomen longer and wider, with the markings the same, but less pronounced; 7th. segment flatly rounded posteriorly and with front bluntly cone-shaped; in addition to the rather short marginal and submarginal hairs along the posterior edge, there is a curving row of fine, short hairs across the middle of the segment, on the ventral face; a faint transverse band across the sides of segment 6 indicate the lateral margin of the genital signature or sternal plate.

Measurements:

	♂		♀	
	length	width	length	width
body	1.11 mm.		1.38	
head	.38	.41 mm.	.43	.48 mm.
prothorax	.12	.28	.12	.30
pterothorax	.19	.36	.23	.38
abdomen	.61	.54	.82	.63
antennae	.22	.18		

Nothocotus subsimilis, species novum. Text-plate XII, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Nothocercus nigrocapillus cadwaladeri*, collected by H. R. Roberts, at Leymebamba, Dept. Amazonas, Peru, July 31, 1932.

Diagnosis: Very close to *N. parvithorax*, but may be distinguished from that species as follows: Front of head broader and more rounded, less conical, and with the sides straight to slightly convex (not concave); 3rd. segment of antennae in ♂ with the distal hook much shorter and the whole segment smaller, while the 1st. segment is much less enlarged. Prothorax not so wide and with the sides less rounded, and with the posterior, lateral angles sharper; metathorax with the sides straight (not concave) and with the posterior lateral angles more acute. Abdomen with pleural plates more deeply pigmented, without the narrow marginal, darker border, and with the internal markings more pronounced, as well as the darker, overlapping portion at the sutures wider.

Male genital armature with parameres shorter, with more slender, pointed tips, which bend abruptly inward; the structure at the junction of the parameres with the basal plate is quite distinct (see figure), while the endomeral plates are larger and the penis has a small oval tubercle on either side. The female differs from the male in the same manner as does that of *N. parvithorax*, and from the female of *parvithorax* in the same

manner as the male differs from that species. There is also a slight difference in the chaetotaxy of the 7th. abdominal segment, as may be seen from the figure.

Measurements:	♂		♀	
	length	width	length	width
body	1.15 mm.		1.32 mm.	
head	.37	.42 mm.	.38	.43 mm.
prothorax	.13	.26	.11	.28
pterothorax	.19	.35	.23	.37
abdomen	.63	.57	.79	.57
antennae	.21		.16	

Three males and one female (including the types) in the type series.

Subfamily HEPTAPSOGASTRINAE

Genus RHOPALOCERAS Taschenberg

Rhopaloceras (subgenus of *Goniodes*) Taschenberg, Nova Acta Halle, XLIV, 1882, p. 46. Type, *Goniodes aliceps* Nitzsch (equals *G. oniscus* Nitzsch). Host, *Tinamus tao*.

The genus as now restricted, will contain but two of the species originally placed in it by Taschenberg, viz.: *R. oniscus* (Nitzsch) and *R. laticeps* (Piaget), but in addition several new species which are described in this paper. Taken on several genera and many species of Tinamous, but only those genera inhabiting forest or woodland.

Diagnosis: Antennae varying from slightly to strongly dimorphic, but the first segment in the ♂ always larger than the corresponding segment in the ♀; first segment never with an appendage, but third segment sometimes with a distal hook (in ♂); antennae of female shorter and filiform.

Temples broad and wing-like, angulated and produced backward almost (if not quite) to the posterior margin of the prothorax; front broadly rounded; a strong hook or trabecular tubercle, located at the frontal margin of the antennary fossae, extends backward and downward under the first segment of the antennae. Prothorax rather large, wider than long, with strongly divergent sides and as wide as mesothorax. Mesothorax wider than long, with sides from nearly straight to concave or convex or divergent; metathorax short, but wider than mesothorax and fused medially with that segment; meso-metasternum strongly developed, with numerous strong hairs; posterior margin of metanotum of same shape as 1st. abdominal segment, and has been mistaken by previous authors as an abdominal segment.

Abdomen of seven segments, spiracles present in segments 1 to 6; pleural plates strongly overlapping, producing an exceedingly complicated pattern of lines and color. A series of unique, strongly developed, comb-like processes on the posterior, ventral margin of the pleural plates 1 to 5, in both sexes, the teeth of which vary greatly in number on the different segments and in the different species of the genus. The teeth are flat, nearly parallel sided, with rounded tips and with a thickened, median, longitudinal vane. They are always most numerous on the 1st. segment and fewest on the 5th., and are always more numerous in the ♀ than in the ♂. Legs large,

especially the third pair, which have long, narrow tibiae with rows of spines on both sides.

Structure of male genital armature and the last abdominal segment in the female present unusually good characters for the separation of the species in this genus. The amount of specialization in the male genital armature seems to bear a direct relationship to the amount of dimorphism in the antennae, *R. oniscus* having the greatest amount of specialization in both, while *R. rudimentarius* has the least. The number of teeth in the ventral combs of the pleural plates is slightly variable, not only in individuals from the same individual host, but on the right and left sides in the same specimens. However some forms have so many more teeth than others that their number forms a good specific character, especially for separating the females, when taken in connection with the structure of the last abdominal segment.

Thus far the genus has been taken on the following genera of Tinamous: *Tinamous*, *Nothocercus* and *Crypturellus*, all of which are more or less forest-inhabiting forms, while it is apparently absent on the genera living in open grass lands, such as *Rhynchotus* and *Nothoprocta*. The size of the parasite seems to be in proportion to the size of the host, the larger forms being found on *Tinamus* and *Nothocercus*, and the smaller on *Crypturellus*. Females when unaccompanied by males, may be identified by careful comparison with the figures illustrating the last abdominal segment and by comparing the teeth in the abdominal combs.

Rhopaloceras oniscus (Nitzsch). Text-plate XIV, figs. 2, 2a, 2b, 2c.

Goniodes oniscus Nitzsch, in Giebel, Zeit. f. ges. Nat., XXVIII, 1866, p. 388, ♀ (Host: *Tinamus tao*).

Goniodes aliceps Nitzsch, in Giebel, Zeit. f. ges. Nat., XXVIII, 1866, p. 389, ♂ (Host: *Tinamus tao*).

Taschenberg has published a very good figure of a *Rhopaloceras*, which he has called *aliceps* (= *oniscus*), but if he has given an approximately correct delineation of the genital armature, the specimen from which the drawing was made is either not *aliceps*, or else the type of *aliceps* was not taken from *Tinamus tao*, the genital armature being of a type very distinct from that of the parasite I have taken on that host, and approximates the genital armature of *R. genitalis simplex*, from *Tinamus major castaneiceps*. I have here presented carefully prepared figures of the antennae and genital apparatus of both sexes, drawn from specimens taken by myself from freshly killed birds of *Tinamus tao tao*, collected at Lagunitas de Aroa, Venezuela, and have employed these specimens as topotypes in the characterization and arrangement of the species and subspecies of the genus.

Diagnosis: The antennae of the ♂ are almost typical of the genus *Goniodes*, having the first segment much enlarged and with the third possessing a short hook on the distal end, or in other words, having the fourth segment attached near the middle of the third, instead of at the end.

♂ genital armature as in all species of the genus, the basal plate is long and wide, extending forward (in this species) to the posterior margin of

the 2nd. abdominal segment. The parameres and endomeres are simple, the former well developed and presenting no unusual characters, while the latter are short and lie alongside the basal portion of the penis, which is unusually well developed. The penis is long and slender, but thickened basally, and extends well beyond the distal ends of the parameres. It is scantily chitinized, but possesses two slender, internal rods, which are strongly chitinized, and which extend from the base almost to the tip, along the lateral portions, but not touching the lateral walls. At present we know of but two other forms of the genus which possess these rod-like structures, viz: *R. genitalis* and *R. g. simplex* (herewith described), but both of these forms have the penis short and thick, and with very different structure throughout.

The female genitalia are also distinct from that of all the other known forms, being long, tapering to slender tips and widened internally. On either side are slender, heavily chitinized rods or braces, extending from the sides of the genitalia diagonally forward into the adjoining abdominal segment, and ending just within the edge of the last abdominal comb. *R. genitalis* and *R. g. simplex* also have these brace-like rods strongly developed, but they are of a very different shape, and are attached to the genitalia at the base instead of on the sides.

Number of teeth in the abdominal combs:

	♂		♀	
	left	right	left	right
1st. segment	19 to 23	21 to 22	21 to 23	21 to 22
2nd. "	18 " 19	17 " 20	17 " 17	18 " 21
3rd. "	16 " 17	15 " 17	14 " 18	18 " 18
4th. "	15 " 16	13 " 15	14 " 15	15 " 15
5th. "	5 " 7	7 " 8	7 " 8	6 " 8

Measurements:	♂		♀	
	length	width	length	width
body	3.66 mm.		4.76 mm.	
head	1.28	1.68 mm.	1.50	2.30 mm.
prothorax	.45	1.12	.52	1.26
mesothorax	.38	1.26	.40	1.30
metathorax	.38	1.45	.53	1.64
abdomen	1.74	1.58	2.25	1.74
antennae	.64		.60	

Material studied:

7 ♂♂ and 1 ♀ from *Tinamus tao tao*, Lagunitas de Aroa Venezuela.
2 ♂♂ and 3 ♀♀ from *Tinamus tao kleei*, La Pampa, Dept. Puno, Peru.

Rhopaloceras laticeps (Piaget).

Goniodes laticeps Piaget, Les Pediculines, 1880, p. 259, pl. XXI, f. 6 (Host: *Tinamus*) *Nothocercus julius*).

Unfortunately, I have not been able to secure material of this genus from *Nothocercus julius*, but after a careful analysis of Piaget's description and figure, it is very evident that it is closely related to my new form *R.*

abbreviatus, from *Nothocercus nigrocapillus*, and I have therefore made *abbreviatus* a subspecies of *R. laticeps*.

I have found that other closely related hosts in this family have forms of *Rhopaloceras* which are conspecific, but differ sufficiently in minor characters to be given subspecific rank. The number of teeth in the abdominal combs of *laticeps* (3 to 15) corresponds closely with those of *abbreviatus*, while the measurements are also close. I feel sure, however, that subspecific characters separating them will be found when specimens of authentic *laticeps* are available for study. The figure published by the author as that of *R. laticeps* Piaget (Univ. Nebr. Studies, 1903, p. 35, pl. IV, fig. 3) taken on *Tinamus robustus*, was incorrectly identified, as also was the host, the latter proving later to be *T. major castaneiceps*, while the parasite is an undescribed form, *R. genitalis simplex*, described below. I herewith append the measurements as given by Piaget for *laticeps*.

Measurements:	♂	
	length	width
body	3.00 mm.	
head	1.00	1.44 mm.
thorax (entire)	.64	.85 (pro- and mesothorax)
abdomen	1.65	1.35 (includes metathorax)
antennae	.48	

Rhopaloceras laticeps abbreviatus, subsp. novum. Text-plate XIII, figs. 2, 2a, 2b, 2c.

Type, ♂ adult, from *Nothocercus nigrocapillus calwaladeri*, collected by H. R. Roberts at Leymebamba, Peru, July 31, 1932. Parasites collected by the author from freshly killed bird.

Diagnosis: With general appearance of *R. laticeps laticeps*, with which it agrees closely in size, general form and with approximately the same number of teeth in the abdominal combs. The head and thorax are proportionately wider and the antennae longer than in *laticeps*, with the first segment more swollen. The sides of the prothorax are decidedly convex; the head is larger in proportion to the thorax and abdomen, the latter being shorter and more rounded posteriorly. The ♂ genital armature is rather simple, with the penis well developed; basal plate long and heavy, and extending well up under the metathorax; the parameres are comparatively short, thickened basally and slender apically, with the tips curving inward; the endomeres are half the length of the parameres; the penis is nearly as long as the parameres, thickened and chitinized except at tip, with a more heavily chitinized lateral border reaching to the tip. (This structure may be merely the endomerical plates, the wide, paler part being the ventral, and the two deeply pigmented bands on each side the dorsal plates.)

Abdominal combs:	♂		♀	
	left	right	left	right
1st. segment	15 to 18	10 to 16	18 to 22	19 to 25
2nd. "	12 " 13	12 " 17	16 " 18	17 " 20
3rd. "	12 " 13	10 " 14	15 " 17	17 " 18
4th. "	9 " 10	8 " 9	12 " 14	13 " 15
5th. "	4 " 5	3 " 4	6 " 7	5 " 6

Measurements:	♂ (type)		♀	
	length	width	length	width
body	2.90 mm.		3.92 mm.	
head	1.02	1.48 mm.	1.26	1.56 mm.
prothorax	.38	.90	.48	1.10
mesothorax	.33	1.08	.36	1.28
metathorax	.32	1.17	.22	1.37
abdomen	1.52	1.30	2.04	1.51
antennae	.56		.44	

Material examined: The ♂ type was the only specimen taken from *N. nigrocapillus cadwaladeri*. 1 ♂ from *N. nigrocapillus* (intermediate between *nigrocapillus* and *cadwaladeri*, collected at Huacapistana, Peru, April 3, 1930. 4 ♂ and 5 ♀ from *N. n. nigrocapillus*, collected at Sandillani, Bolivia, on Nov. 23, 1934.

Remarks: The type specimen is slightly larger than all the other males taken, while those from Sandillani are the smallest. In other respects they all seem to be identical. The measurements and figures for the female were taken from a Sandillani specimen.

Rhopaloceras genitalis genitalis, species novum. Text-plate XV, figs. 2, 2a, 2b, 2c.

Types, adult ♂ and ♀, taken on *Tinamus serratus ruficeps*, collected near Santa Marta, Colombia, May 2, 1913.

Diagnosis: Similar in outline and general characteristics to *R. oniscus*, but slightly smaller, many more teeth in the abdominal combs, ♂ genital armature of an entirely different type, and the last abdominal segment in the ♀ quite distinct (see figures). Sides of the prothorax straight, and with the posterior lateral angles slender and even with the front of the mesothorax.

Male genital armature: Basal plate very heavy (wider than usual), strongly chitinized, especially along the sides, and somewhat shorter than in most species, extending only as far forward as the posterior margin of the first abdominal segment. Parameres short, rather thickened, and tapering rapidly to the slender, *outcurving* tips; endomeres small and inconspicuous, laying along the inner edge of the basal portion of the parameres and over the thickened base of the penis (or pseudopenis?); the penis is well developed, short, thickened, shorter than the parameres, and with the basal portion widened into a thick, mushroom-shaped process; two slender, slightly chitinized, internal rods (not always clearly visible) extend from the posterior edge of the thickened base almost to the rounded tip.

The female genitalia is of a type not found in any other known species of the genus, is rather complicated in its structure, but easily recognized by the heavily chitinized lateral bands or braces, extending diagonally outward from the basal portion of the last sternal plate into the sixth abdominal segment. In *R. oniscus* there are somewhat similar braces, but of different shape, and arising from each side of the genitalia and not from the base.

Abdominal combs:	♂		♀	
	left	right	left	right
1st. segment	16 to 22	19 to 21	24 to 27	26 to 27
2nd. "	15 " 17	15 " 17	17 " 22	19 " 20
3rd. "	13 " 15	13 " 16	17 " 19	16 " 17
4th. "	11 " 14	12 " 14	16 " 19	15 " 18
5th. "	6 " 8	7 " 8	11 " 12	9 " 12

Measurements:	♂		♀	
	length	width	length	width
body	3.48 mm.		4.76 mm.	
head	1.20	1.73 mm.	1.41	1.94 mm.
prothorax	.43	1.06	.50	1.20
mesothorax	.34	1.20	.40	1.34
metathorax	.35	1.33	.43	1.49
abdomen	1.44	1.42	2.56	1.65
antennae	.72		.55	

Material examined: 2 ♂ (including type) and 3 ♀ from *Tinamus serratus ruficeps*, collected at Las Vegas and Pueblo Viejo, Sierra Nevada de Sta. Marta, Colombia, on May 2 and March 13, 1913. 2 ♀ from *Tinamus major major*, collected by O. L. Austin, Jr. at Kartabo, British Guiana, June 29, 1925. Parasites in coll. of H. S. Peters.

Rhopaloceras genitalis simplex, subsp. novum. Text-plate XV, figs. 1, 1a, 1b, 1c. = *R. ruficeps* (Wied.)

Types, ♂ and ♀ adult, taken on freshly killed specimens of *Tinamus major castaneiceps*, collected at Pozo Azul, Costa Rica, June, 1902.

Diagnosis: Quite similar to *R. g. genitalis*, but slightly smaller; abdominal combs with an average of more teeth on segments 1 to 4, and with less on the 5th. segment. The head is the same length as in *genitalis*, but narrower across the temples, while the antennae are considerably shorter (.66 mm. against .72 mm.) and with some of the segments of different shape (see illustration). The sides of the prothorax are markedly concave (straight in *genitalis*), and with a slight angular projection on the sides near the front.

Male genital armature: basal plate about as in *genitalis*, but slightly different in outline toward the posterior end; parameres shorter than in *genitalis*, and attached to the end of the basal plate, instead of inside of it, and with the tips apparently curved inward; the penis extends beyond the tips of the parameres (shorter than parameres in *genitalis*); the endomeral plates are better developed, considerably thickened basally, and are attached further back, inside the ends of the basal plate; the penis (or pseudopenis?) is practically of the same shape and structure, though proportionately longer, the internal rods are more strongly chitinized and always clearly visible.

The female genitalia is also of the same type as in *genitalis*, but is more slender apically, with the basal portion small, and the diagonal rods wider, more conspicuous and extending further into the adjoining segment.

Abdominal combs:	♂		♀	
	left	right	left	right
1st. segment	21 to 22	21	23 to 25	25 to 29
2nd. "	17 " 19	17 to 19	18 " 23	19 " 21
3rd. "	15 " 17	15 " 17	18 " 20	17 " 20
4th. "	13 " 15	12 " 16	15 " 20	15 " 18
5th. "	5 " 7	6 " 7	8 " 10	9 " 11

Measurements:	♂		♀	
	length	width	length	width
body	3.32 mm.		4.44 mm.	
head	1.20	1.64 mm.	1.64	1.98 mm.
prothorax	.44	1.08	.50	1.24
mesothorax	.36	1.35	.40	1.42
metathorax	.40	1.38	.41	1.60
abdomen	1.80	1.46	2.74	1.76
antennae	.66		.58	

Material examined: 6 ♂♂ and 8 ♀♀ (including types), from *Tinamus major castaneiceps*, collected at Pozo Azul, Costa Rica, June, 1902. 2 ♂♂ from *Tinamus major fuscipennis*, collected by the author at Rio Siesola, Costa Rica, October 7, 1904.

Rhopaloceras brevitemporale, species novum. Text-plate XIII, figs. 1, 1a, to 1e.

Types, ♂ and ♀ adult, on freshly killed specimen of *Crypturellus obsoletus punensis*, collected at Calabatea, Dept. La Paz, Bolivia, November 15, 1934. *♂ holotype (U.S.N.M.)*

Diagnosis: Size small; teeth on abdominal combs few in number; spinous process at base of antennae very small and set well inside of antennary fossae, instead of at its outer, anterior edge; head narrower, with less expanded temples, both laterally and posteriorly, but still decidedly wider than abdomen, and larger than usual in proportion to the size of the body; sides of prothorax slightly concave and the postero-lateral angles thicker and more rounded posteriorly; the antennae very simple, differing but slightly in the sexes, except for the slightly lengthened and thickened first segment in the male.

Genital armature of the male organ is simple, the basal plate long and wide, extending well within the metathorax and is poorly pigmented, except laterally on basal portion. The parameres are short and of the usual type, but the endomeral plates are better developed (in proportion to the parameres). The penis is apparently rudimentary for after a careful examination of five males, it was not possible to differentiate it with certainty, it probably lying hidden within the endomeres.

The female genital armature is also simple, very small, slightly protruding and with the brace-rods weak, poorly chitinized and pigmented and of simple construction.

Abdominal combs:	♂		♀	
	left	right	left	right
1st. segment	10 to 11	11 to 12	13 to 18	13 to 16
2nd. "	9 " 12	9 " 11	12 " 14	11 " 14

Abdominal combs (cont.):					
3rd. "	7 " 9	7 " 10	11 " 13	10 " 13	
4th. "	6 " 9	7 " 9	9 " 11	8 " 9	
5th. "	4 " 5	4 " 4	4 " 6	5 " 5	

Measurements:	♂		♀	
	length	width	length	width
body	2.08 mm.		2.96 mm.	
head	.73	1.06 mm.	.97	1.22 mm.
prothorax	.26	.62	.33	.75
mesothorax	.24	.75		
metathorax	.22	.81		
abdomen	1.04	.91		1.12
antennae	.35		.33	

5 ♂♂ and 2 ♀♀ (including the types) from *Crypturellus obsoletus punensis*, collected at Calabatea, Bolivia, Nov. 15, 1934. 1 ♂ and 2 ♀♀ from same host, collected at Sandillani, Bolivia, November 25, 1934. 2 ♀♀ from *Crypturellus obsoletus ochraceiventris*, collected at Encñas, Dept. Junin, Peru, on March 12, 1930.

Rhopaloceras rudimentarius, species novum. Text-plate XIV, figs. 1, 1a, 1b, 1c.

Types, ♂ and ♀ adult, taken on freshly killed specimens of *Crypturellus soui nigriceps*, collected at Tamborapa, Dept. Cajamarca, Peru, on July 14, 1933.

Diagnosis: In proportions of head somewhat resembling *R. laticeps abbreviatus*, but differing from that species in several very essential characters. The head is much smaller in proportion to the size of the body, the abdomen being larger, longer and of different shape; the number of teeth on the abdominal combs somewhat different, while the genital armature of both sexes is entirely different, exceedingly rudimentary and unique in its characters in the male.

Genital armature: The basal plate is wide and long, as in the other known species of the genus, and extends forward to the posterior edge of the metathorax. The parameres and endomeral plates are very small and rudimentary, the former but half the length of the well-developed penis. They are attached to the end of the basal plate, thickened at the base and taper rapidly to a slender tip. The endomeral plates are apparently attached on either side of the base of the penis, extending backward within the end of the basal plate and curve slightly inward towards the tips. The female genital armature is correspondingly simple, being short, but slightly protruding and rather thickened. The diagonal brace-rods are absent, but there is a small detail present in the median portion not observed in any other species of the genus (see figure). In the thickened median portion there is a small clear space, into which protrude posteriorly two short, out-curving, hook-like processes. It is further characterized by the presence of a strong, longish hair on each side and four shorter hairs on the dorsal surface. With the exception of *R. pennaticeps*, this is the only known species with strong hairs on the genital apparatus of the female.

Abdominal combs:	♂		♀	
	left	right	left	right
1st. segment	18	16	22	19
2nd. "	12	12	17	18
3rd. "	12	10	17	16
4th "	11	11	14	13
5th "	5	5	6	4

Measurements:	♂		♀	
	length	width	length	width
body	2.54 mm.		3.56 mm.	
head	.90	1.28 mm.	1.04	1.48 mm.
prothorax	.32	.78	.35	.94
mesothorax	.28	.93	.30	1.06
metathorax	.29	1.06	.34	1.18
abdomen	1.33	1.16	2.07	1.32
antennae	.50		.40	

Material examined:

- 3 ♂♂ and 5 ♀♀ (including types). See citation under types.
 3 ♂♂ and 2 ♀♀ from *Crypturellus soui inconspicuus*, collected at Teoponte, Rio Kaka, Bolivia, August 20, 1934.
 6 ♂♂ and 8 ♀♀ from same host, collected at Chiñiri, Rio Kaka, Bolivia.
 1 ♀ from *C. s. modestus*, collected at Rio Sicsola, Costa Rica, March 23, 1904.
 2 ♂♂ and 2 ♀♀ from *C. s. mustelinus*, collected at Sta. Marta, Colombia.
 1 ♀ from *C. s. soui*, collected at El Callao, Venezuela, in 1909.
 1 ♀ from *C. u. undulatus*, collected at Reyes, Bolivia, Sept. 16, 1934.
 1 ♀ from *C. undulatus yapura*, collected at Shapaja, Rio Huallaga, Peru, November, 1932.

Rhopaloceras pennaticeps (Paine and Mann). Text-plate XV, figs. 3, 3a, 3b, 3c.

Goniodes pennaticeps Paine and Mann, Psyche, vol. XX, 1913, p. 16, fig. 3 (*Anthus lutescens*—straggler from *Crypturellus tataupa*).

Diagnosis: Size small, one of the smallest known species of the genus. Antennae small and but slightly dimorphic in the two sexes, the 1st. segment being longer in the male. The abdominal combs are well developed, with long teeth and ranging in number from a maximum of 12 on the 1st. segment to a minimum of two on the 5th. With the exception of the pleural plates, acetabular bars and head markings, the whole body is faintly pigmented; hairs at lateral angles of the abdominal segments few and short, except on the last three segments; numerous long, strong hairs on the posterior margin of the tergal plates, most numerous on the first segment (about 10), and fewest on the 6th. (two); short and weaker hairs on posterior margin of the sternal plates; prothorax noticeably narrower than the mesothorax.

The male genital armature is more than usually complicated, but poorly chitinized and pigmented and the parts difficult to differentiate, but I think that the illustration shows their correct position. The basal plate is long,

rather narrow and very thin, and with no apparent suture between it and the parameres, which are long and slender and poorly pigmented, except for a small triangular patch at their base. The endomerical plates are strongly developed, thickened, and about half the length of the parameres, apparently lying over the penis, which fills the space between the parameres and is entirely without indication of internal, chitinized rods. The female apparatus is short, thickened, and rather complicated, having the usual slender, lateral plates and in addition, short, thick, diagonal brace-rods of simple shape. It is also distinguished by the presence (as in *R. rudimentarius*) of one strong hair on either side and two longer ones on the dorsal surface.

Number of teeth in abdominal combs:

	♂		♀	
	left	right	left	right
1st. segment	12 to 12	12 to 14	13	16
2nd. "	9 " 10	9 " 9	14	13
3rd. "	7 " 9	9 " 10	11	11
4th. "	7 " 7	7 " 8	9	10
5th. "	2 " 5	3 " 5	3	6

Measurements:

	♂		♀	
	length	width	length	width
body	1.94 mm.		2.80 mm.	
head	.71	1.01 mm.	.80	1.16 mm.
prothorax	.26	.64	.28	.70
mesothorax	.22	.68	.26	.87
metathorax	.09	.74	.13	.95
abdomen	.95	.89	1.64	1.08
antennae	.38		.31	

Two ♂♂ and 1 ♀ from *Crypturellus tataupa*, collected at Sta. Ana, Rio Coroico, Bolivia, July 20, 1934.

There is no question about the identity of the host for this species. The description and figure of *pennaticeps* agree very closely with my specimens, and this is further corroborated by the fact that in the same lot of Mallophaga from which *pennaticeps* was described, there was recorded another form (*Hypocryptus coniceps* subsp.) from *Crypturellus tataupa*.

HEPTAPSOGASTER, genus novum

Genotype, *Heptapsogaster mandibularis*, species novum.

Small to medium-sized species, with antennae sexually dimorphic, with the 1st. segment in the male much swollen and larger than in the ♀, and with the 3rd. segment bearing a noticeable lateral hook at distal end (very pronounced in some species). Front of head either flatly convex or rounded, with the preantennary area short, without clypeal suture or signatural plate. Eye absent or vestigial. Temples always expanded and angulated, long and pointed and usually reaching back to the middle of the prothorax, and bearing two long, strong hairs at the tips.

Prothorax more or less quadrilateral, and never much wider than long; sides straight to convex, but never drawn out into a pronounced median or posterior pointed angle. Mesothorax short, much wider than prothorax, with sides expanded and usually almost as wide as temples, and with several strong hairs in the lateral angle. Metathorax somewhat narrower than mesothorax, about as long and with posterior margin flatly rounded; sides sometimes largely exposed between the mesothorax and 1st. abdominal segment, but in others nearly the whole segment is imbedded within the abdomen. Two to four strong hairs on the mesosternum and two on the metasternum.

Abdomen oval to elongated oval, with pleural plates strongly developed, sharply outlined and with darker internal markings or incassations usually pronounced. Tergal plates always present, but less deeply pigmented than the pleural sclerites. They are always closely joined to the pleural plates, are sometimes unbroken and sometimes separated medially by a hyaline area.

Legs of medium size, tibiae more slender than femora and always bearing numerous spines. Genital armature usually of small to medium size and of diversified structure. Some species have pronounced "scent glands" (in the ♂ only) on the abdomen and others do not, *H. temporalis* possessing 2 pairs on the 4th. and 5th. pleural plates of most unusual design. Parasitic on numerous genera and species of Tinamous.

Heptapsogaster mandibularis, species novum. Text-plate XVI, figs. 2, 2a, 2b.

Types, ♂ and ♀ adult, from *Crypturellus tataupa*, collected by E. J. Hambleton at Vicosa, Brazil, June 22, 1933. (Type in coll. U. S. Bureau of Entomology). U. S. N. 17.

Description of types: Size small (♂ about 1 mm. long); antennae strongly dimorphic, in the ♂ the 1st. segment being much swollen and lengthened, 2nd. short and thick, 3rd. longer than 2nd., with distal hook but same not recurved, and 4th. segment attached to excavated inner side (not on outside); 4th. segment small, 5th. twice as long as 4th. and thicker; trabecular tubercles small, but well developed; antennary fossae shallow; front broad and circular; sides of head slightly swollen at posterior edge of antennary sinus, but from there run straight to the tip of the long, pointed temples, which extend to middle of prothorax and have the tips narrow but rounded; posterior margin of head, between the temples, sinuate. Clypeal band narrow, but deeply colored and with three internal projections on each side, the middle pair much the longest, and the lateral pair the shortest; antennal bands short, rounded, and deeply colored (darker than clypeal band); a large, rounded, submarginal blotch inside of the swollen spot on sides of head; temporal bands encircling whole temple from swollen portion on sides of head to occiput, and with rounded, darker colored projections at anterior end and a second slightly further back, and a third at sides of occiput; mandibles rather small and poorly chitinized; pharyngeal sclerite and gland present; three short dorsal hairs on each side of preantennary area; one short bristle and one long, strong hair at tips of temples.

Prothorax long, but rather narrow, with sides straight and slightly divergent; shape quadrilateral, with anterior and posterior angles rounded, with a short spine in latter; acetabular bars heavy, with a darker spot at

front and rear ends. Mesothorax nearly as broad as temples, twice as wide as prothorax and with sides broadly expanded both anteriorly and laterally, and convex; lateral angles bluntly rounded, with one long hair, and a second on posterior margin at edge of metathorax; in addition to the heavy, deeply colored acetabular bars there is a second dark-colored band which extends from the lateral angles inward and curves backward across the tip of the acetabular bars and half way across the metathorax. Metathorax unusually well developed, being as wide as the 1st. abdominal segment, and much resembling it in shape, having the whole of the lateral margins exposed, with the sides divergent, posterior angles rounded and posterior margin flatly convex; mesosternum with four strong hairs and metasternum with two.

Abdomen oval, of seven segments, spiracles in segments 1 to 6, just inside the inner edge of the pleurites, very small, and difficult to distinguish; lateral angles slightly protuberant, rather acute, with one hair in segments 1 to 5 and two in No. 6; 7th. segment apparently without hairs (or lost); 1st. segment not longer than the succeeding ones (a very unusual condition); 7th. segment rather wide and rounded anteriorly and posteriorly, with sides slightly concave; pleural plates rather wide, sharply outlined, but not deeply colored; tergal plates broadly broken medially in segments 1 to 4, continuous in 5 and 6, and of about the same color intensity as pleural sclerites, which have an intricate system of internal, darker colored bands, consisting of a band beginning at the angle and following the margin to anterior edge, then across the suture to inner margin, from where it bends backward and outward, ending within the sclerite; another short band (joined to marginal band in segments 4 and 5) occupies middle section of pleurite. In fact these markings are of different pattern in all the segments, except 4 and 5, and may be clearly seen in the figure. There are also the following hairs on the posterior margin of the dorsal surface of the pleural plates: segments 1 and 2, one hair; 3 and 4, two hairs, and 5, three hairs; there is also a short, heavy spine at the inner corner of pleural plate on segments 1 and 2.

Male genital armature short and wide, especially the basal plate; parameres very short and thick, bent in sharply at the slender tips; dorsal endomeral plates rather well developed, and lying along the sides of the large fused ventral plates.

Legs of medium size, with swollen tibiae and long, nearly straight claws; but few spines on tibiae.

Female with whole body slightly larger and head considerably wider at the antennae, which are short and filiform; trabecular tubercles more strongly developed and sides of head more swollen back of antennary fossae, so that the temples are less divergent; markings of head the same, also chaetotaxy. Abdomen of same pattern, but more elongated; markings of pleural plates very similar, except in segments 5 and 6, which are shown in the illustrations. The 7th. segment is, however, very different, and of a very characteristic shape. The median portion is deeply and narrowly emarginate, with another small emargination on each side of the bifurcated tip, forming two lateral hooks; there are six marginal and submarginal hairs on each side.

Measurements:	♂		♀	
	length	width	length	width
body	1.04 mm.		1.19 mm.	
head	.33	.41 mm.	.36	.42 mm.
prothorax	.115	.22	.12	.24
mesothorax	.11	.40	.12	.42
metathorax	.08	.39	.09	.40
abdomen	.57	.47	.68	.53
antennae	.20		.17	

Remarks: The chaetotaxy of the male is in doubt, since the material contained but a single specimen of that sex, which is badly mounted and seems to have lost many hairs. To some extent the chaetotaxy shown in the figure of the ♂ was taken from the female. In addition to the types there are four other females in the same lot.

I have 1 ♀ from *Crypturellus soui inconspicuus*, collected at Chiñiri, Bolivia, which is exactly like the type.

This species is represented in the collection by specimens from several different hosts, and which are apparently subspecifically related, although there is one serious objection to this conclusion. On the same individual host from which was secured the single typical female of *mandibularis*, were taken 2 ♂♂ and 2 ♀♀ of a closely related form, in which the 7th. abdominal segment in the ♀ is of an entirely different shape, being broader and without the emarginations and hooks on the posterior margin. In addition to the above mentioned specimens I have the following: 3 ♂♂ and 5 ♀♀ from *Crypturellus undulatus undulatus* and *C. u. yapura*. 1 ♂ from *Crypturellus atrocapillus*. 1 ♀ from *Nothocercus n. nigrocapillus*.

In none of these does the female have the apical abdominal segment as in typical *mandibularis*, but more of the type of the specimens from *C. soui inconspicuus*. For the present I have not attempted to work out the relationship of these forms, since more material is necessary.

This species also possesses one pair of "scent" glands at the inner edge of the pleural plates on segment five (Text-plate XII, f. 4). It is very different in appearance from those in *H. temporalis*. It is somewhat crescent-shaped and the inner edge of the pleural sclerite is somewhat incised to receive it. It lies with the convex side next to the sclerite and with the tips pointing forward and backward. It has no apparent outlet such as the one on *Heptapsus*, or attached filament like some of the others. It is granular in appearance like the central portion of the one on *H. temporalis*, but lacks all trace of the corolla-like flap surrounding it.

Heptapsogaster temporalis temporalis, species novum. Text-plate XVI, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Crypturellus u. undulatus*, collected at Rurrenabaque, Rio Beni, Bolivia, September 11, 1934.

Diagnosis: This species is closely related to *H. mandibularis*, sp. nov.; also to *H. dilatatus* (Giebel) and *subdilatatus* (Piaget), the four species forming a closely related, compact group. The head is very similar to that of *mandibularis*, but differs in being narrower at base of antennae, with temples longer and narrower, reaching back even with the anterior edge of the mesothorax, while their tips bear two strong hairs of nearly the same length, instead of one short and one long; the sides of the head are slightly convex, instead of straight, while the temporal bands are more deeply colored along the sides of the head and bear two median internal projections instead of one; the prothorax is smaller, but of the same shape; the mesothorax is of same shape but slightly wider and lacks the dark band across the frontal margin on each side, while the band running inward from the lateral angles goes straight to the acetabular bars where it ends; the metathorax is much shorter than in *mandibularis* and narrower, being decidedly narrower than the first abdominal segment, but has the sides divergent, with rounded posterior angles; both meso- and metasternum each have two strong hairs (four on mesosternum in *mandibularis*), while there are two short, dorsal hairs on each side between the acetabular bars, and along the line of the meso-metathoracic suture (absent in *mandibularis*). The abdomen is of the same shape, except the 7th. segment, which is conical on anterior margin and has the tip slightly emarginate; the pleural plates are wider, also sharply outlined and not deeply colored; the tergal plates similar to those in *mandibularis*; the markings on the pleural sclerites are decidedly different, and may be better understood by consulting the figure. The male genital armature is of the same type, but differs as to detail (see figure); the chaetotaxy of the abdomen is also distinct, the single hairs in the lateral angles being shorter, with one hair on posterior margin of the 5th. pleural plate and two on the 6th., but also with a spine on the 2nd., 3rd. and 4th. The legs are smaller, especially the tibiae, the 2nd. and 3rd. pair being smaller than the 1st. (the opposite in *mandibularis*), while they bear more spines.

The female also has the front of the head wider than in the male; the antennae is simple, but thicker than that of *mandibularis*; the abdomen is longer than in the male, with the tergal plates continuous; the markings of the pleural plates are quite different from those of the male (see figure), while the second and third pleural sclerites have three spines on the posterior margin, and the fourth and fifth with three hairs; the 7th. segment is quite different from that of male, being long, with the posterior half projecting beyond the 6th., with convex sides and the pointed tip with a narrow, deep emargination.

Measurements:	♂		♀	
	length	width	length	width
body	.98 mm.		1.16 mm.	
head	.32	.38 mm.	.33	.43 mm.
prothorax	.10	.17	.11	.20
mesothorax	.12	.36	.15	.41
metathorax	.09	.35	.09	.39
abdomen	.53	.46	.68	.50
antennae	.18		.15	

In addition to the types, 5 ♂♂ and 8 ♀♀ were taken on the same host.

There are two pairs of "scent glands" situated on the inner portion of the pleural plate on segment 4 and 5, only in the male. They resemble a flat flower, with the petals united into a single flaring corolla, the central portion being slightly raised and granulated (Text-plate XII, f. 2).

Heptapsogaster temporalis femininus, subsp. novum. *Revel. U.S.N.M.*

Type, ♂ and ♀ adult, from *Crypturellus cinereus cinerascens*, collected at Chiñiri, Rio Kaka, Bolivia, September 6, 1934.

Diagnosis: Differs chiefly from *temporalis* in the shape of the 7th. abdominal segment in the female, which is much wider than long, with the posterior margin flatly rounded and with a slight indentation medially (not deeply cleft as in *temporalis*). In the male the 7th. segment is flatly convex on the anterior margin (instead of conical), while the posterior margin is uniformly convex, with no median indentation. The head, especially in the male, is much more flattened across the front. The sides of the meso- and metathorax, and to a lesser extent the first two pleural plates, are somewhat tessellated, but to a much less degree than in *H. t. chiñiri*.

The measurements are very close to those of *temporalis*.

3 ♂ ♂ and 5 ♀ ♀ (including the types) from the same individual host.

A single male from *Rhynchotus r. rufescens* is very close to *femininus* in the shape of the head, the 7th. abdominal segment, and the genital armature, but has the "scent glands" on the 4th. and 5th. abdominal segments nearly twice the size of those in *temporalis*, or the other races, being even wider than the pleural plate to which they are attached. (Text-plate XII, f. 3).

Heptapsogaster temporalis chiñirii, subsp. novum.

Type, ♂ adult, from *Crypturellus atrocipillus*, collected at Chiñiri, Rio Kaka, Bolivia, by M. R. Carriker, on August 24, 1934.

Diagnosis: Resembles *H. t. femininus* in the shape of the head, but has the anterior margin of the 7th. abdominal segment conical, like *temporalis*, but the posterior margin circular. The greater portion of the head, the whole of the thorax and first three abdominal segments have the dorsal integument strongly tessellated and with the lateral margin of the mesothorax finely serrated. The genital armature is quite different from either *temporalis* or *femininus*, with a complicated arrangement of the endomeral plates and peculiar emarginate parameres (on the inner edge).

Three males (including type) in the type series. Female unknown.

Heptapsogaster platycephalus platycephalus, species novum. Text-plate XVII, figs. 1, 1a, 1b, 1c.

Types, ♂ and ♀ adult, from *Crypturellus soui inconspicuus*, collected at Santa Ana, Rio Coroico, Bolivia, July 30, 1934.

Diagnosis: A very distinct species, which may be recognized readily by the very narrow, flattened front of head, narrow, faintly pigmented clypeal band without projections and strongly convex sides of head, with straight temporal bands, faintly pigmented.

Antennae strongly dimorphic, although the 1st. segment is not much thickened in the male (not globular), but the lateral hook on the 3rd. segment is well developed. Trabecular tubercles rather long, rounded in male and pointed in female; antennal bands short and narrow, but deeply pigmented; antennary fossae shallow; eye vestigial, but a short seta in the sunken area occupied by the eye; a large, oval, deeply pigmented blotch at posterior edge of antennary fossa; temporal bands extending from eye to tip of temple with inner margin unbroken and a short, deeply colored projection at the anterior end; a deeply pigmented occipital blotch and connecting band; a narrow, sharply defined ridge on dorsal surface, running forward from the occipital blotch to near the posterior articulation of the mandibles. Two short hairs on each side of preantennary area; a spine on 1st. segment of the antennae in the ♂; a short hair on side of head and two long hairs at tips of the temples, which are rather pointed and extend back to middle of prothorax. Prothorax rather large, wider than long, with sides flatly convex and slightly divergent, with a stout bristle in the rounded posterior angle. Acetabular bars well developed and deeply pigmented and large prothoracic spiracle. Mesothorax shorter than prothorax, but nearly as wide as head, and with sides expanded anteriorly and laterally, convex, and with lateral angles broadly rounded. A short and long hair in the angle and another long one behind it. Metathorax about as long as mesothorax, much narrower, with parallel, convex sides and very flatly convex posterior margin, and with nearly the whole of segment imbedded in the abdomen. Meso- and metasternum each with two long, thick hairs and two short, median hairs on the metanotum.

Abdomen elongated oval in both sexes, with the 1st. segment but little longer than the remainder which are subequal in length. Pleural plates wide but not deeply pigmented, and closely fused with the tergal plates which are continuous in both sexes but less deeply pigmented than the pleural sclerites. Pleural plates with a deeply pigmented, longitudinal, sinuate incassation running forward from the median portion of the sclerite to the suture, where it curves outward, fading in color and running backward to end in a more deeply colored spot in outer, posterior corner of plate. Seventh segment wider than long, oval, unmarked, with about 5 short hairs on each side. Segments 1 to 5 with one hair in angle and 6th. with two; tergal plates 1 to 4 with two short median and one lateral hair on posterior margin; pleural plates 2 and 3 with one spine and one hair on posterior margin; same plates on segment 4 with one spine and two hairs, and the 5th. with three hairs only.

Male genital armature rather unusual. The basal plate long and wide but the parameres very short, nearly straight and pointed, with a small seta at the tip; endomeral plates small and within the end of basal plate.

Measurements:

	♂		♀	
	length	width	length	width
body	1.42 mm.		1.64 mm.	
head	.36	.55 mm.	.40	.61 mm.
prothorax	.15	.32	.16	.33
mesothorax	.13	.53	.14	.56
metathorax	.12	.48	.15	.54
abdomen	.88	.62	1.04	.69
antennae	.22		.215	

Numerous specimens taken on all individuals of *Crypturellus soui inconspicuus* taken in Bolivia, as well as on one from Shapaja, Rio Huallaga, Peru. Also taken on the following hosts: *Crypturellus obsoletus punensis* (many specimens). *C. o. ochraceiventris*, Eneñas, Peru, 2 females. *C. u. undulatus*, 2 ♂♂ and 1 ♀. *Nothocercus n. nigrocapillus*, Sandillani, Bolivia, 1 ♀.

There is some slight variation in the above series but apparently nothing of subspecific value. The two ♀♀ from *C. o. ochraceiventris* are unusually large, and probably represent a good subspecies, but without specimens of the male it does not seem advisable to describe it.

However, a single male taken on *Crypturellus s. soui* is apparently distinct and is described below.

Heptapsogaster platycephalus soui, subsp. novum. Text-plate XVII, fig. 2.

Type, ♂ adult, from *Crypturellus s. soui*, collected at El Callao, Venezuela, May 17, 1910.

Diagnosis: Closely resembling *platycephalus* in general appearance, differing from it in proportions of head and thorax and somewhat in head and body markings.

The front of the head is narrower, the sides of the head less convex and proportionately wider at temples; temporal bands almost unpigmented, except just behind eye. Third antennal segment with apical hook more elongated. Prothorax same, but mesothorax both narrower and shorter; metathorax shorter at the sides and with posterior margin of different shape, it being a flattened, truncated cone instead of flatly convex; the pleural plates are less heavily pigmented and the tergal plates shorter, with the hyaline interspaces at the sutures wider.

Measurements:	♂	
	length	width
body	1.42 mm.	
head	.35	.605
prothorax	.15	.32
mesothorax	.12	.49
metathorax	.14	.47
abdomen	.85	.60
antennae	.21	

Heptapsogaster petersi, species novum. Text-plate XVII, figs. 3, 3a, 3b.

Types, ♂ and ♀ adult, from *Crypturellus t. tataupa*, collected at Vicosa, Brazil by E. J. Hambleton, July 15, 1933. (Types in coll. U. S. Bureau of Entomology).

Diagnosis: Somewhat resembling *H. platycephalus*, especially the shape and markings of the abdomen, but differs in being much larger, with sides of head slightly concave (instead of strongly convex); clypeal band more deeply pigmented and with three graduated projections on each side; metathorax nearly or quite as wide as mesothorax and abdomen longer and more parallel sided.

13. 6. 1935. D.S.M.M.

Antennae with a strong spine on 1st. and 2nd. segments and with the apical hook on 3rd. segment long and recurved, with the 4th. segment set in its middle on outer edge. Front of head flatly convex, with large, rounded trabecular tubercles. A slight swelling just behind the antennary fossae. Eye absent, but seta remaining. Antennal bands narrow but deeply pigmented; a deeply colored, oval blotch at posterior edge of antennary fossae; temporal bands narrow, faintly pigmented and without projections; two occipital blotches, connected by a transverse band. Temples attenuated, rounded at tip, extending to middle of prothorax, and set with two strong hairs. Three short hairs on each side of preantennary area and two on each side of head.

Prothorax small, wider than long with nearly straight, slightly divergent sides, and posterior, rounded angle set with a strong bristle. Mesothorax much narrower than head and short, with sides convex and but slightly expanded; one short and two long, thick hairs in lateral angles. Metathorax slightly longer than mesothorax, slightly narrower in male but equal in width in the female; sides almost entirely exposed, divergent, with rounded posterior angles and posterior margin expanded medially and concave on the sides. Meso- and metasternum each with two strong hairs; mesonotum with a shorter hair on each side. Abdomen with the pleural plates and their markings almost identical (in the ♂) with *H. platycephalus*. Spiracles conspicuously large and clear; tergal plates faintly pigmented and widely separated by hyaline areas along the sutures. Chaetotaxy of abdomen sparse and similar to *platycephalus*. Legs rather strongly developed with long tibiae bearing numerous spines and long, slender, nearly straight, subequal tarsal claws.

Male genital armature also similar to *platycephalus*, but basal plate a little larger and without the subdivision near the base. Parameres short, straight, pointed, with sides sinuate, and with the median portion wider than the base. Ventral endomeral plate rather large and wide, with dorsal plates small and inconspicuous. Apparently a well-developed penis at tip of endomeral plate.

The female has the front of the head wider and more convex, with sides of head about the same. Antennae slender and filiform. Markings on the pleural plates somewhat different from male, the band passing inward across the suture, then curving back along the inner side of the plate, further than the middle, but with a branch curving outward into the plate near the front. The 7th. abdominal segment is narrow, with front conical and posterior margin elongated into a double tip with sides concave. There are three long hairs at the lateral angle of the 6th. segment; the 7th. with about five short marginal hairs on each side, two submarginal at tips and a row of fine setae along each side of the genital plate.

The "scent gland" is well developed on the 5th. segment and of the type of *platycephalus*.

Measurements:	♂		♀	
	length	width	length	width
body	1.64 mm.		1.94 mm.	
head	.41	.61 mm.	.46	.67 mm.
prothorax	.18	.34	.19	.35
mesothorax	.15	.53	.14	.54

Measurements (cont.):

metathorax	.18	.50	.18	.54
abdomen	.98	.62	1.23	.70
antennae	.28		.20	

Heptapsogaster tessellatus tessellatus, species novum. Text-plate XVIII, figs. 1, 1a, 1b, 1c.

Types, ♂ and ♀ adult, from *Nothoprocta curvirostris*, collected at Soquián, Dept. Libertad, Peru, June 15, 1932.

Diagnosis: May be readily distinguished from all other known species of the genus by the following characters: Angulate tips of temples; serrated posterior margin of temples, posterior margin of prothorax and whole of sides of mesothorax; six long internal appendages on clypeal band; heavy incassations on sides of head, with a sharp submarginal ridge; long 6th. abdominal segment almost completely enclosing the 7th. in the male and extending beyond it in the female; and by the striking resemblance to fine mosaic tile over nearly the whole dorsal integument of head, thorax and abdomen.

Front of head flatly convex with trabecular tubercles small; clypeal band narrow, but with six long, deeply pigmented, graduated internal projections; antennal bands short, elongated oval and pitchy brown; antennae of the conventional generic type, the 1st. segment with two spines and 4th. set in middle of outer side of 3rd. Eye prominent, with seta; temples straight from eye to tip, strongly divergent; the tip wide, nearly parallel sided and with outer corner doubly angulated; a prominent, serrated projection on posterior margin of head at each side of occiput, which is flatly convex; a deeply pigmented diagonal band on each side of occiput, joined medially by a paler transverse band; a thin, fine ridge runs forward on dorsal surface, from the occipital blotches to the posterior extremity of the antennal bands. Two short hairs on each side of preantennary area, one inside of antennary fossae, two on sides of head, and two strong hairs on tip of temples; two submarginal pustulated hairs on ventral surface of occiput and a spine on the margin at each side of occiput.

Prothorax rather small, with rounded sides bearing a short, submarginal bristle; posterior margin concave; spiracles prominent and lateral portions of segment rather deeply pigmented. Mesothorax slightly wider than head, sides expanded, convex, with lateral angles pointed and jagged and with the whole of lateral margin serrated; two strong hairs in lateral angle and a third on posterior margin. Metathorax shorter than mesothorax, very much narrower, sides convex, posterior margin flatly convex, with a slight angulation in the middle. Nearly whole of segment imbedded in abdomen. Meso- and metasternum each with two strong hairs; mesonotum with a shorter hair on each side and metathorax with two hairs on median portion of posterior margin.

Abdomen oval, with segments 1 to 5 subequal, the 6th. much longer and the 7th. small and round and deeply imbedded within the 6th. Pleural plates wide, not deeply pigmented and with the spiracles at inner edge. Tergal plates small, broadly separated medially and along the sutures by hyaline areas. Pleural plates with but a faint linear marking in median portion. One hair in lateral angles of segments 1 to 5; two at tip and another deeply submarginal on the 6th.; 7th. without hairs, but with a narrow submarginal pigmented band across posterior margin; pleural plate 2

with one longish hair on posterior margin; 3 to 5 with two such hairs; a stout, pustulated hair on posterior margin of tergal plates 1 to 3, behind spiracle, and a small seta on 4 and 5 in same position; two fine hairs in median portion of tergal plate 1 and 2 and one or two short setae on 3 to 5, with two long hairs in the interspace between 5 and 6. Legs short and rather thick, the tibiae with numerous spines and tarsal claws long, slender and subequal.

Male genital armature rather large, with parameres slender and slightly bent inward; endomerale plate with two lateral, slender, curved prongs; penis present but small. No apparent "scent gland", although there is a small pustule in 6th, pleural plate, bearing a filament, which may be that organ.

Measurements:

	♂		♀	
	length	width	length	width
body	1.28 mm.		1.49 mm.	
head	.41	.51 mm.	.43	.53
prothorax	.10	.26	.12	.27
mesothorax	.12	.52	.14	.55
metathorax	.11	.39	.12	.42
abdomen	.72	.63	.89	.72
antennae	.23		.185	

Heptapsogaster tessellatus truncatus, subsp. novum. Text-plate XVIII, figs. 2, 2a.

Types, ♂ and ♀ adult, from *Nothoprocta branickii*, collected at Desaguadero, Lake Titicaca, Peru, May 4, 1931.

Diagnosis: Very similar to *tessellatus*, but differing from it as follows: Male somewhat larger, but female practically the same size as male, so that there is scarcely any difference in size between the females of the two races and between the male and female of *truncatus*. The pleural plates of the abdomen are not sharply defined from the tergal plates, the two apparently fused, with suture invisible. The tergal plates are smaller and more faintly pigmented than in *tessellatus*. The markings on the pleural plates are of different design (see figure). The male genital armature is decidedly different. The parameres are thickened at base, short, and taper sharply to slender, straight tips bearing a small seta; the lateral prongs of the endomerale plate are shorter and more slender; penis same.

The female may be distinguished from the female of *tessellatus* only by the different style of markings on the pleural plates and slightly larger abdomen; tips of 6th. segment rounded instead of hooked; 7th. segment wider, and the fusion of the pleural and tergal plates more pronounced.

Measurements:

	♂		♀	
	length	width	length	width
body	1.40 mm.		1.44 mm.	
head	.42	.54 mm.	.42	.54 mm.
prothorax	.12	.28	.12	.27
mesothorax	.14	.55	.14	.55
abdomen	.82	.68	.90	.74
antennae	.22		.17	

Heptapsogaster dilatatus (Giebel).

Goniodes dilatatus Giebel, Insecta Epizoa, 1874, p. 192 (*Rhynchotus rufescens*),
nec *Goniocotes dilatatus* Rudow.; Piaget, Les Pediculines, 1880, p. 258, pl.
XXI, fig. 5 (*Crypturellus variegatus*).
Rhopaloceras dilatatus, Taschenberg, Die Mallophagen, 1882, p. 48.

Giebel's description of this species is not clear and might apply equally well to several closely allied forms. Taschenberg has cleared up the synonymy of the species, and makes it clear that the species described by Giebel is not Rudow's form, as he supposed. Piaget has not helped to clear up the situation, since undoubtedly the species described by him as *dilatatus* (from *Crypturellus variegatus*) is not that species at all.

The whole group is much involved, and can only be properly cleared up by examination of the types or new material from the same hosts.

I have not seen any specimens which I could safely identify as this species. The shape of the prothorax as given by both Giebel and Piaget preclude the possibility of it being *H. temporalis* or *mandibularis*, but it, as well as *subdilatatus*, is close to those two species. For the present I prefer to recognize the two species as distinct and await further material for the solution of the problem.

Heptapsogaster subdilatatus (Piaget).

Goniodes subdilatatus Piaget, Les Pediculines, 1880, p. 257, pl. XXI, figs. 4, 4a and 4b (*Tinamus variegatus*).

This species is close to *H. temporalis*, agreeing closely with it in the shape and markings of the head (the figure does not agree with the description in length of temples), except that *subdilatatus* apparently has the internal branches of the clypeal band very much shorter, and *temporalis* lacks the occipital bands running forward from each side of occiput. The mesothorax in *subdilatatus* is much narrower (.25 against .36 mm.), but the metathorax is apparently quite similar. The markings on the pleural plates appear to be similar, but the tergal plates are quite distinct, being continuous across the segment, but separated from the pleural plates by a considerable hyaline area, more than is shown in the figure, according to the description. In the material which I have from *Crypturellus variegatus salvini* there is nothing approaching the type of this species.

It is not improbable that it will prove to be conspecific with *temporalis*, in which case the name of *temporalis* will have to be changed. The presence or absence of the flower-like scent glands on the 4th. and 5th. pleural plates would decide conclusively that question, but there is nothing in the description or the figure to hint at their presence.

× **Goniodes laevis** Piaget.

Les Pediculines, 1880, p. 673, pl. 56, fig. 2 (*Cryptonyx coronatus*); Taschenberg, Nova Acta, Halle, 1882, p. 37 (*Tinamus coronatus*).

Taschenberg gives this species under the section of *Goniodes* found on the Tinamous, and the host as "*Tinamus coronatus*". He apparently

Goniodes coronatus

mistook the name *Cryptonyx* for *Crypturus*, but the genus *Cryptonyx* belongs to the family Phasianidae and equals *Rollulus roulroul*.

He further states that it is a synonym of *Goniocotes coronatus* Giebel (equals *Gc. obscurus* Giebel).

To complicate the matter, Giebel says (Insecta Epizoa, p. 191) that his *Goniocotes obscurus* comes from *Crypturus coronatus*, which is undoubtedly an error for *Cryptonyx coronatus*. This fact is strengthened by the statement by Taschenberg that *G. laevis* Piaget from *Cryptonyx*, is a synonym of Giebel's *Gc. coronatus*.

However, to sum up the matter briefly, *Goniodes laevis* Piaget is a true *Goniodes*, and its host is *Cryptonyx coronatus*, and not a Tinamou.

RHYNCHOTHURA, genus novum

Genotype, *Goniodes sexpunctatus* Piaget.

Small species taken thus far only on the avian genera *Rhynchotus* and *Nothura*. Closely related to *Heptapsogaster* and agreeing with that genus in all characters except the following.

Temples not always extending back to middle of the prothorax, sometimes not projecting beyond the occipital margin. Prothorax always much wider than long, and with sides always produced laterally into a prominent median or posterior angle which bears a spine or short bristle. Meso- and metathorax of more or less the same general type. Abdomen oval to flattened oval, with similar type of pleural and tergal sclerites, except that sometimes the tergal plates (when entire) are separated from the pleural sclerites by a hyaline area, while the pleural plates *never* contain darker, internal markings or incassations, and are not noticeably pigmented more deeply than the tergal plates. Legs of similar style, also male genital armature diversified in pattern.

The genus is a difficult one to define and contains species which perhaps may later prove to be not congeneric. *R. minutus* is especially aberrant, due to the position of the abdominal spiracles (in the hyaline area between the pleural and tergal plates) and the peculiar thickening of the sides of the head in the female and the crenulated frontal margin.

Heptapsogaster tessellatum is another species difficult to allocate, and is perhaps on the border line between *Heptapsogaster* and *Rhynchothura*, with a broader prothorax and but faint markings in the pleural plates.

Rhynchothura sexpunctata (Piaget). Text-plate XVIII, figs. 3, 3a, 3b, 3c.

Goniodes sexpunctatus Piaget, Les Pediculines, Suppl., 1885, p. 59, pl. V, fig. 9 (*Rhynchotus r. rufescens*).

Piaget's figure of this species is very good, but few essential details have been omitted. The metathorax is wider than shown, but of the same shape posteriorly. He does not show the hairs on the meso- and metasternum or the two on the mesonotum and the two on posterior margin of metathorax (same chaetotaxy as in *Heptapsogaster tessellatus*. The shape of the pro-

thorax is correct, also posterior margin of head, both distinctive characters. His illustration of the male antennae is not correct, and I have shown an enlarged view of it, as well as the genital armature.

Complete figure of the male has been prepared as well as the head and apical segments of the abdomen in the female.

The pleural plates are not sharply separated from the tergal sclerites, although the suture is faintly visible, and like all species of this genus the pleural plates are unmarked. An unusual feature is the presence of sternal plates, longer but narrower than the tergal plates (see figure).

The eye is prominent, though small, and with seta. The sides of head are concave in the male and convex in female. The internal projections of the clypeal band are more pronounced in female than in male. Occiput deeply concave, with a protuberance on each side. The thoracic structure is amply illustrated by the figure, as well as the chaetotaxy of the whole body.

The male genital armature is of conventional type. The basal plate is rather long and narrow, with a swollen basal section and divided into two parallel prongs, at the tips of which are attached the parameres; the two prongs are connected by a thin strut in two places. Parameres short and not greatly thickened, with seta at tip. The ventral endomeres are fused into a single plate, nearly reaching the tips of parameres, but penis absent; the dorsal endomeral plates are unusually large and extend rather deeply inside the end of basal plate, over the sides of the ventral plate.

Numerous specimens taken on *Rhynchotus r. rufescens*, collected near Reyes, Dept. Beni, Bolivia, Sept. 28, 1934. It was not present on *R. r. maculicollis*, but was replaced by two other allied forms which have also been placed in this genus.

Measurements:	♂		♀	
	length	width	length	width
body	1.52 mm.		1.80 mm.	
head	.46	.60 mm.	.50	.68 mm.
prothorax	.15	.36	.16	.39
mesothorax	.16	.59	.17	.65
metathorax	.17	.46	.16	.50
abdomen	.86	.73	1.10	.85
antennae	.26		.24	

Rhynchothura crenulata, sp. nov. Text-plate XIX, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Rhynchotus rufescens maculicollis*, collected by M. R. Carriker, at Sandillani, Dept. La Paz, Bolivia, December 11, 1934.

Diagnosis: Recognized by very small size, with whole front of head, from temple to temple with the shape of half an ellipse, and the whole margin slightly crenulated, or sinuate; with the temples produced in a

rounded point nearly to the lateral angles of prothorax and with the occipital margin strongly sinuate. Antennae dimorphic, with first segment much elongated, but scarcely thicker than in the female, and with the third segment with distal hook small. Clypeal band narrow, encircling whole front, and with three small projections on each side; antennal bands running from end of clypeal band to base of mandible, but only deeply colored in median portion; no trace of trabeculae or trabecular tubercles, and antennary fossae obsolete; eye very small, clear, with a short seta; a small blotch in front of and behind eye, connected by a line from inner ends; a narrow, faintly pigmented band around temples, from second ocular blotch to sides of occiput, and with a deeply colored, short projection inward from it in median portion; a deeply colored blotch on each side of occiput, connected by a paler band; two hairs on frontal margin and two others on each side of the dorsal surface of the preantennary area; a short hair on sides of the head and two long, strong, pustulated hairs at tip of each temple; mandibles rather large, but delicately constructed.

Prothorax short and broad, with divergent, convex sides, rounded lateral angles (posterior) and concave posterior margin; a short, stout bristle in lateral angle. Mesothorax much wider than prothorax, as wide as temples, with sides much expanded anteriorly and laterally, the anterior margin at each side passing the posterior angles of the prothorax; posterior angles flattened, with a double, rounded tip, the anterior portion of which bears a short bristle and a long, heavy, pustulated hair; posterior margin with a concave edge extending inward as far as the acetabular bars, and bearing in this groove one long strong hair and three short bristles; acetabular bars long and narrow, curving inward from near anterior margin of mesothorax to near the posterior edge of metathorax. Metathorax shorter than mesothorax and much narrower; posterior margin flatly convex, with a slight indentation on each side of middle, in which is set a long, strong hair. Meso- and metasternum each with two long, strong, pustulated hairs; no hairs on dorsal surface of thorax. Abdomen oval, of seven segments, the first the longest, with the rest gradually diminishing in length; seventh broad, but short, with posterior margin concave on sides and convex at tip, and anterior margin convex. Pleural plates sharply delineated, but faintly colored, and without any sort of interior markings, and with the spiracles within them; tergal plates continuous from side to side, faintly colored, and separated by clear spaces at the sutures. Segments 2 to 6 with one medium hair in angle; segments 2 to 4 with one strong hair on posterior margin of the pleural plate, and No. 5 and 6 with two such hairs; 7th. segment with two marginal hairs on each side (short); segments 1 to 3 with a pair of strong, pustulated hairs in median portion of posterior margin of tergal plate and another on each side, just inside the pleural sclerite. Legs of medium length, but stout, the tibiae especially thickened, with numerous spines. The tibia of 1st. pair of legs is longer and thicker than that of the 2nd. pair, while the femora are about equal. Claws long and slender, and but very slightly curved.

Male genital armature of unusual pattern. The basal plate is short and thick, seemingly composed of two parts, apical and basal, the latter portion inserted within the former; the parameres are very short, thickened at base and abruptly bent inward at the slender tip, while their basal portion seems to be inserted into the bifurcated base of the basal plate. The ventral

endomerale plate is larger than the parameres, with the narrow dorsal endomerale lying alongside it, and the two lie almost wholly within the end of the basal plate.

The female has the antennae simple and filiform, with the 1st., 2nd., 3rd. and 4th. segments subequal in length, and 4th. shorter. The margins of the head are but very slightly crenulated. The thorax is the same as in the male, also the abdomen, except for the 7th. segment, which is much larger than in the male, with the anterior margin conical and the posterior flatly convex, with a slight indentation in the middle. The genital plate is small, covering only the median portion of the 6th. segment and anterior half of 7th., with a darker, elongated patch on each side of it which extends into the 5th. segment. The 7th. segment has 4 hairs on each side, with a few fine, short, dorsal setae on posterior portion.

Measurements:	♂		♀	
	length	width	length	width
body	1.28 mm.		1.65 mm.	
head	.40	.50 mm.	.50	.58 mm.
prothorax	.11	.32	.14	.37
mesothorax	.15	.49	.17	.58
metathorax	.11	.40	.14	.48
abdomen	.71	.58	1.00	.70
antennae	.24		.22	

In addition to the types, four ♂♂ and 1 ♀ were taken from the same host.

Rhynchothura lunulata, sp. nov. Text-plate XIX, fig. 2.

Type, ♀ adult, from *Rhynchotus rufescens maculicollis*, collected by M. R. Carriker, at Sandillani, Dept. La Paz, Bolivia, December 11, 1934.

Diagnosis: Somewhat similar in general appearance to *Rhynchothura crenulata*, of the same host, except that the frontal and temporal margins are uniformly rounded and even (not crenulated); the clypeal margin is wider and the temples scarcely diverging, merely flatly convex; occipital margin almost as in *crenulata*, except that it is less emarginate; head about as wide at the temples as the length; head almost without markings, other than the plain, narrow, faintly pigmented clypeal band (without appendages) and the somewhat narrow, pitchy antennal bands which reach almost to the base of the mandibles. Mandibles heavy and deeply colored; prothorax wider than in *crenulata*, and with sharp lateral angles. Mesothorax wider than head, with sides strongly expanded forward and lateral margins *concave*; lateral angles blunt, in the form of two small, separate tubercles; acetabular bars narrow, but deeply colored. Metathorax narrower than mesothorax, with posterior margin uniformly and flatly rounded form side to side, and with two strong hairs on the margin in median portion. Meso- and metasternum each with two strong, pustulated hairs. Prothorax with a short, stiff bristle at the lateral angles; mesothorax with one long strong hair, one short hair and one spine in lateral angles.

Abdomen elongated, with nearly straight sides, slightly converging; seven segments, with spiracles in segments 1 to 6; seventh segment long

and very wide, flatly convex on posterior margin, with a rounded emargination in the middle; rest of the segments (except first) subequal in length, with pleural plates not sharply delineated and but faintly pigmented; tergal plates broken medially and faintly colored, like pleural sclerites; a large genital plate covers the median portion of segments 5 to 7; lateral angles of segments 1 to 6 with one short hair; one hair on posterior margin of pleural plates 2 and 3, and two hairs in same position on plates 4 and 5, three on 6th. Seventh segment with three longish marginal and one submarginal hairs on each side, with numerous short setae; segments 1 to 3 with a pair of strong, pustulated hairs on posterior margin in median portion and one on each side, within the inner margin of pleural plates; segment 5 with some short setae on each side of the genital plate, at front and back of segment.

Front legs very small, 2nd. and 3rd. pair larger, but all with only half of femora showing beyond the body; tibiae thickened, with numerous spines and claws long and heavy.

The head is without hairs, except two long, strong ones on each narrowly pointed and rounded temple, two on each side of the preantennary area and two on each side of the mandibles.

Measurements:	♀	
	length	width
body	1.56 mm.	
head	.48	.49 mm.
prothorax	.15	.36
mesothorax	.18	.53
metathorax	.11	.46
abdomen	.91	.66
antennae	.23	

Remarks: This species is known from but a single female, the type. What the male may be like is very problematical. The fact that it came from the same individual host as *Rhynchothura crenulata*, and the fact that it differs from that species so slightly in generic characters, makes its allocation generically a difficult one. *R. crenulata* has the front legs, especially the tibiae, as large as the third pair, while the middle pair has smaller tibiae and minute femora. This character, taken in connection with the shape of the head and the type of head markings and the shape of the genital plate lead me to believe that the two are perhaps generically distinct.

Rhynchothura minuta, sp. nov. Text-plate XIX, figs. 3, 3a, 3b.

Types, ♂ and ♀ adult, from *Nothura maculosa nigroguttata*, collected in Uruguay, August, 1860 (Type of parasite and host in coll. U. S. Nat. Museum, No. of host 21065). *U. S. N. 17.*

Description: Size minute; antennae strongly dimorphic, the ♂ having 1st. segment much swollen, as well as elongated, the 2nd. short and rather thick, the third long and curved inward at slender tip, with the 4th. jointed at its middle on the outer side; 4th. segment minute, with 5th. as long as 3rd. and swollen apically (club-shaped). Preantennary area short, wide

and flatly rounded, with margin strongly crenulated; short, thick, rounded trabecular tubercles present; antennary fossae present, but shallow; sides of head nearly straight, but divergent and sinuate; temples bluntly rounded, even with line of occiput; a slight emargination on each side of posterior margin, between the point of temple and occiput, the latter being almost transverse; mandibles rather large, but slender; pharyngeal sclerite and gland present; a narrow band encircles the whole front, which has three short branches on each side; narrow antennal bands from base of trabecular tubercle to mandibular condyle; a narrow marginal band along the sides of temples, with two internal projections; another short band from posterior angle of antennary fossae across to base of antennal band; deeply colored occipital blotches, connected by a narrow, curving band. Two short hairs on dorsal surface of each side of preantennary area, and a third in the antennary fossae; two long, strong, pustulated hairs at tips of temples and one slender hair at each side of occiput. Prothorax wider than long, with rounded anterior angles and acuminate posterior angles, the latter set with a stout spine; prothoracic spiracle present; acetabular bars heavy and well marked. Mesothorax as wide as head; with sides expanded anteriorly and laterally, convex and strongly divergent; posterior margin convex at sides and meso-metathoracic suture clearly visible as far as the acetabular bars, which extend from front edge of mesothorax almost to posterior margin of metathorax; two strong hairs on meso- and metasternum; lateral angles of mesothorax blunt, with a short spine, a short hair and one very long, strong hair; another equally long hair on posterior margin, outside margin of metathorax. Metathorax narrower than mesothorax, but of equal length, with sides nearly straight and posterior margin flatly convex; a short dorsal hair over 3rd. pair of coxae and two stronger hairs in median portion of posterior margin.

Abdomen oval, short, with seven segments and lateral angles scarcely noticeable; spiracles present in segments 1 to 6, located in the clear space between the pleural and tergal plates; 1st. segment twice as long as the remainder, which are sub-equal; 7th. segment with anterior margin rounded, the posterior concave on sides and the middle expanded into a rounded point, with the genital plate showing beyond its posterior margin on each side (in the concave section); pleural plates sharply delineated, of medium width, but not strongly pigmented; tergal plates continuous, colored like the pleural plates, but separated along the sutures by a clear space; genital plate covers median portion of segments 6 and 7; lateral angles of segments 1 to 5 with one slender hair; 6th. with four hairs and 7th. with two on each side, one dorsal and one apparently arising from protruding portion of genital plate; segments 1 and 2 with two median hairs on posterior margin; segments 1 to 3 with a stronger hair at posterior, lateral corner of tergal plate; one hair on each side of basal plate on 5th. segment.

Legs of medium size, rather stout, with little difference in the size of the tibiae, which bear about 6 strong spines; claws long, slender and nearly straight.

Male genital armature short and thick; basal plate very short, consisting of two parts, a thin, expanded apical portion and thickened, rounded basal section, which is bifurcated, and with the parameres apparently jointed on the inner edges of the tip; parameres very short, thick, and sharply bent inward at tips; ventral endomeral plate very large, twice the

length of exposed portion of parameres, and extending from their tips far back inside the basal plate; dorsal endomeral plates small and rod-like, lying over basal portion of the large ventral plate.

The head of the female differs decidedly in shape from that of the male, the preantennary area being much longer, more rounded, but also crenulated; the trabecular tubercles are apparently entirely absent, and antennary fossae obsolete; the antennae are short, with 1st. segment the longest, the remainder successively shorter (a very unusual arrangement); the shape of the post-antennary portion of head the same as in male, but it differs decidedly in having a wide, thickened, deeply pigmented ridge on each side, extending from posterior antennary blotch to tip of temple, narrower posteriorly. The 7th. abdominal segment is wider than in the male, with anterior margin conical, sides rounded and posterior margin slightly sinuate, with four short, dorsal hairs along posterior margin; genital plate covering anterior half of 7th. segment and most of 6th.

Measurements:	♂		♀	
	length	width	length	width
body	1.06 mm.		1.24 mm.	
head	.30	.33 mm.	.35	.36 mm.
prothorax	.11	.22	.11	.22
mesothorax	.10	.37	.12	.38
metathorax	.14	.31	.14	.33
abdomen	.57	.52	.71	.50(?)
antennae	.19		.13	

Remarks: The slide containing the types also contains another adult male and two immature females, but all are in rather poor condition, having undoubtedly been collected from a dried skin, and have as a consequence lost many of the hairs, so that I am not quite certain of the chaetotaxy in some parts of the body. Also the antennae and body (to some extent) seem to be slightly shriveled, but all the characters described above, and given in the figures are clearly visible. This is the only known species which I have examined from the avian genus *Nothura*, and it is of interest to note that it resembles strongly (generically) the species *R. crenulata*, taken on *Rhynchotus*, another genus inhabiting open grass-lands, but is not closely related to any of the forms found on forest-inhabiting genera.

The two immature females present most interesting, and perhaps illuminating differences from the adults. The entire posterior margin of the mesothorax is sharply delineated, while the metathorax is very faint and difficult to distinguish, but its position is clearly shown by the position of the 3rd. pair of coxae and their relation to it. In the adult insect the suture between meso- and metathorax is completely lost in the median portion, only visible outside the acetabular bars. In the nymphs there is also a suggestion as to what has happened to the 1st. abdominal segment. There seems to be a small fragment of it left on each side of metathorax, between that segment and what is now the 1st. abdominal segment, while a faint

transverse band, which may or may not belong to the obsolete 1st. segment, may be seen lying across the area occupied by the metathorax in adult specimens. These details are not clearly visible, and it is possible that they have been misinterpreted, but further investigation should be made along these lines, with immature specimens of all Tinamou lice belonging to the seven-segmented group.

HEPTARTHROGASTER, genus novum

Genotype, *Goniodes parvulus* Taschenberg.

Diagnosis: Size minute to medium; antennae strongly dimorphic, that of ♂ with 1st. segment much swollen and lengthened and with the 3rd. strongly hooked at distal end; front wide and rounded; temples but slightly expanded and not extending behind occiput; head of male of decidedly different shape from female; prothorax rather large, wider than long; mesothorax as wide as temples, and about as long as prothorax or shorter; metathorax well developed, as long as mesothorax, and nearly or quite as wide; meso-metathoracic suture clearly visible as far as or inside of acetabular bars; meso- and metasternum each with a pair of long, strong hairs. Abdomen oval to flatly oval, of seven segments, pleural plates sharply delineated but not deeply pigmented, and with various patterns of internal markings. Male genital armature rather small, but with well-developed endomeral plates; legs of medium size, tibiae stout, with numerous strong spines.

Heptarthrogaster parvulus (Taschenberg). Text-plate XX, figs. 1, 1a, 1b.

Goniodes parvulus Taschenberg, Nova Acta Halle, Die Malloph., 1882, p. 38, pl. I, fig. 4, 4a, 4b (*Tinamus robustus*, Costa Rica; equals *T. major fuscipennis*).

The description of this species as given by its author, is quite clear and fairly complete, but the figure leaves much to be desired, and I have, accordingly, prepared drawings illustrating both sexes and the male genital armature. The drawing of the male was taken from a specimen collected from *Tinamus s. serratus* and the female from a parasite of *T. major castaneiceps*, of Costa Rica, which was found in company with the type series of *Goniodes minutus* Carriker (see note under *Heptarthrogaster minutus*).

These specimens do not agree entirely with Taschenberg's description of the species, but the differences, as far as can be determined, are not even of subspecific value.

Material examined: 2 ♀ ♀ from *Tinamus major castaneiceps*, collected by the author at Pozo Azul, Costa Rica, June, 1902. 3 ♂ ♂ and 4 ♀ ♀ from *Tinamus s. serratus*, collected at Chifiri, Rio Kaka, Bolivia, Sept. 6, 1934.

Measurements:	♂		♀	
	length	width	length	width
body	.87 mm.		1.09 mm.	
head	.28	.32 mm.	.28	.41 mm.
prothorax	.13	.27	.13	.28

Measurements (cont.):

mesothorax	.10	.40	.12	.41
metathorax	.12	.36	.13	.37
abdomen	.52	.48	.62	.50
antennae	.20		.165	

Heptarthrogaster minutus (Carriker). Text-plate XX, figs. 2, 2a, 2b.

Goniodes minutus Carriker, Univ. Stud, Univ. Nebr., Vol. III, No. 2, 1903, p. 33, pl. IV, figs. 1, 2 (*Tinamus robustus*, equals *T. major castaneiceps*).

When this species was described, two very distinct forms were present in the same lot of parasites, so that while the male was correctly determined and described, the female which was described as the female of *minutus* is in reality the female of *parvulus*, and the single female of *minutus* present in the material was overlooked or disregarded.

Last year a series of both sexes of both species was taken on *Tinamus s. serratus*, of Bolivia, and examination of this material revealed the original error. The original description and figure of the male of *minutus* is perfectly correct, but that of the female must be disregarded. The female of *minutus* is so different from that of *parvulus*, that I am rather doubtful of the two species being congeneric. However, for the present I have placed them in the same genus, with another new species, described herein.

I have here refigured the head, end of abdomen and genitalia of the male of *minutus*, together with a complete figure of the female, which is described below.

Description ♀: Resembles superficially the female of *H. parvulus*, but the head is of decidedly distinct shape, with the preantennary area extremely reduced, flatly convex, and with the small mandibles located just within the frontal margin, so that in some specimens the mandibular palpi project beyond the front in the form of a small hyaline flap. Clypeal band narrow and slightly toothed; antennal bands short, extending nearly to the mandibles; temporal bands narrow and occipital blotches small; sides of temples flatly convex, divergent and temporal angles broadly rounded, with one long hair and one short one; occiput broad and concave, with one short bristle on each side; pharyngeal sclerite and gland well developed.

Prothorax large, much wider than long, with sides convex, divergent and sharp posterior angles, bearing a strong spine; mesothorax very short, much shorter than prothorax, with sides expanded and convex (as wide as head) and posterior angle rather sharp, with one long hair and four others on each side along the meso-metathoracic suture, two outside the acetabular bars, one over them and one at inner end of suture; mesosternum with two strong hairs; metathorax longer than mesothorax and as wide at anterior angles, where a considerable extent of the lateral margins are exposed in front of the first abdominal segment; sides convex, converging, and posterior margin flatly convex, with two long hairs on each side.

Abdomen elongated oval, of seven segments, with spiracles in segments 1 to 6; 1st. and 7th. segments the longest, the latter broad, rounded posteriorly, but with tip indented; pleural plates sharply delineated, of medium width, rather heavily chitinized and pigmented, and with darker, interior markings in segments 1 to 5; tergal plates entire, rather strongly pigmented

(but less than pleural plates), but with clear spaces between them along the sutures; segments 1 and 2 with two median pairs of hairs on posterior margins of tergites and a third just inside the pleurites; a darker band across the posterior half of the tergal plate on segment three (a sternal plate) and a dark patch on each side of the genital patch on segments six; lateral angles of segments 1 to 5 with one longish hair; 6th. with three hairs and one long and two short hairs on each side of segment seven, which is almost uncolored; two long hairs on posterior margin of 5th. sternal plate. Legs stout, tibiae heavy and with numerous strong spines; posterior side of femora on 2nd. and 3rd. pairs of legs excavated, so that when the tibiae are folded back they fit into this groove; coxae and femora of 1st. pair of legs unusually large, larger than 2nd. and 3rd.

Measurements:	♂		♀	
	length	width	length	width
body	.90 mm.		1.03 mm.	
head	.26	.32 mm.	.25	.38 mm.
prothorax	.11	.27	.12	.28
mesothorax	.07	.36	.08	.37
metathorax	.11	.36	.13	.38
abdomen	.48	.46	.63	.50
antennae	.18		.16	

Heptarthrogaster grandis, species novum. Text-plate XX, fig. 3.

Type, ♀ adult, from *Tinamus s. serratus*, collected at Santa Ana, Rio Coroico, Bolivia, July 26, 1934.

Diagnosis: Very similar in general structure and markings to the females of *H. parvulus* and *minutus*, with the body and thorax more nearly resembling *parvulus* and the shape of head that of *minutus* (except for position of mandibles, which are as in *parvulus*), but the size much larger than either.

Head rather large, front wide and flatly rounded, with narrow, toothed marginal band; temples somewhat expanded, with sides convex, divergent and angles broadly rounded, with one short and one very long hair; occiput wide and concave; antennal bands short and deeply colored; temporal bands submarginal, narrow, and extending from eye to occiput; mandibles rather heavy, front edge in line with middle of antennae; pharyngeal sclerite and gland small, but well marked; antennae rather long and thickened, with 2nd. segment the longest and 4th. the shortest, and one hair on 1st. segment; two hairs on preantennary area and one short one on each side of mandibles; one hair and one spine at each side of occiput, on margin.

Prothorax large, wider than long, with heavy, submarginal, lateral bands and well-developed acetabular bars; sides nearly straight, divergent, with posterior angles obtuse and bearing a heavy, long spine.

Mesothorax shorter than prothorax, as wide as head, with sides expanded anteriorly, convex, and posterior angles rounded, set with one short and one long, strong hair; another hair just behind angle, a third on the meso-metathoracic suture just inside the acetabular bars and two long hairs on the mesosternum. Metathorax almost as wide as mesothorax and about the same length, with posterior margin flatly circular, with a slight protuberance in the middle, on each side of which are two strong, pustulated, marginal hairs; metasternum with two strong hairs.

Abdomen oval, with 1st. and 7th. segments the longest, with the 6th. nearly as long as 7th., and 2nd. to 5th. subequal; pleural plates rather wide, not deeply pigmented, but with an interior, hook-shaped, darker colored band running backward from the suture to the spiracle, where it ends in a broader, rounded tip, and present only in segments 2 to 5; 1st. segment with short hook running backward from edge of metathorax to spiracle; 7th. segment with lateral margins deeply emarginate and with a peculiar chitinized process on the ventral face which extends beyond the tip; tergal plates faintly pigmented, broadly broken medially, with a hyaline space between them, and along the sutures; segments 1 to 5 with one hair in lateral angles, 6th. with three and 7th. with five hairs on each side (three submarginal and dorsal) and two short hairs at tip, besides several shorter dorsal hairs; segments 1 to 3 with a long, pustulated hair on posterior margin at inner edge of pleural plates; 2nd. segment with two short hairs on posterior margin of pleural plates and the 3rd. and 4th. with three and 5th. with four similar hairs; tergal plates of segments 2 to 5 with one long hair on posterior margin.

Legs of medium length, with femora and tibia stout, the latter with several short spines; claws rather long and strong.

Measurements:	♀	
	length	width
body	1.60 mm.	
head	.40	.58 mm.
prothorax	.19	.39
mesothorax	.15	.59
metathorax	.21	.54
abdomen	.98	.76
antennae	.23	

The type, and only specimen was taken on *Tinamus s. serratus*, but not on the same individual from which specimens of *H. parvulus* and *minutus* were taken. While this parasite closely resembles (generically) the females of *H. parvulus* and *minutus*, the large size and peculiar structure of the 7th. abdominal segment leave some doubt as to its true generic position. It is barely possible that it belongs to a group with antennae similar in the sexes, but for the present I prefer to leave it here.

TRICHODOPEOSTUS, genus novum

Genotype, *Trichodopeostus spinosus*, species novum.

Diagnosis: Closely related in general shape and structure to *Heptapso-gaster*, from which it may be distinguished chiefly by the type of the ♂ genital armature and the presence of short, strong spines on the posterior margin of the dorsal surface of the pleural plates.

Head wider than long and as wide as abdomen; clypeal margin broad and flatly rounded; eye vestigial; antennae dimorphic; temples produced posteriorly to the posterior margin of the prothorax and sharply pointed; prothorax small, much wider than long; mesothorax short and wider than prothorax; metathorax well developed, as long as mesothorax and as wide

or wider than prothorax; meso-metathoracic suture plainly visible outside of acetabular bars; metathorax deeply imbedded within first abdominal segment; abdomen short and oval in shape, of seven segments; spiracles present in segments 1 to 6; a series of three to four short, thick spines along posterior margin of dorsal surface of the pleural plates on segments one to four (inclusive).

Male genital armature asymmetrical and of most unusual shape. The basal plate is broad anteriorly, with one side convex and the other side slightly concave, and tapering towards apical end; parameres as long as basal plate, the length of segments 5 to 7. Both blades of parameres are flatly crescent-shaped and very slender, lying *parallel* to each other, the left one much wider than the right, which is almost hair-like in appearance; endomerical plates and penis completely wanting.

Trichodopoestus spinosus, sp. nov. Text-plate XXI, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Nothocercus n. nigrocapillus*, collected at Sandillani, Dept. La Paz, Bolivia, November 23, 1934.

Description of types: Front of head flatly rounded, with a narrow, dark, marginal band; trabecular tubercles strongly developed, bluntly pointed; antennary fossae shallow; antennae of medium size, strongly dimorphic and with length of segments very unusual; 1st. segment as long as the remainder combined, attenuated at base and widened at tip, where the posterior angle is expanded and bears a strong hair, as well as two other hairs on anterior margin and one on dorsal surface; second segment of normal size; 3rd. compressed into a thick disc, with the anterior side protruding beyond edge of 2nd. segment; 4th. segment minute, and 5th. also very small and slender, as long as 3rd. and 4th. combined. Sides of head flatly convex (almost straight), with a narrow, sinuate, submarginal, faintly pigmented band, which curves inward at the eye and ends in a broadly oval, deeply pigmented tip; temples long and tapering to a bluntly rounded, slender tip which extends backward to frontal edge of mesothorax; occipital margin transverse, slightly sinuate; mandible small and delicate; antennal bands short, oval and deeply pigmented; another deeply pigmented, transverse blotch at posterior edge of antennary fossae; whole posterior margin of temples strongly thickened and flattened; occipital blotches and band pitchy black. Two short bristles and a longish hair on each side of dorsal surface of preantennary area; one short hair between base of antennae and mandibles; one short hair on sides of head; two longish, strong hairs on tip of temples and two on the posterior margin.

Prothorax small, front concave, sides convex and divergent and posterior margin concave; a strong bristle in the broadly rounded posterior angles; heavy lateral bands and acetabular bars. Meso- and metathorax short, about as long as prothorax; mesothorax with sides expanded anteriorly and laterally and flatly convex; posterior margins (on sides) concave and finely serrated; lateral angles blunt, with two short and one long strong hair; posterior margin thickened and flattened and with one long pustulated hair; meso-metathoracic suture extends only as far as the acetabular bars; four strong, pustulated hairs on mesosternum, which is strongly developed (see figure).

Metathorax narrower than mesothorax, with sides slightly exposed; posterior margin flatly rounded and deeply imbedded within the 1st. abdominal segment; metasternum with two strong hairs.

Abdomen short and narrow (narrower than head in both sexes), oval in shape and with the angles scarcely projecting; 1st. segment the longest; spiracles in segments 1 to 6; pleural plates broad, not heavily pigmented, but with a series of intricate, deeply pigmented internal markings or bands on segments 1 to 5; tergal plates continuous, faintly pigmented and separated along the sutures by a hyaline band; 7th. segment narrow, with anterior margin conical and posterior rounded, and bearing a small ventral plate on each side which seems to be continuous with the genital plate that extends up into the 5th segment. Lateral angles of segments 1 and 2 without setae; 3rd. with one short hair; 4th. with one longer hair; 5th. with two and 6th. with four hairs; 7th. with two short hairs on each side. Pleural plates with hairs and spines on posterior margin of dorsal surface as follows: 1st. with 1 hair and 4 spines; 2nd. with 2 hairs and 4 spines; 3rd. and 4th. with 2 hairs and 3 spines; 5th. with 2 hairs and 1 spine. Tergal plates 1 to 5 with a hair on posterior margin near pleural plate, strongest on 1st. segment; three short hairs on each side of median portion of 1st. tergal plate.

Legs short and stout; tibiae with strong spines.

Female much larger than male, with front of head more convex; trabecular tubercles longer and more pointed and temples more divergent and more convex; eye prominent and hyaline, with minute seta; antennae short and filiform, 1st. segment the longest, 2nd. and 5th. equal; but one short hair on posterior margin of temples. Abdomen longer and less oval; 7th. segment with tip bifurcated; peculiarly shaped sternal plates running from side of 7th. segment forward into the 5th., inside of pleural plates. The internal bands of pleural plates as in the male; arrangement of spines on posterior margin of tergal plates not the same, there being 5 on segments 1 and 2, 4 on 3rd., 3 on 4th. and none on the 5th.

Measurements:	♂		♀	
	length	width	length	width
body	1.51 mm.		1.94 mm.	
head	.58	.73 mm.	.59	.90 mm.
prothorax	.19	.39	.19	.42
mesothorax	.16	.63	.18	.68
metathorax	.19	.53	.22	.60
abdomen	.83	.72	1.24	.84
antennae	.26		.24	

Female may be distinguished from females of closely related species by the long, pointed trabecular tubercles; shape of temples; markings and spines on pleural plates and by the peculiar sternal plates across the 5th. to 7th. abdominal segments.

Trichodopoestus incertus, species novum. Text-plate XXI, fig. 2.

Type, ♀ immature, from *Nothocercus nigrocapillus cadwaladeri*, collected at Leymebamba, Dept. Amazonas, Peru, by H. R. Roberts, July 31, 1932.

Diagnosis: General shape of head from tips of temples around the front is almost uniformly semicircular; antennal fossae shallow, with the anterior angle produced into a long, slender, pointed hook (the trabecular tubercles); temples bluntly pointed and much produced posteriorly, reaching back to the posterior angles of the prothorax; occipital margin nearly transverse, slightly sinuate; clypeal band continuous around front of head, deeply pigmented, and with a pointed, inward projecting lobe at the base of the trabecular tubercles; temporal bands extending from eye to tip of temples, but unpigmented; antennae rather short and somewhat thickened, with 1st., 2nd. and 5th. segments subequal and longest, and 4th. the shortest.

Prothorax short, sides straight, slightly divergent and with posterior angle bluntly rounded and bearing a short spine; posterior margin nearly transverse. Mesothorax with sides slightly expanded forward and strongly convex; lateral angles poorly indicated; posterior margin clearly visible across entire width of segment, coming to a blunt point medially and extending backward to the middle of the 1st. abdominal segment. Metathorax very small and distinguished with difficulty, with the sides deep within the 1st. abdominal segment and posterior margin transverse, passing across just behind the median angle of the mesothorax.

Abdomen ovoid, with posterior angles of segments 1 to 5 sharply angulated; pleural plates sharply outlined, but without internal markings (probably due to immaturity); a pair of small tergal plates on segments 1 to 6, broadly separated from each other and from the pleural plates by hyaline areas. Legs short and stout, tibiae with numerous stout spines.

Measurements:	♀	
	length	width
body	1.45 mm.	
head	.45	.65 mm.
prothorax	.15	.33
mesothorax	.25	.49
metathorax	.12	.42
abdomen	.84	.74
antennae	.22	

Remarks: Not having males of this species and all the females being immature, it is impossible to allocate the species generically with much certainty, although all the visible characters point to this genus.

The peculiar structure of the meso- and metathorax are most certainly due to immaturity, for similar conditions have been observed in another species, where the meso-metathoracic suture is entire and the metathorax poorly developed in the young. Until adult specimens can be secured, I prefer to leave the species in the genus where it has now been placed.

In the collection of the U. S. Bureau of Entomology are four specimens of this species, all immature, taken on *Crypturellus tataupa*, collected at Vicoso, Brazil by E. J. Hambleton, June 15, 1933. Two of the specimens are in about the same stage as the type, while the other two are still younger. These specimens are clearly the same specifically, but throw no additional light on their generic position.

Trichodopeostus aculeatus (Piaget).

Goniodes aculeatus Piaget, Les Pediculines, 1880, p. 266, pl. XXII, fig. 2 (*Momotus lessoni*: straggler, probably from *Nothocercus julius*).

Piaget had but a single female of this species, which he states was taken on a skin of *Momotus lessoni* in the Leyden Museum. Unquestionably it was a straggler and its true host is some form of a Tinamou.

Taschenberg recognized this fact when he placed it (incorrectly) in his genus *Rhopaloceras* (Die Mallophagen, p. 48).

It seems positive that it is a female of the genus *Trichodopeostus*, which has thus far only been taken on the avian genus *Nothocercus* (and possibly *Crypturellus tataupa*), and if such be the case, its true host could be *Nothocercus julius*, which is found in the same general regions as *Momotus lessoni*. The form of the head as shown by Piaget is peculiar to this genus, and exactly like the head of the female of *T. spinosus*. The deeply cleft apical segment of the abdomen is also characteristic of the genus. The metathorax is shorter than in *T. spinosus*, and the incrassations on the pleural plates not quite the same. The strongest character which he gives in favor of this genus is the presence of "aculei" on the posterior margin of the pleural plates, one of the generic characters of *Trichodopeostus*.

Until further material is secured, including the male, I propose to keep it as a distinct species.

MEGAPEOSTUS, genus novum

Genotype, *Megapeostus asymmetricus*, species novum.

Size large; antennae strongly dimorphic; eye absent. Clypeal band of uniform width and with from two to six internal projections in both sexes. Temple drawn out into long, narrow, rounded points, set with strong hairs. Prothorax narrow, with straight, divergent sides. Meso- and metathorax short and narrower than head and 1st. abdominal segment. Metathorax almost or quite as wide as mesothorax, with sides exposed and with a slightly hooked postero-lateral angle. Meso- and metasternum with but two long hairs on each.

Abdomen large, elongated oval. Pleural and tergal plates not sharply divided and of same degree of pigmentation, the former with darker internal markings, and the latter uninterrupted in both sexes. One spine on inner, posterior corner of pleural plate on segments 2 to 4. Legs rather short, with thickened femora and slender tibiae, the latter with numerous spines; 1st. pair of femora the largest and tibiae subequal. Tarsal claws slender, nearly straight and subequal in length.

Male genital armature massive and apparently unique in the shape and inequality of length in the parameres. Basal plate short and broad, pigmented only along lateral portion. Parameres of unequal length, the right not more than three fourths the length of the left, which is as long as the basal plate, somewhat styliform in shape but of irregular outline and pointed tip. The shorter paramere is as wide as the other, but bluntly rounded at tip. The ventral endomeres are fused into a plate with hooked apical corners; dorsal endomeres small and apparently fused along sides of

under plate. Penis present but small. Seventh segment in female small and rounded, while the genital plate bears a peculiarly shaped flap on each side behind.

The "scent glands" are present on the 5th. segment at the inner posterior corner of the pleural plate, which is incised to receive it. They are globular, with a short tubular outlet directed inward and downward.

Megapeostus asymmetricus asymmetricus, species novum. Text-plate XXIII, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Crypturellus u. undulatus*, collected at Rurrenabaque, Rio Beni Bolivia, September 11, 1934.

Description of species: Preantennary area short and flatly convex; trabecular tubercles prominent, rounded in ♂ and pointed in ♀. Antennae strongly dimorphic, 1st. segment in ♂ swollen, with a strong spine on posterior margin; second segment half as long as 1st., but articulated at right angles to it, with one spine on inner side; 3rd. segment curves backward parallel with 1st., and bears the minute 4th. segment at its middle on outer side; 5th. larger, but shorter than 3rd. Sides of head slightly concave in male, convex in female; temples long and narrow, with rounded tip bearing two strong hairs; occipital margin sinuate. Clypeal band narrow at sides and widened medially, with two darker, internal median projections in ♂ and six in ♀. Temporal bands narrow, without projections; antennal bands short and pigmented only in the swollen median portion. Two short hairs on each side of preantennary area, one at each side of mandibles and one on each side of head.

Prothorax narrow, with sides straight, but divergent. Lateral bands and acetabular bars heavily pigmented; a strong spine in posterior angles. Mesothorax short, narrower than head, and slightly narrower than 1st. abdominal segment; sides flatly convex and divergent, with rounded angles bearing 2 long and 1 short hair, the longer ones on posterior margin. Metathorax nearly as wide as mesothorax, with sides convex and largely exposed, and with a hooked latero-posterior angle. Posterior margin with sides slightly concave and middle broadly rounded, and with the median portion apparently fused with the abdomen (in male only). Meso- and metasternum each with two long, strong hairs.

Abdomen elongated oval, 1st. segment the longest and the remainder subequal. Pleural plates rather poorly pigmented, not more deeply colored than the continuous tergal plates, which are separated by broad hyaline strips along the sutures. Pleural plates with a median, longitudinal, sinuate band, extending from the spiracles into the next anterior segment; also a rounded blotch on outer, posterior portion of sclerite. A short, stout spine on inner portion of posterior margin of pleural plates 2 to 4 in both sexes. Segment one with 1 hair in angle; segments 2 to 5 with 1 long and 1 short hair; 6th. segment with 3 long hairs and 7th. with 4 short, marginal setae and 2 submarginal hairs on each side.

Seventh segment in ♂ with anterior margin transverse and posterior rounded, wider than long. In the female this segment is small, longer than wide, circular in front and with bifurcated tip behind; it bears some marginal setae and three stout spines on each side on the dorsal surface.

The ♂ genital armature is described in detail under the generic diagnosis. Female similar to the male, except in the simple, filiform antennae, convex sides of head and different 7th. abdominal segment, as described above. The clypeal band has three graduated inner projections on each side instead of one. Numerous specimens of both sexes taken on type host.

Measurements:	♂		♀	
	length	width	length	width
body	2.12 mm.		2.26 mm.	
head	.52	.83 mm.	.56	.90 mm.
prothorax	.25	.46	.24	.44
mesothorax	.20	.68	.20	.68
metathorax	.22	.68	.22	.67
abdomen	1.30	.82	1.41	.85
antennae	.40		.23	

Megapeostus asymmetricus parvigenitalis, subsp. nov. Text-plate XXIII, fig. 2.

Types, ♂ and ♀, from *Crypturellus atrocipillus*, collected at Chiniiri, Rio Kaka, Bolivia, August 24, 1934, by M. R. Carriker.

Diagnosis: Very similar to *asymmetricus* in general appearance, but differs in size and proportions of different body segments, as well as having a much smaller male genital armature which differs also in details of structure. The sexes are practically the same size, except that in the female the thoracic segments and abdomen are narrower than in the male. The genital armature is very much smaller, with shorter basal plate but with the parameres very much shorter and the endomeral plates about the same size. The endomeral plate is narrower, especially at the tip, and lacks the hooks on the sides. The penis is longer and more prominent. The table of comparative measurements given below well illustrates the differences, as well as the two figures, which are drawn to the same scale.

Measurements:	♂		♀	
	length	width	length	width
body	1.94 mm.		1.93 mm.	
head	.53	.79 mm.	.52	.79 mm.
prothorax	.24	.45	.21	.40
mesothorax	.19	.70	.17	.64
metathorax	.22	.65	.21	.58
abdomen	1.15	.78	1.15	.73
antennae	.37		.24	

Measurements (♂ genital armature):

	<i>M. a. asymmetricus</i>		<i>M. a. parvigenitalis</i>	
	length	width	length	width
basal plate	.40 mm.	.16 mm.	.36 mm.	.14 mm.
long paramere	.48	.04	.32	.026
short paramere	.37	.024	.24	.018
endomeral plate	.18	.09	.17	.09

The female may be distinguished from the female of *asymmetricus* by the difference in size, thicker temporal lobes on head and absence of the hook on the lateral angles of the metathorax.

HETEROGONIODES, genus novum

Genotype, *Gonicotes clypeiceps* Giebel.

Most closely related to *Megapeostus*, with which it agrees in large size, highly dimorphic antennae, shape of head and thorax and general character of abdominal sclerites.

The generic characterization of *Megapeostus* may serve for this genus with the following modifications:

More flattened (less convex) frontal margin of head; clypeal band very narrow latterly and poorly pigmented, but widening in the median portion, and entirely without internal projections in either sex. Eye strongly developed in both sexes. Temples project but slightly behind occipital margin of head. Metathorax narrower than mesothorax, with whole segment imbedded within the abdomen and the posterior margin uniformly circular, without lateral angles. Meso- and metasternum with from 6 to 8 strong hairs on each (instead of only 2). Tergal plates of abdomen continuous in male, but broadly interrupted medially in female, and lastly by the male genital armature, which is symmetrical, and of more or less conventional type, although rather massive, with long basal plate but shorter parameres, strongly developed endomeral plate and penis absent. The legs are more strongly developed than in *Megapeostus*, with longer femora. Second pair of tibiae the smallest and 3rd. the largest. Tarsal claws as in *Megapeostus*. The "scent glands" are somewhat similar to *Megapeostus* but less developed. The pleural plate is not incised to receive it and the outlet is rudimentary.

Heterogoniodes clypeiceps (Giebel). Text-plates XXI, fig. 3; XXII, figs. 1, 1a.

Gonicotes clypeiceps Giebel, Zeitschr. f. ges. Naturwiss., 1866, XXVIII, p. 389

(*Crypturellus cinereus*); Piaget, Les Pediculin., 1880, p. 237.

Strongylocotes clypeiceps, Taschenberg, Die Mallophagen, p. 59.

Diagnosis: Much resembling *Megapeostus asymmetricus* in general appearance, but front of head more flattened, clypeal band narrow and poorly pigmented, with a wider median blotch, but without inward projections in either sex. Trabecular tubercles large and rounded in ♂, smaller and pointed in ♀; antennal bands very narrow and pale near margin of head, but expanded into a rounded, very deeply pigmented submarginal blotch; mandibles not unusually large, but with the sides and tips much thickened, and the tips scored with concentric black lines. Sides of head rather deeply concave, margined by a dark band which expands inward into a darker blotch just behind the prominent, hyaline eye, which has a short seta. Occipital bands short, but deeply pigmented. One short hair on each side of preantennary area and two rather short, strong hairs on tip of temples. Prothorax narrow, with sides straight and divergent and posterior angles rounded and set with a strong, short bristle. Mesothorax very short and but little wider than prothorax; sides slightly expanded and convex, with lateral angles bluntly angulated and bearing one short and two long, strong hairs. Mesosternum with three long, strong, pustulated hairs on each side. Metathorax narrower than mesothorax, completely encircled by the first abdominal segment and with posterior margin flatly rounded and sides convex. Metasternum with three strong hairs on each side.

Abdomen short, oval, first segment the longest and the rest subequal, the second segment the widest. Pleural and tergal plates uniformly pigmented, the latter entire in male and interrupted medially by a wide hyaline area in female. Deeply pigmented sternal plates on segments 3 and 4, narrower and longer than corresponding tergal plates; large genital sternal plate covering median portion of segments 5 to 7. Pleural plates with two internal longitudinal bands and a small round blotch in posterior portion. In the 6th. segment the longitudinal bands coalesce in front and the round spot is wanting. Seventh segment unmarked, but with a small oblong appendage on each side of rounded tip. Segments 2 and 3 with one hair in angle; 4th. segment with 2 hairs, 5th. with 3 and 6th. with 4 hairs. 7th. segment with 2 setae on each side and 2 on tip of the appendages. Segments 1 to 5 with a longish hair on posterior margin of tergal plate next to pleural plate, and two median hairs on segments 2, 4, 5 and 6. A short spine on inner posterior corner of pleural plate on segments 2 to 5. Legs rather large, faintly pigmented, but with dark marginal bands on outer edge of 2nd. and 3rd. femora and tibiae. Tibiae with strong spines, few on 1st. but many on 3rd. Tarsal claws long, slender, scarcely curved and subequal. Male genital armature large, especially the basal plate, which crosses segments 4, 5 and 6. Parameres short, nearly straight, slender and slightly sinuate, with nearly uniform width from base to tip. Ventral endomeres fused into a single wide plate, which is nearly as long as the parameres, but extends far back into the basal plate. Dorsal endomeres large, lying between the basal portion of parameres and ventral endomeral plate. Penis apparently absent.

The female differs from the male very little in size, except that the head is wider at the temples and the abdomen slightly larger. The sides of the head are slightly convex instead of concave; the antennae are simple and filiform. The tergal plates are broken medially and the sternal plates but faintly pigmented. The 7th. abdominal segment is broader, shorter, with the anterior margin flatly rounded (flatly conical in ♂) and posterior margin flatly conical with a median emargination and a row of short spines across the posterior portion of the segment.

Measurements:

	♂		♀	
	length	width	length	width
body	2.11 mm.		2.14 mm.	
head	.64	.91 mm.	.65	.98 mm.
prothorax	.23	.48	.24	.49
mesothorax	.17	.65	.18	.67
metathorax	.24	.60	.28	.64
abdomen	1.23	.94	1.27	1.00

Four ♂♂ and 8 ♂♂ from *Crypturellus cinereus cinerascens*, collected at Chiniiri, Rio Kaka, Bolivia, September 6, 1934.

There is little doubt of the identity of these specimens. I have carefully gone over Giebel's original description, the later one by Piaget and the last, and best one, by Taschenberg, and there are many conclusive diagnostic characters. Giebel stated that the type was a male, but Taschenberg says that it is most decidedly a female, and he is quite correct. The

style of antennae and shape of the apical abdominal segment proves this point.

Giebel says, among other things: Head broader than long, with broad convex front, broadening behind the antennae gradually to the straight truncated temples, between which the occiput runs across very smoothly with no indication of hinder temporal angles. The prothorax as long as wide, widening toward the back and rounded, without angles. The broader metathorax widens somewhat behind and its strongly convex posterior margin is deeply imbedded in the 1st. abdominal segment. Taschenberg later examined the type and found it in very bad condition, in fact broken in two pieces, but his description is very good. He corroborated the above details given by Giebel and adds others of equal value, and gives the true sex of the type. He says: The last segment is double pointed, and shows, along with the shape of the antennae, that it is a ♀.

Heterogoniodes heterurus, species novum. Text-plate XXII, fig. 2.

Type, ♀ adult, from *Crypturellus b. berlepschi*, collected at Potedo, Rio San Juan, W. Colombia, May 5, 1918.

Diagnosis: Very similar to *H. clypeiceps* but differing in certain specific details. The male is unknown, and may present other more striking characters.

The head is wider, but of same length, with the front wider and more flatly rounded; the antennae are considerably thicker in all segments and longer; the eye is larger and the temples much wider across the tips, while the occipital margin is strongly sinuate (instead of uniformly concave). The prothorax is shorter and wider, with sides more divergent and more convex. The acetabular bars in both meso- and metathorax are of a peculiar design, seemingly of a twisted, spiral shape. The meso- and metasternum each bear four strong, long hairs on each side, instead of three. The metathorax has the sides nearly straight and more convergent, with the posterior margin more flatly convex. The sternal plates of abdomen are practically invisible, except the genital plate which is short and narrow and of distinct shape. The 7th. abdominal segment has the posterior margin rounded (instead of flatly conical) and the spines are thicker, more closely placed and separated medially by a clear area. The markings of the pleural plates are also different, as may be seen from the figure given. Legs about the same.

Measurements:	♀	
	length	width
body	2.40 mm.	
head	.64	1.06 mm.
prothorax	.22	.53
mesothorax	.19	.67
metathorax	.36	.73
abdomen	1.46	1.09
antennae	.33	

Known only from the type and another female taken on same host.

DISCOCORPUS, genus novum

Genotype, *Discocorpus cephalosus*, sp. nov.

Head, thorax and abdomen much wider than long, the thorax and abdomen (in ♂) forming an almost perfect circle. Antennae simple, the same in both sexes; trabeculae reduced to a rounded tubercle; front of head much flattened, with clypeal area much reduced; temples expanded and broadly angulated; mandibles massive, the left with tip wedge-shaped and the right with bifurcated points, between which the wedge-shaped tip of the left fits; pharyngeal sclerite and gland present; pro- and pterothorax at least twice as wide as long, the latter with posterior margin broadly expanded and rounded, with the median portion extending backward beyond the lateral angles of the first abdominal segment, which is semicircular in shape, widened at the sides and narrow medially; abdomen with but seven segments, the spiracles being present in segments 1 to 6; pleural plates with exceedingly intricate internal markings; genital armature of medium size, rather short and thickened as to basal plate and parameres, but not of unusual structure; legs rather short and stout, the first pair very minute, with the middle pair slightly smaller than the hind ones. Whole insect minute, less than one millimeter in length.

Discocorpus cephalosus, species nov. Text-plate XXIV, figs. 1, 1a, 1b, 1c.

Types, ♂ and ♀ adult, from *Crypturellus atrocapillus*, collected at Chiniñiri, Rio Kaka, Bolivia, by M. R. Carriker, Aug. 24, 1934.

Description of types: Head twice as wide as long; front flattened, slightly concave in the middle; sides of head (behind antennae) convex and slightly sinuate, the temporal angle more pronounced in the ♂ than the ♀; occipital margin strongly sinuate, the occiput proper being convex, with a depression on each side; antennal fossae short, but pronounced; antennae with first segment thickened and somewhat rounded, second the longest, with distal end thicker; 3rd. and 4th. segments equal and shorter, the 5th. about equal to first in length, but equal to 3rd. and 4th. in thickness.

Prothorax nearly four times as wide as long, front deeply concave, sides produced into a blunt point, bearing a short thick spine; posterior margin rounded, but concave medially.

Pterothorax as wide as head, with sides widely divergent and slightly convex; lateral angles blunt and posterior margin broadly expanded and deeply imbedded within the abdomen, reaching back to a line posterior to the lateral angles of the first abdominal segment. The suture between the meso- and metathorax is clearly visible on each side, curving inward and backward for some distance, while the metathoracic portion of the segment is considerably narrower than the mesothoracic, its sides joining the posterior edge of the mesothorax inside of the lateral angles and its whole exposed margin forming a perfect semicircle.

The abdomen is nearly circular, the posterior lateral angles of the segments neither sharp nor protruding, the margin of the abdomen presenting an almost unbroken line to the end of the 6th. segment, where there is a deep angular emargination between the 6th. and 7th. segments; the 7th. segment is flatly rounded posteriorly, with sides concave and anterior portion expanded and rounded and deeply imbedded within the 6th. segment;

the pleural plates of segments 1 to 5 seem to overlap each succeeding segment, forming a most complicated and confusing pattern of bands and lines, which is best shown by reference to the figure.

Chaetotaxy: Frontal margin of head with two short hairs on each side; dorsal surface of clypeal area with four short hairs on each side and another at the base of the trabecular tubercle; another short dorsal hair just outside of the base of the mandibles; a short, fine hair at the posterior margin of the eye, which is vestigial; temples with three thickened bristles, the longest at the angle, a shorter one in front of the angle and a third at the side of the occiput, the first and last being set in large clear pustules. Prothorax with a short stiff spine on the lateral angle. Mesothorax with a long, stiff bristle on forward edge of lateral angle, a shorter hair just behind the angle and a very long, strong hair on the dorsal surface within the angle, the first and last being set in pustules; two short fine hairs on dorsal surface of median area of metathorax, and two on posterior margin; two longish hairs on each side of mesosternum. Lateral angles of abdominal segments 1 to 3 with one medium, slender hair; 4th. with two, and 5th. with three hairs, longer than in segments 1 to 3; 6th. with two longish, strong, pustulated hairs within the posterior angle and one slender hair; 7th. with four strong, pustulated hairs on each side of posterior margin; segments 3 and 4 with two short, dorsal hairs in middle of segment, one on each side of basal plate of genital armature; 5th. segment with three similar hairs on either side of genital armature; segments 2, 3 and 4 with one exceedingly long, strong, pustulated hair on the dorsal surface just at inner edge of pleural plates, on the posterior margin of the tergal plates (these hairs extend back about even with those on the 7th. segment).

The legs are short and thick, the tibiae especially thickened, being almost as large as the femora, and with from five to eight short bristles; first pair of legs very much smaller than next pair and third slightly larger than second.

Of the ♂ genital armature, the basal plate is broad but thin, reaching from the front margin of 7th. segment to middle of the 3rd. It is poorly pigmented, except for a band along each side, to which are attached the parameres and endomerical plates; parameres long and strong, thickened medially and curving sharply inward to the slender tips, one of which is slightly longer than the other; the dorsal endomerical plates are poorly developed, appearing as slender rods along the inner edge of the parameres at their base, while the ventral plate is well developed, filling the space between the bases of the parameres. The penis is well developed, protruding considerably beyond the end of the basal endomerical plate.

The female is very similar to the male except slightly larger, the 7th. abdominal segment of entirely different shape, being wholly imbedded within the 6th. segment, has the posterior margin flatly rounded and the remainder of the margin somewhat uniformly circular. There are three strong hairs on each side of posterior margin and an undulating line of fine, short, ventral hairs across the median portion, which extends into the 6th. segment on each side.

Measurements:	♂		♀	
	length	width	length	width
body	.81 mm.		.96 mm.	
head	.24	.435 mm.	.27	.46 mm.
prothorax	.08	.27	.09	.28
mesothorax	.08	.43	.10	.43
metathorax	.14	.39	.12	.38
abdomen	.51	.60	.60	.62
antennae	.14		.15	

Discocorpus microgenitalis, sp. nov. Text-plate XXIV, figs. 2, 2a, 2b.

Types, ♂ and ♀ adult, from *Crypturellus tataupa*, collected at Vicosa, Brazil, June 15, 1933, by E. J. Hambleton (types of parasite in collection of U. S. Bureau of Entomology, No. 21572). *U.S.N.M. Wash. D.C.*

Diagnosis: In general appearance quite similar to *D. cephalosus* (described above), agreeing closely with that species in the shape and markings of the thorax and abdomen, but differs in having the preantennary area of head longer and the front more deeply emarginate; the mandibles are heavier and of a distinct shape; the antennae are thicker; the 7th. abdominal segment differs in structure and the genital armature in the ♂ is extremely small and rudimentary in structure. The sides of the head are less convex (more nearly straight) and the temporal angles more rounded. On the sides of the head are two short, slender setae, instead of one short and one long, thick hair; there are two long, strong hairs at the temples, one marginal in front of the angle and the other submarginal, behind the angle, with a short, thick spine between them and a short spine (instead of a long hair) on the posterior margin.

Hairs at lateral angles of abdominal segments thicker.

Genital armature very different from that of *cephalosus*. The basal plate is smaller, scarcely pigmented except at the slender prongs which extend from the base, and inside of which are attached the parameres (not at end of basal plate, but inside), which are scarcely more than half the length of those in *cephalosus*, and with the apical half widened and basal half narrow; the endomerical plates are entirely inside the basal plate, the upper pair being merely two narrow bars lying on top of the lateral margin of the lower, which is oval in shape and poorly pigmented. The penis is vestigial. At the tip of the parameres is attached a short, thin spine, shaped much like a long spear-head. This appears to be entirely absent in *cephalosus*.

Measurements:	♂		♀	
	length	width	length	width
body	.91 mm.		1.04 mm.	
head	.26	.45 mm.	.29	.49 mm.
prothorax	.10	.30	.10	.28
mesothorax	.10	.42	.10	.43
metathorax	.12	.38	.12	.38
abdomen	.53	.61	.63	.60
antennae	.16		.16	

LAMPROCORPUS, genus novum

Genotype, *Lamprocorpus hirsutus*, species novum.

General structure and shape of head resembling *Heptapsogaster*, but the structure of the thorax quite different, as well as the chaetotaxy of the thorax and abdomen.

Diagnosis: Size large; front broadly rounded; antennae dimorphic, the first segment much swollen in ♂, 3rd. with distal hook and 4th. and 5th. minute; small tubercular processes instead of trabeculae; eyes large and protruding; temples expanded, angular, with truncated tip, and extending backward to lateral angles of prothorax; mandibles small; sclerite and gland present, well developed; buccal cavity very small.

Prothorax small, wider than long; spiracles prominent; mesothorax with sides expanded anteriorly and laterally; meso-metathoracic suture clearly visible within the acetabular bars; numerous long, strong hairs on sternal plates of both meso- and metathorax. Metathorax bluntly pointed on posterior margin, segment short, with strong hairs on posterior margin, between the acetabular bars, which extend to margin of segment; the portion of the segment outside of the acetabular bars clear and transparent, there seeming at first glance to be an open space between the posterior margin of the mesothorax and first abdominal segment, but the two are apparently only connected by a thin, transparent integument.

Abdomen oval, with seven segments, the first the longest; spiracles clearly visible in segments 1 to 6; segments 2 to 6 subequal in length, 7th. flatly rounded; segments 2 to 6 with poorly pigmented continuous tergal and pleural plates; segments 1 to 5 (inclusive) with a series of strong hairs on dorsal surface of posterior margin and hairs or short thick spines on ventral surface.

Genital armature short and stout, basal plate scarcely twice the length of parameres; the latter rather short and thick; ventral endomeral plate long and broad, expanded and emarginate apically; dorsal endomeres narrow, lying parallel with the ventral plate; penis apparently obsolete.

Female with head of slightly distinct shape (sides of head convex), with antennae small and slender, with 2nd. segment the longest; 7th. segment of abdomen broad and flatly rounded. Legs comparatively small, with femora and tibiae about equal in length; claws slender and almost straight, and both of nearly the same length.

As yet found only on the avian genus *Nothoprocta*.

Lamprocorpus hirsutus, species novum. Text-plate XXV, figs. 1 to 1c.

Types, ♂ and ♀ adult, from *Nothoprocta branickii*, collected at Desaguadero, Lake Titicaca, Peru, May 4, 1931.

Description of types: Head large, wider than abdomen; front broad, flatly rounded, preantennary area short; antennae strongly dimorphic, in ♂ the 1st. segment long and swollen, with a strong spine on inner margin; 2nd. short, thick and curving inward, with two spines on inner side; 3rd. short, with a long hook on distal end which curves inward nearly parallel with segment, and with one spine on outer side at end; 4th. segment minute, with a spine on outside at end; 5th. small and slender, longer than 4th; eye large, protruding, clear, with a small bristle; temples long and strongly

divergent, with sides concave and tip truncate and extending backwards to posterior lateral angles of prothorax; a blunt, flattened angle between temple and occiput, the latter concave; mandibles very small, the left toothed and the right pointed; sclerite and glands well developed; clypeal band narrow, continuous and with four short projections in median portion; antennal bands narrow, sinuate and deeply colored at base of trabecular tubercle; a small blotch at posterior edge of antennary fossae; a narrow band along sides of temples, starting at a deeply colored blotch at posterior edge of eye and tapering backward to outer temporal angle; tip of temple wide, truncate, and with rounded angles, each furnished with a strong pustulated hair; two more strong pustulated hairs on posterior margin of temples, at each side of occipital angle; two dorsal hairs on each side of clypeal area, one on base of antennal band and one between eye and base of mandible.

Prothorax wider than long, sides divergent and convex, posterior angle with a short, erect spine and a short stiff bristle; acetabular bars strongly developed; large spiracle present just within the postero-lateral angle.

Mesothorax much wider than prothorax, sides expanded anteriorly and strongly convex; lateral angles rounded and postero-lateral margin convex; meso-metathoracic suture plainly visible for some distance within the prominent acetabular bars, ending in a strong, pustulated hair on the mesonotum; three long, strong, pustulated, submarginal hairs on sides, behind the lateral angles; mesosternum large, ending posteriorly in two prongs and with a narrow, angulated extension bending back from each side of the frontal margin, and with four long, strong, pustulated hairs on each side.

Metathorax short, lateral margins exposed between mesothorax and 1st. abdominal segment; posterior margin somewhat pointed medially, but bluntly rounded, and metanotum set with five stiff, pustulated hairs on each side of the portion between the acetabular bars; lateral portion of segment, outside of the acetabular bars, clear and transparent, giving the impression of an open space between the mesothorax and 1st. abdominal segment; metasternum rather heavily chitinized on lateral portions, the inner point of the plate forming the attachment for the posterior coxae, while this thickened portion bears eight long, strong, pustulated hairs on each side.

Abdomen comparatively small, oval, with seven segments; the six pairs of spiracles present in segments 1 to 6; first segment the longest, the remainder subequal; the 7th. rather wide, sides flattened and tip slightly emarginate; the lateral angles rounded; pleural plates not the full width of segment, leaving a conspicuous clear area along the suture; pleural plates narrow, not strongly pigmented and apparently fused with the tergal plates, which extend unbroken across the segments. The chaetotaxy is somewhat complicated, but is shown very accurately in the drawing, so that a lengthy detailed description is unnecessary. The complete figure of the ♂ shows the chaetotaxy of the thorax and abdomen *only* on the dorsal surface, while the second figure (without head) shows *only* the ventral hairs. There are also two figures showing the dorsal and ventral chaetotaxy of the abdomen in the female.

The legs are of medium size, the femora and tibiae about equal in length, but the former more swollen; the coxae are comparatively small, but the trochanter in all three pairs of legs is most unusually large, being as well developed as in the hind legs of *Lipeurus*, *Esthiopterum* and *Pseudolipeurus*. A further peculiarity consists of a series of six strong, pustulated hairs along

the posterior margin of the third pair of coxae, but *only in the male*. I do not recall having seen this in any other species found on a Tinamou.

Genital armature comparatively small. Basal plate short, reaching from the end of the 3rd. to end of 6th. segment, and is expanded apically, narrowing towards the base. Parameres short and thickened basally, with tip attenuated and rounded and bent sharply inward; endomerale plate extending within the basal plate beyond the end of parameres, is expanded posteriorly, with thickened sides and bifurcated tip. Penis apparently absent or minute.

The female has the antennae small and filiform, each succeeding segment thinner than the last, and with the 2nd. the longest. Head of same shape and proportions as in the male, except that the sides, behind the eye, are slightly convex, instead of concave. The structure and chaetotaxy of the thorax is the same as in the male, except the posterior margin of the metathorax has one long and eight short hairs on each side. Chaetotaxy of the abdomen decidedly different, as may be seen from the drawings, which are accurate in all details. A rather wide genital patch, with semi-lunar frontal margin, covers the median portion of segments 6 and 7.

Measurements:	♂		♀	
	length	width	length	width
body	2.77 mm.		3.41 mm.	
head (at antennae)		.64 mm.		.88 mm.
“ (at temples)	1.00	1.38	1.14	1.64
“ (at occiput)	.78		.92	
prothorax	.35	.65	.40	.76
mesothorax	.32	1.08	.34	1.26
metathorax	.22	.96	.25	1.12
abdomen	1.52	1.22	1.98	1.58
antennae	.61		.41	

Lamprocorpus spinosus, species novum. Text-plate XXVI, figs. 1, 1a.

Types, ♂ and ♀ adult, from *Nothoprocta pentlandi*, collected at Canta, Dept. Lima, Peru, November 18, 1929.

Diagnosis: Very similar in general appearance to *L. hirsutus*. Head with temples wider and longer, extending backward slightly beyond the frontal margin of the lateral wings of the mesothorax; mesothorax and abdomen of the same width and similar in structure; mesosternum also with eight strong hairs on ventral face; metasternal plate more strongly chitinized behind the coxal articulation and set with 12 to 13 strong, pustulated hairs (instead of 8 as in *hirsutus*); third pair of coxae in male *without* the row of marginal hairs, there being but one hair, as in the female of both species; shape and structure of abdomen and legs essentially the same as in *hirsutus*, but the chaetotaxy of the former is very different.

As to the dorsal aspect of male, the metathorax with fifteen pustulated, spine-like hairs on each side of posterior margin, those in the middle longer; abdominal segments 1 to 5 with a closely set series of short, spiny, pustulated hairs along posterior margin of the tergal plates, segment 1 with about 38 hairs; 2nd. with 42 hairs; 3rd. with 36 hairs; 4th. with 34 hairs and 5th. with 28. On 7th. are two strong, pustulated hairs on apical por-

tion of segment. Ventral aspect: Pleural plates with 4 to 5 strong, pustulated hairs on posterior margin; sternal plates with a series of short, thickened, pustulated hairs on posterior margin as follows: 1st. with about 10 in median portion; 2nd. to 5th. with a series evenly spaced across the whole plate; 2nd. with 36, 3rd. with 32, 4th. with 22 and 5th. with 5 small hairs on each side and 1 long one on each side of basal plate of genitalia.

The female differs from the male in the shape of the head as in *L. hirsutus*, but has the chaetotaxy of the abdomen decidedly different both from the female of *hirsutus* and from the male of *spinosus*.

On the dorsal aspect, the hairs at posterior margin of tergal plates are thicker and slightly longer (than in the ♂), and number as follows: Segment 1, 38 hairs; 2nd. with 44; 3rd. with 42; 4th. with 40; 5th. with 22. On the ventral surface the hairs of the sternal plates are transformed into series of short spines, much thickened basally, and tapering to a fine point, and are set in small clear pustules. They number as follows: Segment 1 with 22; 2nd. with 34; 3rd. with 36, and 4th. with 18. There is a blank space in the median portion, without hairs or spines, and in the lateral portions of segments 2 to 4 the spines are intermixed with hairs similar to those on the tergal plates, 6 on 2nd.; 9 on 3rd., and 7 on 4th. The 5th. segment has 1 long hair on each side of median portion and 8 very small, slender spines in lateral portion. The pleural plates (on ventral aspect) bear strong hairs, graduated in number from 11 on segment 2nd. to 5 on segment 6.

The measurements differ so slightly from those of *hirsutus* that it is of little value to record them.

HEPTAPSUS, genus novum

Genotype, *Heptapsus nothocercae*, species novum.

Diagnosis: Closely related to *Pterocotes* Ewing, with which it agrees in the strongly dimorphic antennae; long pointed temples; short, wide prothorax, with pointed angle in median portion at sides; short, wide meso- and metathorax; somewhat elongated abdomen, and the absence of pleural plates, with the tergal plates extending unbroken across the whole segment and overlapping the sides. Preantennary area much reduced and front flatly rounded, with the sides ending in trabecular tubercles; eyes wanting; no trace of clypeal suture or signatural plate. Abdomen of seven segments, with the spiracles present in segments 1 to 6; legs short, femora stout, but tibiae slender and with numerous long slender spines; tarsal claws long and slender, nearly straight and subequal. Meso- and metasternum each with two long, strong hairs. This genus differs radically from *Pterocotes* in the absence of deep emarginations on the sides of the head, the sides of head being straight, and differing but little in the two sexes. The male genital armature is very different and apparently unique. The basal plate is rather short, wide, and faintly pigmented, while the parameres seem to be lateral extensions of it, since there is no visible suture between them. The parameres are largely hyaline except along the inner edge, where they are thickened and deeply pigmented; the penis is well developed, being nearly one third the length of the parameres. The endomerale plates are vestigial, being represented by small, deeply pigmented linear bodies alongside the base of

the penis. Another unique feature is the shape of the tips of the parameres, which are bifurcated in *nothocercae* and truncate in *H. tergalis*.

In the lateral portion of the 5th. abdominal segment of the male only, is a peculiar, globular gland, which I have provisionally called the "scent glands", the purpose of which can only be conjectured. They lie on the ventral surface, either in a slight depression or just under the ventral integument. They are oval in shape, somewhat flattened, and have a short tubular outlet extending inward and upward (presumably to the surface) for the escape of whatever substance is secreted by the gland (see introduction). (Text-plate XII, fig. 5.) The female has the 7th. abdominal segment normal, with tip rounded, and lacks all trace of the peculiar cigar-shaped, tubercular body which protrudes from the tip of this segment in the female of *Pterocotes*.

Heptapsus nothocercae, species novum. Text-plate XXVII, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Nothocercus bonaparti*, collected at La Cumbre de Valencia, Venezuela, September 12, 1910.

Description of types: Front rather wide, flatly rounded, ending in a pronounced trabecular tubercle at each side; a deeply pigmented, marginal band around the front, with two long and four short internal branches and ending on each side in a rounded, expanded, deeply pigmented blotch. Antennae strongly dimorphic, the male with 1st. segment much swollen and elongated; the 2nd. and 3rd. slender and about half the length of 1st.; 4th. segment attached at the middle of the 3rd., on the outside, and is short and slender; 5th. twice as long as 4th., slender. In the female the antennae are simple and filiform, only the 1st. joint being slightly thickened, but short. Mandibles small, and rather delicate; pharyngeal sclerite and gland well developed; temples narrowly rounded at tip and reaching backward to the lateral angle of the prothorax, and bearing two long, strong hairs. Eye apparently absent. Occipital margin almost transverse. A rounded blotch just behind the shallow antennary fossae, and a narrow submarginal band along the sides of the head, not deeply pigmented; front of head apparently without hairs; two rather stiff hairs on each side of head, two at the tip of the temples and two shorter ones on each side of the occipital margin.

Prothorax strongly developed, about twice as wide as long, with a long, strong bristle in the lateral angle; acetabular bars wide and deeply pigmented. Mesothorax shorter than prothorax, but wider, nearly as wide as head, with sides expanded and convex. Metathorax shorter than mesothorax, also narrower, with posterior margin somewhat sinuate and the whole segment deeply imbedded within the 1st. abdominal segment; two strong hairs in the lateral angles of the mesothorax and a short spine; a strong hair on the dorsal surface, on the meso-metathoracic suture, inside the acetabular bars; four strong hairs on the meso- and metasternum.

Abdomen somewhat elongated and tapering, being widest at the first segment; 1st. segment the longest, the rest subequal in length. The abdominal segments are of a most unusual structure, there being but a single continuous plate or sclerite covering the whole dorsal surface, which doubles over at the sides and extends inward for a short distance on the ventral surface. Apparently these are tergal plates, the pleural sclerites being entirely absent. On each side of the 1st. segment there is a short, deeply

pigmented band which connects it with the metathorax; in segments 2 to 5, at the anterior margin, there is a short hook-like marking on each side which extends backward from the suture, then curves outward, to form a hook.

The basal plate of the genital armature extends forward as far as the posterior margin of the 4th. segment. Chaetotaxy of abdomen simple. One hair in lateral angles of 1st. segment; 2 hairs in segments 2 to 5; 4 in 6th. segment, and but two short hairs on each side of the 7th.; two hairs in median portion at posterior margin of segments 1 and 2 and 5; a short hair just above the hook on segments 2 to 5. The two males of this species have lost many of the body hairs, but their chaetotaxy probably corresponds closely to *H. tergalis*.

The female resembles the male closely in shape of head and body. The temples (sides of head) are a trifle convex, instead of straight, and with the temples a little more pointed at tips; the markings of the preantennary area of the head are more deeply pigmented and somewhat more extended (see figure). The 7th. abdominal segment is a trifle larger, but of nearly the same shape, except slightly emarginate at the tip, where there are two spines and three weak setae on each side. There are also present one to two additional hairs at the sides of segments 3 to 5 on the posterior margin. The clavicles are strongly developed in this species.

Measurements:

	♂		♀	
	length	width	length	width
body	1.30 mm.		1.22 mm.	
head	.37	.53 mm.	.44	.51 mm.
prothorax	.14	.35	.13	.35
mesothorax	.12	.47	.12	.48
metathorax	.10	.38	.10	.39
abdomen	.77	.48	.71	.55
antennae	.26		.18	

Heptapsus tergalis, species novum. Text-plate XXVII, figs. 2, 2a.

Types, ♂ and ♀ adult, the ♂ from *Nothocercus n. nigrocapillus*, collected at Santo Domingo, Dept. Puno, Peru, June 30, 1931, and the ♀ from same host taken at Huacapistana, Dept. Junin, Peru, April 3, 1930.

Diagnosis: Very similar to *H. nothocercae*, but much smaller, with narrower head and shorter temples; the sides of the head in the male decidedly convex, instead of straight; the prothorax is narrower, but of same general shape. Mesothorax is also narrower, with sides more strongly convex and lateral angles more rounded. The abdomen is almost exactly of the same shape and proportions, with similar markings and chaetotaxy. There are two pairs of hairs on the median portion of the ventral surface of segments 2 and 3, which are not shown in the drawing. The two males of *nothocercae* are not in first-class condition, and have lost many of their body hairs, so that probably the chaetotaxy shown for this species (*tergalis*) corresponds very closely with it.

The genital armature in the male is of the same general type as *nothocercae*, but differs in detail, as shown in the accompanying figure.

The legs are short, with thickened femora and short, slender tibiae, set with many *very* long, slender spines; the tarsal claws are also long, slender, nearly straight and subequal.

The "scent glands" in this species are similarly located, and exactly the same as in *H. nothocercae*.

The female differs from the male very much as in *nothocercae*, except that in the present species both ♂ and ♀ have the sides of the head convex. It differs but slightly from the ♀ of *nothocercae*, except narrower thorax and abdomen, and wider and more heavily pigmented temporal bands. The 7th. abdominal segment is flatly conical on the anterior margin, instead of evenly rounded, but the chaetotaxy is the same, as well as of the 6th. segment.

Measurements:	♂		♀	
	length	width	length	width
body	1.14 mm.		1.23 mm.	
head	.35	.45 mm.	.40	.45 mm.
prothorax	.12	.30	.12	.31
mesothorax	.10	.40	.10	.43
metathorax	.09	.34	.11	.34
abdomen	.68	.44	.74	.51
antennae	.22		.17	

Genus **PTEROCOTES** Ewing

Genotype, *Goniodes aberrans* Carriker.

"Forehead greatly reduced, broadly rounded, without signatural plate or clypeal suture. Trabeculae reduced to rounded tubercles. Antennae of male with first segment greatly enlarged and third segment produced laterally beyond its articulation with the fourth into a chitinous, claw-like hook. Temporal lobes large, wing-like, angular processes which extend backward and laterally far beyond the front margin of the thorax. Eye wanting. Prothorax large; pterothorax much broader, being the broadest part of the body. Abdomen short, but not swollen; tergal and sternal plates not interrupted in the middle. Genital armature of male very peculiar; basal plate divided into two broadly separated but converging chitinous strips, each of which passes almost uninterruptedly into a styliform paramere; endomeres formed into a slender needle-like pseudopenis. Legs short and rather weak, with long, slender, weak and almost straight and almost subequal tarsal claws."

"This genus is unique, it is believed, in the type of the male genital armature and in the type of tarsal claws. The enormously expanded temporal lobes are of less generic importance."

Dr. Ewing fails to note the fact that the abdomen is composed of but seven segments, with the spiracles present in segments 1 to 6. Also the partially fused meso-metathorax cannot properly be called a true pterothorax, such as may be found in *Lipeurus*, *Degeeriella*, *Philopterus*, etc.

Apparently the female was not seen by Dr. Ewing, although described and figured together with the male. He fails to indicate certain generic

characters based on the female structure. The antennae are strongly dimorphic, that of the female being simple and filiform; the shape of the head is very different in the sexes, the female lacking the lateral emargination, having the sides of the head strongly convex, and with the eye prominently developed (wanting in male). The mesothorax is not wider than the head, as stated by Dr. Ewing, always being a little narrower. Clavicles very prominent in the prothorax, extending from the anterior coxal articulation backward into the mesothorax, where they end in a loop.

The 7th. abdominal segment in the female has a large, bluntly cigar-shaped body filling the median portion of the segment and extending beyond it for half its length, and with the exposed portion bearing numerous stiff, short hairs. This character of the female at once distinguishes it from the female of the closely related genus *Heptapsus*.

The genus also possesses "scent glands" of similar type to *Heptapsus*. They are situated at the posterior margin of the tergal plate on the 5th. abdominal segment. A portion of the gland is under the plate, and part extends beyond it into the hyaline area of the suture. The tubular outlet issues from this exposed portion, coming out through the thinner integument between the plates. The shape of the gland is slightly different from that of *Heptapsus*, with the tube shorter and thicker.

Pterocotes aberrans aberrans (Carriker). Text-plate XXVI, figs. 2, 2a, 2b, 2c.

Goniodes aberrans Carriker, Univ. Neb. Studies, Vol. III, No. 2, 1903, p. 35, pl. 4, figs. 4 and 5 (*Tinamus robustus*: equals *T. major castaneiceps*), collected at Pozo Azul, Costa Rica, June, 1902.

The original description of this species is very complete and needs but slight further comment. As will be noted in this description, the number of segments for the abdomen is correctly given as seven, but the significance of this fact was entirely overlooked. The description of the thorax is poor, no proper distinction having been made between its component parts, the partially fused meso-metathorax having been improperly called the metathorax. Its structure may be clearly seen in the new figure herewith presented, as well as the male genital armature and the structure of the 7th. abdominal segment in the female, both of which are apparently unique. The drawings of the species here presented were not made from the types of the species (which are not in first-class condition), but from specimens taken on *Tinamus s. serratus*, which are a trifle smaller than the types, but otherwise seem to be identical.

3 ♂♂ and 3 ♀♀ taken on *Tinamus s. serratus*, collected at Sta. Ana, Rio Coroico, Bolivia, July 26, 1934. The differences between these specimens and the types are so infinitesimal that they are not worth recording. *T. serratus* is a very near relative of *T. major*. However a single ♀ taken on a more distantly related host, *Tinamus tao kleei*, proves to be sub-specifically distinct, and is described below.

Measurements:	♂		♀	
	length	width	length	width
body	1.79 mm.		2.12 mm.	
head	.53	.64 mm.	.54	.79 mm.
prothorax	.21	.46	.22	.495
mesothorax	.15	.60	.16	.64
metathorax	.14	.50	.13	.56
abdomen	1.09	.63	1.44	.69
antennae	.46		.27	

Pterocotes aberrans taoi, subspecies novum. Text-plate XXVI, figs. 3, 3a.

Type, ♀ adult, from *Tinamus tao kleei*, collected at La Pampa, Dept. Puno, Peru, July 5, 1931.

Diagnosis: Resembles rather closely the female of *aberrans*, but is much smaller in all proportions. The front of the head is more flatly rounded; the trabecular tubercles shorter and more pointed, with the first segment of the antennae less thickened and shorter; the temples are considerably shorter, not reaching to the lateral angles of the prothorax, so that the margin between the tips of the temples is much less concave than in *aberrans*. The tip of the abdomen is much more slender and pointed, with the lateral margins of segments 6 and 7 forming a continuous straight line. The genital armature is of quite a distinct shape, being longer and projecting a less amount from the tip of the 7th. segment. It is constricted near the inner end, then broadens gradually to near the tip, where it again tapers to a blunt point. The chaetotoxy of the genital apparatus is also very different (see figure).

Measurements:	♀	
	length	width
body	1.78 mm.	
head	.44	.64 mm.
prothorax	.17	.40
mesothorax	.15	.54
metathorax	.13	.45
abdomen	1.18	.57
antennae	.23	

It will be very interesting to see what the male of this species is like.

TINAMICOLA, genus novum

Genotype, *Goniocotes rotundatus* Rudow.

This genus will contain the species found on the Tinamous which might properly be allocated to *Goniocotes* were it not for the fact that they possess but seven abdominal segments. It is doubtful, however, whether they would fit into *Goniocotes*, even were it not for the fact of the seven abdominal segments.

Small to medium sized species with but seven abdominal segments, antennae similar in the sexes; small trabecular tubercles at anterior angle of antennary fossae; meso- and metathorax distinct, but fused medially,

the former considerably wider than the latter, which is more or less imbedded within the first abdominal segment. Abdomen more or less oval. Head with more or less rounded, continuous frontal margin, expanded temples more or less pointed and posterior margin of head undulating or even with blunt angles at sides of occiput; pharyngeal sclerite and gland present. Rather complicated dark markings on head and in pleural plates; genital armature small, of very simple design and structure.

Tinamicola rotundata (Rudow). Text-plate XXVIII, figs. 1, 1a, 1b.

Goniocotes rotundatus Rudow, Beiträge, 1869, p. 22 (*Rhynchotus rufescens*).

Goniocotes dilatatus Rudow, Zeit. f. ges. Naturwiss., XXXV, 1870, p. 479.

Goniocotes rotundatus Rudow, Taschenberg, Die Mallophagen, p. 92, pl. III, fig. 8.

Taschenberg has clearly pointed out the synonymy of this species and given a very good description of it, but what he calls the first abdominal segment is, in reality, the metathorax, which fact is much strengthened by his statement that the first abdominal segments are like those of *Rhopaloceras dilatatus* and *subdilatatus*. His figure, however, is rather inadequate, although the essential generic characters are clearly shown, including the seven abdominal segments and the meso-metathoracic structure.

The head is exactly the same shape and the antennae the same in both sexes. The legs are short and thickened, the femora barely extending beyond the edge of the thorax and abdomen; the tibiae are equal in length to the femora and considerably thickened, especially towards the apical extremity. I have refigured this species, and given an enlarged view of the genital armature, since it has been made the type of a new genus.

The species may easily be recognized by the shape of the head, the serrated occipital margin, the markings of the head, thorax and pleural plates; parallel sided prothorax, with slight angles and long spine in the middle of the segment and broadly expanded or winged mesothorax.

Numerous individuals were taken on *Rhynchotus r. rufescens*, collected near Reyes, Dept. Beni, Bolivia.

Measurements:	♂		♀	
	length	width	length	width
body	1.27 mm.		1.40 mm.	
head	.39	.55 mm.	.42	.58 mm.
prothorax	.12	.26	.12	.28
mesothorax	.14	.56	.18	.58
metathorax	.10	.40	.10	.45
abdomen	.71	.70	.78	.72
antennae	.19		.19	

Tinamicola latithorax, species novum. Text-plate XXVIII, figs. 2, 2a, 2b.

Types, ♂ and ♀ adult, from *Rhynchotus r. rufescens*, collected near Reyes, Dept. Beni, Bolivia, September 28, 1934.

Description: Head and thorax short and broad and abdomen broadly oval; front of head flatly rounded, with narrow clypeal band entire, and with four short internal projections (absent in female); antennal bands

short and expanded and deeply pigmented; antennae very similar in the sexes, that of male being slightly thickened on two basal segments, and all segments in both sexes with narrow marginal bands; mandibles of medium size; pharyngeal sclerite and gland present; trabecular tubercles short; antennary fossa shallow; eye prominent (more so in ♀) and with short seta; sides of head much expanded in region of eye, then more or less straight back to the broadly rounded tip of temple; posterior margin of head undulating, with occiput concave and a marked convexity on each side of it.

Temporal bands rather wide and strongly marked, extending from eye to occiput, with an internal projection at apical end and another just behind it; one longish and two short hairs on each side of preantennary area; another short hair on each side of mandibles and one on the side of the head; two long, strong, pustulated hairs at tip of temples.

Prothorax much wider than long, with sides produced medially into a sharp point, bearing a strong spine; clavicles prominent, as well as acetabular bars. Mesothorax as wide as head, short, with sides expanded anteriorly and convex; posterior margin thickened, with two hairs in the lateral angle and two longer, stronger, pustulated hairs on posterior margin. Metathorax narrower than mesothorax, completely imbedded within the first abdominal segment and posterior margin flatly rounded and slightly undulating; four strong hairs on the mesosternum and two on metasternum, and two on posterior margin of metathorax.

Abdomen short, widest at 1st. segment, ovate in male, but more oval in female and longer. Pleural plates wide, not deeply pigmented and with two slightly darker spots in segments 1 to 5; 6 and 7 unmarked; 7th segment small, rounded anteriorly and posteriorly; one strong hair in lateral angles of segments 1 to 5 and three in 6th segment; 7th segment with two short marginal setae and two stronger submarginal hairs on each side; pleural plates 2 and 3 with one hair on posterior margin, 4 and 5 with two hairs; tergal plates broken medially in segments 2 to 5, with wide hyaline areas between ends and along sutures; two strong hairs in median portion of abdomen on posterior margin of tergal plates in segments 1 to 5, and another longer, stronger hair on same plates just back of the spiracles in segments 1 to 3; short setae in same position on segments 4 and 5.

Legs short, with femora thickened and tibiae more slender, with many strong spines and long, nearly straight, subequal claws.

Male genital armature small, but basal plate well developed and pigmented only along each side; parameres very short, sharply bent inward at tips and with bases pointed and running back diagonally into end of basal plate; ventral endomeral plates fused into a large pseudopenis, with dorsal pair narrow and lying at each side, over the ventral plate. Small seta at tip of paramere.

Female differs but slightly from male. The head has the front more convex (less flattened), and clypeal band without projections; abdomen longer and more oval; 7th. abdominal segment larger, with anterior margin sinuate and posterior rounded. The genital plate is large, covering median portion of segments 5 to 7, with a longitudinal, thickened portion on each side of it across segment 6; two rather strong marginal and one submarginal hairs on each side, with a row of fine setae across posterior margin of genital plate.

Measurements:

	♂		♀	
	length	width	length	width
body	1.12 mm.		1.34 mm.	
head	.35	.50 mm.	.36	.54 mm.
prothorax	.12	.33	.12	.33
mesothorax	.13	.505	.14	.53
metathorax	.11	.41	.13	.44
abdomen	.61	.59	.82	.62
antennae	.19		.18	

Five ♂♂ and 3 ♀♀ (including the types) from the same individual host.

Tinamicola coxata (Piaget).

Goniocotes coxatus Piaget, Les Pediculines, Suppl., 1885, p. 43, pl. V, fig. 1 (*Tinamus solitarius*).

I have been unable to secure any Mallophaga from *Tinamus solitarius*, and can throw but little additional light on this species than is given by Piaget in his description and figure.

It undoubtedly belongs in the genus *Tinamicola*, which has the antennae similar in the sexes, and seems to be closely related to *T. rotundata*. It has the rounded front, with marginal band having internal projections; the same type of antennal bands; the same expanded temples with rounded tips bearing two long hairs, and a similar occipital margin. The prothorax has rounded sides (like *rotundata*), and the metathorax is winged on the sides. The only discordant note is his statement that the metathorax has the posterior margin angulated over the abdomen, but it is not impossible that the posterior margin is angulated instead of rounded as is usually the case in these species. His description of the abdomen is also confusing. In the figure he plainly shows but seven segments, while in the description he says: "The segments unequal in length, the 7th. very short, the 1st. and 8th. the longest, without markings", etc.

I think this should be changed as follows: Segments unequal in length, the 6th. very short, the 1st. and 7th. the longest. Apparently he did not consider the metathorax as the 1st. abdominal segment, as the old authors usually did, which would account for his statement that the 1st. segment was the longest. His statement that the coxae are larger than the femora is a very good diagnostic character, one which I have not seen in this group.

Measurements:

	♂	
	length	width
body	.90 to 1.00 mm.	
head	.31	.40 mm.
thorax	.18	.36
abdomen	.49	.50
antennae	.14	

Tinamicola alatofasciata (Piaget).

Goniocotes alatofasciatus Piaget, Les Pediculines, Suppl., 1885, p. 46, pl. V, fig. 5 (*Rhynchotus rufescens*).

Although many species were taken on this host, I have no specimens which can possibly be identified as Piaget's *alatofasciatus*. For a time I was inclined to believe that it might be a synonym of *T. rotundata* (Rudow), but careful comparison of my specimens of *rotundata* with the description and figure of *alatofasciata* shows that they are not the same, although there is a marked superficial resemblance, except for size, *alatofasciata* being very much larger in all proportions. It would seem, therefore, that we have three distinct species of this genus parasitic on the same host, *rotundata* (Rudow), *latithorax* sp. nov., and *alatofasciata* (Piaget).

This species resembles *rotundata* much more than *latithorax*, having the prothorax nearly the same shape, the head and head markings similar, as well as the markings on the pleural plates, although the latter are not so complicated as in *rotundata*, and the tergal plates are apparently different. The ♂ genital armature is also apparently very similar, according to both description and figure. The only tangible differences I can find between the two species are the following: Very much larger size; difference in the shape of the head in the two sexes (but not in the antennae); prothorax with the sides more convex and the angle at the posterior portion instead of near the middle; apparent absence of tergal plates; and slight difference in design of the markings of the pleural plates.

Measurements:	♂		♀	
	length	width	length	width
body	1.60 to 1.70 mm.		1.80 to 1.90 mm.	
head	.47	.65 mm.	.45	.70 mm.
thorax	.30	.70	.30	.71
abdomen	.90	.85	1.10	.90
antennae	.23	.25		

Genus **PECTENOSOMA** Ewing

Genotype, *Goniocotes verrucosus* Taschenberg.

"Head broad, with short and evenly rounded forehead and large angulate temples. Clypeal suture wanting. Trabeculae small, fixed tubercles. Antennae short and similar in the two sexes. Pterothorax fused, much broader than long, sides strongly divergent and posterior margin outwardly rounded and angulate. Abdomen broad and stout, of seven segments in both sexes, the first and second segments fused into one; abdominal spiracles minute, six pairs present. Some of the abdominal sclerites with combs of tooth-like tubercles. Genital armature of male small, basal plate broad, parameres free, almost straight. Legs short, but scarcely stout. Claws almost equal but slightly curved."

In his characterization of this genus Dr. Ewing was the first worker on Mallophaga to recognize the true condition of the abdominal structure in

the great majority of the Tinamou lice, but his material was too limited to enable him to draw any broad conclusions from his discovery.

His description of the tubercles on the abdominal sclerites is somewhat misleading. They consist simply of raised papillae on the dorsal surface, and can hardly be construed as consisting of combs. He has also failed to note their presence on the three segments of the thorax, as well as on the abdomen. His interpretation of the condition of the meso- and metathorax as being entirely fused into a pterothorax is not entirely correct. The two segments are fused medially (between the acetabular bars), but the suture is clearly visible on the sides, while the metathorax is very much narrower than the mesothorax. This condition does not constitute a true pterothorax, as I have used the term in this paper.

Pectenosoma verrucosa verrucosa (Taschenberg). Text-plate XXIX, figs. 1, 1a, 1b.

Goniocotes verrucosus Taschenberg, Nova Acta, Halle, 1882, p. 68, 94; pl. III, fig. 4, ♂ (*Crypturellus (Tinamus) variegatus*).

Pectenosoma verrucosus, Ewing, Man. Ecto-Parasites, 1929, p. 191.

I have one ♀ only of this species from *Crypturellus variegatus salvini*, which is doubtless not the subspecies of the host from which Taschenberg secured his type, a ♂. Since the sexes vary considerably in this form, it is not possible to make a close comparison of many details between my female and his description and figure of the male. I have assumed, however, that they are the same, and am basing my treatment of the group on that hypothesis.

Thus far the species has been taken only on various species and subspecies of the avian genus *Crypturellus*, ten in all, and while they closely resemble each other, they differ sufficiently among themselves to warrant their separation into three subspecies. I have figured the female from *Crypturellus variegatus salvini*, and the male from *C. undulatus yapura*, whose female is almost exactly like that one from *C. variegatus*.

Additional points of interest in this species are the serrated margin of the sides of the mesothorax and the peculiar structure of the 7th. abdominal segment in the female, which has a deep, narrow median emargination and an additional deep, rounded emargination on each side, at the inner end of which are several small setae. A detailed description of this species is unnecessary, since it may be distinguished at a glance by the peculiar rows of raised papillae on the thorax and abdomen, and the complicated series of deeply pigmented incrassations on the pleural plates

Measurements:

	♂ (from Taschenberg)		♀ (from <i>C. v. salvini</i>)	
	length	width	length	width
body	1.27 mm.		1.41 mm.	
head	.30	.50 mm.	.32	.51 mm.

prothorax	}	.29	.13	.30
mesothorax		.50	.13	.50
metathorax		.13	.42	
abdomen (includes metathorax)	.74	.69	.90	.72
antennae			.18	

Material examined:

1 ♂ from *Crypturellus u. undulatus*, collected near Reyes, Dept. Beni, Bolivia, Sept. 16, 1934.

Numerous ♂♂ and ♀♀ from *C. undulatus yapura*, collected at Puerto Yessup, Dept. Junin, Peru, Feb. 19, 1930, and Shapaja, Rio Huallaga, Peru, Nov. 18, 1933.

Numerous ♂♂ and ♀♀ from *C. obsoletus pinensis*, collected at La Oroya, Dept. Puno, Peru, June 6, 1931; Calabatea and Sandillani, Dept. La Paz, Bolivia, November and December, 1934.

1 ♂ and 1 ♀ from *C. obsoletus ochraceiventris*, collected at Eneñas, Dept. Junin, Peru, March 12, 1930.

2 ♂♂ and 4 ♀♀ from *C. soui nigriceps*, collected at Tamborapa, Dept. Cajamarca, Peru, July 14, 1933.

Numerous ♂♂ and ♀♀ from *C. soui inconspicuus*, collected at Shapaja, Rio Huallaga, Peru, Nov. 1933; Sta. Ana, Teoponte and Chiñiri, Rio Kaka, Bolivia, July and August, 1934.

Pectenosoma verrucosa parva, subsp. novum. Text-plate XXIX, figs. 2, 2a.

Types, ♂ and ♀ adult, from *Crypturellus tataupa*, collected at Sta. Ana, Rio Coroico, Bolivia, July 23, 1934.

Diagnosis: Resembles in general appearance *P. v. verrucosa*, but very much smaller in all proportions. Prothorax with sides less divergent; mesothorax with sides straight, not convex, on anterior margin; 7th. abdominal segment in the female with the lateral emarginations barely indicated; the rows of tubercles, or raised papillae, on the thorax and abdomen much larger and fewer in number; whole body less heavily pigmented and the intricate markings, or incassations of the pleural plates of the abdomen more slender and more sharply outlined; tergal plates narrower, being more widely separated medially; male genital armature slightly different (see figure).

Five ♂♂ and 1 ♀ (including the types) from the same individual host.

Measurements:

	♂		♀	
	length	width	length	width
body	1.10 mm.		1.18 mm.	
head	.25	.38 mm.	.25	.39 mm.
prothorax	.09	.22	.09	.23
mesothorax	.09	.37	.09	.38
metathorax	.08	.33	.08	.32
abdomen	.64	.57	.73	.58
antennae	.14		.13	

Pectenosoma verrucosa angusta, subsp. novum. Text-plate XXIX, fig. 3.

Types, ♂ and ♀ adult, from *Crypturellus atrocapillus*, collected by M. R. Carriker, at Chiñiri, Rio Kaka, Bolivia, August 24, 1934.

Diagnosis: Similar in general appearance to *P. v. verrucosa*, and almost as long, but with the head, thorax and abdomen all very much narrower; lateral margins of temples less convex and temples more pointed; prothorax with the sides more convex than in *verrucosa*, and the lateral angles more produced; mesothorax wider at anterior portion, and with sides less divergent; tergal plates of abdomen wider and longer, so that the median hyaline area is narrower, as well as along the sutures; the 5th. and 6th. abdominal segments are longer, especially the 6th.; the genital sternal plate in the female is poorly developed and faintly pigmented, being scarcely apparent on segment five; dorsal tubercles larger and fewer (than in *verrucosa*) in number on the pleural plates, but more numerous on the tergal plates.

Male genital armature slightly different, the parameres and penis being shorter (see figure).

Measurements:

	♂		♀	
	length	width	length	width
body	.99 mm.		1.32 mm.	
head	.29	.48 mm.	.31	.44 mm.
prothorax	.11	.28	.11	.28
mesothorax	.11	.46	.11	.43
metathorax	.13	.40	.09	.37
abdomen	.72	.67	.80	.57
antennae	.18		.18	

DOCOPHOROCOTES, genus novum

Genotype, *Goniocotes sexsetosus* Piaget, female.

Diagnosis: Head more or less triangular in shape, with front and temples rounded and with temples not extending behind occiput; trabeculae present (apparently fixed); antennae slightly dimorphic, the first three segments in the male larger than in the female, but the first segment not longer than the second nor greatly swollen, while the third has a slight apical hook in the male; no antennary fossa. Whole thorax equal to or smaller than the head; prothorax small, with sides straight and posterior angles sharp; mesothorax small, much narrower than head and very short, with angles rounded; metathorax fused with mesothorax except on sides, where suture is visible; narrower than mesothorax, about as long, and nearly entire segment deeply imbedded within the first abdominal segment. Abdomen short, rounded oval, with pleural plates prominent and tergal plates fairly well pigmented, composed of seven segments, spiracles in segments 1 to 6. Legs rather large, with thickened tibiae, each with spines and short hairs. Sexes almost identical except for size, antennae and shape of last abdominal segment.

Male genital armature of medium size, with short basal plate and short, thick parameres and strongly developed endomeral plates.

Docophorocotes sexsetosus (Piaget). Text-plate XXVII, figs. 3, 3a, 3b.

Goniocotes sexsetosus Piaget, Les Pediculines, Suppl., 1885, p. 48, pl. 5, fig. 7 (On *Rhynchotus rufescens*).

Piaget described this species from a single female, and was not certain of its generic position. His figure is very good, except that he fails to show the trabeculae, but gives the correct number of abdominal segments, although he did not grasp the significance of their reduced number. Even if this species did possess the normal number of abdominal segments (eight), it could not remain in the genus *Goniocotes*, due to the presence of trabeculae and the thoracic structure.

The distinguishing characters of the species are the shape of the head, presence of trabeculae, type of antennae and the thoracic structure. There is a strong superficial resemblance between this species and the two closely related forms of *Nothocotus*, taken on *Nothocercus*, but the resemblance is only superficial, since they are quite distinct generically.

The strong pustulated hairs on the thorax and abdomen (shown in fig.) are all dorsal, this form apparently not possessing the strongly developed ventral hairs of the meso- and metasternum, present on so many Tinamou lice. Numerous specimens were taken by the author on *Rhynchotus r. rufescens*, collected at Reyes, Dept. Beni, Bolivia, September 28, 1934.

Measurements:	♂		♀	
	length	width	length	width
body	1.21 mm.		1.41 mm.	
head	.39	.49 mm.	.42	.51 mm.
prothorax	.14	.28	.14	.30
mesothorax	.10	.38	.09	.40
metathorax	.11	.36	.11	.37
abdomen	.65	.57	.82	.61
antennae	.17		.17	

Subfamily ORNICHOLACINAE

HEPTAGONIODES, genus novum

Genotype, *Heptagoniodes mirabilis*, species novum.

Closely allied to *Kelloggia* in the structure of the thorax and abdomen, with the head somewhat resembling that of *Pterocotes* (except for the broadly truncated temples), while the antennae are similar to some forms of *Goniodes*.

Front of head narrow, almost flat, with the huge antennae set at the front of head in a deep fossa; sides of head deeply constricted medially; temples expanded laterally, but diagonally truncated, and occiput deeply concave. Antennae apparently highly dimorphic. First segment greatly enlarged; 2nd. and 3rd. also large, curved, and of peculiar shape; 4th. minute and rounded, and 5th. small and slender; 1st. and 2nd. segments with several spines or bristles.

Prothorax normal, wider than long; postero-lateral angles somewhat produced and spiracles well developed. Mesothorax small, about as wide as temples; sides divergent; posterior margin produced medially and with sides concave. Metathorax consisting of two separate lobes, which are loosely joined to the mesothorax (possibly mesothorax movable on metathorax as in *Ornicholax*).

Abdomen of seven segments, rather slender and tapering to rounded tip; segments with pleurites broadly overlapping and of peculiar shape; 1st. and 6th. segments the longest; spiracles present in segments 1 to 6; dorsal surface of the pleurites (except along lateral margins) thickly covered with raised papillae, larger and more abundant on 1st. and 2nd. segments.

Remarks: Unfortunately the female is unknown, but a single male having been taken from *Tinamus t. tao* in 1910. The specimen was inadvertently mounted with a ♀ of *Ornicholax robustus taoi*, and has the head pulled loose from the thorax, but with the exception of the absence of many of the hairs, is in very good condition.

Of all the peculiar forms of Mallophaga which infest the Tinamous, this new form is, I think, the most remarkable that it has been my good fortune to examine. The thorax and abdomen are typical of *Kelloggia*, except for the genital armature, which is nearer to that of *Rhopaloceras* in the form of the basal plate, but the working parts are almost unique. The head, if seen without the body, might be classed as typical of *Goniodes* (but without the sharp temporal angles), but by excluding the antennae, it will be seen by careful analysis to be very close to *Kelloggia* also, except for the lateral constriction and deep antennary fossae. The strongly rugose character of the pleural plates is also shared by *Kelloggia*, to a slightly lesser extent.

Heptagoniodes mirabilis, species novum. Text-plate XXX, figs. 3, 3a.

Type, ♂ adult, from *Tinamus tao tao*, collected by the author at La Cumbre de Valencia, Venezuela, on September 24, 1910.

Description: Front of head flattened, narrow, with the antennae set in a deep, oval fossa at the front of the head; sides of head expanded behind the antennary fossae, then abruptly constricted in the median portion, with the temples expanded laterally, then running back diagonally to the posterior angle of the prothorax; occiput deeply concave, and both anterior and posterior angles of temples rounded. Antennae of unusual structure (similar to certain species of *Goniodes*). First segment large, wide at base and tapering to tip; 2nd. also large, but short, thick, and with apical end excavated on inner side, into which is set the 3rd. segment, instead of at the end; 3rd. segment longer than 2nd., but narrower, and with a double curve, and also with the outer side excavated at the tip for the reception of the minute, globular 4th. segment; the 5th. is very small and slender. First segment with one large and two smaller spines in the median portion; 2nd. segment with two spines on inner posterior margin and 3rd. with one at tip. Mandibles small, set but slightly forward of centre of head; buccal cavity very small; pharyngeal sclerite present, but small. Three short, pustulated hairs on each side of the dorso-clypeal area; one long spine out-

side of anterior mandibular condyle on dorsal face; one long, strong hair on margin at posterior angle of antennary fossae, and another within the edge in the lateral constriction; temples with two pustulated hairs at each angle (these hairs have all been lost, their presence only indicated by the pustules).

Prothorax rather large, wider than long, with front rounded, sides curving and slightly divergent to the posterior angle which is produced to a blunt point, set with a strong bristle; prothoracic spiracles well developed and acetabular bars heavy and of conventional type. Mesothorax as wide as temples, anterior angle rounded, sides concave and divergent; posterior angles bluntly rounded, the whole area clear, extending beyond the rest of the segment and set with four pustulated hairs; posterior margin expanded medially into a broadly rounded point, with the lateral portions concave (like *Kelloggia*); acetabular bars heavy and deeply pigmented and extending back well under the metathoracic lobes.

Metathorax consists of two distinct, separate lobes, one on each side of the posterior margin of the mesothorax, and touching each other behind it. These lobes are rounded laterally, bluntly pointed posteriorly, and extend backward even with the posterior lateral angles of the first abdominal segment; a strong, short hair on posterior margin of each lobe.

Abdomen rather slender and tapering; first segment the widest and longest, with its pleurites extending slightly under the sides of the metathoracic lobes, and with their posterior margins sinuate and overlapping the 2nd. segment by half its length; segments two to five somewhat similar in shape, each succeeding segment shorter than the one preceding, and with the pleurites wide, extending far into the interior of the abdomen; 6th. segment longer than 2nd., its pleurites nearly meeting medially; 7th. segment as long as 6th., with posterior margin flatly rounded, sides nearly straight and anterior half sharply conical and extending nearly to front edge of 6th. segment; a small tubercle on each side of the 7th. segment, between it and the 6th. (this tubercle is present in the ♂ of *Kelloggia*, *Ornicholax*, *Austrokelloggia*, and other genera peculiar to the Tinamous). Tergal plates not pigmented, so that the whole area of the abdomen not occupied by the pleural plates is entirely hyaline; one medium-sized, stiff hair in lateral angle of segments 1 to 5; 6th. with three hairs; 7th. with two short hairs on each side and each tubercle with one longish hair. A long, strong, pustulated hair set on posterior edge of pleurites 2 to 5, near their inner end on the dorsal surface.

Legs short and stout, femora of 3rd. pair concealed beneath the abdomen; tibiae of 2nd. and 3rd. pair with about six short spines; claws but slightly curved and slender.

Genital armature very unusual. The basal plate extends from end of metathorax to the tip of the 7th. abdominal segment, and nearly fills the hyaline area of the abdomen between the pleurites. In the type the working parts of the genitalia are outside of the abdomen, and from the structure of the apical portion of the 7th. segment, it seems that this might be the normal position. The parameres are very short, straight and pointed; the endomeres are as thick as the parameres at their base and three fourths as long, enclosing the penis, which is elongated oval, bluntly pointed, and fills the cavity within the parameres.

Measurements:

	♂	
	length	width
body	2.14 mm.	
head	.64	.64 mm.
prothorax	.36	.45
mesothorax	.60	.61
metathorax	.29	.49
abdomen	1.34	.82
antennae	.44	

Note: The position of the 1st. and 2nd. pairs of coxae are not shown in the drawing. They were torn from their normal position, and it was impossible to determine just how they were articulated. There is a slight error in the drawing with respect to the thorax. It should extend further under the head than is shown, the anterior edge resting against the occipital transverse blotch.

Heptagoniodes excavatus (Piaget).

Goniodes excavatus Piaget, *Les Pediculines*, 1880, p. 280, pl. XXIII, fig. 4 (*Tinamus canus*, equals *T. lao tao*).

This remarkable species is unquestionably very close generically to *Heptagoniodes mirabilis*, sp. nov. The antennae are very similar in structure and similarly placed, while the general shape of the head is not greatly different, the incised lateral portions corresponding to the deep emarginations of *mirabilis*. The whole thoracic structure is closely analogous, as well as the abdomen. The female of *H. mirabilis* is unknown, so that a comparison is impossible. However, I cannot reconcile the extreme difference between the male and female as given by Piaget, since I know of no similar case. The different style of antennae is obvious, and should be thus, and even the decidedly different shape of the head might well be possible, but there are two characters which are impossible to reconcile, *viz*: the absence of the metathoracic lobes in the female and the very much smaller size.

Piaget says: "Chez la femelle l'abd. est beaucoup plus court, sans plaques sur le 1er. segment, entièrement colore comme chez le male, avec une suture angulaire."

It is not impossible that he had only males and females of two very distinct species, but without a careful examination of his material I would hesitate to conclude that such was the case.

His description and figures are ample for all practical purposes.

During the preparation of this paper I requested Mr. Gordon B. Thompson of the British Museum to examine these specimens and tell me what he could concerning them. He has sent me some sketches of the types which corroborate Piaget's figure and description, but nothing concerning the female which would shed additional light on its status, and makes no comment on them.

Unfortunately this information was received but a few days before this paper went to press, and there remained no time for further inquiries. If the male and female of *excavatus* are as given by Piaget, the species may be classed as the most remarkable known from the Tinamous.

Genus **ORNICHOLAX** Carriker

Univ. Studies, Univ. Nebr., Vol. III, No. 2, 1903, p. 29. Genotype, *O. robustus* Carriker.

The original characterization of this genus is not only incomplete, but contains an error regarding the number of abdominal segments and concerning the thoracic structure. The following description more correctly characterizes the genus.

Head large, front circular, sides of head straight and subparallel; temples almost square, with rounded angles; occiput deeply emarginate; antennae small, filiform, and same in both sexes; trabeculae large, movable, and articulated well within the lateral margin of the head, so that not more than half their width extends beyond the head; antennary fossae almost wanting; mandibles slender, pointed, and set in center of head; temples bifurcated on the sides, with the bifurcation beginning back of eye, widening posteriorly, and ending at the temporal angle, where both margins bear a stout hair. Clypeal band practically wanting, and antennal bands but faintly indicated.

Prothorax small, partially covered by the temples and with sides produced laterally to a blunt point, bearing a strong spine. Mesothorax broad, with sides expanded both anteriorly and laterally; posterior margin transverse and joined to the metathorax by a *movable articulation*.

Metathorax much narrower, shield-shaped and composed of two lobes which are closely joined medially, although separated by a distinct, hyaline suture. The whole of the metathorax is deeply imbedded within the first abdominal segment, and *fixed*, while the mesothorax, although with the posterior half within the first abdominal segment, is entirely free from it, and articulates slightly on the metathorax.

Abdomen short and wide, tapering toward the tip, and composed of but seven segments, with the spiracles present in segments 1 to 6; in the male there is a small tubercular process lying between the 6th. and 7th. segments, which seems to be fastened to the side of the 6th. segment at its anterior end. The chaetotaxy is sparse; the pleural plates wide and heavily chitinized and pigmented. Genital armature small and simple. Legs very small, the first pair hidden under the prothorax and head; the 2nd. with only the tibiae showing outside the mesothorax, and with the 3rd. pair with but half of the tibiae showing beyond the margin of the first abdominal segment.

Synonymy: In Harrison's Genera and Species of Mallophaga (Parasitology, vol. 9, 1916), he has given *Ornicholax* as a *nomen novum* for *Lepidophorus* Taschenberg (preoccupied), and Ewing has followed him in his Manual of Ectoparasites.

This is an error. There was no type designated by Taschenberg for his subgenus *Lepidophorus*, nor did Harrison designate any, therefore he had no right to use the genus *Ornicholax* Carriker as a *nomen novum* for *Lepidophorus*, especially since no species placed by Taschenberg in *Lepidophorus* will fall into the genus *Ornicholax*.

I have here designated the type of *Lepidophorus* as *Goniocotes agonus* Nitzsch, the oldest species of those placed in it by Taschenberg, and the genus *Kelloggia* Carriker becomes a *nomen novum* for *Lepidophorus* of Taschenberg (preoccupied).

Ornicholax robustus robustus Carriker. Text-plate XXX, fig. 2.

Ornicholax robustus Carriker, Univ. Studies, Uni. Nebr. III, No. 2, 1903, p. 29, pl. IX, figs. 1, 1c (*Tinamus major castaneiceps*,⁴ Pozo Azul, Costa Rica).

In addition to the specimens noted under the original description of the species, I have examined the following during the preparation of this paper.

1 ♂ from *Tinamus major ruficeps*, collected at Las Vegas, Dept. Magdalena, Colombia.

1 ♂ and 1 ♀ from same host, collected at Pueblo Viejo, Sierra Nevada de Sta. Marta, Colombia.

3 ♂♂ from *Tinamus robustus fuscipennis*, Rio Sicsola, Costa Rica.

4 ♂♂ and 4 ♀♀ from *Tinamus s. serratus*, Sta. Ana, Rio Coroico, Bolivia.

4 ♂♂ from same host, taken at Chiñiri, Rio Kaka, Bolivia.

The specimens from Costa Rica and Colombia seem to be exactly like the type series in all particulars, but the Bolivian examples are a trifle smaller, but with the same proportions in all parts of the body. A single male taken on *Tinamus t. tao*, however, is quite different, but in characters which seem to be only of subspecific value, and is described below.

Measurements:

	♂	
	length	width
whole body	2.24 to 2.41	
head	.74 to .78	.78 to .83
prothorax	.23	.47
mesothorax	.28	.81
metathorax	.34	.62
abdomen	1.24	1.14
trabeculae	.10	.12

Ornicholax robustus taoi, subsp. nov. Text-plate XXX, figs. 1, 1a.

Type, ♂ adult, from *Tinamus t. tao*, collected at Lagunita de Aroa, Venezuela, December 30, 1910.

Diagnosis: Differs chiefly from *O. r. robustus* in smaller size; narrower head across the temples; head longer than wide (head wider than long in

⁴The host was erroneously identified in the original description, as *Tinamus robustus*.

robustus); slightly wider prothorax (in proportion to length); much narrower mesothorax; trabeculae proportionately larger (same size as in *robustus*); the pleural plates of the abdomen are wider, extending further into the clear central area of the abdomen, making that area correspondingly smaller, head more heavily chitinized. The chaetotaxy is essentially the same.

Measurements:	♂	
	length	width
whole body	2.04	
head	.69	.63
prothorax	.20	.44
mesothorax	.27	.69
metathorax	.28	.50
abdomen	1.10	.96
trabeculae	.10	.12

Genus **KELLOGGIA** Carriker

Kelloggia Carriker, Univ. Studies, Univ. Nebr., Vol. III, No. 2, April, 1903, p. 31.
= Genotype, *Goniocoles agonus* Nitzsch (by subsequent designation).

I wish to make a slight correction and addition to the original description of this interesting genus.

In the original description appears the following: "female with seven (abdominal) segments, male with eight, but with the seventh aborted." This is an error. Both sexes have but seven abdominal segments, the first having been lost or so completely fused with the second that no sign of the suture appears. The first pair of abdominal spiracles appear in the posterior portion of the first segment, and since it is a well known fact that no insect is known with spiracles in the first abdominal segment, this is *prima facie* evidence of the above statement. Further proof of the fusion of the first two segments in this and other genera parasitic on the *Tinamou* lies in the fact that the tergal plates of the 1st. and 2nd. segments are still found separated and visible within the long first segment as it now appears.

As to the seventh segment being "aborted" in the male, as given in the original description, this so-called aborted segment is merely a protuberant process which is an integral part of the fully developed seventh, or last segment, as has been mentioned under *Ornicholax* and *Austrokelloggia*. An additional character which seems to be of generic value is the bifurcated lateral margin of the head, that portion lying between the eye and the temporal angles. This character was not properly interpreted in the original description and figure, and is more strongly developed in *Kelloggia latithorax* (described below), as well as in the new genus *Austrokelloggia*.

Kelloggia brevipes Carriker. Text-plate XXXII, figs. 5, 5a.

Kelloggia brevipes Carriker, Univ. Studies, Univ. Nebr., III, No. 2, 1903, p. 154, pl. 9, fig. 2 (*Tinamus major castaneiceps*, Pozo Azul, Costa Rica. Host wrongly determined as *T. robustus* in original descr.)

The front of the head in the male is more flattened than in the female, and of slightly different proportions.

In the original description of the species no mention was made of the very unusual bifurcated structure of the temples. In the figure of the species is shown what appears to be narrow lateral bands along each side of the head. In reality there is present on the dorsal surface a submarginal, sharply-edged ridge, starting from the lateral margin of the head just behind the eye and extending backward, widening slightly, to the temporal angles and ending within the margin at the base of a strong hair, just behind the rounded angle (see figure).

The ♂ genital armature is small, the basal plate rather weak, extending forward to the posterior edge of the 5th. abdominal segment and poorly chitinized except at the basal portion and a narrow strip along the sides. The parameres are well developed, nearly one-half the length of the basal plate, curving inward at the tips which are bluntly rounded, and are about the same thickness from base to tip. The endomeres are small and thin, about one-third the length of the parameres, and lie along the basal portion of their inner edge, and apparently over the well-developed penis, which nearly fills the space enclosed between the parameres. The penis is bluntly rounded at the tip and is strengthened by peculiarly shaped, internal, chitinized processes (see figure).

Measurements:	length		width	
	♂	♀	♂	♀
body	1.60	1.90		
head	.54	.64	.58	.65
prothorax	.19	.20	.37	.42
mesothorax	.26	.27	.57	.60
metathorax	.26	.28	.43	.47
abdomen	.92	1.05	.81	.89
antennae	.22	.21		
width of head at base of antennae			.26	.245

In addition to the type series listed under the original description, I have examined the following material.

12 ♂♂ and 11 ♀♀ from *Tinamus s. serratus*, collected at St. Ana and Chiñiri, Bolivia, July and August, 1934. 1 ♂ and 1 ♀ from *Tinamus m. major*, collected at Kartabo, British Guiana, by O. L. Hastings, July, 1925 (in coll. of H. S. Peters).

Kelloggia latithorax, species novum. Text-plate XXXII, fig. 6.

Type, ♀ adult, from *Crypturellus atrocapillus*, collected at Chiniiri, Rio Kaka, Bolivia, August 24, 1934, by M. R. Carriker.

Diagnosis: Head very similar to that of *K. brevipes*, but the thoracic and abdominal structure very different, the mesothorax being almost as wide as the first abdominal segment, while the abdominal plates present a very intricate and puzzling problem.

Description: Head large, front narrow and flatly rounded, with a continuous and narrow marginal band; preantennary area short; antennary fossae absent, the sides of the head overlapping the basal portion of the first antennal segment; antennal bands narrow and long, extending to sides of mandibles; sides of head nearly straight (slightly convex) and widely divergent, with the posterior half strongly bifurcate; temporal angles blunt, with posterior margin of temples convex and extending backward nearly to the prothoracic angle; occiput deeply concave; no trace of trabeculae or tubercles; whole head (except clypeal and antennal bands) uniformly, but faintly, pigmented. Two short hairs on each side of preantennary area; one short hair on lateral margin of temple, arising from the inner (dorsal) edge of the bifurcation; a stout pustulated hair on each of the bifurcations at the temporal angles, and a third on the posterior margin of head.

Prothorax very short and wide, with the sides drawn out to a slender point, bearing a strong bristle; acetabular bars transverse (not curved), along the posterior margin of the segment only and crossing over under the mesothorax to the articulation of the middle pair of coxae.

Mesothorax faintly pigmented, slightly wider than head, with sides expanded forward almost to the posterior edge of the temples; whole lateral margin (back to the posterior angle) rounded and with median section serrated; posterior margin extends backward medially in a bluntly rounded angle to the middle of the 1st. abdominal segment, with the lateral portion deeply concave; acetabular bars short, widely disconnected from those of the prothorax and ending just over the posterior margin of mesothorax.

Metathorax consists of two distinct lobes or plates, lying between the pleural plates of the abdomen and extending backward over the dorsal surface of the abdomen to the middle of the 2nd. segment, sides of lobes convex. Posterior tip rather sharply angulated and posterior margin straight; whole segment very faintly pigmented. Apparently these metathoracic plates *overlap* the abdomen, since two pairs of tergal plates are visible underneath them.

Abdomen large, oval, wider than head or mesothorax, first segment much the longest and each succeeding segment shorter, except the 7th. Pleural plates well developed and sharply outlined, with acute lateral angles and separated from each other by a narrow hyaline band. The dorsal sutures between the abdominal segments are completely invisible, the whole dorsal surface of the abdomen being apparently fused into a single integument, which is *finely pitted*, not only on the mesothorax and pleural plates, but over the whole surface of the abdomen. Two rows of tergal plates are present in the median portion of segments 1 to 6. There are seven pairs of these plates, two pairs apparently belonging to the 1st. segment, which is a further positive proof that the first (long) segment in all of these seven-segmented Tinamou lice has been derived from the more or less com-

plete fusion of the old 1st. and 2nd. segments. The spiracles, furthermore, lie at the outer edge of these tergal plates, from the 2nd. to the 7th. In addition to the pleural and tergal plates mentioned above, there is a series of six large, hyaline, broadly overlapping sternal plates, which not only overlap each other, but also the pleural plates. The five pairs of long setae shown in the median portion of the abdomen are unquestionably dorsal. The remainder of the abdominal chaetotaxy may be clearly seen from the figure. Legs short and stout, middle pair of coxae the largest; 1st. pair of femora and tibiae the largest, the 3rd. the smallest; the 2nd. and 3rd. tibiae with numerous spines.

Measurements:

	♀	
	length	width
body	1.50 mm.	
head (at antennae)	.50	.26 mm.
“ (at temples)		.58
prothorax	.25	.37
mesothorax	.24	.61
metathorax	.28	.37
abdomen	.92	.74
antennae	.18	

Remarks: The thoracic structure in this species is rather baffling, which may be partly due to a slight immaturity in the specimen, or to excessive clearing, although I think not. The curious large sternal plates are also very unusual; I have seen nothing similar, and there is not the slightest trace of them in *Kelloggia brevipes*. However, the metathoracic lobes *do* overlie the abdomen in *brevipes*, but there is no indication of the double row of tergal plates possessed by the present species. The shape of the mesothorax is also unusual, but the differences between the two are probably only specific. I am not at all certain that *latithorax* has been properly allocated generically by placing it in *Kelloggia*, but it is certainly very closely related to that genus. One additional ♀ (slightly immature) taken on *C. obsoletus punensis*, La Oroya, Dept. Puno, Peru.

Kelloggia agona (Nitzsch in Giebel).

Gonicotes agonus Nitzsch in Giebel, Zeit. f. ges. Naturw., XXVIII, 1866, p. 387 (*Tinamus tao*).

Lepidophorus agonus, Taschenberg, Die Mall., 882, p. 61, pl. I. fig. 6.

This species is undoubtedly close to *K. brevipes* Carriker, just how close it is impossible to say. Unfortunately I have secured no specimens of *Kelloggia* from *Tinamus tao*, and until such material is available for study I prefer to keep *agona* as a distinct species.

AUSTROKELLOGGIA, genus novum

Type of genus, *Austrokelloggia intermedia*, sp. nov.

This genus very clearly forms a connecting link between the genera *Kelloggia* and *Ornicholax*, possessing some of the characters of each, but with the metathorax differing from both.

Diagnosis: Head slightly conical, with broadly rounded front (broader and more flatly rounded in the male); temples slightly expanded and rounded and with the occipital margin deeply concave; sides of head bifurcated (as in *Kelloggia*); trabeculae present and (apparently) movable, as in *Ornicholax*; prothorax very short, much wider than long and with the sides produced to a slender, bluntly rounded angle, more or less as in *Ornicholax*; mesothorax about as wide as temples, with the sides expanded, posterior margin angulated and extending backward half way through the metathorax (as in *Kelloggia*); metathorax extending backward to posterior margin of the first abdominal segment, and imbedded within the abdomen (not overlapping it). The metathorax has the appearance of being bilobed (as in *Kelloggia*), but is in reality entire, being united behind the mesothorax, but with a clear median area somewhat resembling a suture. Legs very small, all of the femora being concealed under the body. Abdomen and genital armature very similar to that of *Kelloggia*; abdomen with but seven segments, the first pair of spiracles present in the first segment.

Austrokelloggia intermedia, species novum. Text-plate XXXI, figs. 1, 1a, 1b.

Types, ♂ and ♀ adult, from *Nothocercus n. nigrocapillus*, collected at Sandillani, Dept. La Paz, Bolivia, November 23, 1934.

Description ♀: For general shape and structure see diagnosis of the genus, above. Front uniformly circular; trabeculae well developed, slightly convex on lateral and posterior margins and nearly as long as the first segment of antennae; eye prominent; temples slightly convex, with bifurcation sharply marked, beginning at the eye and ending just behind the temporal angles, which are slightly protuberant and bear a strong hair set in a slight depression; antennal and clypeal bands entire, the former widening slightly in the middle and the latter with two short bands extending backward from the front in a line parallel with the antennal bands; mandibles well developed; pharyngeal sclerite and gland present; antennae with segments simple in both sexes, but with the first three segments considerably thickened in the male (see figure); the first segment is slightly thickened and equal in length to 3rd. and 5th., with the second segment the longest and fourth the shortest.

Prothorax with lateral angles terminating in a strong spine; the frontal margin slightly convex and the posterior edge concave; the acetabular bars prominent and deeply colored. Mesothorax equal in width to the temples, with the lateral portion expanded and convex, almost reaching to the lateral angles of the prothorax; the lateral margin toothed in the middle and the lateral angles with one weak and two strong hairs. Metathorax with the sides and posterior margin slightly concave and with the frontal margin underneath the posterior margin of the mesothorax. The whole metathorax has the exact shape of a butterfly with wings spread. Abdomen tapering, the first segment the widest and longest and with broadly expanded frontal margin, extending considerably beyond the sides of the mesothorax; segments 1 to 6 with angles scarcely protruding and rectangular; a tubercular process between the 6th. and 7th. segments, which is joined to the former and bears a medium-sized hair; the 7th. segment rather large, with rounded sides and concave posterior margin; the six pairs of abdominal spiracles present in segments 1 to 6. Pleural and tergal plates either completely

fused or else latter absent; median portion of segments 2 to 6 hyaline, between the plates; first and seventh segments uniformly pigmented.

Chaetotaxy: Two short hairs on each side of clypeal margin and two others within clypeal area on either side; one short hair arising from the inner ridge of the bifurcation on the side of head; one strong, thick bristle on each rounded point of the bifurcated temples and two others on the posterior margin of the temples, just outside of the prothorax; lateral angles of abdomen with rather short, stiff hairs as follows: segment 1 with one short and one long; 2nd. with one long and two shorter; 3rd., 4th. and 5th. same as second; 6th. with one longish hair; 7th. with two long and four short hairs on each side; segments 1 to 5 with a longish, stiff hair set in a pustule on the dorsal surface at the posterior edge of the segments, inside the area normally occupied by the pleural plates (inside of the spiracles); a series of short, fine hairs on the ventral surface of the posterior portion of the 6th. segment and across the anterior portion of the 7th., in the form of a semicircle. The tibiae are about as long as the femora, narrow basally and swollen apically, and with numerous short, slender spines; tarsi well developed and claws short and thick.

Male: The clypeal margin of the head is broader and more flatly rounded than in the female, with the temples wider and bifurcation more pronounced; the abdomen is smaller, but the thorax almost the same size. The 7th. abdominal segment is longer, narrower, tapering on the sides, and of a somewhat complex structure, having a quadrilateral median portion, extending beyond the rest of the segment and apparently free from it except at the base, and with an elongated tubercular process lying on each side of it, between it and the remainder of the segment. This whole structure is unquestionably the 7th. abdominal segment, because the 6th. pair of spiracles are present in the segment immediately anterior to it. This tubercular process also present in the males of other genera found on *Tina-mous*, but I have not been able to determine its physiological nature.

The genital armature is small. The basal plate rather long and narrow; the parameres short and thickened, with the inner side grooved, into which grooves fit the endomeral plates.

Measurements:

	♀		♂	
	length	width	length	width
body	1.56 mm.		1.57 mm.	
head	.49	.54 mm.	.49	.60 mm.
head at base of trabeculae		.31		.30
prothorax	.16	.34	.18	.36
mesothorax	.31	.54	.32	.58
metathorax	.23	.43	.24	.43
abdomen	.88	.68	.90	.77
antennae	.20		.22	

Remarks: In addition to the type specimens, 5 ♀ ♀ were taken on the same individual host and 1 ♂ (which seems to be identical) from *Crypturellus soui inconspicuus*, collected at Chiniñiri, Rio Kaka, Bolivia.

1 ♂ and 1 ♀ from *Nothocercus nigrocapillus cadwaladeri*, collected at Leymebamba, Peru, July 31, 1932; 3 ♂ ♂ and 2 ♀ ♀ from a specimen

of *Nothocercus nigrocapillus* collected at Huacapistana, Dept. Junin, Peru, this bird being intermediate between *nigrocapillus* and *cadwaladeri*.

HYPOCRYPTUS, genus novum

Genotype, *Strongylocotes (Lepidophorus) coniceps* Taschenberg, Nova Acta, Halle, 1882, p. 63, pl. I, fig. 8 (*Crypturellus (Tinamus) variegatus*).

Nearest to *Ornicholax* Carriker, from which it differs chiefly in smaller size; different shape of head; and distinct type of meso-metathoracic structure, having the metathorax entire, not bilobed as in *Ornicholax*. It is also close in some characters to *Kelloggia*.

Diagnosis: Head conical in shape, with rounded front and posterior portion as in *Ornicholax* and *Kelloggia*, in fact, except for the trabeculae, the head is nearer to the type of *Kelloggia* than to *Ornicholax*; antennae similar in the sexes; trabeculae present, slightly smaller than in *Ornicholax*, but also movable; antennary fossa often well developed; clypeal bands present in the form of two prongs running backward from the frontal margin into the clypeal area (absent in *Ornicholax* and *Kelloggia* but present in *Austrokelloggia*); the narrow flaps on the sides of the head are reduced to a small lobe just in front of the temporal angle, which bears a strong, long spine; prothorax as in *Ornicholax*. Mesothorax narrower and longer, but of the same general shape, but is entirely outside of the first abdominal segment (not half within it as in *Ornicholax*). Metathorax smaller, posterior portion clear, with only the anterior, lateral portions of the segment heavily pigmented (resembling two lobes, with a clear area between), these chitinized areas bearing the articulations for the third pair of coxae.

The meso-metathoracic suture is never straight, always sinuate, and is sometimes fused medially, while even in the species which show it entire, the two segments are very closely joined, and are not, apparently, movable as in *Ornicholax*. The abdomen is essentially as in *Ornicholax*, with broad, heavily chitinized and pigmented pleural plates, with the spiracles just under their inner edge (very minute and scarcely visible), and not in the large round clear spot on each pleural plate.

Genital armature slightly more complex than in *Ornicholax*. Legs the same, having the coxae small, but the trochanter in all three pairs strongly developed as in *Lamprocorpus*.

Known from several species, all from the avian genus *Crypturellus*.

Hypocryptus coniceps coniceps (Taschenberg).

Strongylocotes (Lepidophorus) coniceps Taschenberg, Nova Acta, Halle, XLIV, 1882, p. 63, pl. I, fig. 8 (On *Crypturellus variegatus*).

I have not been able to secure specimens of this parasite from the type host, but have examined many individuals taken from five other species and subspecies of the genus *Crypturellus*. Many of these answer fairly well to Taschenberg's description and plate, as far as they go, but none have the proportions of the head which he gives in his measurements and in the figure (.44 mm. long by .66 mm. wide). All of my specimens have

a much narrower head, usually about in the proportion of .44 mm. long by .55 mm. wide. The close similarity between specimens from different hosts (except those from *Crypturellus cinereus cinerascens*) leads me to believe that the form from *C. variegatus* must also be closely allied, and for the present I am allocating most of my specimens as subspecies of *coniceps*.

While the general appearance of the specimens from different hosts is very close, I find a most amazing difference in the genital armature of the male, a parallel case to that of the genus *Rhopaloceras*. Just what value these differences in genitalia may possess with respect to specific or subspecific rank, I am rather at a loss to determine, but the characters seem to be very stable.

Other characters which are noticeably different are the partial fusing of the meso-metathoracic suture in some forms; the shape of the metathorax and the shape of the head, some having the preantennary area much wider and rounder than in others, while some have the temples considerably more expanded than others, in proportion to the head length.

Hypocryptus coniceps heterurus, subsp. novum. Text-plate XXXI, fig. 2.

Type, ♀ adult, taken on *Crypturellus cinereus cinerascens*, collected by the author at Chifiri, Rio Kaka, Bolivia, September 6, 1934.

Diagnosis: Head almost an equilateral triangle, with rounded angles, a little wider at temples than long; trabeculae well developed, somewhat triangular in shape, with bluntly rounded end and anterior and posterior edges nearly straight; mandibles rather large, but slender, and with pointed tips; sides of head, from eye to temporal angle, straight; posterior margin of temples evenly rounded; occiput narrow and rather deeply concave; pharyngeal sclerite and gland present, but small; frontal band very narrow, but with two wider, short internal bands, branching backward from it into the clypeal area, in a line parallel with the antennal bands; antennal bands pronounced, widening medially and extending from base of trabeculae to the mandibular condyle; a large, oval, hyaline space in front of mandibles; antennae with 2nd. segment longest and 3rd. and 4th. shortest and subequal, and 1st. and 5th. equal; two very small hairs on each side of dorsal surface of preantennary area; one short hair on sides of temples; two long, strong hairs on temporal angles, one at the angle, the other behind it, and with two other on the posterior margin, nearer to the occiput.

Prothorax hexagonal, with front concave; anterior portion of sides slightly concave, and posterior portion convex; posterior angle about 90°, and set with a stout, spine-like bristle; posterior margin slightly concave.

Mesothorax a little wider than head, with sides expanded forward and uniformly rounded, the lateral angle being obsolete, and with the anterior margin nearly reaching to the lateral angles of the prothorax, so that almost the entire posterior half of that segment is imbedded within the mesothorax; five longish, strong hairs and one short curving spine, on the rounded lateral angles; the posterior margin sinuate, with median portion convex; central portion of segment clear, with a darker band encircling the clear space on front and sides.

Metathorax wider than prothorax, sides convex and converging sharply to the short, nearly straight posterior margin; lateral margin and narrow, median, longitudinal line clear; the posterior, lateral portion of the metasternum projects outward over the 1st. abdominal segment in the form of a square corner, giving the colored portion of the segment a quadrangular appearance.

Abdomen in the form of a slightly tapering oval, the widest portion being at the posterior portion of the 3rd. segment; composed of seven segments, the spiracles in segments 1 to 6; lateral angles not acute; pleurites wide and uniformly colored, except for a deeply colored, peculiarly shaped process at the inner edge, which seems to lock the segments together; a large, oval, clear spot just below and outside of this process on segments 1 to 6; the spiracles are not placed in these clear spots, but under the inner edge of the pleurites; 7th. segment broad and rounded posteriorly; a stout hair in the lateral angles of segments 1 to 6, and three longish and three short hairs on each side of 7th., besides several short, stiff hairs on dorsal surface near lateral angles; a longish hair on posterior margin on each side of the sternites on segments 1 to 5, just inside of the pleurites. Legs short and stout, tibiae as long and almost as thick as the femora, the former with 5 to 8 stiff, short bristles.

Measurements:	♀	
	length	width
body	1.84 mm.	
head	.54	.62 mm.
prothorax	.28	.36
mesothorax	.22	.64
metathorax	.23	.43
abdomen	1.14	.91
antennae	.20	

Hypocryptus coniceps inconspicuus, subsp. novum. Text-plate XXXII, fig. 2.

Types, ♂ and ♀ adult, from *Crypturellus soui inconspicuus*, collected at Chiñiri, Rio Kaka, Bolivia, September 6, 1934.

Time is lacking to carefully work out the differences in this and the following three subspecies of *coniceps*. There are differences in the shape of the head and metathorax and proportions of different bodily segments.

For the time being they may be recognized by the figures given of the genital armature in the males, together with the host from which they have been taken. In addition to the types, another ♀ was taken from the same host.

Hypocryptus coniceps undulatus, subsp. novum. Text-plate XXXII, fig. 4.

Type (and only specimen), ♂ adult, from *Crypturellus u. undulatus*, collected at Rurrenabaque, Rio Beni, Bolivia, September 11, 1934.

(See figure of genital armature.)

Hypocryptus coniceps nigriceps, subsp. novum. Text-plate XXXII, fig. 1.

Types, ♂ and ♀ adult, from *Crypturellus soui nigriceps*, collected at Tamborapa, Dept. Cajamarca, Peru, July 14, 1933.

5 ♂♂ and 5 ♀♀ in the type series. See figure of genital armature

Hypocryptus coniceps obsoletus, subsp. novum. Text-plate XXXII, fig. 3.

Type, ♂ adult, from *Crypturellus obsoletus punensis*, collected at Calabatea, Rio Coroico, Bolivia, November 15, 1934.

Six female holotypes from the same host, taken at Sandillani, Dept. La Paz, Nov. 15, 1934, and 3 ♀♀ from *Crypturellus obsoletus ochraceiventris*, collected at Eneñas, Dept. Junin, Peru, March, 1930.

Hypocryptus genitilis, species novum. Text-plate XXXI, fig. 2.

Types, ♂ and ♀ adult, from *Crypturellus t. tataupa*, collected at Vicosá, Brazil, June 22, 1933, by E. J. Hambleton. (Types in coll. U. S. Bureau of Entomology).

Diagnosis: Differs from *H. coniceps heterurus* in much smaller size; decidedly different shape of metathorax and 7th. abdominal segment. The metathorax is very short, with sides scarcely convergent, and very little difference in the dorsal and ventral outline on lateral and posterior margins; it is fused medially with the mesothorax, the suture being completely invisible at that point. Like all the forms of the genus (except *H. c. heterurus*) there is a broad hyaline area between the strongly chitinized and pigmented lateral lobes, which support the 3rd. pair of coxae.

The male genital armature is of a type totally different from any other I have seen, not only in this genus, but in others, and it is rather difficult to properly interpret the details of its structure. The parameres seem to be very short, straight and pointed and diverging from the base of the basal plate; the ventral endomeres are three times the length of the parameres, also slender, slight bent inward, and somewhat irregular in contour; the dorsal endomeres are small, shorter than the parameres and lie on top and at the inner edge of the base of the ventral pair; the space between the ventral endomeres is filled by a large elongated sac, with the tip turned to one side and furnished with a small opening (see figure).

Measurements:	♂		♀	
	length	width	length	width
body	1.36 mm.		1.48 mm.	
head	.40	.53 mm.	.48	.56 mm.
prothorax	.10	.28	.12	.28
mesothorax	.15	.53	.16	.55
metathorax	.16	.33	.17	.37
abdomen	.78	.70	.86	.76
antennae	.18		.17	

8 ♂♂ and 14 ♀♀ (including types) in the type series.

1 ♂ and 6 ♀♀ from the same host, collected at Marajo, Brazil, November, 1911 (in collection U. S. Nat. Museum).

2 ♀♀ from same host, taken at Sta. Ana, Rio Coroico, Bolivia, July, 1934.

List of Hosts and their Parasites

<i>Tinamus tao tao</i>	<i>Tinamus serratus ruficeps</i>
<i>Pseudolipeurus taoi</i>	<i>Rhopaloceras g. genitalis</i>
<i>Strongylocotes angulocapitis</i>	<i>Ornicholax r. robustus</i>
<i>Rhopaloceras oniscus</i>	<i>Kelloggia brevipes</i>
<i>Heptagoniodes mirabilis</i>	<i>Nothocercus n. nigrocapillus</i>
“ <i>excavatus</i>	<i>Pseudolipeurus grandis</i>
<i>Ornicholax robustus taoi</i>	<i>Strongylocotes subspinosus</i>
<i>Kelloggia agona</i>	“ <i>spinosus</i>
<i>Tinamus tao kleei</i>	<i>Rhopaloceras laticeps abbreviatus</i>
<i>Pseudolipeurus taoi</i>	<i>Physconella nothocercae</i>
<i>Rhopaloceras oniscus</i>	<i>Nothocotes subsimilis</i>
<i>Pterocotes aberrans taoi</i>	<i>Heptapsogaster p. platycephalus</i>
<i>Tinamus major major</i>	<i>Trichodopeostus spinosus</i>
<i>Nirmocotes cordiceps</i>	<i>Heptapsus tergalis</i>
<i>Tinamus major latifrons</i>	<i>Austrokelloggia intermedia</i>
<i>Kelloggia brevipes</i>	<i>Nothocercus nigrocapillus cadwala-</i>
<i>Tinamus major fuscipennis</i>	<i>deri</i>
(= <i>T. robustus</i> of previous authors)	<i>Rhopaloceras laticeps abbreviatus</i>
<i>Megaginus quadrithorax</i>	<i>Nothocotes subsimilis</i>
<i>Rhopaloceras genitalis simplex</i>	<i>Heptapsogaster mandibularis</i>
<i>Heptarthrogaster parvulus</i>	subsp.
<i>Ornicholax r. robustus</i>	<i>Trichodopeostus spinosus</i>
<i>Tinamus major castaneiceps</i>	“ <i>incertus</i>
<i>Pseudolipeurus tinami</i>	<i>Heptapsus tergalis</i>
<i>Rhopaloceras genitalis simplex</i>	<i>Austrokelloggia intermedia</i>
<i>Heptarthrogaster parvulus</i>	<i>Nothocercus bonaparti</i>
“ <i>minutus</i>	<i>Nothocotes parvithorax</i>
<i>Ornicholax r. robustus</i>	<i>Trichodopeostus spinosus</i> subsp.
<i>Kelloggia brevipes</i>	<i>Heptapsus nothocercae</i>
<i>Pterocotes a. aberrans</i>	<i>Nothocercus julius</i>
<i>Tinamus solitarius</i>	<i>Strongylocotes spinosus</i>
<i>Tinamicola coxata</i>	<i>Rhopaloceras laticeps laticeps</i>
<i>Tinamus serratus serratus</i>	<i>Crypturellus cinereus cinereus</i>
<i>Pseudolipeurus tinami</i>	<i>Heterogoniodes clypeiceps</i>
<i>Strongylocotes angulocapitis</i>	<i>Crypturellus cinereus cinerascens</i>
<i>Heptarthrogaster parvulus</i>	<i>Strongylocotes abdominalis</i>
“ <i>minutus</i>	<i>Heterogoniodes clypeiceps</i>
“ <i>grandis</i>	<i>Hypocryptus coniceps heterurus</i>
<i>Pterocotes a. aberrans</i>	<i>Crypturellus berlepschi berlepschi</i>
<i>Ornicholax r. robustus</i>	<i>Heterogoniodes heterurus</i>
<i>Kelloggia brevipes</i>	<i>Megaginus emarginatus sordidus</i>

⁵ The nomenclature followed for the Tinamidae is that used by Peters in his "Hand List of the Birds of the World".

<i>Crypturellus obsoletus obsoletus</i>	<i>Megaginus e. emarginatus</i>
<i>Pseudolipeurus longipes</i>	<i>Rhopaloceras rudimentarius</i>
<i>Strongylocotes c. complantus</i>	<i>Heptapsogaster mandibularis</i>
<i>Crypturellus obsoletus punensis</i>	“ <i>p. platycephalus</i>
<i>Pseudolipeurus longipes</i>	<i>Pectenosoma v. verrucosa</i>
<i>Strongylocotes c. complantus</i>	<i>Megapeostus asymmetricus</i>
“ <i>subconiceps</i>	<i>parvigenitalis</i>
<i>Nirmocotes nirmoides</i>	<i>Trichodopeostus spinosus</i>
<i>Rhopaloceras brevitemporalis</i>	<i>Austrokelloggia intermedia</i>
<i>Megaginus e. emarginatus</i>	<i>Hypocryptus coniceps incon-</i>
<i>Physconella h. hamata</i>	<i>spicuus</i>
<i>Pseudophilopterus hirsutus obso-</i>	<i>Crypturellus soui soui</i>
<i>letus</i>	<i>Strongylocotes subconiceps</i>
<i>Heptapsogaster p. platycephalus</i>	<i>Rhopaloceras rudimentarius</i>
<i>Pectenosoma v. verrucosa</i>	<i>Heptapsogaster platycephalus</i>
<i>Kelloggia latithorax</i>	<i>soui</i>
<i>Hypocryptus coniceps obsoletus</i>	<i>Cuclotogaster laticorpus</i>
<i>Crypturellus obsoletus ochraceiven-</i>	<i>Crypturellus undulatus undulatus</i>
<i>tris</i>	<i>Pseudolipeurus genitalis</i>
<i>Strongylocotes c. complantus</i>	<i>Strongylocotes complantus inter-</i>
<i>Rhopaloceras brevitemporalis</i>	<i>ruptus</i>
<i>Heptapsogaster p. platycephalus</i>	<i>Rhopaloceras rudimentarius</i>
<i>Pectenosoma v. verrucosa</i>	<i>Heptapsogaster t. temporalis</i>
<i>Hypocryptus coniceps obsoletus</i>	“ <i>p. platycephalus</i>
<i>Crypturellus soui modestus</i>	<i>Megapeostus a. asymmetricus</i>
<i>Cuclotogaster laticorpus</i>	<i>Pectenosoma v. verrucosa</i>
<i>Strongylocotes subconiceps</i>	<i>Hypocryptus coniceps undulatus</i>
<i>Rhopaloceras rudimentarius</i>	<i>Crypturellus undulatus yapura</i>
<i>Ornicholax r. robustus</i>	<i>Nirmocotes nirmoides</i>
<i>Crypturellus soui panamensis</i>	<i>Pseudophilopterus h. hirsutus</i>
<i>Physconella k. kelloggi</i>	<i>Rhopaloceras rudimentarius</i>
<i>Crypturellus soui nigriceps</i>	<i>Megapeostus a. asymmetricus</i>
<i>Strongylocotes subconiceps</i>	<i>Discocorpus cephalosus</i>
<i>Physconella k. kelloggi</i>	<i>Heptapsogaster mandibularis</i>
<i>Rhopaloceras rudimentarius</i>	subsp.
<i>Megaginus e. emarginatus</i>	<i>Pectenosoma v. verrucosa</i>
<i>Heptapsogaster mandibularis</i>	<i>Crypturellus atrocapillus - garleppi affinis</i>
<i>Pectenosoma v. verrucosa</i>	<i>Strongylocotes complantus inter-</i>
<i>Hypocryptus coniceps nigriceps</i>	<i>ruptus</i>
<i>Crypturellus soui mustelinus</i>	<i>Physconella hamata genitalis</i>
<i>Rhopaloceras rudimentarius</i>	<i>Megapeostus asymmetricus</i>
<i>Ornicholax r. robustus</i>	(<i>microgenitalis</i>) = <i>parvigeni</i> 6-65 (see Coroller, 310, p. 275)
<i>Crypturellus soui inconspicuus</i>	<i>Heptapsogaster mandibularis</i>
<i>Pseudolipeurus subsimilis</i>	subsp. = <i>chiria</i> (see Coroller 310, p. 275)
<i>Strongylocotes subconiceps</i>	<i>Discocorpus cephalosus</i>
<i>Physconella kelloggi subsimilis</i>	<i>Pectenosoma verrucosa angusta</i>
	<i>Kelloggia latithorax</i>

<i>Crypturellus variegatus variegatus</i>	<i>Tinamicola alatofasciata</i>
<i>Strongylocotes lipogonus setosus</i>	“ <i>latithorax</i>
<i>Heptapsogaster subdilatus</i>	<i>Heptapsogaster dilatatus</i>
<i>Megapeostus asymmetricus</i>	“ <i>temporalis</i> subsp.
<i>parvigenitalis</i>	<i>Rhynchothura sexpunctata</i>
<i>Pectenosoma v. verrucosa</i>	<i>Docophorocotes sexsetosus</i>
<i>Hypocryptus c. coniceps</i>	<i>Rhynchotus rufescens maculicollis</i>
<i>Crypturellus variegatus salvini</i>	<i>Menacanthus artifasciatus</i>
<i>Strongylocotes complantus variegatus</i>	<i>Strongylocotes l. lipogonus</i>
<i>Pectenosoma v. verrucosa</i>	<i>Rhynchothura crenulata</i>
<i>Crypturellus t. tataupa</i>	“ <i>lunulata</i>
<i>Nirmocotes orbicularis</i>	<i>Tinamicola latithorax</i>
“ <i>glabrous</i>	<i>Nothoprocta branickii</i>
<i>Strongylocotes c. complantus</i>	<i>Cuclotocephalus extraneus</i>
<i>Rhopaloceras pennaticeps</i>	<i>Heptapsogaster tessellatus truncatus</i>
<i>Heptapsogaster petersi</i>	<i>Lamprocorpus hirsutus</i>
“ <i>mandibularis</i>	<i>Nothoprocta pentlandi</i>
<i>Discocorpus microgenitalis</i>	<i>Cuclotocephalus secundus</i>
<i>Esthiopterum tataupa</i>	<i>Lamprocorpus spinosus</i>
<i>Pectenosoma verrucosa parva</i>	<i>Nothoprocta curvirostris</i>
<i>Hypocryptus genitilis</i>	<i>Heptapsogaster t. tessellatus</i>
<i>Crypturellus (macrourus?)</i>	<i>Lamprocorpus spinosus</i>
<i>Strongylocotes alienus</i>	<i>Nothura maculosa nigroguttata</i>
<i>Rhynchotus rufescens rufescens</i>	<i>Rhynchothura minuta</i>
<i>Menacanthus artifasciatus</i>	<i>Nothura boraquiria</i>
<i>Lipeurus rhynchoti</i>	<i>Strongylocotes tinnami</i>
<i>Strongylocotes l. lipogonus</i>	(<i>Trinoton biguttatum?</i>)
<i>Tinamicola rotundata</i>	

EXPLANATION OF TEXT-PLATES I-XXXII

The numbers in parentheses, following the explanation of the figures, represent the magnification on the printed plate, and the magnification is the same in succeeding figures unless a different number appears.

TEXT-PLATE I. Fig. 1, *Lipeurus rhynchoti* ♂ (32); a, ♂ genitalia (154). Fig. 2, *Cuclotogaster laticorpus* ♀ (32). Fig. 3, *Esthiopterum tataupa* ♀ (48).

TEXT-PLATE II. Fig. 1, *Pseudolipeurus genitilis* ♂ (48); a, ♀; b, ♂ genitalia (154). Fig. 2, *P. tinami*, antenna of ♂ and ♀ (48); a, ♂ genitalia (154). Fig. 3, *P. subsimilis* ♂ (48); a, ♀; b, ♂ genitalia (154).

TEXT-PLATE III. Fig. 1, *Pseudolipeurus grandis* ♀ (48); a, leg articulation (128). Fig. 2, *P. longipes* ♂ (48); a, ♂ genitalia (154); b, head and abdomen, ♀ (48). Fig. 3, *P. longipes taoi*, ♂ genitalia (154).

TEXT-PLATE IV. Fig. 1, *Pseudophilopterus h. hirsutus* ♂ (64); a, ♂ genitalia (154). Fig. 2, *P. h. obsoletus*, head and thorax, ♂ (64); a, ♂ genitalia (154). Fig. 3, *Nirmocotes nirmoides* ♀ (48).

TEXT-PLATE V. Fig. 1, *Nirmocotes orbicularis* ♂ (48); a, ♀. Fig. 2, *N. cordiceps* ♀. Fig. 3, *N. glabrous* ♀.

TEXT-PLATE VI. Fig. 1, *Strongylocotes l. lipogonus* ♂ (32); a, ♀; b, ♂ genitalia (161). Fig. 2, *S. c. complantus* ♂ (32); a, ♀; b, ♂ genitalia (154).

TEXT-PLATE VII. Fig. 1, *Strongylocotes complantus interruptus* ♂ (32); a, ♀. Fig. 2, *S. abdominalis* ♂; a, ♀. Fig. 3, *S. complantus variegatus* ♂; a, ♀. Fig. 4, *S. spinosus* ♀.

TEXT-PLATE VIII. Fig. 1, *Strongylocotes subconiceps* ♂ (32); a, ♀. Fig. 2, *S. subspinosis* ♂; a, ♀. Fig. 3, *S. angulocapilis* ♀.

TEXT-PLATE IX. Fig. 1, *Physconella kelloggi subsimilis* ♀ (96); a, ♂ genitalia (308). Fig. 2, *P. h. hamata* ♂ (96); a, ♂ genitalia (308).

TEXT-PLATE X. Fig. 1, *Physconella nothocercae* ♀ (96); a, tip of abdomen. Fig. 2, *P. hamata genitilis*, ♂ genitalia (308). Fig. 3, *Megaginus e. emarginatus* ♂ (96); a, ♀; b, ♂ genitalia (308); c, mandibles. Fig. 4, *M. quadrithorax* (96); a, ♂ genitalia (308).

TEXT-PLATE XI. Fig. 1, *Cuclotocephalus extraneus* ♀ (48); a, mandibles (154). Fig. 2, *C. secundus* ♀ (48). Fig. 3, *Nothocotus parvithorax* ♂ (64); a, ♀; b, ♂ genitalia (154).

TEXT-PLATE XII. Fig. 1, *Nothocotus subsimilis* ♂ (64); a, ♀; b, ♂ genitalia (154). Fig. 2, "Scent Glands", *Heptapsogaster l. temporalis* (308). Fig. 3, "S.G.", *H. temporalis* subsp. Fig. 4, "S.G.", *H. mandibularis*. Fig. 5, "S.G.", *Heptapsus nothocercae*. Fig. 6, "S.G.", *Megaginus e. emarginatus*; a, *M. quadrithorax*; b, *M. emarginatus sordidus*. Fig. 7, *Heptapsogaster temporalis* subsp.

TEXT-PLATE XIII. Fig. 1, *Rhopaloceras brevitemporalis* ♂ (32); a, antenna ♂ (64); b, abdominal combs (154); c, ♂ genitalia; d, ♀ genitalia (64). Fig. 2, *R. laticeps abbreviatus* ♂ (32); a, abdominal combs (154); b, ♀ genitalia (32); c, ♂ genitalia (154).

TEXT-PLATE XIV. Fig. 1, *Rhopaloceras rudimentarius* ♂ (32); a, abdominal combs (154); b, ♀ genitalia (32); c, ♂ genitalia (154). Fig. 2, *R. oniscus*, antenna ♀ (64); a, antenna ♂; b, ♂ genitalia (154); c, ♀ genitalia (32).

TEXT-PLATE XV. Fig. 1, *Rhopaloceras genitilis simplex*, antenna ♀ (64); a, antenna ♂; b, ♀ genitalia (32); c, ♂ genitalia (154). Fig. 2, *R. g. genitilis*, antenna ♀ (64); a, antenna ♂; b, ♀ genitalia (32); c, ♂ genitalia (154). Fig. 3, *R. pennaticeps*, antenna ♀ (64); a, antenna ♂; b, ♀ genitalia (32); c, ♂ genitalia (154).

TEXT-PLATE XVI. Fig. 1, *Heptapsogaster t. temporalis* ♂ (64); a, ♀; b, ♂ genitalia (154). Fig. 2, *H. mandibularis* ♂ (64); a, ♀; b, ♂ genitalia (154). Fig. 3, *H. temporalis femininus* ♀ (64); a, ♂ genitalia (308). Fig. 4, *H. temporalis chinürii*, ♂ genitalia.

TEXT-PLATE XVII. Fig. 1, *Heptapsogaster p. platycephalus* ♂ (48); a, ♀; b, pleural plate of ♀ (96); c, ♂ genitalia (154). Fig. 2, *H. platycephalus soui* ♂ (48). Fig. 3, *H. petersi* ♂; a, ♀; b, ♂ genitalia (154).

TEXT-PLATE XVIII. Fig. 1, *Heptapsogaster t. tessellatus* ♂ (64); a, ♀; b, ♂ genitalia (308); c, pleural plates, ♀ (64). Fig. 2, *H. tessellatus truncatus*, ♂ genitalia (308); a, pleural plates ♀ (64). Fig. 3, *Rhynchothura sexpunctata* ♂ (48); a, ♀; b, antenna ♂ (154); c, ♂ genitalia (154).

TEXT-PLATE XIX. Fig. 1, *Rhynchothura crenulata* ♂ (64); a, ♀; b, ♂ genitalia (154). Fig. 2, *R. lunulata* ♀ (48). Fig. 3, *R. minuta* ♂ (64); a, ♀; b, ♂ genitalia (154).

TEXT-PLATE XX. Fig. 1, *Heptarthrogaster parvulus* ♀ (64); a, ♂; b, ♂ genitalia (308). Fig. 2, *H. minutus* ♀ (64); a, ♂ (64); a, ♂; b, ♂ genitalia (308). Fig. 3, *H. grandis* ♀ (48).

TEXT-PLATE XXI. Fig. 1, *Trichodopeostus spinosus* ♂ (48); a, ♀; b, ♂ genitalia (161). Fig. 2, *T. incertus* ♀ juv. (56). Fig. 3, *Heterogoniodes clypeiceps*, head and tip of abdomen, ♀ (48).

TEXT-PLATE XXII. Fig. 1, *Heterogoniodes clypeiceps* ♂ (48); a, ♂ genitalia (154). Fig. 2, *H. heterurus* ♀ (48).

TEXT-PLATE XXIII. Fig. 1, *Megapeostus a. asymmetricus* ♂ (48); a, ♀; b, ♂ genitalia (154). Fig. 2, *M. asymmetricus parvigenitalis*, ♂ genitalia (154).

TEXT-PLATE XXIV. Fig. 1, *Discocorpus cephalosus* ♂ (96); a, ♀; b, ♂ genitalia (308); c, mandibles. Fig. 2, *D. microgenitalis* ♂ (96); a, ♀; b, ♂ genitalia (308).

TEXT-PLATE XXV. Fig. 1, *Lamprocorpus hirsutus*, dorsal aspect ♂ (32); a, ventral aspect ♂; b, dorsal aspect ♀; c, ventral aspect ♀; d, ♂ genitalia (154); e, head of ♀ (32).

TEXT-PLATE XXVI. Fig. 1, *Lamprocorpus spinosus* ♀, dorsal (left) and ventral (right) aspects (32); a, ♂ genitalia (161). Fig. 2, *Pterocotes a. aberrans* ♂ (48); a, ♀; b, ♂ genitalia (154); c, ♀ genitalia, ventral aspect (48). Fig. 3, *Pterocotes a. taoi* ♀; a, ♀ genitalia, ventral aspect.

TEXT-PLATE XXVII. Fig. 1, *Heptapsus nothocercae* ♂ (64); a, ♀; b, ♂ genitalia (161). Fig. 2, *Heptapsus tergalis* ♂ (64); a, ♂ genitalia (308). Fig. 3, *Docophorocotes sexsetosus* ♂ (64); a, ♀; b, ♂ genitalia (154).

TEXT-PLATE XXVIII. Fig. 1, *Tinamicola rotundata* ♂ (64); a, ♀; b, ♂ genitalia (308). Fig. 2, *T. latithorax* ♂ (64); a, ♀; ♂ genitalia (154).

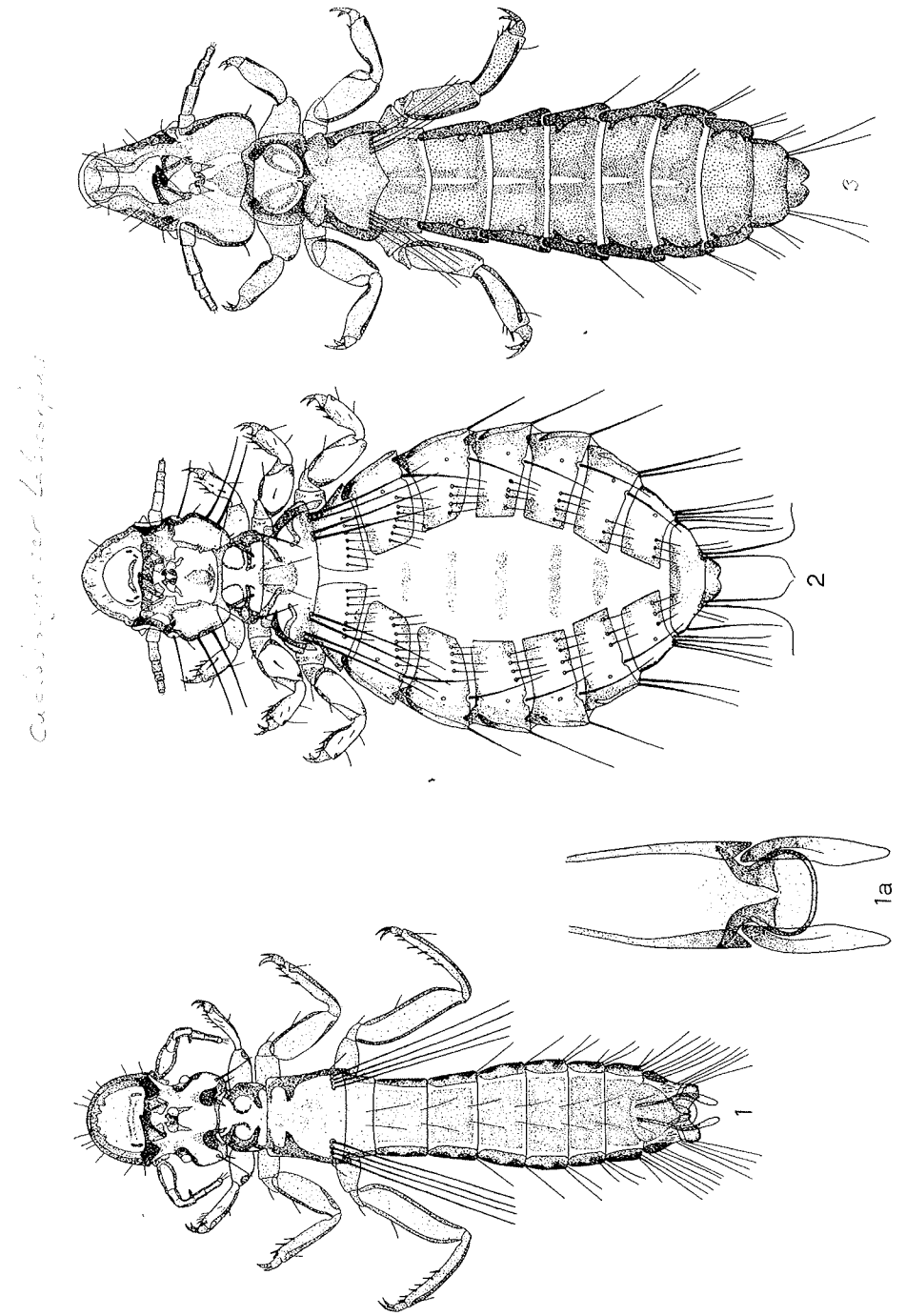
TEXT-PLATE XXIX. Fig. 1, *Pectenosoma v. verrucosa* ♀ (64); a, tip of abdomen ♂; b, ♂ genitalia (308). Fig. 2, *P. verrucosa parva* ♀ (64); a, ♂ genitalia (322). Fig. 3, *P. v. angusta*, ♂ genitalia.

TEXT-PLATE XXX. Fig. 1, *Ornicholax robustus taoi* ♂ (48); a, ♂ genitalia (154). Fig. 2, *O. r. robustus*, ♂ genitalia. Fig. 3, *Heptagoniodes mirabilis* ♂ (48); a, ♂ genitalia (154).

TEXT-PLATE XXXI. Fig. 1, *Austrokelloggia intermedia* ♀ (64); a, ♂ genitalia (308); b, tip of abdomen, ♂ (64). Fig. 2, *Hypocryptus coniceps heterurus* ♀ (48). Fig. 3, *H. tataupa*, ♂ genitalia (308). = *H. gen. nov.* - see *Contrib.* 210, p. 235.

TEXT-PLATE XXXII. Fig. 1, *Hypocryptus coniceps nigriceps*, ♂ genitalia (308). Fig. 2, *H. c. inconspicuus*, ♂ genitalia. Fig. 3, *H. c. obsoletus*, ♂ genitalia. Fig. 4, *H. c. undulatus*, ♂ genitalia. Fig. 5, *Kelloggia brevipes* ♂ (48); a, ♂ genitalia (154). Fig. 6, *Kelloggia latithorax* ♀ (64).

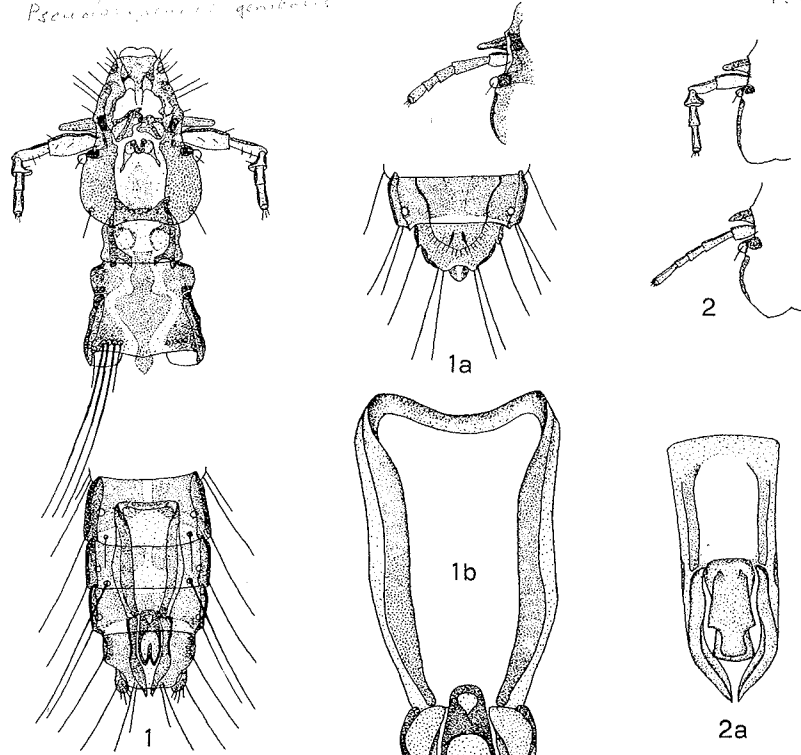
TEXT-PLATE I



TEXT-PLATE II

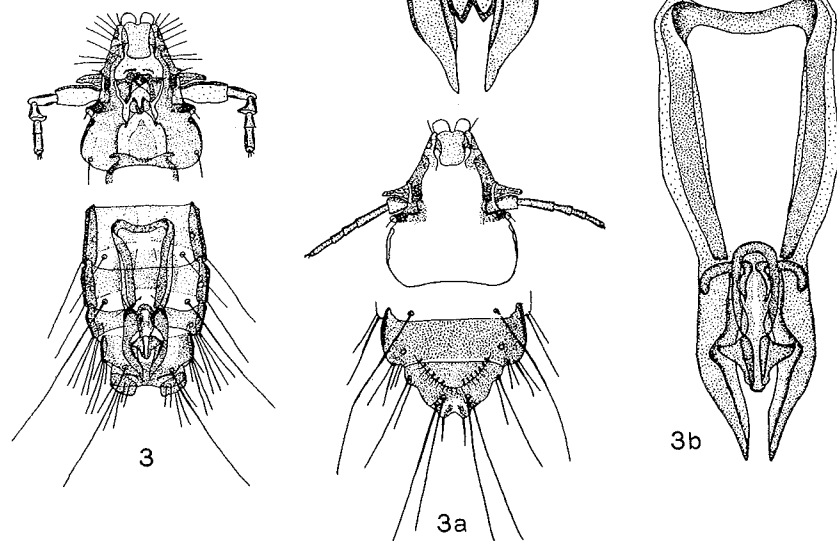
P.

Pseudobrycones genibialis



P. lineatus

P. sublineatus

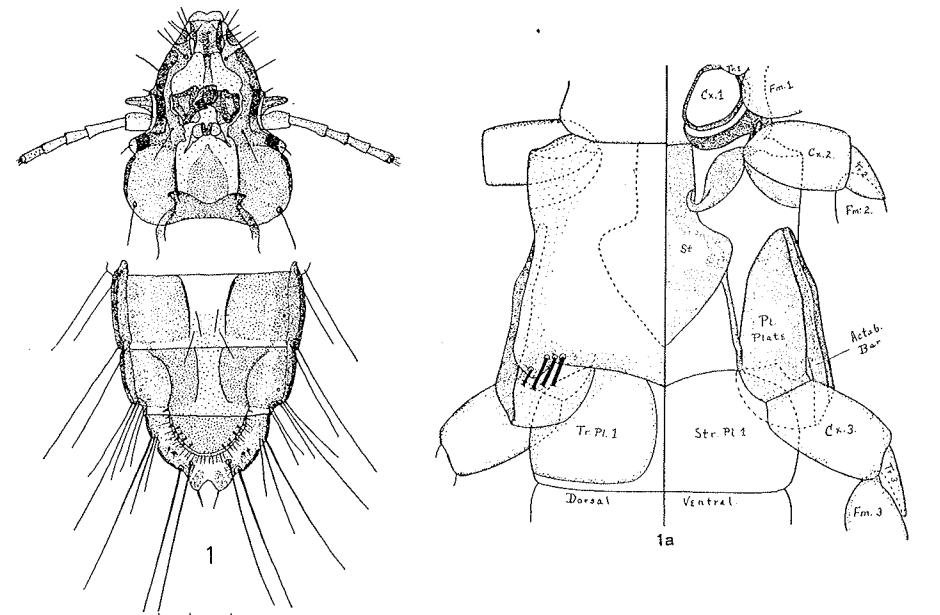


(188)

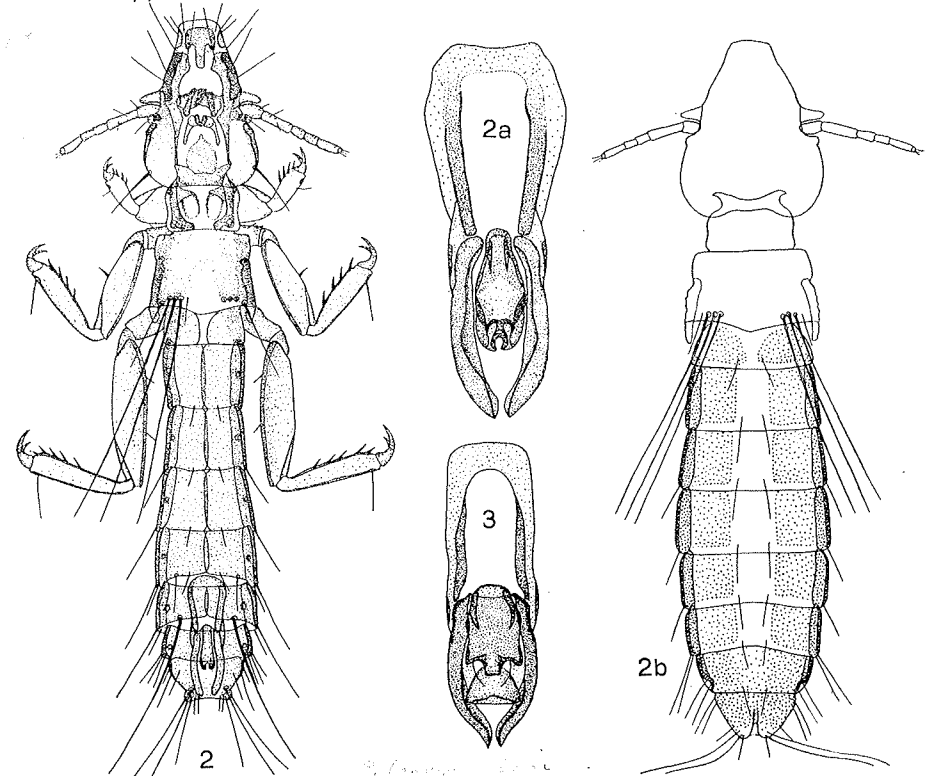
Pseudobrycones sublineatus
Pseudobrycones sublineatus
Pseudobrycones sublineatus

P. grandis

TEXT-PLATE III

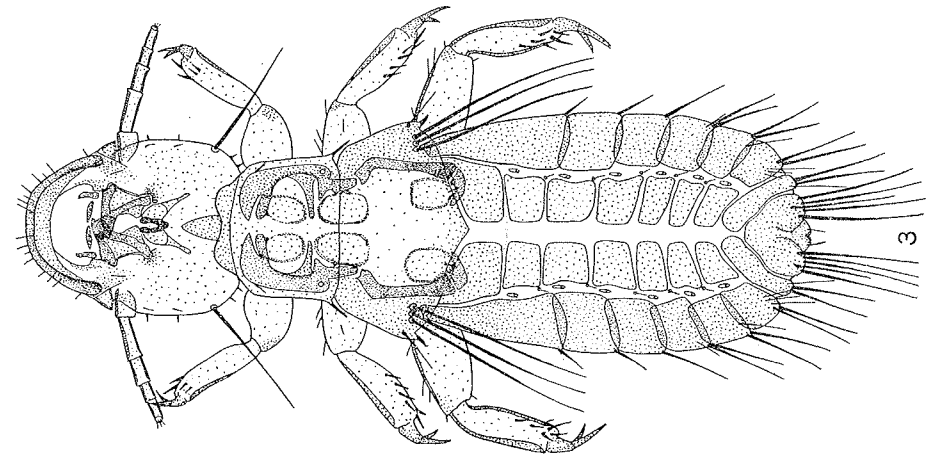
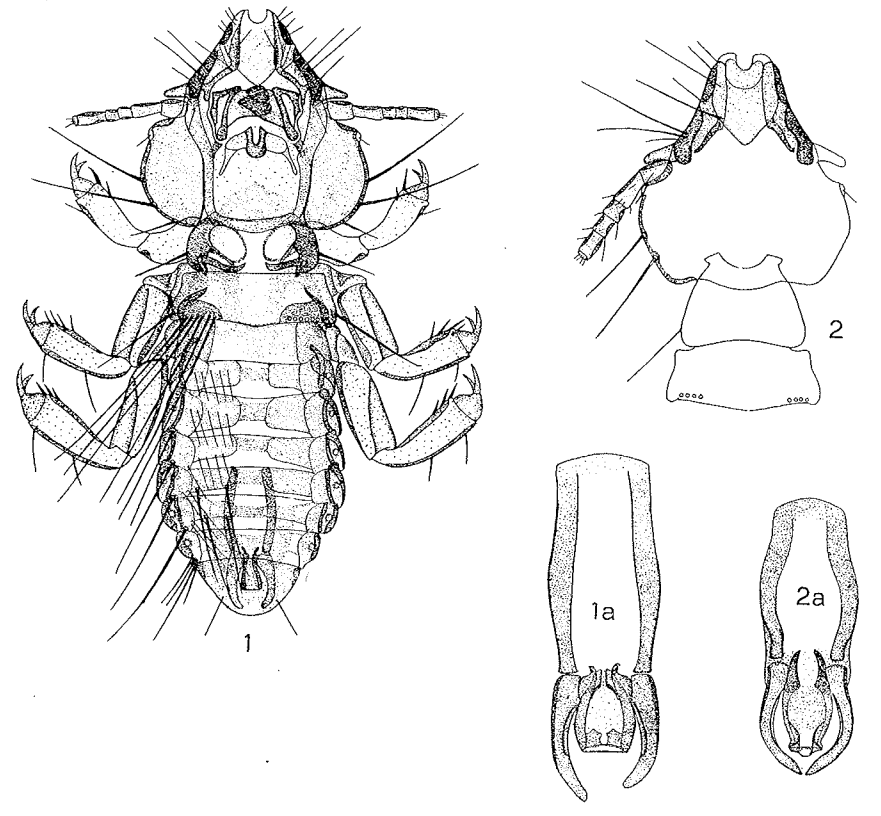


P. longipes



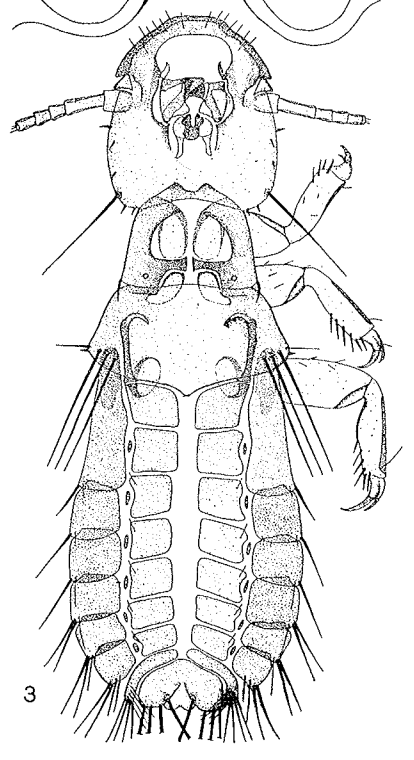
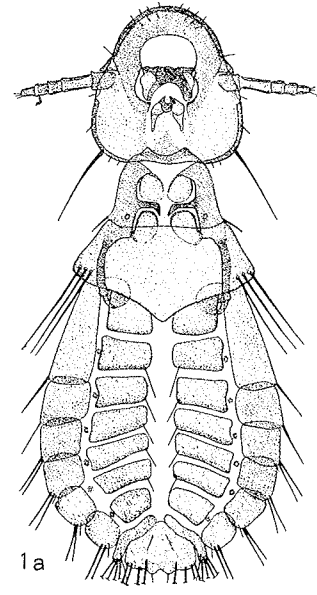
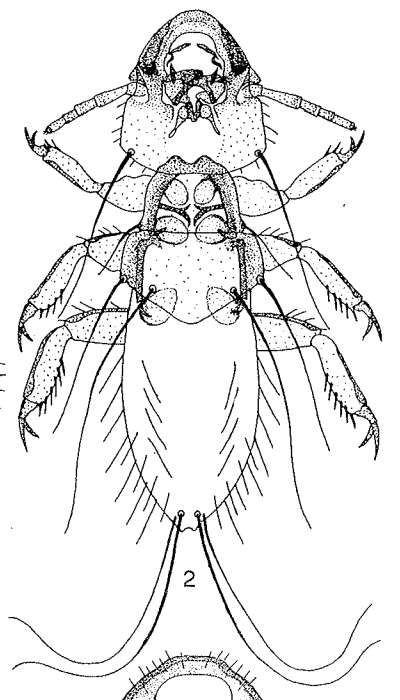
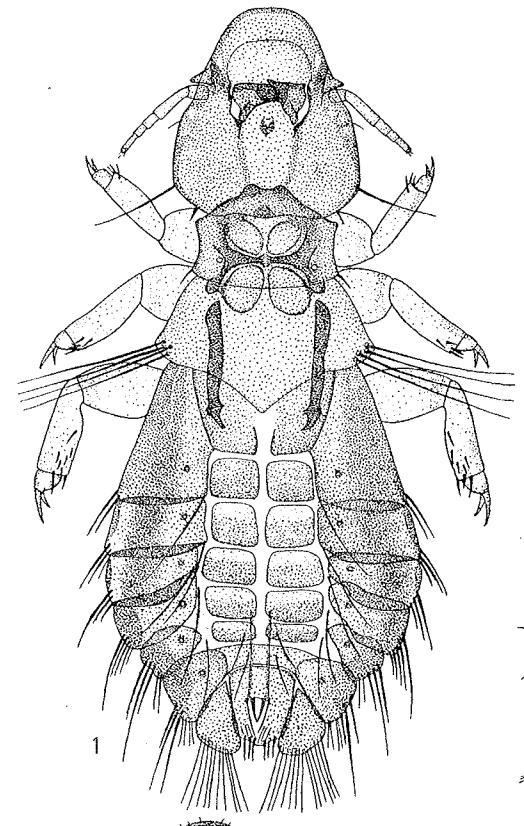
(189)

Pseudobrycones longipes
Pseudobrycones longipes



(190)

Nemastolus ruficornis

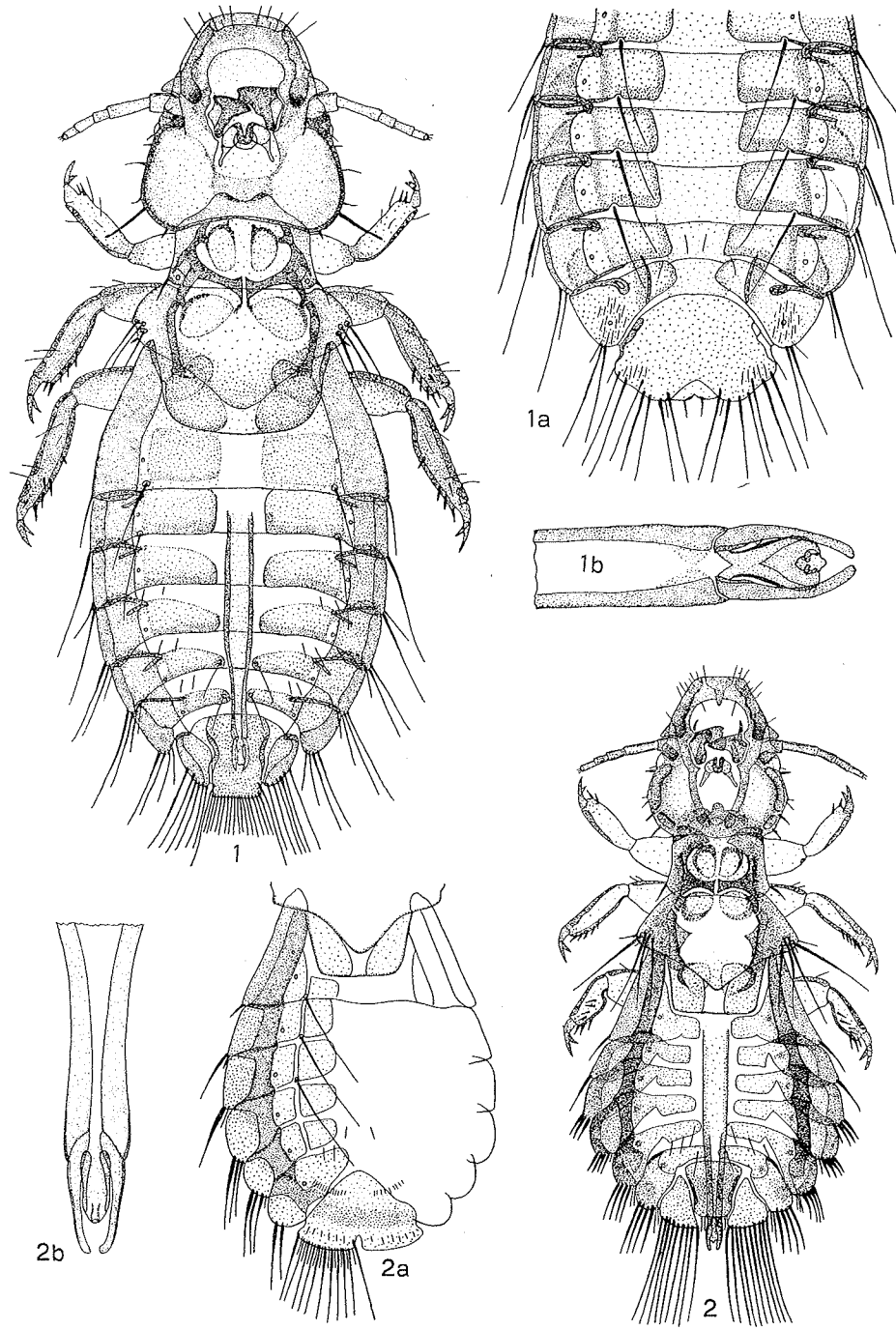


N. glaberrimus

(191)

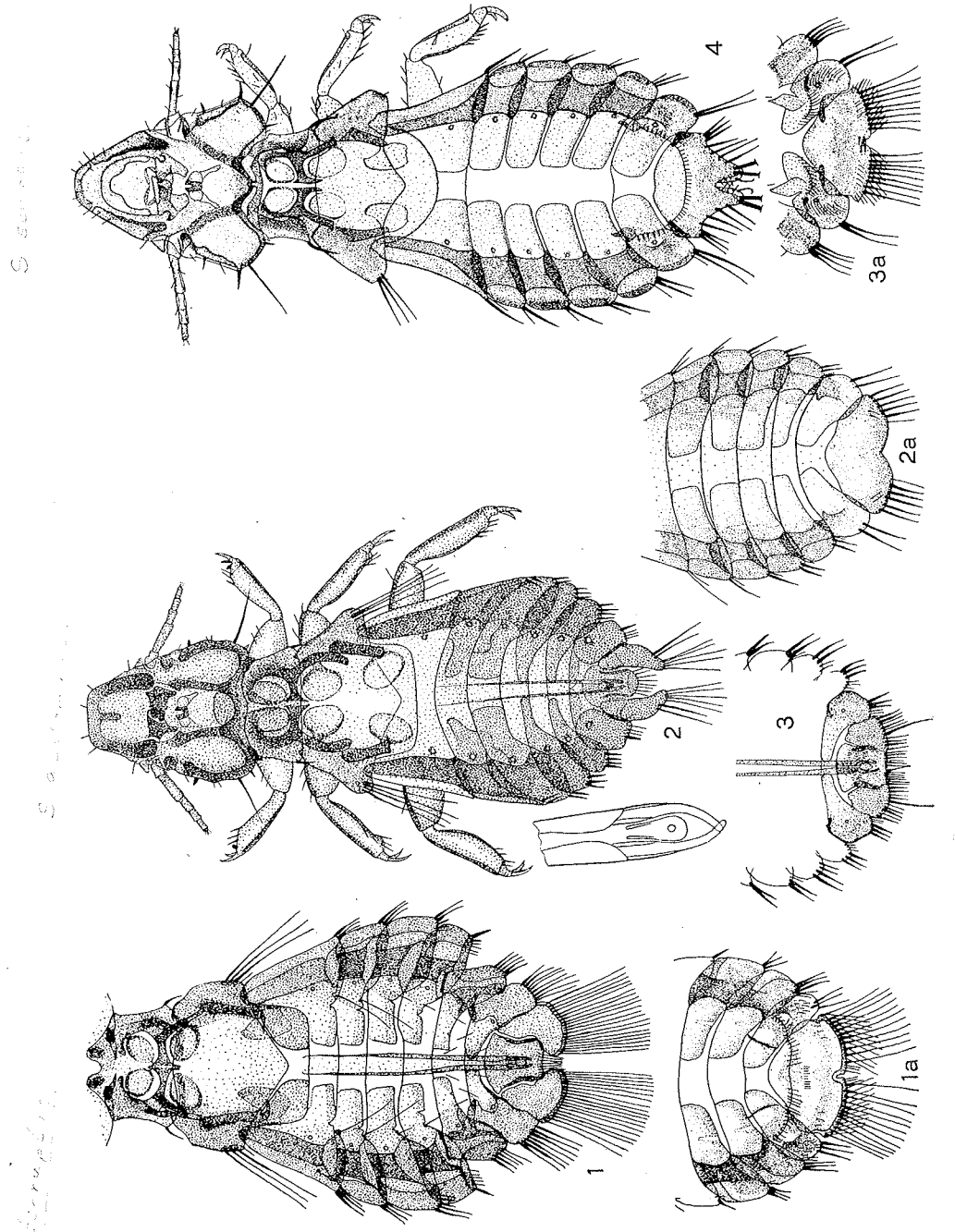
Strongyloides

TEXT-PLATE VI



(192)

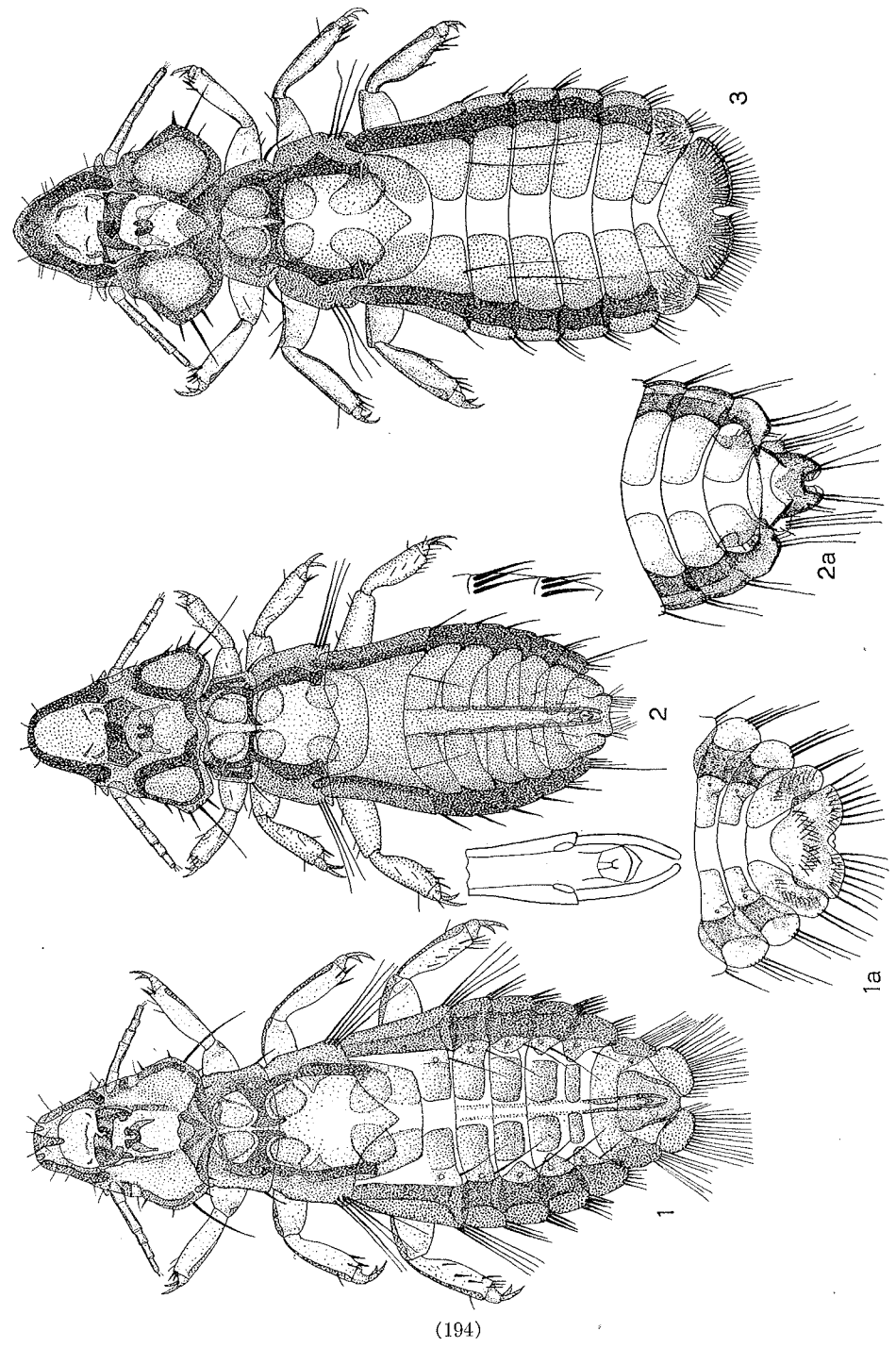
TEXT-PLATE VII



(193)

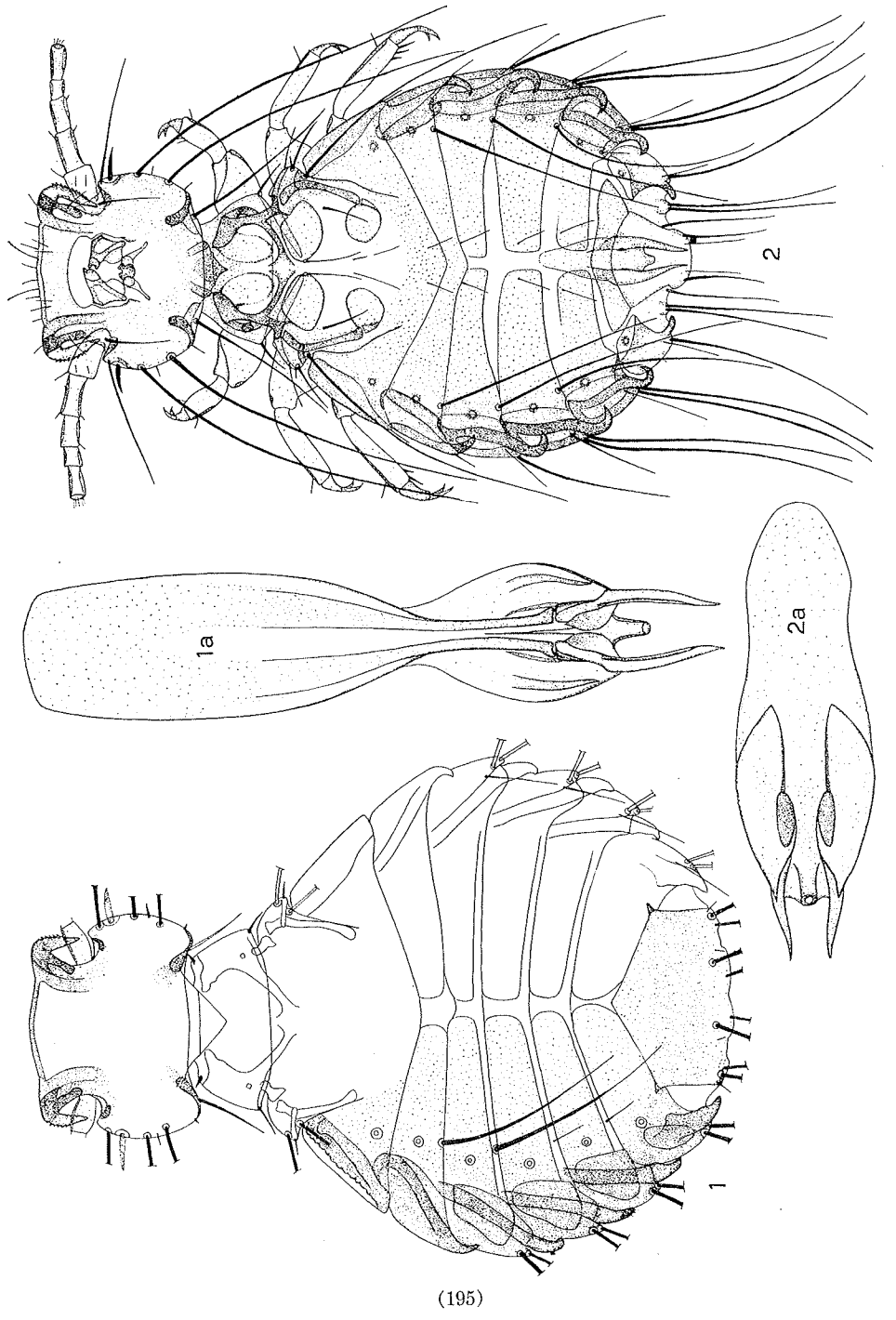
TEXT-PLATE VIII

Stenomyia *Stenomyia* *Stenomyia*



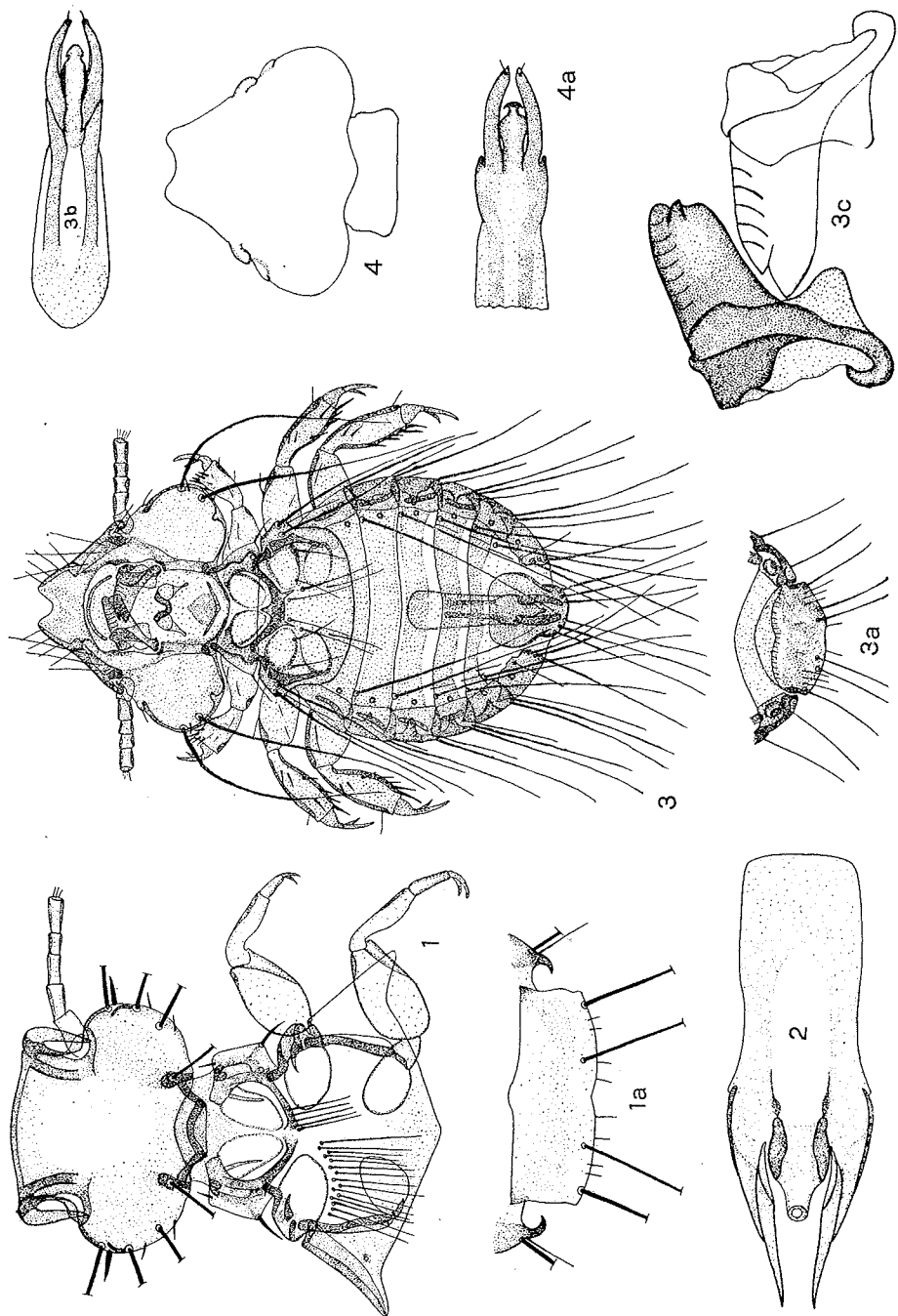
(194)

TEXT-PLATE IX



(195)

TEXT-PLATE X



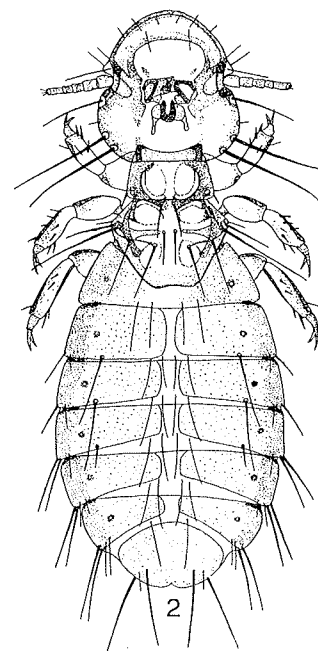
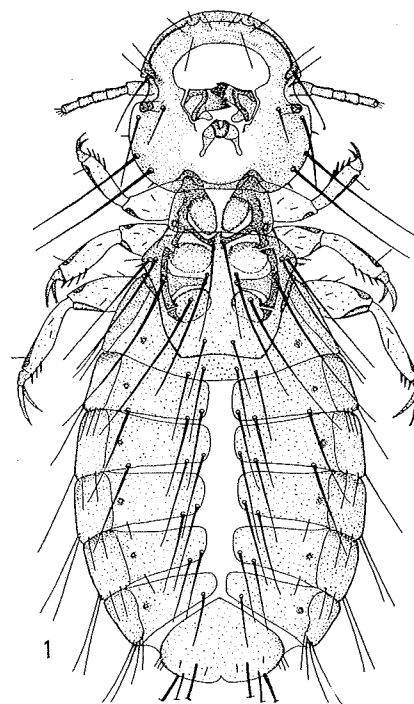
(196)

Cuculoboccephalus

TEXT-PLATE XI

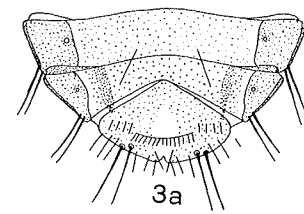
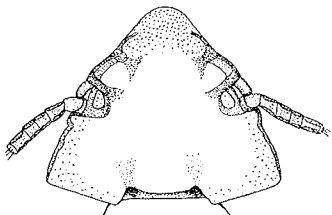
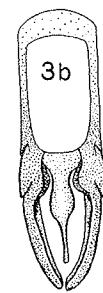
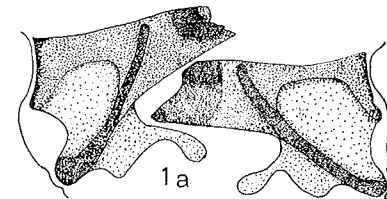
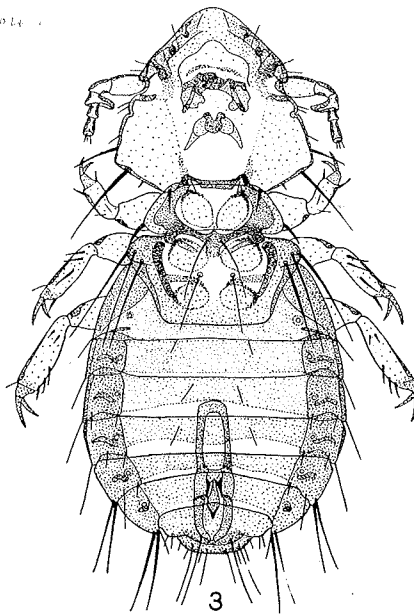
Cuculoboccephalus parvillorosa

p. 196

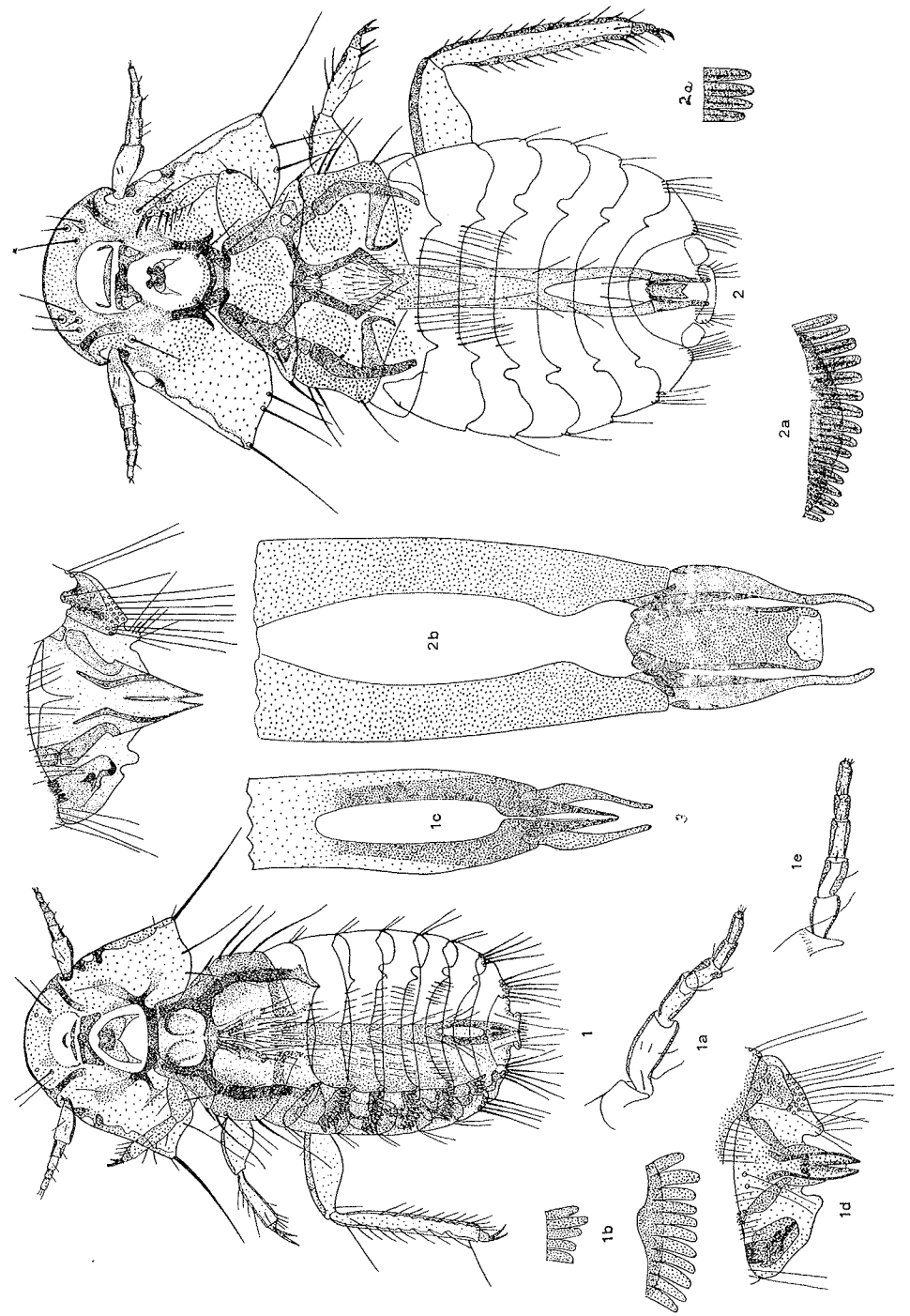
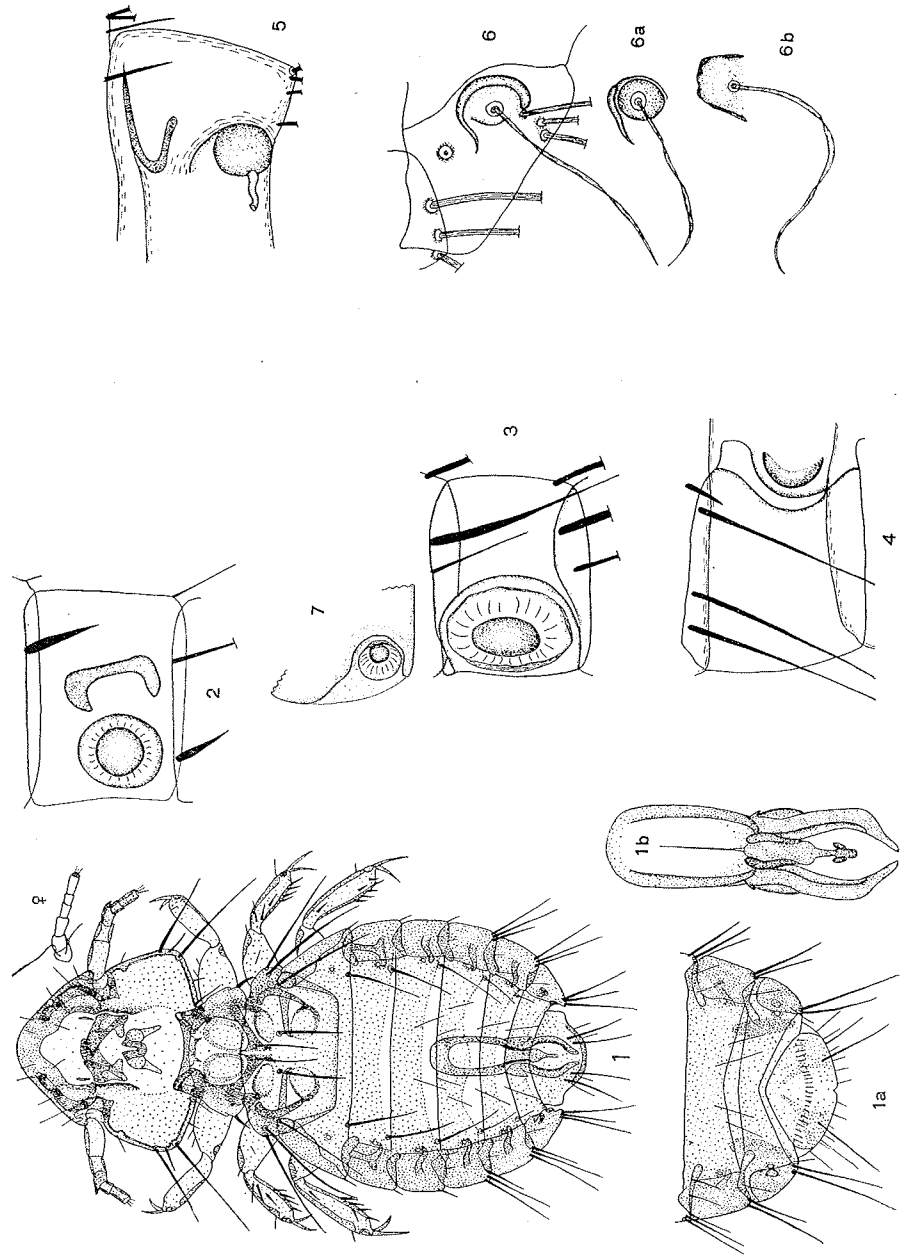


Nallosia parvillorosa

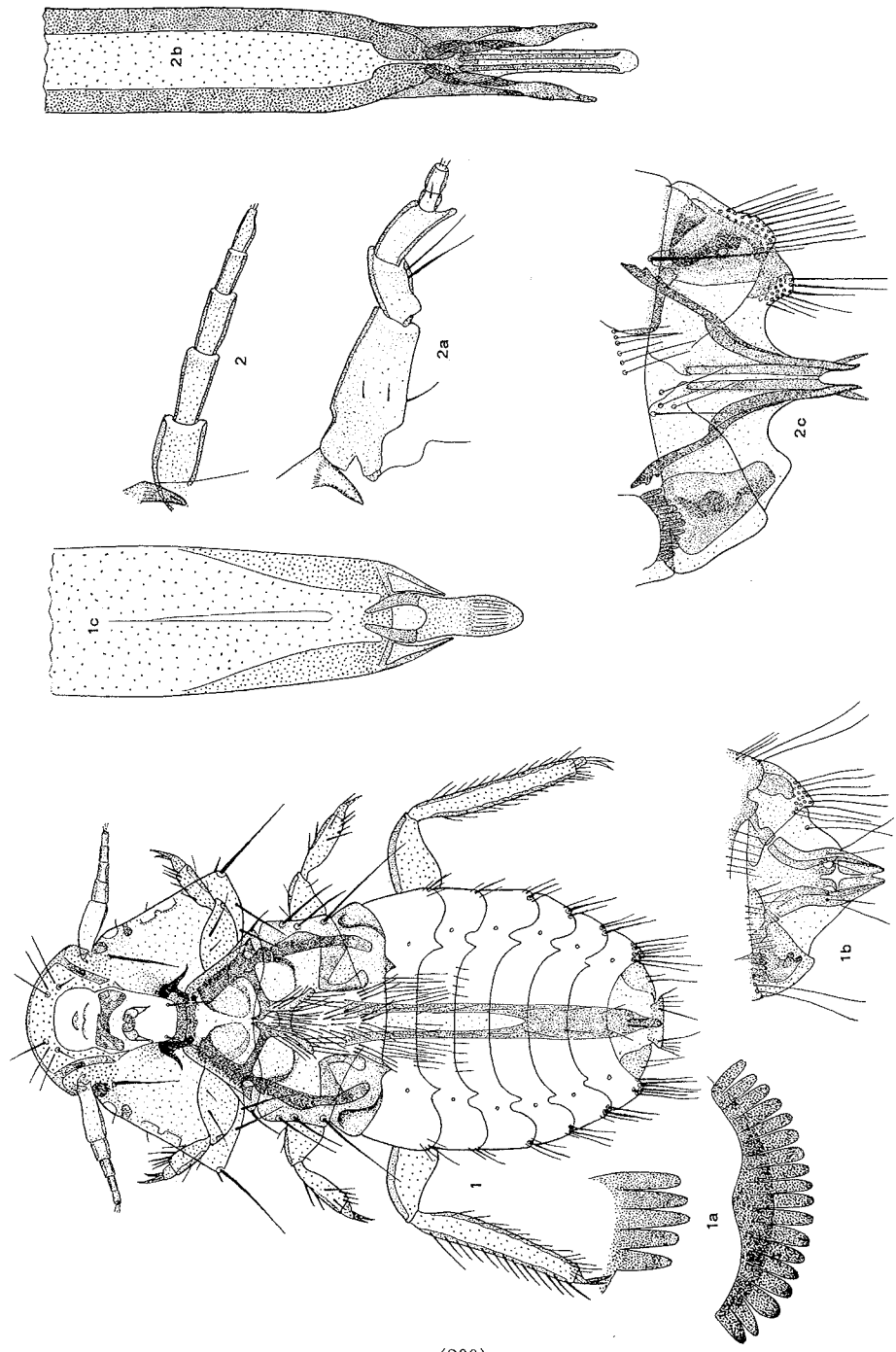
p. 196



(197)

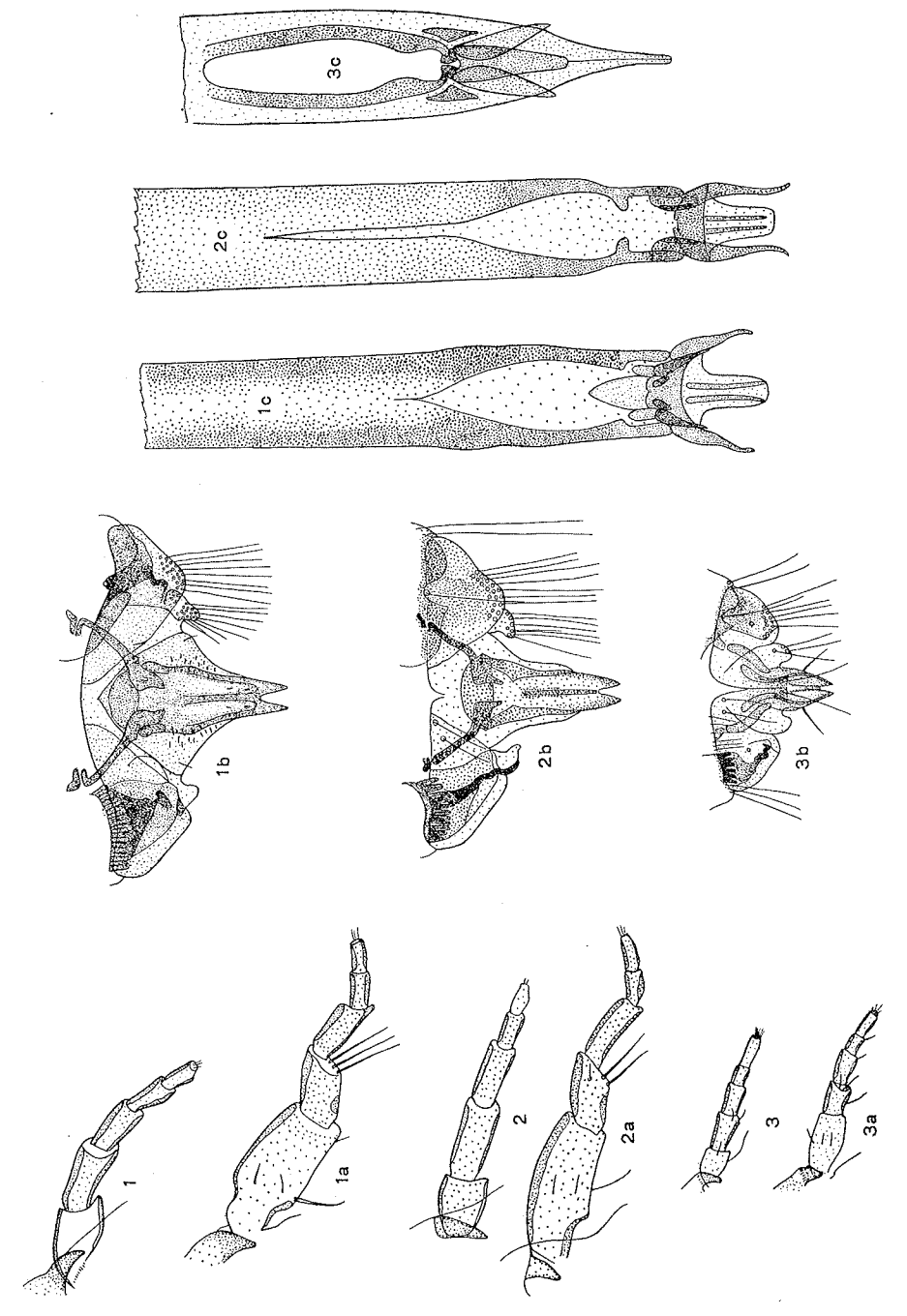


TEXT-PLATE XIV

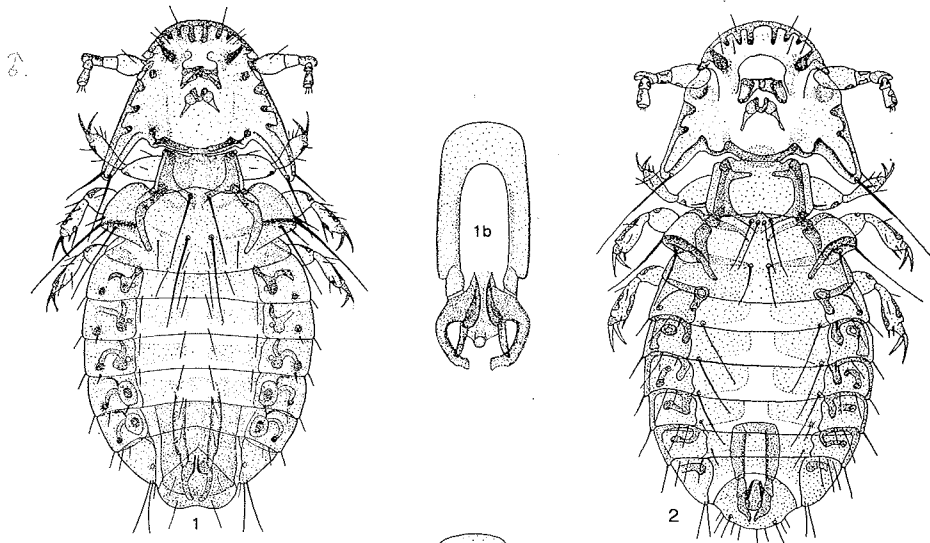


(200)

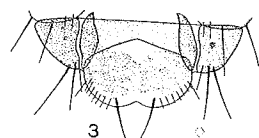
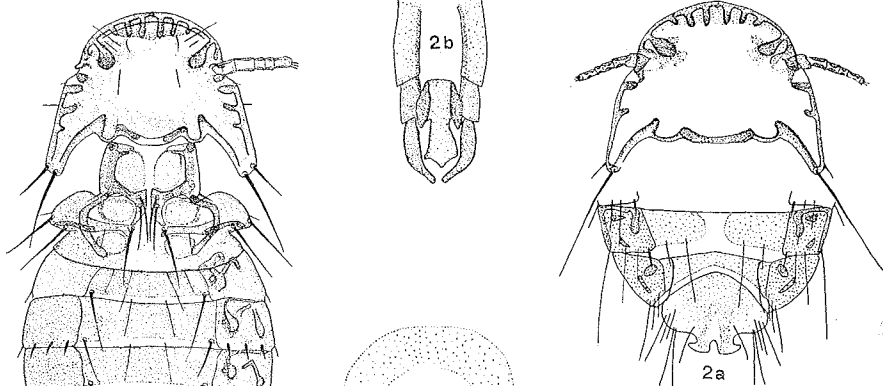
TEXT-PLATE XV



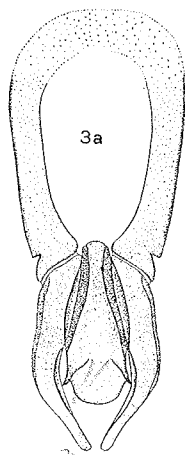
(201)



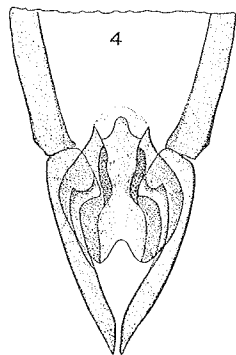
♀



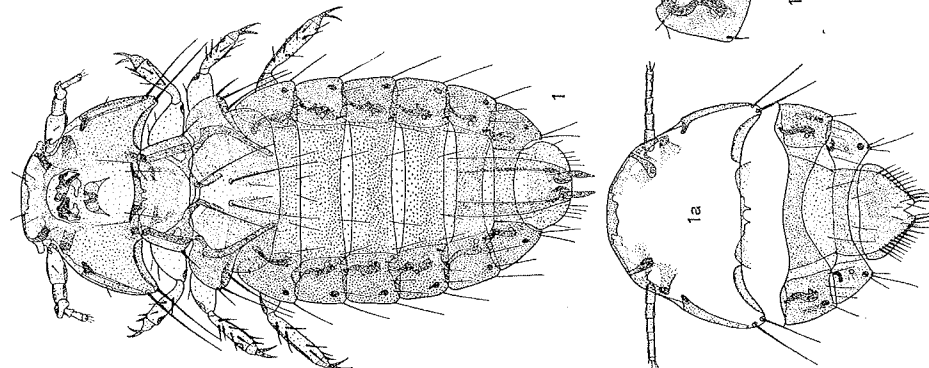
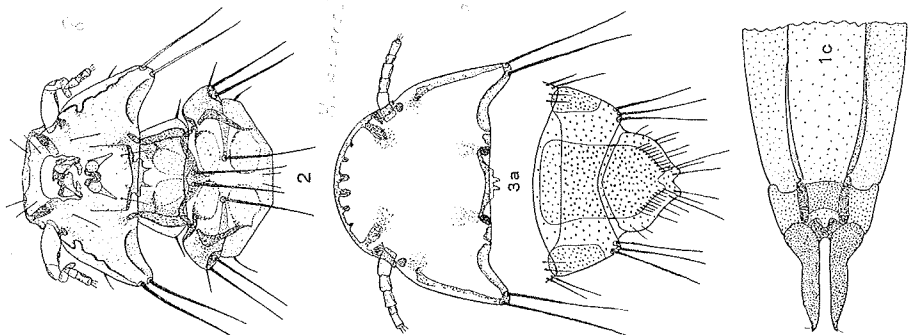
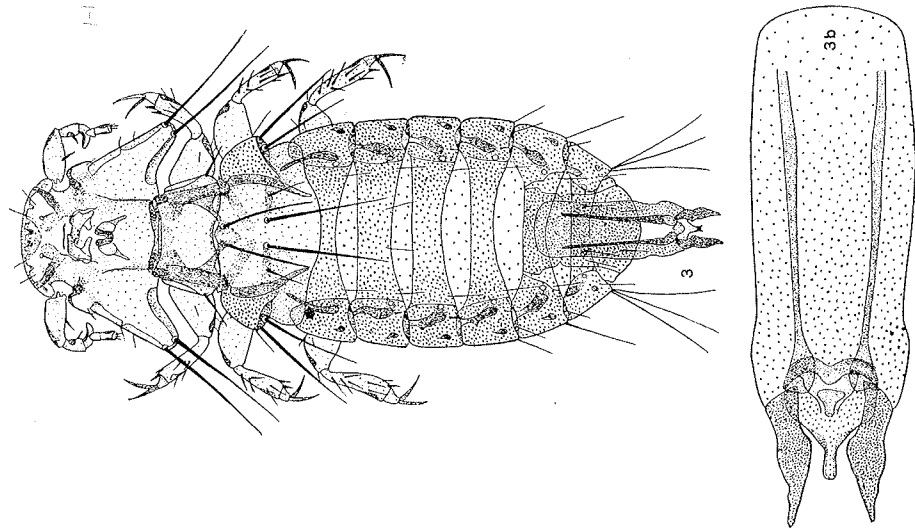
H. bempilii feminae



(202)



H. mandibularis

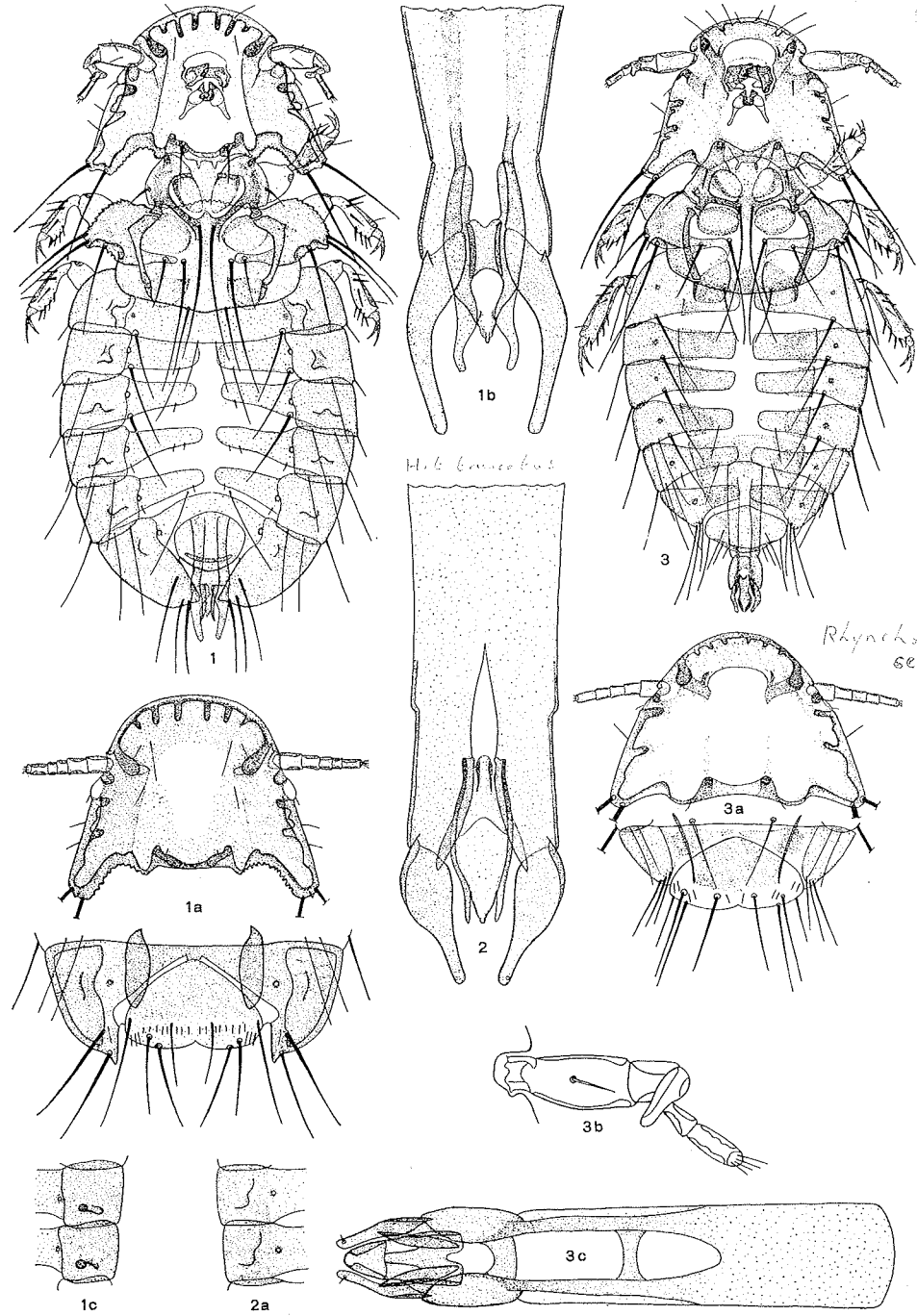


(203)

Heptapsorhynchus b. basicalatus

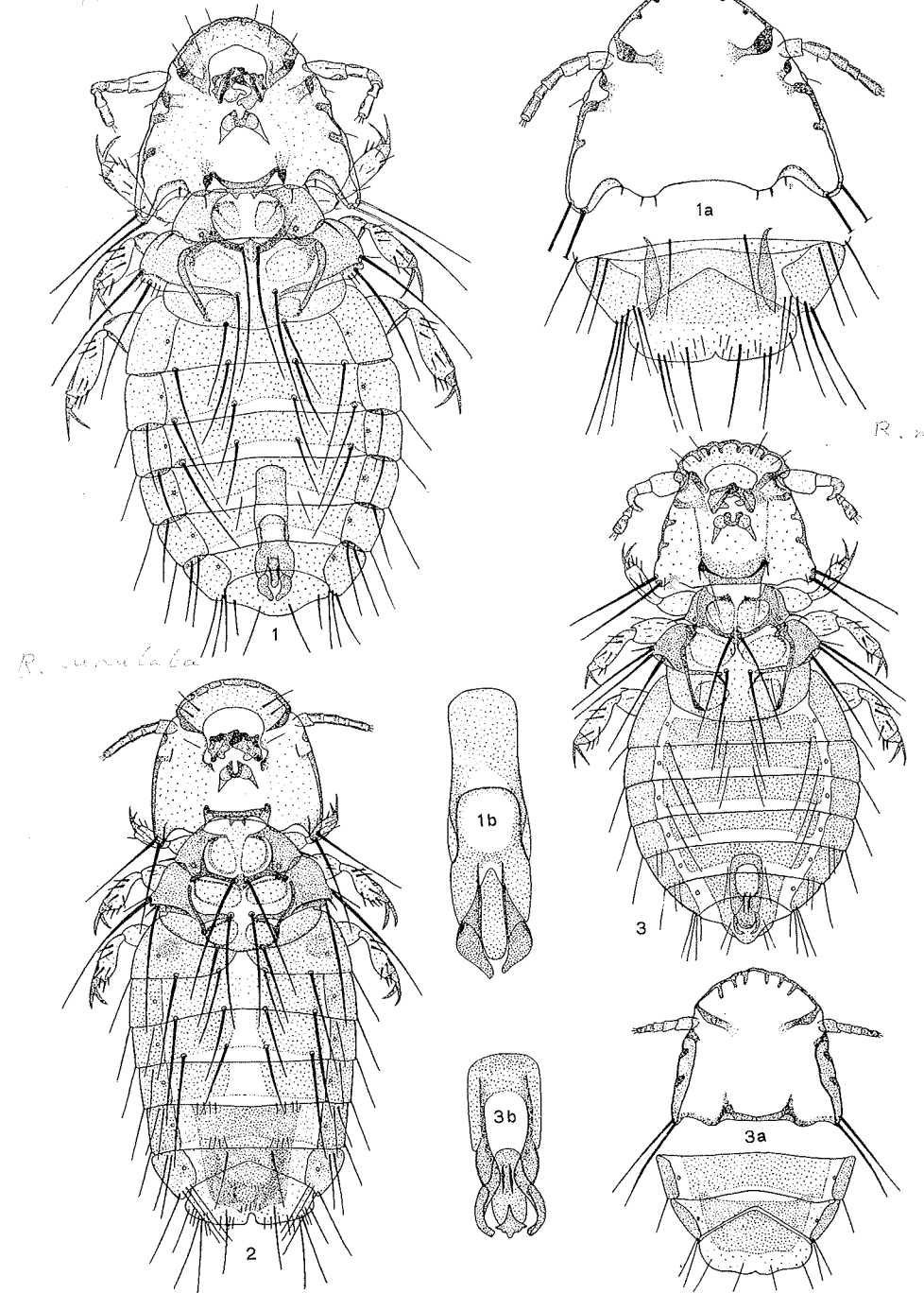
TEXT-PLATE XVIII

M. ...



(204)

Rhynchosoma ornata TEXT-PLATE XIX

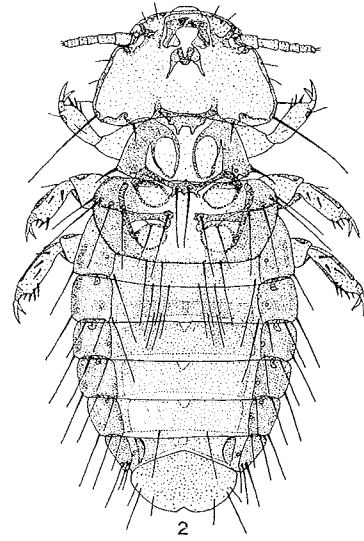
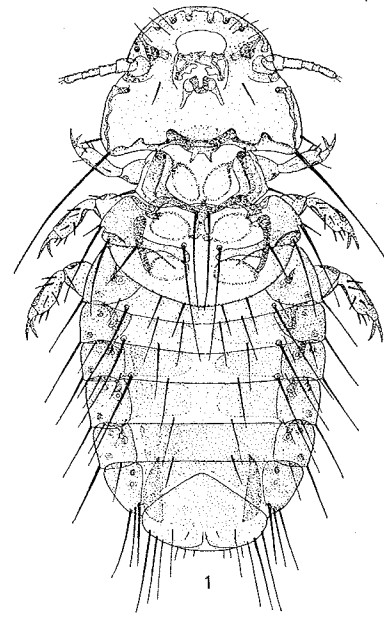


(205)

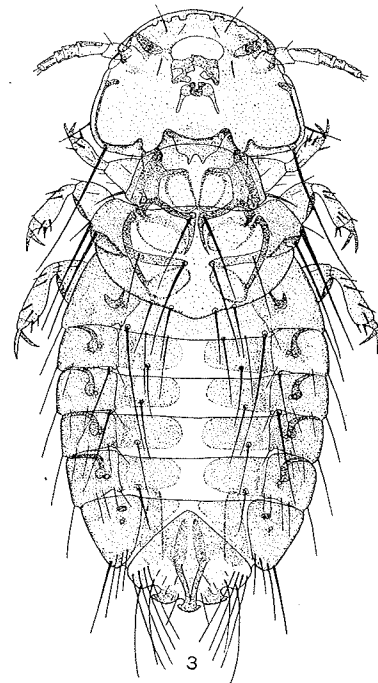
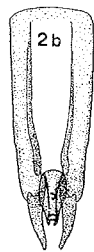
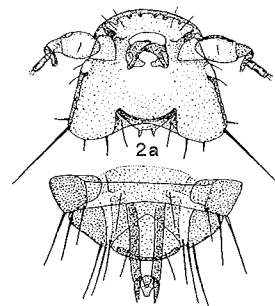
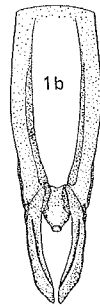
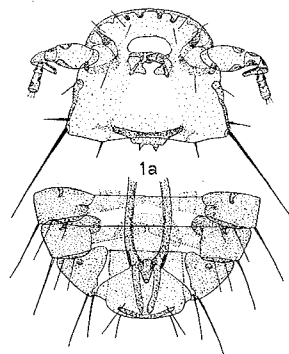
Hephaeltrigaster curvata

TEXT-PLATE XX

H. quadrata

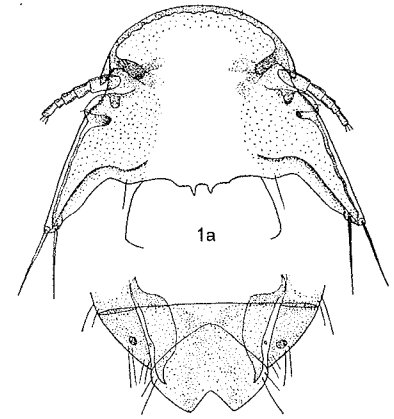
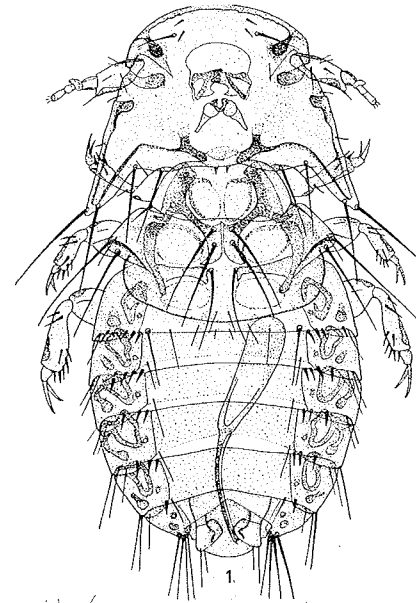


H. quadrata

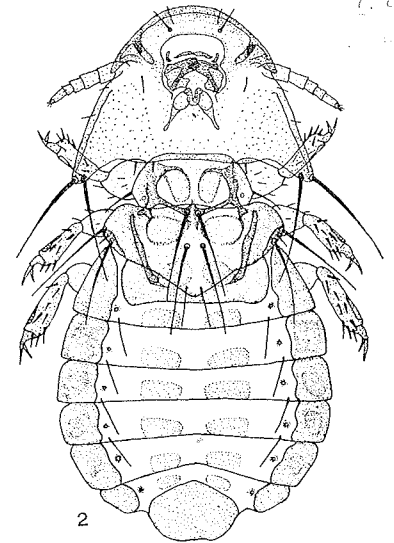
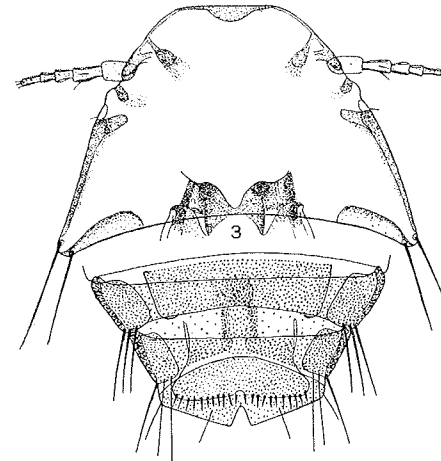


TEXT-PLATE XXI

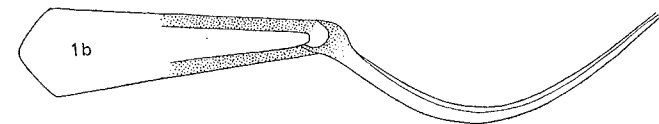
Tetranychus spinosus



Heterogonodes obscurus

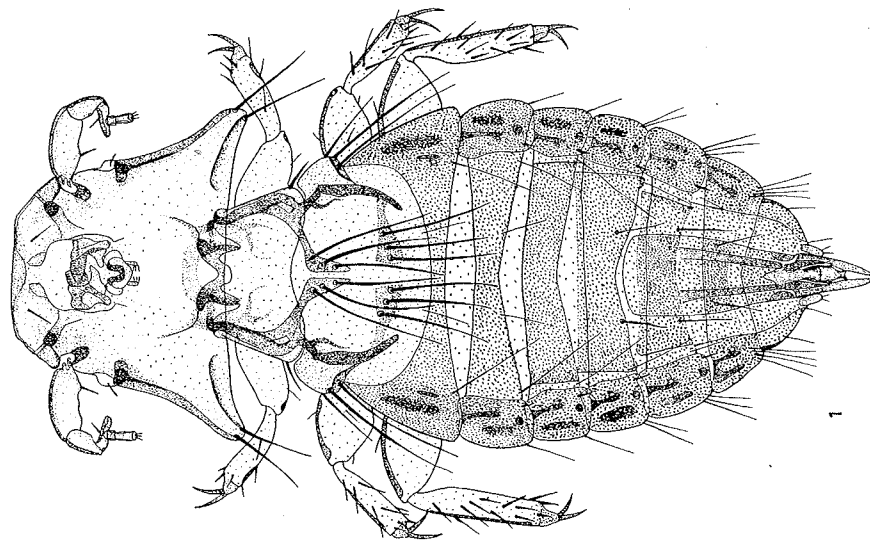
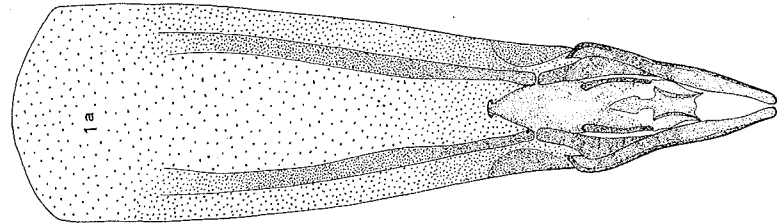
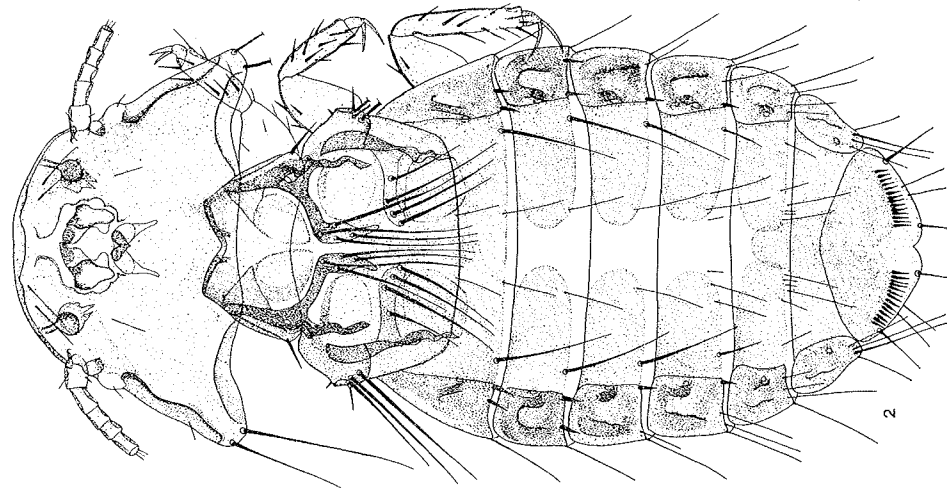


T. curvatus



TEXT-PLATE XXII

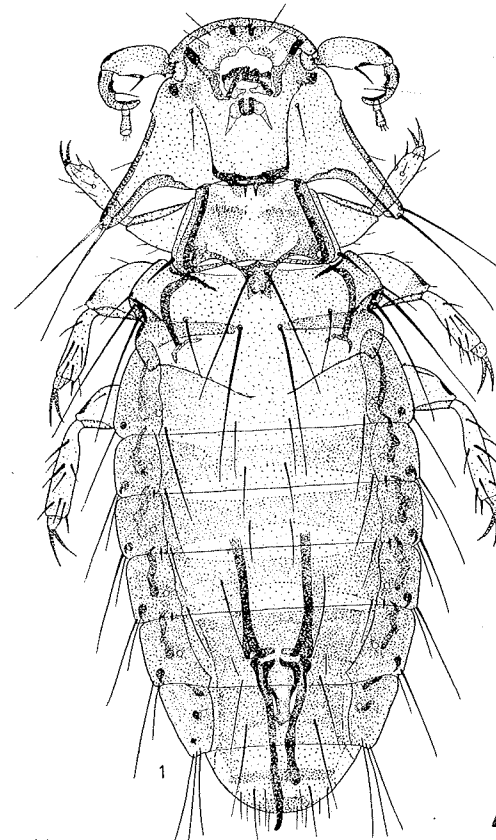
H. acicularis



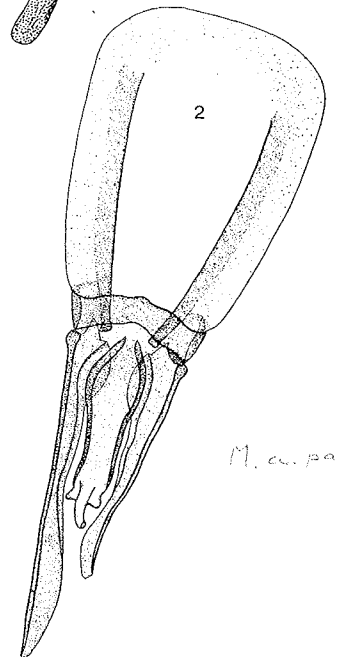
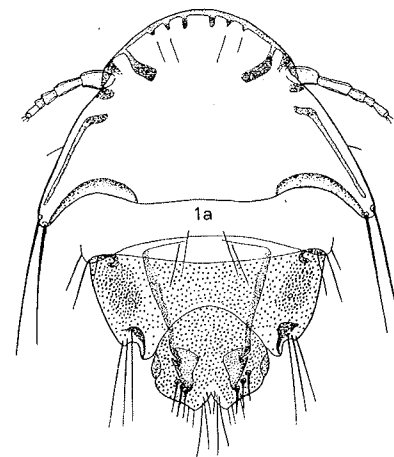
(208)

Heterosomus acicularis

TEXT-PLATE XXIII



Megapeosus a. asymmetricus
P. n. s.

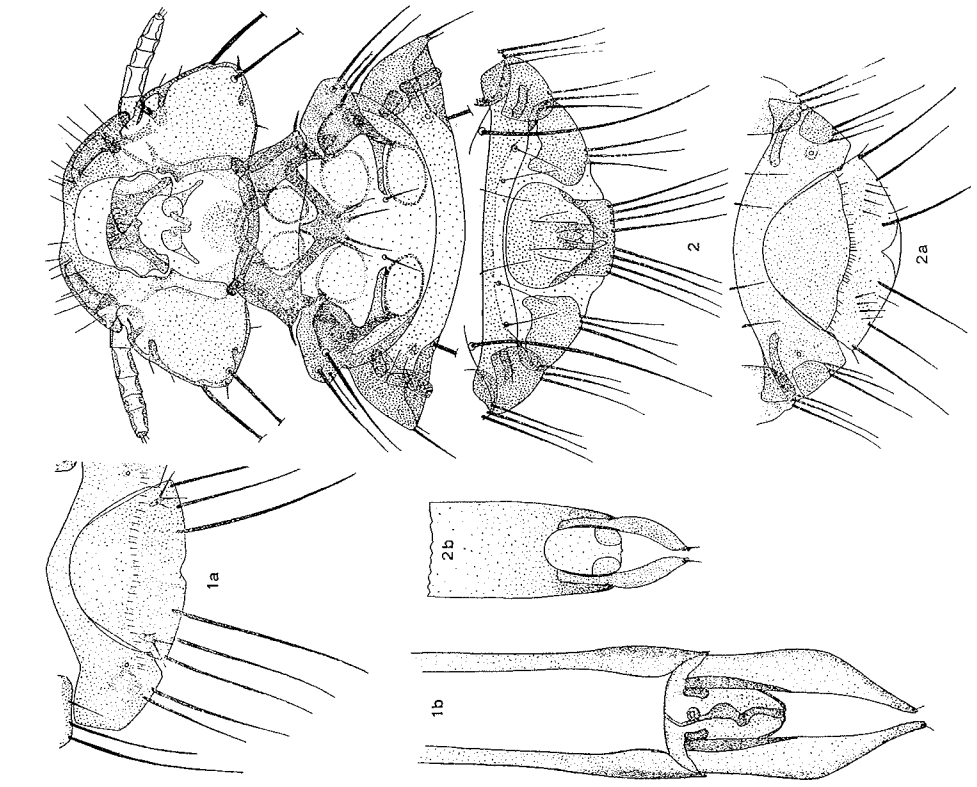


M. cu. parvigenitilis

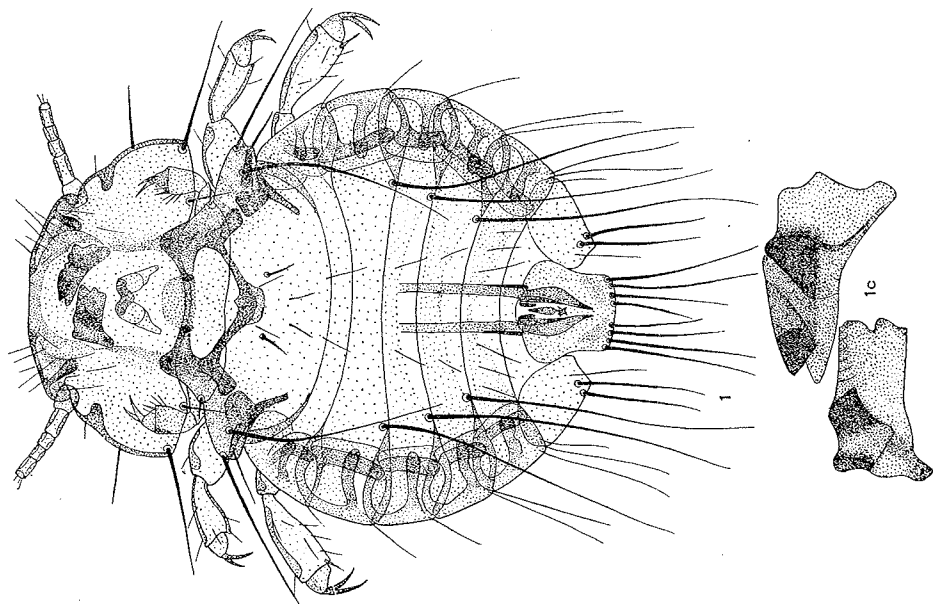
(209)

TEXT-PLATE XXIV

D. microscopica

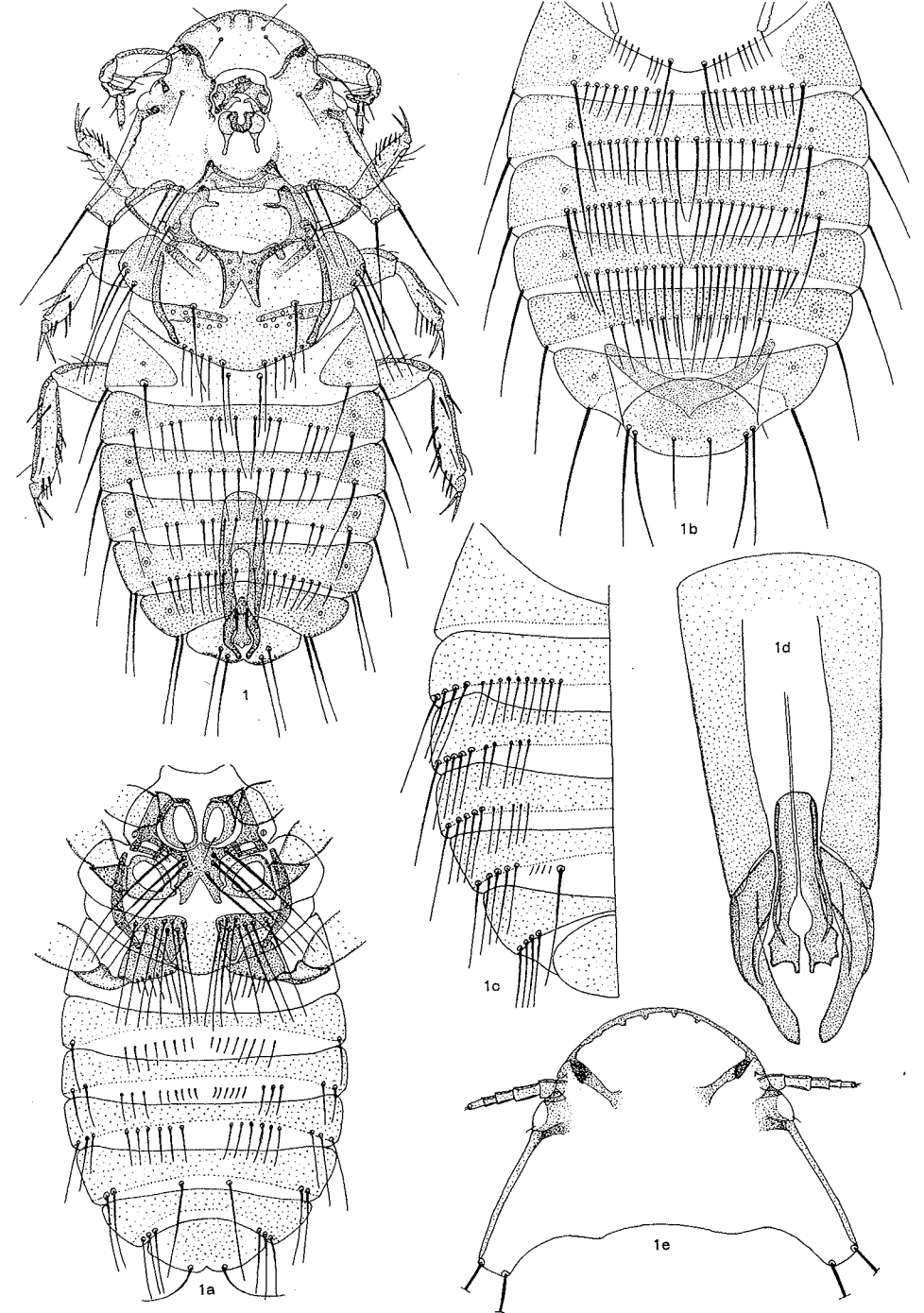


D. cephalovici



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TEXT-PLATE XXV

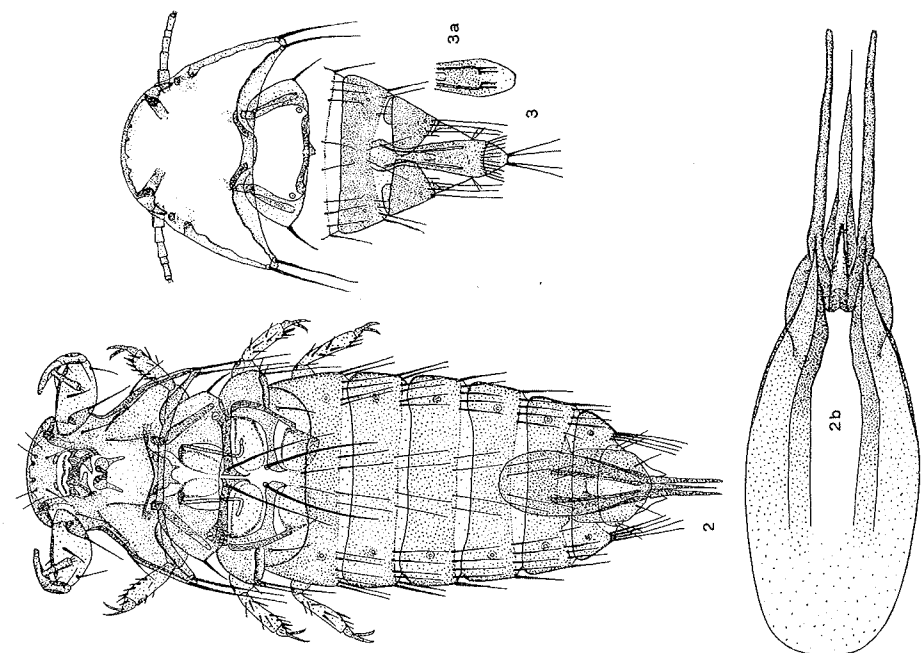


(211)

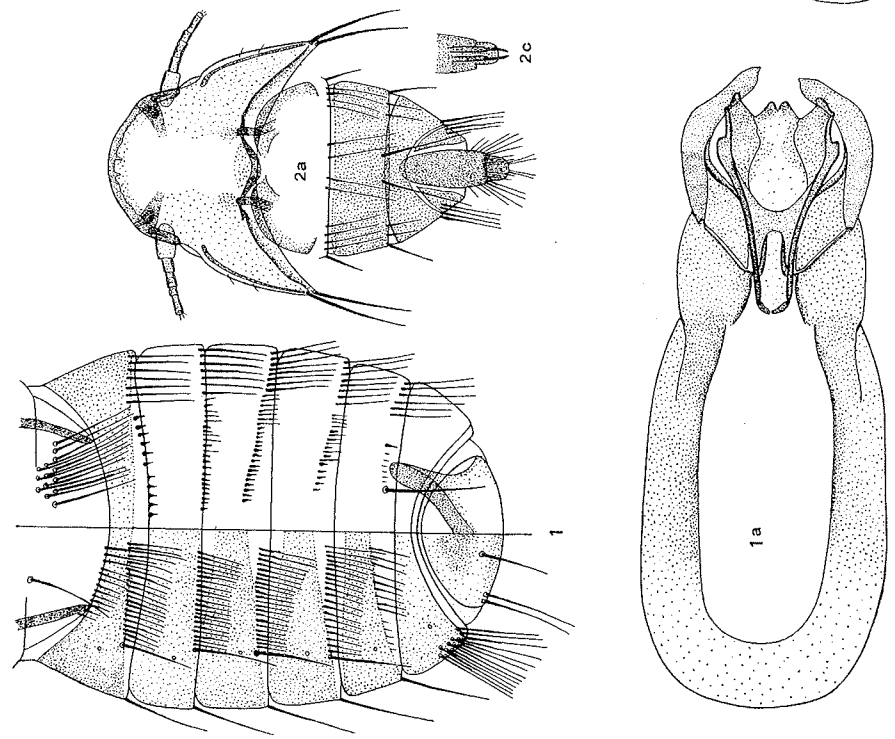
Lamprocorpus kerinbus

TEXT-PLATE XXVI

Platyscolus abnormis



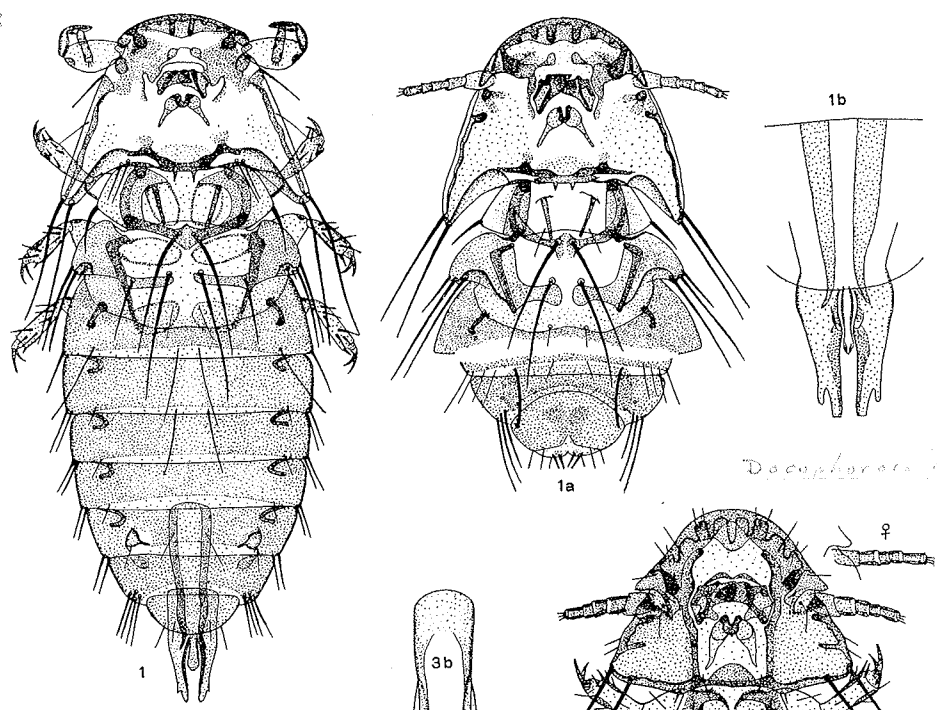
Lomaxosoma spinosum



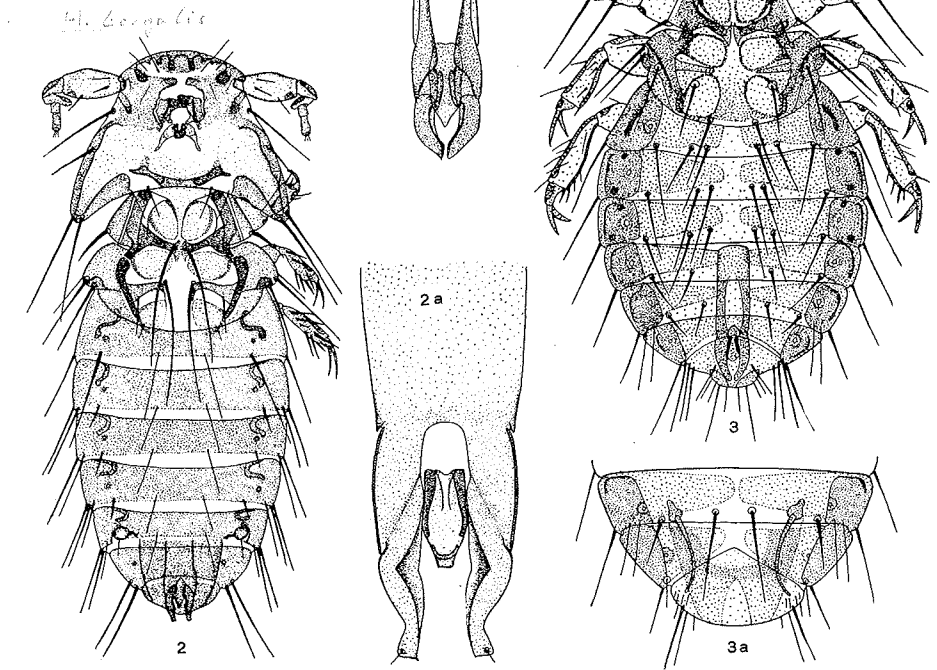
(212)

Hyalopterus nobbocerca TEXT-PLATE XXVII

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Dacophorax sensu lato

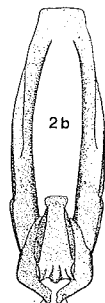
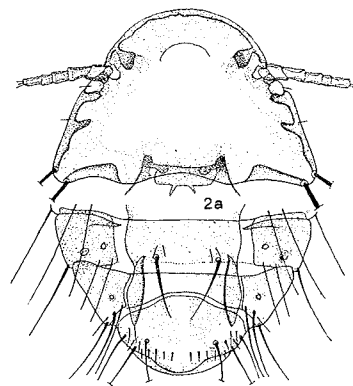
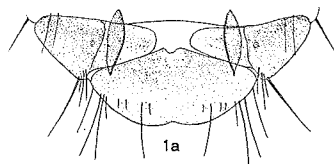
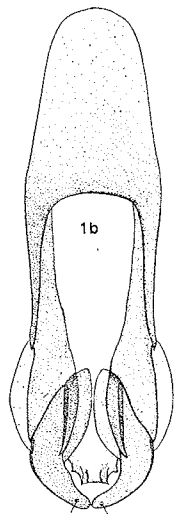
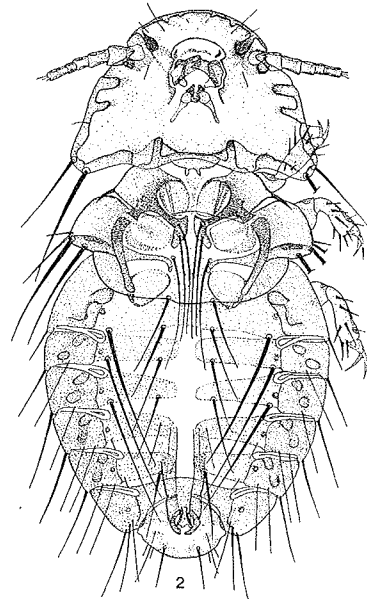
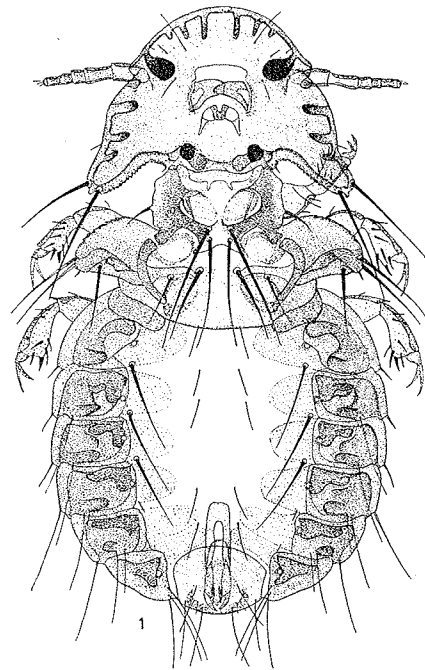


(213)

Tinamicola rotundata

TEXT-PLATE XXVIII

T. labillardieri

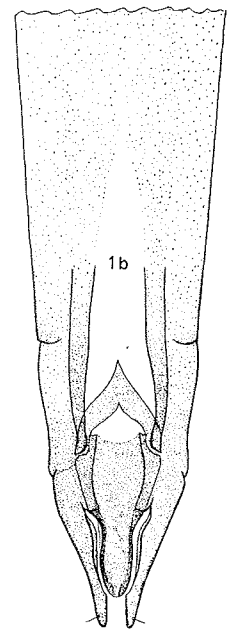
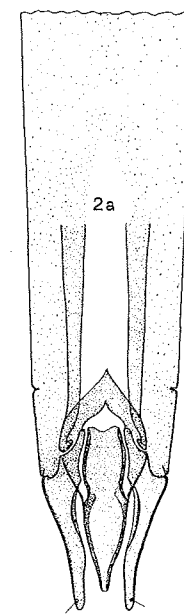
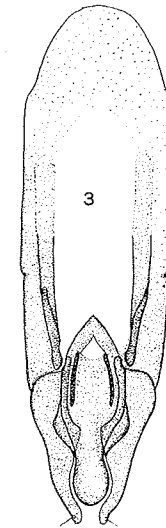
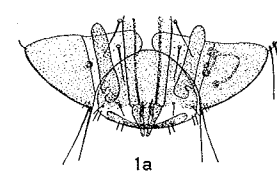
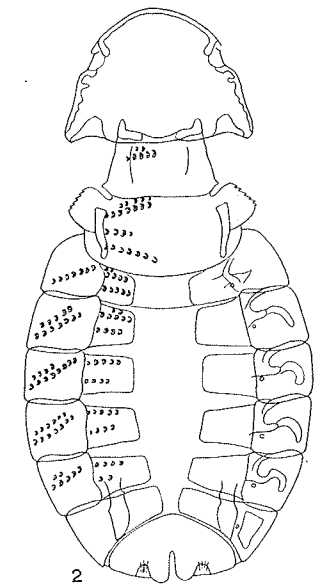
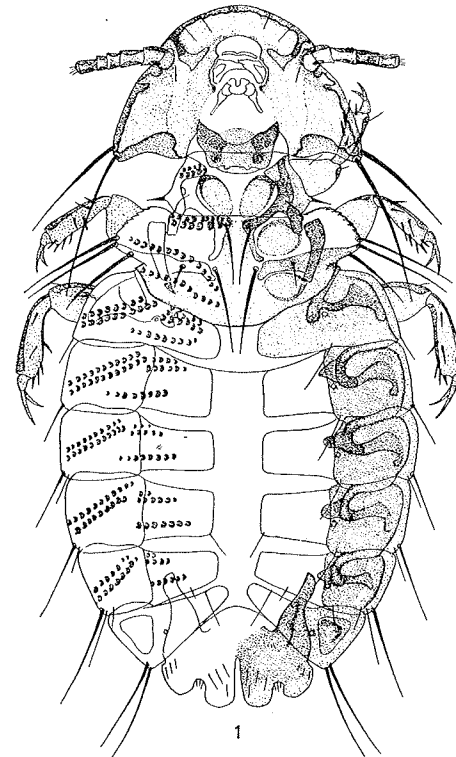


(214)

TEXT-PLATE XXIX

Pectiniparus v. verrucosa

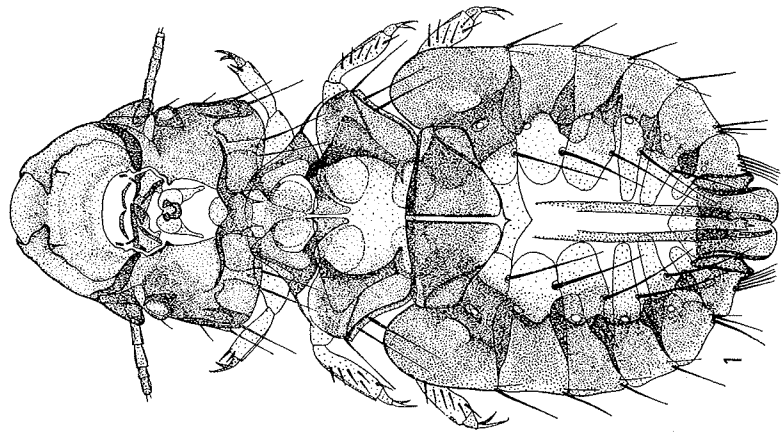
P. v. parva



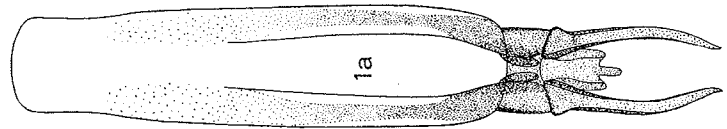
P. v. angusta

(215)

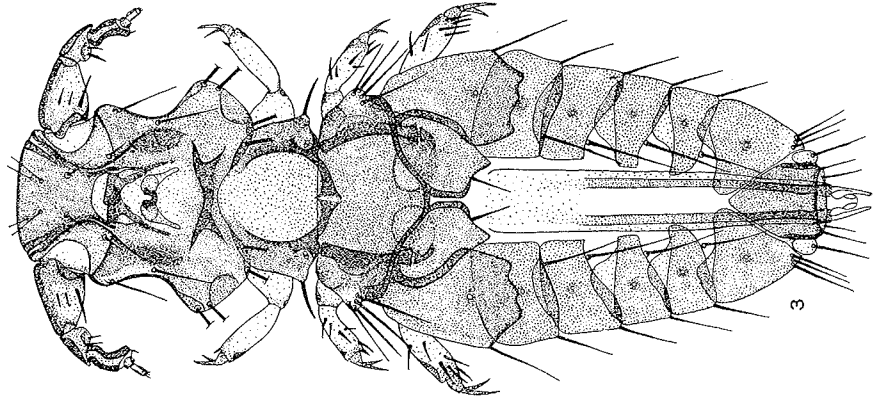
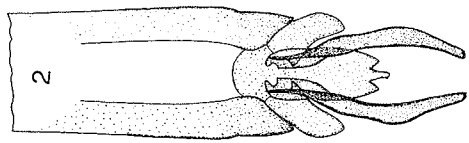
Omnivalea n. casti



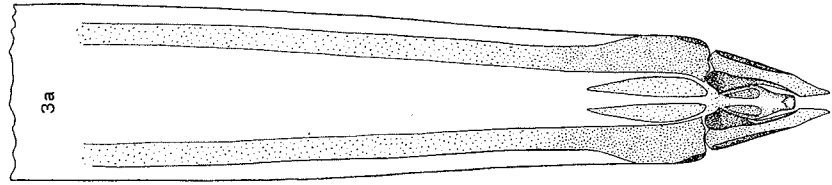
(216)



Omnivalea n. casti



3

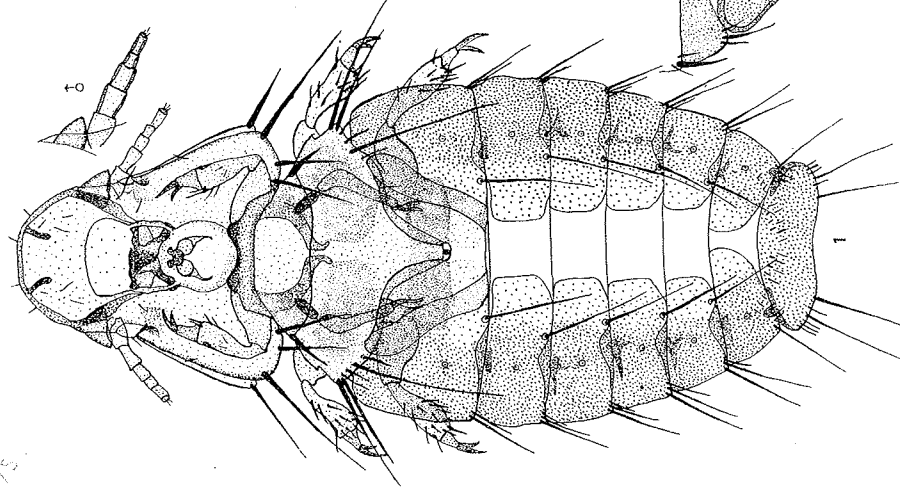


3a

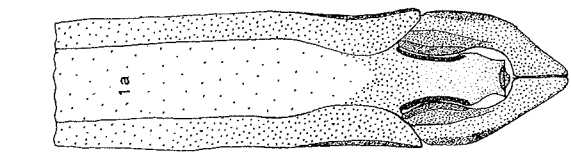
TEXT-PLATE XXX

Hyalosiphia maculata

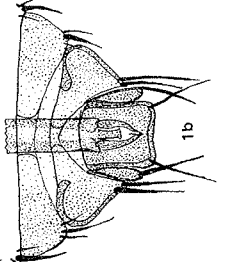
Anechobolus volucrium
P. 175



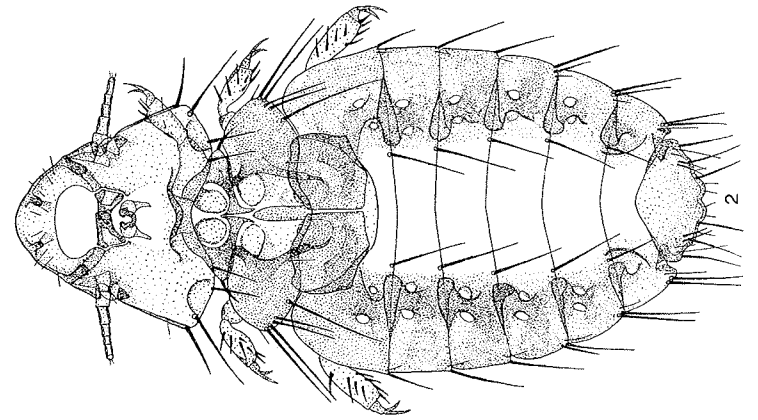
1



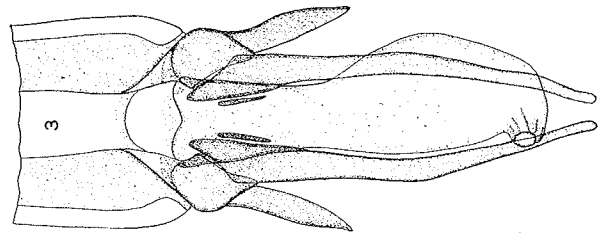
1a



1b



2

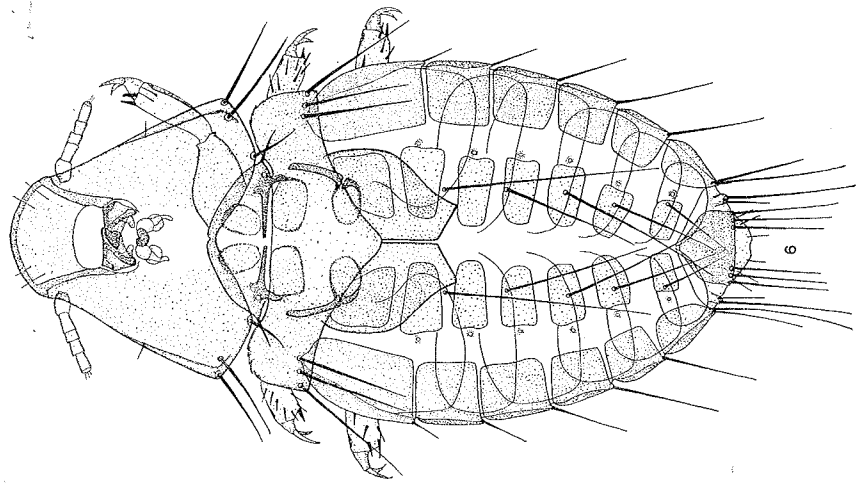


3

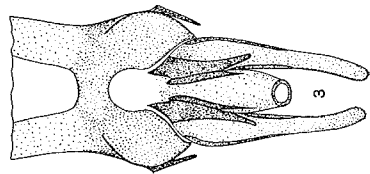
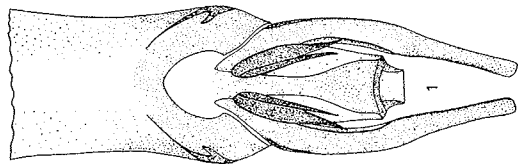
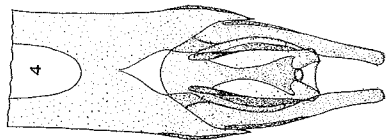
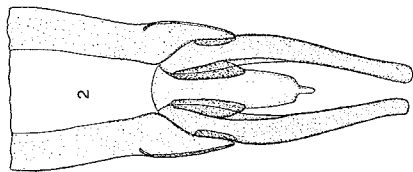
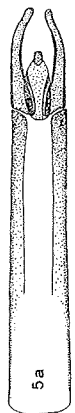
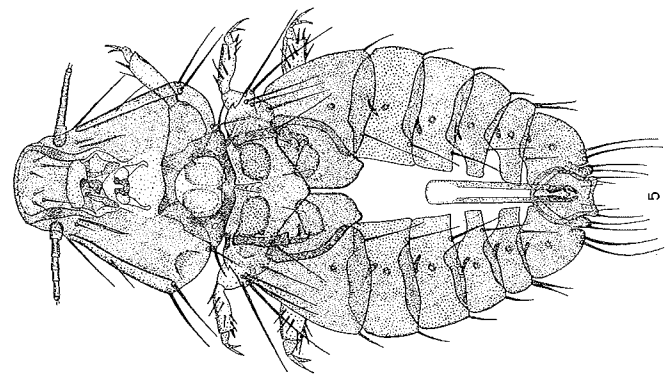
TEXT-PLATE XXXI

TEXT-PLATE XXXII

Helicolenus



Helicolenus brevipes



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	<u>In desc.</u>	
	<u>Page</u>	
<i>Austrokelloggia</i>	175.	
<i>Chaetoboccephalus</i>	101	
<i>Chaetobogaster</i>	67.	
<i>Discorpus</i>	147	
<i>Docophorocotes</i>	165.	
<i>Heptagonioides</i>	166.	
<i>Heptapsogaster</i>	115.	
<i>Heptapous</i>	153.	<i>Stromylocetes</i> 84.
<i>Heptarthrogaster</i>	134	
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