is not worthy of separation from the more widely based subfamily *Macrolininæ*.

Austropassalus Mjöberg, 1917.

1917. *Austropassalus* Mjöberg, Arkiv f. Zool. xi. No. 3, p. 11 (monotype: *A. hultgreni* Mjöberg, 1917).
1935. *Notocetius* Hincks & Dibb, Ent. mon. Mag. lxxi. p. 272 (monotype: *N. cornutus* Hincks & Dibb, 1935) (syn. nov.).

A. hultgreni Mjöberg, 1917.

1917. *Austropassalus hultgreni* Mjöberg, Arkiv f. Zool. xi. No. 3, p. 11, figs. 5–7 (North Queensland: Atherton).
1935. *Notocetius cornutus* Hincks & Dibb, Ent. mon. Mag. lxxi p. 273, figs. 1 & 2 (North Queensland: Malanda) (syn. nov.).

These two descriptions are obviously and at once referable to the same distinctive species, a remarkable one in several respects, but less isolated than Mjöberg's paper would lead us to expect. Its relationships have been discussed in the paper of Hincks and Dibb referred to above.

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EXPLANATION OF PLATE I.

Fig. 1.—*Passalus* (*Phoroneus*) *nigidioides*, sp. n. Type, Guatemala: La Conquista. Dorsal view × 2½.
Fig. 2.—Ditto. Lateral view, × 2½. Photo. Allen & Bott, Solihull.

V.—*Notes on some species of Mallophaga from* Crypturellus parvirostris (*Wagler*), *and* Crypturellus t. tataupa (*Temminck*). By L. R. Guimarães and G. H. E. Hopkins.

Paine and Mann (1913) recorded *Goniocotes verrucosus* Taschenberg, *Goniodes complanatus* Piaget, and *Goniodes coniceps* Taschenberg from *Crypturus* (now *Crypturellus*) *tataupa*, stated to have been obtained by Dr. E. Snethlage (of Museu Goeldi) at Marajó, in November 1911. They also described *Goniodes pennaticeps* from a single male supposedly obtained from *Anthus lutescens* Pucheran, at Marajó, during the same month, but as this species is a *Rhopaloceras* it is unquestionably a tinamou louse and almost certainly of the same provenance as the other tinamou lice dealt with in Paine and Mann's paper. Part of Paine and Mann's material was available to Carriker (1936) who included (p. 181) their series of "*coniceps*" under *Hypocryptus* (now *Hypocrypturellus*) *genitalis*, described (p. 80) a teneral male and four "females" (actually nymphs) from Marajó as *Nirmocotes orbicularis*, and included two fully adult pairs from Paine and Mann's material under his redescription (p. 85) of *Strongylocotes complanatus*. He did not see specimens of *Goniocotes verrucosus* (now *Pectenosoma verrucosa*), of which Paine and Mann only had a pair, nor the single type of *Goniodes* (now *Rhopaloceras*) *pennaticeps*.

In the same paper, Carriker (p. 82) described as *Nirmocotes glabrous* a "female" (actually a nymph), found on *Crypturellus tataupa*, from Viçosa, Brazil, redescribed (p. 114) as *Rhopaloceras pennaticeps* two males and a female found on *Crypturellus tataupa*, from Sta. Ana, Bolivia, and described *Pectenosoma verrucosa parva* (p. 165), from material collected on this same host.

Kéler, in 1938 (p. 320, fig. 9) described a species of *Strongylocotes*, which he named *paucisetosus*, from material collected on "*Crypturus tataupa*", from the State of Sta. Catarina, Brazil.

In 1940, Carriker (p. 299) sank *Nirmocotes* to *Strongylocotes*, a procedure undoubtedly correct, since *Nirmocotes* proved to be based on teneral and nymphal stages, and sank also *Nirmocotes orbicularis* Carriker and *Nirmocotes glabrous*

Carriker as synonyms of *Strongylocotes complanatus* (Piaget).

Clay, in 1943 (p. 384) sank the "female" of *Strongylocotes orbicularis* (Carriker) and *Strongylocotes paucisetosus* Kéler to *Strongylocotes glabrous* (Carriker), and considered the male of *Strongylocotes orbicularis* to be an almost mature male of the same type as *Strongylocotes lipogonus*.

Summarizing the above, the following species should have *Crypturellus t. tataupa* as a normal host: *Pectenosoma verrucosa parva*, *Hypocrypturellus genitalis*, *Rhopaloceras pennaticeps*, *Strongylocotes orbicularis* and *Strongylocotes glabrous* (syn. *paucisetosus*). According to Carriker the last two names are synonyms of *Strongylocotes complanatus*.

However, Guimarães and Lane (1937, p. 13, figs. 4, 4*a*, 4*b*) published drawings and measurements of both sexes of a *Rhopaloceras*, from *Crypturellus parvirostris* (Wagler), which they claimed to agree with Paine and Mann's description and figure and whose measurements are much closer to those given by Paine and Mann than those of the form, from *Crypturellus tataupa*, which Carriker, described as *Rhopaloceras pennaticeps*; the male genitalia of their specimens also differed considerably from Carriker's drawing. These differences suggested the possibility of a mistake in the identity of the tinamou from which Paine and Mann's material was collected.

Trying to solve the problem, we find, not only that *Crypturellus tataupa* is unrecorded from Marajó island (in the estuary of the Amazon), but that in Dr. Snethlage's catalogue of Amazon birds (Bull. Mus. Goeldi, 8, 1914), she does not mention *Crypturellus tataupa* from Marajó. On the other hand, she does record (p. 49) examples of *Crypturellus parvirostris* collected at Fazenda Teso S. José, in that island, a locality also visited (p. 12) by O. Bertran, preparator of the Museu Goeldi, in November 1911, the date mentioned by Paine and Mann. It therefore seems clear that the host of Paine and Mann's material was originally misdetermined and that *Crypturellus parvirostris* (not *C. tataupa*) is the type host of *Strongylocotes orbicularis* (Carriker), and the probable true host of *Rhopaloceras pennaticeps* (Paine and Mann).

Once the true identity of the host of Paine and Mann's material is settled, and having in hand specimens of the species dealt with by earlier authors, we have the necessary means to clear up several involved questions.

Strongylocotes orbicularis and *Strongylocotes glabrous*.

We cannot agree with Carriker's assertion that *Strongylocotes glabrous* and *Strongylocotes orbicularis* are synonyms of *Strongylocotes complanatus*.

Piaget's type material of *S. complanatus* was from a *Tinamus obsoletus*, in the Rotterdam zoo. It has been assumed that the bird must have been of the nominotypical form, *Crypturellus o. obsoletus* (Temminck), and this assumption gains very strong support from the fact that a pair of a series of 5 males and 5 females from this host-form (collected at Nova Teutonia, State of Sta. Catarina, Brazil) have been compared with Piaget's type by Miss Clay and found to agree in all respects. The form has been redescribed and figured by Kéler (1938, p. 315, fig. 8), whose material was from the same source as that compared with Piaget's type, which agrees perfectly with Kéler's description and figure. As noted above, Kéler described (p. 320), from material collected on *Crypturellus tataupa*, his species *Strongylocotes paucisetosus*, which is, without doubt, the adult form of *Strongylocotes glabrous*, originally based on a nymph collected on the same species of tinamou. Comparing examples of *Strongylocotes* from *Crypturellus o. obsoletus* with those from *Crypturellus t. tataupa* and *Crypturellus parvirostris*, we find that they are different, the most obvious differences being that in both sexes the frons is more rounded in the material from *Crypturellus t. tataupa* and *Crypturellus parvirostris*, and that the setæ on the posterior edge of the genital plate of the females from both these hosts are few and very small, whereas in *Strongylocotes c. complanatus* (host: *C. o. obsoletus*) these setæ are very long and form a great mass on the outer half of the margin of the plate. Besides this, both sexes of *S. c. complanatus* are much larger than the *Strongylocotes* from *C. t. tataupa* and *C. parvirostris*, and the median structure of the male genitalia is of different form.

The *Strongylocotes* from *C. t. tataupa* (*glabrous*) and that from *C. parvirostris* (*orbicularis*) are very closely related to *complanatus*, and could legitimately be regarded as subspecies of the latter, though we think it preferable to keep them separate, on account of the differences mentioned above. Mr. Carriker authorizes one of us to state that he is in full agreement with the views expressed, except that he regards the differences between these *Strongylocotes* as being rather subspecific than specific.

We also cannot agree with Carriker in his treatment of *orbicularis* and *glabrous*, since we consider them not synonyms, but subspecifically different, though they are very much alike and not easily separated. The differences are very slight and only noticeable on close attention.

In structure, the two subspecies are differentiated only by the form of the lobes of the 8th abdominal segment of the male (7th according to Carriker). In *orbicularis* (fig. 3) the lateral margins of these lobes meet at a more acute angle than in *glabrous* (fig. 1) and therefore, their external margins are relatively narrower. This differential character, although slight, is constant in the male specimens we examined. One abnormal male of *glabrous* (fig. 2) shows the right lobe narrower than the left one, but both lobes different in form from those of *orbicularis*. The text figures show these differences better than descriptions.

The biometric data of the specimens examined corroborated the differences discussed above.

The differences in length between the males of the two subspecies are statistically significant*, the male examples of *glabrous* being larger than *orbicularis*. The length, in millimetres, of the measured males of *glabrous* varied from 2·600 to 2·850 with a mean of 2·734±·1048, while those of *orbicularis* varied from 2·380 to 2·560, with a mean of 2·474± ·0605. The application of *t* test (Student) shows that the difference between these means is highly significant, since P is less than ·001.

As the males of *glabrous* seemed to show a stronger constriction at the level of the 6th segment (5th according to Carriker) we took the necessary measurements for comparing them with those of *orbicularis*. The width of the 5th and 6th segments was measured and the proportion borne by the width of the 6th segment to that of the 5th was computed. We found that in *glabrous* the width of the 6th segment varies between ·794 and ·808 of that of the 5th segment, with a mean of ·802± ·004858; and in *orbicularis* between ·833 and ·865, with a mean of ·847± ·009338. The difference between these means is, according to *t* test, highly significant, confirming our first impression.

* The material was measured in creosote, between slide and cover glass, after treatment with ten per cent. caustic potash. The measurements were made with a Zeiss microscope, with ocular 7× and objective 3×.

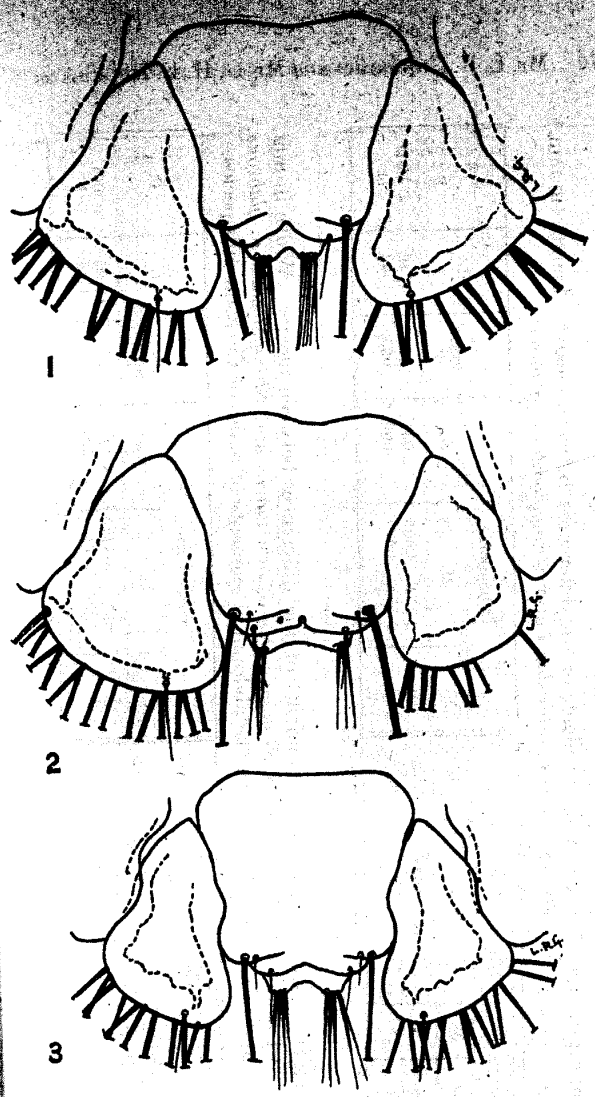


Fig. 1.
Posterior abdominal segments of male *Strongylocotes a. glabrous* (dorsal).

Fig. 2.
Posterior abdominal segments of anomalous male of *Str. o. glabrous* (dorsal).

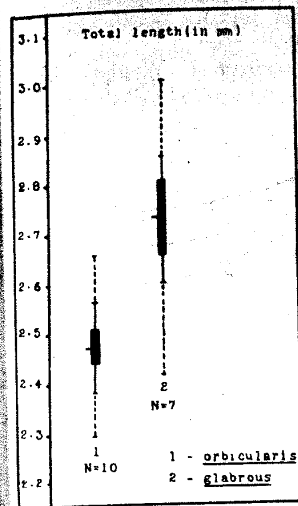
Fig. 3.
Posterior abdominal segments of male *Strongylocotes o. orbicularis* (dorsal).

TABLE I.—Test of significance (Student) of the differences between means. Length (in mm.) of *Strongylocotes o. orbicularis* and *Strongylocotes o. glabrous.*

Sex	Glabrous			Orbicularis			d.	t.	P.
	N.	M.	S_2.	N.	M.	S_2.			
♂♂	7	2·734 ± ·1048	·066	10	2·474 ± ·0605	·033	·260	6·46	< ·001
♀♀	4	2·610 ± ·0875	·023	15	2·575 ± ·0687	·066	·035	·86	·4

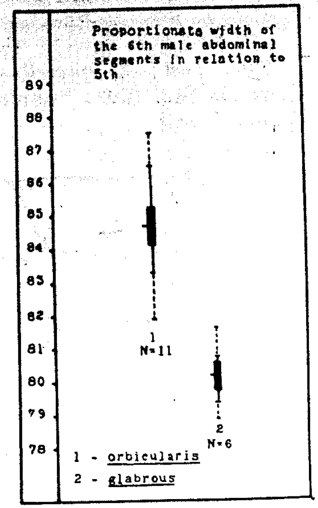
TABLE II.—Test of significance (Student) of the differences between means. Width in mm. of abdomen of females of *Strongylocotes o. orbicularis* and *Strongylocotes o. glabrous,* and ratio of width of 6th to 5th abdominal segments of males of the same subspecies.

Sex	Glabrous			Orbicularis			d.	t.	P.
	N.	M.	S_2.	N.	M.	S_2.			
♂♂	6	·802 ± ·004858	1·18	11	·847 ± ·008720	8·72	4·5	10·85	< ·001
♀♀	4	1·170 ± ·0605	·011	15	1·132 ± ·0414	·024	·038	1·49	> ·1



GRAPH 1.

Graphic estimation of the significance of the differences between mean lengths of males of *S. o. orbicularis* and *S. o. glabrous.*



GRAPH 2.

Graphic estimation of the significance of the differences between means of proportionate width of the 6th abdominal segments of males in relation to the 5th in *S. o. orbicularis* and *S. o. glabrous.*

The vertical lines are observed ranges ; the theoretical ranges ($M \pm 3\sigma$) are represented by broken vertical lines ; the small rectangles represent the range of the mean ($M \pm 2\sigma_M$), with crossline at M. If these rectangles do not overlap it can be assumed that the means differ significantly.

Between the females of the two subspecies, however, we do not find any difference, morphological or in measurement. As the differences between their lengths and those between the widths of their abdomens are not significant, they cannot be used to differentiate them. Although we are unable to distinguish the females, we still consider *orbicularis* and *glabrous* as different subspecies, based on the differences between the males. The results discussed are summarized in Tables I. and II. Graphs 1 and 2 include only data referring to males.

Pectenosoma verrucosa subparva, subsp. n.

Goniocotes verrucosus Paine and Mann, 1913, nec Taschenberg, 1882. Psyche, Camb., Mass., xx. no. 1, p. 15, fig. 1.

Type host:—*Crypturellus parvirostris* (Wagler), from Fazenda Sta. Lina, Presidente Wenceslau, State of São Paulo, Brazil.

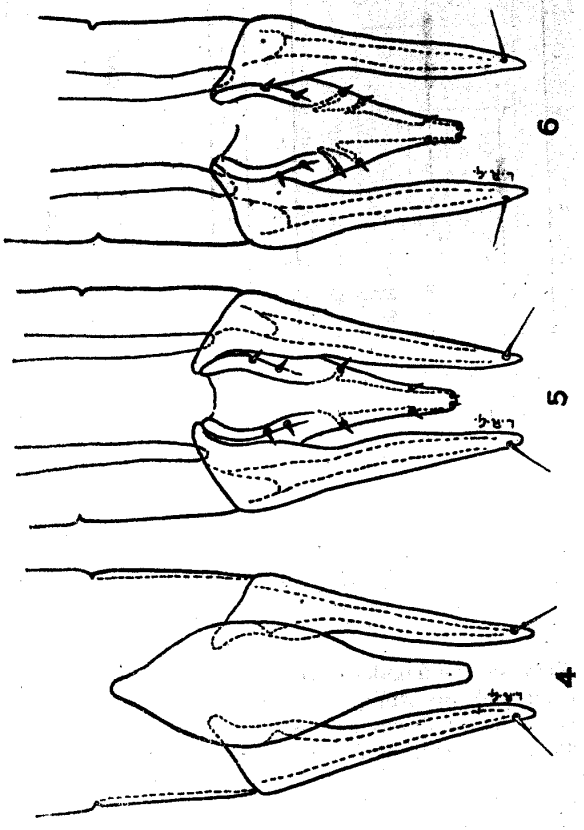


Fig. 4.
Genitalia of male of *Pectenosoma v. subparva* (dorsal).
Fig. 5.
Genitalia of male of *Pectenosoma v. subparva*, subsp. n. (ventral).
Fig. 6.
Genitalia of male of *Pectenosoma v. parva* (ventral).

Specimens examined:—3 males and 3 females from Mogy das Cruzes, state of S. Paulo, Brazil; 29 males and 19 females from Faz. Recreio, Coxim, State of Mato Grosso, Brazil; 3 males, from Cantareira, State of S. Paulo, Brazil; 2 males and 1 female, from Faz. M. Peixoto, Jaragua, State of Goiaz, Brazil; 1 male and 7 females, from Faz. Palmira, Assis, State of S. Paulo; and 10 males and 26 females, from Presidente Wenceslau, State of S. Paulo.

This form (figs. 4, 5) is very near *Pectenosoma verrucosa parva* Carriker, 1936 (fig. 6), from which it differs only by the presence of two rows of papillæ on the pleurites of the 2nd abdominal segment of the male. The females are practically alike.

The mean length in mm. of 10 male specimens is 1·299± ·01449, and of 10 females, 1·490± ·01634.

Measurements of types.

	Male (holotype)		Female (allotype)	
	Length	Width	Length	Width
Total	1·290		1·490	
Head	·280	·430	·300	·460
Prothorax ..	·130	·260	·130	·260
Pterothorax	·150	·410	·170	·420
Abdomen...	·750	·620	·920	·690

Types:—Holotype male and allotype female no. 45.744 and several male and female paratypes in the collection of insects of the Department of Zoology of S. Paulo, Brazil. Male and female paratypes to be deposited in the British Museum (Natural History), and United States National Museum.

Discussion.—The number and distribution of papillæ in the abdominal tergites are among the most conspicuous characters used to separate the several subspecies of *Pectenosoma verrucosa*. Two of these forms, described by Carriker (1944, pp. 203–205), *tinami* and *boucardi*, are distinguished, according to this author, only by the presence of a row of two papillæ on the 6th tergite (5th according to Carriker) of the female in *boucardi*, whereas the female of the other subspecies, *tinami*, shows no papillæ on this tergite. The males are absolutely identical with regard to the distribution of papillæ, as well as in all other characters.

Comparing examples of *Pectenosoma* from *Crypturellus parvirostris* with those from *Crypturellus t. tataupa* (type-host of *Pectenosoma verrucosa parva* Car.) our attention was attracted by the fact that in specimens taken from *C. parvirostris* a second row of papillæ on the pleurites of the 2nd abdominal segment was generally present, in contrast with specimens of *Pectenosoma verrucosa parva*, in which these pleurites show, usually, only a single row. This difference is also corroborated by the drawings given by Paine and Mann (fig. 1, p. 15) which were based, as shown above, on material from *C. parvirostris*, and by Carriker (pl. xxix. fig. 2) based on material from *Crypturellus t. tataupa*.

Trying to check statistically the significance of the presence of this second row of papillæ on the pleurites of the 2nd abdominal segment in *Pectenosoma* from *C. parvirostris*, we conclude that it is highly significant. Of 114 examples (males and females) examined from *C. parvirostris* 105 or 92·10 per cent show two rows on the 2nd pleurite, and only 9 or 7·90 per cent a single row. Among the 15 examples from *C. t. tataupa*, 5 or 33·34 per cent show two rows, and 10 or 66·66 per cent only one. Applying the X^2 test we find that the probability of these differences being due to chance is under ·001 ($X^2=36$, 45 n=1). In order to find out if these differences were significant in both sexes, we used the same test, with Yates' correction, for each sex separately. Of 58 males from *C. parvirostris*, 56 or 96·55 per cent show two rows and only 2 examples, or 3·45 per cent, a single row. Among 8 males of *Pectenosoma v. parva* (from *C. t. tataupa*), only one or 12·5 per cent showed two rows and 7, or 87·5 per cent, one. The X^2 test, applied to these examples, gave a value of 35·34, corresponding to a probability of less than ·001 that this difference is due to random variation. For the females we found different results, since among 56 examples collected on *C. parvirostris*, 49 or 87·5 per cent present two rows and 7 or 12·5 per cent only one, while from a total of 7 females of *Pectenosoma v. parva*, 4 examples, or 57·14 per cent present two rows and 3 or 42·86 per cent, one row. The X^2 test, with Yates' correction, reveals that in the female the difference in the number of rows is not significant, since its value is 2·32. This corresponds to a probability above ·1 of these differences being attributable to chance.

The data discussed above are summarized in Tables III., IV. and V.

TABLE III.—Test of homogeneity (X^2) for number of rows of papillæ on the 2nd abdominal pleurite of both males and females of *Pectenosoma verrucosa parva* and *Pectenosoma verrucosa subparva*.

	Two rows	One row	Total
Subparva	105	9	114
Parva	5	10	15
	110	19	129

$X^2=36,45$ n=1 P<·001

TABLE IV.—Test of homogeneity (X^2) for number of rows of papillæ on the 2nd abdominal pleurite of males of *Pectenosoma verrucosa parva* and *Pectenosoma verrucosa subparva*.

	Two rows	One row	Total
Subparva	56	2	58
Parva	1	7	8
	57	9	66

$X^2=35,34$ n=1 P<·001

TABLE V.—Test of homogeneity (X^2) for number of rows of papillæ on the 2nd abdominal pleurite of females of *Pectenosoma verrucosa parva* and *Pectenosoma verrucosa subparva*.

	Two rows	One row	Total
Subparva	49	7	56
Parva	4	3	7
	53	10	63

$X^2=2,32$ n=1 P>·1

The number of papillæ in the second row on the second pleurite in *Pectenosoma* from *C. parvirostris* varies from one to five; three or four is, however, the normal number. In the specimens of *Pectenosoma v. parva* that show a 2nd row, this is formed by one to three papillæ. Some speci-

mens also show a different number of papillæ on each side, or show a 2nd row on only one side. For our calculation these last specimens, when taken from *C. parvirostris*, were considered as having only one row, and when taken from *C. t. tataupa* as having two rows, *i. e.* the bias was placed against our belief that the two forms are separable.

Unfortunately the small number of female specimens of *Pectenosoma verrucosa parva* available does not allow an appreciation of the variability of the number of papillæ that form the 2nd row.

We do not find in either sex any other character that can help us in the separation of these forms. Even the small differences that are noted in the male genitalia of the two forms, and that can be seen in figs. 4, 5 and 6, could be covered by individual variation.

The differences indicated are, indeed, very small, but because of their relative constancy we think it best to give subspecific status to the forms here studied. The impossibility of crossing between them, on account of the barrier set up by the specific difference between their hosts, means that they are not likely to be mere variations within one subspecies.

Hypocrypturellus genitalis mendax, subsp. n.

Goniodes coniceps Paine and Mann, 1913, *nec* Taschenberg, 1882. Psyche, Camb., Mass. xx. no. 1, p. 16.
Hypocryptus genitalis Carriker, 1936, Proc. Acad. nat. Sci. Philad. lxxxviii. p. 181 (partim).

Type host: *Crypturellus parvirostris* (Wagler), from Faz. Sta. Lina, Presidente Wenceslau, Brazil.

Specimens examined: 1 male from Santana, Rio Tapajoz, State of Pará, Brazil; 4 males, 5 females and 2 nymphs from Ilha Seca, State of S. Paulo, Brazil; 2 males, 1 female and 1 nymph from Salobra, State of Mato Grosso, Brazil; 4 males, 5 females and 3 nymphs from Fazenda Recreio, Coxim, State of Mato Grosso, Brazil, 15 males, 21 females and 14 nymphs from Assis, State of S. Paulo, Brazil and 20 males, 29 females and 10 nymphs from Presidente Wenceslau, State of S. Paulo, Brazil.

This subspecies differs from *genitalis genitalis* only by the shape of the male genital armature (figs. 7, 8). This organ is, as a whole, smaller than that of *g. genitalis* (figs. 9, 10); the endomeres are shorter and the median structure, which in *g. genitalis* is a large elongated sac with the tip

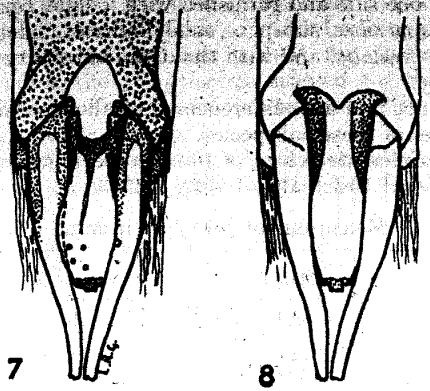


Fig. 7.
Genitalia of male of *Hypocrypturellus g. mendax*, subsp. n. (ventral).
Fig. 8.
Genitalia of male of *Hypodrypturellus g. mendax*, subsp. n. (dorsal).

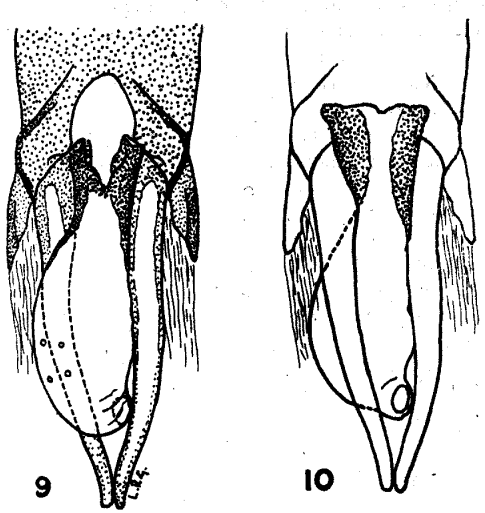


Fig. 9.
Genitalia of male of *Hypocryptureulls g. genitalis* (ventral).
Fig. 10.
Genitalia of male of *Hypocrypturellus g. genitalis* (dorsal).

turned to one side and furnished with a small opening, is, in *genitalis mendax*, subsp. n., subcylindrical, much shorter than in *g. genitalis*, and with the distal extremity directed posteriorly.

We do not find any differences that allow separation of the females of these subspecies.

The mean length in mm. of 10 male specimens is 1·517± ·01636, and of 10 females, 1·732±.02573.

Measurements of types in mm.

	Male (holotype)		Female (allotype)	
	Length	Width	Length	Width
Total	1·520		1·730	
Head	·400	·610	·450	·640
Prothorax ..	·110	·310	·120	·320
Pterothorax	·150	·580	·160	·630
Abdomen...	·870	·720	1·000	·820

Types: Holotype male and allotype female no. 45.745, and several male and female paratypes, in the insect collection of the Department of Zoology of São Paulo. Paratypes, male and female, to be deposited in the British Museum (Natural History), and in the United States National Museum.

Note.—According to Carriker, the parameres of *g. genitalis* "are very short, straight and pointed and diverging from the base of basal plate". We think that what Carriker considers parameres are only two strongly sclerotized formations (located on the distal extremity of the basal plate) to which the muscles that retract the copulatory apparatus are attached. These formations, although strong and sclerotized, are quite flexible, and are seen sometimes curved backwards, as shown clearly in several of our specimens. In the copulation apparatus of *Hypocrypturellus genitalis mendax*, subsp. n., an identical formation can be seen, although less conspicuous than in *g. genitalis*.

Rhopaloceras pennaticeps (Paine and Mann).

Goniodes pennaticeps Paine and Mann, 1914, Psyche, Camb., Mass. xx. no. 1, p. 16, fig. 3; Harrison, 1916, *Parasitology*, ix. no. 1, p. 78. *Rhopaloceras pennaticeps* (Paine and Mann), Carriker, 1936. Proc. Acad. nat. Sci. Philad. lxxxviii. p. 114, pl. xv. figs. 3, 3*a*, 3*b*, 3*c*; Guimarães and Lane, 1937, Rev. Mus. Paul. xxiii. p. 13, figs. 4, 4*a*, 4*b*; Kéler, 1939, Arb. morph. tax. Ent. Berlin-Dahlem, vi. no. 3, p. 225, figs. 2, 3; Carriker, Proc. U.S. nat. Mus. xcv. p. 135.

As stated above, the doubt about the true identity of the host of Paine and Mann's material was originated by the differences pointed out in 1937 by Guimarães and Lane between the *Rhopaloceras* studied by them, from *Crypturellus parvirostris*, and the one studied by Carriker, from *Crypturellus tataupa*.

However, the examination of specimens of *Rholapoceras* collected on these two birds shows that the differences

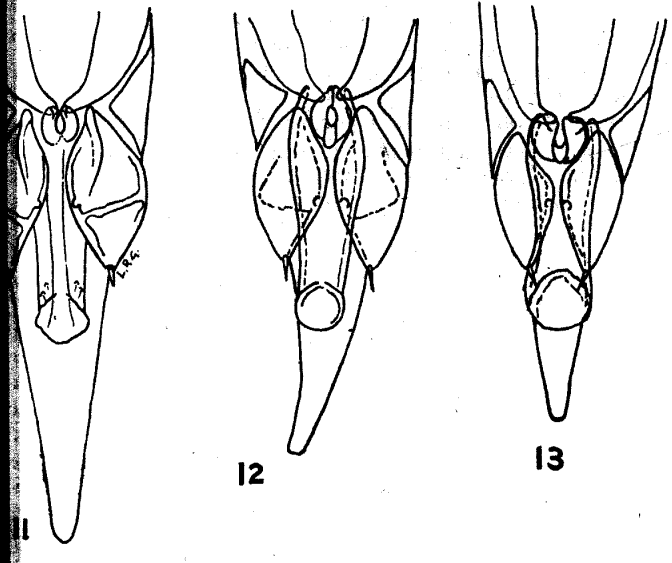


Fig. 11.
Genitalia of male of *Rhopaloceras pennaticeps* from *C. parvirostris*.
Fig. 12.
Genitalia of male of *Rhopaloceras pennaticeps* from *C. tataupa*, Villa Rica, Paraguay.
Fig. 13.
Genitalia of male of *Rhopaloceras pennaticeps* from *C. tataupa*, Sta. Catarina, Brazil.

pointed out are, actually, much less conspicuous than supposed by Guimarães and Lane, and that the specimens studied do not show a single character that allows their separation, even in a subspecific sense. By comparison of the total lengths of the few known males of *Rhopaloceras pennaticeps* it can be verified that specimens from *C. parvirostris* show a tendency to a greater length than those from *C. tataupa*, but oue of the latter, collected in Villa

Rica, Paraguay, has a length of 2·420 mm., which fits better into the series from *parvirostris* than into the one from *tataupa*. The specimens from *C. tataupa* measure 2·103 mm. (Bolivia—Carriker), 2·110 mm. (Sta. Catarina, Brazil—Kéler), 2·200 mm. (Sta. Catarina, Brazil) and 2·420 mm. (Villa Rica, Paraguay); those from *C. parvirostris* measure 2·340 mm. (Marajó, Brazil—Paine and Mann), 2·380 (S. Paulo, Brazil—Guimarães and Lane), and 2·420 mm., 2·450 mm., 2·460 mm., 2·460 mm., 2·470 mm., 2·600 mm. and 2·630 mm. (S. Paulo, Brazil).

The genitalia are essentially identical, with only a slight difference in one of the specimens examined: the male from Sta. Catarina (fig. 13) shows the central tubular structure that we take to be the penis wider apically, being at least as wide as the parameres. This peculiar form of the penis in the examples from *C. tataupa* is confirmed by Kéler's drawing and by the examination of another specimen from Bolivia, as Carriker has informed us in a letter. The Villa Rica specimen shows, however, the penis (fig. 12) with a form identical with the specimens from *parvirostris* (fig. 11). Although we think it extremely likely that the tinamou from Villa Rica was misdetermined, and that the forms of *Rhopaloceras* occurring on *C. tataupa* and *C. parvirostris* are separable, yet we have no alternative to treating them as a single taxonomic unit until the obtaining of further material confirms or disproves the differences we believe to exist. It is curious that the supposed differences which originally aroused our suspicions and initiated the investigations described in this paper have not been confirmed by study of the material.

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[TWELFTH SERIES.]

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VI.—*Contributions towards a knowledge of the* Isotomidæ (*Collembola*).—VII–XV. By Richard S. Bagnall, D.Sc.

Since the publication of Parts I–VI of this series I have received, through the great generosity of Dr. Ian Stach of Cracow, a copy of his book on the Isotomidæ, published by the Polish Academy of Sciences and Letters (1947, 1–488, plates 1–53). Whilst it deals primarily with the Polish species of the family, valuable tables, comments, and bibliographies of each section and genus are added, and the work must be regarded not only as of the greatest importance to students but also as a lasting monument to its learned author, to whom I now have particular pleasure in dedicating the genera *Ianstachia* and *Stachomia* and the species *Hydroisotoma stachi*.

It will be some time before I can make an exhaustive study of Stach's work, but there are certain innovations calling for comment. Like myself, Stach has created the subfamily Proisotominæ, but he has brought into that section the genus *Folsomia* from the Anurophorinæ and has removed *Isotomina* (=*Hemisotoma m.*) *thermophila* and its allies to the Isotominæ. This latter change is, I think, both warranted and helpful, but the question of *Folsomia* is a more difficult one, and if one removes the Proisotomin elements from the group (as I have done in Part XIII herein) it is difficult to justify the step. One has only to compare the heavy manubrial hooks of *Isotomodes* (a true Anurophorin) with those of the *Litsteria* section of