# STUDIES IN NEOTROPICAL MALLOPHAGA. XII. PART 6: LICE OF THE TINAMOUS 1

M. A. CARRIKER, Jr. Bucaramanga, Colombia

(With 17 text-figures)

Parts 1,2 and 5 of this series appeared in the present publication; n.ºs 3 and 4 in the Boletin de Entomologia Venezolana in 1955.

For further explanation regarding the material treated in this paper see the introduction to Part 5 (Rev. Brasil. Biol., 21 (2):205). In this paper are treated the genus Heptapsus, and a portion of Rhyncothura. All measurements are in millimeters and all figures were drawn by the author.

My sincere thanks are due to Dr. H. Lent for the publication of this paper in the Revista Brasileira de Biologia, and for his kindness in correcting the proof of same.

## Genus Heptapsus Carriker, 1936

Type species: Heptapsus nothocercae Carriker, Proc. Acad. Nat. Sci. Phila., 88:153. Host: Nothocercus b. bonapartei (G. R. Gray).

The genus presently contains four species: tergalis Carriker, 1936; cylindratus Clay, 1937; inexpectatus Carriker, 1944 and the genotype.

The material now in hand shows that the genus has a much wider distribution than was originally supposed, and is not confined to the avian genus Nothocercus, although most abundant on the species of that genus. Two distinct species have now been taken on the same individual of Nothocercus bonapartei, and I have new species from Nothocercus julius, N. bonapartei intercedens and N. b. frantzii.

Amongst the material collected by Plaumann at Nova Teutonia, Santa Catarina, Brazil, is a pair of this genus labelled as from Amazona aestiva, an obvious error. The male genitalia of this species is quite distinct from any of the other known species. Fortunately, in the material sent me by Mr. Emerson there is a single female which is identical with the Plauman female, and was

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collected on a skin of Crypturellus u. undulatus, taken in Bolivia, so that the Plaumann pair apparently came from this host, and may be described. I have noted while working with this genus that widely separated populations in Colombia tend to differ slightly in the male genitalia, a condition which must be kept in mind.

I have received a large series of H. inexpectatus from Mr. Emerson, taken from skins of Nothocercus n. nigrocapillus collected in Bolivia and deposited in west-german museums. This series is very uniform interse and differs very slightly from the types of the species. The differences are not sufficient for subspecific recognition. I also have  $5 \ \delta \ \delta \$  and  $2 \ Q \ Q \$  taken from the type host collected in the Dept. of Caldas, Colombia in 1951. There is a slight variation of the endomera in the two series.

#### Heptapsus tergalis cylindratus Clay, 1937

Proc. Zool. Soc. Lond, 1937:12, pl. 4, figs. 1-2 (Host: Crypturellus n. noctivagus).

The description and figures of this species leave much to be desired, and the comparison with *H. tergalis* is not entirely correct: (1) The frons is scarcely flatter in cylindratus. (2) Sides of head, posterior to antennal fossae in both nothocercae and tergalis are markedly convex, not concave as stated by CLAY. Head is considerably wider at temples in cylindratus, according to table of measurements. I cannot check on statement regarding 3rd segment of the antennae and the chaetotaxy.

Apparently the only characters of any importance which separate this race of tergalis from the nominate form are the width of the head and the type of the male genitalia.

# Heptapsus costaricensis sp. n.

(Figs. 1-3)

Types, & and & adults, removed from skin of Nothocercus bonapartei frantzii (Lawrence), by Mr. K. C. Emerson, in a west-german museum (types in Emerson coll.).

Diagnosis — Distinguished from all of the known species of the genus by the large size of the male (1.49), and by the female being smaller than the male (1.30). Head very wide at tips of temples in male, with sides very slightly convex; from narrow and flattened in male, wide and circular in female; considerable differences between the sexes in the incrassations of the from, an unusual character; sides of head in female strongly convex.

In both sexes the prothorax is short, with temples extending posterior to its lateral angles. Abdomen very similar to that of tergalis, in both sexes, the

male possessing well marked tergal incrassations, completely absent in the female (a generic character).

No apparent pleurites in this genus, except on segment VI in the female; tergites extend uniformly in color across abdomen; sternites, if present, lie directly under tergites and are invisible excepting a small portion of the posterior margin in some cases.

Male genitalia differ from *inexpectatus* chiefly in structure of the endomera, and by the presence on outer margin of parameres of a peculiar incrassation (see fig.). No trace of a suture between parameres and basal plate (same as *inexpectatus*), but endomera very small and simple.

The figure of the male genitalia of *inexpectatus* published in 1944, is not entirely correct, the endomera being much longer than shown, and with its anterior end circular. Species represented by  $\delta$  holotype, Q allotype and Q Q paratypes.

Measurements	of	the	types:
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	Length	Width	Length	Width	
Body Head frons temples occiput. Prothorax. Mesothorax. Metathorax. Abdomcn. Basal plate. Parameres. Endomera.			1.30 0.414 0.328 0.103 0.103 0.11 0.725	0.33 0.497 0.45 0.45 0.377 0.504	

#### Heptapsus julius sp. n.

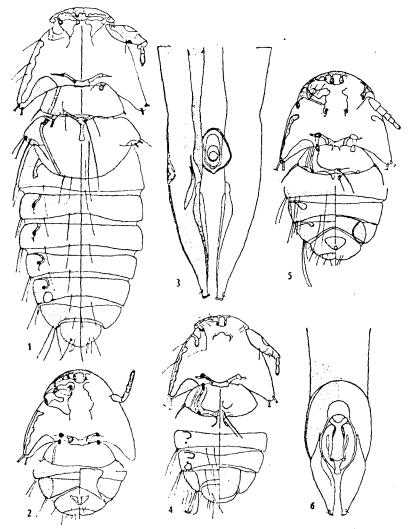
(Figs. 4-6)

Types, § and 9 adults, from Nothocercus julius (Bonaparte), collected by the author at Alto del Pozo, Santander N., Colombia, Sept. 17, 1946 (coll. author).

Diagnosis — Of medium size, female slightly larger in all measurements; from strongly convex in male and of normal width (0.26); much wider and circular in female, more so than in costaricensis; incrassations of anterior portion of head, as well as along sides of temples, differ considerably in the sexes. A distinguishing character is the presence of well-marked tergal incrassa-

tions in the female, almost as deeply pigmented as in male, a character rarely seen, the females being almost always without tergal incrassations.

Male genitalia very different from all of the known species of the genus, excepting those of undulatus, which they resemple superficially. Suture between parameres and basal plate sharply marked; parameres short and thickened medially, while basal plate is divided by a circular suture as in undulatus and inexpectatus; endomera oval, resembling that of several other species.



Heptapsus costaricensis sp. n., male - Fig. 1: Body; fig. 2: head and tip of abdomen; fig. 3: genitalia. Heptapsus julius sp. n. - Fig. 4: Male, head and tip of abdomen; fig. 5: female, head and tip of abdomen; fig. 6: male genitalia.

Species represented by & holotype, Q allotype, 15 & & and 11 Q Q paratypes, and a large series from the type host collected above Bucaramanga at hacienda Las Vegas.

Measurements	of	the	types:
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· · · · · · · · · · · · · · · · · · ·	Longth	Width	Length	Width	
Body	1,25	_	1.32		
frons		0.26		0.34	
Head temples	0.39	0.478	0.418	0.51	
occiput	0.30		0.315		
Prothorax	0.13	0.33	0.137	0.34	
Mesothorax	0.11	0.44	0.12	0.48	
Metathorax	0.10	0.36	0.10	0.37	
Abdomen	0.72	0.46	0.80	0.52	
Basal plate	0.15	0.07		_	
Paremeres	0.055	0.062		_	
Endomera	0.062	0.037	_ }		

#### Heptapsus immaculatus sp. n.

(Figs. 7-9)

Types, & and 2 adults, from Nothocercus bonapartei intercedens Salvadori, collected by the author above Frontino, Antioquia, Colombia, May 25, 1950 (in coll. author).

Diagnosis – Very small size, with female slightly larger in all measurements; this species and undulatus (described below) being the smallest known species of the genus. It is further distinguished from all others by the very small and indistinct tergal incrassations in the male, while there is no trace of them in the female; from in male flatly conical (not convex), in the female circular; sides of head in male much less convex than in female; abdominal tergites much narrower in median portion in both sexes, with wide hyaline spaces between.

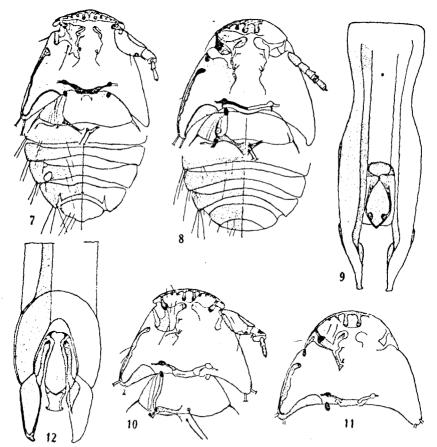
General structure of male genitalia resembles somewhat that of inexpectatus; no visible suture between basal plate and parameres, the latter sharply emarginate in subtropical portion; the broad, strongly chitinized inner margin of parameres extends uninterrupted from the twisted margin almost to apical end of basal plate; endomera of the short, semi-cylindrical type, but there is no visible penis, the posterior end being truncate. Species represented by & holotype, & allotype and 2 & & and 2 & & paratypes. Measurements follow next species.

## Heptapsus undulatus sp. n.

(Figs. 10-12)

Types, & and & adults, from Crypturellus u. undulatus (Temminck), collected by Plaumann at Nova Teutonia, Sta. Catarina, Brazil, Aug. 3, 1938 (coll. Brit. Mus.).

Diagnosis — Some incasurements are same as those of immaculatus, some less and others slightly greater. Frons flatly rounded, circular in female; incrassations of frons practically the same in the sexes, but remaining markings of head differ strongly (see figs.); temples much thickened apically, short and not reaching lateral angles of prothorax.



Heptapsus immaculatus sp. n. - Fig. 7: Male, head and tip of abdomen; fig. 8: female, head and tip of abdomen; fig. 9: male genitalia. Heptapsus undulatus sp. n. - Fig. 10: Male, head and thorax; fig. 11: female, head; fig. 12: male genitalia.

Abdominal tergites similar in shape in the sexes, and but very slightly narrowed medially; tergal incrassations very similar in the sexes, but slightly paler in female.

Male genitalia rather unique, although with a strong resemblance to those of julius, but parameres shorter and stouter, with basal tips less slenderly pointed; margins heavily chitinized and apical tips differently shaped, without setae. Basal plate has same circular division as in julius but there are two strongly chitinized bands running backward through apical portion, absent in julius; endomera of same cylindrical, oval shape, but with wider penis possessing lateral apical appendages, which are not present in julius.

Species represented by a holotype, a allotype and a second female collected from the type host in Bolivia (See remarks in introduction to the genus regarding the identity of the host of this species).

Measurements of types of H. immaculatus and H. undulatus:

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	Length	Width	Length	Width	Length	Width	Length	Width
Body	1.14 	0.26 0.47 0.342 0.46 0.395 0.47 0.07 0.062 0.03	1.08 	0.33 0.483 	1.22 	0.26 0.475 0.33 0.435 0.355 0.455 0.076 0.06 0.041	1.33 	0.335 0.518 0.336 0.456 0.384 0.49

Genus Rhyncothura Carriker, 1936

Type species: Goniodes sexpuntatus Piaget, 1880.

Changes of nomenclature have been made which do not conform to the 1952 Checklist of Mallophaga by Hopkins & Clay, but which seem to be necessary after a more careful study of the old material and the new (see Part 4 of this series, Bol. Ent. Venez., 11 (3-4), Dec., 1955).

Undoubtably there will be disagreements among students of Mallophaga over the changes in nomenclature which I have made, but such changes are largely a matter of individual opinion, one which will continue to be batted back and forth as long as Mallophaga are studied, but at all events my own personal opinions have been set forth for the acceptance or rejection of my esteemed colleagues.

The genus *Rhyncothura* is a difficult one to characterize, and in the present revision it will contain species which are far from being typical of it, but which are closer to it than to any other existing genus. I shall probably be accused of using *Rhyncothura* as a "dumping ground", the same as I have

accused the authors of the 1952 Checklist of using Heptapsogaster as a "dumping ground". If this should happen there will be no hard feelings on my part.

Many species now placed under Rhyncothura have a very close, superficial resemblance to Heptapsogaster, but all may be easily separated from that genus on two, easily detected characters. First, the structure of the metathorax, as was clearly explained in the previous paper of this series treating the genus Heptapsogaster, and secondly by the entire absence of any trace of "scent glands" in Rhyncothura, which are always present in Heptapsogaster and in some cases fantastically developed. In Rhyncothura the posterior margin of the metathorax is circular and completely (or almost, very rarely) imbedded within segment I of the abdomen.

In Heptapsogaster, as previously explained, the posterior margin of the metathorax forms a flatly convex line across the abdomen, with its posterolateral angles projecting beyond the margin of the first abdominal segment, with the entire length of its sides exposed between mesothorax and abdomen.

The species which have now been placed in Rhyncothura are far from forming a homogeneous group, as in Heptapsogaster, and in some ways it is not an entirely satisfactory arrangement, but it must suffice until sufficient new material has been secured to warrant a re-arrangement.

The type of species now most commonly represented in the genus is that of sexpuntatus (Piaget), the genotype, while the most aberrant are the Heptapsogaster tesselatus group, the genus Tinamicola Carriker and Heinrothiella Eichler.

It is not necessary to elaborate further on the various types of structure to be found in this genus, as now constituted, but each species will be considered separately and such brief descriptions given as may be necessary for their identification.

I must, however again call attention to a statement made previously by me regarding the hosts of some of the genera of Mallophaga found on the Tinamous, since I know and have collected them all. To illustrate: the genus Rhyncothura is invariably found on the avian genera Nothura, Nothoprocta, Rhynchotis and Tinamotes, inhabitants of the open grass-lands or the "paramos" of southern South America. On the other hand, Heptapsogaster, without exception is found only on Tinamus, Crypturellus and Nothocercus, all inhabitants of dense forest or heavy second-growth

Heptarthrogaster is also parasitic only on these last three avian genera (and recently found in an aberrant form on Odontophorus: family Phasianidae).

# Rhyncothura sexpuntata (Piaget, 1885)

Goniodes sexpuntatus Piaget, Les Pedicul. Suppl.: 59, pl. V, fig. 9 (Host: Rhynchotes rufescens (Temminck).

Rhyncothura sexpuntata (Piaget), Carriker, 1936, Stud. Neotr. Mall. I: 127, pl. 18, figs. 3, 3 c.

Heptapsogaster sexpuntatus (Piaget). Hopkins & Clay, 1952, Checklist Mall: 170.

The original description of this species given by myself in 1936 is full and complete, and figures correct, and no further comment is needed.

#### Rhyncothura chacoensis Carriker, 1944

Proc. U. S. Nat. Mus., 95 (3180):171, figs. 18c, f and g. (Host: Nothoprocta cinerascens (Burm.).

Original description and figures are ample. It is clearly a Rhyncothura, with metathorax completely embedded within abdominal segment I, and with posterior margin circular. There are no incrassations on the pleurites, the small round spots on pleurites I-V are merely spiracles.

Temples rather long and narrowly rounded at tips, with the 2 usual long, strong setae. The incrassations of frons and sides of head are very well developed, the middle pair on frons being the longest. Genital sternites of female are characteristic.

#### Rhyncothura crenulata Carriker, 1936

Proc. Acad. Nat. Sci. Phila., 88:128, pl. 19, figs. 1, 1a, 1b (Rhynchotus rufescens maculicollis G. R. Gray).

Shape of head very similar in the sexes, the female being larger and with tips of temples wider and more rounded. Incrassations along sides of head of medium size, with carina narrow and hyaline; carina of frons very narrow and pigmented, with six very small incrassations of equal size.

Pleurites and tergites very faintly pigmented and without incrassations. Genital sternite of female similar to *chacoensis*; posterior margin of metathorax more flattened than usual in the genus, with a slight indentation on each side of median line, in which is set a strong seta.

## Rhyncothura tesselata tesselata (Carriker, 1936)

Heptapsogaster tesselatus Carriker, Proc. Acad. Nat. Sci. Phila., 88:124, pl. 18, figs. 1a, b and c (Nothoprocta c. curvirostris: error = N. c. peruviana Taczanowski).

At first glance this seems to be a Heptapsogaster, but in reality is one of the border-line species not typical of either Heptapsogaster or Rhyncothura, but the structure of metathorax is clearly that of the latter genus. The temples, while more extended posteriorly than usual for this genus, are wide at tips and sharply truncate, a character never present in Heptapsogaster. Abdominal sclerites very similar to sexpuntata, in that the tergites are widely

separated medially, but unique in having segment VI in both sexes longer than I and completely encircling VII.

Posterior margin of metathorax somewhat flattened, but with slight median point. The tesselated dorsal surface of head, pro and mesothorax and the crenulated margins of tips of temples and anterior margin of mesothorax are all characteristic of this species and its races, and not found on any other species of this genus or *Heptapsogaster*.

## Ryncothura tesselata truncata (Carriker, 1936)

Heptapsogaster tesselatus truncatus Carriker, Proc. Acad. Nat. Sci. Phila., 88:125, pl. 18, figs. 2, 2a (Nothoprocta ornata branichi Taczanowski).

Closely related to nominate form, differs by having tergal sclerites closely fused, with suture invisible; tergal plates smaller and less pigmented. Small male genitalia decidedly different.

## Rhyncothura tesselata ornata (Carriker, 1944)

Heptapsogaster tesselatus ornatus Carriker, Proc. U. S. Nat. Mus., 95 (3180):164, figs. 17d-f (Nothoprocta o. ornata (G. R. Gray).

Nearest to nominate form; male genital armature very similar; incrassations of pleurites more pronounced and different from those of truncata; head of male narrower than either of the two previous races, being almost the same shape as in female of tesselata. No additional material or remarks.

# Rhyncothura tesselata pentlandi (Carriker, 1944)

Heptapsogaster tesselatus pentlandi Carriker, ibid.: 164 (Nothoprocta p. pentlandi (G. R. Gray).

This race is a poorly defined one, being somewhat intermediate between tesselata and ornata, with shape of head in male as in former, but with genitalia similar to latter. Also differences in measurements.

# Rhyncothura tesselata ecuadorana ssp. n.

(Figs. 13 and 14)

Types, & and Q adults, from Nothoprocta c. curvirostris Scl. & Salvin, from a museum skin collected in Ecuador (Emerson coll.).

Diagnosis — Nearest to the nominate race. Very little difference in shape of head in male and in male genitalia, but it may be distinguished as follows: Frons more rounded in female; temples narrower apically and with lateral margins convex, with a depression near tip (straight in tesselata; sides of prothorax almost straight (rounded in tesselata); sides of mesothorax smooth, not serrated; incressations of pleurites different from all of the known races, while the shape of the parameres is intermediate between tesselata and truncata, with endomera resembling former.

Measurements of male, as a whole, close to pentlandi, but in female quite different; head and from narrower, also all segments of thorax.

Measurements of male compared with tesselata (corrected). Head at temples  $0.40 \times 0.61$  against  $0.44 \times 0.55$ ; prothorax  $0.13 \times 0.285$  against  $0.12 \times 0.42$ ; abdomen  $0.805 \times 0.705$  against  $0.78 \times 0.68$ . Measurements of female close to nominate race. No measurements made of male genitalia of tesselata, and type not now available.

#### Rhyncothura dilatata (Rudow, 1870)

Goniocotes dilatatus Rudow, Z. ges. Naturw., 35:479 (Nothura boraquira). Goniodes dilatatus (Rudow), Giebel, Insecta Epizoa, 1874:192 (host as above). Heptapsogaster dilatatus (Giebel), Carriker, 1936: 126; Clay, Field Mus. Nat. Hist. Zool., 24:376.

CLAY definitely settled the status of this species, having secured specimens from type host, which were fully described and figured and neotypes erected. I have seen no specimens, but from her description and figure it is clearly a Rhyncothura, as now constituted. The metathorax is typical of the genus, while it has a strong resemblance to the tesselatus group, but without the tesselated upper surface of head and thorax, or the serrated tips of temples. The incrassations of the frontal carina and sides of temples strongly developed, three on a side and three on each side of frons; prothorax with lateral angles slightly posterior to middle of segment and strongly pronounced.

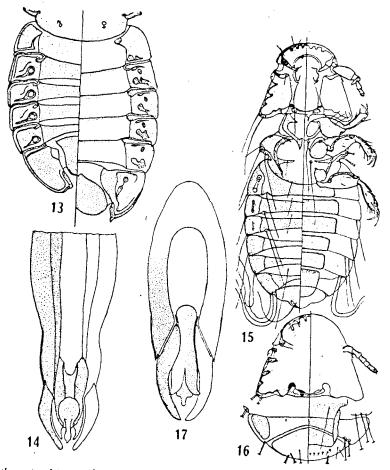
#### Rhyncothura minuta Carriker, 1936

(Figs. 15-17)

Proc. Acad. Nat. Sci. Phila., 88:131, pl. 19, figs. 3, 3a, 3b (Nothura maculosa nigroguttata, -error  $\pm N.m.$  maculosa (Temminck).

The types of this species are in poor condition. I have received from K. C. Emerson specimens of the species from Nothura maculosa nigroguttata, from Argentina and can find no differences between them and the types from Uruguay. The new drawings in this paper were made from them.

It is now clearly evident that the wide, dark margins along the sides of the head in the original figure are, in reality, the sides of the temples folded under. Also in original figure from and temples are shown as being crenulated.



Rhyncothura tesselata ecuadorana ssp. n. - Fig. 13: Male and female, metathorax and abdomen; fig. 14: male genitalia. Rhyncothura minuta Carriker, 1936 - Fig. 15: Male, body; fig. 16: female, head and apical abdominal segments; fig. 17: male genitalia.

but this must have been caused by shrinkage of the specimens in clearing, the margins being actually as shown in new figure.

# Rhyncothura boliviana Carriker, 1944

Rhyncothura minuta boliviana Carriker, Proc. U. S. Nat. Mus., 95 (3180):167. figs. 17g; 18a, b (Nothura maculosa oruro Bond & de Schauensee: error, = N.m.agassizii Bangs).

Male differs from R. minuta in shape of head and proportions of thoracic segments, shape of abdomen, type of abdominal sclerites and in shape and

proportions of genitalia. Female very similar to male, the head, excepting the dimorphic antennue, similar in shape and markings, though slightly longer (an unusual character). Head of female is longer than in minuta with but a slight trace of the dark band along outer temporal margins.

Note: This dark band has been explained under previous species and is clearly seen in the new figure of minuta, being merely the marginal carina folded under head.

## Rhyncothura subdilatata (Piaget, 1880)

Goniodes subdilatatus Piaget, Pedicul.: 257, pl. 21, fig. 4 (Crypturellus variegatus (Gmelin).

Heptapolgaster subdilatatus (Piaget), Clay, P.Z.S. B, I, 1937: 139; Carriker, 1955:126.

CLAY has elucidated clearly the status of this species. She says: "On Piaget's slide of this species there are three specimens labelled dilatatus and ten labelled sub illatatus, which are all one and the same thing, and their host is indicated as being "Crypturellus variegata". Figures are given by CLAY, clearly indicating that the species is a Rhyncothura. She also asserts that "the scent glands are apparently absent in both sexes", and added proof that it is a Rhyncothura.

The host as given by Piaget is certainly in error, but was not questioned by Clay, but I cannot agree that this is correct. I have 3 & and 1 & of a Heptapsogaster from Crypturellus v. variegatus (= H. favus, now in press) which are totally different from Piaget's subdilatatus. Further proof of the incorrectness of Piaget's host is that no Rhyncothura has ever been taken on a forest-inhabiting Tinamou (Tinamus, Crypturellus, Nothocercus), all known species being from Nothura, Nothoprocta, Rhynchotes and Tinamotes, all paramo or savanna inhabiting genera of southern S.A., north to paramos of Ecuador. I strongly suspect that the true host of subdilatata is a Nothura, but this cannot be proven until specimens of it are collected from a recently killed bird.

## Rhyncothura teres Clay, 1937

P.Z.S., B. I:143, pl. 2, figs. 1, 2, text fig. 6c (Nothura maculosa peruviana Revi. & Stolz.).

This species was described from two hosts, Nothura maculosa peruviana and Nothoprorus pericardia (Chile), but the types were indicated as being from the former. Until recently I was doubtful of the correctness of the host allocations, but have now received from Mr. Emerson a fine female of teres taken on N. prekardia, also from Chile. It is identical with the female para-

type of teres received from Clay, so that there can be no cause for doubting the original designation of the hosts for this species.

R. teres has the head in both sexes similar to minuta, but from in male is more convex. It may be easily recognized by the entire absence, in both sexes, of incrassations arising from inner margin of frontal carina, and in having the two incrassations on sides of temples posterior to the ocular blotch; sides of temples in male slightly concave, straight in female.

Note: The remaining species of Rhyncothura will be treated in next number of this series of papers.