

REVISION OF THE
SUBTRIBE CYLINDROXYSTINA
(COLEOPTERA: STAPHYLINIDAE:
PAEDERINAE)

LEE H. HERMAN

BULLETIN
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY
NUMBER 203
NEW YORK : 1991

Recent issues of the *Bulletin* may be purchased from the Museum. Lists of back issues of the *Bulletin*, *Novitates*, and *Anthropological Papers* published during the last five years are available free of charge. Address orders to: American Museum of Natural History Library, Department D, Central Park West at 79th St., New York, New York 10024.

REVISION OF THE
SUBTRIBE CYLINDROXYSTINA
(COLEOPTERA: STAPHYLINIDAE:
PAEDERINAE)

LEE H. HERMAN
*Curator, Department of Entomology
American Museum of Natural History*

BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Number 203, 83 pages, 229 figures

Issued March 19, 1991

Price: \$7.00 a copy

CONTENTS

Abstract	3
Introduction	3
Acknowledgments	3
Abbreviations	4
Taxonomic History	4
Distribution and Habitat	5
Anatomical Notes	5
Phylogeny	10
Discussion	11
Cylindroxystina	11
<i>Cylindroxystus</i>	12
Key to Males of <i>Cylindroxystus</i>	15
Description of Species	15
<i>Neolindus</i>	33
Key to Males of <i>Neolindus</i>	35
Key to Females of <i>Neolindus</i>	38
Key to <i>Neolindus</i> (Secondary Sexual Characters Excluded)	38
Description of Species	40
References	83

ABSTRACT

The Neotropical tribe Cylindroxystini is reduced to a subtribe, Cylindroxystina, of the Paederini. Cylindroxystina is distinguished from all other subtribes of the Paederinae by the sickle-shaped, edentate mandibles, nipple-shaped fourth segment of the maxillary palpus, single pair of paratergites of abdominal segment III, and cylindrical abdomen. The paratergites of segments IV to VI are absent, the tergum and sternum of each segment are fused, and the segment is cylindrical. Segment VII also lacks paratergites, but the tergum and sternum remain separate. Two genera, *Cylindroxystus* and *Neolindus*, are included in the subtribe. For *Cylindroxystus*, 2 species, *pluviosus* and *borinquense*, both from the Caribbean, are transferred from *Lobrathium* and 11 new species are described as follows: *crenus*, *flavus*, *luridus*, and *sinuosus* from Ecuador; *furvus* and *messus* from Peru; *alleni* and *redactus* from Panama; *lyrus* from Venezuela; *concovoperculum* from Guyana; and *cavus* from Brazil. *Cylindroxystus* is distinguished from *Neolindus* by the third antennal segment that is cupulate or has a carina surrounding the apex. Twenty-seven new species are described in *Neolindus* as follows: *agilis*, *brewsterae*, *densus*, *ha-*

matus, *lodhii*, *sinuatus*, and *unilobus* from Brazil; *cephalochymus* from Peru; *bidens*, *bullus*, *dichymus*, *lirellus*, *milleri*, *parallelus*, *procarinatus*, *prolatus*, and *retusus* from Ecuador; *pumicosus* from Colombia; *brachiatus*, *plectrus*, and *rudiculus* from Venezuela; *apiculus*, *basisinuatus*, *campbelli*, and *punctogularis* from Panama; and *cuneatus* and *incanalis* from Costa Rica. *Neolindus* is separated from *Cylindroxystus* by the presence of one or two pairs of cephalic trichobothria which are lacking in *Cylindroxystus*. Until now *Cylindroxystus* was known only by one specimen from Costa Rica, and *Neolindus* by a few specimens from Brazil and Peru. The subtribe is redescribed and both genera and all the species are described and illustrated and their phylogenetic relationships discussed. Keys to the males of both genera are provided. Most of the present work is based on characteristics of the male. Females were unavailable for over half of the species, and it was not always possible to reliably associate the sexes. Species of both genera have been collected rarely and most seem to have been collected from leaf litter on the forest floor at some distance from streams.

INTRODUCTION

I became interested in the Neotropical genus *Cylindroxystus* while curating the staphylinid collection in the Field Museum of Natural History. At that time I first saw the single, tiny specimen of *Cylindroxystus longulus* and a second unknown species from Guyana. Later I found a second new species from Bolivia in the American Museum. I was particularly interested that *Cylindroxystus longulus* had been set aside by Bierig (1943: 158) as the only species in the new tribe, Cylindroxystini, that he regarded as the connecting link between the two large tribes Paederini and Pinophilini. Also, judging by the widely separated collecting localities (Costa Rica, Guyana, and Bolivia), the genus was clearly more widespread and speciose than previously thought. Later, while sorting specimens of *Gnathymenus* and *Stenopholea* from samples of Neotropical Staphylinidae stored in alcohol, I found other specimens of *Cylindroxystus* and another similar genus, *Neolindus*. I became intrigued with the possibility that the two genera were sister taxa and also

with Bierig's idea that the tribe was a bridge between the other two paederine tribes. Unfortunately, most of the additional specimens were undescribed species, so I delayed this study for many years. Now that I am engaged in a generic revision of the Paederinae it seems useful to explore the relationship between *Cylindroxystus* and *Neolindus*. The question of the relationship of these two genera to other Paederinae, and therefore the disposition of Cylindroxystini, will be examined as I study other genera and subtribes of the Paederinae.

ACKNOWLEDGMENTS

Thanks are owed to Milton Campbell of the Canadian National Collection, Ottawa, Ontario, the late Henry Dybas and former Curator James S. Ashe of the Field Museum of Natural History, Chicago, Illinois, and Alfred F. Newton, formerly of the Museum of Comparative Zoology, Cambridge, Massachusetts, for lending much of the material used in this study—and also to Maurizio Pa-

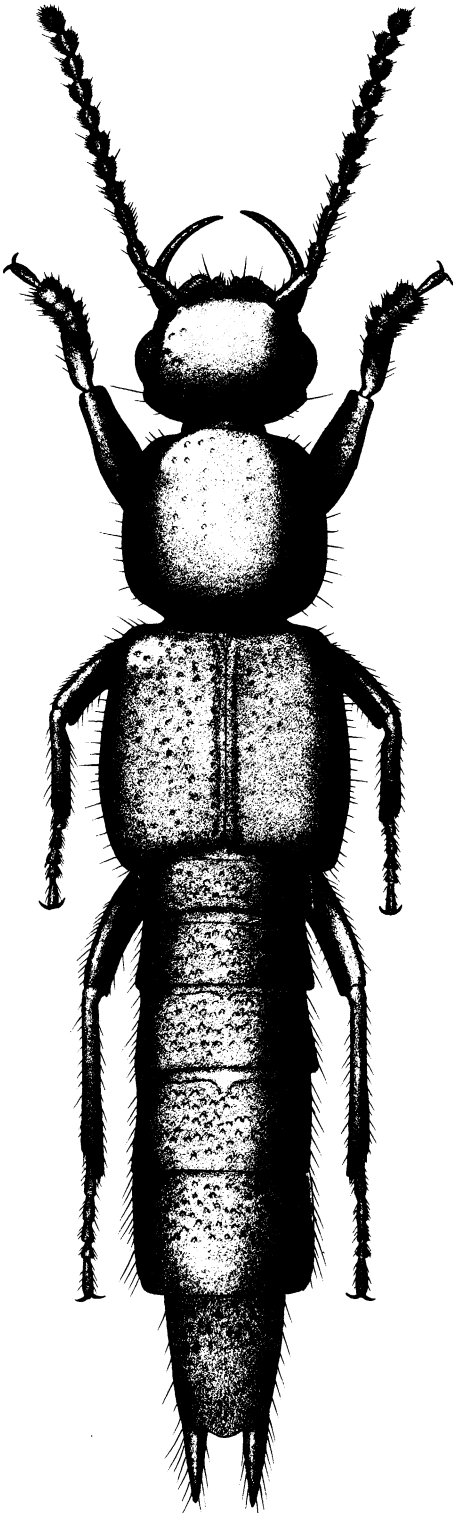


Fig. 1. *Neolindus basisinuatus*.

oletti of the Università degli Studi di Padova, Padova, Italy, for the gift of some Venezuelan species. I am grateful to Ulrich Irmeler of Forschungsinstitut für Ökosystemforschung Universität, Kiel, West Germany, Terry Erwin of the National Museum of Natural History, Washington, D.C., Peter Hammond of the British Museum of Natural History, London, and José Albertino Rafael and Ana Yoshi Harada of the Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil, for lending types. The reviews and comments of this manuscript by Milton Campbell, Didier Drugmand, Christine Lyon, and James Miller helped improve it and are much appreciated.

Abbreviations

AMNH	American Museum of Natural History, New York
BMNH	The Natural History Museum, London
CNC	Canadian National Collection, Ottawa
FMNH	Field Museum of Natural History, Chicago
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus
MCZ	Museum of Comparative Zoology, Cambridge
UIC	Ulrich Irmeler Collection, Kiel
USMN	National Museum of Natural History, Washington, D.C.

TAXONOMIC HISTORY

In 1876 Sharp described *Lindus* with one species from Brazil. Sharp regarded the genus to be near *Lithocharis* but cited no characters to support that view. While placing *Lindus* in the Paederini, he noted its similarity to *Oedichirus* of the Pinophilini and suggested that *Lindus* might be a transitional form between the two tribes. Blackwelder (1944: 122), without giving reasons, moved the genus—by then renamed *Neolindus* because *Lindus* was preoccupied (Scheerpeltz, 1933: 1219)—to the subtribe Paederina, in which he also included *Gnathymenus* and *Paederus*. Both *Gnathymenus* and *Paederus* have a compressed fourth segment of the maxillary palpus whereas this segment is nipple-shaped in *Neolindus*. Fagel (1958: 9) cited a few characters for the genus, but until Irmeler's work (1981), only one species was known in the genus. Irmeler added five species: one from

Brazil and four from Peru. Unfortunately, three of his new species were described from females, which are difficult to identify to species or to correctly associate with the males.

Cylindroxystus was also described with one species (Bierig, 1943), and until the present work, no other species were known. Bierig, noting that *Cylindroxystus* shared characters with the Paederini and part of the Pinophilini, proposed the tribe Cylindroxystini. Except for citation of the type species (Blackwelder, 1952: 114), no other mention has been made of the genus.

In the present work, Cylindroxystini is reduced to a subtribe of the Paederini because it has the small fourth segment of the maxillary palpus characteristic of the tribe. A second genus, *Neolindus*, is added because it shares derived features with *Cylindroxystus*.

DISTRIBUTION AND HABITAT

The 47 species of this subtribe were collected from 42 Neotropical localities, where they are found in leaf litter in the lowlands to as high as 2500 m elevation. Species are known from Bolivia north to Costa Rica and the Caribbean Islands (figs. 13, 79). Flightless species all were collected above 900 m elevation. Species of both genera are collected rarely but most species for which collection data are available were collected by sifting leaf litter from the forest floor and the collections were made in areas with no nearby streams.

ANATOMICAL NOTES

The following numbered sections refer to characters (listed in table 1) used in the phylogenetic analysis. Unnumbered sections that are introduced by an italicized sidehead are discussions of other significant characters.

I am undecided about the sister group of the Cylindroxystina, but for this analysis I used the Cryptobiina because both groups have a similar fourth segment of the maxillary palpus.

Characters 0, 1. Cephalic trichobothria (character 0) are found in *Neolindus* on the lateral portion of the vertex near the dorsal margin of the eye (figs. 64, 78). The bothrium is an oval or round, deep, cup-shaped pit that is usually surrounded by a ridge. The trich is

TABLE 1
Characters for the Cylindroxystina

0.	Cephalic trichobothria: Absent (0); Present (1).
1.	Trichobothrial number: One pair (0); Two pair (1).
2.	Cephalic carina at anterior margin: Absent (0); Present (1).
3.	Antennal segments 4 to 10, spinelike surrounding apex: Absent (0); Present (1).
4.	Antennal segment 3: Normal (0); Cupulate (1); Apex surrounded with carina (2).
5.	Antennal segment 10: Subequal to 9 (0); Much longer than 9 (1).
6.	Mandibular denticles: Present (0); Absent (1).
7.	Maxillary palpus, fourth segment: Conical (0); Nipple shaped (1).
8.	Pronotal shape: Longer than wide (0); Wider than long (1).
9.	Pronotal marginal bead and tergo-sternal suture: Separated (0); Fused (1).
10.	Mesendosternite: Slender (0); Broad (1)
11.	Abdominal segments III to VII, internal canals at base: Absent (0); Present (1).
12.	Abdominal segment VIII, internal canals at base: Absent (0); Present (1).
13.	Abdominal paratergites III: Two pairs (0); One pair (1); Absent (2).
14.	Abdominal paratergites IV to VII: Present (0); Absent (1).
15.	Tergum and sternum VII: Separated (0); Fused (1).
16.	Abdominal tergum and sternum VIII, base: Separated (0); Fused (1).
17.	Sternum VIII, surface at apex of internal canals: Unmodified (0); Depressions (1).
18.	Sternum VIII, carinae: Absent (0); Elongate cells (1) Present (2).
19.	Tergum VIII, posterior margin; Rounded (0); Emarginate (1); Lobed (2); Trilobed (3); Truncate (4).
20.	Tergum VIII, middle of basal ridge: Carina absent (0); Carina present (1); Pointed (2).
21.	Tergum IX, base: Fused (0); Divided (1).
22.	Aedeagus, median hole on ventral surface: Absent (0); Present (1).
23.	Aedeagus, median orifice: Sclerites hidden (0); Sclerites exposed (1).
24.	Aedeagus, setae on ventral surface: Absent (0); Present (1).
25.	Aedeagus, transverse carina or process on ventral surface: Absent (0); Present (1).
26.	Elytra: Longer than or equal to pronotum (0); Shorter than pronotum (1).
27.	Gular punctuation: Absent (0); Two setae (1); Four setae (2); Transverse cluster of setae (3).

long, slender, and parallel-sided to near the apex. Species have either one (fig. 64) or two (fig. 78) pairs (character 1): the pair near the anterior margin of the eye is always present, but only nine species have a pair behind the eye near the basal angle of the head. Six of the nine species with two pairs of trichobothria were collected above 900 m elevation, and one at 2500 m.

Species of *Cylindroxystus* lack trichobothria, thereby providing a character to distinguish them from species of *Neolindus*. Within the Paederinae trichobothria occur sporadically in the adults. In the Cryptobiina, they are found on the head or abdomen of some genera and cephalic trichobothria are characteristic of the Scopaeina. Since Scopaeina is the only subtribe in which trichobothria are found in all genera, I assume they are independently derived among the three subtribes. So far, I have encountered these structures in no other adults of the subfamily. Paederine larvae characteristically possess trichobothria.

Character 2. Two species of *Neolindus* have a midlongitudinal carina on the deflexed anterior margin of the head, a character that I have not seen elsewhere.

Character 3. Some species of *Cylindroxystus* have short, stout, spinelike setae surrounding the apex of antennal segments 4 to 10 (fig. 8). These setae are large in some species but small and difficult to see in others. The function of these setae is not known, and so far, they have not been found in other taxa.

Character 4. A cupulate third antennal segment is characteristic of all species of *Cylindroxystus* (fig. 8) except *pluviosus* and *borinquense*, which have a carina surrounding the apex of the segment. I have not found the cupulate character in other paederine genera.

Character 5. Three species of *Cylindroxystus* have the last two antennal segments much elongated. I have not seen this character elsewhere.

Antennal pubescence. The antennal segments of most paederine species have short, fine, dense pubescence on the outer segments. One or more of the base segments may possess only longer, more sparse, thicker pubescence. The basal segment on which fine pubescence begins has been used to separate

taxa. Fine pubescence begins on the mouth segment in *Cylindroxystus* and in most *Neolindus* species. However, in *Neolindus*, the pubescence begins on segment 3 in *apiculus* and *campbelli* and on segment 5 in *agilis*, *brewsterae*, *bullus*, and *densus*. In the Cryptobiina fine pubescence begins on segments 1, 3, or 4. Since I cannot specify the direction of character state transition, I have not used the feature.

Character 6. Mandibles that are long, slender, and edentate are characteristic of both *Neolindus* and *Cylindroxystus* (figs. 9, 67). Similar mandibles are found in some species of Pinophilini but they are denticulate and of quite different form.

Character 7. The fourth segment of the maxillary palpus is small and nipple-shaped in *Neolindus* and *Cylindroxystus* (figs. 6, 71). Species of Cryptobiina have a similarly shaped segment, which might suggest a sister-group relationship with *Cylindroxystina*.

The form of the fourth segment of the maxillary palpus, which exhibits more variability in the Paederinae than in other subfamilies, is useful for recognition of some genera and perhaps for defining subtribes. The fourth segment is enlarged in the Pinophilini and small in the Paederini and supports my claim that the *Cylindroxystina* are part of the Paederini rather than part of the Pinophilini.

Eyes. Most species of *Cylindroxystus* and *Neolindus* have eyes that are longer than the postocular length of the head [measured as follows: with the head in direct dorsal view, the eye length is the distance between a line across the anterior margin of the eyes and another across the posterior margin of the eyes; the postocular length is the distance between the line across the posterior margin of the eyes and one parallel to it that crosses the anterior margin of the neck]. Three species of *Neolindus* and five of *Cylindroxystus* have reduced eyes. *Cylindroxystus pluviosus* has only a few facets remaining; the facets of the eye of *Cylindroxystus borinquense* are large but the eye is reduced. All species with reduced eyes occur above 900 m elevation, but not all species found above that elevation have reduced eyes.

Gular punctation. See character 27.

Character 8. The prothorax is longer than

it is wide (fig. 3) or wider than it is long (fig. 64) in the *Cylindroxystina*. Throughout the Paederinae the length/width ratio of the prothorax is variable, but in most groups the prothorax seems to be longer than it is wide.

Character 9. The pronotal marginal bead and protergosternal suture are separated in most Paederinae but are partially fused in *Cylindroxystus*.

Paramedial row of pronotal punctures. Many species of the *Cylindroxystina* have a row of setigerous punctures on each side of an impunctate median strip. Usually the row comprises one puncture behind another in a more or less straight line. This single file of punctures is what I have referred to as the paramedial row of setigerous punctures in this subtribe. In some species the paramedial row is a longitudinal cluster rather than single file of punctures; in other species the longitudinal cluster of punctures grades into dense punctation on the lateral third of the pronotum. The pronotum always has an impunctate median strip that may have asetate micropunctures, or punctules.

Mesothoracic peritreme. Both *Neolindus* and *Cylindroxystus* have a small mesothoracic peritreme. In the Pinophilini this structure is large and covers the basement of the prothorax thereby closing the procoxal cavity. An enlarged peritreme is a derived character that has arisen at least twice, perhaps three times, in the Paederinae as well as several times in other subfamilies. Presence of a small peritreme is one of the characters that leads me to believe that the *Cylindroxystina* is neither a tribe that links the Pinophilini and the Paederini nor part of the Pinophilini.

Character 10. *Mesendosternite.* The mesendosternite is slender in *Cylindroxystus* but broad and flattened in *Neolindus*. However, because these observations are based on dissection of only one specimen of *Cylindroxystus* and two of *Neolindus*, I am extrapolating for other species in the two genera. The mesendosternite of most other Paederinae is slender.

Elytral length. See character 26.

Characters 11, 12, 17, 18. Most *Neolindus* and *Cylindroxystus* have a tube or canal inside the integument at the lateral base of abdominal segments III to VIII (11). Segment

TABLE 2
Character State Matrix for the *Cylindroxystina*

	111111111122222222
	0123456789012345678901234567
Ancessor	0000000000000000000000000000
Cryptobiina	0000000100100000000000000000
<i>Neolindus</i>	
<i>agilis</i>	1000001100111110002400000101
<i>amazonicus</i>	11000011001111100?0?????0?
<i>apiculus</i>	1000001110111110000021000001
<i>basisinuatus</i>	1000001110111110000011011001
<i>bidens</i>	1000001110111110000310111001
<i>brachiatus</i>	1100001100111110010000000011
<i>brewsterae</i>	1000001100111110002000000101
<i>bullus</i>	1000001110111110002100000101
<i>campbelli</i>	1000001110111110000011000001
<i>cephalochymus</i>	1000001100111110002400000111
<i>cuneatus</i>	1000001110111110000010010001
<i>densus</i>	1000001100111110002100000101
<i>dichymus</i>	1000001110111110000411111001
<i>hamatus</i>	1100001110111110002100000001
<i>hanagarthi</i>	1000001110111110010321????03
<i>incanalis</i>	10000011001110210002000000001
<i>lirellus</i>	1100001100111110010100000011
<i>lodhii</i>	1000001110111110000011010001
<i>milleri</i>	1000001110111110000010010001
<i>parallelus</i>	1100001100111110010000000011
<i>peruvianus</i>	100000110011111000210?????01
<i>plectrus</i>	1100001100111110000000000011
<i>procarinatus</i>	1010001100111110002100000101
<i>prolatus</i>	1100001100111110010300000001
<i>pumicosus</i>	1100001100111110010000000011
<i>punctiventris</i>	1000001100111110002100000101
<i>punctogularis</i>	1000001110111110000320010003
<i>religans</i>	1000001110111110000320111001
<i>retusus</i>	1010001100111110002100000101
<i>rudiculus</i>	1100001100111110010000000011
<i>schubarti</i>	1000001110111110000310111002
<i>sinuatus</i>	1000001110111110000011011001
<i>unilobus</i>	1000001110111110000211010001
<i>Cylindroxystus</i>	
<i>alleni</i>	0?01101101000110101200000101
<i>borinquense</i>	0?0020110?011110010000000011
<i>cavus</i>	0?00111100011110001000000001
<i>conconvoperculus</i>	0?00111100011110001000000001
<i>crenus</i>	0?01101101011110002000000011
<i>flavus</i>	0?01101101000110102200000101
<i>furvus</i>	0?01101101000110101200000101
<i>longulus</i>	0?01101101000110101200000101
<i>luridus</i>	0?01101101001110102200000101
<i>lyrus</i>	0?00111100011110001000000001
<i>messus</i>	0?01101101001110001200000101
<i>pluviosus</i>	0?00201100011110000000????11
<i>redactus</i>	0?01101101000110101200000011
<i>sinuosus</i>	0?01101101011110002000000011

VIII has more of these canals, usually two median and two lateral canals on the tergum (figs. 44, 87) and sternum (figs. 45, 88), and they are usually larger and more prominent than on the other segments (character 12). In some species of *Neolindus* the two median canals are divided (figs. 91, 97, 115). At the posterior end of the canals there is an opening to the outside. For most species of *Neolindus* there is a depression or groove at the distal end of the canal (fig. 227) and in *Cylindrox-*

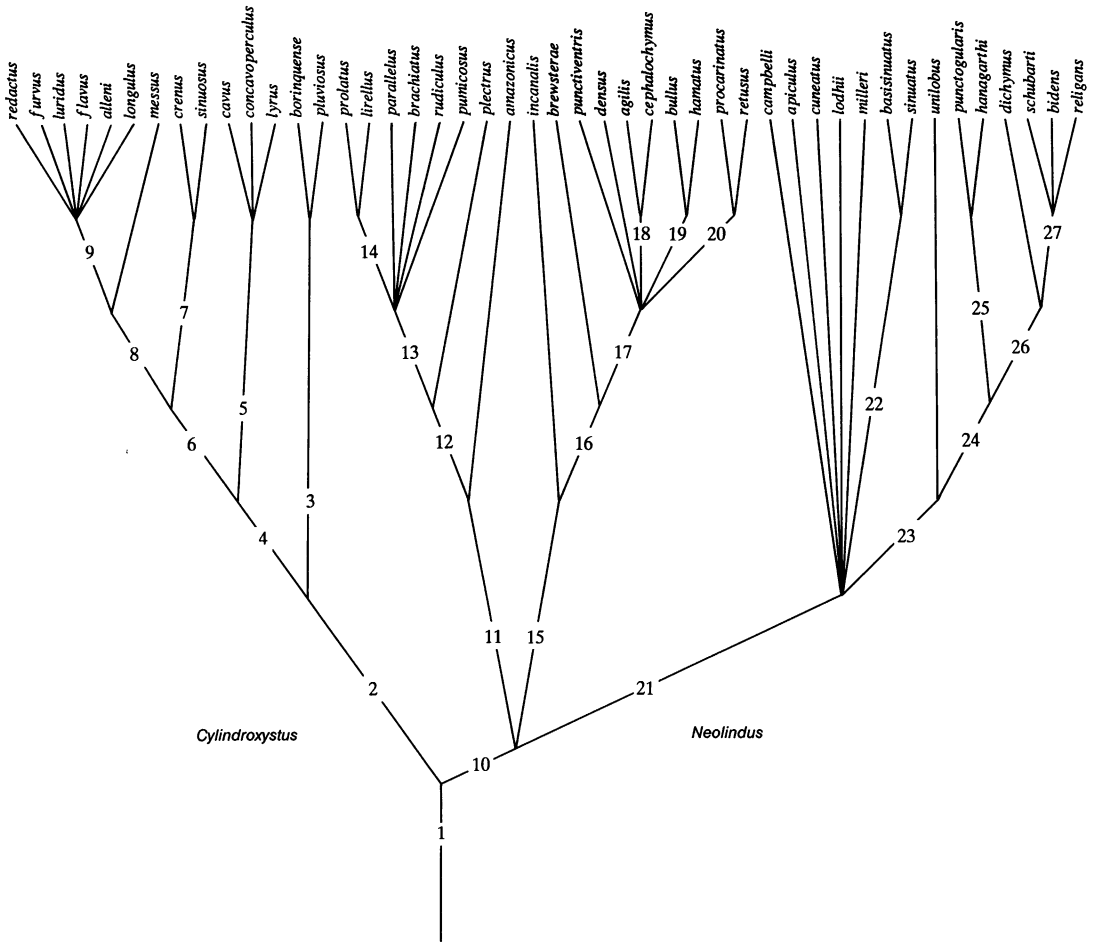


Fig. 2. Cladogram for the Cyliandroxystina. Diagnoses of the branches are provided in table 3.

ystus borinquense the groove on each segment is deep and prominent (fig. 62). This groove or depression is especially developed on sternum VIII in some species of *Neolindus*.

For most species the inner surface of the canals are unadorned, but three species of *Cyliandroxystus* (*cavus*, *concavoperculum*, and *lyrus*; fig. 2, clade 5) have microtrichia covering the inner surface.

Although I find no associated glands, there may be secretory cells that empty chemicals into the canals. The canals may deliver secretions to the outside of the integument and the grooves and carinae may help disperse the chemical over the integument.

Some species of both genera have a series of parallel carinae on sternum VIII (fig. 229)

and tergum VIII (character 17). Species with grooves or depressions at the apices of the canals (fig. 227) lack the parallel carinae (character 18); some species have neither grooves or carinae and two species of *Neolindus* (*milleri* and *cuneatus*) have short weakly developed carinae at the base of the sternum. Only a few species of *Cyliandroxystus* have these parallel carinae but some others have elongate cells that appear to be precursors to the carinae. Normally, the integumental surface of the sternum and tergum VIII is covered with large, round or oval, setigerous depressions that seem to be enlarged setigerous punctures. On some species of *Cyliandroxystus* the basal depressions are elongate, and on a few the proximal end of

the depression is open; that is, the margin or wall of the anterior end is missing, thereby creating a series of parallel carinae. Some species of *Neolindus* have parallel carinae at the base of tergum and sternum VIII and only *Neolindus milleri* and *cuneatus* exhibit what seem to be intermediate stages.

Characters 13, 14, 15. Most Paederinae have two pairs of paratergites on segments III to VII; the remaining segments never have them. Some genera of the Procirrina, a subtribe of the Pinophilini, lack paratergites III to VII; e.g., *Oedichirus* has paratergites on III. In most Procirrina segments III to VII lack paratergites and the terga and sterna of each segment are fused into cylinders. The loss of paratergites and fusion of the tergum and sternum is paralleled in genera of several other staphylinid subfamilies.

Neolindus and *Cylindroxystus* have one pair of paratergites as well as a ridge that suggests a second pair on III (character 13). Segments IV to VI lack paratergites (character 14) and in each the tergum and sternum are fused into a cylinder (character 15). Segment VII lacks paratergites and the tergum and sternum are separated; this trait is unique in the Paederinae.

The cylindrical abdomen led Sharp (1876) to think that *Neolindus* was transitional between the Pinophilini and the Paederini and prompted Bierig (1943) not only to reach the same conclusion for *Cylindroxystus* but to propose a new tribe. However, the separated terga and sterna of VII and the presence of paratergites on III in both *Neolindus* and *Cylindroxystus* suggest independent origins of the abdominal form for Procirrina and Cylindroxystina.

Character 16. Tergum and sternum VIII are separated in most Staphylinidae. In some *Cylindroxystus* the base of segment VIII is fused into a cylinder, and across the base of the tergum is a suture that creates a hinged sclerite that can move up and down, with the suture acting as a fulcrum (fig. 14). Since I have seen neither intermediates nor this form of segment VIII elsewhere in the family, it is unclear whether the cylindrical base is the result of a fused tergum and sternum or is an extension of the sternum around to the dorsal surface.

TABLE 3

**Synapomorphic characters for
Cylindroxystus and *Neolindus***

(Clade numbers refer to figure 2. Characters following each clade number are defined in Table 1 and discussed in text. Asterisks designate homoplastic characters.)

Clade 1.	6.1, 7.1, 13.1, 14.1
Clade 2.	4.1
Clade 3.	4.2, *11.1, *12.1, *26.1
<i>borinquense</i>	*17.1
Clade 4.	4.1, 18.1
Clade 5.	5.1, *11.1, *12.1
Clade 6.	3.1, 9.1
Clade 7.	*11.1, *12.1, *18.2, *26.1
Clade 8.	*19.2, *25.1
<i>messus</i>	*12.1
Clade 9.	16.1
<i>redactus</i>	*26.1
<i>luridus</i>	*18.2
<i>flavus</i>	*18.2
Clade 10.	0.1, 10.1, *11.1, *12.1
Clade 11.	*1.1
Clade 12.	*26.1
Clade 13.	17.1
<i>pumicosus</i>	*25.1
Clade 14.	*19.1
<i>prolatus</i>	*19.3
Clade 15.	*18.2
<i>incanalis</i>	13.2
Clade 16.	*25.1
Clade 17.	*19.1
Clade 18.	*19.4
<i>cephalochymus</i>	*26.1
Clade 19.	*8.1
<i>hamatus</i>	*1.1
Clade 20.	2.1
Clade 21.	*8.1, 20.1
<i>campbelli</i>	*21.1
<i>apiculus</i>	*20.2, *21.1
<i>cuneatus</i>	*23.1
<i>lodhii</i>	*23.1
<i>milleri</i>	*23.1
Clade 22.	*21.1, *23.1, *24.1
Clade 23.	*19.2, *23.1
<i>unilobus</i>	*21.1
Clade 24.	*19.3
<i>hanagarthi</i>	*17.1, *21.1
Clade 25.	*19.3, *20.2, 27.3
Clade 26.	*22.1, *24.1
<i>dichymus</i>	*19.4, *21.1
Clade 27.	*19.3
<i>schubarti</i>	*27.2
<i>religans</i>	*20.2

Characters 17, 18. See character 11.

Sternum VIII. Both the posterior margin and the surface of sternum VIII are highly variable in males of *Neolindus* but are less so in males of *Cylindroxystus*. The variation in *Neolindus* provides many characters for delimiting species.

Character 19. The posterior margin of tergum VIII can be strongly to slightly rounded, arcuatotruncate, lobed either with one median or with one median and two lateral lobes, or emarginate. The emargination can range from feeble and barely discernible to moderately deep. The tergal margin is variable in the subfamily but usually rounded.

Character 20. Tergum VIII has a basal ridge that is usually sinuate and in some species has a median carina that extends posteriorly (fig. 215); in a few species this ridge is evident only as a pointed median lobe (fig. 206). Sternum VIII is similarly modified in some species. I have not seen this character in other Paederinae.

Character 21. Tergum IX of some species of *Neolindus* is partially (figs. 171, 176) or completely divided (figs. 74, 201) midlongitudinally. The tergum is medially fused in most other Paederinae.

Characters 22, 23, 24, 25. The parameres of the Cylindroxystina are present and appressed to the median lobe near the basal foramen of the aedeagus. The broad, flattened, rounded parameres are difficult to see in most species. Parameres are present in most *Neolindus* and absent in some *Cylindroxystus*. The condition of the parameres is variable in the Paederinae; the type found in Cylindroxystina is evident in other subtribes.

The median lobe of the Cylindroxystina exhibits several unique features. Some species of *Neolindus* have a median hole (figs. 210, 224) behind the basal foramen (character 22), some have two clusters of setae (figs. 210, 222) near this hole (character 24), and others have the setae but lack the hole (figs. 193, 214). Carinae (character 25) occur on the ventral surface of some species but they are typical of the entire subfamily. At the apex of the median lobe several complex sclerites are exposed at the opening of the median foramen (character 23) in some species (figs. 186, 193, 204). These sclerites are variously modified but the homology of the

points, depressions, bumps, and curves is indeterminate. The sclerites may be enlargements of smaller ones found on the internal sac.

Character 26. The elytral length [measured from the apex of the scutellum along the elytral suture to a transverse line across the posterior margin of the elytra] of most species is longer than the pronotal length [measured midlongitudinally from the anterior to the posterior margin]. Although most species, those with elytra as long as or longer than the pronotum and fully developed flying wings, are probably capable of flight, seven species of *Neolindus* and five of *Cylindroxystus* have reduced elytra and flying wings. All the flightless species are found above 900 m elevation, one as high as 2500 m, whereas species capable of flight usually are found in the lowlands.

A parallel situation exists in the Dolicaonina (Herman, 1981), where 60 percent of the species are flightless and are found in the Neotropical highlands while the flying species occur in the lowlands. In both subtribes it seems likely that the flying species are widespread and exhibit less local endemism. At higher elevations there are probably a greater number of localized species. However, in contrast to the Dolicaonina, most species of Cylindroxystina are found in the lowlands.

Character 27. The gula of most Cryptobiina lack setae and that of *Cylindroxystus* and most species of *Neolindus* has two setae. One *Neolindus* species has a transverse row of four setae and two have a transverse cluster; this cluster appears to be unique.

PHYLOGENY

Applying the Hennig86, version 1.5, phylogenetic program to the data in tables 1 and 2 and using the bb* command produces 30 equally parsimonious trees of 73 steps with a consistency index of 49 and retention index of 86. Figure 2 is a consensus tree of these 60 trees. The numbered clades are diagnosed in table 3.

Cylindroxystina (fig. 2; clade 1) is defined by the falcate, edentate mandibles (fig. 9; character 6), nipple-shaped fourth segment (figs. 6, 71; character 7) of the maxillary palpus, presence of one pair of paratergites on

abdominal segment III (character 13), and the absence of paratergites on abdominal segments IV to VII (character 14). The combination of the absence of paratergites VII along with the separation of the tergum and sternum is unique to the *Cylindroxystina*.

Neolindus (fig. 2, clade 10) is characterized by cephalic trichobothria (figs. 64, 78; character 0), a broad mesendosternite (character 10), and internal canals at the base of segments III to VIII (figs. 87, 88; characters 11, 12); it is divided into three species groups. The first group includes *amazonicus* to *prolatus* (fig. 2, clade 11) and is defined by the presence of two pairs of cephalic trichobothria (fig. 78; character 1), a character shared only by *hamatus*. This group (clade 13) includes all but one *Neolindus* species with a groove at the apex of the internal canals of sternum VIII (fig. 227; character 17). A second group includes species *incanalis* to *retusus* (fig. 2, clade 15) and is supported by the presence of parallel carinae at the base of sternum VIII (fig. 229; character 18). The third group (clade 12; species *campbelli* to *dichymus*) includes species in which the pronotum is wider than it is long (character 8) and that also have a median carina extending posteriorly from the basal ridge (fig. 215) of tergum VIII (character 20).

Cylindroxystus (fig. 2, clade 2) is defined by the presence of a cupulate third antennal segment (fig. 8; character 4). Half the species also have internal canals at the base of segments III to VIII (characters 11, 12). There are several interesting species clusters in the genus. One (clade 5) includes species (*cavus*, *conconvoperculum*, and *lyrus*) with elongate 10th and 11th antennal segments (character 5). Another (*sinuosus* through *redactus*; fig. 2, clade 6) has stout, spinelike setae surrounding the apex of each of antennal segments 4 to 10 (fig. 8, character 3). Abdominal segment VIII is unique in clade 9 (*longulus*

to *redactus*) in that the base of the segment is cylindrical with the tergum and sternum fused (fig. 14; character 16) and the tergal base has a transverse suture that acts as a fulcrum when the tergum is raised.

DISCUSSION

This revision was unsatisfying in that so few specimens were available for study. The 47 species are represented by only 79 males and 32 females; 23 species are based only on the male holotype and three others only on the female holotype. The female is known for only 21 species. Only three species were available in numbers sufficient to allow dissection for more than the aedeagus. As a consequence, characters of the mouthparts, endosclerites, legs, antennae, and female genital segment could not be explored or illustrated more thoroughly. Furthermore, problems of morphological variation, distributional range, and habitat could not be addressed.

One of the most puzzling questions to be asked about *Cylindroxystina* species is, where do they live? Unfortunately, a relatively large number of species is represented by a small number of specimens. Nearly all were collected from leaf litter and other debris on the ground. Based on collecting data on the locality labels, it seems likely that most species will be found in forest-floor leaf litter at some distance from a stream. The one species (*milleri*) I collected was found in leaf litter on a dry slope above a stream. Other collectors have indicated similar sites; only a few specimens were collected in litter near a stream.

It is possible that, as with the *Dolicaonina*, many other species of the *Cylindroxystina* will be found at additional localities, especially if the habitat is identified. The 47 species of *Cylindroxystina* came from only 42 localities. Again, this is paralleled in the New World *Dolicaonina* where 78 species were found at 87 localities (Herman, 1981).

CYLINDROXYSTINA

Cylindroxystini Bierig, 1943: 158.

Type Genus: *Cylindroxystus*.

DIAGNOSIS: This subtribe is separated from all other *Paederinae* by the presence of a pair

of paratergites on abdominal segment III and their absence on segments IV to VII (fig. 1), the falcate, edentate mandibles (figs. 9, 67), and small nipple-shaped fourth segment of the maxillary palpus (figs. 6, 71). Tergum and

sternum VII are separated, not fused into a cylinder.

DESCRIPTION: Gular sutures widely separated (figs. 5, 63). Mandibles sickle-shaped and edentate (figs. 9, 67). Maxillary palpus with fourth segment small and nipple-shaped (figs. 6, 71). Prothoracic furcasternum widely separated from hypomeron (figs. 10, 66). Mesothoracic peritreme small. Abdominal segment III with one pair of paratergites (fig. 1); segments IV to VII without paratergites (fig. 1); segments IV to VI with tergum and sternum fused into cylinder; segment VII with sternum and tergum separated. Metatibia with comb on both sides of apex.

DISCUSSION: *Cylindroxystina* was first recognized by Bierig (1943) as a tribe which he

regarded to be a link between the larger tribes Pinophilini and Paederini. He proposed this arrangement because *Cylindroxystus*, the only genus, has a cylindrical abdomen, as in the Procirrina, and a small fourth segment of the maxillary palpus, as in the Paederini.

I reduce the tribe to a subtribe of the Paederini and add another genus, *Neolindus*. The group is moved to the Paederini because it has the small fourth segment of the maxillary palpus, a tribal synapomorphy, and exhibits none of the characters of Pinophilini. The cylindrical abdomen, thought by Bierig to support a connection with the Pinophilini and seen only in the subtribe Procirrina, is structurally different and therefore not homologous.

CYLINDROXYSTUS

Figures 3–62

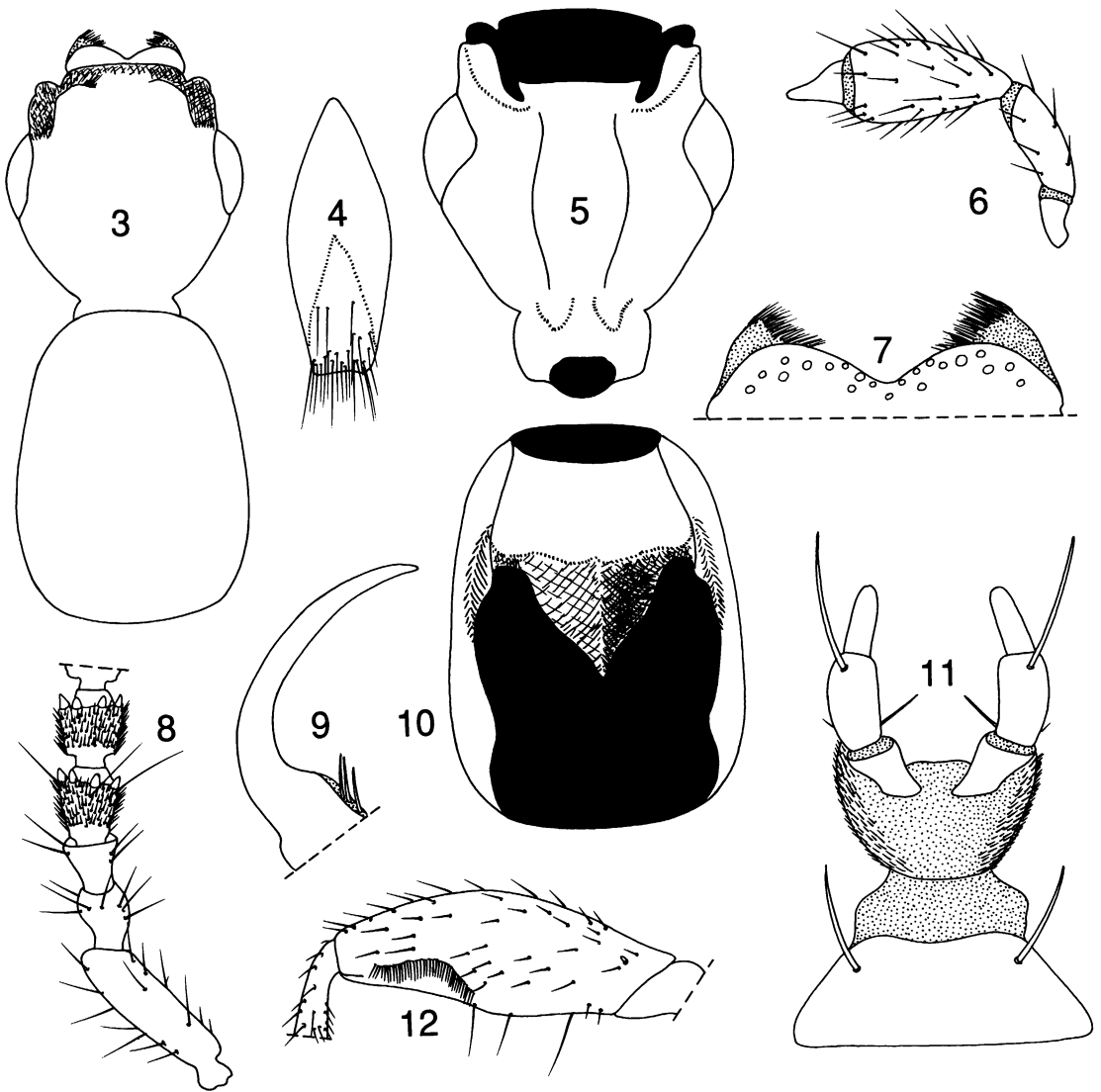
Cylindroxystus Bierig, 1943: 158. Type species: *Cylindroxystus longulus* Bierig. Fixed by Bierig, 1943: 158, 160 by original designation and monotypy. — Blackwelder, 1952: 114 (type species).

DIAGNOSIS: *Cylindroxystus* can be separated from all other Paederinae by the presence of paratergites on segment III and their absence from segments III to VII, and by the cupulate third antennal segment (fig. 8). Tergum and sternum IV to VI are fused to form a cylinder, the fourth segment of the maxillary palpus is nipple-shaped (fig. 6), and the mesothoracic peritreme is small.

DESCRIPTION: Head shape variable; sides gradually convergent toward base and without basal angles (fig. 3) or gradually rounded toward base and with rounded basal angles. Neck about four-tenths to one-half width of head; dorsal surface with transverse groove. Lateral edge of gena expanded laterally (fig. 3). Eye length much less than postocular length to much greater than postocular length, eye occupying most of lateral side of head. Eyes without setae. Tentorium with dorsal arms touching vertex just behind line across middle of eyes. Surface polished and with scattered punctation, often punctulate. Gular sutures widely separated (fig. 5); surface with two setae. Head without trichobothria (fig. 3). Antenna with first segment nearly as long

as segment 2 through 4 to 2 through 5; segments not or slightly expanded apically; segment 3 cupulate (fig. 8) or not cupulate but with carina around apex. Mandible long, slender, falcate, and edentate (fig. 9); protheca reduced to membranous region with a few setae at base of mandible. Maxillary palpus (fig. 6) moderately long; second segment shorter than third and gradually expanded apically; third segment strongly expanded from base to near middle then slightly narrowed to apex; fourth segment nipple-shaped and small, about one third length of third segment. Labial palpus (fig. 11) with first segment shorter than second and second longer than third; first and second segments of similar thickness and third more slender. Labrum edentate and deeply and broadly emarginate (fig. 7).

Prothorax (fig. 3) longer than wide; widest near middle, near base, or parallel sided. Surface shining, with scattered punctures. Lateral margin without stout setae. Marginal bead present; bead joining tergo-sternal suture anteriorly. Protergo-sternal suture present. Hypomeron polished and without punctures or sculpturing. Prosternum with or without median carina extending toward anterior margin. Prosternum (fig. 10) without broad punctate region anterior to procoxae. Furcasternum (fig. 10) moderately broad but widely separated from hypomeron; surface with median carina. Procoxal cavity open poste-



Figs. 3–12. *Cyliandroxyustus furvus*. 3. Head and pronotum, dorsal view, setae omitted. 4. Sternum IX, male. 5. Head, ventral view, setae omitted. 6. Maxillary palpus. 7. Labrum, setae removed. 8. Antennal segments 1 to 5. 9. Mandible, left. 10. Prothorax, ventral view, setae omitted. 11. Labium. 12. Profemur, anterior view.

riorly (fig. 10). Mesothoracic peritreme small. Elytra with epipleural ridge. Scutellum impunctate and polished. Meso-metasternal suture well developed. Mesendosternite straight. Metendosternite forked.

Abdominal segment III with one pair of paratergites; segments IV to VII without paratergites; segments IV to VI each with tergum and sternum indistinguishably fused and forming cylinder; segment VII with tergum

and sternum separated. Sternite II narrow and fused to III; posterior margin without setae. Sternites II and III with median carina. Sternite IV without gland on anterior margin. Abdomen without glandular openings in intersegmental membrane. Abdominal segments with or without internal canals at base of terga and/or sterna. Sternum IX of male elongate, tapered basally and truncate apically (fig. 4). Tergum IX (fig. 26) fused me-

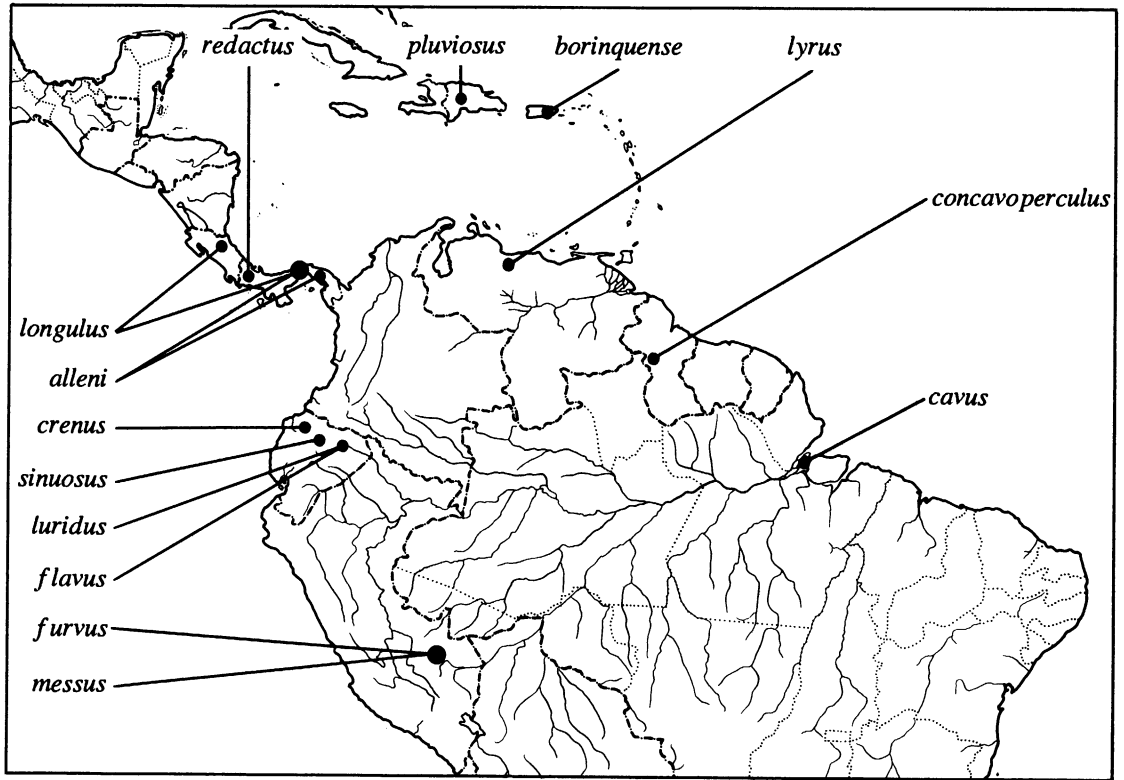


Fig. 13. Distribution of *Cyliandroxystus* in Central and South America. Large dots represent several localities.

dially; posterior margin entire. Tergum X exposed (fig. 26). Valvifer and coxite present (fig. 27).

Aedeagus with basal foramen directed to left in situ; parameres present and appressed to base near basal foramen (figs. 36, 42, 54) but usually difficult to see or absent (fig. 15).

Protibia with two rows of combs. Metatibia with comb on both sides of apex or on inner side only. Profemur with comb on ventral edge of anterior face (fig. 12). Tarsal segments without middorsal groove; fourth segment not expanded as lobe beneath fifth segment; protarsal segments densely pubescent beneath first four segments; segments 1 to 4 of mesotibia and metatibia with some setae on ventral surface but not densely pubescent.

DISTRIBUTION AND HABITAT: *Cyliandroxystus*, until now known only from Costa Rica, occurs in Costa Rica, Panama, Colombia, Ecuador, Peru, Brazil, Guyana, and Venezuela. Two species are from the mountains of Puerto Rico and Hispaniola (fig. 13).

Little is known of the habitat but most of the specimens were taken from leaf litter. The species are rarely collected and the largest sample, eight specimens of *furvus*, was collected from the surface of a tent. Most species are represented by one or two specimens and most were collected in the lowlands. Some were found in the highlands above 900 m and one species at about 7000 ft (2100 m).

DISCUSSION: For the 14 species reported herein only 29 males and 8 females were studied. Six species are each represented by one male. Females are known for only 6 of the 14 species.

Five species of *Cyliandroxystus* are flightless and have reduced elytra and flying wings. These five were collected above 900 m elevation. At least two species (*longulus* and *lyrus*), evidently capable of flight, were found above 900 m. Other species may have been collected above 900 m and apparently can fly but the elevation date was not given on the label.

All species, except *pluviuosus* and *bor-*

inquese, have a cupulate third antennal segment (fig. 8). These two have instead a carina surrounding the apex of the third segment.

KEY TO MALES OF *CYLINDROXYSTUS*

1. Segment VIII with tergum and sternum divided from base to apex (fig. 56) 2
Segment VIII with tergum and sternum fused at base into cylinder (fig. 14) 9
- 2(1). Antennal segments 10 and 11 elongated; 10 more than three times longer than 9 3
Antennal segments 10 and 11 unmodified; 10 approximately as long as 9 5
- 3(2). Sternum VIII with base of emargination acute (fig. 56); antennal segment 10 about 13 times longer than 9 and 10 longer than 11; Venezuela ... 12. *lyrus*
Sternum VIII with base of emargination rounded (figs. 46, 50); antennal segment 10 about 4 to 6 times longer than 9 and 10 subequal to 11 4
- 4(3). Antennal segment 10 about six times as long as 9; aedeagus with operculum as shown in figure 47; Brazil .. 10. *cavus*
Antennal segment 10 about four times as long as 9; aedeagus with operculum as shown in figure 51; Guyana 11. *concavoperculus*
- 5(2). Abdominal segments IV to VIII with deep, posteriorly directed groove at base near lateral margin (fig. 62); Puerto Rico .. 14. *borinquense*
Abdominal segments IV to VIII without deep groove but with depression at base near lateral margin 6
- 6(5). Pronotal and elytral (measured along suture from apex of scutellum to line across posterior margin of elytra) length approximately equal; tergum VIII with triangular lobe on posterior margin (fig. 37); Peru 7. *messus*
Pronotum shorter than elytra; tergum VIII with rounded posterior margin (figs. 38, 44, 57) 7
- 7(6). Sternum VIII with shallowly emarginate posterior margin (fig. 59); tergum VIII with strongly rounded posterior margin (fig. 57); Dominican Republic 13. *pluviosus*
Sternum VIII with moderately deep emargination of posterior margin (figs. 41, 45); tergum VIII with slightly rounded posterior margin (figs. 38, 44) 8

- 8(7). Aedeagus with deep depression just behind basal foramen (fig. 39); ventral surface of median lobe with apical half broadly rounded; Ecuador 8. *crenus*
Aedeagus with broad depression at apical fifth of ventral surface of median lobe and another just behind basal foramen (depressions shown in lateral view of aedeagus in fig. 43); Ecuador 9. *sinuosus*
- 9(1). Elytra reduced, shorter than pronotum; Panama 6. *reductus*
Elytra longer than pronotum 10
- 10(9). Sternum VIII with rounded posterior margin (fig. 20); Ecuador ... 3. *flavus*
Sternum VIII with shallowly (figs. 16, 19) to feebly (figs. 25, 31) emarginate posterior margin 11
- 11(10). Sternum VIII shallowly emarginate (figs. 16, 19) 12
Sternum VIII feebly emarginate or truncate (figs. 25, 31) 13
- 12(11). Pronotal length/width ratio 1.31–1.35; Costa Rica; Panama ... 1. *longulus*
Pronotal length/width ratio 1.17–1.20; Panama 2. *alleni*
- 13(11). Head with postocular margins gradually curved to distinct basal angles of head; aedeagus with bilobed carina at base of operculum (fig. 24); elytra bicolored yellowish brown with reddish brown along suture and apices; Ecuador 4. *luridus*
Head with postocular margins strongly convergent posteriorly from eyes (fig. 3); head with poorly developed basal angles; aedeagus with two short, transverse carinae at base of operculum (fig. 30); elytra concolorous reddish brown to dark reddish brown; Peru 5. *furvus*

DESCRIPTION OF SPECIES

1. *Cylindroxystus longulus* Bierig Figures 13, 14–16

Cylindroxystus longulus Bierig 1943: 160. (Type locality: Costa Rica: Finca Castilla. Holotype: Female, examined; deposited FMNH.)

DIAGNOSIS: This species is one of six with the tergum and sternum of abdominal segment VIII fused into a cylinder (fig. 14) and may be separated from others (except *alleni*) by the moderately deep emargination of sternum VIII (fig. 16) and the absence of internal

canals at the base of sternum VIII. Males of *longulus* are distinguished from those of *alleni* by the narrower prothorax. The length/width ratio for *longulus* is 1.31–1.35 whereas that of *alleni* is 1.17–1.20.

DESCRIPTION OF MALE: Length 3.3 to 5.5 mm.

Color dark reddish brown, antennae and legs paler, yellowish brown.

Dorsum of head with punctures confined to edges of vertex; central region of vertex glabrous, devoid of punctation or punctulation or with some punctulation. Postocular margin of head broadly rounded and moderately convergent to rounded basal angle. Eye length less than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 each with short, stout, spinelike setae around apex; segment 10 approximately as long as 9 and about two-thirds as long as 11.

Prothorax longer than wide; pronotal length/width 1.31–1.35 ($\bar{x} = 1.32$; $SD = 0.01$; $n = 6$). Pronotum with paramedial row of two punctures, and with scattered punctures laterad of impunctate median strip. Prosteronum without pit adjacent to median carina; median carina present but short and poorly developed. Elytral length greater than pronotal length; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with posterior margin broadly and feebly emarginate. Segment VIII with tergum and sternum fused at base; tergum VIII with transverse suture across base and posterior margin with small, broad, apically rounded triangular lobe (fig. 14); sternum VIII without internal canals near base; sternum VIII with moderately deep, median emargination (fig. 16); median surface of sternum VIII without depression; tergum and sternum VIII with elongate, setigerous "cells" at base.

Aedeagus (fig. 15) with median orifice covered by an operculum; operculum with small transverse carina near lateral margin; ventral surface of median lobe without depressions, lobes, or processes.

FEMALE: Characters of head, prothorax, and

elytra as described for male. Sternum VII with truncate posterior margin. Tergum VIII with broad, apically rounded, triangular lobe on posterior margin. Sternum VIII with posterior margin feebly emarginate or truncate.

DISCUSSION: *Cylindroxystus longulus*, the type species of the genus, was described on the basis of a single female from Finca Castilla in Costa Rica. The females of *Cylindroxystus* are difficult to identify or to associate with conspecific males. Four males and a female from central Panama are almost indistinguishable from *longulus*. The Panamanian female and the holotype can be separated only by size, the holotype is larger, and the condition of the posterior margin of sternum VIII, which is truncate for the holotype and feebly emarginate for the Panamanian specimen. The Panamanian specimens were collected at about 3200 ft elevation but the elevation and location of the Costa Rican locality, Finca Castilla, are unknown. However, the holotype specimen label indicates the Finca is on or near the Limon plain, which suggests a lowland locality. Until other evidence is available I regard the Panamanian specimens to be *longulus*.

DISTRIBUTION AND HABITAT: The species is known from the Limon plain of Costa Rica where it was collected in June from forest humus and from Panama where it was found in leaf litter at 3200 ft (fig. 13).

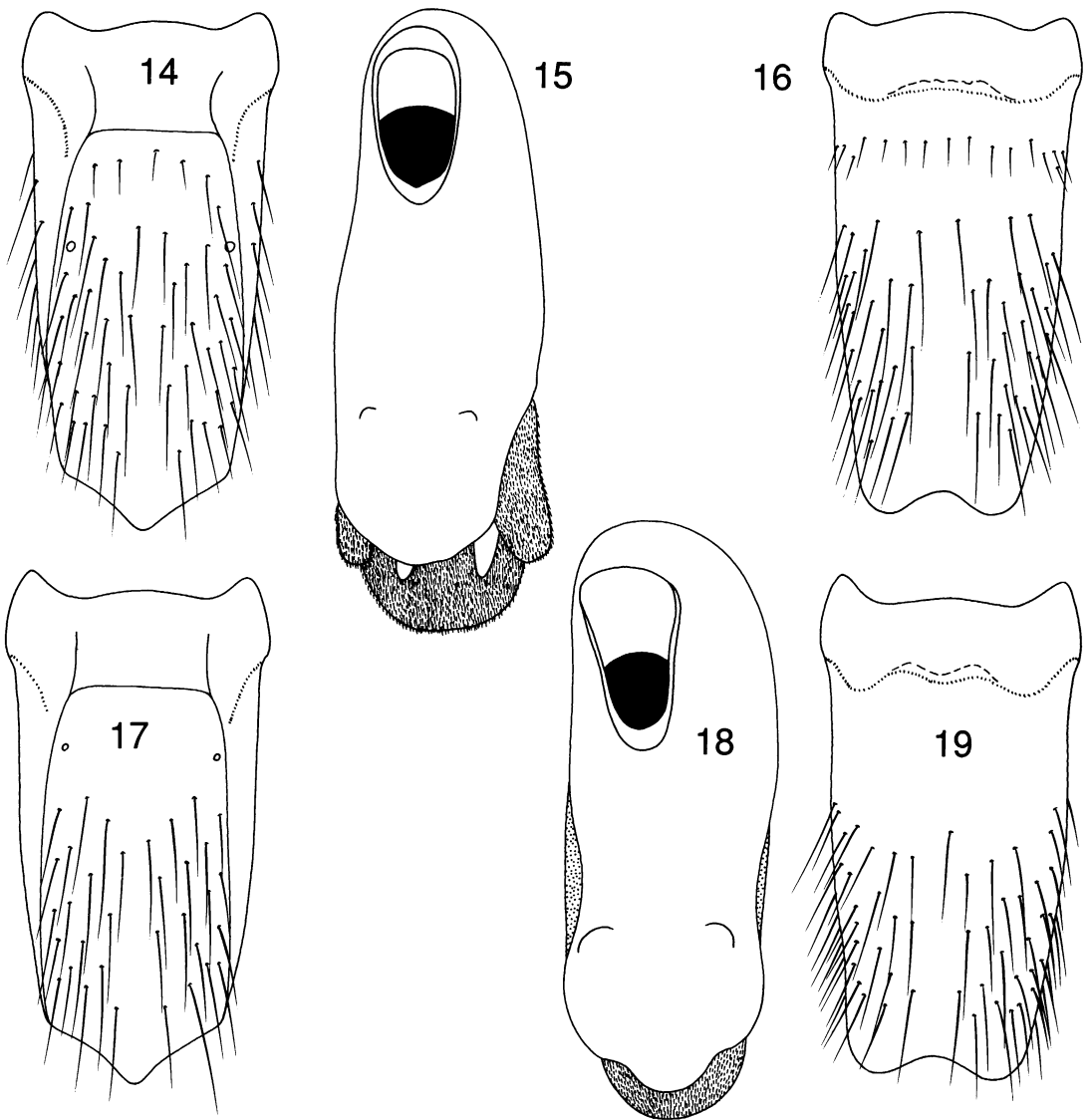
MATERIAL EXAMINED: **Costa Rica:** Finca Castilla, llano de Limón, June, 1938 (holotype; deposited FMNH). **Panama:** *Panama:* Cerro Campana, 3200 ft, February, 1976 (2 males, 1 female; deposited MCZ), June 17, 1976 (1 male, 1 female; deposited MCZ), cloud forest leaf litter, A. Newton collector.

2. *Cylindroxystus alleni*, new species

Figures 13, 17–19

HOLOTYPE: Male. Panama: Canal Zone: Albroom Forest Site Ground, November 28, 1967, black light trap, Hutton & Gonzalez collectors (deposited AMNH).

PARATYPES: Four males. **Panama:** *Canal Zone:* with same data as and deposited with holotype (2 males; deposited AMNH); Barro Colorado Island, February 13, 1976, litter under rotting logs, A. Newton collector (1 male; deposited MCZ); *Panama Province:*



Figs. 14–16. *Cyliandroxyustus longulus*, male. 14. Segment VIII, dorsal view. 15. Aedeagus, ventral view. 16. Sternum VIII.

Figs. 17–19. *Cyliandroxyustus alleni*, male. 17. Segment VIII, dorsal view. 18. Aedeagus, ventral view. 19. Sternum VIII.

Altos de Majé, October 6–15, 1975, leaf litter along stream margin, D.S. Chandler collector (1 male; deposited MCZ).

DIAGNOSIS: This species, one of six with the tergum and sternum of abdominal segment VIII fused into a cylinder (fig. 17), can be separated from all others except *longulus* by the moderately deep emargination of sternum VIII (fig. 19) and the absence of internal

canals at the base of sternum VIII (fig. 19). *Cyliandroxyustus alleni* is similar to *longulus* and is separated by the wider prothorax. The length/width ratio for *alleni* is 1.17–1.20 and for *longulus* it is 1.31–1.35.

DESCRIPTION OF MALE: Length about 4.2 mm.

Color reddish brown, legs and antennae paler.

Dorsum of head with punctation confined to edges of vertex; median surface with scattered punctulation. Postocular margin of head gradually rounded and moderately convergent to rounded basal angle. Eye length greater than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 with short, stout, spinelike setae surrounding apex of each segment; segment 10 approximately as long as 9 and about two thirds as long as 11.

Prothorax longer than wide; pronotal length/width 1.17–1.20 (\bar{x} = 1.19; SD = 0.01; n = 5). Pronotum with paramedial row of two punctures and with a few scattered punctures laterad of row. Prosternum without pit adjacent to median carina; median carina present and distinct. Elytral length greater than pronotal length; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with broad, shallow, median emargination of posterior margin; median surface without setae or depressions. Segment VIII with tergum and sternum fused at base; tergum VIII with transverse suture across base and posterior margin with broad, moderately large, apically rounded, triangular lobe (fig. 17); sternum VIII without internal canals near base (fig. 19); sternum VIII with broad, moderately deep, median emargination of posterior margin and median surface without setae or depressions (fig. 19); tergum and sternum VIII with elongate "cells" near base.

Aedeagus (fig. 18) with median orifice covered with operculum; operculum with minute, transverse carina near lateral margin of base; ventral surface of median lobe without lobes, depressions, or processes.

FEMALE: Characters of head, prothorax, and elytra as described for male. Sternum VII with posterior margin truncate. Tergum VIII with triangular, apically rounded lobe on posterior margin. Sternum VIII with feebly emarginate posterior margin.

DISTRIBUTION AND HABITAT: This species is known from two, presumably lowland, localities in Panama (fig. 13). At the Majé lo-

cality it was collected from leaf litter and on Barro Colorado Island it was taken at a black light and from litter.

ETYMOLOGY: To honor his contributions to the study of beetles, this species is named for my long-time friend and colleague Robert T. Allen of the University of Arkansas, who gave me most of the specimens.

MATERIAL EXAMINED: Holotype, four paratypes and two females.

The females were collected as follows: **Panama:** *Canal Zone:* Barro Colorado Island, February 12, 1976, litter under old tree and vine fall, A. Newton, deposited in the Museum of Comparative Zoology, Cambridge, Massachusetts.

3. *Cylindroxystus flavus*, new species

Figures 13, 20–22

HOLOTYPE: Male. Ecuador: Napo: Limoncocha, 250 m, June 18, 1976, *Ficus* litter with fruits, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: *Cylindroxystus flavus*, one of six species with the tergum and sternum of abdominal segment VIII fused basally into a cylinder (fig. 22), can be separated from them by the broadly rounded posterior margin of abdominal sternum VIII of the male (fig. 20). This species, with infusions of yellowish brown on reddish brown elytra, is similar to *luridus* and can be distinguished by the two small carinae near the lateral basal margin of the operculum of the aedeagus (fig. 21), absence of the internal canals of abdominal sternum VIII (fig. 20), and its smaller size.

DESCRIPTION OF MALE: Length about 2.8 mm.

Color reddish brown with paler yellowish brown infusions on elytra, legs and antennae yellowish brown.

Dorsum of head with punctation confined to edges of vertex; median surface with sparse punctulation. Postocular margin of head gradually rounded and moderately convergent to rounded, weak basal angle. Eye length less than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 [difficult to see because of size of species] with short, stout, spinelike setae surrounding apex of each segment; segment 10 approximately as long as 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.32. Pronotum with paramedial row of two punctures and with a few scattered punctures laterad of row. Prosternum without pit near midline; median carina absent. Elytra longer than pronotum; surface with sutural and two discal rows of punctures; surface shining between punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with truncate posterior margin. Segment VIII with tergum and sternum fused at base; tergum VIII with transverse suture across base and posterior margin with small, broad, apically rounded, triangular lobe (fig. 22); sternum VIII (fig. 20) without internal canals near base; sternum VIII with broadly rounded posterior margin and median surface without setae or depressions; tergum and sternum VIII with elongate "cells" near base; sternum VIII with weak carinae near base.

Aedeagus (fig. 21) with median orifice covered by operculum; operculum with small transverse carina near lateral margin; ventral surface of median lobe without depressions, lobes, or processes.

DISCUSSION: *Cylindroxystus flavus* is similar to *luridus* and was collected at the same locality and habitat at the same time. They can be separated by characters given in the Diagnosis.

DISTRIBUTION AND HABITAT: The species was collected in the eastern lowlands of Ecuador (fig. 13) from *Ficus* litter with fruit.

ETYMOLOGY: From the Latin *flavus* for yellow or yellowish, referring to the yellowish infusions on the elytra of this species.

MATERIAL EXAMINED: Holotype only.

4. *Cylindroxystus luridus*, new species

Figures 13, 23–25

HOLOTYPE: Male. Ecuador: Napo: Limoncocha, 250 m, June 18, 1976, from *Ficus* litter with fruit, S. & J. Peck collectors (deposited FMNH).

DIAGNOSIS: *Cylindroxystus luridus* is one of six species with the base of the sternum and tergum VIII fused into a cylinder (fig. 23). It can be separated from these other species by the feebly emarginate posterior margin of abdominal sternum VIII (fig. 25), pres-

ence of internal canals at the base of abdominal sternum VIII (fig. 25), the bilobed carina at the base of the aedeagal operculum (fig. 24), and the reddish brown infusions on the yellowish brown elytra.

DESCRIPTION OF MALE: Length about 4.1 mm.

Color of head, prothorax, and abdomen reddish brown; elytra yellowish brown with reddish brown infusions along suture and apical third; legs and antennae yellowish brown.

Dorsum of head with punctation confined to edges of vertex; median surface glabrous. Postocular margin of head gradually rounded and moderately convergent to rounded basal angle. Eye length about equal to postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 with short, stout, spinelike setae surrounding apex of each segment (as in fig. 8); segment 10 approximately as long as 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.18. Pronotum with paramedial row of two punctures and with a few scattered punctures laterad of row. Prosternum without pit adjacent to median carina; median carina present and moderately developed. Elytra longer than pronotum; surface with sutural row and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with broad, shallow median emargination of posterior margin; median surface without setae. Segment VIII with tergum and sternum fused at base; tergum VIII with transverse suture across base and posterior margin with small, apically rounded, triangular lobe on posterior margin (fig. 23); sternum VIII (fig. 25) with internal canal near middle of base and another on lateral side (visible only in lateral view); posterior margin of sternum VIII with broad, shallow median emargination; median surface of sternum VIII without setae or depression; tergum and sternum VIII with elongate "cells" near base; sternum weakly carinate near base.

Aedeagus (fig. 24) with median orifice cov-

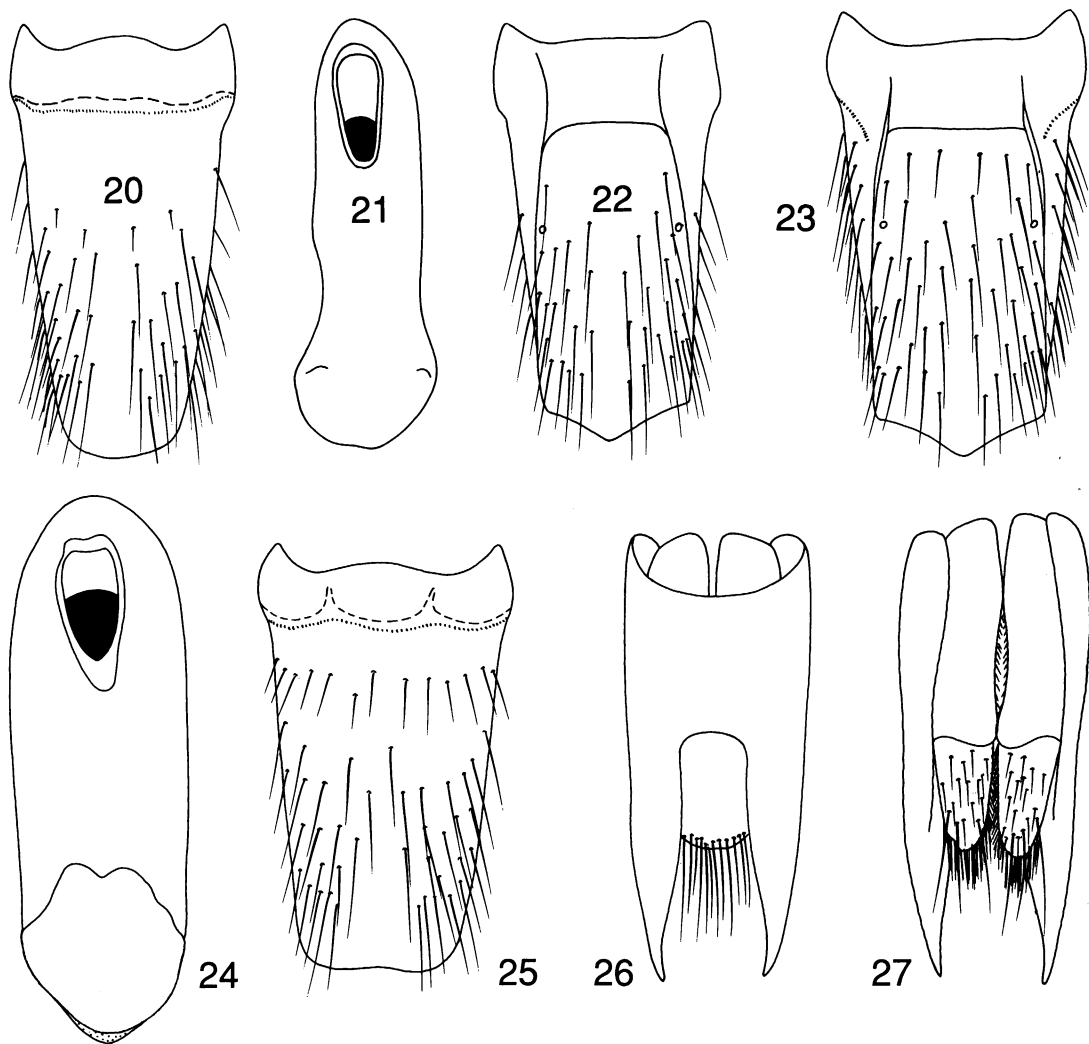


Fig. 20-22. *Cyliandroxystus flavus*, male. 20. Sternum VIII. 21. Aedeagus, ventral view. 22. Segment VIII, dorsal view.

Figs. 23-25. *Cyliandroxystus luridus*, male. 23. Segment VIII, dorsal view. 24. Aedeagus, ventral view. 25. Sternum VIII.

Figs. 26-27. *Cyliandroxystus* sp., female. 26. Terga IX and X, setae omitted. 27. Segment IX, ventral view.

ered by operculum; operculum with bilobed anterior margin and unadorned surface; median lobe without lobes, depressions, or processes.

DISTRIBUTION AND HABITAT: This species was found in the eastern lowlands of Ecuador (fig. 13) where it was collected from *Ficus* litter with fruit.

ETYMOLOGY: From the Latin *luridus* for

pale yellow, referring to the yellowish infusions on elytra of the species.

MATERIAL EXAMINED: Holotype only.

5. *Cyliandroxystus furvus*, new species

Figures 3-13, 28-31

HOLOTYPE: Male. Peru: Cuzco Departamento: Pillahuata, Manu rd., km 128, Sep-

tember 16, 1982, on tent, collectors L.E. Watrous and G. Mazurek (deposited FMNH).

PARATYPES: Five males with same label data as holotype (deposited 4 FMNH; 1 AMNH).

DIAGNOSIS: *Cylindroxystus furvus* is one of six species with the base of abdominal tergum and sternum VIII fused into a cylinder (fig. 28) but it is readily separated from these species by the strongly convergent postocular lateral margins of the head (fig. 3). Other diagnostic characters include the feebly emarginate posterior margin of sternum VIII (fig. 31), absence of internal canals at the base of sternum VIII (fig. 31), and the presence of two transverse carinae at the base of the aedeagal operculum (fig. 30).

DESCRIPTION OF MALE: Length 3.5 to 4.1 mm.

Color dark reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; central portion of vertex glabrous and devoid of punctation and punctulation. Postocular margin of head gradually curved and strongly convergent to feeble basal angle. Eye length about equal to postocular length of head (fig. 3). Labrum edentate, and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 each with short, stout, spinelike setae around apex (fig. 8); segment 10 approximately as long as 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.29–1.39 (\bar{x} = 1.35; SD = 0.03; n = 7). Pronotum with paramedial row of two punctures and with scattered punctures laterad of row. Prosternum without pit near midline; median carina absent. Elytra longer than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with truncate posterior margin. Segment VIII with sternum and tergum fused at base (fig. 28); tergum VIII with transverse suture across base and posterior margin with triangular, apically rounded, median lobe (fig. 29) or with median lobe truncate (fig. 28); sternum VIII (fig. 31) without internal canals near base; sternum VIII with posterior margin feebly emarginate and

median surface without setae or depression; sternum and tergum VIII with elongate, feebly developed "cells" near base.

Aedeagus (fig. 30) with median orifice covered by operculum; operculum with small, transverse carina near lateral margin of base; ventral surface of median lobe without lobes, depressions, or processes.

FEMALE: Characters of head, prothorax, and elytra as described for male. Sternum VII with posterior margin truncate. Tergum VIII with triangular, apically rounded lobe on posterior margin. Sternum VIII with truncate posterior margin.

DISTRIBUTION AND HABITAT: This species is known from the eastern highlands of Peru (fig. 13) where it was collected on a tent.

ETYMOLOGY: From the Latin *furvus* for dark or dusky, referring to the dark color of this species.

MATERIAL EXAMINED: Holotype, five paratypes, and two females all collected together.

6. *Cylindroxystus redactus*, new species

Figures 13, 32–34

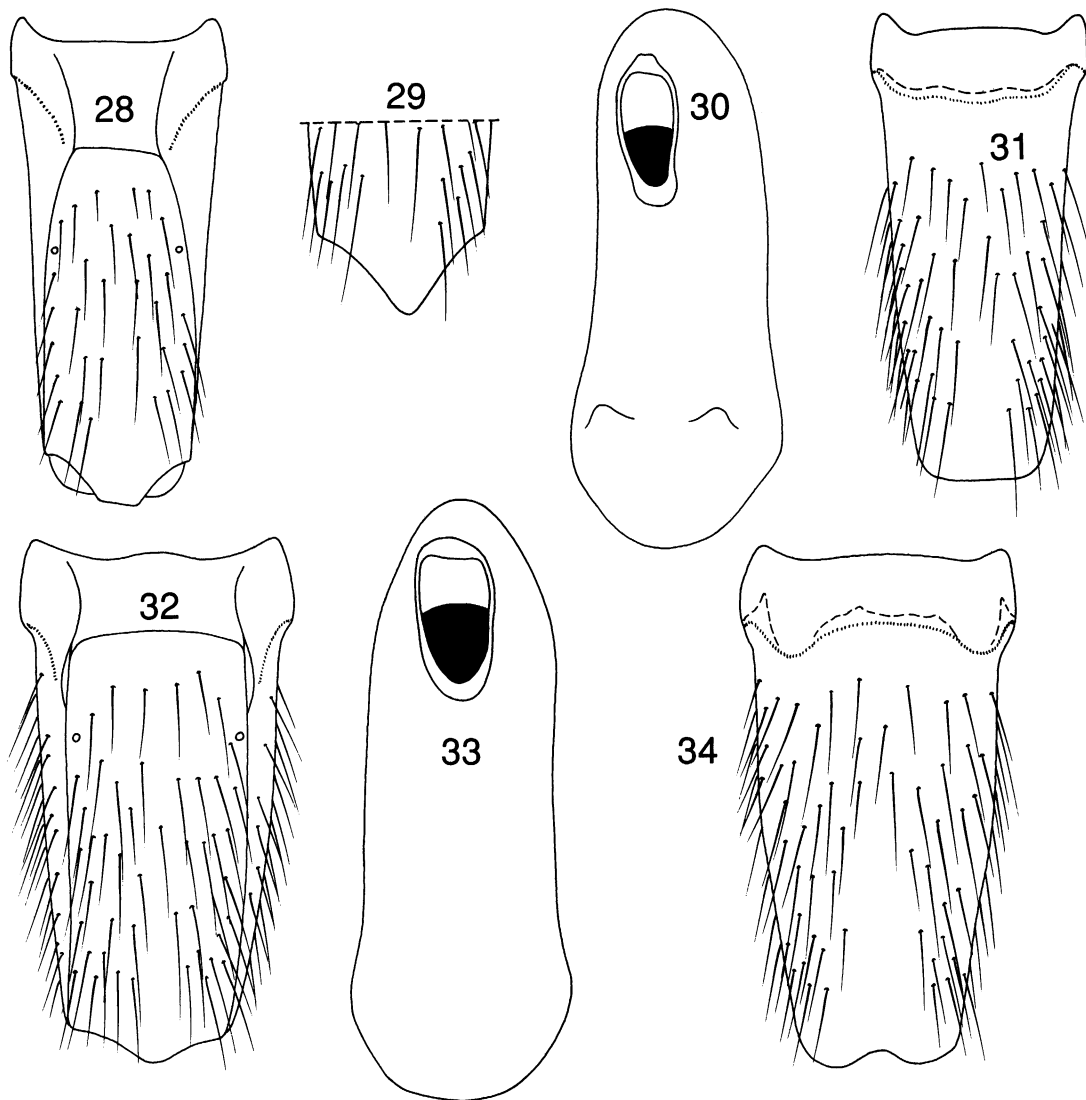
HOLOTYPE: Male. Panama: Chiriqui: 3.5 km E of Escopeta, 81°50'W 8°34'N, 1856 m, June 18, 1980, humus from Cerro Bollo cloud forest, J. Wagner collector (deposited FMNH).

DIAGNOSIS: *Cylindroxystus redactus*, one of the six species with the base of abdominal sternum and tergum VIII fused into a cylinder (fig. 32), is the only one of the six with reduced eyes and elytra. The posterior margin of sternum VIII (fig. 34) is moderately deeply emarginate and internal canals are present basally.

DESCRIPTION OF MALE: Length about 4 mm.

Color reddish brown, legs and antennae paler.

Dorsum of head with punctation confined to edges of vertex; median surface sparsely punctulate. Postocular margin of head gradually curved and moderately convergent to basal angle. Eye length much less than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 with short, stout, spine-like setae surrounding apex of each segment (as in fig. 8); segment 10 approximately as long as 9 and about half as long as 11.



Figs. 28–31. *Cylindroxystus furvus*, male. 28. Segment VIII, dorsal view. 29. Tergum VIII, apex. 30. Aedeagus, ventral view. 31. Sternum VIII.

Figs. 32–34. *Cylindroxystus redactus*, male. 32. Segment VIII, dorsal view. 33. Aedeagus, ventral view. 34. Sternum VIII.

Prothorax longer than wide; pronotal length/width 1.34. Pronotum with parame-dial row of two punctures and with a few scattered punctures laterad of row. Proster-num without pit adjacent to median carina; median carina present but short. Elytra shorter than pronotum; surface with row of punctures near suture and another near lateral margin. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove or internal canal at base near lateral margin. Sternum VII with broad, shallow emargination of posterior margin; median surface without setae. Segment VIII with tergum and sternum fused at base (fig. 32); tergum VIII with transverse suture across base and posterior margin with small, broad, apically rounded triangular lobe (fig. 32); sternum VIII (fig. 34) with internal canals near

lateral edge of base; posterior margin of sternum VIII with broad, moderately deep emargination (fig. 34); median surface of sternum VIII without setae or depression; tergum and sternum VIII with elongate "cells" near base.

Aedeagus (fig. 33) with median orifice covered by simple, unadorned operculum; ventral surface of median lobe without carinae, depressions, lobes, or processes.

FEMALE: Characters of head, prothorax, and elytra as described for male. Sternum VII with truncate posterior margin. Tergum VIII with broad, rounded lobe on posterior margin. Sternum VIII with truncate posterior margin.

DISCUSSION: The species is flightless.

DISTRIBUTION AND HABITAT: This species was collected from humus in a Panamanian (fig. 13) cloud forest at about 1800 m.

ETYMOLOGY: From the Latin *redactus* for reduced, referring to the reduced elytra and eyes of this species.

MATERIAL EXAMINED: Holotype and one female from the type locality (deposited FMNH).

7. *Cylindroxystus messus*, new species

Figures 13, 35–37

HOLOTYPE: Male. Peru: Cuzco Departamento: Consuelo, Manu rd, km 165, October 4, 1982, leaf litter, L.E. Watrous and G. Mazurek collectors (deposited FMNH).

PARATYPE: One male with same label data as holotype (deposited FMNH).

DIAGNOSIS: *Cylindroxystus messus* is one of eight species with the tergum and sternum of abdominal segment VIII separated. It is distinguished from them by the triangular lobe on the posterior margin of abdominal tergum VIII (fig. 37), the moderately deep emargination of the posterior margin of abdominal sternum VIII (fig. 35), and the two transverse carinae at the base of the aedeagal operculum (fig. 36).

DESCRIPTION OF MALE: Length about 4.6 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; median surface with scattered punctulation. Postocular margin of head gradually rounded and moderately convergent to rounded basal angle. Eye length less than postocular length of head. Labrum edentate and with broad, moderately deep

emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 each with short, stout, spinelike setae surrounding apex; segment 10 approximately as long as 9 and about two-thirds as long as 11.

Prothorax longer than wide; pronotal length/width 1.28–1.30 ($\bar{x} = 1.29$). Pronotum with paramedial row of two punctures and with a few scattered punctures laterad of row. Prosternum without pit adjacent to median carina; median carina present but short and moderately developed. Elytra approximately as long as pronotum; surface with a few punctures near suture and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, shallow, median emargination of posterior margin; median surface without depression. Segment VIII with tergum and sternum separated at base; tergum and sternum VIII each with two lateral and two median internal canals at base (figs. 35, 37); internal canals with smooth internal surfaces, without microtrichia; tergum VIII without transverse suture across base (fig. 35); tergum VIII with broad, apically acute, triangular lobe on posterior margin (fig. 37); sternum VIII (fig. 35) with moderately deep and broad median emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII with elongate "cells" near base.

Aedeagus (fig. 36) with median orifice covered by operculum; operculum with small, transverse carina near base; ventral surface of median lobe without lobes, depressions, or processes.

FEMALE: Unknown.

DISTRIBUTION AND HABITAT: This species was collected from leaf litter in the eastern highlands of Peru (fig. 13).

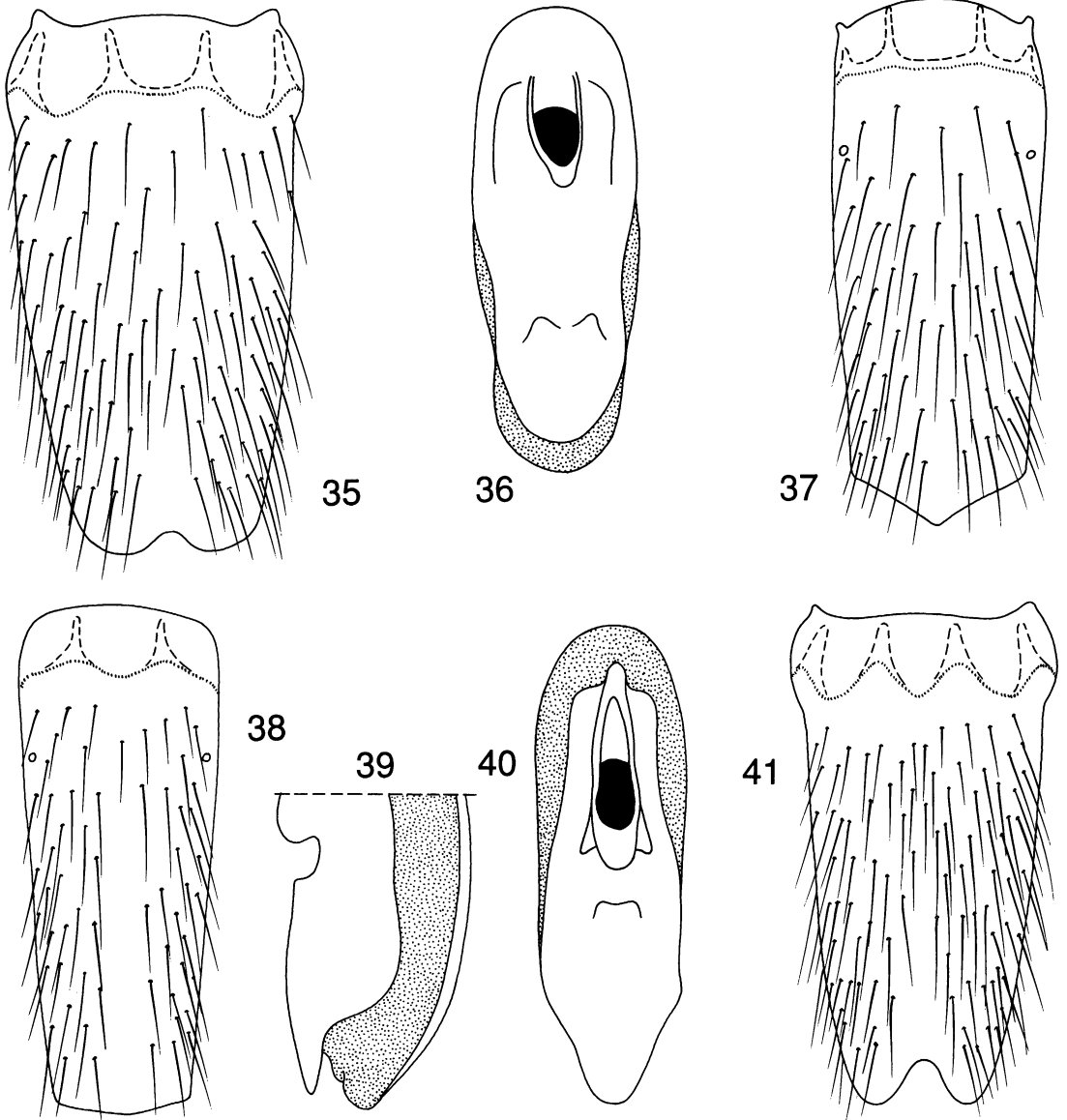
ETYMOLOGY: From the Latin *messus* for reap.

MATERIAL EXAMINED: Holotype and one paratype.

8. *Cylindroxystus crenus*, new species

Figures 13, 38–41

HOLOTYPE: Male. Ecuador: Pichincha: old Quito-Sto. Domingo rd, W. Chiriboza [sic; correct spelling is Chiriboga], 7100–7500 ft,



Figs. 35–37. *Cyliandroxystus messus*, male. 35. Sternum VIII. 36. Aedeagus, ventral view. 37. Tergum VIII.

Figs. 38–41. *Cyliandroxystus crenus*, male. 38. Tergum VIII. 39. Aedeagus, apex, lateral view. 40. Aedeagus, ventral view. 41. Sternum VIII.

June 10, 1982, leaf litter, H. Frania collector (deposited CNC).

PARATYPE: One male with same label data as holotype (deposited CNC).

DIAGNOSIS: *Cyliandroxystus crenus* is one of eight species with the tergum and sternum of

abdominal segment VIII separated and it is distinguished from most of those by the reduced elytra, that are shorter than the pronotum, and reduced eyes. The deep emargination of the posterior margin of abdominal sternum VIII (fig. 41) and features of the ae-

deagus (fig. 40) will permit separation from *sinuosus*, *borinquense*, and *pluviosus*, which also have reduced elytra.

DESCRIPTION OF MALE: Length about 5.7 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation around edges of vertex and with one setigerous puncture near center of vertex; surface with moderately dense punctulation. Postocular margin of head broadly curved and moderately convergent to rounded basal angle. Eye reduced, length much less than postocular length of head. Labrum edentate and with broad, deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 each with short, stout, spinelike setae surrounding apex; segment 10 slightly longer than 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.48–1.50 (\bar{x} = 1.49). Pronotum without paramedial row of punctures, punctation moderately dense laterad of impunctate median stripe. Prosternum without pit adjacent to median carina; median carina present and well developed. Elytra shorter than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on both sides of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, shallow emargination of posterior margin; median surface without depression. Segment VIII with tergum and sternum separated at base; tergum VIII with two and sternum with four internal canals; internal canals with smooth inner surfaces, without microtrichia; tergum VIII without transverse suture across base (fig. 38); tergum VIII (fig. 38) with slightly rounded posterior margin; sternum VIII (fig. 41) with moderately broad, deep, median emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII with carinae near base.

Aedeagus (fig. 39) without operculum covering median orifice; ventral surface of median lobe with sharp depression just behind basal foramen (figs. 39, 40).

FEMALE: Unknown.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: This species was collected from leaf litter on the western slopes of the Ecuadorian Andes at about 7000 ft elevation (fig. 13).

ETYMOLOGY: From the Latin *crena* for notch, referring to the notch on the ventral surface of the aedeagus that is best seen in lateral view.

MATERIAL EXAMINED: Holotype and one paratype.

9. *Cylindroxystus sinuosus*, new species Figures 13, 42–45

HOLOTYPE: Male. Ecuador: Napo: 24 km N Baeza, 1000 m, March 4, 1976, J.M. Campbell collector (deposited CNC).

DIAGNOSIS: *Cylindroxystus sinuosus*, with abdominal tergum and sternum VIII separated, reduced elytra, that is, shorter than the pronotum, reduced eyes, and absence of an operculum over the median orifice of the aedeagus (fig. 43), is thus distinguished from all but three species, *crenus*, *borinquense*, and *pluviosus*. From these three species, *sinuosus* is separated by the moderately deep emargination of the posterior margin of abdominal sternum VIII (fig. 45) and the broad depression on the apical quarter of the ventral surface of the aedeagus (fig. 43).

DESCRIPTION OF MALE: Length about 4.9 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation around edges of vertex and with one setigerous puncture near middle of vertex; median surface with moderately dense punctulation. Postocular margin of head broadly curved and moderately convergent to rounded basal angle. Eye reduced, length much less than postocular length of head. Labrum edentate and with broad, deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 each with short, stout, spinelike setae surrounding apex; segment 10 approximately as long as 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.4. Pronotum with paramedial row of 5 punctures and with scattered punc-

tures laterad of row. Prosternum without pit adjacent to median carina; median carina present and well developed. Elytra shorter than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on both sides of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, moderately deep, median of posterior margin; median surface without depression. Segment VIII with tergum and sternum separated at base; tergum and sternum VIII each with four internal canals (figs. 44, 45); tergum VIII with small lateral canals (fig. 44); internal canals with smooth inner surface, without microtrichia; tergum without transverse suture across base (fig. 44); tergum VIII (fig. 44) with broadly rounded posterior margin; sternum VIII (fig. 45) with broad, moderately deep emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII with carinae near base.

Aedeagus (fig. 42) without operculum covering median orifice; ventral surface of median lobe with broad depression at apical quarter; ventral surface sinuous in lateral view (fig. 43).

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: The species was collected from the eastern edge of the Ecuadorian Andes (fig. 13) where it was collected from leaf litter beside a fallen tree (Campbell, personal communication).

ETYMOLOGY: From the Latin *sinuosus* for full of bends, referring to the sinuate surface of the aedeagus as seen in lateral view.

MATERIAL EXAMINED: Holotype only.

10. *Cylindroxystus cavus*, new species

Figures 13, 46–48

HOLOTYPE: Male. Brazil: Pará: Ilha de Mosqueiro, June 20, 1974, soil-litter layer in primary forest, R.T. Schuh collector (deposited AMNH).

DIAGNOSIS: *Cylindroxystus cavus* can be separated from all other species of the genus by the pits on each side of the prosternal carina. This species is one of eight with tergum and sternum VIII separated, and one of

only three with the tenth and eleventh antennal segments elongated. *Cylindroxystus cavus* is separated from *conconvoperculus* and *lyrus*, which also have elongated antennal segments, by having the tenth antennal segment about six times as long as the ninth and subequal to the eleventh, by the moderately broad and moderately deep emargination of the posterior margin of abdominal sternum VIII (fig. 46), and by the form of the aedeagal operculum (fig. 47).

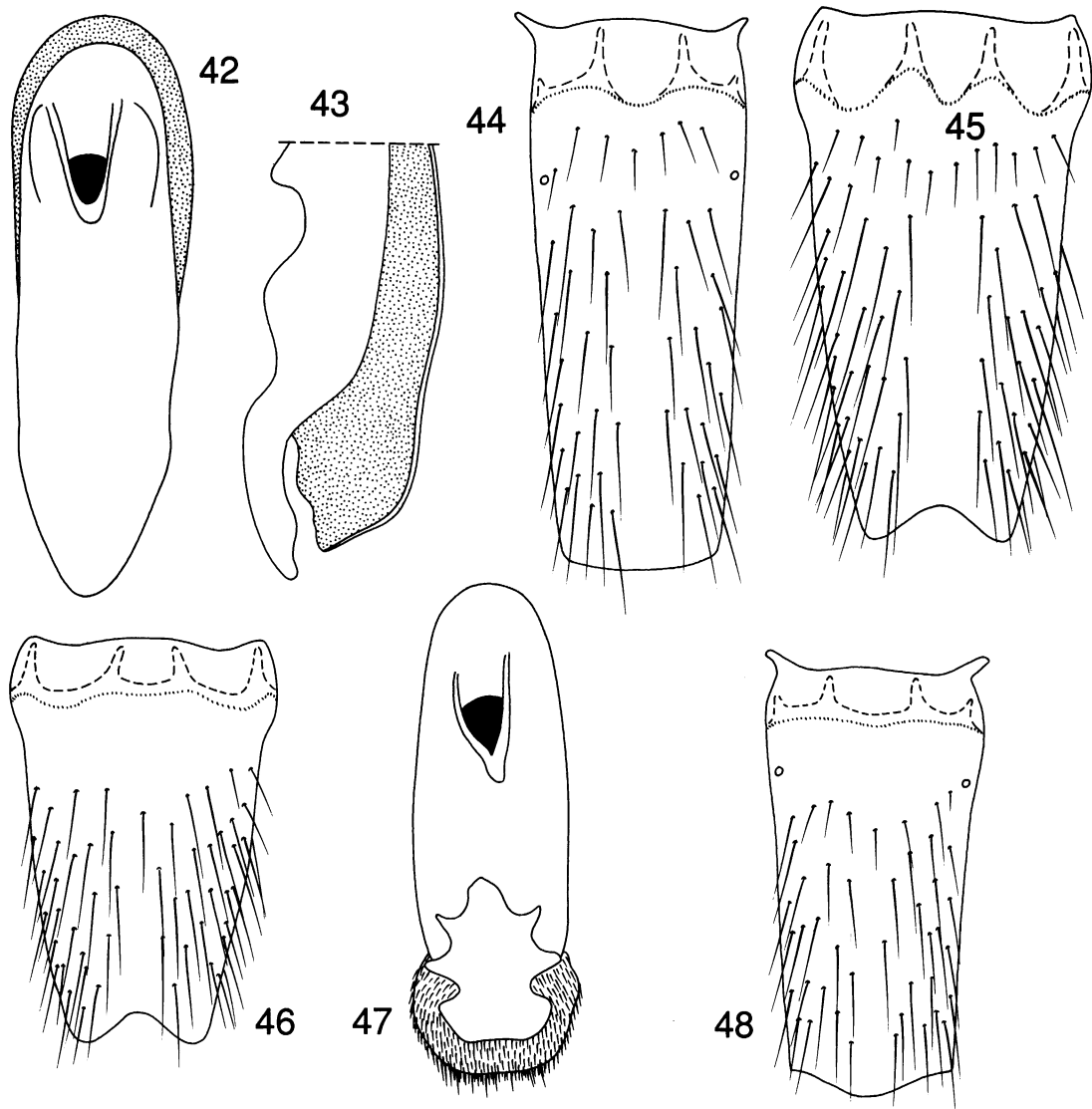
DESCRIPTION OF MALE: Length about 4 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; median surface with scattered punctulation. Postocular margin of head broadly rounded and moderately convergent to rounded basal angle. Eye length greater than postocular length of head, eye occupying most of lateral side of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 without short, stout, spinelike setae around apex of each segment; segments 10 and 11 elongated, 10 approximately six times as long as 9 and about equal to length of 11.

Pronotum longer than wide; pronotal length/width 1.18. Pronotum with paramedial row of four punctures and with scattered punctures laterad of row. Prosternum with large, deep pit adjacent to median carina; median carina present and well developed. Elytra longer than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, shallow, median emargination of posterior margin; median surface without setae or depression. Segment VIII with tergum and sternum separated at base; tergum (fig. 48) and sternum VIII (fig. 46) each with two lateral and two median internal canals at base; internal canals with microtrichia on internal surfaces; tergum VIII without transverse suture across base (fig. 48); tergum VIII (fig. 48) with broadly rounded posterior margin; sternum VIII (fig. 46) with broad, moderately deep median emargination of posterior mar-



Figs. 42-45. *Cyliandroxyastus sinuosus*, male. 42. Aedeagus, ventral view. 43. Aedeagus, apical half, lateral view. 44. Tergum VIII. 45. Sternum VIII.

Figs. 46-48. *Cyliandroxyastus cavus*, male. 46. Sternum VIII. 47. Aedeagus, ventral view. 48. Tergum VIII.

gin and median surface without setae or depression; tergum and sternum VIII with elongated "cells" near base.

Aedeagus (fig. 47) with median orifice covered by operculum; operculum with two lateral and one median lobe and surface without depression; ventral surface of median lobe without carinae, lobes, depressions, or processes.

FEMALE: Unknown.

DISTRIBUTION AND HABITAT: This species was collected from litter in eastern Brazil (fig. 13).

ETYMOLOGY: From the Latin *cavus* for hollow or hole, referring to the two prosternal pits.

MATERIAL EXAMINED: Holotype only.

11. *Cylindroxystus concavoperculus*,
new species

Figures 13, 49–51

HOLOTYPE: Male. British Guiana: Kaieteur, savannah and environs, September 4, 1937, Richards and Smith collectors (deposited FMNH).

DIAGNOSIS: *Cylindroxystus concavoperculus* is one of eight species with the tergum and sternum of abdominal segment VIII separated and one of only three with the 10th and 11th antennal segments elongated. It can be distinguished from *cavus* and *lyrus* by the tenth antennal segment that is four times longer than the ninth and shorter than the eleventh, by the broad, shallow emargination of the posterior margin of abdominal sternum VIII (fig. 50), and by the form of the aedeagal operculum (fig. 51).

DESCRIPTION OF MALE: Length about 4.7 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; median surface with moderately dense punctulation. Postocular margin of head broadly rounded and moderately convergent to rounded basal angle. Eye length greater than postocular length of head, eye occupying most of lateral side of head. Labrum edentate and with broad, deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 without short, stout, spinelike setae surrounding apex of each segment; segments 10 and 11 elongate, 10 approximately four times longer than 9 and shorter than, about four-fifths as long as, 11.

Pronotum longer than wide; pronotal length/width 1.28. Pronotum with paramedial row of four punctures and with scattered punctures laterad of row. Prosternum without pit adjacent to median carina; median carina present and well developed. Elytra longer than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, shallow emargination of posterior margin; median surface without depression. Segment VIII with tergum and sternum sep-

arated at base; tergum and sternum VIII each with two lateral and two median internal canals (figs. 49, 50); internal canals with microtrichia on internal surface; tergum VIII without transverse suture across base (fig. 49); tergum VIII (fig. 49) with broadly rounded posterior margin; sternum VIII (fig. 50) with broad, shallow, median emargination of posterior margin, with microcarina parallel and near posterior margin, and with broad, shallow, median depression; tergum and sternum VIII with elongate "cells" near base.

Aedeagus (fig. 51) with median orifice covered by operculum; form of operculum shown in figure 51 and surface with broad, deep depression; ventral surface of median lobe without carinae, lobes, depressions, or processes.

FEMALE: Unknown.

DISTRIBUTION AND HABITAT: This species was collected in Guyana, but the specimen lacks habitat data (fig. 13).

ETYMOLOGY: From the Latin *concavus* for hollowed or arched inward and *operculum* for cover or lid, referring to the hollowed surface of the operculum of the aedeagus.

MATERIAL EXAMINED: Holotype only.

12. *Cylindroxystus lyrus*, new species

Figures 13, 52–56

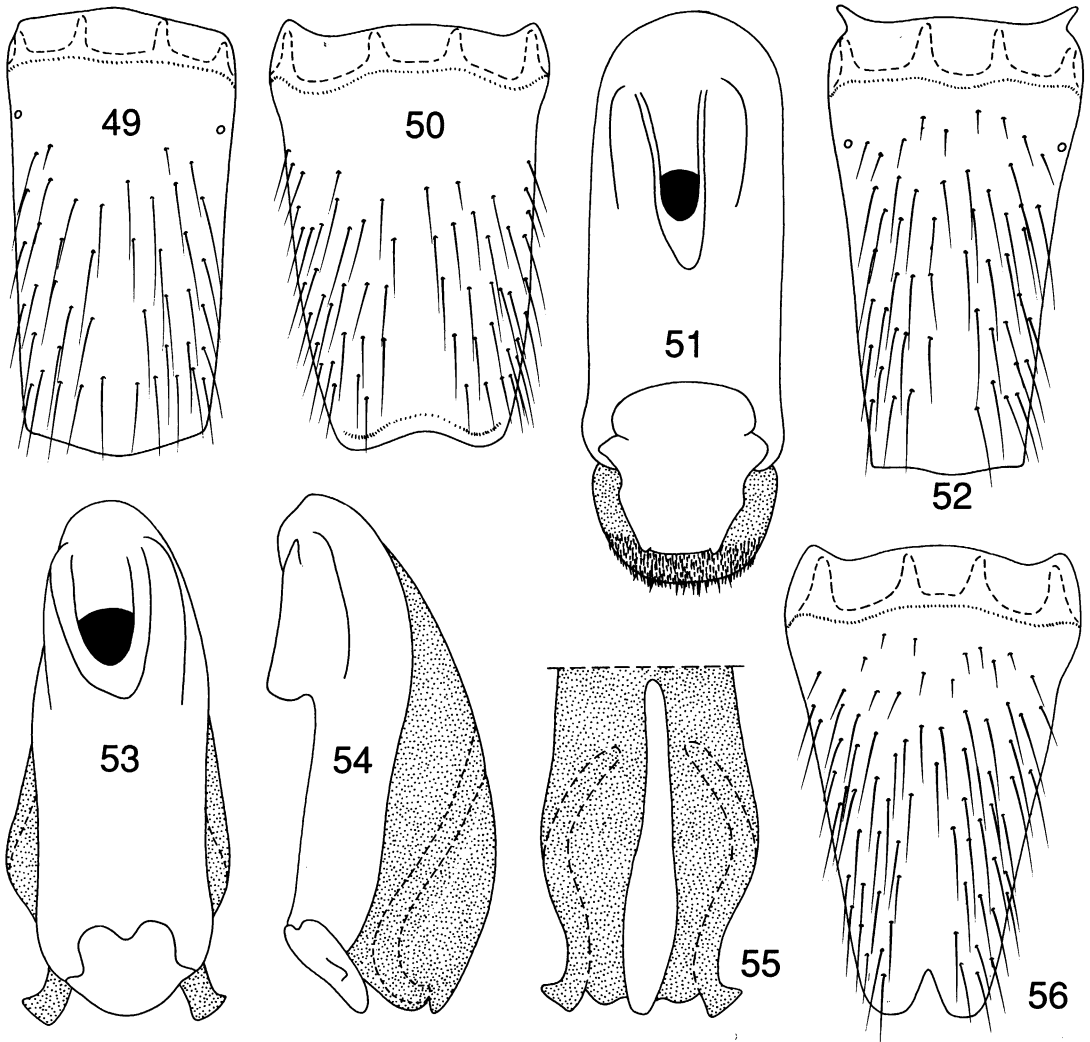
HOLOTYPE: Male. Venezuela: Aragua: Rancho Grande, 15 km N Maracay, 1500 m, February 21, 1971, S. Peck collector (deposited CNC).

DIAGNOSIS: *Cylindroxystus lyrus* is one of eight species with the tergum and sternum of abdominal segment VIII separated and one of only three with the 10th and 11th antennal segments elongated. This species is recognized by the 10th antennal segment that is 13 times longer than the 9th and longer than the 11th, by the narrow wedge-shaped emargination of the posterior margin of abdominal sternum VIII (fig. 56), and by the lyre-shaped configuration of two of the internal sclerites of the aedeagus (fig. 55).

DESCRIPTION OF MALE: Length about 5.6 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; median surface with moderately dense punctulation. Postocular margin of head broadly rounded and strongly



Figs. 49–51. *Cylindroxystus concavoperculus*, male. 49. Tergum VIII. 50. Sternum VIII. 51. Aedeagus, ventral view.

Figs. 52–56. *Cylindroxystus lyrus*, male. 52. Tergum VIII. 53. Aedeagus, ventral view. 54. Aedeagus, lateral view. 55. Aedeagus, dorsal view, apical portion. 56. Sternum VIII.

convergent to rounded basal angle. Eye length greater than postocular length of head. Labrum edentate and with broad, deep emargination of anterior margin. Antennal segment 3 cupulate; segments 4 to 10 without short, stout, spinelike setae around apex of each segment; segments 10 and 11 elongate, 10 approximately 13 times longer than 9 and slightly longer than 11.

Prothorax longer than wide; pronotal length/width 1.31. Pronotum with parame-dial row of four punctures and with scattered

punctures laterad of row. Prosternum without pit adjacent to median carina; median carina present and short but well developed. Elytra longer than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on inner side of apex.

Abdominal sterna III to VIII without groove but with depression and internal canal at base near lateral margin. Sternum VII with broad, moderately deep emargination of posterior margin; median surface without depression. Segment VIII with tergum and ster-

num separated at base; tergum and sternum VIII each with two lateral and two median internal canals at base (figs. 52, 56); internal canals with microtrichia on internal surface; tergum VIII without transverse suture across base (fig. 52); tergum VIII (fig. 52) with slightly rounded posterior margin; sternum VIII (fig. 56) with deep wedge-shaped emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII with elongate "cells" near base.

Aedeagus (figs. 53, 54) with median orifice covered by operculum; configuration of operculum shown in figure 53; surface of operculum with broad, shallow depression; ventral surface of median lobe without lobes, depressions, or processes; internal sclerite curved and together forming lyrelike configuration (fig. 55).

FEMALE: Unknown.

DISTRIBUTION AND HABITAT: This species was collected in the highlands of northern Venezuela (fig. 13).

ETYMOLOGY: From the Latin and Greek word *lyra* for lyre, referring to the lyre shaped internal struts of the aedeagus as shown in figure 55.

MATERIAL EXAMINED: Holotype only.

13. *Cylindroxystus pluviosus*
(Blackwelder), new combination
Figures 13, 57-59

Lobrathium pluviosum Blackwelder, 1943: 313, 320. (Type locality: Dominican Republic: vicinity of Valle Nuevo, 6000 ft. Holotype: male, examined; deposited MCZ.)

PARATYPE: One female with same label data as and deposited with the holotype and one male from: **Dominican Republic:** Loma de la Peña, NW Constanza, ca 5000 ft, August, 1938 (deposited USNM).

DIAGNOSIS: *Cylindroxystus pluviosus* has tergum and sternum VIII separated and reduced eyes and elytra (shorter than the pronotum), and is thereby separated from all but *borinquense*, *sinuosus*, and *crenus*. The shallow posterior margin of abdominal sternum VIII (fig. 59), the dense pronotal punctation and absence of a paramedial row of pronotal punctures, and the absence of posteriorly directed grooves on the abdominal sterna will distinguish *pluviosus* from these other three species.

DESCRIPTION OF MALE: Length 6.0 to 6.25 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation around edges of vertex, a few punctures on anterior portion of vertex, and two punctures near middle; median surface with scattered punctation. Postocular margin broadly rounded and weakly convergent to rounded basal angle. Eyes tiny, length much less than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 with carinae surrounding apex, not cupulate; segments 4 to 10 without short, stout, spinelike setae around apex of each segment; segment 10 approximately as long as 9 and about half as long as 11.

Prothorax longer than wide; pronotal length/width 1.28-1.32 (\bar{x} = 1.30; n = 3). Pronotum without paramedial row of punctures but with moderately dense punctation scattered over surface laterad of impunctate median stripe. Prosternum without pit adjacent to median carina; median carina present, short, and moderately developed. Elytra shorter than pronotum; surface with sutural row of punctures and with punctation scattered over disk, not arranged in rows. Metatibia with comb on both sides of apex.

Abdominal sterna III to VIII without grooves but with short depression and internal canal at base near lateral margin. Sternum VII with feebly emarginate posterior margin; median surface without depression. Segment VIII with tergum and sternum separated at base; tergum and sternum VIII each with four internal canals (figs. 57, 59); internal canals with sculptured inner surfaces, without microtrichia; tergum VIII without transverse suture across base (fig. 57); tergum VIII (fig. 57) with broadly rounded posterior margin; sternum VIII (fig. 59) with broad, shallow emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII without carinae or elongate "cells" near base.

Aedeagus (fig. 58) without operculum covering median orifice; median lobe without carina on ventral surface but with shallow depression at middle near apex [Note: The aedeagus of the holotype is missing].

FEMALE: Characters of head, prothorax, el-

etra, and abdomen as described for male except as follows. Sternum VII with truncate posterior margin. Tergum and sternum VIII each with broadly rounded posterior margin.

DISCUSSION: *Cylindroxystus pluviosus* was originally described in *Lobrathium* and was placed in the same undescribed subgenus as *borinquense* and *reductum* (Blackwelder, 1943: 321). The falcate, edentate mandibles (as in fig. 9), nipple-shaped fourth segment of the maxillary palpus (fig. 6), cupulate third antennal segment (fig. 8), and absence of abdominal paratergites on segments IV to VII place *pluviosus* and *borinquense* in *Cylindroxystus* rather than *Lobrathium*. The other species, *reductum*, is unrelated and should remain in *Lobrathium*.

The species is flightless.

DISTRIBUTION AND HABITAT: The species was collected in the Dominican Republic (fig. 13) where it was found at 5000 and 6000 ft elevation.

MATERIAL EXAMINED: Holotype and paratype male and one paratype female.

14. *Cylindroxystus borinquense*
(Blackwelder), new combination
Figures 13, 60–62

Lobrathium borinquense Blackwelder, 1943: 313, 319. (Type locality: Puerto Rico: El Yunque, 3000 ft. Holotype: male, examined; deposited MCZ.)

PARATYPES: One female with same label data as holotype (deposited MCZ). Another paratype (deposited USNM), said to be a male was not examined.

DIAGNOSIS: The coarse, posteriorly directed grooves on the abdominal sterna separates *borinquense* from all other species of *Cylindroxystus*. Other diagnostic characters include the separated tergum and sternum of abdominal segment VIII, presence of a paramedial row of pronotal punctures, reduced elytra, and transverse median carina on the apical fifth of the ventral surface of the aedeagus (fig. 61).

DESCRIPTION OF MALE: Length 7.4 to 8.1 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with punctation confined to edges of vertex; median surface with sparse punctulation. Postocular margin of head

broadly rounded and moderately convergent to rounded basal angle. Eye length less than postocular length of head. Labrum edentate and with broad, moderately deep emargination of anterior margin. Antennal segment 3 with carinae surrounding apex, not cupulate; segments 4 to 10 without short, stout, spine-like setae around apex of each segment; segment 10 approximately as long as 9 and about a two thirds as long as 11.

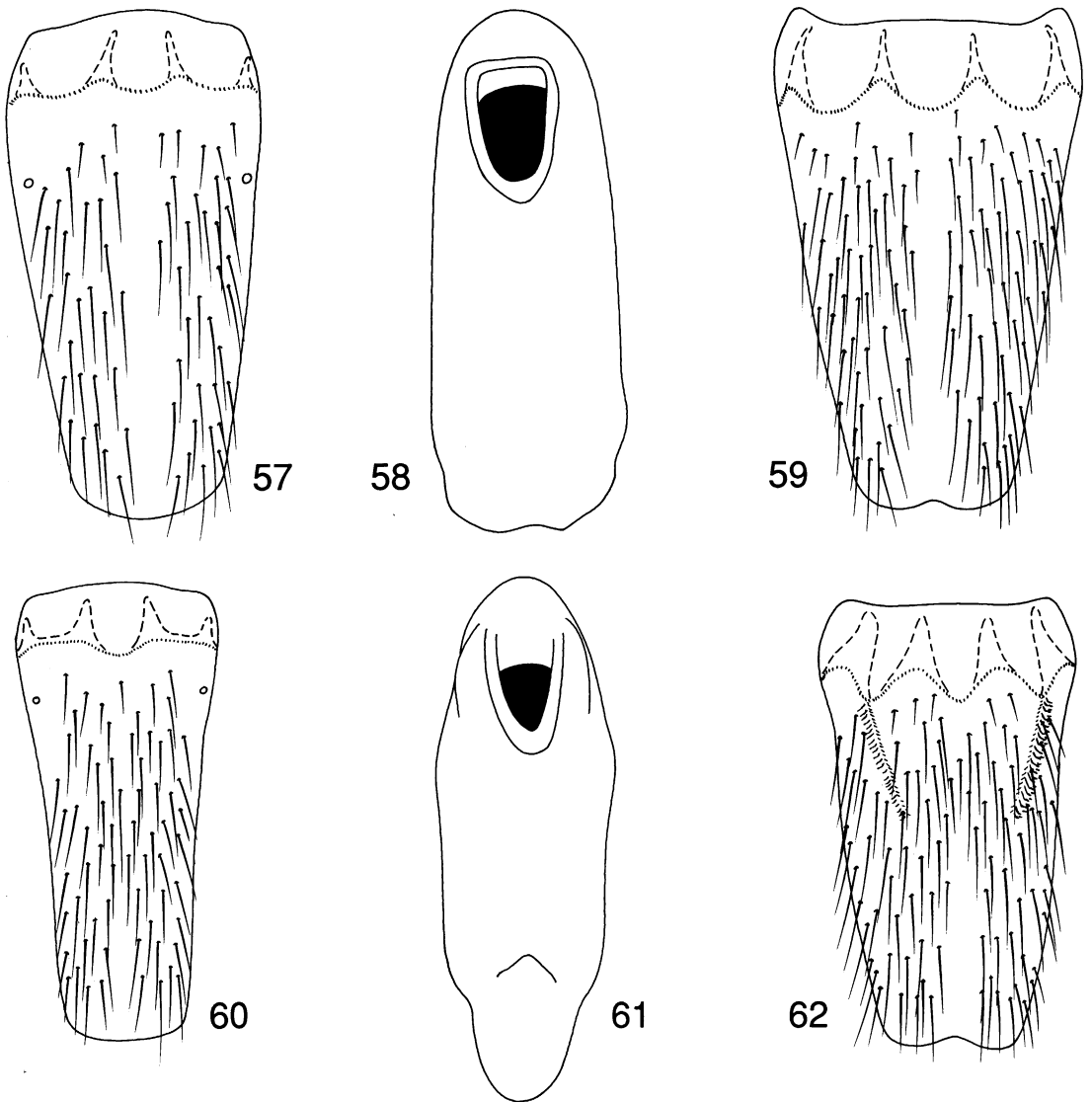
Prothorax longer than wide; pronotal length/width 1.70 (both specimens). Pronotum with paramedial row of six punctures and with sparse, scattered punctation laterad of row. Prosternum without pit adjacent to median carina; median carina present and well developed. Elytra shorter than pronotum; surface with sutural and two discal rows of punctures. Metatibia with comb on both sides of apex.

Abdominal sterna III to VIII with coarse groove near lateral margin and extending posteriorly from base and with internal canal at base; groove bordered by carina on each side. Sternum VII with broadly and feebly emarginate posterior margin; median surface without depression. Segment VIII with tergum and sternum separated at base; tergum and sternum VIII each with four internal canals at base (figs. 60, 62); internal canals with sculptured inner surfaces and without microtrichia; tergum VIII without transverse suture across base; tergum VIII (fig. 60) with broadly rounded posterior margin; sternum VIII (fig. 62) with broad, shallow median emargination of posterior margin and median surface without setae or depression; tergum and sternum VIII without elongate "cells" or carinae near base.

Aedeagus (fig. 61) without operculum covering median orifice; median lobe with short, transverse, median carina at about apical fifth of ventral surface and with shallow, midlongitudinal depression just anterior to carina.

FEMALE: Characters of head, prothorax, elytra, and abdomen as described for male except as follows. Sternum VII with posterior margin truncate. Tergum and sternum VIII each with rounded posterior margin.

DISCUSSION: *Cylindroxystus borinquense* was originally placed in *Lobrathium* where it was regarded as belonging to an undescribed subgenus (Blackwelder, 1943: 320). The genus *Cylindroxystus* was described in the same



Figs. 57–59. *Cylindroxystus pluviosus*, male. 57. Tergum VIII. 58. Aedeagus, ventral view. 59. Sternum VIII.

Figs. 60–62. *Cylindroxystus borinquense*, male. 60. Tergum VIII. 61. Aedeagus, ventral view. 62. Sternum VIII.

year by Bierig. The habitus of *borinquense* is similar to species of *Lobrathium* and it shares some characters with that genus. However, the falcate, edentate mandibles (fig. 9), nipple-shaped fourth segment of the maxillary palpus (fig. 6), cupulate third antennal segment (fig. 8), and absence of abdominal paratergites on segments IV to VII clearly place the species in *Cylindroxystus*.

The facets of the eyes of *borinquense* are larger than those of any other *Cylindroxystina* species, and the eyes are relatively large compared to other flightless species.

DISTRIBUTION AND HABITAT: The species was collected at about 3000 ft in Puerto Rico (fig. 13).

MATERIAL EXAMINED: Holotype male and female paratype.

NEOLINDUS

Figures 63–229

- Neolindus* Scheerpeltz, 1933: 1219 (replacement name). Type species: *Neolindus religans* (Sharp). Fixed by Scheerpeltz, 1933: 1219, through objective synonymy with *Lindus*. — Blackwelder, 1939: 120 (type species). — Blackwelder, 1944: 122 (checklist of species, Latin America). — Blackwelder, 1952: 259 (type species). — Fagel, 1958: 9 (redescription; type species). — Irmiler, 1981: 209 (new species and key to species).
- Lindus* Sharp, 1876: 281. [Preoccupied]. Type species: *Lindus religans* Sharp. Fixed by Sharp, 1876: 283, by monotypy. — Duvivier, 1883: 176 (catalog). — Bernhauer and Schubert, 1912: 202 (catalog). — Blackwelder, 1939: 119 (type species). — Blackwelder, 1952: 220 (type species). — Fagel, 1958: 9 (synonym of *Neolindus*).

DIAGNOSIS: *Neolindus* can be separated from all genera of the Paederinae by the presence of one or two pairs of cephalic trichobothria (figs. 64, 78), and one pair of paratergites on segment III but their absence on segments IV to VIII (fig. 1). Tergum and sternum IV to VI are fused to form a cylinder. The fourth segment of the maxillary palpus is nipple-shaped (fig. 71) and the mesothoracic peritreme is small.

DESCRIPTION: Head shape variable; sides gradually rounded to basal angle of head, but lateral sides occupied by enlarged eye in some species; basal angles rounded (fig. 78) or angulate (fig. 64). Neck about four-tenths to six-tenths width of head; dorsal surface with transverse groove. Lateral edge of gena expanded (fig. 64). Eye length shorter than to longer than postocular length of head; eye occupying most of lateral side of head in some species. Eye without setae. Tentorium with dorsal arms touching vertex between eyes. Surface shining and with scattered punctation and usually punctulation. Gular sutures widely separated (fig. 63). Head with one (fig. 64) or two (fig. 78) pairs of trichobothria, one pair adjacent to dorsal margin of eye, second pair, when present, behind and above eye. Antenna with first segment shorter than second and third combined to as long as second, third, and fourth combined; third segment not cupulate (fig. 65). Mandibles (fig. 67) long, slender, sickle-shaped, and edentate; pros-

theca present as membranous lobe with or without setae. Maxillary palpus (fig. 71) moderately long; second segment shorter than to as long as third segment and gradually expanded apically; third segment strongly expanded apically to near middle then gradually narrowed to apex; fourth segment (fig. 71) nipple-shaped and small, about a sixth or seventh as long as third segment. Labial palpus (fig. 70) with first and third segments shorter than second; first and second segments of about equal thickness, third more slender. Labrum with (fig. 68) or without two rounded lobes on anterior margin near middle.

Prothorax longer than wide to wider than long (fig. 64); widest near middle. Surface shining and punctate. Lateral margin without stout setae. Marginal bead present and separated from tergosternal suture. Protergosternal suture present, poorly developed near coxal cavity and absent anteriorly (fig. 66). Hypomeron polished and without punctures or sculpturing. Prosternum with median carina extending toward anterior margin (fig. 66). Prosternum without broad punctate region anterior to procoxae. Furcasternum (fig. 66) moderately broad but widely separated from hypomeron; surface with median carina. Procoxal cavity open posteriorly (fig. 66). Mesothoracic peritreme small. Elytra with epipleural ridge. Scutellum impunctate and polished. Meso-metasternal suture well developed. Mesendosternite straight, flattened and broad. Metendosternite forked.

Abdominal segment III with one pair of paratergites (fig. 1); segments IV to VI without paratergites (fig. 1); segments IV to VI each with tergum and sternum fused into cylinder; segment VII with tergum and sternum separated. Sternite II narrow and fused to III; posterior margin with row of setae. Sternites II and III with median carina. Sternite IV without gland on anterior margin. Abdomen without glandular openings in intersegmental membrane. Abdominal segments with (figs. 87, 88) or without (figs. 120, 122) internal canals at base of sterna and terga. Tergum IX with apices straight. Tergum IX fused (fig. 75, 84) or divided medially (fig. 74, 176); posterior margin entire or emarginate. Ter-

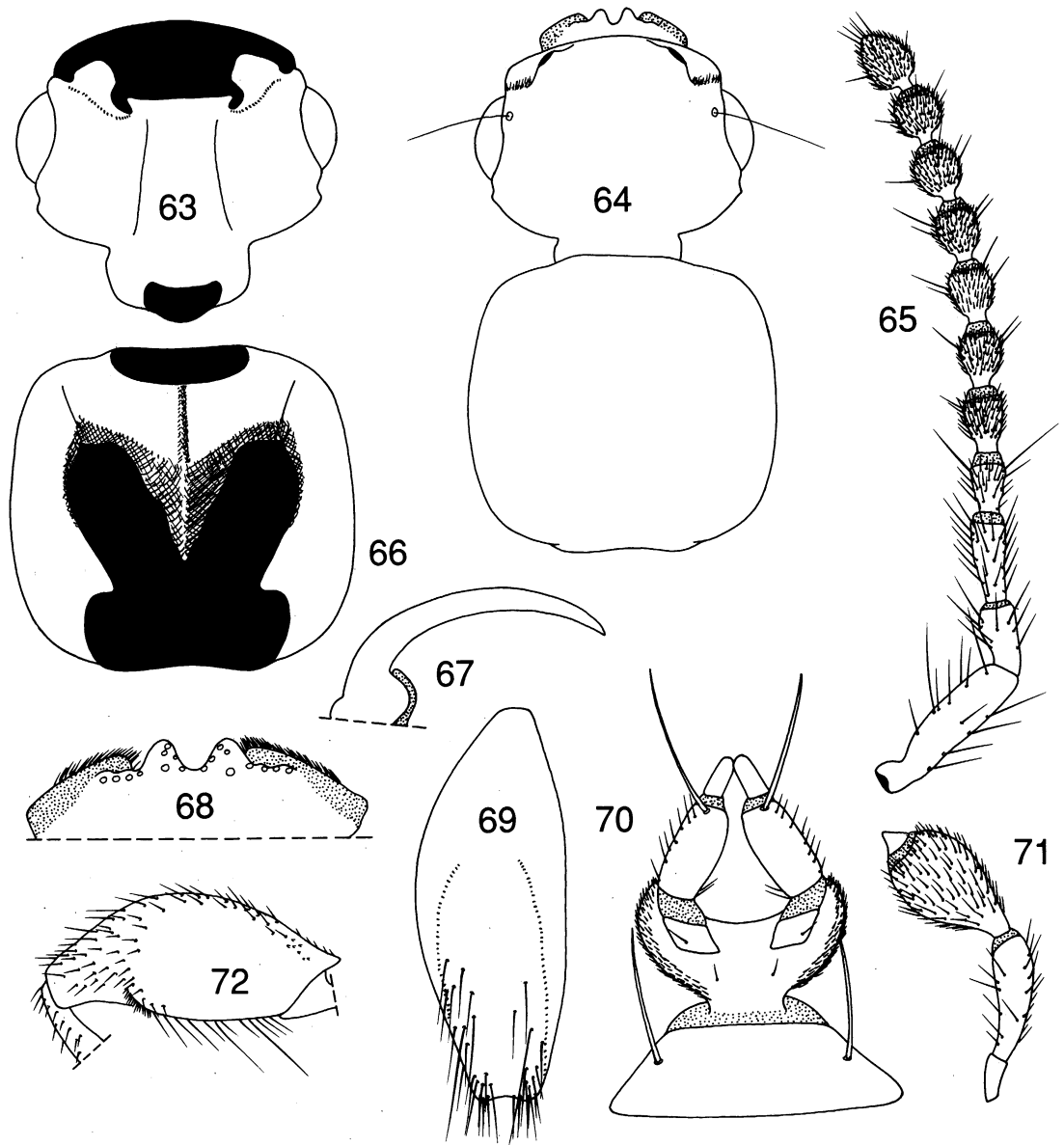


Fig. 63–72. *Neolindus basisinuatus*. 63. Head, ventral view, setae omitted. 64. Head and pronotum, dorsal view, setae omitted. 65. Antenna. 66. Prothorax, ventral view, setae omitted. 67. Mandible, left. 68. Labrum, setae omitted. 69. Sternum IX, male. 70. Labium. 71. Maxillary palpus. 72. Profemur, anterior view.

gum X exposed (fig. 84). Valvifer and coxite present (figs. 73, 76).

Aedeagus with basal foramen directed to left *in situ*; parameres present and appressed to base near basal foramen (fig. 81).

Protibia with three rows of combs. Metatibia with comb on both sides of apex. Profemur with comb on ventral edge of anterior

face. Tarsal segments without middorsal groove; fourth segment not expanded as lobe beneath fifth segment; protarsal segments 1 to 4 strongly expanded laterally and densely pubescent beneath; segments of mesotibia and metatibia with some setae on ventral surface but not densely pubescent.

DISTRIBUTION AND HABITAT: *Neolindus* has

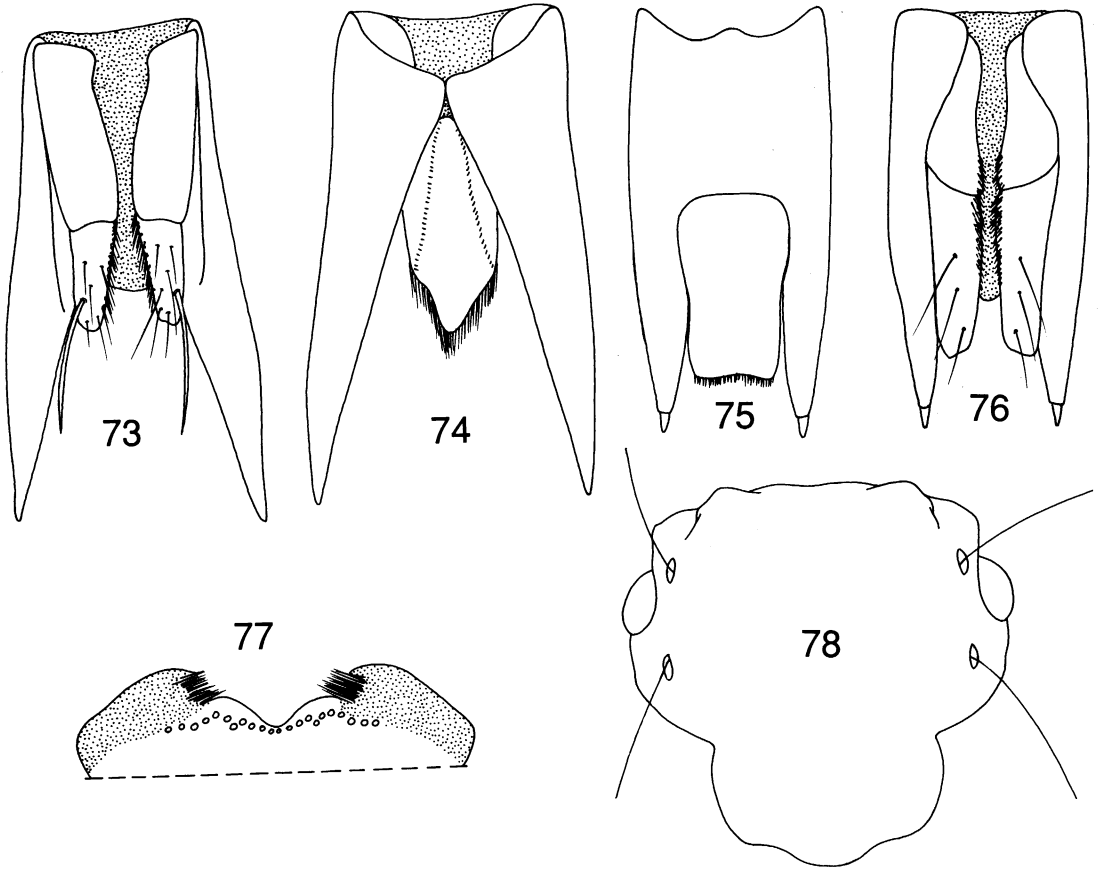


Fig. 73–76. *Neolindus* spp., female. 73. Segment IX, ventral view. 74. Terga IX and X, setae omitted. 75. Terga IX and X, setae omitted. 76. Segment IX, ventral view. Figs. 77–78. *Neolindus pumicosus*. 77. Labrum, setae omitted. 78. Head, dorsal view, setae

been found in Costa Rica, Panama, Venezuela, Colombia, Ecuador, Peru, Bolivia, and Brazil (fig. 79). The genus has not been reported from the Caribbean.

Little is known of the habitat for *Neolindus*, most of the records are from leaf litter. *Neolindus* are rarely collected, the largest sample was six specimens of *pumicosus*, most collections were of one or two specimens. Species generally were from lowland localities, those from the highlands were found to as high as 2500 m (8200 ft). Collecting labels for only one species indicated it was taken in moist litter near streams; others were found in *Ficus* litter, a cow pasture, epiphytic humus, and litter in a cloud forest. The only species that I collected was from dryer litter on a slope above a stream and I never found any *Neolindus* in any of many streamside samples. I suspect that species may be col-

lected more commonly in moist litter at some distance from streams.

DISCUSSION: For the 33 species covered herein only 50 males and 29 females were studied. Fourteen species are represented by one male, 3 by one female, 18 by males only, and for only 15 species are the females known.

Seven species are flightless with reduced elytra and flying wings. All of these were collected above 900 m; most species found above that elevation were flightless.

KEY TO MALES OF *NEOLINDUS*

- 1. Pronotum longer than wide 2
- Pronotal width equal to or greater than length (fig. 64) 17
- 2(1). Head with two trichobothria near each eye (fig. 78) 3
- Head with one trichobothrium near each eye (fig. 64) 10

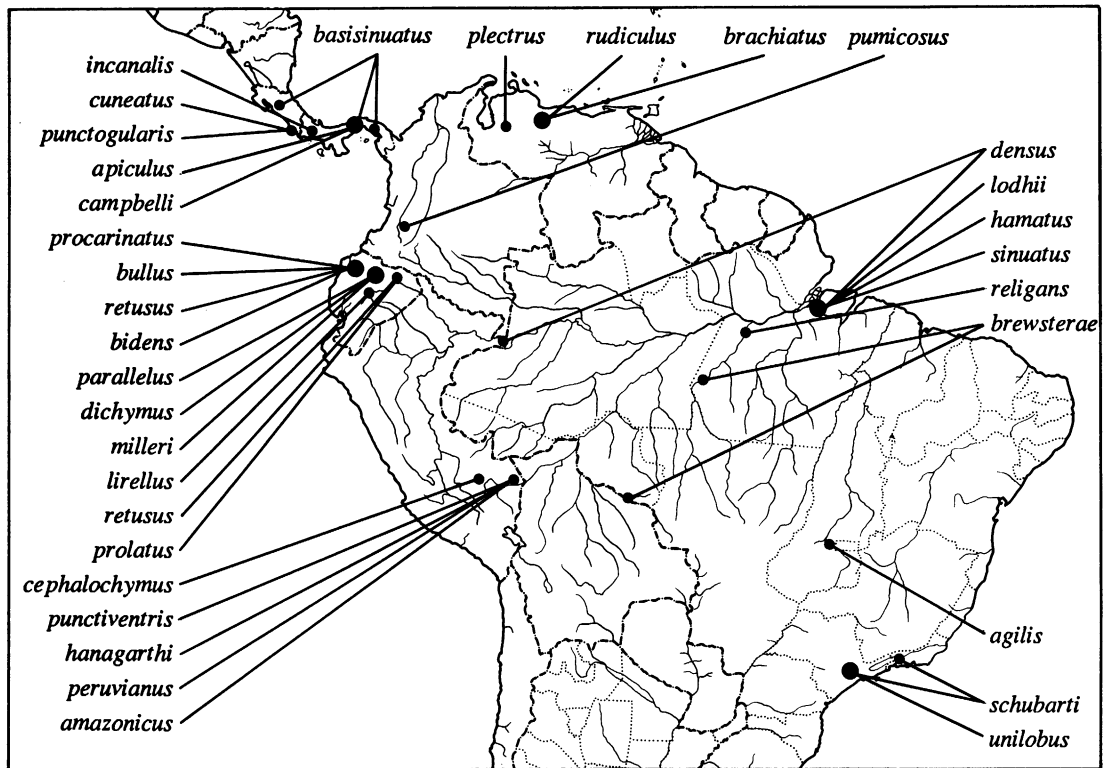


Fig. 79. Distribution of *Neolindus* in Central and South America. Large dots represent several localities.

- | | |
|--|--|
| <p>3(2). Pronotum with dense, randomly arranged punctation laterad of impunctate median strip 4</p> <p>Pronotum with paramedial row of punctures and with remaining punctation sparse and scattered 5</p> <p>4(3). Sternum VIII with broad, deep, median depression of surface (fig. 92); head densely and strongly punctulate; aedeagus with apical portion of median lobe triangular (fig. 93); Colombia 17. <i>pumicosus</i></p> <p>Sternum VIII with median surface slightly flattened to gently convex; head with weak, moderately dense punctulation; aedeagus with apical portion of median lobe attenuate (fig. 81); Venezuela 15. <i>plectrus</i>¹</p> <p>5(3). Eye longer than postocular length of head; Ecuador 21. <i>prolatus</i></p> | <p>6(5). Eye shorter than or equal to postocular length of head 6</p> <p>Sternum VIII with median incision parallel sided for most of length (figs. 88, 108) 7</p> <p>Sternum VIII with sides of median incision divergent from base (fig. 80, 97) 8</p> <p>7(6). Sternum VIII without setae in narrow midlongitudinal groove (fig. 108); tergum VIII with shallowly emarginate posterior margin (fig. 109); Ecuador 20. <i>lirellus</i></p> <p>Sternum VIII with setae in broad midlongitudinal depression (fig. 88); tergum VIII with rounded apical margin (fig. 87); Ecuador 16. <i>parallelus</i></p> <p>8(6). Sternum VII with moderately deep emargination bordered on each side by process (fig. 101); sternum VIII with patch of setae on each side of depression surrounding median incision (fig. 97); Venezuela 18. <i>brachiatus</i></p> <p>Sternum VII with truncate or shallowly emarginate posterior margin and pos-</p> |
|--|--|

¹ *Neolindus plectrus* appears twice in the key, in couplets 4 and 9, because the pronotal punctation might be interpreted as including a paramedial row.

- terior margin without processes (fig. 83); sternum VIII without setae in depression surrounding incision (figs. 80, 103) 9
- 9(8). Aedeagus with apex of median lobe tapered (fig. 81); sternum VIII with broad, deep median incision (fig. 80); incision about one fifth-length of sternum; Venezuela 15. *plectrus*
Aedeagus with apex of median lobe expanded (fig. 105); sternum VIII with moderately broad and deep median incision (fig. 103); incision about one-eighth length of segment; Venezuela 19. *rudiculus*
- 10(2). Tergum VIII with moderately deeply to shallowly emarginate posterior margin (figs. 136, 159) 11
Tergum VIII with rounded, truncate, or feebly emarginate posterior margin (figs. 122, 140, 144, 165) 12
- 11(10). Head with midlongitudinal carina present at anterior margin; sternum VIII moderately densely pubescent adjacent to glabrous median depression (fig. 158); Ecuador 32. *retusus*
Head without midlongitudinal carina at anterior margin; sternum VIII densely pubescent adjacent to glabrous median depression (fig. 134); Peru 26. *punctiventris*
- 12(10). Sternum VII with broad, glabrous, median depression anterior to marginal emargination (fig. 123); Costa Rica 23. *incanalis*
Sternum VII without median depression and with seta on median region (figs. 128, 143) 13
- 13(12). Head with midlongitudinal carina at anterior margin; sternum VIII with elongate median strip lacking setae (fig. 164); Ecuador 31. *procarinatus*
Head without midlongitudinal carina at anterior margin; sternum VIII with setae on median strip except adjacent to margin (fig. 139) 14
- 14(13). Aedeagus with apex of median lobe rounded (figs. 125, 129, 145) 15
Aedeagus with apex of median lobe deeply emarginate (fig. 141); Peru 27. *cephalochymus*
- 15(14). Sternum VIII with dense patch of setae at middle near emargination (figs. 124, 131) 16
Sternum VIII with sparse patch of setae at middle near emargination (fig. 147); Brazil 28. *agilis*
- 16(15). Aedeagus with transverse subapical carina (fig. 125); Brazil .. 24. *brewsterae*
Aedeagus with two acute, subapical processes (fig. 129); Brazil, Columbia 25. *densus*
- 17(1). Tergum VIII with median lobe on posterior margin (figs. 203, 206) 18
Tergum VIII with rounded, truncate, or emarginate posterior margin (figs. 151, 183, 197, 215) 22
- 18(17). Tergum VIII with one lobe on posterior margin (fig. 203); Brazil .. 41. *unilobus*
Tergum VIII with three lobes on posterior margin (fig. 221) 19
- 19(18). Gula with transverse cluster of numerous setae on anterior portion; Panama 42. *punctogularis*
Gula with two to four setae 20
- 20(19). Sternum VIII with longitudinal carinae (figs. 211, 220) 21
Sternum VIII without longitudinal carinae (fig. 223); Brazil 47. *religans*
- 21(20). Sternum VIII with carina on each side of median marginal incision (fig. 220); Ecuador 44. *bidens*
Sternum VIII with carina on basal third on each side of midline (fig. 211); Brazil 43. *schubarti*
- 22(17). Tergum VIII emarginate apically (fig. 157) 23
Tergum VIII rounded or truncate apically (figs. 183, 194, 197, 215) 24
- 23(22). Sternum VIII with deep, narrow, basally parallel-sided emargination (fig. 149); Brazil 29. *hamatus*
Sternum VIII with broad, shallow, divergent-sided emargination (fig. 154); Ecuador 30. *bullus*
- 24(22). Sternum VII deeply emarginate and margin with two broad lobes (fig. 216); Ecuador 45. *dichymus*
Sternum VII shallowly emarginate and margin without lobes (figs. 187, 196) 25
- 25(24). Sternum VIII with elongate diagonal groove on each side of apical third and laterad of median marginal incision; Brazil 37. *lodhii*
Sternum VIII without diagonal groove on surface 26
- 26(25). Sternum VIII with base of emargination lobed or sinuate (figs. 195, 199) .. 27
Sternum VIII with base of emargination rounded, smooth, and unlobed (figs. 168, 177, 188) 28
- 27(26). Sternum VIII with shallow apical emargination; emargination about one-fifteenth of length of sternum (fig. 199); Brazil 40. *sinuatus*
Sternum VIII with deep apical emargination; emargination about one-fifth of

- length of sternum (fig. 195); Panama, Costa Rica 39. *basisinuatus*
- 28(26). Sternum VIII with lateral margins of emargination sinuate (fig. 188); Ecuador 38. *milleri*
- Sternum VIII with lateral margins of emargination straight (fig. 177) ... 29
- 29(28). Sternum VIII with base of emargination narrowly rounded (fig. 177); Costa Rica 36. *cuneatus*
- Sternum VIII with base of emargination broadly rounded (figs. 168, 173) .. 30
- 30(29). Aedeagus with apex rounded (fig. 170); Panama 34. *campbelli*
- Aedeagus with apex pointed (fig. 174); Panama 35. *apiculus*

- ficult to distinguish; Panama 34. *campbelli*
- 9(7). Tergum VIII with triangular lobe at middle of posterior margin (fig. 212, 226) 10
- Tergum VIII with broadly rounded posterior margin (fig. 190, 194) 11
- 10(9). Tergum VIII with three triangular, apically acute lobes on posterior margin (fig. 226, 228) 12
- Tergum VIII with one broad, triangular, apically rounded lobe at middle of posterior margin (fig. 212); lateral edge of posterior margin with only suggestion of lobe; Brazil 43. *schubarti*
- 11(9). Head with scattered punctures on central portion of vertex; Ecuador 38. *milleri*
- Head without punctures on central portion of vertex; Brazil; Panama 40. *sinuatus*; 39. *basisinuatus*
- 12(10). Tergum VIII with midlongitudinal carina on apical portion (fig. 228); carina extending onto median lobe of posterior margin; antennal segment 2 about half as long as 3; Peru 46. *hanagarthi*
- Tergum VIII without midlongitudinal carina on apical portion (fig. 226); antennal segment 2 about three-fourths of length of 3; Brazil 47. *religans*

KEY TO FEMALES OF NEOLINDUS

- 1. Pronotum longer than wide 2
- Pronotal width equal to or greater than length 7
- 2(1). Head with midlongitudinal carina at anterior margin; Ecuador *retusus*
- Head without midlongitudinal carina at anterior margin 3
- 3(2). Pronotum shorter than elytra; Brazil/Bolivia; Brazil/Colombia 24. *brewsterae*; 25. *densus*
- Pronotum longer than elytra 4
- 4(3). Head with one trichobothrium near eye (as in fig. 64); pronotum randomly and densely punctate 6
- Head with two trichobothria near eye (as in fig. 78); pronotum with paramedial row of punctures and scattered punctures laterad of row 5
- 5(4). Elytral length slightly longer than pronotal width; Peru 22. *amazonicus*
- Elytral length less than pronotal width; Venezuela 18. *brachiatus*
- 6(4). Pronotum with scattered punctures laterad of paramedial row; Peru 33. *peruvianus*
- Pronotum with dense punctation laterad of paramedial row; Peru 27. *cephalochymus*
- 7(1). Antennal segments 2 and 3 shining, without dense, fine pubescence; segments 4 to 11 with fine dense pubescence... 9
- Antennal segment 2 shining, without dense, fine pubescence; segments 3 to 11 with fine dense pubescence 8
- 8(7). Elytra with 5 distinct rows of punctures on disk; Panama 35. *apiculus*
- Elytra with discal rows of punctures dif-

KEY TO NEOLINDUS (Secondary Sexual Characters Excluded)

The purpose of this key is to aid the search and identification of currently unknown females. In constructing this key I have assumed that the condition of the posterior margin of tergum VIII is the same for both sexes because that is the case for the 12 *Neolindus* species for which both sexes are represented. Males and females of many species may be identified with this key but all identifications are less reliable with this key than with that for the males.

- 1. Pronotum longer than wide 2
- Pronotal width equal to or greater than length 10
- 2(1). Head with one trichobothrium near eye (fig. 64) 6
- Head with two trichobothria near eye (fig. 78) 3
- 3(2). Pronotum slightly longer than elytra (measured from apex of scutellum to line across posterior margin of elytra);

- Ecuador; Peru 21. *prolatus*; 22. *amazonicus*
- 4(3). Pronotum longer than elytra by about a third 4
- Head with dense, coarse punctulation on vertex; vertex with scattered setigerous punctures on central portion; Colombia 17. *pumicosus*
- Head with moderately dense to dense, fine punctulation on vertex; vertex without setigerous punctures on central portion 5
- 5(4). Pronotum with single paramedial row of punctures and with scattered punctures laterad of row 21
- Pronotum without paramedial row of punctures or with cluster of setae in row adjacent to impunctate median strip and with dense punctation on each side of impunctate median stripe; Venezuela 15. *plectrus*
- 6(2). Head with midlongitudinal carina at anterior margin 24
- Head without midlongitudinal carina at anterior margin 7
- 7(6). Pronotum without single paramedial row of setigerous punctures or with cluster of punctures in row adjacent to impunctate median strip and with dense punctation laterad of median strip 8
- Pronotum with single, paramedial row of setigerous punctures 9
- 8(7). Pronotum about as long as elytra (measured from apex of scutellum along elytral sutural to line across posterior margin); Peru 26. *punctiventris*
- Pronotum longer than elytra by about a third; Peru 27. *cephalochymus*
- 9(7). Pronotum with three punctures (excluding puncture on anterior margin) in paramedial row; Costa Rica 23. *incanalis*
- Pronotum with seven or more punctures (excluding puncture on anterior margin) in paramedial row; Brazil; Colombia; Brazil; Peru 24. *brewsterae*; 25. *densus*; 28. *agilis*; 33. *peruvianus*
- 10(1). Antennal segment 4 shining, without fine pubescence; Ecuador 30. *bullus*
- Antennal segment 4 with dull luster, covered with fine, dense pubescence .. 11
- 11(10). Antennal segments 1 and 2 shining, without fine pubescence; segments 3 to 11 with dull luster and covered with dense, fine pubescence; Panama 34. *campbelli*; 35. *apiculus*
- Antennal segments 1 to 3 shining, without fine pubescence; segments 4 to 11 with dull luster and covered with dense, fine pubescence 12
- 12(11). Head with a few setigerous punctures on central portion of vertex 13
- Head devoid of setigerous punctation on central portion of vertex 14
- 13(12). Pronotum without single paramedial row of setigerous punctures or with cluster of punctures in row adjacent to impunctate median strip; punctation laterad of glabrous median stripe moderately dense to dense 15
- Pronotum with single paramedial row of setigerous punctures; punctation laterad of row sparse 17
- 14(12). Pronotum without single paramedial row of punctures or with cluster of punctures in row adjacent to impunctate median strip 25
- Pronotum with single paramedial row of punctures 18
- 15(13). Tergum VIII with trilobed posterior margin (as in fig. 212, 226, 228) 16
- Tergum VIII with rounded posterior margin (figs. 190, 194); Costa Rica; Ecuador; Brazil 36. *cuneatus*; 38. *milleri*; 40. *sinuatus*
- 16(15). Tergum VIII with midlongitudinal carina apically and extending onto median lobe (fig. 228); Peru 46. *hanagarthi*
- Tergum VIII without midlongitudinal carina (fig. 226); Brazil 47. *religans*
- 17(13). Tergum VIII with trilobed posterior margin (fig. 206); Ecuador 42. *punctogularis*
- Tergum VIII with one median triangular lobe on posterior margin (fig. 203); Brazil 41. *unilobus*
- 18(14). Tergum VIII with trilobed posterior margin (fig. 212); Brazil 43. *schubarti*
- Tergum VIII with rounded, truncate, or emarginate posterior margin 18
- 19(18). Tergum VIII with rounded posterior margin (fig. 194); Panama 39. *basisinuatus*
- Tergum VIII with emarginate or sinuotuncate posterior margin (figs. 98, 151, 183) 20
- 20(19). Tergum VIII with emarginate posterior margin (fig. 151); Brazil 29. *hamatus*
- Tergum VIII with sinuotuncate posterior margin (figs. 98, 183); Venezuela; Brazil 18. *brachiatus*; 37. *lodhii*
- 21(5). Tergum VIII with slightly to strongly rounded posterior margin (figs. 87, 102, 104) 22

- Tergum VIII with feebly to shallowly emarginate posterior margin (fig. 98, 109) 23
- 22(21). Tergum VIII with slightly rounded posterior margin (fig. 87); Ecuador 16. *parallelus*
- Tergum VIII with moderately strongly to strongly rounded posterior margin (figs. 102, 104); Venezuela; Venezuela 18. *brachiatus*; 19. *rudiculus*
- 23(21). Tergum VIII with shallowly emarginate posterior margin (fig. 109); Ecuador 20. *lirellus*
- Tergum VIII with feebly emarginate posterior margin (fig. 98); Venezuela 18. *brachiatus*
- 24(6). Tergum VIII with feebly emarginate posterior margin (fig. 165); Ecuador 31. *procarinatus*
- Tergum VIII with moderately deeply emarginate posterior margin (fig. 159); Ecuador 32. *retusus*
- 25(14). Tergum VIII with trilobed posterior margin (fig. 221) 26
- Tergum VIII with arcuatotruncate or rounded posterior margin (fig. 197, 215) 27
- 26(25). Tergum VIII with midlongitudinal carina apically (fig. 228); Peru 46. *hanagarthi*
- Tergum VIII without midlongitudinal carina (figs. 221, 226); Ecuador; Brazil 44. *bidens*; 47. *religans*
- 27(25). Tergum VIII with arcuatotruncate posterior margin (fig. 215); Ecuador 45. *dichymus*
- Tergum VIII with rounded posterior margin (fig. 197); Brazil 40. *sinuatus*

DESCRIPTION OF SPECIES

15. *Neolindus plectrus*, new species
 Figures 79, 80-84

HOLOTYPE: Male. Venezuela: Trujillo: Bococono, Ande, Guaramacal, 2500 m, bosque humedo montaña, litter, February 1987, M.G. Paoletti collector (deposited AMNH).

DIAGNOSIS: *Neolindus plectrus* can be separated from all other *Neolindus* species by the presence of two pairs of cephalic trichobothria (as in fig. 78), by the reduced elytra, by the absence of a paramedial row of pronotal punctures, by the dense, randomly arranged punctation of the pronotum, and by the long process on the apex of the aedeagus (fig. 81).

DESCRIPTION OF MALE: Length about 6.2 mm.

Color reddish brown, elytra and abdomen darker, legs and antennae paler.

Dorsum of head with setigerous punctures confined to edges of vertex; surface moderately densely but weakly punctulate. Head with two trichobothria on lateral side of vertex, one near anterior margin of eye, second behind eye near posterior angle of head. Head without midlongitudinal carina at anterior margin. Eye length less than postocular length of head. Gula with two setae near anterior end. Labrum with small rounded lobe on anterior margin near middle. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with irregular paramedial row of setigerous punctures, row amongst dense punctation of remainder of surface. Elytral length less than pronotal length and less than pronotal width; surface with one sutural and two discal rows of punctures and other scattered punctation.

Abdominal sternum VII (fig. 83) with moderately broad, shallow median emargination of posterior margin; surface without setae or depression adjacent to emargination. Segment VIII with four internal canals at base of tergum (fig. 82); sternum with two simple internal canals at lateral portion of base (fig. 80) and two small poorly developed ones near middle of base. Sternum VIII (fig. 80) with broad, moderately deep, median emargination of posterior margin; sides of emargination curved and divergent from base; surface slightly flattened adjacent to emargination; surface with groove beginning near apex of each lateral internal canal (as in fig. 227) and without parallel longitudinal carinae beginning near basal ridge; basal ridge without short median carina or median point. Tergum VIII (fig. 82) with broadly rounded posterior margin; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carina beginning near basal ridge. Tergum IX (fig. 84) fused medially.

Aedeagus (fig. 81) with moderately thick collar surrounding basal foramen and without sclerites exposed at apex of median ori-

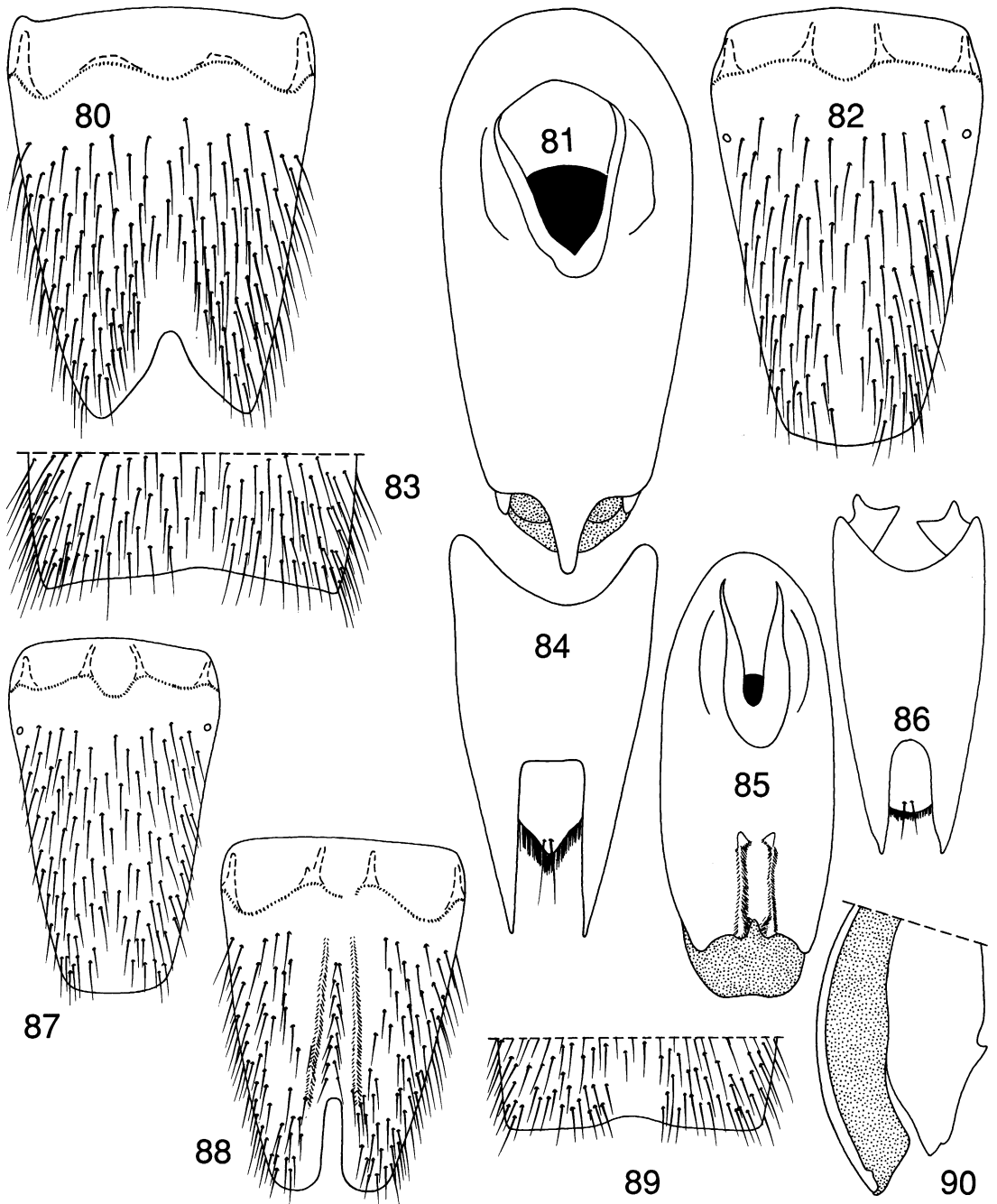


Fig. 80-84. *Neolindus plectrus*, male. 80. Sternum VIII. 81. Aedeagus, ventral view. 82. Tergum VIII. 83. Sternum VII, apex. 84. Terga IX and X, setae omitted.
 Figs. 85-90. *Neolindus parallelus*, male. 85. Aedeagus, ventral view. 86. Terga IX and X, setae omitted. 87. Tergum VIII. 88. Sternum VIII. 89. Sternum VII, apex. 90. Aedeagus, apex, lateral view.

fic. Median lobe with attenuate process on posterior margin of ventral surface; ventral surface without setae, carinae, median hole or depression.

FEMALE: Not known.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: The species was collected at 2500 meters from litter in a humid montane forest in Venezuela (fig. 79).

ETYMOLOGY: From the Latin *plectrus* for a tool used to pluck or strike a stringed instrument, referring to the shape of the apical projection of the aedeagus.

MATERIAL EXAMINED: Holotype only.

16. *Neolindus parallelus*, new species

Figures 79, 85–90

HOLOTYPE: Male. Ecuador: Napo: Baeza, 7800 ft, June 6, 1982, ridge top leaf litter, H. Frania collector (deposited CNC).

DIAGNOSIS: Among the nine *Neolindus* species with two pairs of cephalic trichobothria (as in fig. 78) this is one of six with reduced elytra. It can be separated from these six by the narrow parallel-sided median emargination of sternum VIII of the male (fig. 88) and the longitudinal carinae that begin on each side of the base of the emargination; between these carinae are two rows of setae (fig. 88) a character unique in the genus. The aedeagus of *parallelus* has an emarginate posterior margin of the aedeagal median lobe and two carinae extending anteriorly from the posterior margin toward two pointed processes (fig. 85).

DESCRIPTION OF MALE: Length about 5.4 mm.

Color reddish brown. Head, prothorax and elytra reddish brown, abdomen dark reddish brown. Antennae and legs yellowish brown.

Dorsum of head without punctures on central region, punctures restricted to edges of vertex; surface moderately densely punctulate. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior edge of eye, second near posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length less than postocular length of head. Gula with two setae near anterior end. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4

to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of punctures and scattered punctures laterad of row. Elytral length less than pronotal length and less than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 89) with shallow, median emargination of posterior margin; median region slightly depressed and without distinct cluster of setae adjacent to depression near posterior margin of segment. Segment VIII with four simple internal canals at base of tergum (fig. 87) and with two simple internal canals at lateral portion of base of sternum and one simple and one bifurcated internal canal near middle of base of sternum (fig. 88). Sternum VIII (fig. 88) with deep, narrow, parallel-sided, median emargination; region anterior to emargination with long, narrow median depression and with oval-shaped depression on each side of median depression; median depression margined laterally by carina and with two rows of setae in middle; lateral depressions without setae; surface with groove beginning at apex of each internal canal (as in fig. 227); surface without numerous parallel longitudinal carinae beginning near basal ridge; basal ridge without short median carina or median point. Tergum VIII (fig. 87) with posterior margin broadly rounded; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carinae beginning near base. Tergum IX (fig. 86) fused medially.

Aedeagus (figs. 85, 90) with thick collar surrounding basal foramen and without sclerites exposed at apex of median orifice. Median lobe with sinuate apical margin and with median emargination; ventral surface with carina on each side of midline extending anteriorly from posterior margin and ending in raised point; ventral surface without setae, median hole or depression.

FEMALE: Not known.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: The only known specimen is from Ecuador, where it was found in leaf litter at 7800 ft elevation on the eastern side of the Andes (fig. 79).

ETYMOLOGY: From the Latin *parallelus* for side by side equidistantly, referring to the parallel-sided emargination of the posterior margin of the male's eighth sternum.

MATERIAL EXAMINED: Holotype only.

17. *Neolindus pumicosus*, new species

Figures 77–79, 91–96

HOLOTYPE: Male. Colombia: Valle [del Cauca]: Soladito, 6700 ft, July 20, 1970, J.M. Campbell collector (deposited CNC).

PARATYPES: Four males (deposited 3 CNC; 1 AMNH) from same locality as holotype, three with same date of collection, two collected on July 13, 1970.

DIAGNOSIS: *Neolindus pumicosus* is one of only nine species in the genus with two pairs of cephalic trichobothria (fig. 78). It can be separated from all other *Neolindus* by the dense, coarse punctulation of the dorsum of the head. Other diagnostic characters are the reduced elytra, absence of a paramedial row of pronotal punctures, and deep, narrow emargination of the posterior margin, large median depression, and pattern of the pubescence of sternum VIII of the male (figs. 91, 92), and shape the apical third and configuration of the carinae of the aedeagus (fig. 93).

DESCRIPTION OF MALE: Length 9 to 10 mm.

Color dark reddish brown, antennae and legs reddish brown.

Dorsum of head with most of setigerous punctures on edges of vertex, central portion of vertex with scattered setigerous punctures; vertex densely covered with coarse punctulation. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior margin of eye, second behind posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length less than postocular length of head. Gula with two setae near anterior end. Labrum with rounded lobe near middle. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum without paramedial row of setigerous punctures; surface with dense punctation laterad of impunctate median strip. Elytral length less than pronotal length and less than pronotal

width; surface with sutural row of punctures and densely and randomly punctate over remainder of disk.

Abdominal sternum VII (fig. 95) with broad, moderately deep median emargination of posterior margin; median region of segment without depression and uniformly pubescent. Segment VIII with four internal canals at base of tergum (fig. 94); sternum (fig. 91) with internal canal near each lateral base and with two divided canals near middle. Sternum VIII (figs. 91, 92) with moderately deep, narrow median emargination; sides of emargination straight and divergent from base; surface adjacent to sides of emargination carinate; sternum with broad, deep depression covering most of median surface; depression with elongate median stripe devoid of setae and with slightly raised oval region in middle; setae adjacent to emargination in depression medially directed; depression margined laterally by ridge; ridge broad and enlarged apically and ending abruptly before apex of sternum; surface with canal beginning at apex of each internal canal (as in fig. 227); surface without numerous parallel longitudinal carina beginning near basal ridge; basal ridge without short median carina or median point. Tergum VIII (fig. 94) with posterior margin broadly rounded; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carinae beginning near base. Tergum IX fused medially.

Aedeagus (figs. 93, 96) with moderately thick collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with lateral margin compressed near apex; ventral surface with subapical, transverse carina and with midlongitudinal carina extending apically from transverse carina; apical portion triangular in ventral view; apex rounded; ventral surface without setae, median hole or depression.

FEMALE: Not known.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: This species was collected in Colombia at 6700 ft elevation (fig. 79) from moist leaf litter on the floor of a humid montane forest. There were no streams in the vicinity (Campbell, personal commun.).

ETYMOLOGY: From the Latin *pumicosus* for porous, like pumice, referring to the dense punctulation of the dorsal surface of the head.

MATERIAL EXAMINED: The holotype and four paratypes.

18. *Neolindus brachiatus*, new species

Figures 79, 97–102

HOLOTYPE: Venezuela: Aragua: Portachuelo, Parque Pittier, cloud forest, 1250 m, soil, February, 1987, M.G. Paoletti collector (deposited AMNH).

PARATYPE: Two males. Venezuela: Aragua: Rancho Grande, 15 km north of Maracay, 1500 m, cloud forest, February 21, 1971, S. Peck collector (deposited CNC).

DIAGNOSIS: *Neolindus brachiatus*, with two pairs of cephalic trichobothria (as in fig. 78), is easily separated from all other species by the reduced elytra, condition of the posterior margin of sternum VII (fig. 101), deep median depression and setal pattern of sternum VIII of the male (fig. 97), the form of the emargination of the posterior margin of sternum VII of the male (fig. 97), and the aedeagus with its two large apical arms (fig. 100).

DESCRIPTION OF MALE: Length 4 to 5 mm.

Color reddish brown, elytra and abdomen darker; antennae and legs yellowish brown.

Dorsum of head without setigerous punctures on central region, punctures confined to edges of vertex; surface with fine, moderately dense punctulation. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior edge of eye, second behind posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length less than postocular length of head (holotype and one paratype) or greater than postocular length of head (paratype). Gula with two setae near middle. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 and 3 subequal in length.

Prothorax longer than wide. Pronotum with paramedial row of punctures and scattered punctures laterad of row. Elytral length less than pronotal length and less than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 101) with

broad, moderately deep median emargination of posterior margin; margin with broad, pointed lobe on each side of emargination; surface adjacent to emargination slightly depressed; depression without setae; pubescence denser surrounding depression. Segment VIII with four internal canals at base of tergum (fig. 98); sternum (fig. 97) with two simple internal canals at lateral portion of base and with two bifurcate canals near middle of base. Sternum VIII (fig. 97) with moderately deep, median emargination; sides of emargination straight and divergent from base; apical portion of sternum with broad, median depression surrounding emargination; depression bordered laterally by longitudinal carina; depression devoid of setae except for large basal patch; setae of basal patch posterolaterally directed; apex of sternum without setae near margin; surface with groove beginning at apex of each internal canal (as in fig. 227) and without numerous parallel longitudinal carinae beginning near base; basal ridge without short median carina or median point. Tergum VIII with sinuottruncate (fig. 98; paratype) to slightly rounded (fig. 102; holotype and paratype) posterior margin; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carinae beginning near basal ridge. Tergum IX (fig. 99) fused medially.

Aedeagus (fig. 100) with moderately thick collar surrounding basal foramen without sclerites exposed beyond apex of median orifice. Median lobe with pair of long, thick, cylindrical, posteroventrally directed arms at apex; arms diverging from one another and each with apex curved ventrally to pointed apex; ventral surface without setae, carinae, median hole or depression.

FEMALE: Characters of head, pronotum, and elytra as described for male. Abdominal sternum VII and VIII with posterior margin unmodified. Tergum VIII with posterior margin rounded.

DISCUSSION: The holotype and one paratype of this species have small eyes, the other paratype has large eyes but the elytra of all three specimens are reduced.

I also have examined two females collected with the two paratypes that seem to be con-

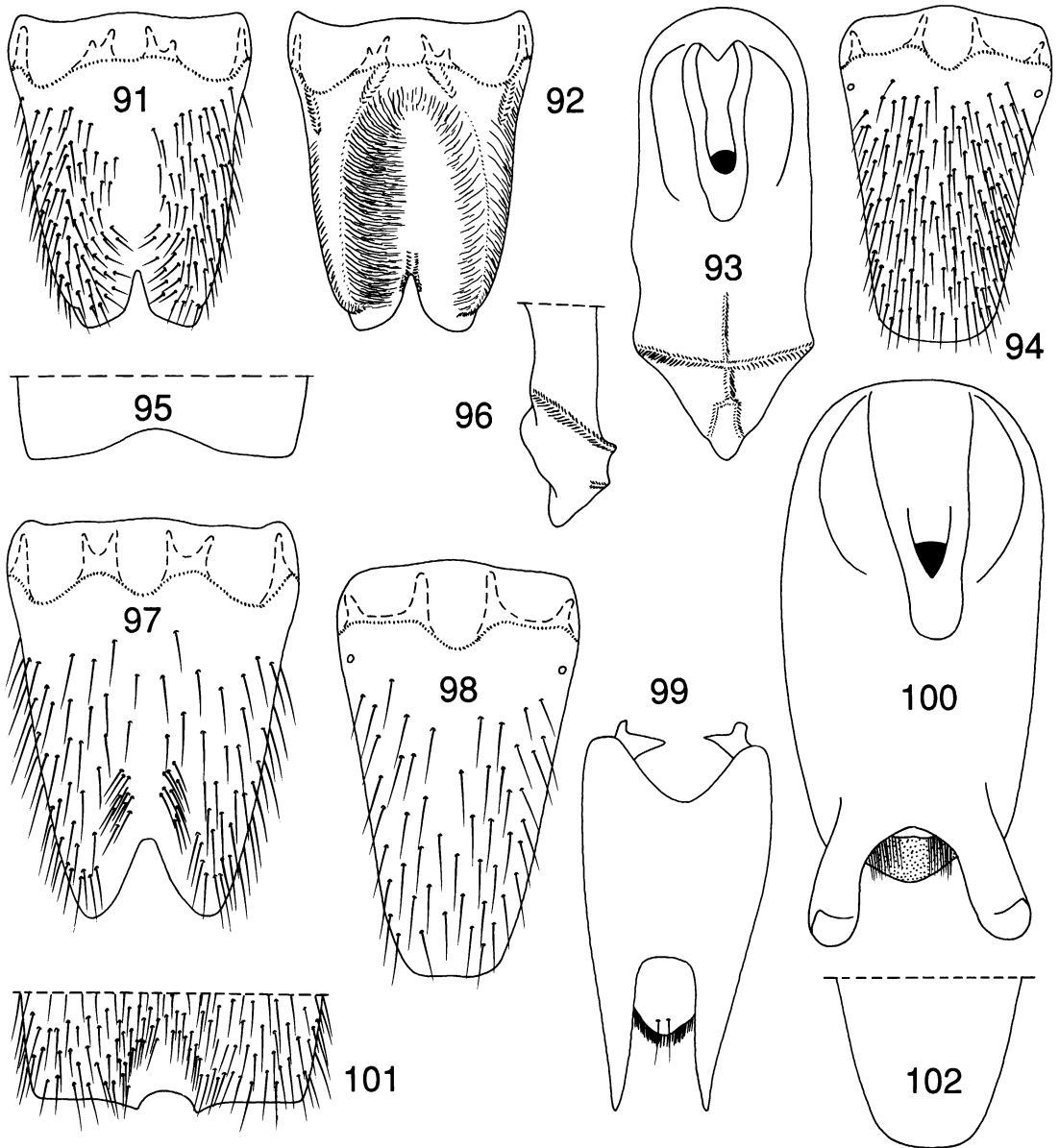


Fig. 91-96. *Neolindus pumicosus*, male. 91. Sternum VIII, setal pattern. 92. Sternum VIII, surface contours. 93. Aedeagus, ventral view. 94. Tergum VIII. 95. Sternum VII, apex, setae omitted. 96. Aedeagus, apex, lateral view.

Figs. 97-102. *Neolindus brachiatus*, male. 97. Sternum VIII. 98. Tergum VIII. 99. Terga IX and X, setae omitted. 100. Aedeagus, ventral view. 101. Sternum VII, apex, setae omitted. 102. Tergum VIII, apex, setae omitted.

specific with *Neolindus brachiatus*. The eyes of one of the females are longer than the postocular length of the head, the eyes of the other female are shorter than the postocular length of the head.

This species is flightless.

DISTRIBUTION AND HABITAT: This species is known from two localities in the Venezuelan cloud forests (fig. 79). Specimens were collected at 1500 m and in soil at 1250 m.

ETYMOLOGY: From the Latin *brachiatus* for with arms, referring to the two processes or arms at the apex of the aedeagus.

MATERIAL EXAMINED: Holotype, two paratypes, and two females. The females have the same collecting data as the paratypes (deposited CNC).

19. *Neolindus rudiculus*, new species

Figures 79, 103–107

HOLOTYPE: Male. Venezuela: Aragua: Rancho Grande, 15 km north Maracay, 1500 m, February 21, 1971, S. Peck collector (deposited CNC).

DIAGNOSIS: One of nine species with two pairs of cephalic trichobothria (as in fig. 78), *Neolindus rudiculus* is separated from the others by the reduced elytra, the spatuliform apical third of the aedeagus (fig. 105), and the wedge-shaped emargination of sternum VIII of the male (fig. 103).

DESCRIPTION OF MALE: Length about 4.5 mm.

Color reddish brown; antennae and legs yellowish brown.

Dorsum of head with setigerous punctures confined to edges of vertex; central portion of vertex with fine, moderately dense punctulation. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior margin of eye, second behind posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye reduced, length less than postocular length of head. Gula with two setae near middle. Labrum edentate, sclerotized portion bilobed. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of punctures and scattered punctures laterad of row. Elytral length less than pronotal length and less than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII with posterior margin, surface, and pubescence unmodified. Segment VIII with four simple internal canals at base of tergum (fig. 104); sternum (fig. 103) with two simple internal canals at lateral portion of base and with two bifurcated internal

canals near middle. Sternum VIII (fig. 103) with moderately deep, wedge-shaped median emargination of posterior margin; sides of emargination straight and divergent from base; median region adjacent to emargination with long oval depression; depression without setae; apex of sternum without setae; surface with longitudinal canal beginning at apex of each internal canal (fig. 227) and without numerous parallel longitudinal carinae beginning near basal ridge; basal ridge without short median carina or median point. Tergum VIII (fig. 104) with posterior margin rounded; surface without numerous parallel longitudinal carinae beginning at basal ridge; surface without midlongitudinal carina on apical portion; basal ridge without short median carina or median point. Tergum IX (fig. 107) fused medially.

Aedeagus (figs. 105, 106) with moderately thick collar surrounding basal foramen and without sclerites exposed at apex of median orifice. Median lobe with apical portion extended into long flattened, spatulate process; process with apical portion expanded; expanded portion with small pointed lobe on lateral margin; ventral surface without setae, carinae, median hole or depression.

FEMALE: Not known.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: The species is known only from a cloud forest at 1500 m in Venezuela (fig. 79).

ETYMOLOGY: From the Latin *rudicula* for wooden spoon or spatula, referring to the form of the apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype only.

20. *Neolindus lirellus*, new species

Figures 79, 108–113

HOLOTYPE: Male. Ecuador: Pastaza: 22 km SW Puyo, 900 m, July 15, 1976, litter, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: One of nine species with two pairs of cephalic trichobothria (as in fig. 78), *Neolindus lirellus* has reduced elytra and flying wings, and a deep, narrow, parallel-sided emargination of the posterior margin of sternum VIII of the male behind which are two narrowly separated longitudinal carinae (fig. 108); these characters along with the aedeagal characters (fig. 113) separate the species from

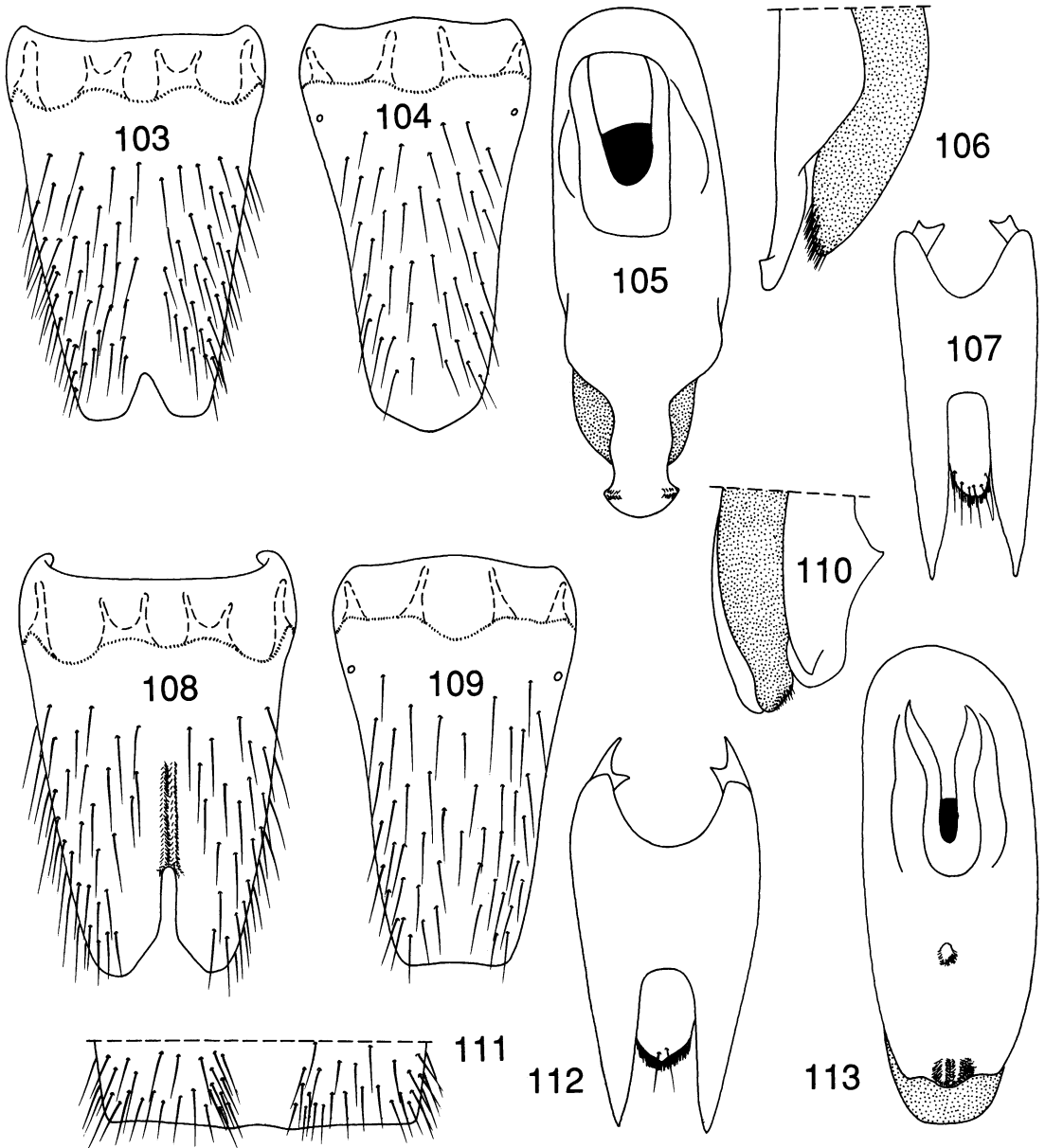


Fig. 103–107. *Neolindus rudiculus*, male. 103. Sternum VIII. 104. Tergum VIII. 105. Aedeagus, ventral view. 106. Aedeagus, apex, lateral view. 107. Terga IX and X, setae omitted.

Figs. 108–113. *Neolindus lirellus*, male. 108. Sternum VIII. 109. Tergum VIII. 110. Aedeagus, apex, lateral view. 111. Sternum VII, apex. 112. Terga IX and X, setae omitted. 113. Aedeagus, ventral view.

all others. Among species with two pairs of cephalic trichobothria, *Neolindus lirellus* is most similar to *Neolindus parallelus*, with which it shares similarity of the aedeagus and sternum VIII. From *parallelus*, *lirellus* is eas-

ily separated by the position of longitudinal carinae on sternum VIII (cf. figs. 88 and 108), and the form of the posterior margin and carinae of the ventral surface of the aedeagus (cf. figs. 85 and 113).

DESCRIPTION OF MALE: Length about 4.7 mm.

Color reddish brown. Head and prothorax reddish brown, elytra and abdomen dark reddish brown. Antennae and legs pale reddish brown to yellowish brown.

Dorsum of head without punctures on central region, punctures restricted to edges of vertex; surface with moderately dense, feeble punctulation. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior margin of eye, second near posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length slightly less than postocular length of head. Gula with two setae near anterior end. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 slightly longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of punctures and scattered punctures laterad of row. Elytral length less than pronotal length and less than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 111) with shallow, median emargination of posterior margin; median region slightly depressed and with cluster of setae adjacent to depression near posterior margin of segment. Segment VIII with four internal canals at base of tergum (fig. 109); sternum (fig. 108) with two simple internal canals near lateral margin of base and with two divided canals near middle. Sternum VIII (fig. 108) with deep, narrow, parallel-sided, median emargination; region anterior to emargination with long, narrow median depression bordered by carina on each side; sternum without depression adjacent to median depression; median depression without setae; surface with groove beginning at apex of each internal canal (as in fig. 227) and without numerous parallel longitudinal carinae beginning at basal ridge; basal ridge without short median carinae or median point. Tergum VIII (fig. 109) with posterior margin broadly and shallowly emarginate; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal ca-

rinae beginning near basal ridge. Tergum IX (fig. 112) fused medially.

Aedeagus (figs. 110, 113) with thick collar surrounding basal foramen without sclerites exposed beyond apex of median orifice. Median lobe with rounded median lobe on posterior margin of ventral surface; ventral surface of median lobe with two short carinae near posterior margin and with pointed tumescence at middle of apical half; ventral surface without setae, median hole or depression.

FEMALE: Not known.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: The only known specimen was collected from litter at 900 m on the eastern side of the Ecuadorian Andes (fig. 79).

ETYMOLOGY: From the Latin diminutive of *lira* for earth or ridge thrown up by the plow, referring to the furrow on the ventral surface of sternum VIII of the male near the incision of the posterior margin.

MATERIAL EXAMINED: Holotype only.

21. *Neolindus prolatus*, new species

Figures 79, 114–118

HOLOTYPE: Male. Ecuador: Napo: Limoncocha, 250 m, June 18, 1976, *Ficus* litter with fruits, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: Among nine species with two pairs of cephalic trichobothria (as in fig. 78), *Neolindus prolatus* is one of three with fully developed flying wings and elytra. One, *Neolindus hamatus*, has the pronotal length and width nearly equal, but in *prolatus* the pronotal length is greater than its width, and sternum and tergum VIII lack parallel carinae near the base. The other, *amazonicus*, has the elytral length greater than the pronotal width. *Neolindus prolatus* can be separated from the remaining six species, not only by elytral length, but by the configuration of the apical third of the aedeagus (fig. 114), and presence of a triangular lobe on the middle of the posterior margin of tergum VIII of the male (fig. 117).

DESCRIPTION OF MALE: Length about 4.6 mm.

Color dark reddish brown, abdomen darker; antennae and legs reddish brown to

yellowish brown; hind legs with base of femora reddish brown and apical portion and tibia yellowish brown.

Dorsum of head with setigerous punctures confined to edges of vertex; central portion of vertex with scattered, moderately dense punctulation. Head with pair of trichobothria on lateral side of vertex near eye, one trichobothrium near anterior edge of eye, second near posterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of punctures and scattered punctures laterad of row. Elytral length slightly less than pronotal length and less than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII with broad, shallow emargination of posterior margin; median region without depression or particular clustering of setae. Segment VIII with four simple internal canals at base of tergum (fig. 117) and two simple canals at lateral portion of base of sternum (fig. 115) and two bifurcated canals at middle. Sternum VIII (fig. 115) with moderately deep median emargination; sides of emargination straight and divergent from base; surface anterior to emargination with shallow, median depression; depression without setae; surface with groove beginning at apex of each internal canal (as in fig. 227) and without numerous parallel longitudinal carinae beginning near base; basal ridge without short median carina or median point. Tergum VIII (fig. 117) with trilobed posterior margin, median lobe longest; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carinae beginning near base. Tergum IX (fig. 118) fused medially.

Aedeagus (figs. 114, 116) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with moderately long, median process on apex; process with one median point; ven-

tral surface without setae, carinae, median hole or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The only known specimen was collected from *Ficus* litter in the eastern Ecuadorian lowlands at 250 m elevation (fig. 79).

ETYMOLOGY: From the Latin *prolatus* for extended or elongated, referring to the elongation of the apex of the aedeagus.

MATERIAL EXAMINED: Holotype only.

22. *Neolindus amazonicus* Irmeler

Figure 79

Neolindus amazonicus Irmeler, 1981: 210, 213.

(Type locality: Peru: Pucalpa. Holotype: female; deposited UIC.)

DIAGNOSIS: *Neolindus amazonicus* is one of nine species with two pairs of cephalic trichobothria (as in fig. 78). Of these only three (*amazonicus*, *prolatus*, and *hamatus*) have eyes longer than the postocular length of the head. In the key to species that does not use male sexual characteristics, *amazonicus* runs to the couplet that includes *prolatus*, a smaller species from Ecuador. *Neolindus amazonicus* can be separated from *hamatus* by the pronotum that is longer than wide.

DESCRIPTION OF FEMALE: Length about 6.1 mm.

Color reddish brown; antennae and legs yellowish brown.

Dorsum of head with setigerous punctures confined to edges of vertex; surface moderately densely punctulate. Head with two trichobothria on lateral side of vertex, one near anterior margin of eye, second behind eye near basal angle of head. Head without midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Labrum edentate, with moderately deep median emargination and with each side rounded. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense, fine pubescence; segments 2 and 3 subequal in length.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length slightly less than pronotal length and

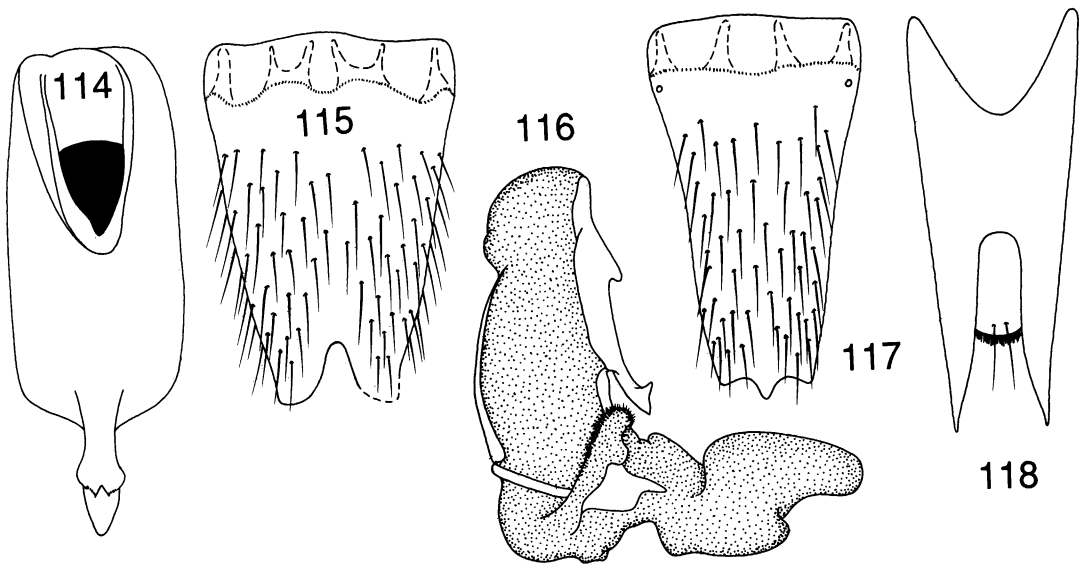


Fig. 114–118. *Neolindus prolatus*, male. 114. Aedeagus, ventral view. 115. Sternum VIII, apex of one side damaged and shown with broken line. 116. Aedeagus, lateral view, internal sac everted. 117. Tergum VIII. 118. Terga IX and X, setae omitted.

longer than pronotal width; surface with one sutural and four discal row of punctures.

Abdominal sternum VII unmodified. Sternum VIII with posterior margin unmodified. Tergum VIII with rounded posterior margin; surface without short median carina or median point extending from basal ridge; surface without midlongitudinal carina on apical portion; surface without numerous parallel longitudinal carina beginning near basal ridge.

MALE: Unknown.

DISCUSSION: Since the male is not known *amazonicus* is difficult to separate from *prolatus*.

DISTRIBUTION AND HABITAT: This species is known from one locality in Peru where it was collected from a cow pasture (fig. 79).

MATERIAL EXAMINED: Holotype.

23. *Neolindus incanalisis*, new species

Figures 79, 119–123

HOLOTYPE: Male. Costa Rica: Puntarenas; Osa Peninsula, 5 km west of Rincon de Osa, 8°42'N, 83°31'W, 50 m elevation, forest floor litter, March 24–30, 1973, J. Wagner & J. Kethley collectors (deposited FMNH).

DIAGNOSIS: *Neolindus incanalisis* is unique in the genus in that it lacks the internal canals

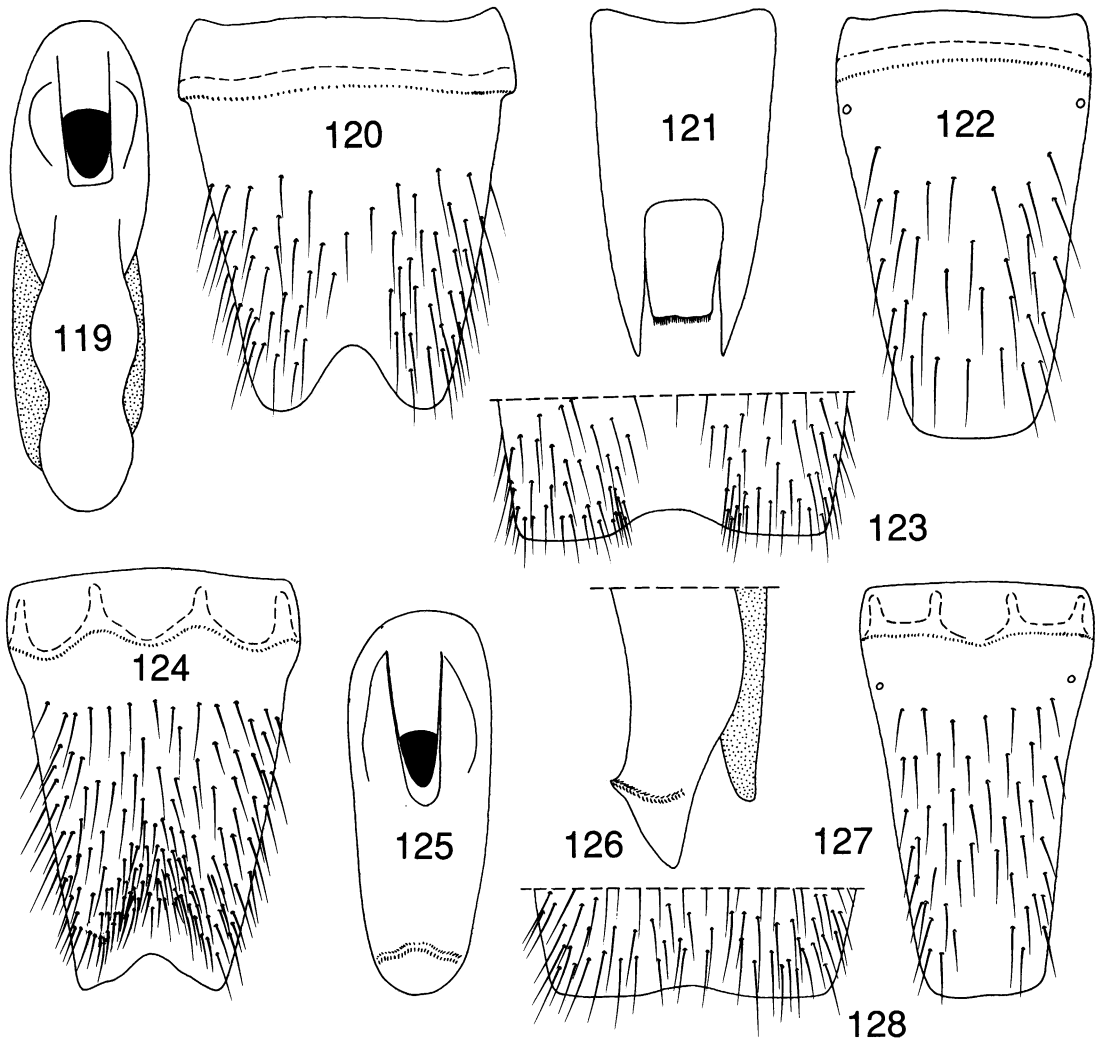
at the base of the tergum and sternum VIII (figs. 120, 122). This species is one of 11 that have parallel longitudinal carinae at the base of tergum and sternum VIII (as in fig. 229). The pronotum is longer than wide, the paramedial row of pronotal punctures has only three punctures, the form of the aedeagus, although simple, is distinctive (fig. 119) with sinuous lateral margins of the apical third and a rounded apex, and sternum VII of the male has a deep median emargination of the posterior margin (fig. 120).

DESCRIPTION OF MALE: Length about 3 mm.

Color reddish brown, antennae and legs yellowish brown.

Dorsum of head with setigerous punctures confined to lateral edges of vertex; median surface of vertex densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Head without midlongitudinal carina near anterior margin. Eye length about equal to postocular length of head. Gula with two setae near anterior end. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 slightly longer than 3.

Prothorax slightly longer than wide. Pro-



Figs. 119–123. *Neolindus incanalisis*, male. 119. Aedeagus, ventral view. 120. Sternum VIII. 121. Terga IX and X, setae omitted. 122. Tergum VIII. 123. Sternum VII, apex.

Figs. 124–128. *Neolindus brewsterae*, male. 124. Sternum VIII. 125. Aedeagus, ventral view. 126. Aedeagus, apex, lateral view. 127. Tergum VIII. 128. Sternum VII, apex.

notum with paramedial row of setigerous setae and a few scattered setigerous punctures laterad of impunctate median strip; surface densely punctulate. Elytral length slightly less than pronotal length and subequal to pronotal width; surface with one sutural, discal, and humeral row of punctures.

Abdominal sternum VII (fig. 123) with broad, moderately deep, median emargination of posterior margin; median surface with broad depression adjacent to emargination; depression without setae; surface with dense

pubescence adjacent to depression near posterior margin. Segment VIII without internal canals at base of sternum (fig. 120) or tergum (fig. 122). Sternum VIII (fig. 120) with moderately deep and broad, median emargination of posterior margin; sides of emargination straight and divergent from base; surface just anterior to emargination with shallow median depression; depression without setae; surface without grooves beginning near basal ridge but with numerous longitudinal carinae beginning near base (as in fig. 229); basal ridge

without short median carina or median point. Tergum VIII (fig. 122) with posterior margin slightly rounded; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous longitudinal carinae beginning near basal ridge. Tergum IX (fig. 121) fused medially.

Aedeagus (fig. 119) with thin collar surrounding basal foramen and without sclerites exposed beyond apex of median orifice. Median lobe with apical portion spoon shaped and with lateral margins of apical third sinuous; ventral surface without setae, carinae, median hole or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: This species is known only from the western lowlands of Costa Rica where it was collected from forest floor litter (fig. 79).

ETYMOLOGY: From the Latin *in* for not or without and *canalis* for waterpipe, referring to the absence of the internal canals of sternum VIII that are present in all of the other species of *Neolindus*.

MATERIAL EXAMINED: Holotype only.

24. *Neolindus brewsterae*, new species
Figures 79, 124–128

HOLOTYPE: Male. Brazil: Pará: Jacaréacanga, December 1969, F.R. Barbosa collector (deposited AMNH).

DIAGNOSIS: One of 11 species with numerous, parallel longitudinal carinae at the base of sternum (as in fig. 229) and tergum VIII, *Neolindus brewsterae* can be separated from them by the dense cluster of setae near the emargination of the posterior margin of sternum VIII of the male (fig. 124) and the transverse, subapical carina of the aedeagus (fig. 125). Other diagnostic features are the elongate pronotum, the presence of one cephalic trichobothrium, and the feeble emargination of tergum VIII (fig. 127).

DESCRIPTION OF MALE: Length about 3.7 mm.

Color reddish brown, abdomen darker, antennae and legs paler.

Dorsum of head with setigerous punctation restricted to edges of vertex; median portion with feeble punctulation anteriorly. Head with

one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Head without midlongitudinal carina near anterior margin. Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum edentate and with shallow median emargination. Antennal segments 1 to 4 shining and sparsely pubescent; segments 5 to 11 with fine dense pubescence; segment 2 slightly longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and with scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 128) with broad, shallow median emargination of posterior margin; surface uniformly pubescent and without median depression. Segment VIII with four internal canals at base of sternum (fig. 124) and tergum (fig. 127). Sternum VIII (fig. 124) with broad, moderately deep emargination; sides of emargination curved and divergent apically from base; surface adjacent to emargination with broad, shallow median depression and devoid of pubescence; pubescence denser near depression; surface without longitudinal grooves beginning near basal internal canals but with numerous, parallel longitudinal carinae starting near base (as in fig. 229); basal ridge without midlongitudinal carina or median point. Tergum VIII (fig. 127) with broadly rounded posterior margin; surface with numerous longitudinal carinae starting near base; basal ridge without short midlongitudinal carina or median point; surface without midlongitudinal carina on apical portion. Tergum IX fused medially.

Aedeagus (figs. 125, 126) with thin collar surrounding basal foramen and without sclerites exposed at apex of median orifice. Median lobe with broadly rounded apical margin; ventral surface with transverse, subapical carina and without setae, median hole or depression.

FEMALE: Characters of head, pronotum, and elytra as described for male. Abdominal sternum VII and VIII and tergum VIII unmodified.

DISTRIBUTION AND HABITAT: The species is known from the lowlands of Bolivia and Brazil (fig. 79).

ETYMOLOGY: This species is named for Bea Brewster, our departmental secretary, who has assisted me with my work in many ways over the years

MATERIAL EXAMINED: Holotype and five females. Four females with the same label data as holotype except for one collected in January, 1970 (deposited AMNH). One female with the following label data: **Bolivia:** [El] Beni: Ilha Flores, Rio Itenez, August 7, 1964, J.K. Bouseman & L. Lussenhop collectors (deposited AMNH).

25. *Neolindus densus*, new species

Figures 79, 129–133

HOLOTYPE: Male. Brazil: Pará: Belem, IPEAN, March 26, 1970, J.M. & B.A. Campbell collectors (deposited CNC).

PARATYPE: Male. **Colombia:** Amazonas: Leticia, February 27–28, 1974, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: *Neolindus densus* is one of 11 species with numerous, parallel carinae at the base of tergum and sternum VIII (as in fig. 229) and can be distinguished from the others by the dense cluster of setae behind the emargination of the posterior margin of sternum VIII of the male (fig. 131) and by characters given in the key. The species is similar to *agilis*; the emargination of sternum VIII is deeper in *densus* than *agilis* (cf. figs. 131 and 147). Subtle details of the aedeagus separate the two species (cf. figs. 129 and 145); *densus* has a median bump near the apex which *agilis* lacks; the apical margin of *densus* is strongly rounded and that of *agilis* is broadly rounded.

DESCRIPTION OF MALE: Length about 4.5 mm.

Dorsum of head with setigerous punctures restricted to edges of vertex, anterior portion of vertex with moderately dense punctulation. Head with one trichobothrium on lateral side of head near anterior margin of eye. Head without short midlongitudinal carina at anterior margin. Eye length about equal to postocular length of head. Gula with two setae near anterior end. Labrum with apically rounded lobe on each side of middle. Antennal segments 1 to 4 shining and sparsely pubescent; segments 5 to 11 with dense fine pubescence; segment 2 slightly longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and with scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 133) with moderately deep and broad median emargination of posterior margin; median without depression and with uniform pubescence. Segment VIII with four internal canals at base of sternum (fig. 131) and tergum (fig. 132). Sternum VIII (fig. 131) with broad, moderately deep median emargination of posterior margin; sides of emargination sharply curved and divergent from base; surface with narrow, shallow median depression adjacent to emargination; pubescence adjacent to emargination dense and setae thick; surface without grooves beginning at apex of internal canals but with numerous, parallel, longitudinal carinae starting near basal ridge (as in fig. 229); basal ridge without short median carina or median point. Tergum VIII (fig. 132) with posterior margin weakly emarginate; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous, parallel, longitudinal carinae beginning near basal ridge. Tergum IX fused medially (fig. 130).

Aedeagus (fig. 129) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with short transverse carina near lateral margin of ventral surface and with median bump; apical margin rounded; ventral surface without setae, median hole or depression.

FEMALE: Characters of head, pronotum, and elytra as described for male. Abdominal sternum VII and VIII unmodified. Tergum VIII with posterior margin broadly rounded.

DISTRIBUTION AND HABITAT: This species is known from Brazil and Colombia (fig. 79) where it was collected by sifting leaf litter and fruit from the floor of a rain forest (Campbell, personal commun.).

ETYMOLOGY: From the Latin *densus* for thick or close, referring to the dense cluster of setae on the apical portion of the male's eighth sternum.

MATERIAL EXAMINED: A holotype, one

paratype, and two females. The females have the same collecting data as the paratype (deposited CNC).

26. *Neolindus punctiventris* Irmiler

Figures 79, 134–138, 229

Neolindus punctiventris Irmiler, 1981: 210, 215.
(Type locality: Peru: Pucalpa. Holotype: Male; deposited UIC.)

DIAGNOSIS: *Neolindus punctiventris* one of 11 species with numerous parallel carinae at the base of tergum and sternum VIII (fig. 229) can be separated from the other 10 by the dense random pronotal punctation, absence of a paramedial row of pronotal punctures, the dense pubescence behind and laterad of the median emargination of the posterior margin of sternum VIII of the male and absence of setae from the median strip (fig. 134), and the transversely carinate apical process of the aedeagus (fig. 135). The pronotum is longer than wide and the head has only one pair of cephalic trichobothria (as in fig. 64).

DESCRIPTION OF MALE: Length about 5.5 mm.

Color reddish brown, abdomen darker, antennae and legs paler.

Dorsum of head with moderately dense setigerous punctation; punctation absent from median spot just behind anterior margin; impunctate spot with moderately dense punctation. Head with one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Eye length shorter than postocular length of head. Gula with two setae near anterior end. Labrum with rounded lobe on anterior margin near middle. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with fine dense pubescence; segment 2 slightly shorter than 3.

Prothorax longer than wide. Pronotum without paramedial row of setigerous punctures but with moderately dense punctation on all but glabrous median strip. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII (fig. 138) with shallow median emargination of posterior margin; surface without depression or glabrous spot adjacent to emargination. Segment VIII with four internal canals at base of sternum (fig. 134) and tergum (fig. 136).

Sternum VIII (fig. 134) with broad, moderately deep median emargination of posterior margin; sides of emargination slightly sinuate and divergent from base; surface with triangular median depression; depression without setae; surface adjacent to depression with dense, lateroposteriorly directed pubescence; surface without grooves beginning near internal canals of base but with numerous parallel longitudinal carinae starting near base (as in fig. 229); base without short midlongitudinal carina or median point extending from transverse basal ridge. Tergum VIII (fig. 136) with shallow, median emargination; surface with numerous longitudinal carinae starting near base; surface without midlongitudinal carina on apical portion; base without short median carina extending from transverse basal ridge. Tergum IX (fig. 137) fused medially.

Aedeagus (fig. 135) with thin collar surrounding basal foramen and without sclerites exposed beyond apex of median orifice. Median lobe constricted near apex; ventral surface with transverse, subapical carina and without setae, median hole or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species was collected from litter near a stream in the eastern lowlands of Peru (fig. 79).

MATERIAL EXAMINED: Holotype and a second male as follows: **Peru:** *Madre de Dios* Departamento: Tambopata, litter along river, October 25, 1982, L.E. Watrous and G. Mazurek collectors (deposited FMNH).

27. *Neolindus cephalochymus*, new species

Figures 79, 139–143

HOLOTYPE: Peru: Cuzco Departamento: Consuelo, Manu road km 165, October 2, 1982, litter under crown of felled tree, L.E. Watrous and G. Mazurek collectors (deposited FMNH).

DIAGNOSIS: *Neolindus cephalochymus*, one of 11 species with numerous parallel longitudinal carinae at the base of tergum and sternum VIII (as in fig. 229), is the only one of these 11 with reduced elytra and flying wings. The aedeagus is distinctive in that the apical margin is deeply emarginate and the ventral surface has a knob near each lateroapical margin (fig. 141), the pronotum is longer than wide, and the anterior dorsal portion of the

terior margin. Eye small, length much less than postocular length of head. Gula with two setae near anterior end. Labrum with small rounded lobe on anterior margin near middle. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with fine dense pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum without paramedial row of setigerous punctures but with moderately dense punctation on all but glabrous median strip. Elytral length less than pronotal length and less than pronotal width; surface with sutural row of punctures, remainder of punctation randomly arranged.

Abdominal sternum VII (fig. 143) with shallow, median emargination of posterior margin; surface without median depression or glabrous spot adjacent to emargination. Segment VIII with four internal canals at base of tergum (fig. 140) and sternum (fig. 139). Sternum VIII (fig. 139) with broad, moderately deep, median emargination of posterior margin; sides of emargination divergent from base; surface without median depression or glabrous spot; pubescence slightly denser at middle near posterior margin; surface without grooves beginning near internal canals but with numerous parallel longitudinal carinae beginning near base (as in fig. 229); basal ridge without median carina or point. Tergum VIII (fig. 140) with feeble emargination of posterior margin; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous carinae beginning near base. Tergum IX (fig. 142) fused medially.

Aedeagus (fig. 141) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with broad, deep emargination of posterior margin; ventral surface with boss near and laterad of base of median emargination; ventral surface without setae, carinae, median hole or depression.

FEMALE: Characters of head, pronotum, and elytra as described for male except for the absence of the median cephalic tumescence. Abdominal sterna VII and VIII unmodified. Tergum VIII with posterior margin weakly sinuottruncate.

DISCUSSION: This species is flightless.

DISTRIBUTION AND HABITAT: This species was collected from litter in Peru (fig. 79).

ETYMOLOGY: From the Greek *kephale* for head and *kyma* for anything swollen, referring to the tumescence on the anterior portion of the head between the antennal insertions.

MATERIAL EXAMINED: Holotype and one female. The female was collected at the type locality by the collectors of the holotype on October 4, 1982 from rotten palm.

28. *Neolindus agilis*, new species

Figures 79, 144–148

HOLOTYPE: Male. Brazil: Distrito Federal: 2 km west of Brasilia, December 6–8, 1969, J.M. & B.A. Campbell collectors (deposited CNC).

DIAGNOSIS: *Neolindus agilis*, which is similar to *densus*, is one of a group of species with numerous, parallel carina at the base of tergum and sternum VIII (as in fig. 229). However, the elongate pronotum, the fully developed elytra, the presence of a paramedial row of pronotal punctures, and the shallow emargination of tergum VIII (fig. 147) separate *agilis* from most of these species. From *densus*, *agilis* is distinguished by the shallower emargination of sternum VIII of the male (cf. fig. 131 and 147), and by the absence of a median knob near the apex and the broadly rounded posterior margin of the aedeagus (cf. figs. 129 and 145). The presence of carinae on segment VIII (as in fig. 229), one pair of cephalic trichobothria (as in fig. 64), and a pronotum longer than wide separate *agilis* from most species of the genus.

DESCRIPTION OF MALE: Length about 4.3 mm.

Color reddish brown, elytra darker, antennae and legs paler.

Dorsum of head with setigerous punctures confined to edges of vertex; surface sparsely punctulate. Head with one trichobothrium on lateral side of vertex near dorsal margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length nearly equal to postocular length of head. Gula with two setae near anterior end. Labrum edentate and with median emargination. Antennal segments 1 to 4 shining and sparsely pubescent; segments 5 to 11 with dense, fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and sparse, scattered punctation laterad of row.

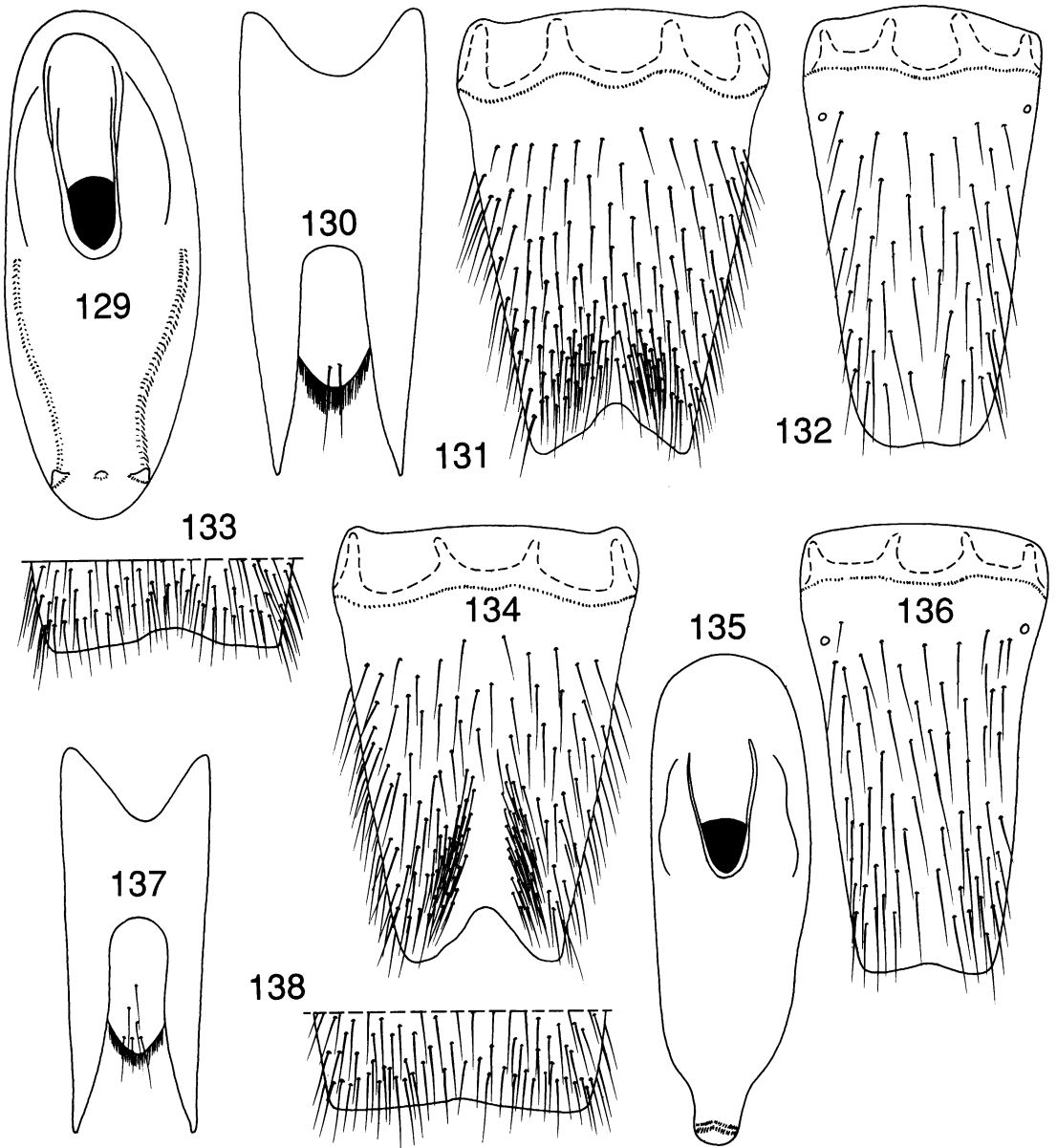


Fig. 129–133. *Neolindus densus*, male. 129. Aedeagus, ventral view. 130. Terga IX and X, setae omitted. 131. Sternum VIII. 132. Tergum VIII. 133. Sternum VII, apex.
 Figs. 134–138. *Neolindus punctiventris*, male. 134. Sternum VIII. 135. Aedeagus, ventral view. 136. Tergum VIII. 137. Terga IX and X, setae omitted. 138. Sternum VII, apex.

head is tumescent. These features separate the species from all other *Neolindus*.

DESCRIPTION OF MALE: Length about 4.6 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with sparse, setigerous

punctuation confined to edges of vertex; surface with weak, moderately dense punctulation; dorsum with low, median tumescence near anterior margin between antennal insertions. Head with one trichobothrium on lateral side of vertex near eye (as in fig. 64). Head without midlongitudinal carina at an-

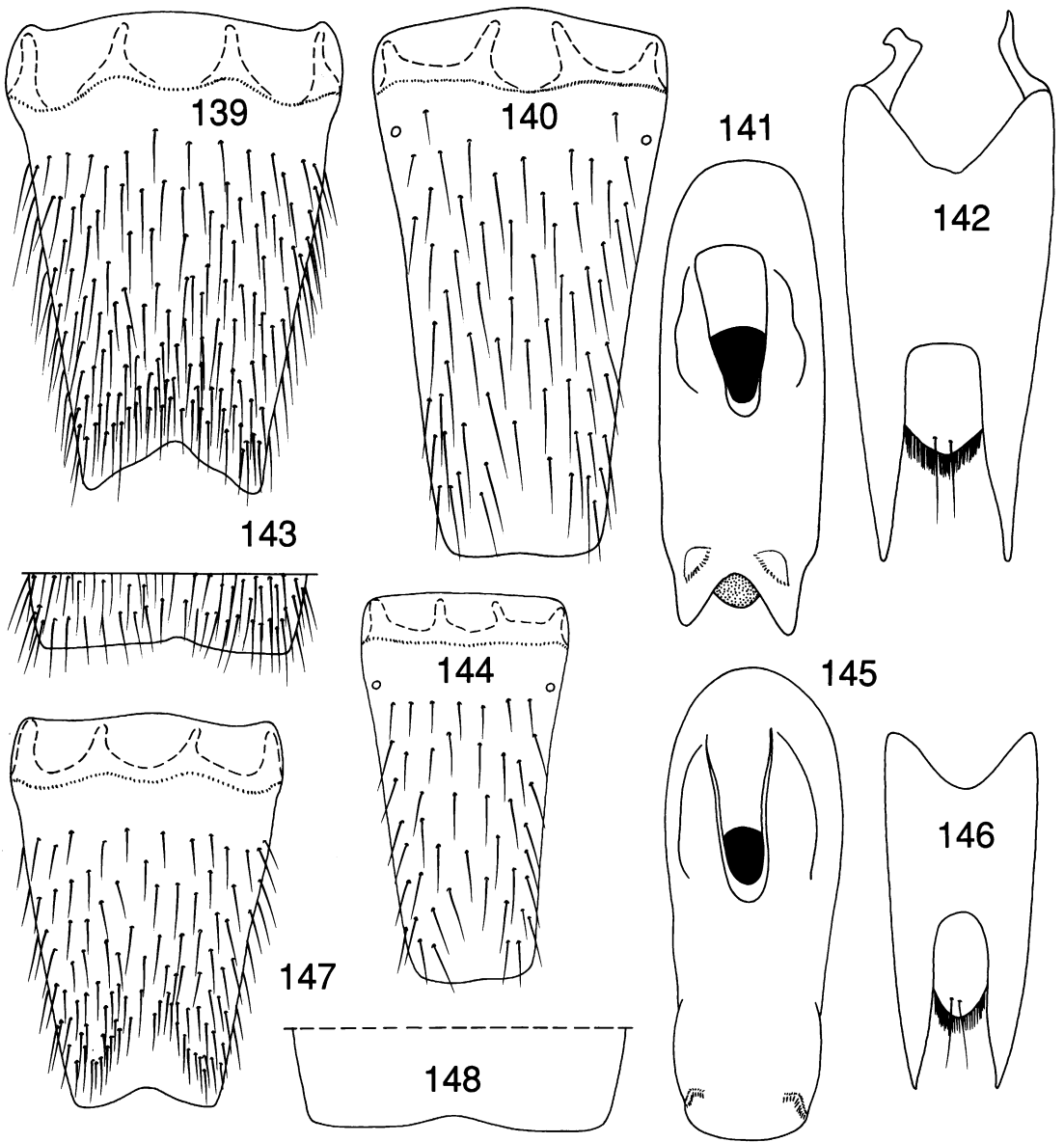


Fig. 139–143. *Neolindus cephalochymus*, male. 139. Sternum VIII. 140. Tergum VIII. 141. Aedeagus, ventral view. 142. Terga IX and X, setae omitted. 143. Sternum VII, apex.

Figs. 144–148. *Neolindus agilis*, male. 144. Tergum VIII. 145. Aedeagus, ventral view. 146. Terga IX and X, setae omitted. 147. Sternum VIII. 148. Sternum VII, apex, setae omitted.

Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sternum VII (fig. 148) with broad, shallow, median emargination of posterior margin; surface with small, shallow depression adjacent to emargination; depression without setae. Segment VIII with four

internal canals at base of sternum (fig. 147) and tergum (fig. 144). Sternum VIII (fig. 147) with broad, shallow, median emargination of posterior margin; surface without median depression but with moderately large, curved, glabrous region adjacent to emargination; surface without grooves beginning near basal internal canals on surface but with numerous

parallel longitudinal carinae starting near base (as in fig. 229); basal ridge without midlongitudinal carina or median point. Tergum VIII (fig. 144) with sinuotruncate posterior margin; surface with numerous parallel longitudinal carinae starting near base; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion. Tergum IX (fig. 146) fused medially.

Aedeagus (fig. 145) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with broadly rounded posterior margin; ventral surface with small, acute, subapical process near lateral margin and without setae, median hole, or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species is known from Brazil (fig. 79) where it was collected from cerrado by sifting recently opened *Nasutitermes* nests. The collector notes that as he tore apart the arboreal termite nest searching for termitophiles and piling the residue on the ground, a number of staphylinids were attracted (Campbell, personal commun.). It is likely that *Neolindus agilis* was from the forest floor, not the termite nest.

ETYMOLOGY: From the Latin *agilis* for quick, light, nimble, or agile.

MATERIAL EXAMINED: Holotype only.

29. *Neolindus hamatus*, new species

Figures 79, 149–153

HOLOTYPE: Male. Brazil: Pará: Belem, IPEAN, March 17–18, 1970, J.M. & B.A. Campbell collectors (deposited CNC).

DIAGNOSIS: Of the species of *Neolindus* with the pronotum wider than long, only *hamatus* and *bullus* have numerous carinae at the base of the tergum and sternum VIII (as in fig. 229). As with *bullus*, the male of *hamatus* has an emarginate posterior margin of tergum VIII (fig. 151); however, the emargination of sternum VIII is deep and narrow in *hamatus* (fig. 149) but shallow and wide in *bullus* (fig. 154). Further, *hamatus* has four cephalic trichobothria (as in fig. 78) whereas *bullus* has two (as in fig. 64). The form of the aedeagus is unique, with its deep depression and car-

inate lateral margins near the apex and hooked subapical lateral margin (figs. 150, 152).

DESCRIPTION OF MALE: Length about 4.8 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with setigerous punctures confined to edges of vertex; median surface feebly punctulate. Head with two trichobothria on lateral side of vertex near eye; one trichobothrium near anterior third of eye, second behind posterior edge of eye (as in fig. 78). Head without midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Gula with one seta near anterior end. Labrum edentate. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with fine dense pubescence; segment 2 longer than 3.

Prothorax slightly wider than long. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII with broad, feeble, median emargination of posterior margin; surface with small median spot near posterior margin devoid of setae. Segment VIII with four internal canals at base of tergum (fig. 151) and two simple and two divided canals at base of sternum (fig. 149). Sternum VIII (fig. 149) with deep median emargination of posterior margin; sides of emargination straight and nearly parallel basally and divergent apically; surface without median depression or glabrous area; surface without grooves beginning near apex of internal canals but with numerous parallel longitudinal carinae beginning near basal ridge (as in fig. 229); basal ridge without short median carina or median point. Tergum VIII (fig. 151) with broad, moderately deep, median emargination; surface with numerous parallel longitudinal carina beginning near basal ridge; surface without midlongitudinal carina on apical portion; basal ridge without short median carina or median point. Tergum IX (fig. 153) fused medially.

Aedeagus (figs. 150, 152) with thin collar surrounding basal foramen and without scler-

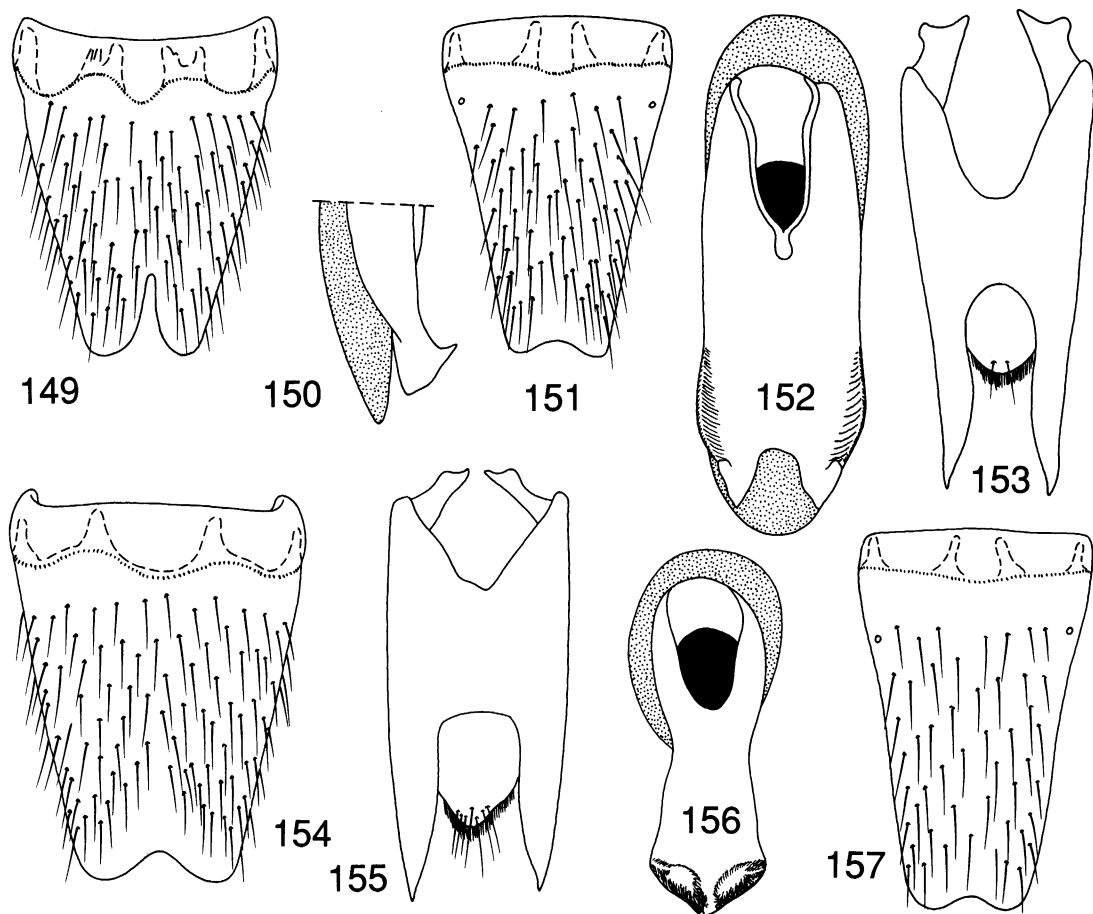


Fig. 149–153. *Neolindus hamatus*, male. 149. Sternum VIII. 150. Aedeagus, apex, lateral view. 151. Tergum VIII. 152. Aedeagus, ventral view. 153. Terga IX and X, setae omitted.

Figs. 154–157. *Neolindus bullus*, male. 154. Sternum VIII. 155. Terga IX and X, setae omitted. 156. Aedeagus, ventral view. 157. Tergum VIII

rites exposed beyond median orifice. Median lobe with apical portion of ventral surface deeply depressed and lateral margin carinate; lateral margin with acute subapical hook; posterior margin with deep median emargination; ventral surface without setae or median hole.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species is known only from Brazil (fig. 79) where it was probably collected by sifting leaf litter from the forest floor (Campbell, personal commun.).

ETYMOLOGY: From the Latin *hamatus* for hooked or with hooks, referring to the hook-

like projections on the apical portion of the aedeagus.

MATERIAL EXAMINED: Holotype only.

30. *Neolindus bullus*, new species

Figures 79, 154–157

HOLOTYPE: Male. Ecuador: Pichincha: 4 km southeast Santo Domingo, 500 m, June 8, 1976, forest litter, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: *Neolindus bullus* is one of 11 species with numerous carinae on the base of the tergum and sternum of VIII (as in fig. 229) and of these, *bullus* is one of two with

the pronotum as wide as or wider than long. Tergum VIII of the male has an emarginate posterior margin (fig. 157), and the aedeagal median lobe is simple with a pair of bosses on the apex of the ventral surface (fig. 156).

DESCRIPTION OF MALE: Length about 3.8 mm.

Color dark reddish brown, elytra darker, antennae and legs paler.

Dorsum of head with most setigerous punctation on edges of vertex; median region of vertex with two setigerous punctures anteriorly and with sparse punctulation. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length approximately equal to postocular length of head. Gula with two setae near anterior end. Labrum edentate. Antennal segments 1 to 4 shining and sparsely pubescent; segments 5 to 11 with dense fine pubescence; segment 2 slightly longer than 3.

Prothorax wider than long. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII with broad, shallow, median emargination of posterior margin; surface with small, median glabrous spot. Segment VIII with four internal canals at base of sternum (fig. 154) and tergum (fig. 157). Sternum VIII (fig. 154) with broad, moderately deep, median emargination of posterior margin; surface with broad, feeble median depression; depression and apical portion of sternum without pubescence; surface without grooves near apex of internal canals; surface with numerous parallel longitudinal carinae beginning near base (as in fig. 229); basal ridge without short median carina or median point. Tergum VIII (fig. 157) with broad, moderately deep, median emargination; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous parallel longitudinal carinae beginning near base. Tergum IX (fig. 155) fused medially.

Aedeagus (fig. 156) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe,

in ventral view, with lateral margin apically divergent from near basal foramen to near apex then strongly convergent to apex; ventral surface with subapical boss near lateral margin; ventral surface without setae, carinae, median hole or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species was collected from forest litter at 500 m in the western lowlands of Ecuador (fig. 79).

ETYMOLOGY: From the Latin *bull*a for bubble, knob, or boss, referring to the pair of bumps on the apical portion of the ventral surface of the aedeagus.

MATERIAL EXAMINED: Holotype only.

31. *Neolindus procarinatus*, new species

Figures 79, 164–167

HOLOTYPE: Male. Ecuador: Pichincha: 4 km southeast of Santo Domingo, 500 m, forest litter, June 8, 1976, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: Among 11 species with numerous carinae at the base of tergum and sternum VIII (as in fig. 229) only *procarinatus* and *retusus* have a short midlongitudinal carina on the deflexed anterior dorsal margin of the head but the two can be separated by size, *procarinatus* is smaller, and the emargination of the posterior margin of tergum VIII which is feeble on *procarinatus* (fig. 165) but well developed in *retusus* (fig. 159). *Neolindus procarinatus* has the pronotum longer than wide and one pair of cephalic trichobothria (as in fig. 64).

DESCRIPTION OF MALE: Length about 6 mm.

Color reddish brown, elytra and abdomen darker, antennae yellowish brown.

Dorsum of head with setigerous punctation laterally and anteriorly, setigerous punctation absent from posterior portion of vertex; surface without punctulation. Head with one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Head with short midlongitudinal carina on deflexed anterior margin. Eye length about equal to postocular length of head. Gula with two setae near anterior end. Labrum with two apically rounded lobes on anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

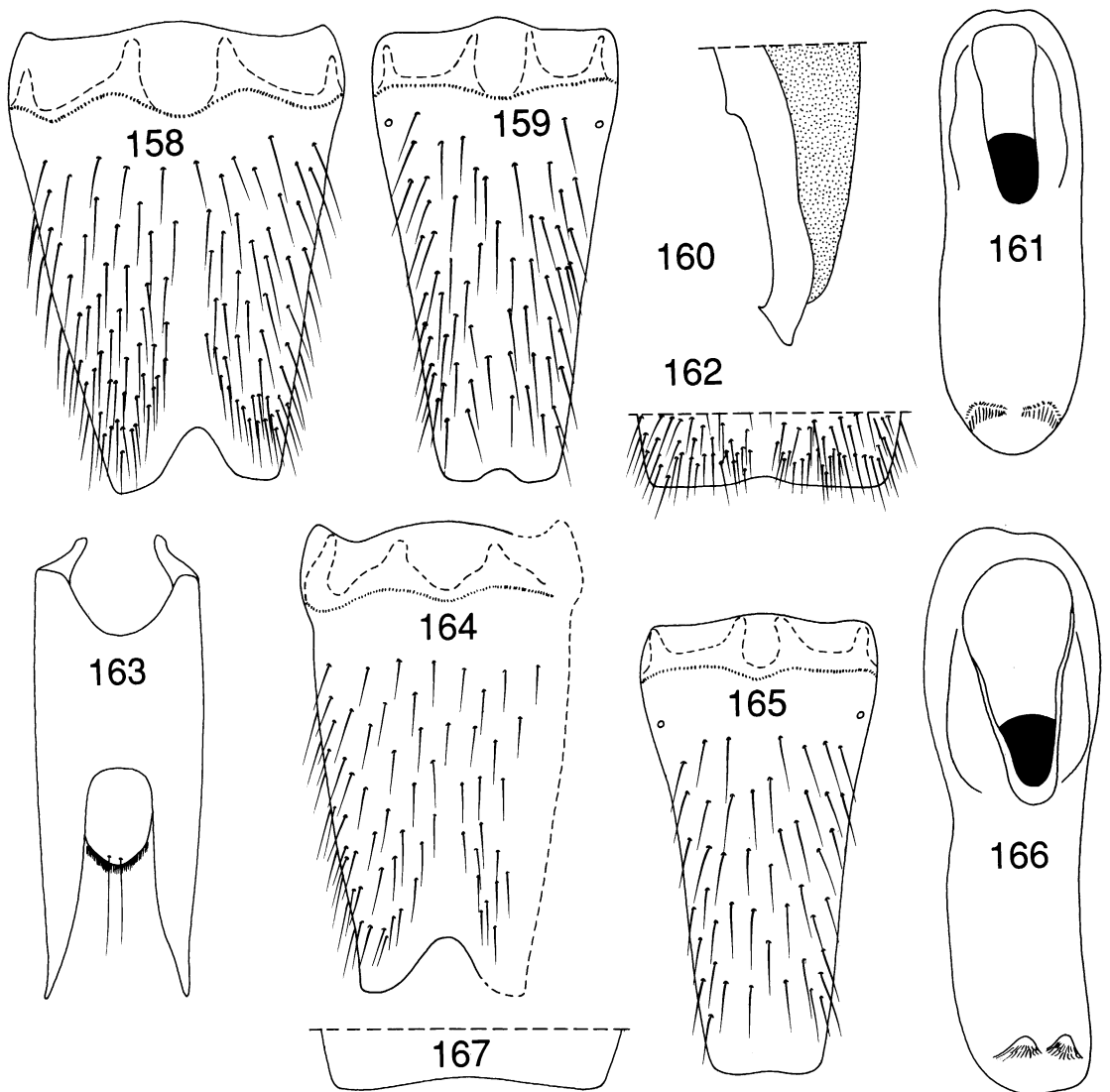


Fig. 158–163. *Neolindus retusus*, male. 158. Sternum VIII. 159. Tergum VIII. 160. Aedeagus, apex, lateral view. 161. Aedeagus, ventral view. 162. Sternum VII, apex. 163. Terga IX and X, setae omitted. Figs. 164–167. *Neolindus procarinatus*, male. 164. Sternum VIII, one side damaged and shown with broken line. 165. Tergum VIII. 166. Aedeagus, ventral view. 167. Sternum VII, apex, setae omitted.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII (fig. 167) with broad shallow median emargination of posterior margin; median region without median depression and uniformly pubescence. Seg-

ment VIII with four internal canals at base of sternum (fig. 164) and tergum (fig. 165). Sternum VIII (fig. 164) with moderately deep and broad median emargination; sides of emargination straight and divergent from base; surface with median depression extending anteriorly from emargination; depression without setae; surface without grooves beginning at apex of internal canals but with numerous, parallel longitudinal ca-

rinae beginning near base (as in fig. 229); basal ridge without short median carina or median point. Tergum VIII (fig. 165) with feeble emargination of posterior margin; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous, parallel carinae beginning near base. Tergum IX fused medially.

Aedeagus (fig. 166) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with broadly rounded apical margin; ventral surface with short, transverse, subapical carina near lateral margin and without setae, median hole or depression.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species is only known from Ecuador where it was collected from forest litter at 500 m elevation (fig. 79).

ETYMOLOGY: From the Latin *pro* for before, forward, or in front of and *carinatus* for keeled, referring to the midlongitudinal carina on the anterior edge of the head.

MATERIAL EXAMINED: Holotype only.

32. *Neolindus retusus*, new species

Figures 79, 158–163

HOLOTYPE: Male. Ecuador: Napo: Limoncocha, 250 m, June 25, 1976, forest litter, S. & J. Peck collectors (deposited CNC).

DIAGNOSIS: *Neolindus retusus* is one among 11 species with numerous parallel carinae at the base of tergum and sternum VIII (as in fig. 229) but can be separated from all but *Neolindus procarinatus* by the presence of a short midlongitudinal carina on the deflexed anterior dorsal margin of the head. *Neolindus retusus* is separated from *procarinatus* by the deeper emargination of the posterior margin of tergum VIII (cf. figs. 159 and 165) and the larger size of *retusus*. Also diagnostic for *retusus* are the elongate pronotum and the presence of only one pair of cephalic trichobothria (as in fig. 64).

DESCRIPTION OF MALE: Length about 9.5 mm.

Color dark reddish brown, abdomen darker, antennae and legs reddish brown.

Dorsum of head with setigerous punctures on anterior portion of middle of vertex and

on lateral edges of vertex, posterior portion of vertex without setigerous punctures; surface with scattered, feeble punctules. Head with one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Head with short midlongitudinal carina on deflexed anterior margin. Eye length slightly less than postocular length of head. Gula with two setae near anterior end. Labrum with pair of apically rounded denticles near middle. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of punctures and numerous punctures laterad of row. Elytral length approximately equal to pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII (fig. 162) with broad, shallow, median emargination of posterior margin; surface without setae on median strip adjacent to emargination. Segment VIII with four internal canals at base of sternum (fig. 164) and tergum (fig. 165). Sternum VIII (fig. 164) with moderately broad and deep median emargination of posterior margin; sides of emargination curved slightly and divergent from base; surface with median depression adjacent to emargination; depression and narrow median stripe without setae; surface without grooves beginning near apex of internal canals but with numerous, parallel longitudinal carinae beginning near base (as in fig. 229); basal ridge without short median carina or median point. Tergum VIII (fig. 165) with moderately deep median emargination of posterior margin; basal ridge without short median carina or median point; surface without midlongitudinal carina on apical portion; surface with numerous, parallel longitudinal carinae beginning near base. Tergum IX fused medially (fig. 163).

Aedeagus (fig. 161) with thin collar surrounding basal foramen and without sclerites exposed beyond apex of median orifice. Apical margin of median lobe broadly rounded; ventral surface with short, transverse, subapical carina near lateral margin and without setae, median hole or depression.

FEMALE: Characters of head, pronotum, and elytra as described for male. Abdominal ster-

num VII unmodified. Sternum VIII with broad, shallow, median emargination of posterior margin. Tergum VIII with moderately deep median emargination of posterior margin similar to that of male.

DISCUSSION: I tentatively regard the female to be conspecific with the male holotype. Both are from Ecuador and are externally similar in size, shape, punctation, presence of the short midlongitudinal carina at the anterior margin of the head, and presence of the median emargination of tergum VIII. However, the female was collected at 500 m elevation on the west side of the Andes, and the male, the holotype, was collected at 250 m on the east side. There are three possibilities to explain this anomalous distribution: the locality for one of the specimens may be incorrect, the two may be different species, or the two may be one species that lives on both sides of the Andes. The correct distribution of *retusus* will be known only with more collecting.

DISTRIBUTION AND HABITAT: The species is known from Ecuador and was collected in leaf litter and may live on both sides of the Andes (fig. 79).

ETYMOLOGY: From the Latin *retusus* for notched at the apex, referring to the notch of the apical margin of the posterior margin of tergum VIII.

MATERIAL EXAMINED: The holotype and one, possibly conspecific, female from the following locality: Ecuador: *Pichincha*: 4 km southeast of Santo Domingo, 500 m, forest litter, June 8, 1976, S. & J. Peck collectors (deposited CNC).

33. *Neolindus peruvianus* Irmeler

Figure 79

Neolindus peruvianus Irmeler, 1981: 210, 214. (Type locality: Peru: Pucalpa [sic]. Holotype: female; deposited UIC.)

DIAGNOSIS: *Neolindus peruvianus* is one of 11 species with a cluster of longitudinally arranged carinae that begin at the base of tergum VIII. However, without knowledge of the male, identification of this species will be difficult or impossible. Insofar as *peruvianus* is identifiable, characters are presented in the key to females, where only a few species are available, and in the key that does not rely

on sexual characteristics of the male; in the latter key *peruvianus* runs to the second half of couplet 9, which includes three other species.

DESCRIPTION OF FEMALE: Length about 3.8 mm.

Color pale reddish brown; antennae and legs yellowish brown.

Dorsum of head with setigerous punctures confined to edges of vertex; punctation sparse; surface without punctulation. Head with one trichobothrium on lateral side of vertex near anterior portion of dorsal margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye moderately large, slightly longer than postocular length of head. Gula with two setae on anterior portion of gula. [Labrum not visible, covered with debris.] Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with fine pubescence; segment 2 longer than 3.

Prothorax longer than wide. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and two discal rows of punctures.

Abdominal sterna VII and VIII unmodified. Tergum VIII with four simple internal canals at base; posterior margin with broad, moderately deep emargination of posterior margin; surface with numerous longitudinal carinae beginning near base; surface without midlongitudinal carina at base or apex.

MALE: Unknown.

DISCUSSION: Since *peruvianus*, known only by the female, has no especially distinctive features the species will be difficult to identify and recognition of the male will be less likely.

DISTRIBUTION AND HABITAT: The species is known only from Peru where it was collected in a banana grove (fig. 79).

MATERIAL EXAMINED: Holotype.

34. *Neolindus campbelli*, new species

Figures 79, 168–172

HOLOTYPE: Male. Panama: Cerro Campana, 2900 ft, August 1, 1970, J.M. Campbell collector (deposited CNC).

PARATYPE: One male with same label data as the holotype (deposited CNC).

DIAGNOSIS: The pronotum of *Neolindus*

campbelli is wider than long and the head has one pair of trichobothria (as in fig. 64). The species can be separated from all other species except *apiculus* by the dense fine pubescence on antennal segment 3, punctation on the central portion of the vertex of the head, absence of a distinct row of pronotal punctures, large size, broad and deep emargination of sternum VIII of the male (fig. 168), and medially divided ninth tergum (fig. 171). *Neolindus campbelli* is most similar to *apiculus* but can be distinguished by the thickness of the arms at the apex of the aedeagus and the form of the apical margin of the aedeagus (cf. figs. 170 and 174).

DESCRIPTION OF MALE: Length about 11 mm.

Color dark reddish brown, elytra and abdomen darker, nearly black, antenna and legs paler.

Dorsum of head with most of vertex covered with moderately dense setigerous punctation but with small spot near anterior margin devoid of setigerous punctures; surface with moderately dense punctulation. Head with one trichobothrium on lateral side of vertex near middle of eye (as in fig. 64). Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum with apically rounded lobe near middle of anterior margin. Antennal segments 1 and 2 shining and sparsely pubescent; segments 3 to 11 with dense fine pubescence; segment 2 and 3 subequal in length.

Prothorax wider than long. Pronotum without paramedial row of setigerous punctures but with paramedial cluster of punctures and with numerous punctures laterad of cluster. Elytral length greater than pronotal length and greater than pronotal width; surface with sutural row of punctures and numerous other punctures on remainder.

Abdominal sternum VII (fig. 172) with broad, moderately deep median emargination; surface with feeble median depression; depression without setae. Segment VIII with four internal canals at base of tergum (fig. 169) and sternum (fig. 168). Sternum VIII (fig. 168) with broad, deep median emargination of posterior margin; sides of emargination straight and divergent; surface anterior to emargination with median depression and devoid of setae; surface with grooves near

apex of lateral internal canals and without numerous longitudinal carinae beginning near base; basal ridge without median carina or median point. Tergum VIII (fig. 169) with rounded posterior margin; basal ridge pointed at middle; surface without midlongitudinal carina on apical portion. Tergum IX (fig. 171) partially divided medially.

Aedeagus (fig. 170) with thick collar surrounding basal foramen and without sclerites exposed just beyond median orifice. Median lobe broad; posterior margin thinly sclerotized and broadly emarginate; apical portion with short, thick arms; ventral surface with deep median depression; lateral margin of depression carinate; carina extends to medially directed lobe just behind basal foramen; ventral surface without setae or median hole.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII and VIII unmodified. Tergum VIII with posterior margin broadly rounded.

DISTRIBUTION AND HABITAT: This species is known only from Panama where it was collected from leaf litter in a cloud forest (fig. 79).

ETYMOLOGY: This species is named for J. Milton Campbell, of the Biosystematics Research Laboratories in Ottawa, Ontario who collected the type series, to honor his contributions to the study of the Staphylinidae.

MATERIAL EXAMINED: Holotype, one paratype, and one female. Female with the following label data: **Panama:** *Panama:* Cerro Campana, 3200 ft, cloud forest leaf litter, February 14–23, 1976, A. Newton collector (deposited MCZ).

35. *Neolindus apiculus*, new species

Figures 79, 173–176

HOLOTYPE: Male. Panama: Canal Zone, Barro Colorado Island, January–February 1945, J. Zetek collector (deposited USNM).

DIAGNOSIS: *Neolindus apiculus* is similar to *campbelli* in that both have dense fine pubescence on the third antennal segment, punctures on the central portion of the vertex of the head, a medially divided ninth tergum (fig. 176), rounded posterior margin of tergum VIII (fig. 175), deep and broad emargination of sternum VIII of the male (fig. 173),

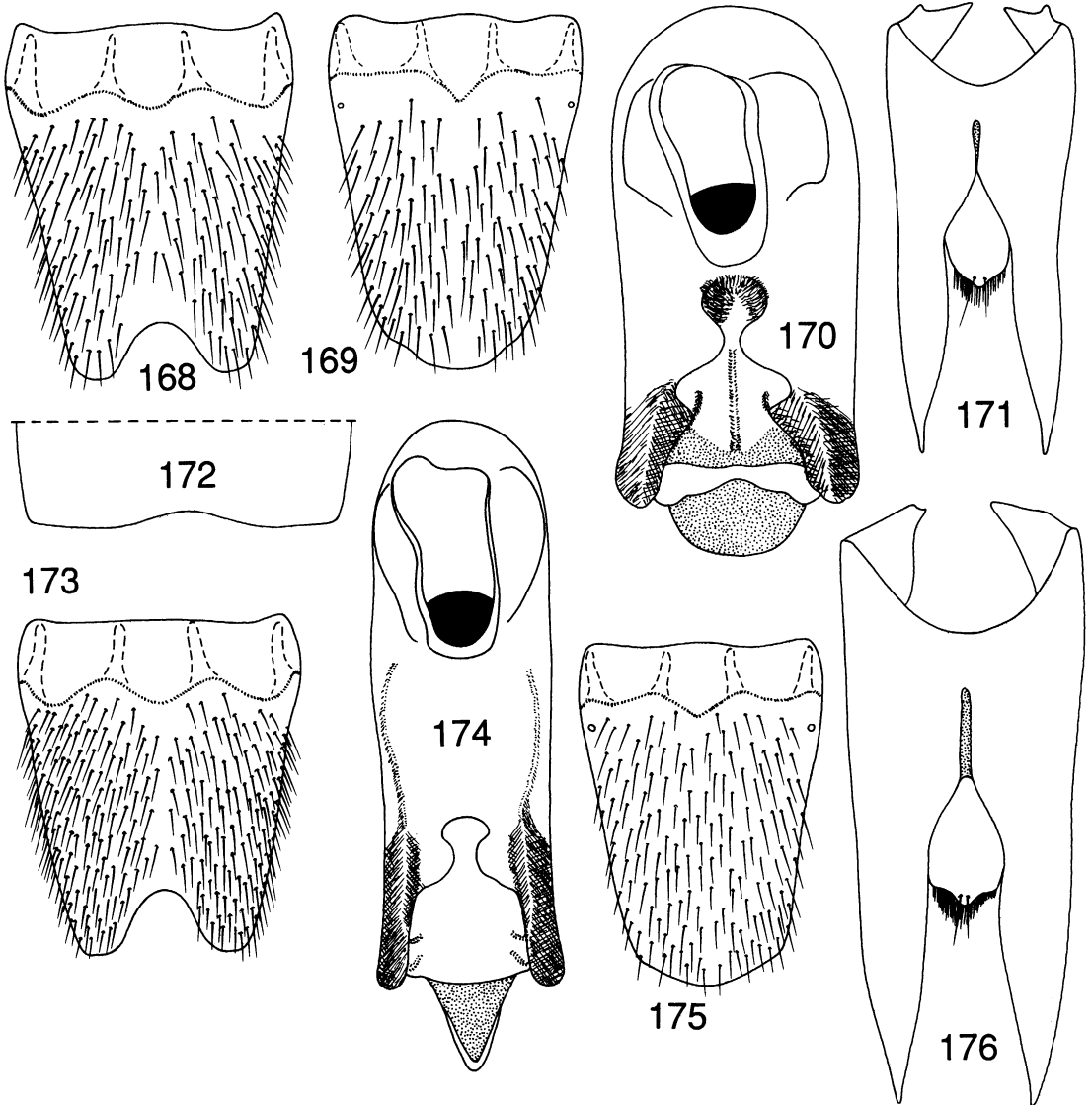


Fig. 168–172. *Neolindus campbelli*, male. 168. Sternum VIII. 169. Tergum VIII. 170. Aedeagus, ventral view. 171. Terga IX and X, setae omitted. 172. Sternum VII, apex, setae omitted.

Figs. 173–176. *Neolindus apiculus*, male. 173. Sternum VIII. 174. Aedeagus, ventral view. 175. Tergum VIII. 176. Terga IX and X, setae omitted.

a pronotum that is wider than long, one pair of cephalic trichobothria (as in fig. 64), and lack a paramedial row of pronotal punctures. These characters separate *apiculus* and *campbelli* from other species of the genus. *Neolindus apiculus* is distinguished from *campbelli* by the more slender arms at the apex of the aedeagus and by the apical margin of the aedeagus (cf. figs. 170 and 174).

DESCRIPTION OF MALE: Length about 12.5 mm.

Color reddish brown.

Dorsum of head with setigerous punctures scattered over most of vertex but absent from anterior median spot; surface densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of dorsal margin of eye (as in fig. 64). Head without

midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum with large apically rounded lobe near middle of anterior margin. Antennal segments 1 and 2 shining and sparsely pubescent; segments 3 to 11 with dense fine pubescence; segment 2 and 3 subequal in length.

Prothorax wider than long. Pronotum without paramedial row of punctures but with paramedial cluster of punctures and with numerous, scattered setigerous punctures laterad of cluster. Elytral length greater than pronotal length and slightly less than pronotal width; surface with one sutural row of punctures and four poorly developed discal rows.

Abdominal sternum VII with broad, shallow median emargination of posterior margin; surface with median glabrous spot adjacent to emargination; surface without median depression. Segment VIII with four internal canals at base of tergum (fig. 175) and sternum (fig. 173). Sternum VIII (fig. 173) with broad, deep median emargination; sides of emargination straight and divergent; surface with broad, shallow median depression; depression with setae on all but narrow median stripe and area adjacent to emargination; surface with shallow grooves near apex of lateral internal canals but without longitudinal carinae beginning near basal ridge; basal ridge without median carina or median point. Tergum VIII (fig. 175) with broadly rounded posterior margin; basal ridge acutely pointed medially; surface without midlongitudinal carina on apical portion; surface without numerous carinae beginning near basal ridge. Tergum IX (fig. 176) partially divided medially.

Aedeagus (fig. 174) with thin collar surrounding basal foramen and without sclerites exposed beyond median orifice. Median lobe with thinly sclerotized posterior margin; apical region with long moderately thick arms; ventral surface with apical surface broadly and deeply depressed; inner margin of depression with rounded lobe near base; lateral sides of ventral surface carinate; ventral surface without setae or median hole.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII and VIII unmodified. Tergum VIII with broadly rounded posterior margin.

DISTRIBUTION AND HABITAT: This species is known from the lowlands of Panama (fig. 79).

ETYMOLOGY: From the Latin *apiculus* for apex or apical, referring to the pointed apex of the aedeagus.

MATERIAL EXAMINED: Holotype and one female. The female is from: **Panama:** *Canal Zone:* Barro Colorado Island, July 18, 1938, E. Williams collector (deposited FMNH).

36. *Neolindus cuneatus*, new species

Figures 79, 177–181

HOLOTYPE: Male. Costa Rica: Puntarenas: Osa Peninsula, 5 km west of Rincon de Osa, 8°42'N, 83°31'W, March 24–30, 1973, 50 m elevation, old epiphytic humus, sticks, leaves, J. Wagner & J. Kethley collectors (deposited FMNH).

DIAGNOSIS: *Neolindus cuneatus* has a wide pronotum that lacks a paramedial row of punctures, has one pair of cephalic trichobothria (as in fig. 64), a rounded posterior margin of tergum VIII (fig. 178), and V-shaped emargination of sternum VIII of the male (fig. 177). The emargination of the apical margin and the configuration of the sclerites at the apex of the aedeagus are characteristic of *cuneatus* (fig. 179).

DESCRIPTION OF MALE: Length about 4.5 mm.

Color dark reddish brown, antennae and legs paler.

Dorsum of head with four setigerous punctures on median region of vertex and other punctation on lateral edges of vertex; surface feebly and moderately densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum with apically rounded lobe near middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 3 about one-fifth longer than 2.

Prothorax wider than long. Pronotum without paramedial row of setigerous punctures but with dense punctation laterad of glabrous median stripe. Elytral length greater

than pronotal length and greater than pronotal width; surface with one distinct sutural and discal row of punctures and with numerous punctures on lateral portion.

Abdominal sternum VII (fig. 181) with broad, shallow median emargination of posterior margin; surface without median depression and uniformly pubescent. Segment VIII with four internal canals at base of tergum (fig. 178) and two simple and two bifurcated internal canals at base of sternum (fig. 177). Sternum VIII (fig. 177) with broad, moderately deep, wedge shaped, median emargination of posterior margin; sides of emargination straight and divergent from base; surface immediately adjacent to and surrounding emargination shallowly depressed and without setae; surface with grooves at apex of lateral internal canals and without numerous longitudinal carinae beginning near basal ridge; basal ridge without median carina or point. Tergum VIII (fig. 178) with broadly rounded posterior margin; basal ridge with short median carina; surface without midlongitudinal carina on apical portion; surface without numerous longitudinal carinae beginning near base. Tergum IX (fig. 180) fused medially.

Aedeagus (fig. 179) with thin collar surrounding basal foramen and with complex sclerite exposed beyond apex of median orifice. Median lobe with broad, moderately deep emargination; ventral surface with shallow midlongitudinal depression and shallow depression adjacent to emargination; ventral surface without cluster of setae, carinae, or median hole.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: This species was collected from litter in the western lowlands of Costa Rica (fig. 79).

ETYMOLOGY: From the Latin *cuneatus* for wedge shaped, referring to the form of the emargination of the posterior margin of sternum VIII.

MATERIAL EXAMINED: Holotype only.

37. *Neolindus lodhii*, new species

Figures 79, 182-187

HOLOTYPE: Male. Brazil: Pará: Belem, IPEAN, April 1, 1970, J.M. & B.A. Campbell collectors (deposited CNC).

PARATYPE: Three males from the type locality, one with same collectors and date as the holotype (deposited CNC), one with same collectors as the holotype but collected on March 26, 1970 (deposited CNC). The third specimen was collected by R.T. Schuh on July 2, 1973 from litter in "Mocambo" (deposited AMNH).

DIAGNOSIS: *Neolindus lodhii* with a wide pronotum and one pair of cephalic trichobothria, can be recognized by the complex sclerites at the apex of the aedeagus (figs. 184, 186), the curved lateral margins of the emargination of sternum VIII, and the pair of diagonal depressions separated by a long cluster of setae laterad of the emargination and near the apex of sternum VIII of the male (fig. 182).

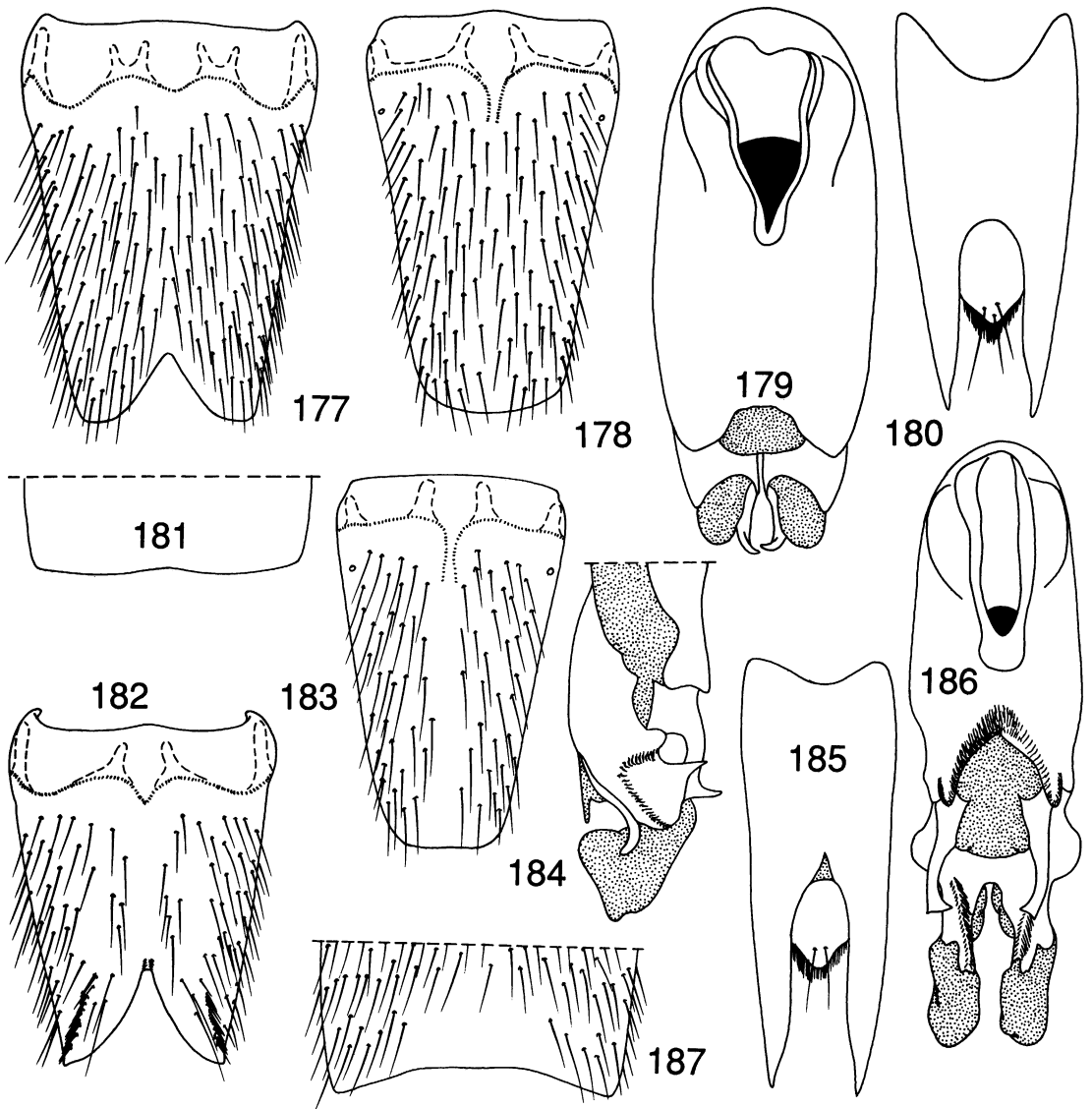
DESCRIPTION OF MALE: Length about 6 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with setigerous punctures confined to edges of vertex; surface sparsely and feebly punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Eye length longer than postocular length of head. Gula with two setae near anterior end. Labrum with large, apically rounded lobe near middle of anterior margin and with smaller, apically rounded lobe near lateral edge of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 about two-thirds of length of 3.

Prothorax wider than long. Pronotum with paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII (fig. 187) with broad, moderately deep emargination of posterior margin; surface without depression and glabrous adjacent to posterior margin. Segment VIII with four internal canals at base of tergum (fig. 183) and sternum (fig. 182). Sternum VIII with broad, deep median emargination of posterior margin (fig. 182); sides of emargination curved and divergent; surface of segment with small, median carina immediately adjacent to base of emargination; surface with shallow, median depres-



Figs. 177–181. *Neolindus cuneatus*, male. 177. Sternum VIII. 178. Tergum VIII. 179. Aedeagus, ventral view. 180. Terga IX and X, setae omitted. 181. Sternum VII, apex, setae omitted.

Figs. 182–187. *Neolindus lodhii*, male. 182. Sternum VIII. 183. Tergum VIII. 184. Aedeagus, apex, lateral view. 185. Terga IX and X, setae omitted. 186. Aedeagus, ventral view. 187. Sternum VII, apex.

sion; median depression without setae; surface adjacent to lateral side of emargination with diagonally oriented depression; depression with a few setae; surface with another depression laterad of and parallel to medial diagonal depression; second diagonal depression without setae but surface with microsculpturing; diagonal depressions divided by row of seta; surface with short depression

beginning at apex of each lateral internal canal; surface without numerous longitudinal carinae beginning near basal ridge; basal ridge acutely pointed medially. Tergum VIII (fig. 183) with arcuatotruncate posterior margin; basal ridge with short median carina; surface without numerous longitudinal carinae beginning near basal ridge. Tergum IX (fig. 185) fused medially.

Aedeagus (figs. 184, 186) with moderately thick collar surrounding basal foramen and with complex sclerites exposed beyond median orifice. Median lobe with broad, deep emargination of posterior margin; ventral surface without setae, carinae, or median hole but with depression adjacent to emargination.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species is known from eastern Brazil (fig. 79) where one collector found it in litter in a "Mocambo," a local designation for a riverine forest. Milton Campbell (personal commun.) collected the species by sifting forest floor leaf litter mixed with fallen fruit.

ETYMOLOGY: This species is named for Sarfraz Lodhi who has assisted my work with the collection here at the American Museum for 18 years.

MATERIAL EXAMINED: Holotype and three paratypes.

38. *Neolindus milleri*, new species

Figures 79, 188–191

HOLOTYPE: Male. Ecuador: Napo: 33 km N Tena, 59 km E on Loreto rd, 2800 ft, November 4, 1988, leaf litter on dry slope, L. Herman collector (deposited AMNH).

DIAGNOSIS: *Neolindus milleri* has a pronotum that is wider than long and one pair of cephalic trichobothria (as in fig. 64). It is distinguished from all other *Neolindus* species by the shape of the emargination of the male's sternum VIII (fig. 188), by the configuration of the apical margin of the median lobe, and by the shape of the exposed apical sclerites of the aedeagus (fig. 189). This species is one of only nine with sclerites exposed at the apex of the aedeagus. The posterior margin of tergum VIII is rounded and there is a median carina at the base extending from the transverse basal ridge (fig. 190).

DESCRIPTION OF MALE: Length about 5.5 mm.

Color reddish brown, antennae and legs paler.

Dorsum of head with most punctation confined to edges of vertex but with a few scattered punctures on central portion of vertex; median surface with moderately dense punctulation. Head with one trichobothrium on

lateral side of vertex near anterior edge of inner margin of eye (as in fig. 64). Eye length greater than postocular length of head. Gula with two setae near anterior end. Labrum with large, apically rounded denticle near middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 3 about one seventh longer than 2.

Prothorax wider than long. Pronotum without paramedial row of punctures and with dense, randomly arranged punctation laterad of impunctate median stripe. Elytra length greater than pronotal length and slighter greater than pronotal width; surface with one sutural row, remainder of surface with dense irregularly arranged punctation.

Abdominal sternum VII with broad, feeble emargination of posterior margin; surface without median depression; pubescence uniformly distributed. Segment VIII with four simple internal canals at base of tergum (fig. 190) and two simple and two bifurcated internal canals at base of sternum (fig. 188). Sternum VIII (fig. 188) with deep, broad median emargination of posterior margin; sides of posterior margin sinuous and divergent from base; surface without median depression and pubescence uniformly distributed; surface with shallow depression near apex of lateral internal canal and without numerous longitudinal carinae near base; basal ridge without median carina or median point. Tergum VIII (fig. 190) with rounded posterior margin; surface without numerous carinae beginning near base; basal ridge with median carina; surface without midlongitudinal carina on apical portion. Tergum IX (fig. 191) fused medially, but with faint ridge suggestive of longitudinal division.

Aedeagus (fig. 189) with thin collar surrounding basal foramen and with small slender sclerites exposed beyond median orifice. Median lobe with deeply and broadly emarginate posterior margin; ventral surface without depression, carinae, setae, or median hole.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII with posterior margin truncate. Abdominal sternum VIII with broad, shallow emargination of posterior margin; tergum VIII with rounded posterior margin.

DISTRIBUTION AND HABITAT: The species

was collected at the eastern edge of the Ecuadorean Andes (fig. 79) at about 2800 ft elevation (850 m) from leaf litter on a dry slope above a stream. From that spot the Amazonian forest can be seen stretching eastward for 2000 miles to the Atlantic Ocean.

ETYMOLOGY: This species is named for my friend, Jim Miller, with whom I was traveling at the time I collected it.

MATERIAL EXAMINED: Holotype and one female. The female has the same collecting data as the holotype (deposited AMNH).

39. *Neolindus basisinuatus*, new species
Figures 1, 63–72, 79, 192–196

HOLOTYPE: Male. Panama: Canal Zone, Barro Colorado Island, April–May, 1942 (deposited USNM).

PARATYPES: Five males. **Panama:** *Canal Zone:* Barro Colorado Island, January–February, 1945, J. Zetek collector (deposited USNM). **Panama:** *Canal Zone:* Anchiote road, 5 mi southwest Gatun, June 19, 1976, rain forest leaf litter, A. Newton collector (deposited MCZ). **Panama:** *Canal Zone:* Frijoles train stop, October 25, 1975, leaf litter, D. S. Chandler collector (deposited MCZ). **Panama:** *Panama Prov.:* Altos de Majé, October 6–15, 1975, litter in old forest, D. S. Chandler collector (deposited MCZ). **Costa Rica:** *Heredia:* OTS La Selva Field Station, Puerto Viejo de Sarapiquí, Rio Puerto Viejo, March 5–11, 1973, epiphytic humus, 10°26'N, 83°59'W, J. Wagner & J. Kethley collectors (deposited FMNH).

DIAGNOSIS: *Neolindus basisinuatus* has a wide pronotum, one pair of cephalic trichobothria (as in fig. 64) and can be separated from others of the genus by these characters along with features of sternum VIII and the aedeagus. Sternum VIII of the male is broadly emarginate and the base of the emargination is sinuate (fig. 195). The aedeagus (fig. 193) has a broad median depression with a cluster of setae on each side and a cluster of sclerites of characteristic configuration exposed at the apex.

DESCRIPTION OF MALE: Length about 6.1 mm.

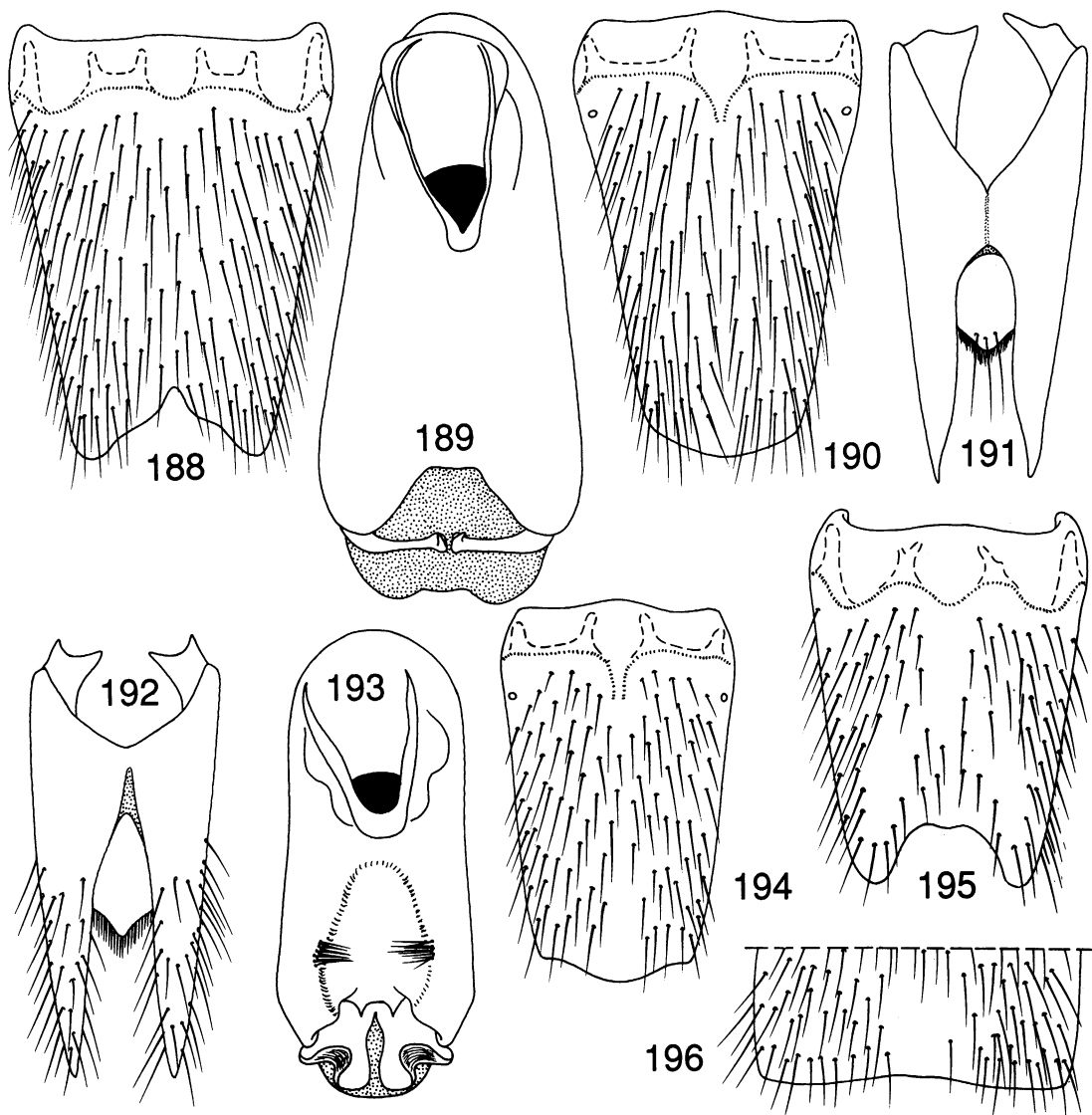
Color reddish brown, elytra darker, antennae and legs paler.

Dorsum of head with setigerous punctures confined to edges of vertex; surface with sparse punctulation. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Eye length greater than postocular length of head. Head without midlongitudinal carina at anterior margin. Gula with two setae near anterior margin. Labrum with apically rounded lobe near middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 3 about one-fifth longer than 2.

Prothorax wider than long. Pronotum with paramedial row of setigerous punctation and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural row and dense unorganized punctation with other rows indistinctly developed.

Abdominal sternum VII (fig. 196) with broad, moderately deep, sinuous emargination of posterior margin; surface with small, median, impunctate strip near posterior margin; surface without median depression. Segment VIII with four internal canals at base of tergum (fig. 194) and with two simple and two bifurcated internal canals at base of sternum (fig. 195); bifurcate canals near middle. Sternum VIII (fig. 195) with broad, deep, median emargination; emargination with broad, sinuate base; sides of emargination straight and divergent; surface with setae on broad median strip and with diagonal glabrous strip laterad of median strip; surface without median depression; surface with grooves beginning near apex of lateral internal canal and without longitudinal carinae beginning near basal ridge; basal ridge without median carina or median point. Tergum VIII (fig. 194) with broadly rounded posterior margin; basal ridge with short median carina; surface without midlongitudinal carina on apical portion; surface without longitudinal carinae. Tergum IX (fig. 192) medially divided.

Aedeagus (fig. 193) with moderately thick collar surrounding basal foramen and with complex sclerites exposed beyond apex of median orifice. Median lobe broad; posterior margin with broad median emargination; base of emargination sinuate; ventral surface with



Figs. 188–191. *Neolindus milleri*, male. 188. Sternum VIII. 189. Aedeagus, ventral view. 190. Tergum VIII. 191. Terga IX and X, setae omitted.

Figs. 192–196. *Neolindus basisinuatus*, male. 192. Terga IX and X, setae omitted. 193. Aedeagus, ventral view. 194. Tergum VIII. 195. Sternum VIII. 196. Sternum VII, apex.

cluster of setae near apical fifth but without median hole and with shallow depression adjacent to emargination.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII and VIII unmodified; tergum VIII with broad, rounded lobe.

DISTRIBUTION AND HABITAT: This species

was collected in the lowlands of Panama and Costa Rica from forest floor litter and epiphytic humus (fig. 79).

ETYMOLOGY: From the Latin *basis* for bottom and *sinuatus* for bend or curve, referring to the form of the basal margin of the emargination of the posterior margin of sternum VIII.

MATERIAL EXAMINED: Holotype, five paratypes, and three females. The females are from the type locality; two were collected in July–August 1942 and January–March 1944 by J. Zetek (deposited USNM); the third was collected in August 1969 by J. Lawrence and B. and T. Hlavac (deposited MCZ).

40. *Neolindus sinuatus*, new species

Figures 79, 197–199

HOLOTYPE: Male. Brazil: Pará; 5 km east of Belém, May 30, 1973, soil-litter layer in primary “terra firme” forest, R.T. Schuh collector (deposited AMNH).

DIAGNOSIS: *Neolindus sinuatus*, one of the species with a wide pronotum and one pair of cephalic trichobothria (as in fig. 64), is separated from all others species by the rounded posterior margin of tergum VIII (fig. 197), the broad, shallow emargination of sternum VIII of the male (fig. 199), and characters of the aedeagus (fig. 198) which include the small cluster of setae near the base of the apical emargination, and the broad, deep emargination of the apical margin.

DESCRIPTION OF MALE: Length about 6.8 mm.

Color reddish brown, elytra and abdomen darker, antennae and legs paler.

Dorsum of head with two setigerous punctures on anterior portion of vertex, other punctation confined to edges of vertex; surface moderately densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length greater than postocular length of head. Gula with two setae near anterior margin. Labrum with large apically rounded lobe near middle of anterior margin and with smaller apically rounded lobe near lateral edge of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 3 about one-fifth longer than 2.

Prothorax wider than long. Pronotum with irregular paramedial row of setigerous punctures and scattered, moderately dense punctation laterad of row. Elytral length greater than pronotal length and greater than pron-

otal width; surface with distinct sutural row of punctures, other rows indistinctly developed but surface densely punctate.

Abdominal sternum VII with broad, shallow emargination of posterior margin; surface with small, median glabrous spot and without median depression. Segment VIII with four internal canals at base of tergum (fig. 197) and with two simple and two bifurcated canals at base of sternum (fig. 199). Sternum VIII (fig. 199) with broad, shallow median emargination; base of emargination sinuate; sides of emargination divergent; surface with small median glabrous spot just anterior of median emargination; surface with small diagonal glabrous spot laterad of median glabrous spot; surface without depressions; surface with grooves beginning at apex of lateral internal canals but without longitudinal carinae beginning near basal ridge; basal ridge with acute median point. Tergum VIII (fig. 197) with rounded posterior margin; basal ridge with median carina; surface without midlongitudinal carina on apical portion; surface without numerous parallel, longitudinal carina beginning near base. Tergum IX divided medially.

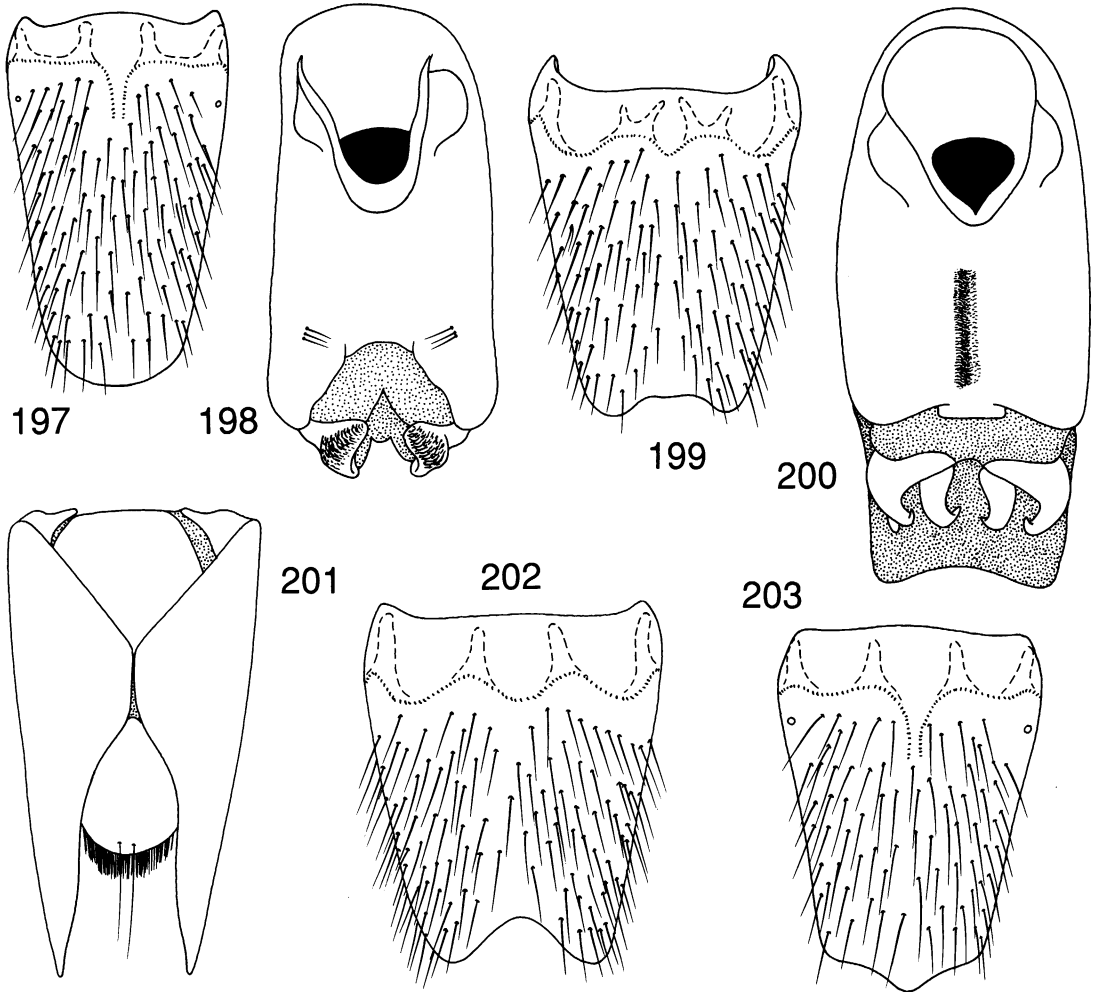
Aedeagus (fig. 198) with moderately thick collar surrounding basal foramen and with complex sclerites exposed beyond apex of median orifice. Median lobe with broad, deep emargination of posterior margin; ventral surface with subapical cluster of setae near lateral margin; ventral surface with apical half broadly depressed and without median hole.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII and VIII unmodified. Tergum VIII with rounded posterior margin.

DISTRIBUTION AND HABITAT: The species is known from eastern Brazil where it was collected by sifting forest floor leaf litter (fig. 79).

ETYMOLOGY: From the Latin *sinuatus* for bend or curve, referring to the form of the basal margin of the emargination of the posterior margin of sternum VIII.

MATERIAL EXAMINED: Holotype and one female. Female with label data as follows: **Brazil:** Pará: Belem, IPEAN, March 17–18, 1970, J.M. & B.A. Campbell collectors (deposited CNC).



Figs. 197–199. *Neolindus sinuatus*, male. 197. Tergum VIII. 198. Aedeagus, ventral view. 199. Sternum VIII.

Figs. 200–203. *Neolindus unilobus*, male. 200. Aedeagus, ventral view. 201. Terga IX and X, setae omitted. 202. Sternum VIII. 203. Tergum VIII.

41. *Neolindus unilobus*, new species
 Figures 79, 200–203

HOLOTYPE: Male. Brazil: São Paulo, Barbiellini collector (deposited FMNH).

DIAGNOSIS: *Neolindus unilobus* is one of only a few species with a triangular lobe at the middle of the posterior margin of tergum VIII (fig. 203) and pronotum that is wider than long and can be separated from them by the presence of only one lobe on the posterior margin of tergum VIII (fig. 203), the

wide deep emargination of sternum VIII (fig. 202), the medially divided ninth tergum (fig. 201), the median groove of the aedeagus, and the configuration of the sclerites exposed at the end of the aedeagus (fig. 200). This species is one of only a few with punctures on the central portion of the vertex.

DESCRIPTION OF MALE: Length about 6 mm. Color reddish brown.

Dorsum of head with setigerous punctation on edges of vertex and with punctation across anterior portion of vertex; median region

sparsely and weakly punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye occupying most of lateral side of head, length greater than postocular length of head. Gula with two setae. Labrum with two apically rounded lobes on middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 slightly longer than 3.

Prothorax wider than long. Pronotum with irregular paramedial row of setigerous punctures and scattered punctures laterad of row. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural and three discal rows of punctures.

Abdominal sternum VII with broad, shallow, median emargination of posterior margin; surface without median depression and uniformly pubescent. Segment VIII with four internal canals at base of tergum (fig. 203) and sternum (fig. 202). Sternum VIII (fig. 202) with broad, moderately deep median emargination; sides of emargination straight and divergent apically from base; surface with small, feeble, median depression anterior to emargination; surface with short depression beginning at apex of each internal canal and without longitudinal carinae beginning near base; basal ridge without short median carina or point. Tergum VIII (fig. 203) with apically rounded, median, triangular lobe on posterior margin; basal ridge with short median carina; surface without midlongitudinal carina at apical portion; surface without numerous longitudinal carinae beginning near base. Tergum IX (fig. 201) divided medially.

Aedeagus (fig. 200) with moderately thick collar surrounding basal foramen and with complex sclerite exposed beyond median orifice. Median lobe with median depression extending anteriorly from near posterior margin of ventral surface; ventral surface with broad lobe on lateral portion of posterior margin; ventral surface without setae, carinae, or median hole.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: This species is known from Brazil (fig. 79).

ETYMOLOGY: From the Latin *unus* for one and *lobus* for a rounded projection or pro-

tuberance, referring to the lobe on the posterior margin of tergum VIII.

MATERIAL EXAMINED: Holotype only.

42. *Neolindus punctogularis*, new species

Figures 79, 204–207

HOLOTYPE: Male. Panama: Chiriqui Prov., Cerro Colorado, 1235 m, litter under cut twig pile in small hillside clearing, January 23, 1981, W. Suter collector (deposited FMNH).

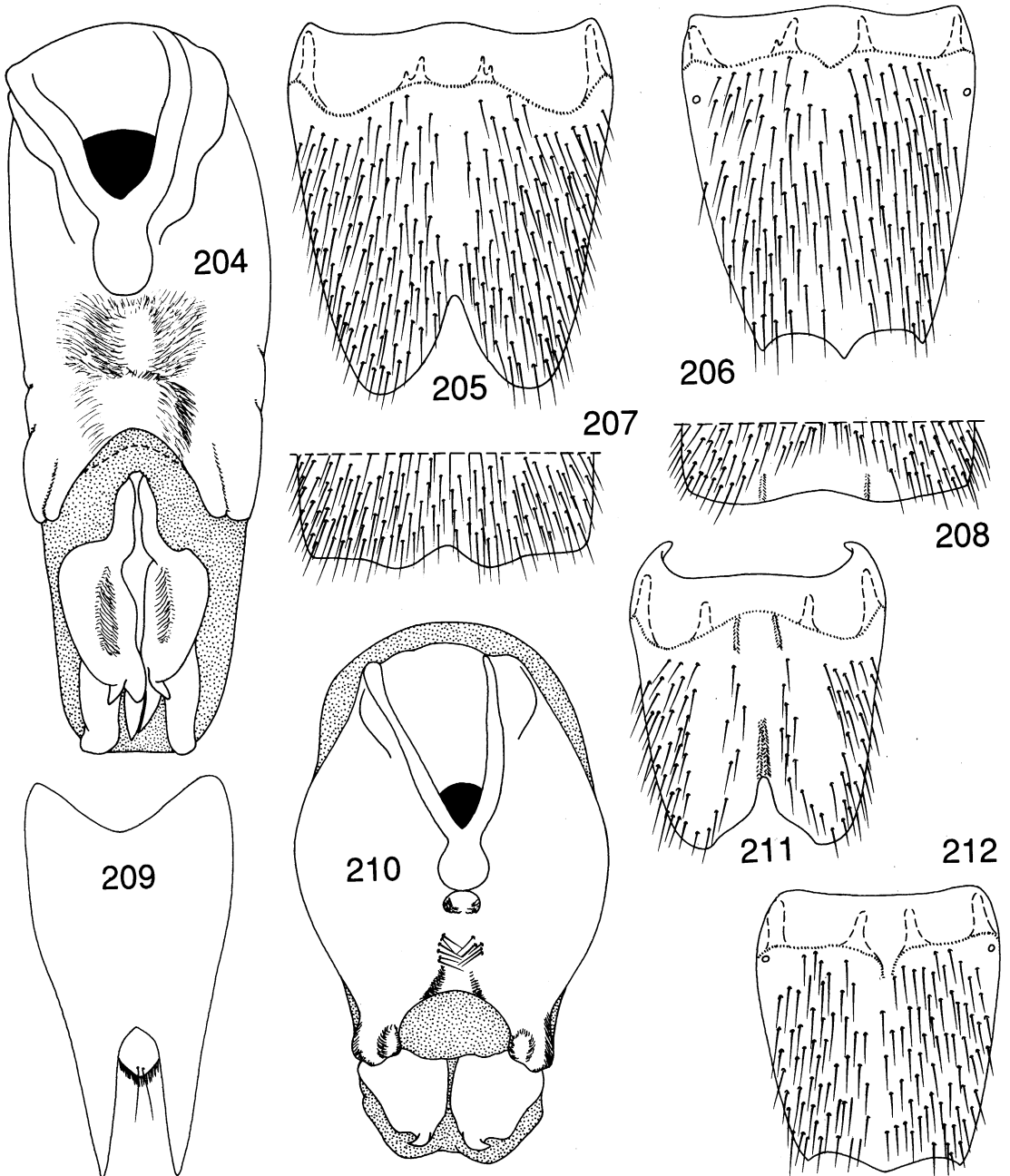
DIAGNOSIS: *Neolindus punctogularis* is one of four species (see *religans*, *bidens*, and *schubarti*) with the pronotum wider than long in which tergum VIII of the male has a trilobed posterior margin (fig. 206) and may be separated from them by the dense transverse cluster of setae on the anterior margin of the gula (a feature unique to *punctogularis*), the absence of carinae on sternum VIII (cf. figs. 205 to 211, 220, and 223), the sinuate posterior margin of sternum VII of the male that is then deeply emarginate medially (fig. 207), and the absence of setae on the ventral surface of the aedeagus (cf. figs. 204 to 210, 222, and 224).

DESCRIPTION OF MALE: Length about 12.6 mm.

Color of head and prothorax reddish. Elytra and abdomen black with reddish infusions. Legs nearly concolorous with head and pronotum. Antenna with first segment about same color as head, remaining segments pale reddish brown.

Dorsum of head with setigerous punctures confined to edges of vertex; surface densely punctulate. Head with one trichobothrium on lateral side of vertex near middle of inner margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye large, nearly as long as lateral side of head. Gula with transverse cluster of numerous setae near anterior margin. Labrum with apically rounded denticle near middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 about six-tenths as long as 3.

Prothorax wider than long. Pronotum with irregular paramedial row of setigerous punctures and scattered punctures laterad of row. Elytra length greater than pronotal length and greater than pronotal width; surface with su-



Figs. 204–207. *Neolindus punctogularis*, male. 204. Aedeagus, ventral view. 205. Sternum VIII. 206. Tergum VIII. 207. Sternum VII, apex.

Figs. 208–212. *Neolindus schubarti*, male. 208. Sternum VII, apex. 209. Terga IX and X, setae omitted. 210. Aedeagus, ventral view. 211. Sternum VIII. 212. Tergum VIII.

tural row of punctures and with remaining punctures irregularly arranged.

Abdominal sternum VII (fig. 207) with sin-

uate posterior margin and with deep median emargination; surface without median depression; pubescence uniformly distributed.

Segment VIII with three simple and one bifurcated internal canal at base of tergum (fig. 206) and two simple and two small bifurcated canals at base of sternum (fig. 205). Sternum VIII (fig. 205) with broad, deep emargination of posterior margin; sides of emargination curved and divergent from base; surface without median depression but with midlongitudinal glabrous stripe extending anteriorly from emargination; surface with two short grooves near apex of lateral internal canal and without numerous longitudinal carinae beginning near base; basal carina without median carina or median point. Tergum VIII (fig. 206) with three apically acute lobes on posterior margin; surface without numerous longitudinal carinae beginning near base; basal ridge pointed medially; surface without midlongitudinal carina on apical portion; surface without midlongitudinal carina beginning at basal ridge. Tergum IX fused medially.

Aedeagus (fig. 204) with thick collar surrounding basal foramen and with complex sclerites exposed beyond median orifice. Median lobe with deep emarginate posterior margin; ventral surface with deep cavity behind basal foramen; ventral surface without carinae, setae, or median hole.

FEMALE: Unknown.

DISTRIBUTION AND HABITAT: This species is known only from the mountains in Panama where it was collected at 1235 m elevation from litter (fig. 79).

ETYMOLOGY: From the Latin *punctura* for hole or prick and *gula* for gullet or throat, referring to the transverse row of dense punctation on the anterior portion of the gula.

MATERIAL EXAMINED: Holotype only.

43. *Neolindus schubarti* Irmmler

Figures 79, 208–212

Neolindus schubarti Irmmler, 1981: 210, 212. (Type locality: Brazil: Rio de Janeiro, Estr. do Sumatê. Holotype: male; deposited INPA.)

DIAGNOSIS: *Neolindus schubarti* is one of the species with three triangular lobes on the posterior margin of tergum VIII (fig. 212) and a pronotum that is wider than long. From these other species (*bidens*, *religans*, and *punctogularis*) *schubarti* can be separated by sternum VIII of the male which has two ca-

rinae near the base and two others just behind the median emargination of the posterior margin (fig. 211). Also details of the aedeagus useful for identification (fig. 210) include the cavity behind the basal foramen, the cluster of setae near the middle of the apical region, and the knob near the apex of the arm of the posterior margin. *Neolindus prolatus* has a median triangular lobe on the posterior margin of tergum VIII (fig. 117) but in contrast to *schubarti*, has two pairs of cephalic trichobothria (as in fig. 78) and a pronotum that is longer than wide. Most species have two setae near the anterior end of the gula; *schubarti* has a transverse row of four setae.

DESCRIPTION OF MALE: Length about 10 mm.

Color dark reddish brown, antennae and legs paler.

Dorsum of head with setigerous punctation confined to edges of vertex; median surface with sparse punctulation. Head with one trichobothrium on lateral side of vertex near anterior third of eye. Head without midlongitudinal carina at anterior margin. Eye occupying most of lateral side of head, length greater than postocular length of head. Gula with transverse row of four setae. Labrum with four apically rounded lobes on anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 3 about a fourth longer than 2.

Prothorax wider than long. Pronotum with paramedial row of setigerous punctures or with irregular linear cluster of punctures and scattered punctures laterad of row. Elytral length slightly longer than pronotal length and less than pronotal width; surface with one sutural and four discal rows of punctures, middle two rows irregular.

Abdominal sternum VII (fig. 208) with broad, deep, median emargination of posterior margin; surface with broad, median depression; surface with boss on lateral side of depression near posterior margin; depression without pubescence. Segment VIII with four internal canals at base of tergum (fig. 212) and sternum (fig. 211). Sternum VIII (fig. 211) with broad, median emargination; emargination wide apically and strongly narrowed basally; sides of emargination sinuate and divergent; surface with long, narrow, basally

tapered, median depression; depression margined laterally by longitudinal carina; depression without setae; surface of sternum with broad, shallow, glabrous depression laterad of median depression; lateral depression with long cluster of setae near median depression; base of sternum with longitudinal carina laterad of midline; surface with short shallow grooves beginning at apex of internal canals; surface without numerous longitudinal carinae beginning near basal ridge; basal ridge without median carina or median point. Tergum VIII (fig. 212) with trilobed posterior margin; basal ridge with short median carina; surface without midlongitudinal carina on apical portion; surface without numerous longitudinal carinae beginning near base. Tergum IX (fig. 209) fused medially.

Aedeagus (fig. 210) with moderately thick collar surrounding basal foramen and with sclerites exposed beyond apex of median orifice. Median lobe broad; posterior margin with broad, deep, median emargination; ventral surface with shallow median depression leading to deep round median cavity between emargination and basal foramen; median depression with small cluster of setae on lateral margin; ventral surface without carinae.

FEMALE: Character of head, prothorax, and elytra as described for male. Abdominal sternum VII unmodified. Tergum VIII with trilobed posterior margin; lobes apically rounded. Sternum VIII unmodified.

DISTRIBUTION AND HABITAT: The species is known from Brazil (fig. 79).

MATERIAL EXAMINED: The holotype, two males and a female: **Brazil:** *São Paulo:* Est. Biol. Boracea, Salesopolis, December 17–26, 1969, J.M. & B.A. Campbell collectors (1 male, 1 female, deposited CNC). **Brazil:** Rio [de] Jan[eiro] (1 male, deposited FMNH).

44. *Neolindus bidens*, new species

Figures 79, 219–222

HOLOTYPE: Male. Ecuador: Pichincha: 47 km south of Santo Domingo, Rio Palenque Station, 700 ft, May 18–30, 1975, forest litter, S. & J. Peck collectors (deposited CNC).

PARATYPE: One male with same label data as holotype (deposited CNC).

DIAGNOSIS: *Neolindus bidens* has three triangular lobes on the posterior margin of ter-

gum VIII (fig. 221) that along with the pronotum that is wider than long will separate the species from most others of the genus. Sternum VIII of the male has a broad, sinuous emargination of the posterior margin that becomes a narrow median incision and, on the surface, a short carina just laterad of the incision (fig. 220). Sternum VII of the male has a median incision bordered laterally by a projection (fig. 219). The aedeagus is distinctive (fig. 222) in that there is a cluster of setae in a deep median depression near the apex and a carina on the lateral margin. *Neolindus bidens* is closest to *schubarti*, *dichymus*, and *punctogularis*. Of these *dichymus* has a truncate posterior margin of tergum VIII (fig. 215) and the others have a trilobed posterior margin (cf. figs. 221 and 206, 212, and 226). Details of the aedeagus (cf. figs. 222 to 204, 210, and 224) and sternum VIII (cf. figs. 220 and 205, 211, and 223) will permit separation of the species. *Neolindus prolatus* also has a triangular lobe at the middle of the posterior margin tergum VIII (fig. 117) but has two pairs of cephalic trichobothria (as in fig. 78) unlike *bidens* which has one (as in fig. 64).

DESCRIPTION OF MALE: Length about 7.1 mm.

Color dark reddish brown, antennae and legs paler.

Dorsum of head with setigerous punctation confined to edges of vertex; surface moderately densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length about equal to postocular length of head. Gula with two setae. Labrum with apically rounded lobe near middle of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segments 2 and 3 subequal in length.

Prothorax wider than long. Pronotum without paramedial row of punctures, surface with scattered punctures laterad of impunctate median strip. Elytral length greater than pronotal length and slightly greater than pronotal width; surface with one sutural and two discal rows of punctures near lateral margin and many irregularly distributed punctures adjacent to sutural row.

Abdominal sternum VII (fig. 219) with broad, moderately deep, median emargination of posterior margin; posterior margin with small lobe on lateral edge of emargination; surface adjacent to emargination with shallow median depression; depression without pubescence. Segment VIII with four internal canals at base of tergum (fig. 221) and with two simple internal canals and two bifurcated canals at base of sternum (fig. 220). Sternum VIII (fig. 220) with shallow sinuate emargination extending from near lateral edge of segment to narrow, deep median emargination; sides of median portion of emargination straight and divergent; surface with subapical longitudinal carina laterad of median emargination; surface with broad depression laterad of carina and long, narrow, median depression extending anteriorly from median emargination; depressions lacking pubescence except for one seta at apical end of carina on another one near posterior margin; surface without shallow groove or depression beginning at apex of lateral internal canal; surface without longitudinal carinae beginning near base; basal ridge without median carina or median point. Tergum VIII (fig. 221) with three triangular, apically acute lobes on posterior margin; basal ridge with short median carina; surface without midlongitudinal carina on apical portion; surface without longitudinal carinae beginning near basal ridge. Tergum IX (fig. 218) fused medially.

Aedeagus (fig. 222) with moderately thick collar surrounding basal foramen and with sclerites exposed beyond apex of median orifice. Median lobe broad; posterior margin with broad, deep median emargination; ventral surface with large, deep median depression; depression with deeper, median canal leading to rounded median pit; lateral surface of canal with cluster of setae; ventral surface with carinae parallel to and near lateral margin.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species was collected at 700 ft elevation from forest litter in the western lowlands of Ecuador (fig. 79).

ETYMOLOGY: From the Latin *bi* for two and *dens* for tooth, referring to the the two pro-

jections on the posterior margin of sternum VII.

MATERIAL EXAMINED: Holotype and one paratype.

45. *Neolindus dichymus*, new species

Figures 79, 213-217

HOLOTYPE: Male. Ecuador: Napo: Tena-Baeza road, km 24, north of Cotundo, 3600-4000 ft, leaf litter, ridge, May 3, 1982, H. Frania collector (deposited CNC).

DIAGNOSIS: Sternum VII (fig. 216) of the males has a deep emargination of the posterior margin that is bordered laterally by a large projection; the form of the margin of this sternum is unique in the genus. Other diagnostic features include the sinuate posterior margin of sternum VIII of the male (fig. 213), the truncate posterior margin of tergum VIII (fig. 215), and the cluster of setae behind the median foramen, the deep median emargination of the posterior margin and the configuration of the sclerites exposed at the apex of the aedeagus (fig. 214). The pronotum is wider than long and the head has one pair of cephalic trichobothria (as in fig. 64).

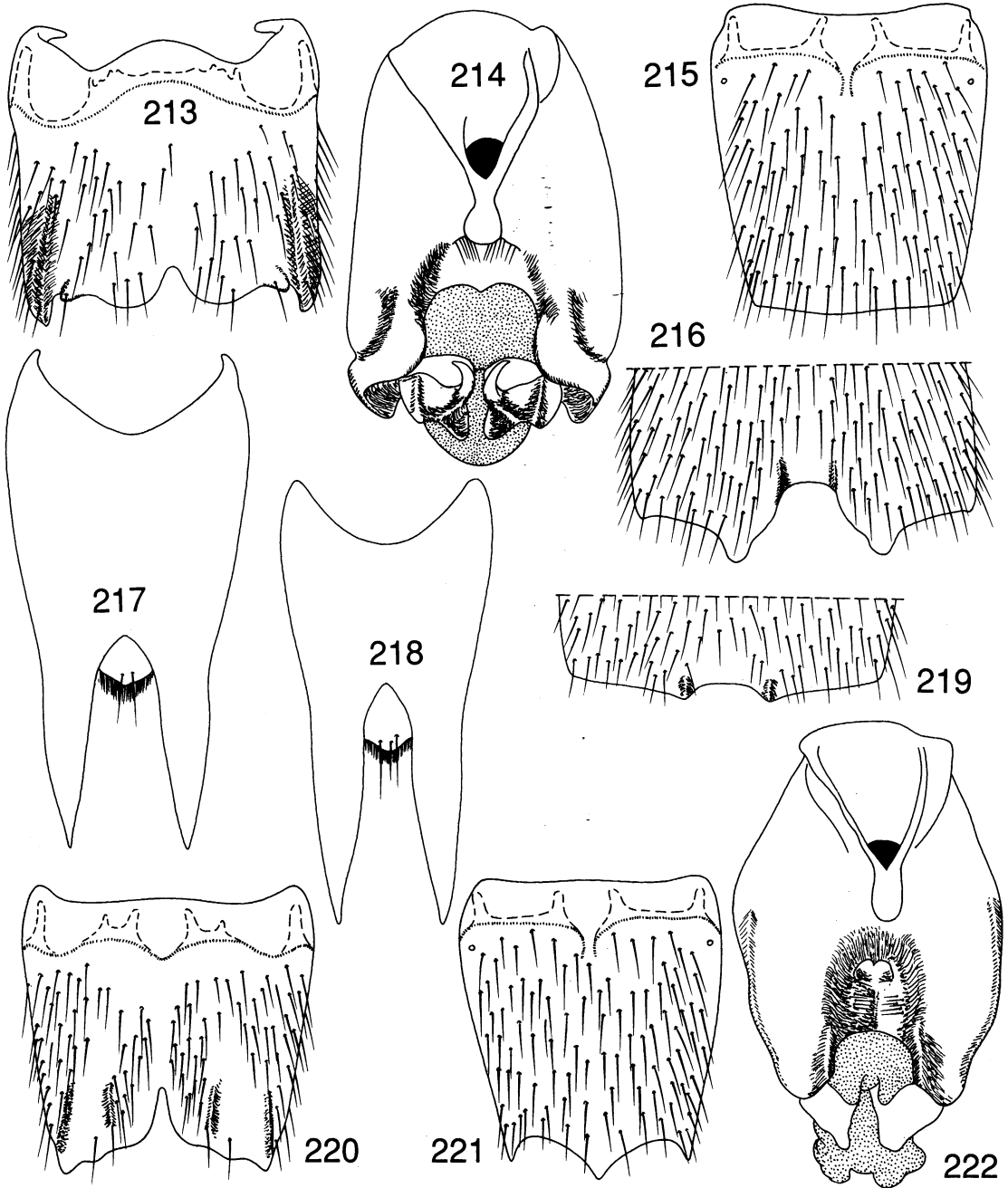
DESCRIPTION OF MALE: Length about 6 mm.

Color reddish brown, elytra and abdomen darker, antennae and legs paler.

Dorsum of head with setigerous punctures confined to edges of vertex; surface densely punctulate. Head with one trichobothrium on lateral side of vertex near anterior third of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye length about equal to postocular length of head. Gula with two setae. Labrum with rounded lobe near midline of anterior margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segments 2 and 3 subequal in length.

Prothorax wider than long. Pronotum without paramedial row of setigerous punctures; median stripe impunctate and surface with numerous punctures laterad of glabrous stripe. Elytral length greater than pronotal length and greater than pronotal width; surface with one sutural row and remaining dense punctation randomly arranged.

Abdominal sternum VII (fig. 216) with large deep median emargination; posterior margin



Figs. 213-217. *Neolindus dichymus*, male. 213. Sternum VIII. 214. Aedeagus, ventral view. 215. Tergum VIII. 216. Sternum VII, apex. 217. Terga IX and X, setae omitted.

Figs. 218-222. *Neolindus bidens*, male. 218. Terga IX and X, setae omitted. 219. Sternum VII, apex. 220. Sternum VIII. 221. Tergum VIII. 222. Aedeagus, ventral view.

with large lobe on lateral edge of median emargination; lobe with rounded apex and sinuous mesial margin; surface of sternum with median depression near posterior margin; depression without setae. Segment VIII with four internal canals at base of tergum (fig. 215) and with two simple and two multiply divided canals at base of sternum (fig. 213). Sternum VIII (fig. 213) with elaborately sinuate posterior margin; posterior margin with stout process at lateral edge and with moderately deep, narrow median emargination; sides of emargination straight and divergent; cariniform process present on lateral edge of posterior margin with pointed apex; surface of sternum with long, curved carina beginning on lateral process and continuing medially; surface with boss near lateral third of posterior margin; surface with long median depression behind median emargination; depression without setae; surface with short shallow depressions beginning at apex of lateral internal canals and without numerous longitudinal carinae beginning near basal ridge; basal ridge without median carina or median point. Tergum VIII (fig. 215) with arcuatotruncate posterior margin; basal ridge with short median carina; surface without midlongitudinal carina on apical portion; surface without numerous longitudinal carinae beginning near basal ridge. Tergum IX (fig. 217) fused medially.

Aedeagus (fig. 214) with moderately thick collar surrounding basal foramen and with complex sclerites exposed beyond apex of median orifice. Median lobe broad; posterior margin deeply emarginate; emargination with small pointed lobe at middle; surface adjacent to emargination depressed; depression leading to deep pit; ventral surface with cluster of setae near pit; ventral surface with carina near apex and with deep impression laterad of carina.

FEMALE: Not known.

DISTRIBUTION AND HABITAT: The species was collected from leaf litter at 3600 to 4000 ft elevation on the east side of the Andes of Ecuador (fig. 79).

ETYMOLOGY: From the Greek *di* for two and *kyma* for anything swollen, referring to the pair of bosses on the lateral portion of the posterior margin of sternum VIII.

MATERIAL EXAMINED: Holotype only.

46. *Neolindus hanagarthi* Irmeler

Figures 79, 228

Neolindus hanagarthi Irmeler, 1981: 209, 210 (Type locality: Peru: Pulcalpa. Holotype: female; deposited UIC.)

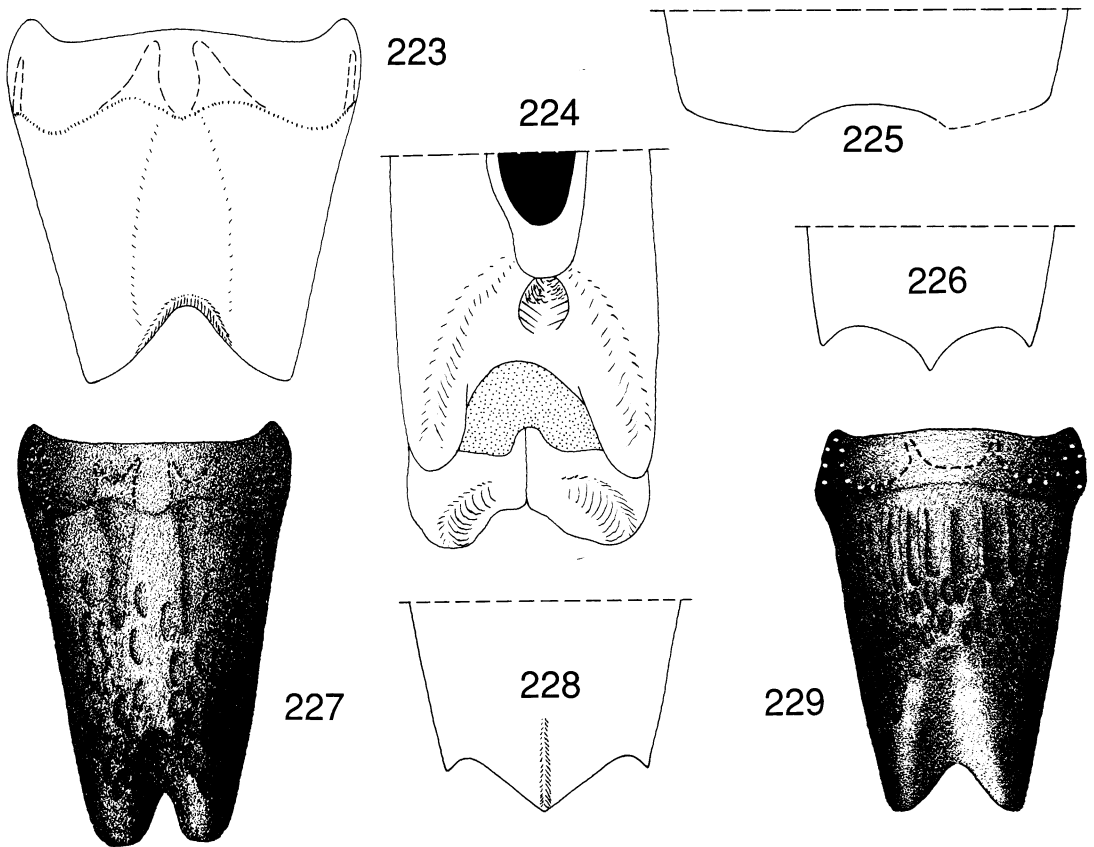
DIAGNOSIS: *Neolindus hanagarthi*, known only from the female, has three lobes on the posterior margin of tergum VIII (fig. 228) a characteristic shared with *bidens*, *schubarti*, *punctogularis*, and *prolatus*. *Neolindus hanagarthi* is the only one of these species with a midlongitudinal carina on the apical portion of tergum VIII; this carina extends onto the median lobe of the posterior margin (fig. 228). The third segment of the antenna is about twice as long as the second. The third segment of some other species is longer than the second but not two times longer; for most species the second segment is longer than the third.

DESCRIPTION OF FEMALE: Length about 14 mm.

Color of head and prothorax reddish black. Elytra black. Legs nearly concolorous with head and prothorax. Antennae with first segment about same color as head, remaining segments yellowish brown.

Dorsum of head with most setigerous punctures confined to edges of vertex and with two pairs at the edges of vertex; surface densely punctulate, particularly at middle near anterior margin. Head with one trichobothrium on lateral side of head near middle of dorsal margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye large, nearly as long as lateral side of head. Gula with transverse cluster of setae on anterior margin. Labrum with apically rounded denticle near middle of anterior margin and with smaller apically rounded denticle nearer lateral margin. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense, fine pubescence; segment 3 slightly more than twice as long as 2.

Prothorax wider than long. Pronotum with long, paramedial cluster of setigerous punctures and with scattered punctures laterad of cluster. Elytral length greater than pronotal length and about equal to pronotal width; surface with sutural row of punctures and with remaining punctures irregularly arranged.



Figs. 223–226. *Neolindus religans*, male. 223. Sternum VIII, setae omitted. 224. Aedeagus, ventral view, apical portion. 225. Sternum VII, apical portion, setae omitted, part of posterior margin damaged and shown by dotted line. 226. Tergum VIII, female, apical portion, setae omitted.

Fig. 227. *Neolindus rudiculus*, male. Sternum VIII, setae omitted.

Fig. 228. *Neolindus hanagarthi*, female. Tergum VIII, setae omitted.

Fig. 229. *Neolindus punctiventris*, male. Sternum VIII, setae omitted.

Abdominal sternum VII unmodified. Sternum VIII unmodified. Tergum VIII (fig. 228) with three apically acute lobes on posterior margin; surface without numerous longitudinal carinae beginning near base; basal ridge pointed medially; surface with midlongitudinal carina extending onto median lobe of posterior margin. Tergum IX divided midlongitudinally.

MALE: Unknown.

DISCUSSION: This species is represented by only the female which for *Neolindus* are normally difficult to separate from other species. The presence of a midlongitudinal carina on the median lobe of tergum VIII make it likely that *hanagarthi* will be more easily identified

than other females and also possible that the male will be recognized.

DISTRIBUTION AND HABITAT: This species is known from only one specimen at one locality in Peru where it was collected in the forest (fig. 79).

MATERIAL EXAMINED: Holotype.

47. *Neolindus religans* (Sharp)

Figures 79, 223–226

Lindus religans Sharp, 1876: 283. (Type locality: Brazil: Tapajos. Lectotype: male; designated here; label data as follows: *Lindus religans*, Amazonas, Type, D.S./ Tapajos/S. America, Brazil/Type/Lectotype, *Neolindus religans* Shp., det. L. Herman; deposited BMNH).

Neolindus religans (Sharp): Blackwelder, 1944: 122 (checklist). — Blackwelder, 1952: 259 (type species). — Irmeler, 1981: 210 (*Neolindus*; characters in key).

DIAGNOSIS: *Neolindus religans* is one of four species with three lobes on the posterior margin of tergum VIII (fig. 226) and a wide pronotum. The males are separated from them by the emargination of sternum VIII that is wide at the base and surrounded at the base by a ridge (fig. 223). The surface of sternum VIII lacks longitudinal carinae, and the gula has only two setae near the anterior end.

DESCRIPTION OF MALE: Length about 6.5 mm.

Color of pale to dark reddish brown; legs and antennae pale reddish brown to yellowish brown.

Dorsum of head with most of setigerous punctures confined to margins of vertex, with two pairs at edges of central region; surface moderately dense punctulate. Head with one trichobothrium on lateral side of vertex near anterior portion of inner margin of eye (as in fig. 64). Head without midlongitudinal carina at anterior margin. Eye large, occupying nearly all of lateral side of head. Gula with two setae near anterior margin. Labrum with apically rounded denticle adjacent to median emargination. Antennal segments 1 to 3 shining and sparsely pubescent; segments 4 to 11 with dense fine pubescence; segment 2 about three-fourths length of segment 3.

Prothorax wider than long. Pronotum with long paramedial cluster of setigerous punctures and scattered punctures lateral of paramedial cluster. Elytral length greater than pronotal length; surface with sutural and three discal rows of punctures.

Abdominal sternum VII (fig. 225) with broad, moderately deep emargination of posterior margin; surface adjacent to emargination depressed and remainder of median re-

gion less strongly depressed; pubescence absent from median region adjacent to emargination. Segment VIII with four internal canals at base of tergum and with four at base of sternum (fig. 223). Sternum VIII (fig. 223) with broad, deep emargination of posterior margin; emargination wide apically and basally; sides of emargination curved slightly and divergent from base; surface adjacent to and surrounding base of emargination carinate; surface with broad, shallow median impression; impression impunctate and without setae or longitudinal carinae; surface with short depression at apex of internal canal; surface without numerous longitudinal carinae beginning near basal ridge; basal ridge pointed medially. Tergum VIII (fig. 226) with trilobed median emargination; basal ridge without median point or carina; surface without numerous longitudinal carinae beginning near basal ridge. Tergum IX fused medially.

Aedeagus (fig. 224) with moderately thick collar surrounding basal foramen and with sclerites exposed beyond apex of median orifice. Median lobe broad; posterior margin with broad, deep, median emargination; ventral surface with shallow median depression and deep round median cavity between emargination and basal foramen; median depression apparently with setae adjacent to median cavity; ventral surface without carinae.

FEMALE: Characters of head, prothorax, and elytra as described for male. Abdominal sternum VII unmodified. Tergum VIII with trilobed posterior margin and without carina on median lobe; lobes apically acute. Sternum VIII unmodified.

DISTRIBUTION AND HABITAT: The species is known from Brazil (fig. 79).

MATERIAL EXAMINED: A male lectotype and a female paralectotype (deposited BMNH) and another female paralectotype (deposited FMNH), all collected from the type locality.

REFERENCES

- Bernhauer, M., and K. Schubert
1912. Coleopterorum Catalogus . . . Staphylinidae III. VII. Subfam. Paederinae. 40: 191-288. Berlin.
- Bierig, A.
1943. Algunos estaphylinidae (Col.) nuevos de Costa Rica. Rev. Chilena Hist. Nat. 45 (1941): 154-163.
- Blackwelder, R. E.
1939. A generic revision of the staphylinid beetles of the tribe Paederini. Proc. U.S. Nat. Mus. 87(3069): 93-125.
1943. Monograph of the West Indian beetles of the family Staphylinidae. U.S. Nat. Mus. Bull. 182: i-viii + 1-658.
1944. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Part I. U.S. Nat. Mus. Bull. 185: xii + 1-188.
1952. The generic names of the beetle family Staphylinidae, with an essay on genotypy. U.S. Nat. Mus. Bull. 200: i-iv + 1-483.
- Duvivier, A.
1883. Énumération des Staphylinides, décrits depuis la publication du catalogue de M. M. Gemminger et de Harold. Ann. Soc. Entomol. Belgique 27: 91-215.
- Fagel, G.
1958. Paederini (Coleoptera Polyphaga) fam. Staphylinidae. Parc Nat. Upemba Explor. Miss. G. F. de Witte . . . (1946-1949). Brussels, fasc. 51: 1-470.
- Herman, L. H.
1981. Revision of the subtribe Dolicaonina of the New World, with discussions of phylogeny and the Old World genera (Staphylinidae, Paederinae). Bull. Am. Mus. Nat. Hist. 168(6): 327-520.
- Irmeler, U.
1981. Neue Arten der neotropischen Gattung *Neolindus* Scheerpeltz (Coleoptera, Staphylinidae). Studies on Neotropical Fauna and Environment 16: 209-215.
- Scheerpeltz, O.
1933. Coleopterorum Catalogus. . . Staphylinidae VII. Supplementum I, 129: 989-1500. Berlin.
- Sharp, D.
1876. Contributions to an insect fauna of the Amazon Valley. Coleoptera-Staphylinidae. Trans. Entomol. Soc. London, 1876: 27-424.

THIS PUBLICATION IS PRINTED ON ACID-FREE PAPER.

