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MALLOPHAGA OF VENEZUELAN MAMMALS

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K. C. Emerson[1] and Roger D. Price[2]

ABSTRACT

Seven species of Mallophaga have been previously reported from Venezuelan mammals. In this paper an additional 28 species and subspecies, 7 of which are new, are reported from Venezuela; and 21 other species which have not been previously reported from Venezuela are included because their hosts are found there.

INTRODUCTION

The late F. L. Werneck, while a member of the staff of Instituto Oswaldo Cruz in Rio de Janeiro, Brazil, published a comprehensive review of the Mallophaga found on mammals throughout the world. His monumental study included considerable data on species collected in Brazil, Colombia, Guyana, and Bolivia. Because hosts do not respect national boundaries, many of those species should also occur in Venezuela. The authors have provided data and illustrations from Werneck for species not collected by Smithsonian personnel, so that the subject may be treated as completely as possible at this time. The classification followed in this paper is essentially that used by Werneck.

All new species described are based on collections made by personnel of the Smithsonian Venezuelan Project which was directed by Dr. Charles O. Handley, Jr., U.S. National Museum of Natural History, and Dr. Vernon J. Tipton, Brigham Young University.

The authors gratefully acknowledge Dr. Handley for host names and distribution; Dr. Tipton for sorting and recording data pertaining to the Mallophaga; and the 406th U.S. Army Medical Laboratory for providing the many illustrations executed by Mr. Takashi Ando, Mr. Sei Fujisawa, Mrs. Kinuyo Miyasaka, Mr. Tadashi Tanami, and Mr. Ken Utsugi.

Holotypes and allotypes of new species described in this paper are deposited in the collections of the U.S. National Museum. Paratypes, where numbers permit, will be distributed to the Universidad Central de Venezuela and to other museums.

TAXONOMY

Key to the Mallophaga of Venezuelan Mammals

1. Antennae clubbed, third segment pedunculate and often more or less concealed beneath head; with maxillary palpi 2
   Antennae filiform, exposed; without maxillary palpi 38

2. With one or two pairs of ventral spinous head processes 3
   Without ventral spinous head processes 5

3. With only one pair of ventral spinous head processes, these arising near base of maxillary palpus (Fig. 1, 2) ..... *Heterodoxus spiniger* (Enderlein)
   With two pairs of ventral spinous head processes, these more laterally placed (Fig. 15, 19) 4

4. Median marginal setae of abdominal tergites and sternites of relatively uniform lengths (Fig. 19, 20); sternites with some anterior setae ..... *Cummingsia intermedia* Werneck

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Median marginal setae of abdominal tergites and sternites variably short and long (Fig. 15, 16); sternites without anterior setae ..... *Cummingsia peramydis* Ferris

5. With only five pairs of abdominal spiracles (none on VIII) 6
With six pairs of abdominal spiracles (present on VIII) 31

6. With two claws on each of tarsi II-III 7
With only one thin claw on each of tarsi II-III 9

7. Head uniquely shaped, with posteriorly directed processes at lateral temple and preantennal margins (Fig. 9, 10) ..... *Harrisonia uncinata* Ferris
Head with lateral margins otherwise, without posteriorly directed processes 8

8. Abdominal tergites each with only single row of setae; lateral margin of head not evenly rounded (Fig. 13) ..... *Hoplomyophilus nativus* Mendez
Abdominal tergites each with two rows of setae (Fig. 5, 6); lateral margin of head evenly rounded ..... *Trimenopon hispidum* Ferris

9. Male 10
Female 21

10. Parameres each with three prominent long distal setae (Fig. 42, 46) 11
Parameres without such prominent long setae or with only one or two shorter distal setae 12

11. Terminal paramere seta much longer than others (Fig. 46); median genital sac sclerite tapered to fine point ..... *Gliricola venezuelanus,* n. sp.
Terminal paramere seta subequal to others (Fig. 42); median genital sac sclerite bluntly rounded ..... *Gliricola pintoi* Werneck

12. Abdominal sternal setae generally stout (Fig. 36); genitalia with short, narrow basal plate and unique inwardly curved parameres (Fig. 38) ..... *Gliricola mirandai* Werneck
Abdominal sternal setae finer; genitalia with typical elongate, wide basal plate and parameres shaped or directed otherwise 13

13. Genital sac with many median sclerites (Fig. 30) ..... *Gliricola lindolphoi* Werneck
Genital sac either without or with only single evident sclerite 14

14. Genital sac without evident sclerite 15
Genital sac with median sclerite 16

15. Last abdominal segment with two longer setae each side (Fig. 32) ..... *Gliricola decurtatus marajoensis* Werneck
Last abdominal segment with only one longer seta each side (Fig. 24) ..... *Gliricola porcelli* (Schrank)

16. Parameres with distinct terminal barb 17
Parameres without distinct terminal barb 19

17. Last abdominal segment with one very long seta each side, this being much longer than length of last tergite (Fig. 48); parameres slender, outwardly curved (Fig. 50) ..... *Gliricola echimydis* Werneck
Last abdominal segment with one medium seta each side, shorter than length of last tergite; parameres usually either broader or straighter than above 18

18. Pleurite VIII each with two very long setae (Fig. 64); large lice, over 1.30 mm long; large genitalia (Fig. 66), over 0.40 mm long and 0.10 mm wide .... *Gliricola tiptoni,* n. sp.
Pleurite VIII each with only one very long seta (Fig. 68); small lice, under 1.20 mm long; small genitalia (Fig. 70), under 0.35 mm long and 0.10 mm wide ..... *Gliricola mendezi,* n. sp.

19. Last segment with only minute setae (Fig. 60); pleurite VIII each with only one long seta; genitalia with irregularly curved expanded parameres (Fig. 62) ..... *Gliricola handleyi,* n. sp.

Last segment with stout medium terminal seta on each side; pleurite VIII each with two longer setae; genitalia with evenly curved tapered parameres 20

20. Genital sclerites as in Fig. 54; large lice, over 1.17 mm long (Fig. 52) ..... *Gliricola wenzeli,* n. sp.
Genital sclerites as in Fig. 58; small lice, under 1.17 mm long (Fig. 56) ..... *Gliricola vogelsangi* Werneck

21. Tergite III with markedly convex posterior portion dovetailed into tergite IV (Fig. 43) ..... *Gliricola venezuelanus,* n. sp.
Tergite III with essentially straight posterior border 22

22. Median three setae on each side of ventral anteriormost terminalia row normal, slender, not spatulate (Fig. 33, 37, 59) 23
At least some to all of such setae distinctly flattened, spatulate 25

23. None of pleurites II-VII with conspicuously longer setae (Fig. 31) ..... *Gliricola decurtatus marajoensis* Werneck
At least pleurites V-VII each with longer, heavier setae 24

24. Sternal setae minute (Fig. 59); pleurite IV with heavier, longer seta; median four setae on each side of ventral anteriormost terminalia row including one much longer seta (Fig. 61) ..... *Gliricola handleyi,* n. sp.
Sternal setae longer, heavier (Fig. 35); pleurite IV without longer seta; median four setae on each side of ventral anteriormost terminalia row all subequal (Fig. 37) ..... *Gliricola mirandai* Werneck

25. Last tergite without longer seta at posterior margin (Fig. 55) .... *Gliricola vogelsangi* Werneck
Last tergite with distinctly longer seta at posterior margin 26

26. Longest terminal seta shorter than length of last segment (Fig. 23, 27) ..... *Gliricola lindolphoi* Werneck
Gliricola porcelli (Schrank)
Longest terminal seta longer than length of last segment 27

27. Pleurite VIII each with two longer setae 28
Pleurite VIII each with only one longer seta 30

28. Pleurites V-VI without longer, heavier setae (Fig. 63) ..... *Gliricola tiptoni,* n. sp.
Gliricola wenzeli, n. sp. (in part)
Pleurites V-VI each with longer, heavier setae 29

29. Large lice, over 1.30 mm long (Fig. 51) ..... *Gliricola wenzeli,* n. sp. (in part)
Small lice, under 1.25 mm long (Fig. 39) ..... *Gliricola pintoi* Werneck

30. Large lice, over 1.25 mm long (Fig. 67) ..... *Gliricola mendezi,* n. sp.
Small lice, under 1.20 mm long (Fig. 47) ..... *Gliricola echimydis* Werneck

31. Ventral head with more than 12 long setae (Fig. 99, 100); female with dense groups of long setae on tergites III-IV and with only a few median setae on tergites VI-VIII; male with large distinctive genitalia (Fig. 102) ..... *Aotiella aotophilus* (Ewing)
Ventral head with no more than six or so long setae; female without groups of long setae on tergites III-IV, and with more setae distributed across tergites VI-VIII; male genitalia otherwise 32

32. Very large lice (Fig. 83, 84), head width over 0.60 mm and total length over 3.50 mm ..... *Macrogyropus dicotylis* (Macalister)
Much smaller lice, with head width under 0.50 mm and total length under 3.00 mm 33

33. Abdominal tergites and sternites with both long and short setae, longer ones reaching to alveoli of those of following segment 34
Abdominal tergites and sternites with uniformly short setae, none extending to alveoli of those of following segment 35

34. Most lateral abdominal tergal setae distinctly shorter than median ones (Fig. 75, 76); male genitalia with long parameres and sclerites as in Fig. 78 ..... *Gyropus wernecki*, n. sp.

Lateral abdominal tergal setae almost as long as median ones (Fig. 79, 80); male genitalia with very short parameres and sclerites as in Fig. 82 .. *Gyropus thompsoni* Werneck

35. Large lice (Fig. 95, 96), with head width over 0.35 mm and total length over 1.90 mm; male with large genitalia, over 0.15 mm wide, and with tapered, even-sided, blunt parameres (Fig. 98) ..... *Macrogyropus costalimai* (Werneck)

Small lice, with head width under 0.35 mm, and total length under 1.90 mm; male with small genitalia, under 0.12 mm wide, and with irregular or sharply pointed parameres 36

36. Abdominal tergites and sternites with double row of setae (Fig. 71, 72); male genitalia with large, pointed parameres and coarse, heavy spination on sac (Fig. 74) ..... *Gyropus ovalis* Burmeister

Abdominal tergites and sternites with single row of setae; male genitalia with irregular small parameres and uniformly fine spination on sac 37

37. Small lice (Fig. 91, 92); female head width under 0.34 mm, and total length under 1.90 mm; male genitalia (Fig. 94) under 0.55 mm long, and 0.13 mm wide ..... *Macrogyropus amplexans longisetis* Werneck

Large lice (Fig. 87, 88); female head width over 0.34 mm, and total length over 1.90 mm; male genitalia (Fig. 90) over 0.55 mm long, and 0.13 mm wide ..... *Macrogyropus amplexans amplexans* (Neumann)

38. With zero to three pairs of abdominal spiracles 39

With six pairs of abdominal spiracles 47

39. With spiracles on abdominal segments III-IV or III-V 40

Without abdominal spiracles 43

40. Lateroanterior margin of head essentially straight, converging to shallow medioanterior depression (Fig. 147, 148) ..... *Felicola subrostratus* (Burmeister)

Anterior margin of head more or less evenly rounded 41

41. Abdominal tergites with distinct row of short setae (Fig. 143, 144); male genitalia with very long, slender parameres (Fig. 146) ..... *Suricatoecus quadraticeps* (Chapman)

Abdominal tergites with sparse setae, most with not over three setae on each side; male genitalia with shorter, broader parameres (Fig. 130, 142) 42

42. Abdominal tergites with lateral setae much shorter than median setae (Fig. 139, 140) ..... *Trichodectes potus* Werneck

Abdominal tergites with lateral setae as long as median setae (Fig. 127, 128) ..... *Trichodectes fallax* Werneck

43. Very large lice (Fig. 103, 104), with head width over 0.80 mm, and total length over 2.40 mm ..... *Lymeon gastrodes* (Cummings)

Smaller lice, with head width under 0.70 mm, and total length under 2.10 mm 44

44. Female subgenital plate with median posteriorly directed elongated portion fringed with evenly spaced setae on each side (Fig. 125); male genitalia with triangular, undivided endomeral plate, and parameral arch rounded apically (Fig. 126) ..... *Trichodectes barbare* Neumann

Female subgenital plate without prolongation as above, and with short to long setae transversely across plate; male genitalia with apically divided endomeral plate and parameral arch with apical pointed process 45

45. Very small lice, with total length under 1.40 mm; female subgenital plate with only one very long median seta each side (Fig. 109); male genital sac with heavy, large spinules (Fig. 110) ..... *Neotrichodectes minutus* (Paine)

Larger lice, with total length over 1.50 mm; female subgenital plate with cluster of long median setae each side; male genital sac with finer, smaller spinules 46

46. Female gonapophyses rounded, with setae along anterior but not medial margin (Fig. 113); male genitalia with parameral arch not extending beyond endomeral plate (Fig. 114) ..... *Neotrichodectes pallidus* (Piaget)

Female gonapophyses angulate, with setae along medial margin (Fig. 117); male genitalia with parameral arch extending beyond endomeral plate by approximately length of plate (Fig. 118) ..... *Neotrichodectes semistriatus*, n. sp.

47. Anterior margin of head more or less evenly rounded 48

Anterior margin of head angulate, due to fairly straight converging sides, and flat to concave median portion 54

48. Most abdominal tergites without large conspicuous plates; head generally wider than long 49

Most abdominal tergites with large conspicuous median plate; head about as wide as long 51

49. Majority of abdominal tergites and sternites with more than 1 row of setae (Fig. 135, 136) ..... *Trichodectes ferrisi* Werneck

All abdominal tergites with only one row of setae 50

50. Female ventral terminalia as in Fig. 133; male genitalia with slender parameres (Fig. 134) ..... *Trichodectes galictidis* Werneck

Female ventral terminalia as in Fig. 121; male genitalia with broad parameres (Fig. 122) ..... *Trichodectes canis* (DeGeer)

51. Female with inner margin of gonapophyses virtually straight (Fig. 205); male genitalia as in Fig. 206 ..... *Bovicola equi* (Linnaeus)

Female with inner margin of gonapophyses having projection or lobe; male genitalia otherwise 52

52. Dorsum of head with sparse setae (Fig. 193, 194); male genitalia as in Fig. 196 ..... *Bovicola caprae* (Gurlt)

Dorsum of head with numerous setae (Fig. 197, 199); male genitalia otherwise 53

53. Female with inner margin of gonapophyses having large lobe (Fig. 201); male genitalia as in Fig. 202 ..... *Bovicola ovis* (Linnaeus)

Female with inner margin of gonapophyses having small lobe (Fig. 198); male genitalia otherwise; male rare ..... *Bovicola bovis* (Linnaeus)

54. Head with deep narrow medioanterior notch 55

Head lacking such deep notch 57

55. Head with unusual rounded projection on either side of medioanterior notch (Fig. 155, 156) ..... *Cebidicola armatus* (Neumann)

Head without such projection associated with medioanterior notch 56

56. Female last tergite and subgenital plate with only very short setae (Fig. 159, 161); male genitalia as in Fig. 162 ..... *Cebidicola semiarmatus* (Neumann)

Female last tergite and medioposterior margin of subgenital plate with longer setae (Fig. 163, 165); male genitalia as in Fig. 166 ..... *Cebidicola extrarius* Werneck

57. Male genitalia without separated parameres, but with fused parameral arch and median bifurcate endomeral plate; abdomen either elongate, parallel-sided, and head broad anteriorly, or, if abdomen rounded and head tapered, total length under 1.35 mm 58

Male genitalia with separated parameres; abdomen and head variable, but usually with more rounded abdomen and total length over 1.40 mm 61

58. Head tapered anteriorly (Fig. 151, 152); abdomen rounded; small lice, under 1.35 mm long ..... *Felicola felis* (Werneck)

Head broad anteriorly; abdomen more or less parallel sided; larger lice, over 1.70 mm long 59

59. Small lice (Fig. 207, 208), under 2.00 mm long; male with widely bifurcate endomeral plate (Fig. 210) and without paired tergal plates ..... *Tricholipeurus albimarginatus* Werneck

Large lice, over 2.00 mm long; male with narrowly bifurcate endomeral plate and with paired tergal plates 60

60. Small lice, under 2.30 mm long; male genitalia with parameral arch lacking prominent medioposterior projection (Fig. 218) ..... *Tricholipeurus parallelus* (Osborn)

Large lice, over 2.35 mm long; male genitalia with parameral arch having prominent medioposterior projection (Fig. 214) ..... *Tricholipeurus lipeuroides* (Megnin)

61. Head sharply tapered, with narrow medioanterior notch 62

Head anteriorly broadly flattened to slightly concave, without definite notch 63

62. Male genitalia with sharply tapered parameres, apically curved inward (Fig. 188); tergites III-IV with only very small accessory plate posterior to principal plate (Fig. 187); female unknown ..... *Eutrichophilus comitans* Werneck

Male genitalia with parameres blunt, apically curved outward (Fig. 186); tergites III-IV with large prominent accessory plate posterior to principal plate (Fig. 184) ..... *Eutrichophilus lobatus* Ewing

63. Female over 2.60 mm long; male with accessory plate only on tergite VII; genitalia as in Fig. 178, with sharply tapered parameres ..... *Eutrichophilus guyanensis* Werneck

Female under 2.40 mm long; male either without accessory plate or with such plate present on more than tergite VII; genitalia otherwise 64

64. Female with very large prominent gonapophyses and with posteriorly pointed subgenital plate (Fig. 191); male without accessory tergal plates (Fig. 190) and with genitalia as in Fig. 192 ..... *Eutrichophilus minor* Mjöberg

Female with smaller gonapophyses and with subgenital plate shaped otherwise; male with at least three accessory tergal plates and genitalia otherwise 65

65. Male with only three small accessory tergal plates (on V-VII) and genitalia as in Fig. 182, with slender transverse sclerite; female under 1.80 mm long, with ventral terminalia as in Fig. 181 ..... *Eutrichophilus exiguus* Werneck

Male with four or six large accessory tergal plates (on III-VI or II-VII), and genitalia as in Fig. 170 or 174; female over 1.85 mm long, with ventral terminalia as in Fig. 169 or 173 66

66. Male under 2.30 mm long, with six accessory tergal plates (on II-VII), and genitalia as in Fig. 174; female with last tergite complete across segment and with ventral terminalia as in Fig. 173 ..... *Eutrichophilus cordiceps* Mjöberg

Male over 2.30 mm long, with only four accessory tergal plates (on III-VI), and genitalia as in Fig. 170; female with last tergite medially divided and with ventral terminalia as in Fig. 169 ..... *Eutrichophilus cercolabes* Mjöberg

Family Boopidae

Genus *Heterodoxus* LeSouëf and Bullen

Heterodoxus LeSouëf and Bullen, 1902:159. Type-species: *Heterodoxus macropus* Le Souëf and Bullen, 1902.

Heterodoxus spiniger (Enderlein) (Fig. 1-4)

Menopon spiniger Enderlein, 1909:80, Pl. 8, Fig. 4-5.

Menopon (*Menacanthus*) *spinigerum* Neumann, 1912b:364, Fig. 12.

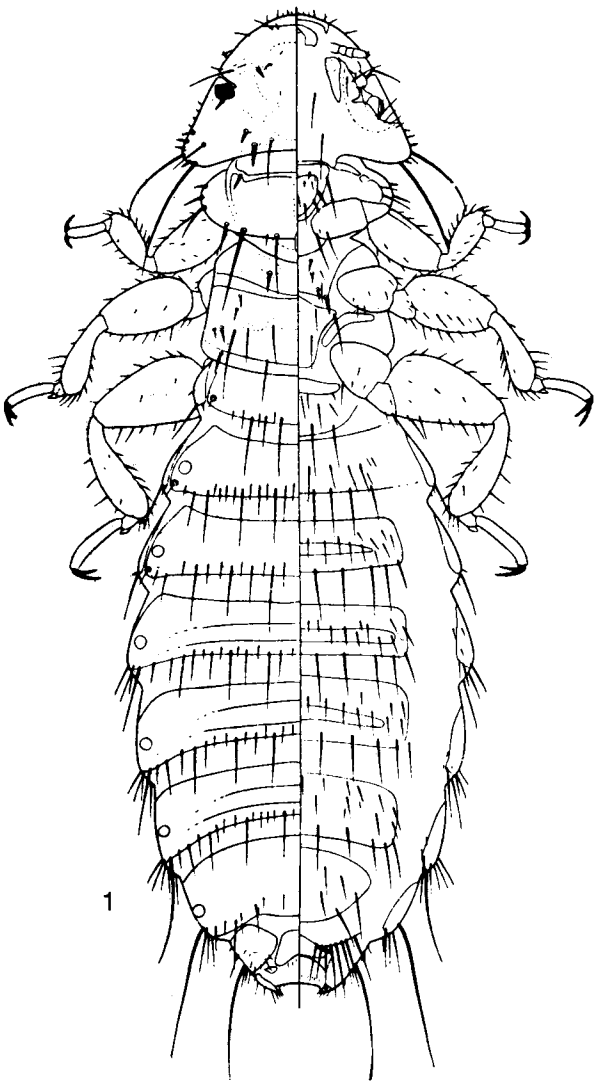
Menopon armiferus Paine, 1912a:362, Fig. A-D.

The holotype was collected off a domestic dog (*Canis familiaris* Linnaeus) in the Kalahari Desert in southern Africa. It has since been recorded from domestic dogs in Australia, North America, South America, and Africa. It has been taken also from coyotes and foxes in several localities in North America.

VENEZUELAN RECORDS

Werneck (1948) recorded it off a domestic dog collected at Zaraza, **Guarico,** Venezuela. Stafford (1943) also recorded it off a domestic dog in Venezuela, but no specific locality was given.

Fig. 1-4. *Heterodoxus spiniger* (Enderlein), from *Canis familiaris*. From Werneck, 1936:1, dorsal-ventral view of female; 2, dorsal-ventral view of male; 3, ventral view of female terminalia; 4, male genitalia.



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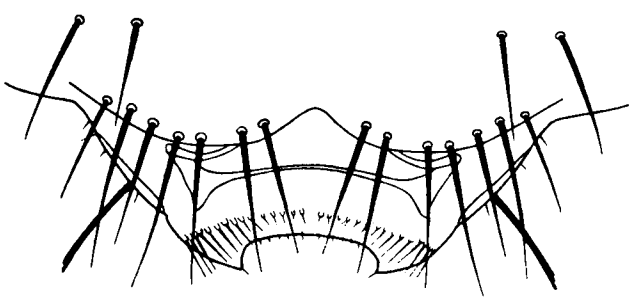

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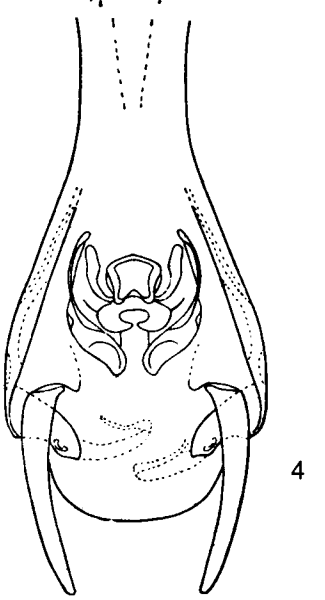

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Comments. This common parasite of domestic dogs is probably widespread in Venezuela.

Family Trimenoponidae

Genus *Trimenopon* Cummings

Trimenopon Cummings, 1913:39. Type-species: *Trimenopon echinoderma* Cummings, 1913.

Trimenopon hispidum (Burmeister) (Fig. 5-8)

Gyropus hispidus Burmeister, 1838:443.
Menopon jenningsi Kellogg and Paine, 1910:461, Fig. 1.
Trimenopon echinoderma Cummings, 1913:40, Fig. 4.
Menonpon extraneum Galliard, 1934:1318, Fig. A (*nec* Piaget, 1880).
Trimenopon rozeboomi Emerson, 1940:339, Fig. 1-4.

The holotype was collected off a skin of "*Bradypus tridactylus*," which was most likely a contamination, as the true host is the guinea pig, *Cavia porcellus* (Linnaeus). It has been recorded off laboratory guinea pigs in Panama, Brazil, Peru, Russia, and Yugoslavia. It has also been recorded by Werneck (1948) off wild *C. porcellus* in Brazil and Paraguay, *C. aperea* Erxleben in Brazil, *C. rufescens* Lund in Brazil, *C. fulgida* Wagler in Brazil, *C. anolaimae* J. A. Allen in Colombia, and *C. azarae* Lichtenstein in Paraguay. This species probably occurs in Venezuela, but has not been reported there.

Genus *Harrisonia* Ferris

Harrisonia Ferris, 1922:80. Type-species: *Harrisonia uncinata* Ferris, 1922.

Harrisonia uncinata Ferris (Fig. 9-12)

Harrisonia uncinata Ferris, 1922:81, Fig. 2c, 3c, 4d, and 6.

The holotype was taken off a skin of *Hoplomys gymnurus* (Thomas) collected at San Javier, Ecuador. Ferris also recorded it from the same locality off *Proechimys semispinosus* Tomes and *Nelomys mirae* Thomas (=*Tylomys mirae*). Werneck (1948) recorded it off *P. trinitatis* Allen and Chapman from Princeton, Trinidad. Emerson (1966) recorded it off *P. semispinosus* from many localities in Panamá. The authors have also seen specimens collected off *P. semispinosus* from **Heredia, Limón** and **San José** provinces in Costa Rica and off *P. trinitatis* from Cumaca, Trinidad.

VENEZUELAN RECORDS

H. uncinata was taken off 23 specimens of *Proechimys semispinosus* collected at Urama, **Yaracuy** and **Carabobo;** Boca Mavaca, Capibara, and Tamatama, T.F. **Amazonas;** Manacal, **Sucre;** and Kasmera, **Zulia.** It was also taken off 5 specimens of *P. guyannensis* (E. Geoffroy) collected at El Manaco, **Bolívar;** Belén, and San Juan Rió Manapiare, T. F. **Amazonas.**

Comments. One host had 20 specimens, but most had fewer than five lice. *Harrisonia* is a monotypic genus.

Genus *Hoplomyophilus* Mendez

Hoplomyophilus Mendez, 1967:289. Type-species: *Hoplomyophilus nativus* Mendez, 1967.

Hoplomyophilus nativus Mendez (Fig. 13-14)

Hoplomyophilus nativus Mendez, 1967:289, Fig. 1-4.

The holotype was taken off *Hoplomys gymnurus* (Thomas) collected at Cerro Azul, Panama. Mendez also recorded it off the same host collected at Isla Escudo de Veraguas, Camp Pina, and Rio Changena, Panama. Emerson (1971) recorded it off the same host collected at El Recreo, **Zelaya,** Nicaragua.

VENEZUELAN RECORDS

One male was taken off a specimen of *Proechimys semispinosus* Tomes collected at Urama, **Yaracuy** and **Carabobo.**

Comments. *Hoplomyophilus* is a monotypic genus.

Genus *Cummingsia* Ferris

Cummingsia Ferris, 1922:83. Type-species: *Cummingsia maculata* Ferris, 1922.

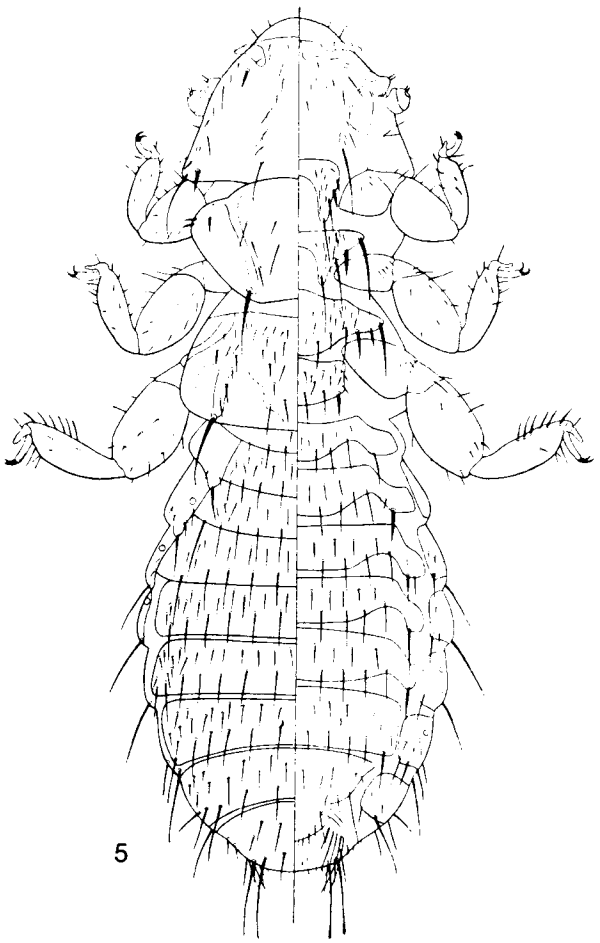
The genus contains three species, two of which have been collected in Venezuela.

Cummingsia peramydis Ferris (Fig. 15-18)

Cummingsia peramydis Ferris, 1922:85, Fig. 2D, 3E, 4C, 8.
Acanthomenopon horridum Harrison, 1922:156, Fig. 1c, 2.

The holotype was taken off a skin of *Peramys domesticus* (Wagner) (=*Monodelphis domestica*) collected at Quixada, **Ceará,** Brazil. Harrison recorded it off *Peramys* sp. (= *Mono-*

Fig. 5-8. *Trimenopon hispidum* (Burmeister), from *Cavia porcellus*. From Werneck, 1936:5, dorsal-ventral view of female; 6, dorsal-ventral view of male; 7, ventral view of female terminalia; 8, male genitalia.



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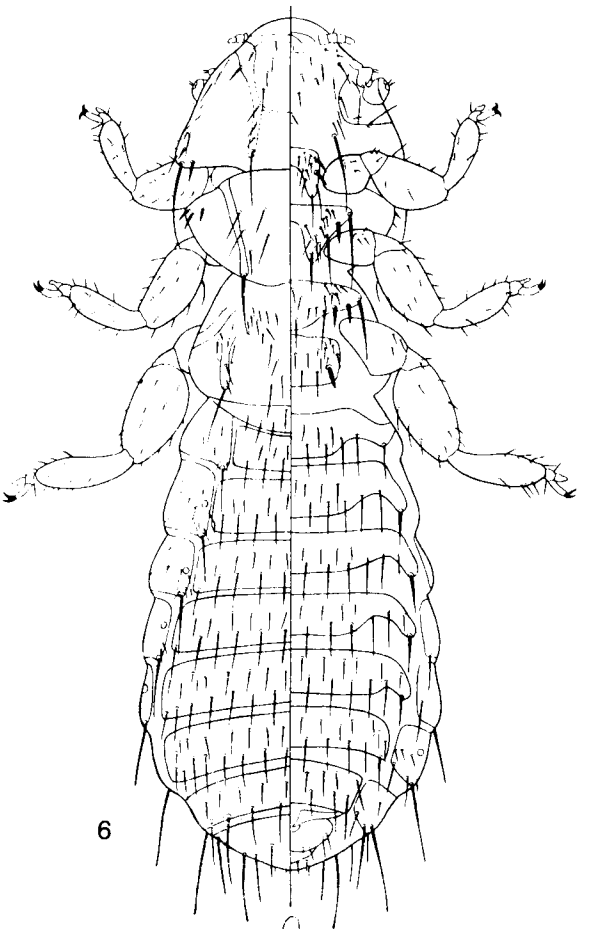

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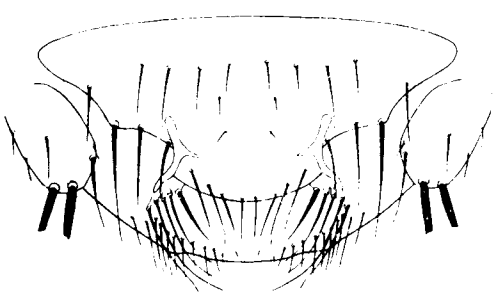

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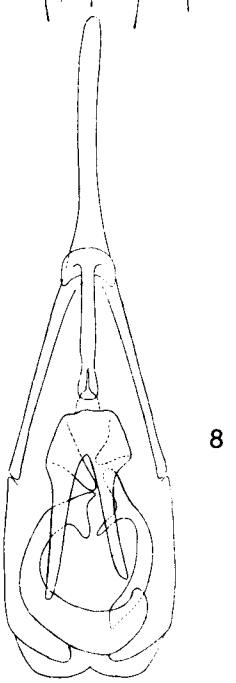

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Fig. 9-12. *Harrisonia uncinata* Ferris, from *Proechimys semispinosus*, Yaracuy: 9, dorsal-ventral view of female; 10, dorsal-ventral view of male; 11, ventral view of female terminalia; 12, male genitalia.

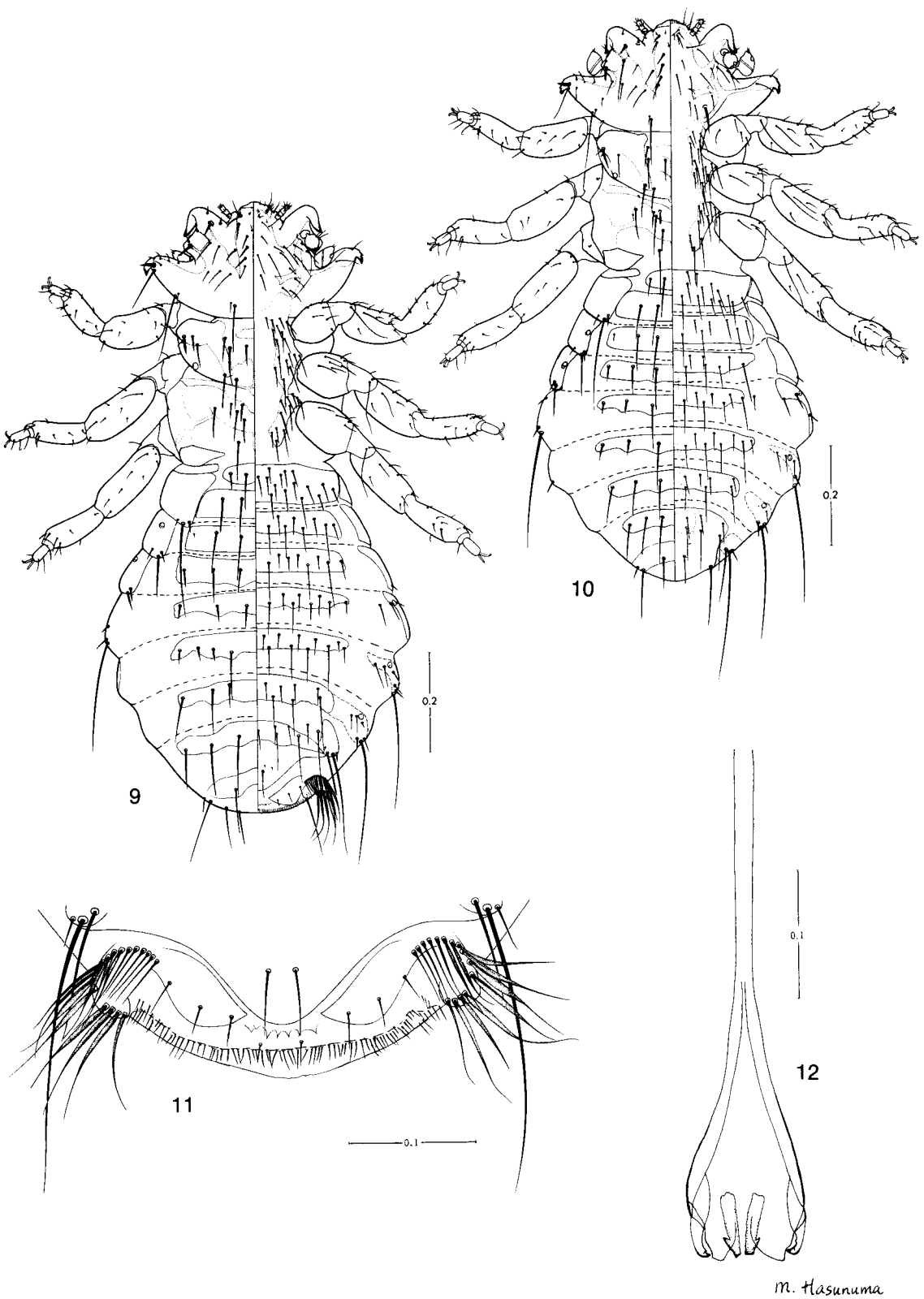
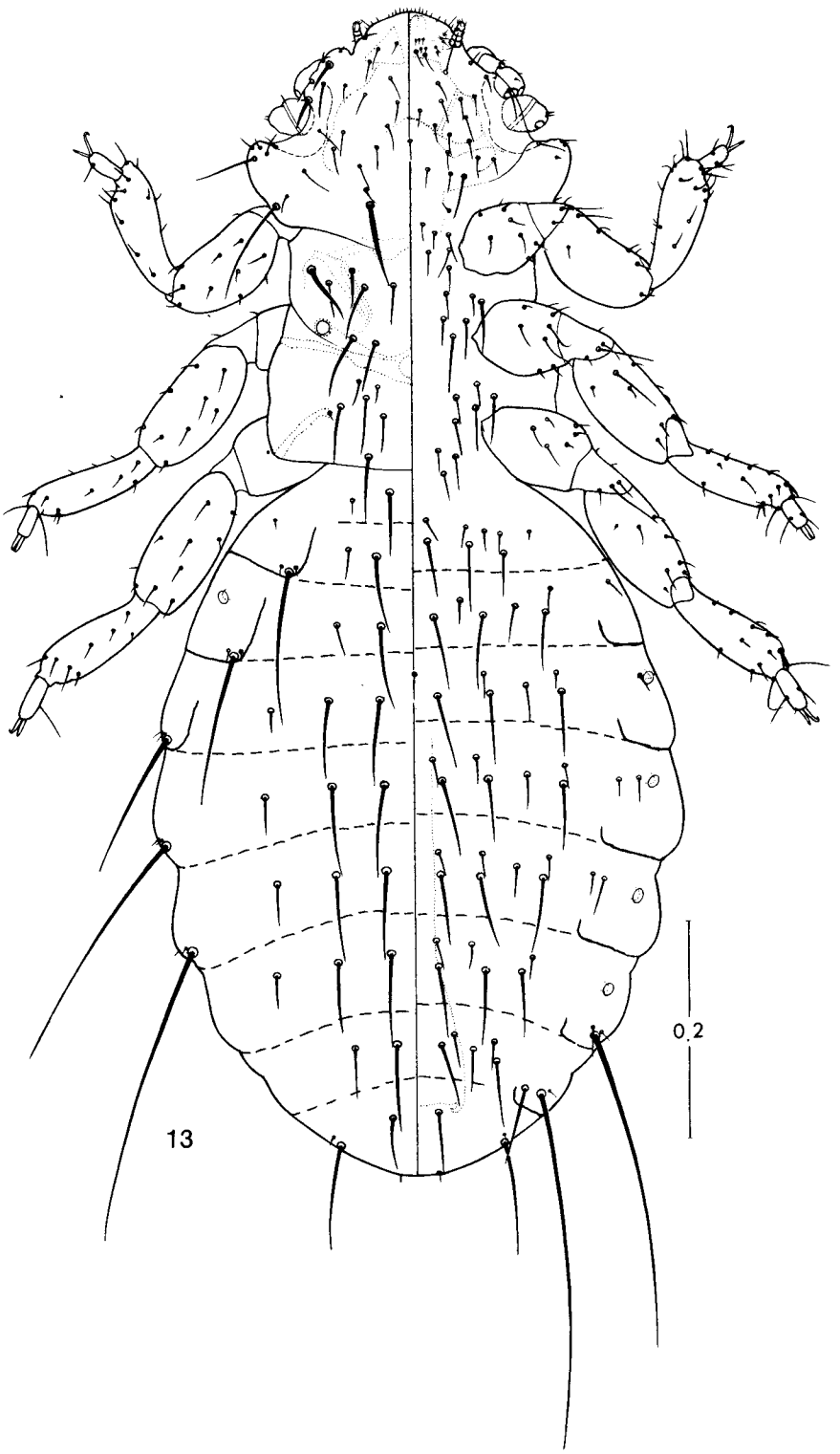


Fig. 13-14. *Hoplomyophilus nativus* Mendez, from *Proechimys semispinosus,* Yaracuy and Carabobo: 13, dorsal-ventral view of male; 14, male genitalia.



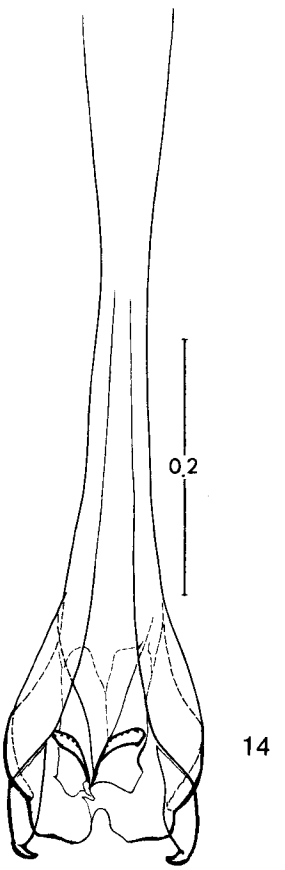
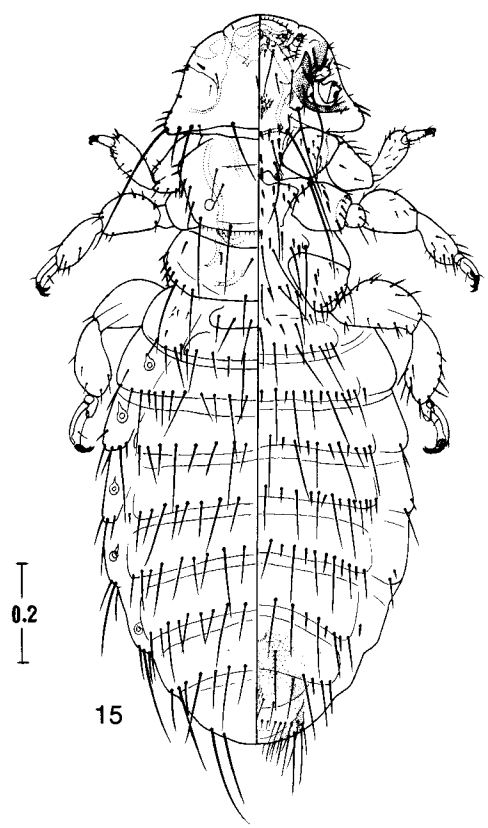
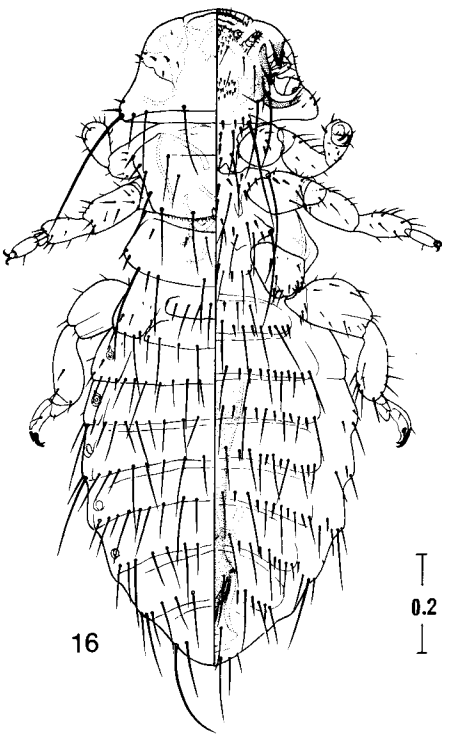
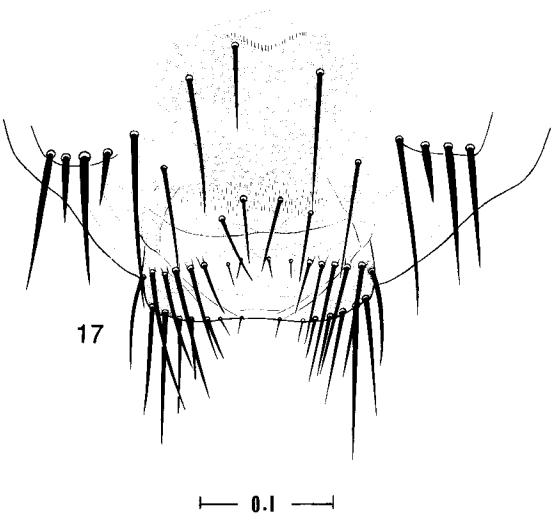
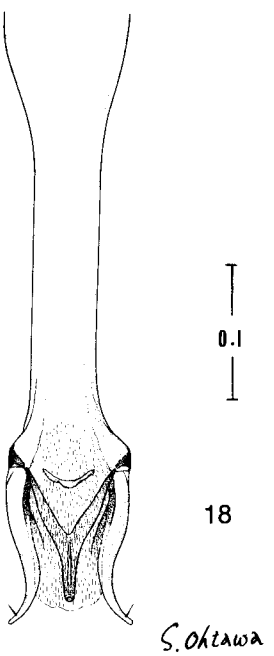


Fig. 15-18. *Cummingsia peramydis* Ferris, from *Monodelphis brevicaudata*, Trujillo: 15, dorsal-ventral view of female; 16, dorsal-ventral view of male; 17, ventral view of female terminalia; 18, male genitalia.









delphis sp.) collected at Bahia, Brazil. Werneck (1948) recorded it off *P. domesticus* (= *Monodelphis domestica*) from **Pará** and **Pernambuco,** Brazil.

VENEZUELAN RECORDS

C. peramydis was taken off 13 specimens of *Monodelphis brevicaudata* (Erxleben) collected at Isnoto and El Dividive, **Trujillo;** Mirimire and La Pastora, **Falcón;** Tamatama, T. F. **Amazonas;** Altamire, **Barinas;** and near Icabarú, **Bolívar.**

Comments. There were 31 specimens on one host and more than 20 specimens on two other hosts. The remaining infestations were light.

Cummingsia intermedia Werneck (Fig. 19-22)

Cummingsia intermedia Werneck, 1937:70, Fig. 1-6.

The holotype was taken off *Marmosa incana paulensis* Tate collected in **Rio de Janeiro,** Brazil. The species has not been reported since the original record.

VENEZUELAN RECORDS

C. intermedia was taken off three specimens of *Marmosa dryas* Thomas collected at Hda. Misisí, **Trujillo;** and Tabay, **Merida.**

Comments. One host had three specimens, another two, and the third only one.

Family Gyropidae

Genus *Gliricola* Mjöberg

Micropus Denny, 1842:247 (*nec* Meyer and Wolf, 1810).
Gliricola Mjöberg, 1910:292.
Paragliricola Ewing, 1924:29.

Type-species: *Gyropus gracilis* Nitzsch, 1818.

Gliricola porcelli (Schrank) (Fig. 23-26)

Pediculus porcelli Schrank, 1781:500, Pl. I, Fig. 1.
Pediculus saviae Schrank, 1803:186.
Pediculus bifurcatus Olfers, 1816:83.
Gyropus gracilis Nitzsch, 1818:304.
Gyropus porcelli perfoliatus Neumann, 1912a: 216.
Gyropus bicaudatus Paine, 1912b:441, Pl. 20, Fig. 3.
Gliricola perfoliata Harrison, 1916:32.

The holotype was collected off a laboratory guinea pig, *Cavia porcellus* (Linnaeus). It is found worldwide on that host. Werneck (1948) also recorded it off wild *C. porcellus* in Brazil, *C. aperea* Erxleben in Brazil and Paraguay, *C. fulgida* Wagler in Brazil, *C. rufescens* Lund in Brazil, and *C. cutleri* Bennett in Peru.

VENEZUELAN RECORDS

G. porcelli was taken off 12 specimens of wild *Cavia porcellus* from San Agustín, and San Fernando, **Monagas;** and near Montalbán, **Carabobo.**

Comments. The four most heavily infested hosts had 84, 80, 44, and 35 specimens, respectively, while the others had a smaller number.

Gliricola lindolphoi Werneck (Fig. 27-30)

Gliricola lindolphoi Werneck, 1942:302.

The holotype was collected off *Cavia aperea* Erxleben at Santo Amaro, **São Paulo,** Brazil. Werneck (1948) also reported it off the domestic guinea pig.

VENEZUELAN RECORDS

G. lindolphoi was taken off two specimens of *Cavia porcellus* (Linnaeus) near Caripe, **Monagas.**

Comments. One host had one female of this species and the other had three males and three females. The female of this species closely resembles that of *G. porcelli.* Since *G. lindolphoi* and *G. porcelli* were not taken off the same host specimens, it is believed that the females illustrated are properly identified.

Gliricola decurtatus marajoensis Werneck (Fig. 31-34)

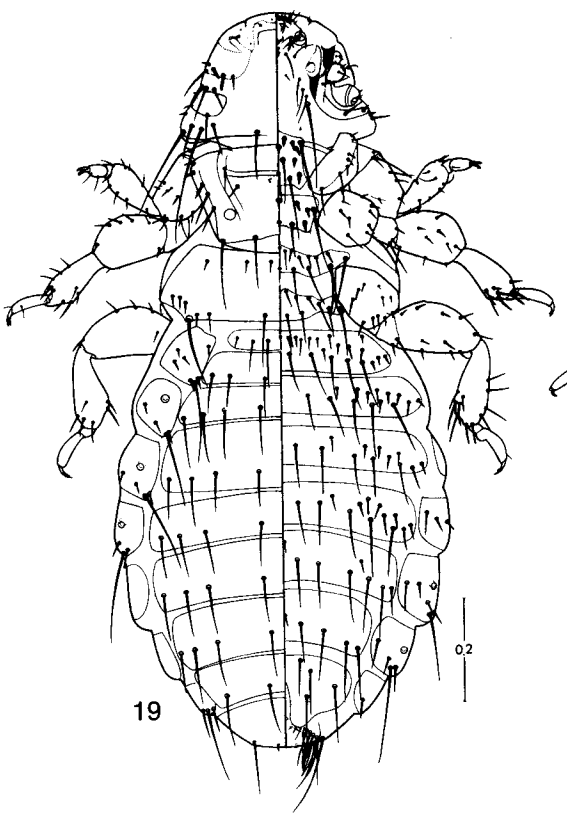
Gliricola decurtatus marajoensis Werneck, 1942: 310, Pl. 2, Fig. C.

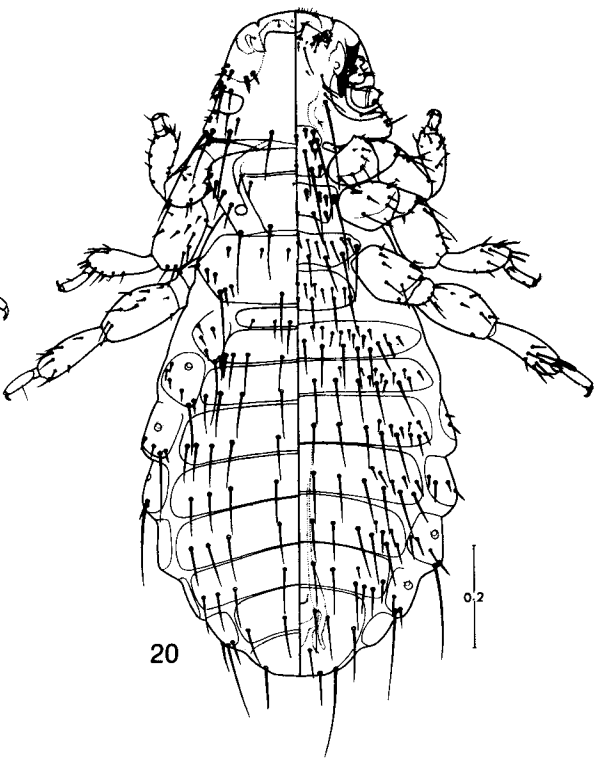
The holotype was collected off *Loncheres armatus* I. Geoffroy (= *Echimys armatus*) in **Pará,** Brazil. Werneck (1948) also reported it off the type-host collected from three other localities in Brazil. Other subspecies of *Gliricola decurtatus* are recorded from a variety of hosts in Brazil. We have been unable to examine Werneck's types. However, based upon his descriptions and illustrations, the specimens listed are appropriately referred to this species.

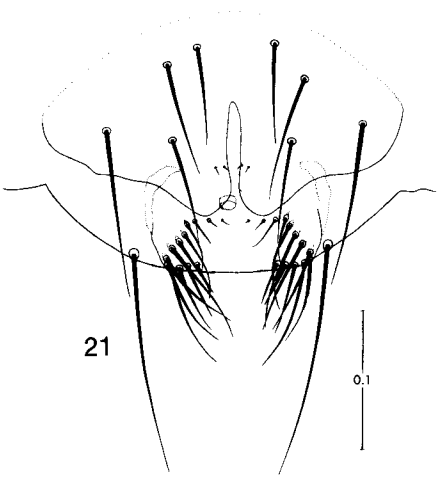
VENEZUELAN RECORDS

G. decurtatus marajoensis was taken off 4 specimens of *Echimys armatus* (I. Geoffroy) collected at Hato Mata de Bejuco, **Monagas**

Fig. 19-22. *Cummingsia intermedia* Werneck, from *Marmosa dryas*, Trujillo: 19, dorsal-ventral view of female; 20, dorsal-ventral view of male; 21, ventral view of female terminalia; 22, male genitalia.







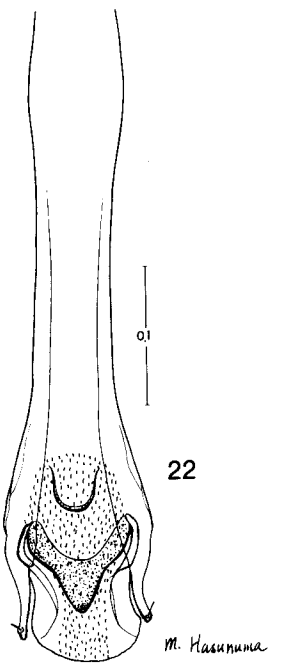
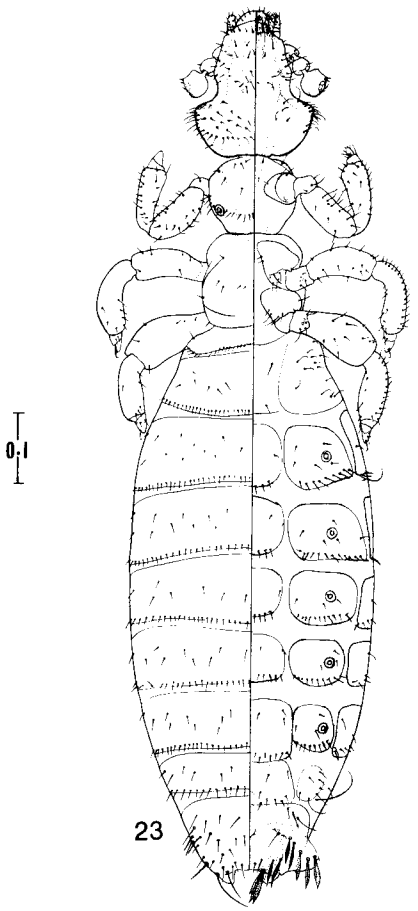
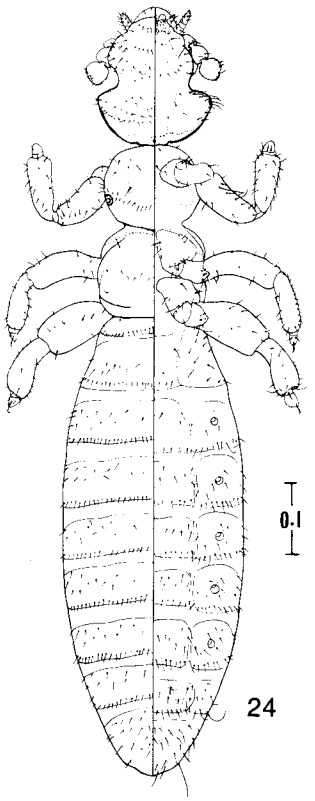
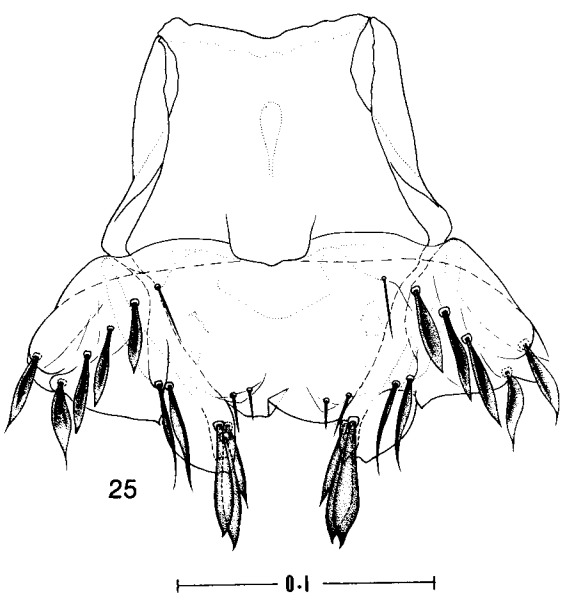
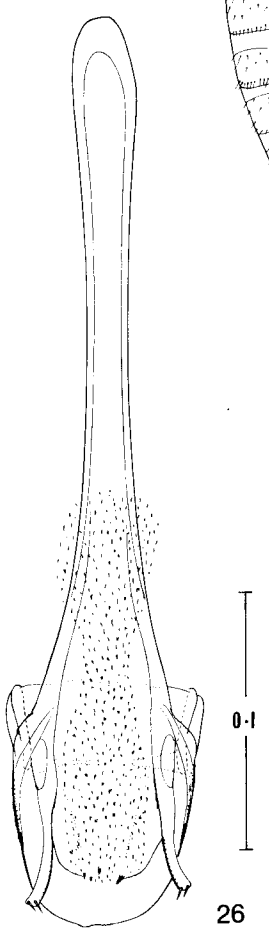


Fig. 23-26. *Gliricola porcelli* (Schrank), from *Cavia porcellus,* Monagas: 23, dorsal-ventral view of female; 24, dorsal-ventral view of male; 25, ventral view of female terminalia; 26, male genitalia.









S. Ohtaka

Fig. 27-30. *Gliricola lindolphoi* Werneck, from *Cavia porcellus*, Monagas: 27, dorsal-ventral view of female; 28, dorsal-ventral view of male; 29, ventral view of female terminalia; 30, male genitalia.

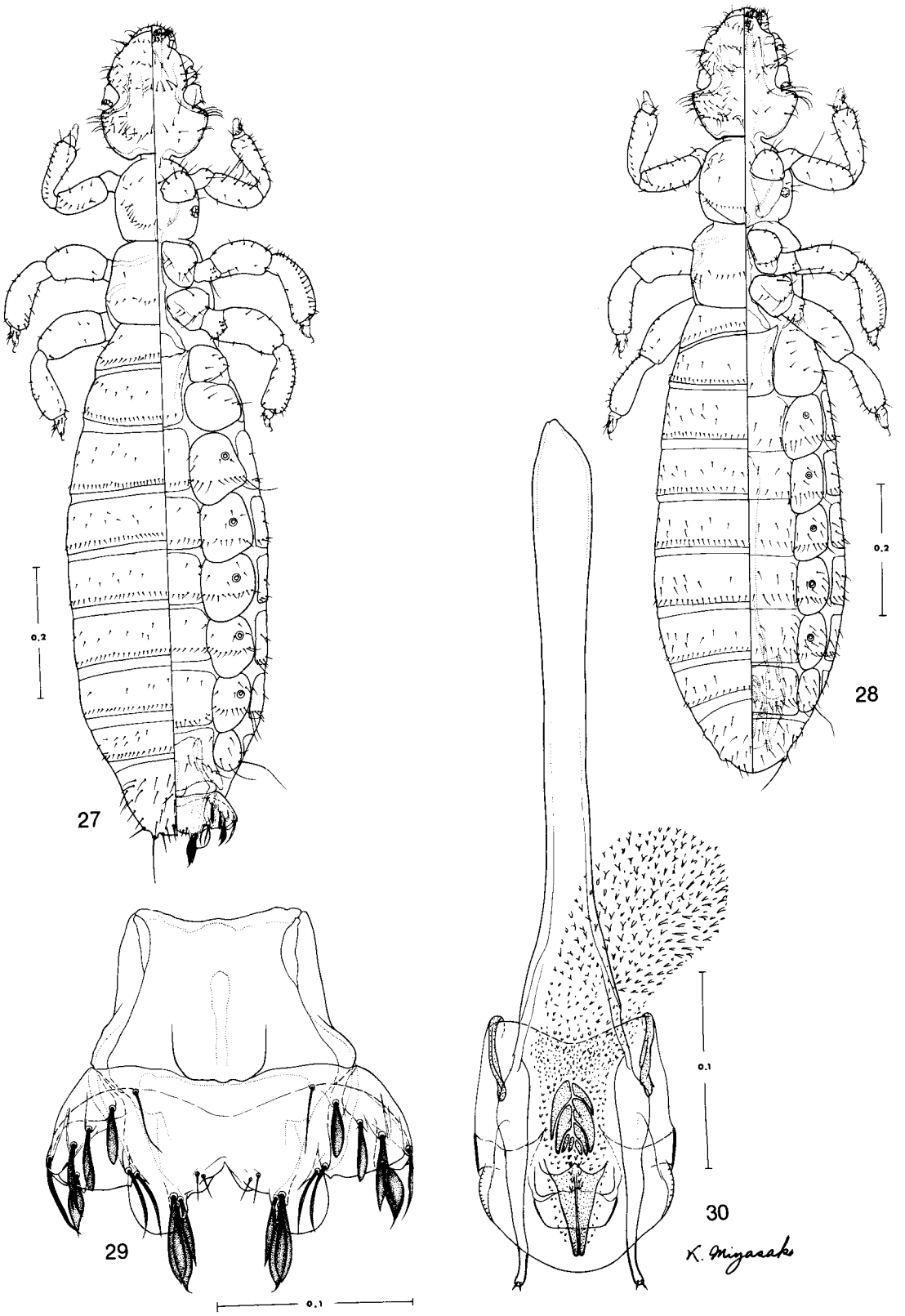
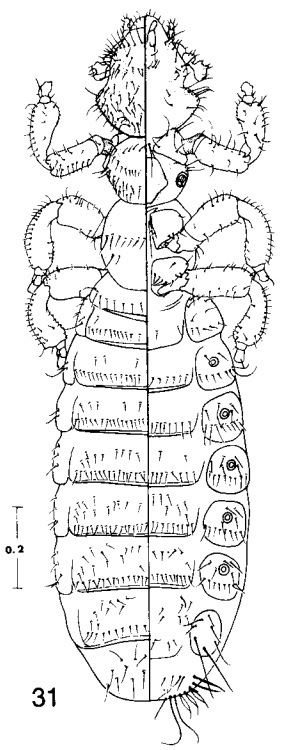
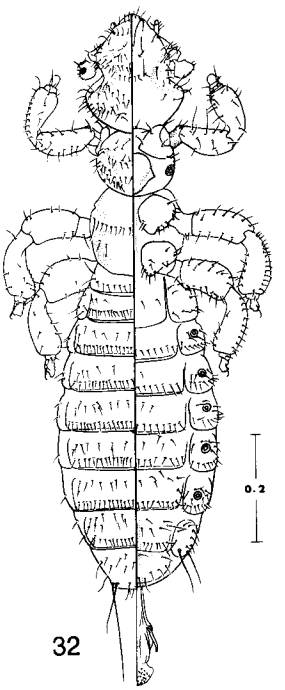
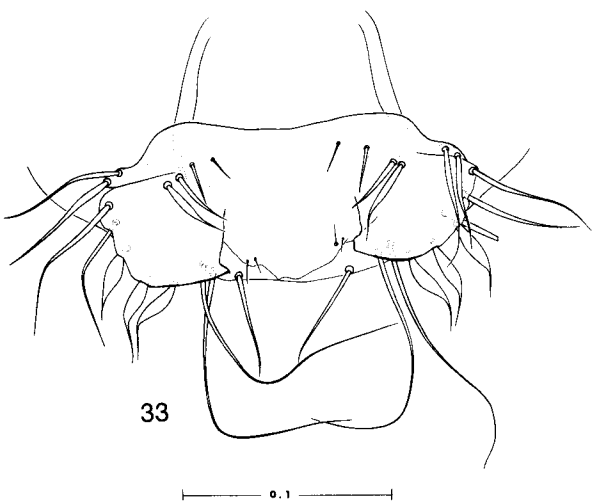
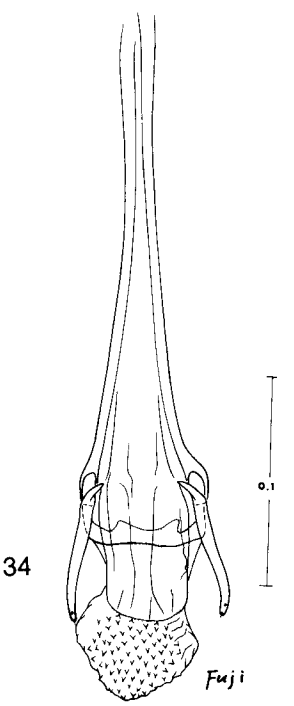


Fig. 31-34. *Gliricola decurtatus marajoensis* Werneck, from *Echimys semivillosus*, Lara: 31, dorsal-ventral view of female; 32, dorsal-ventral view of male; 33, ventral view of female terminalia; 34, male genitalia.









and Rio Mavaca, and San Juan Rio Manapiare, T. F. **Amazonas.** It was also taken off 39 specimens of *Echimys semivillosus* (I. Geoffroy) collected near El Tocuyo, **Lara.**

Comments. One host had 22 specimens, two other hosts had 18, but the majority had fewer than 10. No significant difference was found between the populations found on the two host species.

Gliricola mirandai Werneck
(Fig. 35-38)

Gliricola mirandai Werneck, 1935b:417, Fig. 1-6.

The holotype was taken off *Isothrix bistriata* Wagner collected at Porto Bicentenario, Rio Manuel Correia, **Mato Grosso,** Brazil. Werneck (1948) also recorded it from the type-host collected in Bolivia; no specific locality was given.

VENEZUELAN RECORDS

Three males and three females of *G. mirandai* were taken off a single specimen of *Isothrix bistriata* collected at Boca Mavaca, T. F. **Amazonas.**

Gliricola pintoi Werneck
(Fig. 39-42)

Gliricola pintoi Werneck, 1935a:373, Fig. 1-6.

The holotype was taken off *Proechimys oris* Thomas collected at Abaete, **Pará,** Brazil. It has been taken off *P. guyannensis* (E. Geoffroy) collected in San Joaquin, **Beni,** Bolivia on March 25, 1963. The illustrations are of specimens from that collection. This species probably occurs in Venezuela but has not been reported there.

Gliricola venezuelanus, new species
(Fig. 43-46)

Holotype male. External morphology and chaetotaxy as in Fig. 44. Head width 0.19 mm. Pleurite VIII with one very long seta; terminal segment without longer posterior setae. Total length 1.16 mm. Genitalia (Fig. 46) 0.09 mm wide and 0.35 mm long; prominent blunt parameres each with three long distal setae, the most posterior one distinctly longer than the others; sac with single elongate median sclerite tapered to sharp point posteriorly.

Allotype female. External morphology and chaetotaxy as in Fig. 43. Head width 0.20 mm. Abdominal tergite III (second apparent tergite) with markedly convex posterior margin. Pleurite VIII with single very long seta; last tergite with one very long seta each side. Ventral terminalia as in Fig. 45, with spatulate and slender setae distributed as shown. Total length 1.31 mm.

Discussion. The third (second apparent) abdominal tergite of the female is unique, thereby separating this species from all other known species of *Gliricola.* The structure and chaetotaxy of the male genitalia parameres and the shape of the genital sac sclerite are also distinctive.

Type-material. Holotype male, allotype female, and paratypes off *Proechimys guyannensis* (E. Geoffroy) collected April 7, 1967, at Hato San José, **Bolívar,** Venezuela.

VENEZUELAN RECORDS

In addition to the holotype and allotype, paratypes were collected off *Proechimys guyannensis* (E. Geoffroy) at Río Supamo, Hato San José, near Icabarú, and Hato La Forida, **Bolívar;** Belén, Boca Mavaca, Río Mavaca, Tamatama, Capibara, near Puerto Ayaencho, and San Juan Río Manapiare, T. F. **Amazonas.** Paratypes were collected off *Proechimys semispinosus* Tomes at Capibara and Tamatama, T. F. **Amazonas;** Cumaná and Manacal, **Sucre;** Montalbán, **Carabobo;** Altamira, **Barinas;** and Nulita, **Apure.** Paratypes were collected off *Proechimys canicollis* J. A. Allen, 35 km NW La Paz, **Zulia.**

Gliricola echimydis Werneck
(Fig. 47-50)

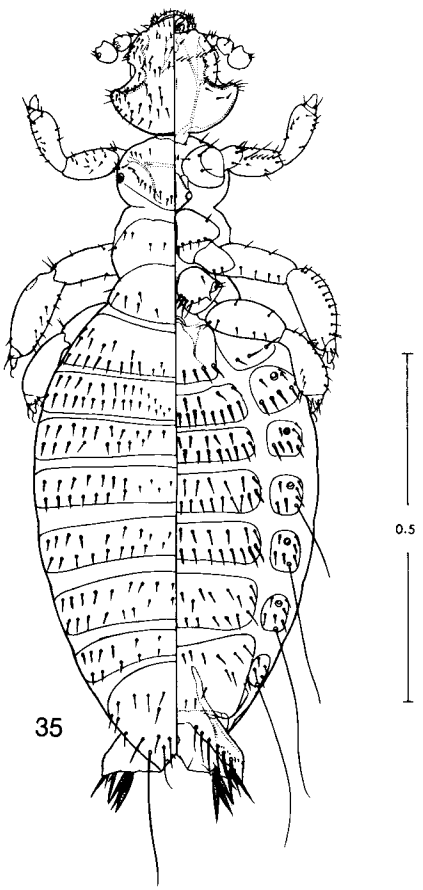
Gliricola echimydis Werneck, 1933:344, Fig. 1-8.

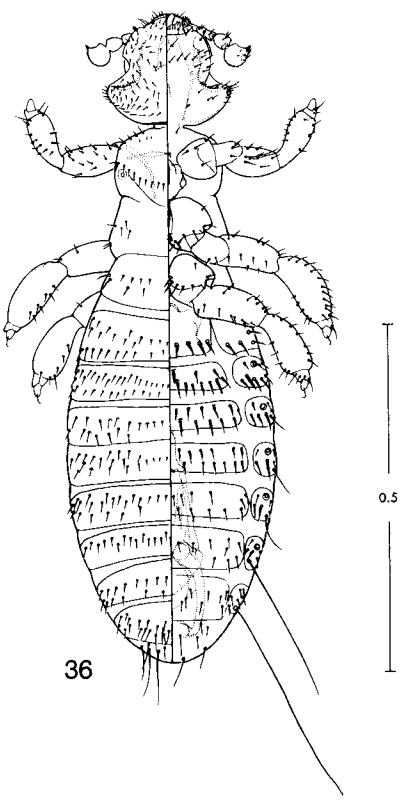
The holotype was taken off *Echimys cayennensis* Desmarest (= *Proechimys iheringi* Thomas?) collected at Angra dos Reis, **Rio de Janeiro,** Brazil. Werneck (1948) also recorded it off *Proechimys albispinus* (I. Geoffroy) (= *Proechimys iheringi*) collected at Corcovado, **Rio de Janeiro,** Brazil; and *P. dimidiatus* Günther at Angra dos Reis, **Rio de Janeiro,** Brazil. This species is probably also found in Venezuela, but it has not been reported there. The illustrations are of specimens taken off *P. guyannensis* (E. Geoffroy) collected at A. de Guarayos, **Beni,** Bolivia, on June 8, 1964.

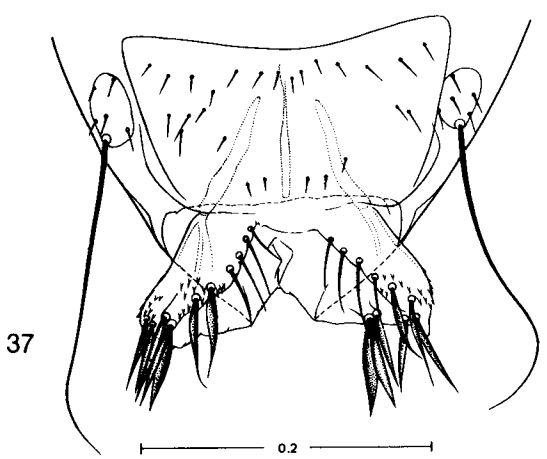
Gliricola wenzeli, new species
(Fig. 51-54)

Holotype male. External morphology and chaetotaxy as shown in Fig. 52. Head width 0.21 mm. Pleurite II with single long seta; pleurite VIII with two long setae. Last segment posteriorly with one medium seta on each side, these being shorter than length of last tergite. Total length 1.20 mm. Genitalia (Fig. 54) 0.12

Fig. 35-38. *Gliricola mirandai* Werneck, from *Isothrix bistriata*, T. F. Amazonas: 35, dorsal-ventral view of female; 36, dorsal-ventral view of male; 37, ventral view of female terminalia; 38, male genitalia.







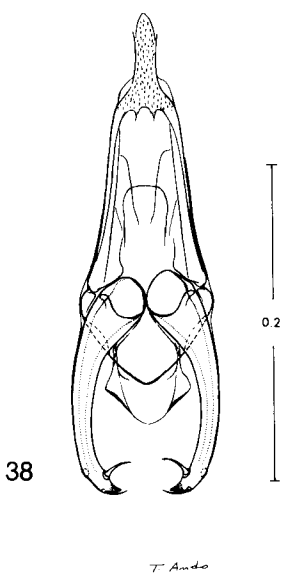
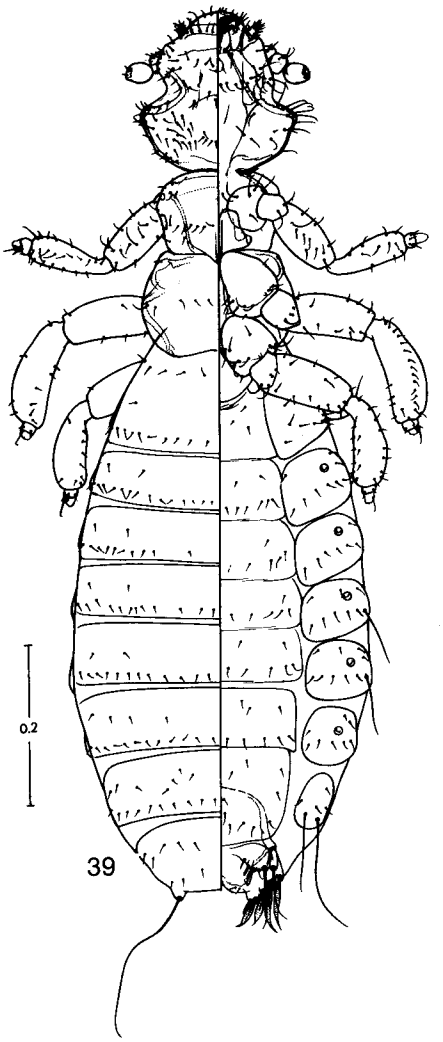
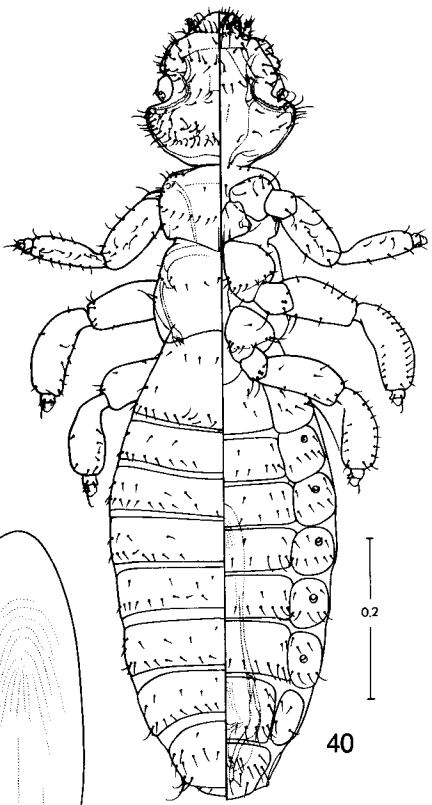
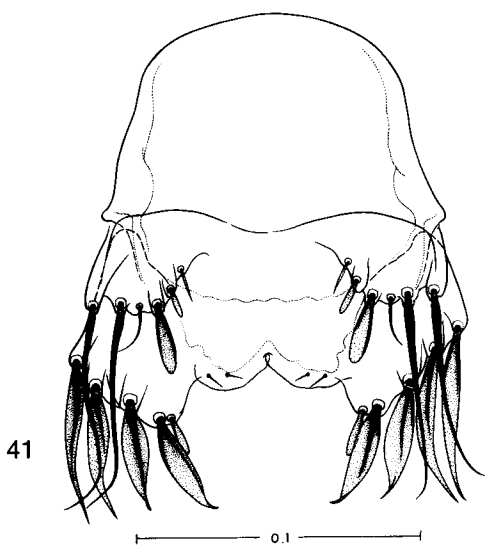


Fig. 39-42. *Gliricola pintoi* Werneck, from *Proechimys guyannensis*, Beni, Bolivia: 39, dorsal-ventral view of female; 40, dorsal-ventral view of male; 41, ventral view of female terminalia; 42, male genitalia.







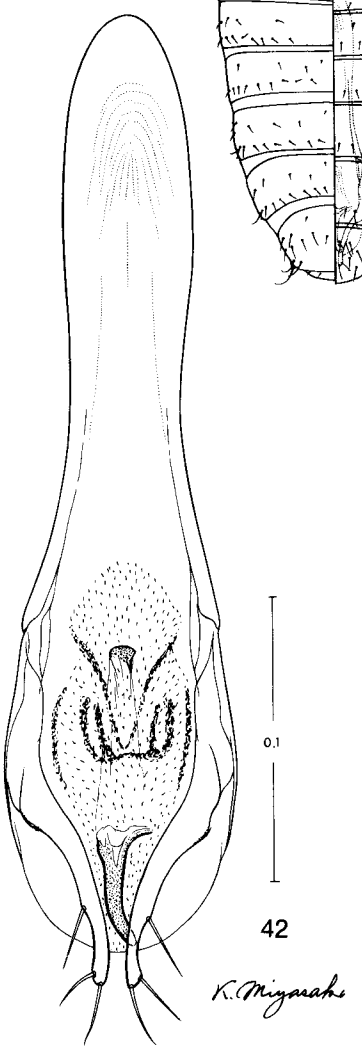
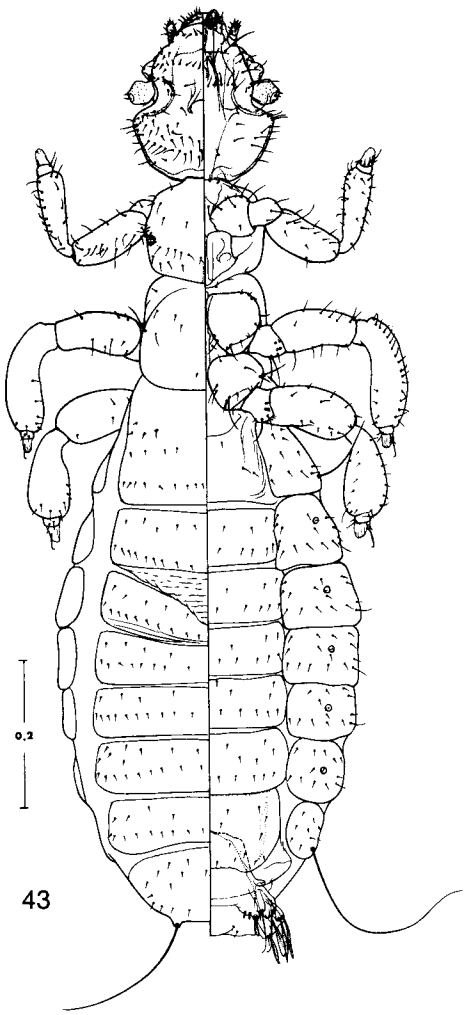


Fig. 43-46. *Gliricola venezuelanus*, new species, from *Proechimys guyannensis*, Bolívar: 43, dorsal-ventral view of female; 44, dorsal-ventral view of male; 45, ventral view of female terminalia; 46, male genitalia.



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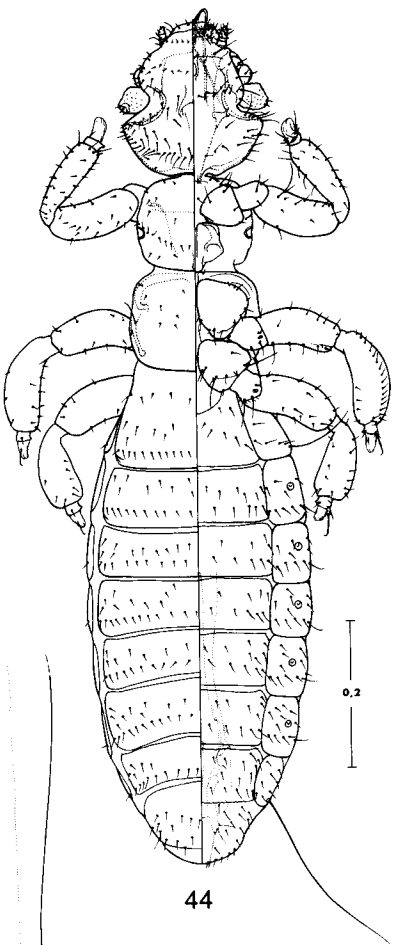

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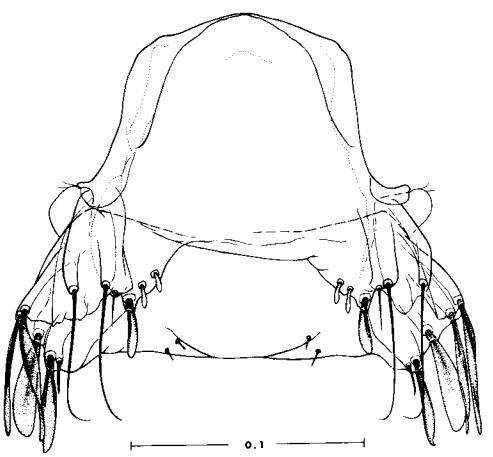

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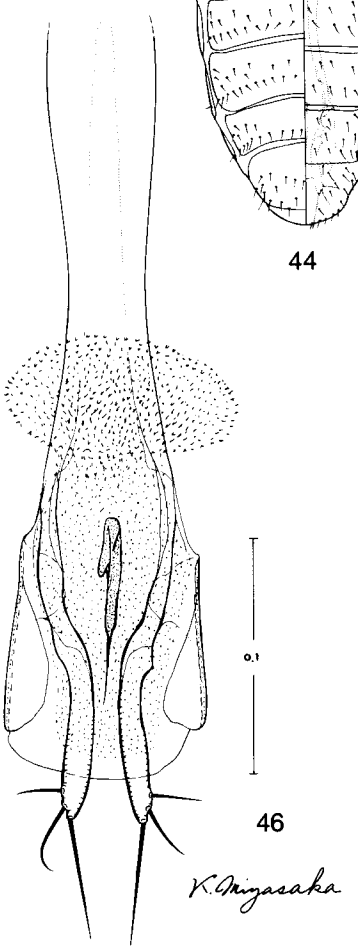

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Fig. 47-50. *Gliricola echimydis* Werneck, from *Proechimys guyannensis*, Beni, Bolivia: 47, dorsal-ventral view of female; 48, dorsal-ventral view of male; 49, ventral view of female terminalia; 50, male genitalia.

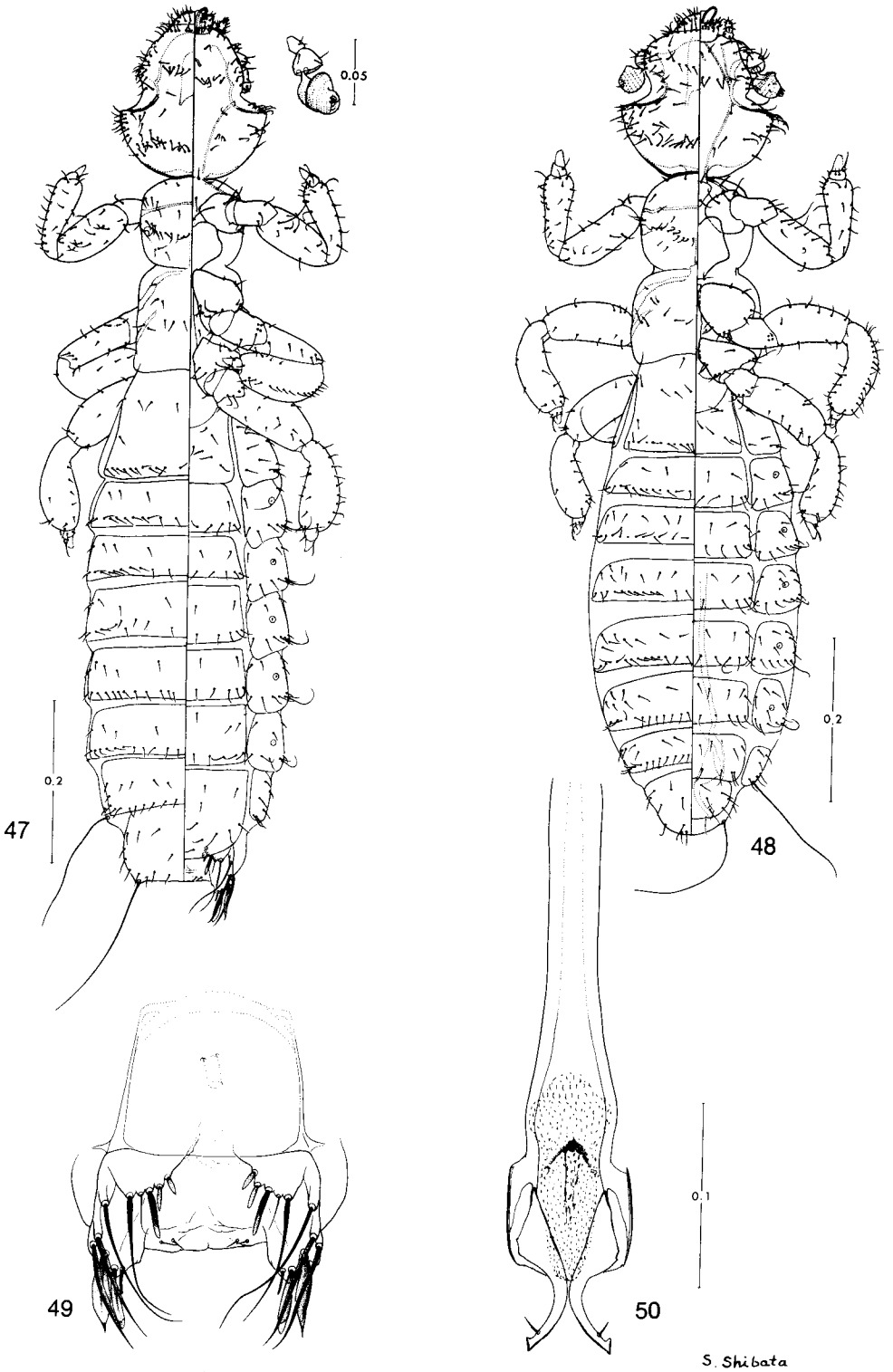
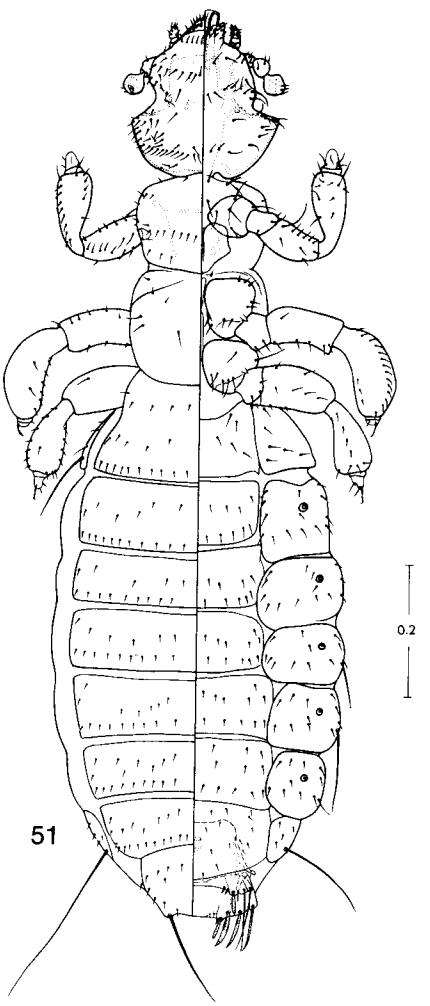
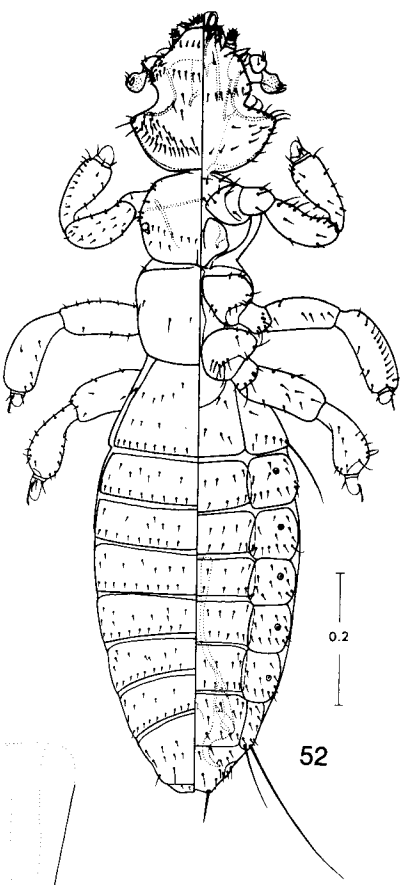
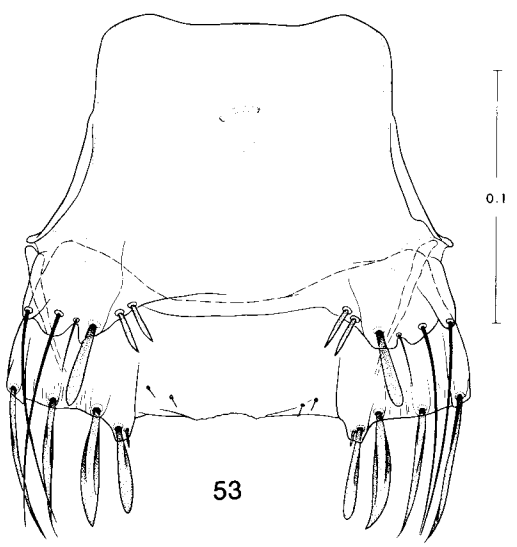
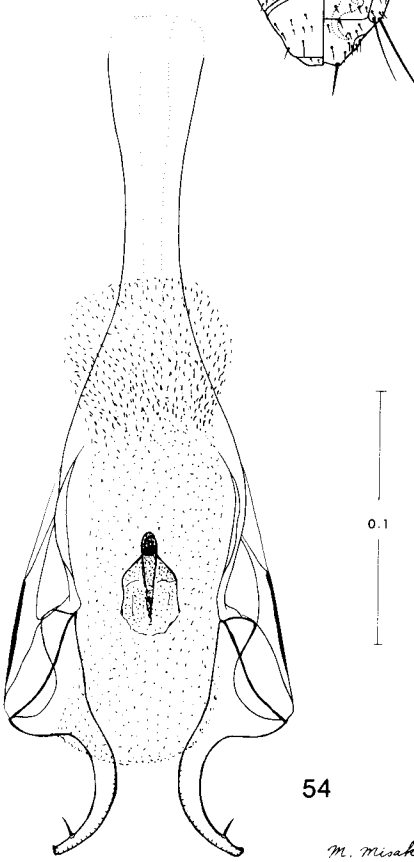


Fig. 51-54. *Gliricola wenzeli*, new species, from *Proechimys semispinosus*, Sucre: 51, dorsal-ventral view of female; 52, dorsal-ventral view of male; 53, ventral view of female terminalia; 54, male genitalia.









mm wide and 0.31 mm long; parameres outwardly curved, each with single subapical seta and with indistinct suggestion of terminal barb; median sclerite of genital sac as shown.

Allotype female. External morphology and chaetotaxy as shown in Fig. 51. Head width 0.23 mm. Pleurite II with single long seta; setae of pleurites V-VI vary from long (as shown) to all short; pleurite VIII with two long setae. Last segment with long posterior seta on each side, these longer than length of last tergite. Ventral terminalia as in Fig. 53, with distribution of spatulate and slender setae as shown. Total length 1.43 mm.

Discussion. This species is closely related to *G. echimydis* and *G. vogelsangi* Werneck. *G. wenzeli* is larger than either of them in all aspects. The terminal abdominal segment of the female of *G. wenzeli* is rounded, while it is almost square shaped in *G. echimydis* and *G. vogelsangi*. The barbing of the paramere tip and the shape of the genital sac sclerite also help to separate *G. wenzeli* males. The innermost seta of the posterior terminalia row is much longer for the female *G. vogelsangi* than for *G. wenzeli*.

Type-material. Holotype male, allotype female, and paratypes off *Proechimys semispinosus* Tomes collected July 19, 1967, at Manacal, **Sucre,** Venezuela.

VENEZUELAN RECORDS

In addition to the holotype and allotype, paratypes were collected off 17 specimens of the type-host at Manacal, **Sucre;** and Cueva del Guácharo, La Laguna, and San Agustín, **Monagas.**

Comment. Infestations varied from 62 males, 113 females, and 99 immatures on one host to one male and one female on another.

Gliricola vogelsangi Werneck
(Fig. 55-58)

Gliricola vogelsangi Werneck, 1951:303, Fig. 1-5.

The holotype was taken off *Proechimys trinitatis* Allen and Chapman (= *P. semispinosus* Tomes) collected at Caripito, **Monagas,** Venezuela. There have been no published records since the original description.

Gliricola handleyi, new species
(Fig. 59-62)

Holotype male. External morphology and chaetotaxy as shown in Fig. 60. Head width 0.21 mm. Pleurite VIII with one very long seta; last segment with only minute setae. Total length 1.20 mm. Genitalia (Fig. 62) 0.12 mm wide and 0.31 mm long; parameres irregularly enlarged distally, each directed somewhat laterad, and each with indistinct short terminal setae; genital sac with small elongate median sclerite.

Allotype female. External morphology and chaetotaxy as shown in Fig. 59. Head width 0.23 mm. Pleurites IV-VII each with long, heavy seta; pleurite VIII with one very long seta. Last tergite with one long seta on each side. Ventral terminalia as in Fig. 61, with spatulate setae restricted to posteriormost row, and relative setal lengths as shown. Total length 1.23 mm.

Discussion. This series is closest to *G. vogelsangi, G. wenzeli,* and *G. echimydis* in general appearance. The male of *G. handleyi* is, however, separable from them by its distinctively different genitalic structure and the absence of any long setae on the terminal segment. The female of *G. handleyi* differs from the others by the absence of spatulate setae in the anteriormost ventral terminalia row and by the distribution of long pleural setae.

Type-material. Holotype male, allotype female, and 32 paratypes off three specimens of *Proechimys hoplomyoides* Tate collected May 9, 1966, at 125 km, 85 km SSE of El Dorado, **Bolívar,** Venezuela.

VENEZUELAN RECORDS

Type-material only.

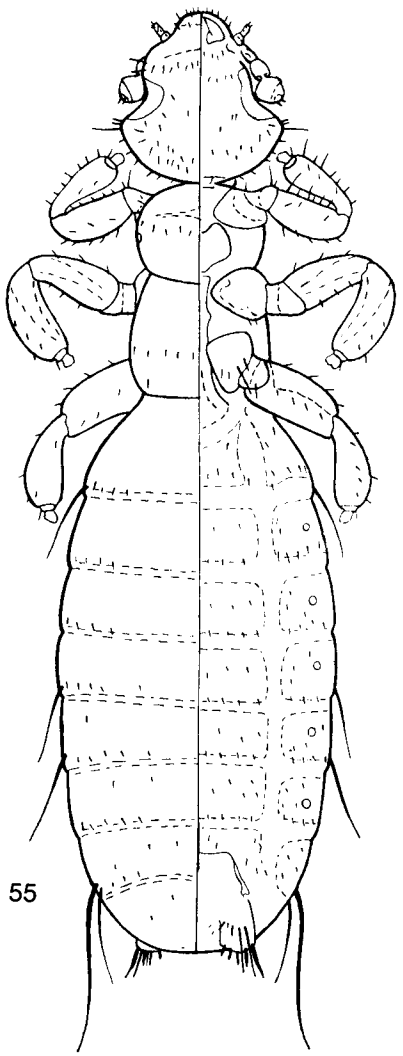
Gliricola tiptoni, new species
(Fig. 63-66)

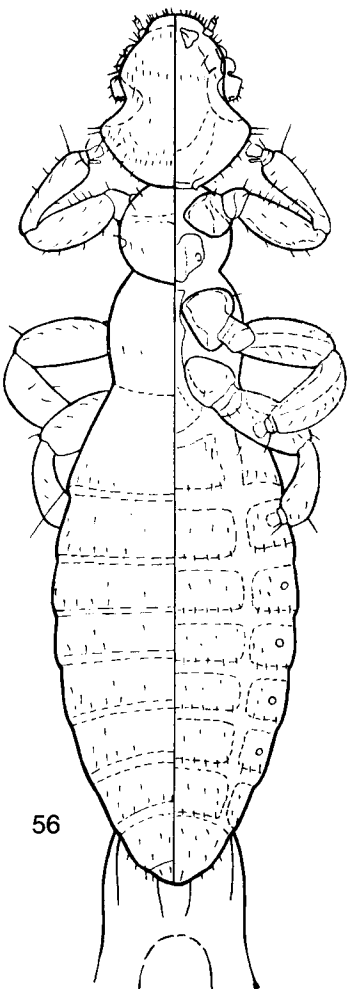
Holotype male. External morphology and chaetotaxy as shown in Fig. 64. Head width 0.22 mm. Pleurite II with one long seta; pleurite VIII with two long setae; terminal segment with one medium seta on each side, these being shorter than length of last tergite. Total length 1.38 mm. Genitalia (Fig. 66) 0.12 mm wide and 0.47 mm long; parameres directed laterad, each with distinct apical barb and one subapical seta; genital sac with single elongate, pointed, median sclerite.

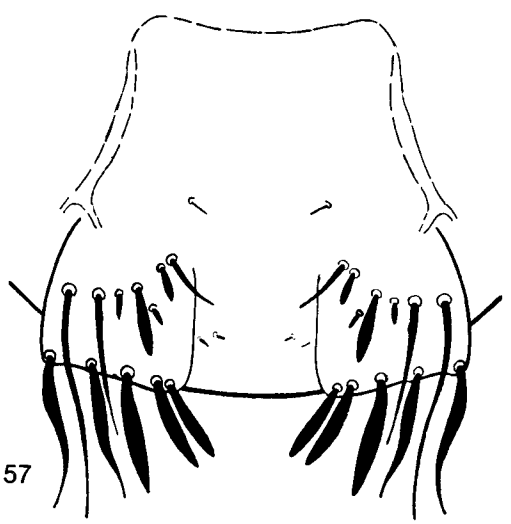
Allotype female. External morphology and chaetotaxy as shown in Fig. 63. Head width 0.22 mm. Pleurite II with one long seta; pleurite VIII with two very long setae; last tergite with one very long seta on each side. Ventral terminalia as in Fig. 65, with distribution and lengths of spatulate and slender setae as shown. Total length 1.43 mm.

Discussion. This species is probably closest to those in the *G. decurtatus* complex. However, it is easily separated from them by its large size,

Fig. 55-58. *Gliricola vogelsangi* Werneck, from *Proechimys trinitatis*. From Werneck, 1951: 55, dorsal-ventral view of female; 56, dorsal-ventral view of male; 57, ventral view of female terminalia; 58, male genitalia.







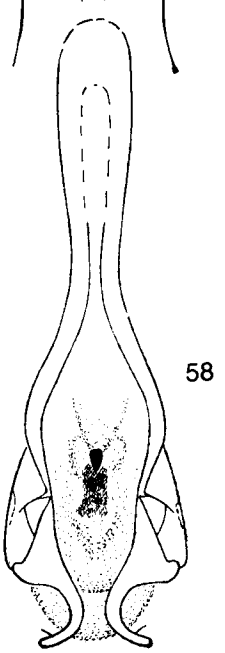


Fig. 59-62. *Gliricola handleyi,* new species, from *Proechimys hoplomyoides,* Bolívar: 59, dorsal-ventral view of female; 60, dorsal-ventral view of male; 61, ventral view of female terminalia; 62, male genitalia.

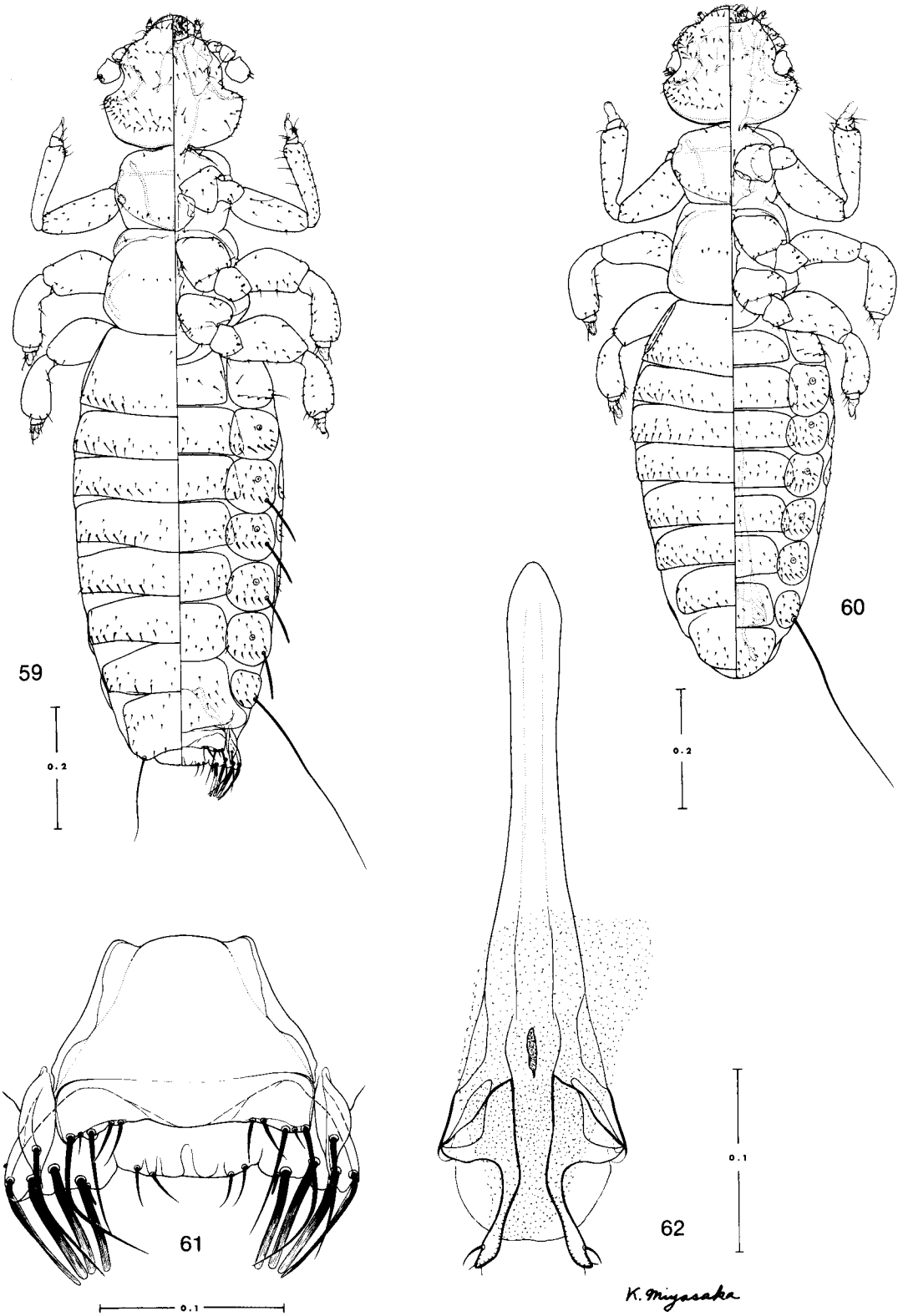
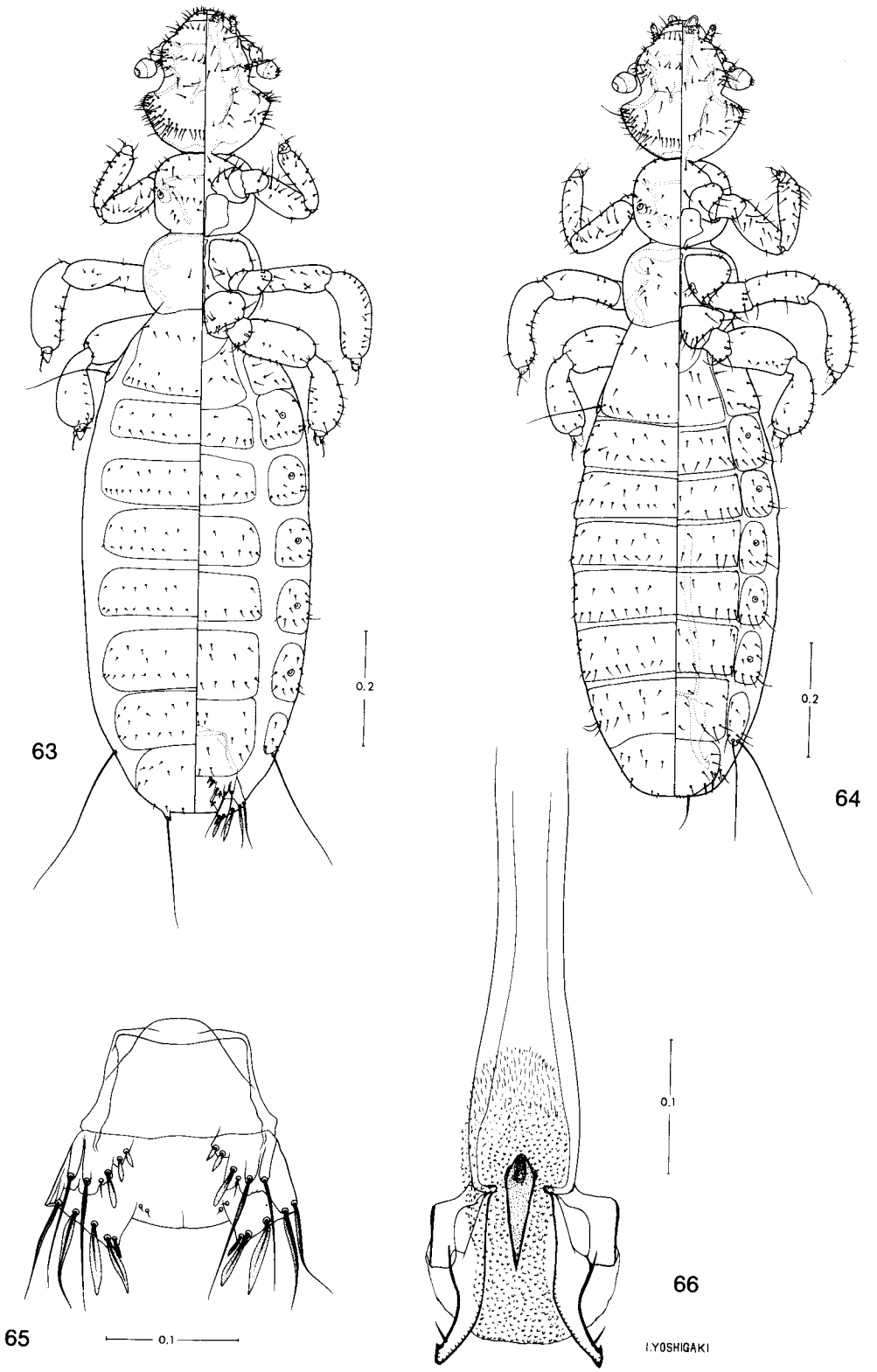


Fig. 63-66. *Gliricola tiptoni*, new species, from *Proechimys semispinosus*, Trujillo: 63, dorsal-ventral view of female; 64, dorsal-ventral view of male; 65, ventral view of female terminalia; 66, male genitalia.



by the male having quite different genitalic structure and chaetotaxy of the last segment, and by the female having different setal lengths and types associated with its terminalia. Apparently some females are inseparable from those of *G. wenzeli*, but the male of *G. tiptoni* is larger and has much larger and different genitalia.

Type-material. Holotype male and allotype female off *Proechimys semispinosus* Tomes collected September 13, 1965, at El Dividive, **Trujillo,** Venezuela.

VENEZUELAN RECORDS

In addition to the holotype and allotype, paratypes were collected off *Proechimys semispinosus* Tomes taken at El Rosario and Kasmera, **Zulia;** Isnoto, El Dividive, Sta. Apolonia, and Agua Santa, **Trujillo;** Altamira, **Barinas;** Montalbán, **Carabobo;** Nulita, **Apure;** Cumaná and Manacal, **Sucre;** Urama and Minas de Aroa, **Yaracuy;** Caserio Boro, near El Tocuyo, **Lara;** Cerro Socopo, Río Socopito, near Mirimiri, and Cerro Santa Ana, **Falcón;** Curapao, **Miranda;** Hato las Palmitas, **Guárico;** Tamatama and Capibara, T. F. **Amazonas.**

Paratypes were collected off *Proechimys guyannensis* (E. Geoffroy) taken at Puerto Ayacucho and San Juan Río Manapiare, T. F. **Amazonas;** and near Icabarú, **Bolívar.**

Paratypes were collected off *Proechimys canicollis* J. A. Allen taken 35 km NW La Paz, **Zulia.**

Comment. This parasite was taken off 252 specimens of *Proechimys*, most of which were *P. semispinosus.*

Gliricola mendezi, new species
(Fig. 67-70)

Holotype male. External morphology and chaetotaxy as shown in Fig. 68. Head width 0.20 mm. Pleurites II-VII each with one longer seta; pleurite VIII with one very long seta; last segment with one somewhat longer seta on each side, these being much shorter than length of last tergite. Total length 1.10 mm. Genitalia (Fig. 70) 0.07 mm wide and 0.30 mm long; parameres slender, fairly straight, flexed laterally only near tip, and each with distinct apical barb and subapical seta; single median sclerite associated with genital sac.

Allotype female. External morphology and chaetotaxy as shown in Fig. 67. Head width 0.18 mm. Pleurites II-VIII with longer setae as in male; last segment with one very long seta on each side. Ventral terminalia as in Fig. 69, with lengths and distribution of spatulate and slender setae as shown. Total length 1.31 mm.

Discussion. This species does not appear to be closely related to any known species. The male is distinguished by its genitalia, especially the shape of the parameres and genital sac sclerite, by the distribution of longer setae on the pleurites and terminalia, and by its dimensions. The female is recognizable by its dimensions, the number of longer pleural and terminal setae, and the ventral terminalia chaetotaxy.

Type-material. Holotype male and allotype female off *Proechimys semispinosus* Tomes collected May 21, 1967, at Tamatama, T. F. **Amazonas,** Venezuela.

VENEZUELAN RECORDS

In addition to the holotype and allotype, paratypes were collected off type-host taken at Río Mavaca, Tamatama, and Capibara, T. F. **Amazonas.**

Genus *Gyropus* Nitzsch

Gyropus Nitzsch, 1818:303.
Haemabrus Nitzsch, 1874:6.
Diplocerus Nitzsch, 1874:6.
Monogyropus Ewing, 1924:10.
Allogyropus Ewing, 1924:20.
Tetragyropus Ewing, 1924:21.
Eogyropus Eichler, 1952:76.

Type-species: *Gyropus ovalis* Burmeister, 1838, by subsequent designation.

Gyropus ovalis Burmeister
(Fig. 71-74)

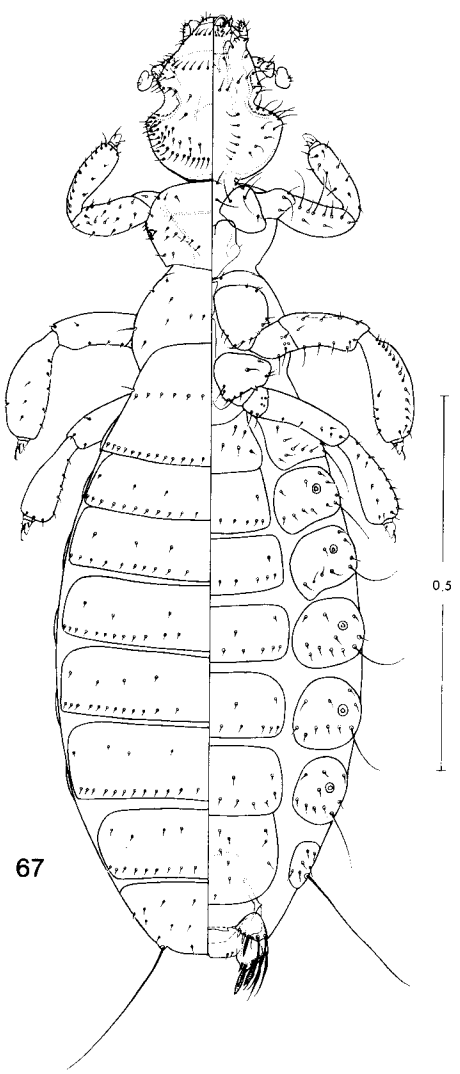
Gyropus ovalis Burmeister, 1838:443.
Gyropus turbinatum Piaget, 1880:609, Pl. 50, Fig. 7.
Macrogyropus mexicanus Zavaleta, 1946:438, Fig. 2, and G-L.

The holotype was taken off a domestic guinea pig, *Cavia porcellus* Linnaeus. It is now found worldwide on that host. Werneck (1948) recorded it off wild *C. porcellus* collected in **Distrito Federal, Rio de Janeiro, São Paulo,** and **Mato Grosso,** Brazil; *C. aperea* Erxleben collected in **São Paulo** and **Mato Grosso,** Brazil, and **Villarica,** Paraguay; *C. pamparum* Thomas collected in **Chaco,** Argentina; *C. tschudii pallidior* Thomas collected in **Arequipa,** Peru; *C. rufescens* Lund collected in **São Paulo,** Brazil; and *C. fulgida* Wagler collected in **Espírito Santo,** Brazil.

VENEZUELAN RECORDS

Gyropus ovalis was taken off 6 specimens of *Cavia porcellus* collected at San Agustín, **Monagas;** and Montalbán, **Carabobo.**

Fig. 67-70. *Gliricola mendezi*, new species, from *Proechimys semispinosus*, T. F. Amazonas: 67, dorsal-ventral view of female; 68, dorsal-ventral view of male; 69, ventral view of female terminalia; 70, male genitalia.



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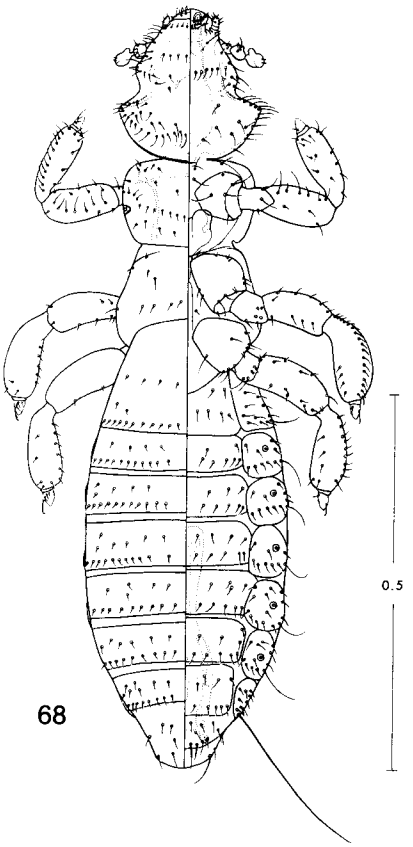

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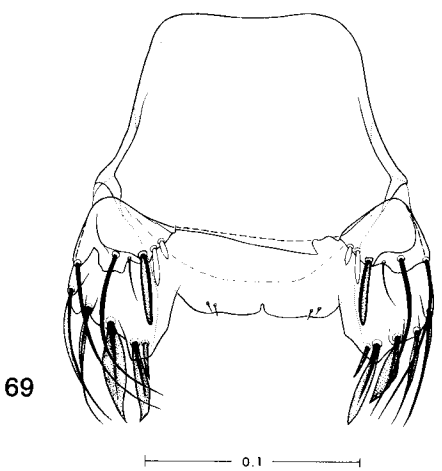

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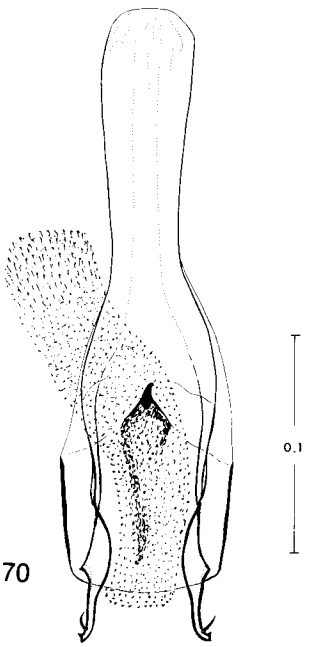

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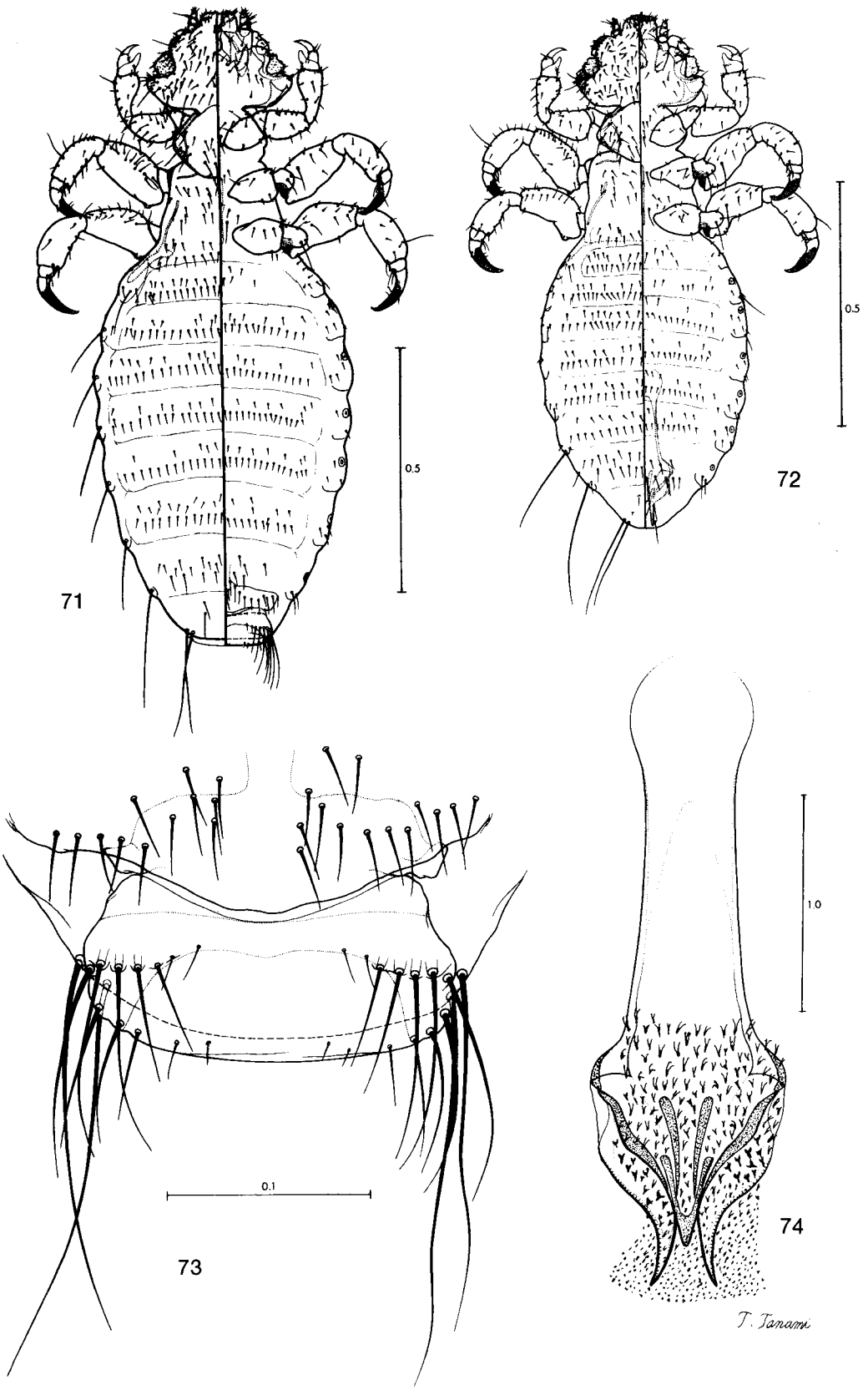
M. Misaki

Fig. 71-74. *Gyropus ovalis* Burmeister, from *Cavia porcellus*, Monagas: 71, dorsal-ventral view of female; 72, dorsal-ventral view of male; 73, ventral view of female terminalia; 74, male genitalia.



Comments. One host had 13 specimens, another had 9, and the remainder had only 1 or 2.

Gyropus wernecki, new species
(Fig. 75-78)

Holotype male. External morphology and chaetotaxy as shown in Fig. 76. Head width 0.28 mm; each side with one very long marginal temple seta and one longer dorsal seta. Tergites with only single row of setae, those lateral shorter than those medial. All pleurites with one very long seta. Sternites with setal lengths much as for tergites. Total length 1.25 mm. Genitalia (Fig. 78) 0.14 mm wide and 0.38 mm long; parameres long, slender, abruptly flexed to one side, and without setae.

Allotype female. External morphology and chaetotaxy as shown in Fig. 75; much as for male except for terminalia. Head width 0.30 mm. Ventral terminalia as in Fig. 77. Total length 1.43 mm.

Discussion. This species is closest to *G. emersoni* Mendez, collected off *Proechimys semispinosus panamensis* Thomas in Panama, and *G. mesoamericanus* Mendez off *Hoplomys gymnurus truei* J. A. Allen in Panama. The male of *G. wernecki* differs from that of *G. mesoamericanus* in having differently shaped parameres of the genitalia and a differently structured genital sac. It differs from that of *G. emersoni* in having longer and more slender parameres of the genitalia. While the lateroposterior chaetotaxy of the female of the three species is similar, *G. wernecki* differs from the other two in the median chaetotaxy. The parameres of *G. parasetosus* Werneck, found on *Proechimys spinosus* Desmarest (=*Proechimys setosus* Desmarest?) in Brazil, are much longer than those of *G. wernecki;* the parameres of *G. setosus* Neumann, found on *P. securus* Thomas in Bolivia, are approximately the same length as those of *G. wernecki*, but they are of a different shape and the genital sac contains more complex structures.

Type-material. Holotype male and allotype female off *Proechimys semispinosus* Tomes collected November 7, 1965, at Sta. Apolonia, **Trujillo,** Venezuela.

VENEZUELAN RECORDS

In addition to the holotype and allotype, paratypes were collected off the type-host taken at Manacal, **Sucre;** La Pastora, Cerro Socopo, Río Socopito, and Cerro Santa Ana, **Falcón;** Kasmer, and El Rosario, **Zulia;** Montalbán, **Carabobo;** Urama, **Yaracuy** and **Carabobo;** Nulita, **Apure;** Altamira, **Barinas;** Caserio Boro, near El Tocuyo, **Lara;** Agua Santa, Isnoto, El Dividive, and Sta. Apolonia, **Trujillo;** San Agustín and Cueva del Guácharo, **Monagas;** Tamatama and Río Mavaca, T. F. **Amazonas;** and Minas de Aroa, **Yaracuy.**

Paratypes were collected off *Proechimys guyannensis* (E. Geoffroy) taken at Puerto Ayacucho, Belén, Boca Mavaca, Río Mavaca, and Capibara, T. F. **Amazonas;** and El Manaco, **Bolívar.**

Paratypes were collected off *Proechimys canicollis* J. A. Allen, taken 35 km NW La Paz, **Zulia.**

Comments. Specimens were taken off 269 individual hosts, most of which also had *Gliricola tiptoni.* One host had 13 males, 16 females, and 64 immature specimens; another had 21 males, 21 females, and 46 immatures; but most had fewer than 20.

Gyropus thompsoni Werneck
(Fig. 79-82)

Gyropus thompsoni Werneck, 1935b:421, Fig. 7-13.

The holotype was taken off *Isothrix bistriata* Wagner collected near Porto Bicentenario, Rio Manoel Correia, **Mato Grosso,** Brazil. There have been no published records since the original description.

VENEZUELAN RECORDS

Gyropus thompsoni was taken off four specimens of *Isothrix bistriata* collected at Boca Mavaca, T. F. **Amazonas.**

Comments. One host had 39 specimens, one had 22, one 12, and one had only a single specimen.

Genus *Macrogyropus* Ewing

Macrogyropus Ewing, 1924:25.
Heterogyropus Ewing, 1924:27.

Type-species: *Macrogyropus dentatus* Ewing, 1924.

Macrogyropus dicotylis (Macalister)
(Fig. 83-86)

Gyropus dicotylis Macalister, 1869:420, Fig'd.
Macrogyropus dentatus Ewing, 1924:26, Pl. 1, Fig. 5.

The holotype was collected off *Dicotyles torquatus* Goeldi and Hagmann (= *Tayassu tajacu* [Linnaeus]). Werneck (1948) recorded the species off the type-host collected in **Pará, Espirito Santo, Rio de Janeiro, Minas Gerais, São**

Fig. 75-78. *Gyropus wernecki,* new species, from *Proechimys semispinosus,* Trujillo: 75, dorsal-ventral view of female; 76, dorsal-ventral view of male; 77, ventral view of female terminalia; 78, male genitalia.

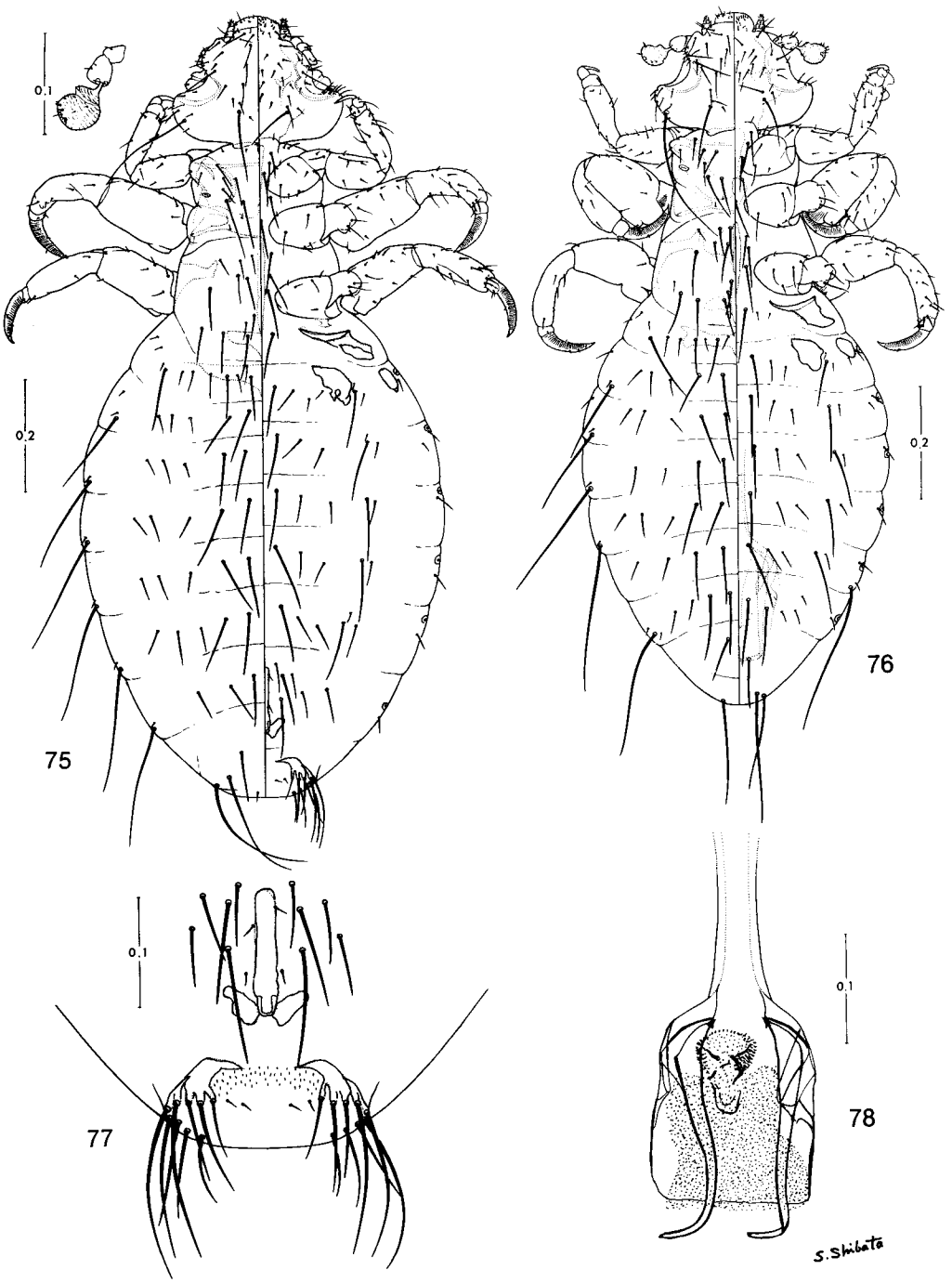


Fig. 79-82. *Gyropus thompsoni* Werneck, from *Isothrix bistriata*, T. F. Amazonas: 79, dorsal-ventral view of female; 80, dorsal-ventral view of male; 81, ventral view of female terminalia; 82, male genitalia.

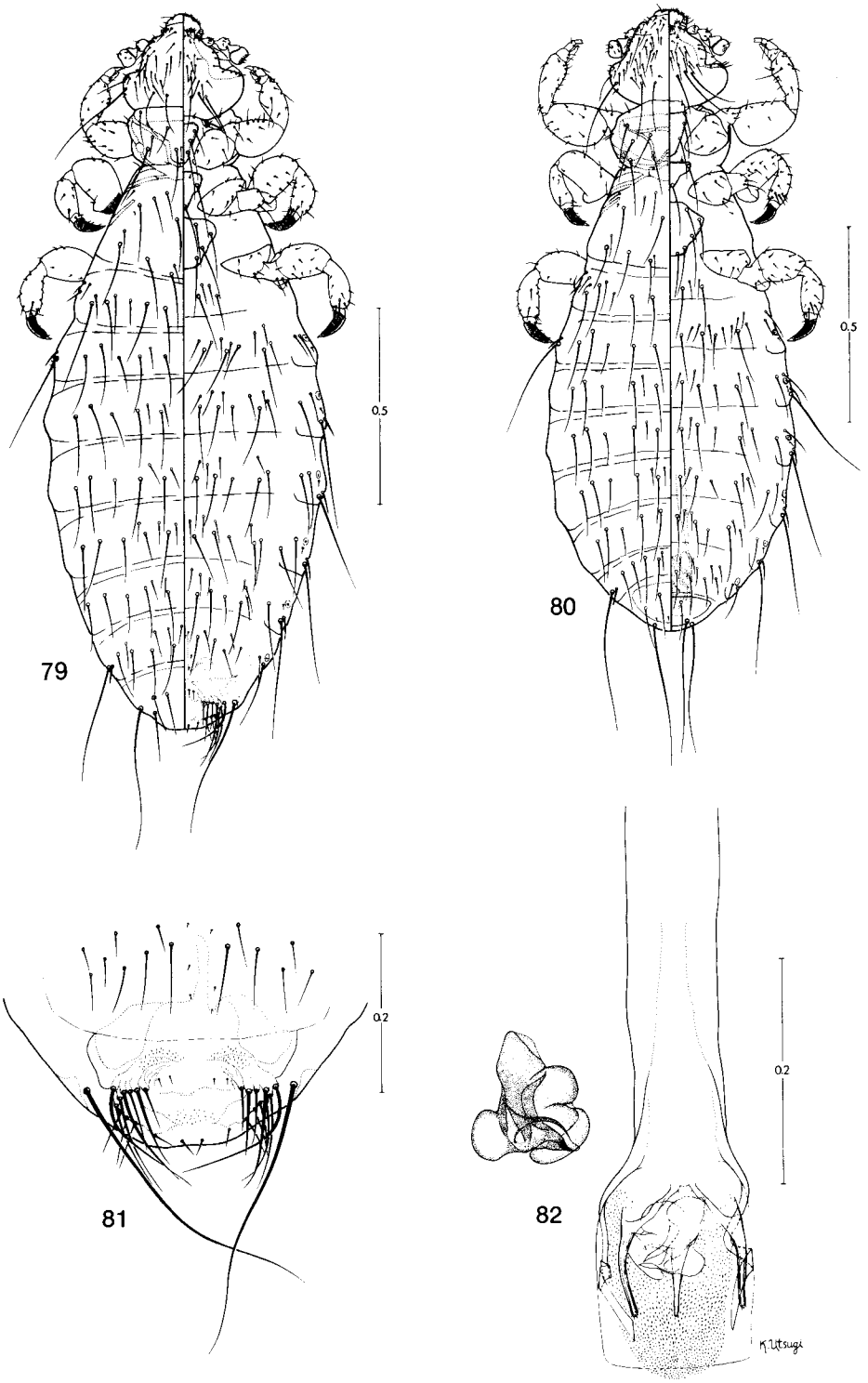
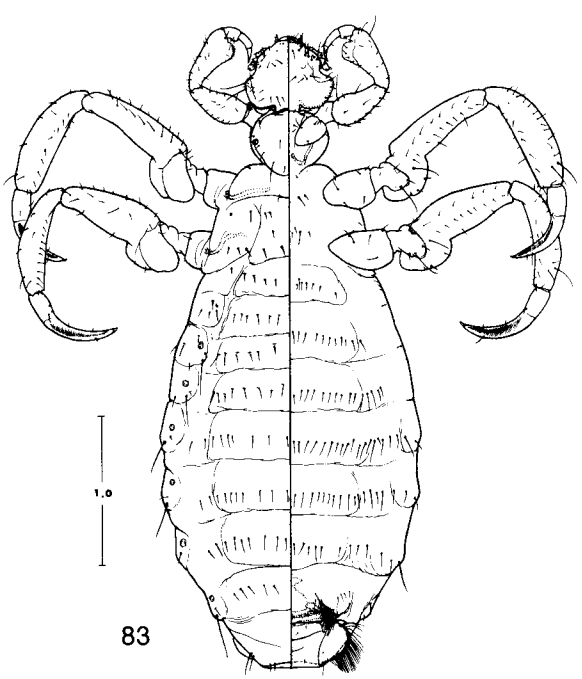


Fig. 83-86. *Macrogyropus dicotylis* (Macalister), from *Tayassu pecari*, Bolívar: 83, dorsal-ventral view of female; 84, dorsal-ventral view of male; 85, ventral view of female terminalia; 86, male genitalia.



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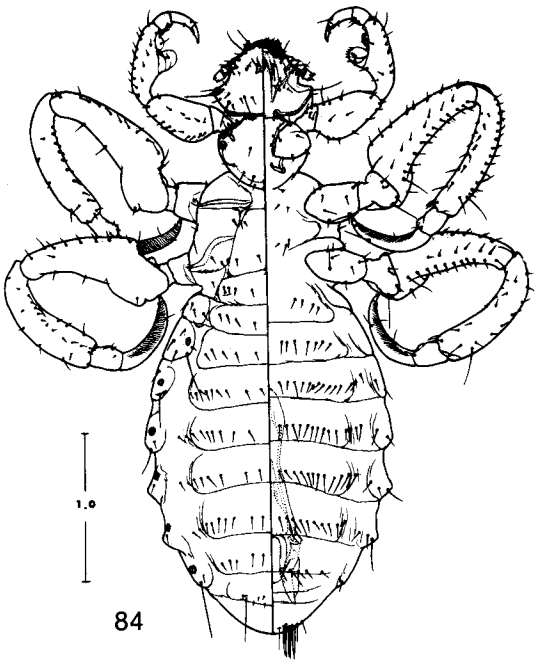

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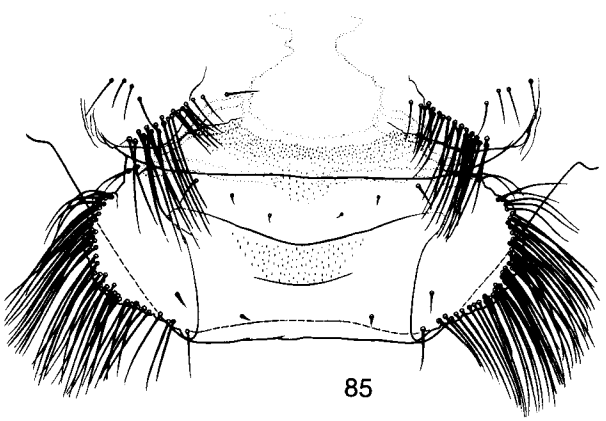

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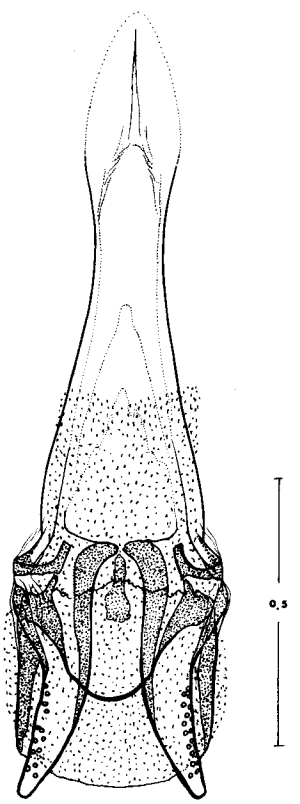

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Paulo, and **Santa Catarina,** Brazil; Costa Rica; Nicaragua; Guyana; and Argentina. Emerson (1966) recorded it off the type-host collected in Panamá. Werneck (1948) recorded the species off *Tayassu albirostris* Illiger (=*Tayassu pecari* [G. Fischer]) collected in **Rio de Janeiro** and **Pará,** Brazil.

VENEZUELAN RECORDS

M. dicotylis was taken off *Tayassu tajacu* (Linnaeus) at Nulita, **Apure;** Altamira, **Barinas;** Río Supamo, **Bolívar;** and near Mirimiri, **Falcón.** It was taken off *Tayassu pecari* (G. Fischer) collected at Río Supamo, and near Icabarú, **Bolívar.**

Macrogyropus amplexans amplexans (Neumann)
(Fig. 87-90)

Gyropus amplexans Neumann, 1912a:224, Fig. 11-13.

The holotype was taken off *Dasyprocta aguti* (Linnaeus) collected in Brazil, without specific locality. Werneck (1948) recorded it off the type-host collected in **Rio de Janeiro, Minas Gerais,** and **Mato Grosso,** Brazil. He also recorded it off *D. azarae* Lichtenstein collected in **Mato Grosso,** Brazil and off *D. variegata* Tschudi collected in Restrepo, **Meta,** Colombia. Emerson (1971) recorded it off *D. punctata punctata* Gray collected in Nicaragua.

VENEZUELAN RECORDS

Seven females of *M. amplexans amplexans* were taken. Unfortunately, most data on these specimens are inadequate.

Comments. In the absence of adequate Venezuelan material, illustrations are of male specimens collected in Nicaragua.

Macrogyropus amplexans longisetis Werneck
(Fig. 91-94)

Macrogyropus amplexans longisetis Werneck, 1948:92, Fig. 119-120.

The holotype was taken off *Myoprocta acouchy* Erxleben collected in Macapá, **Pará,** Brazil. Werneck (1948) also recorded it off the type-host collected at Mel, Rio Cumina, **Pará,** Brazil.

VENEZUELAN RECORDS

One male and four females were taken off two specimens of *Myoprocta pratti* Pocock collected at Boca Mavaca, T. F. **Amazonas.** One female was taken off the same host species collected at Río Mavaca, T. F. **Amazonas.**

Macrogyropus costalimai (Werneck)
(Fig. 95-98)

Heterogyropus costalimai Werneck, 1931a:21, Fig. 1-3.

The holotype was taken off *Cuniculus paca* (Linnaeus) (=*Agouti paca* Linnaeus) collected in Mun de Itaguai, **Rio de Janeiro,** Brazil. Werneck (1948) recorded it off the type-host collected in **Distrito Federal, Rio de Janeiro, Espírito Santo,** and **São Paulo,** Brazil; and Guyana.

VENEZUELAN RECORDS

M. costalimai was taken off three specimens of *A. paca* collected at La Copa, near Montalbán, **Carabobo;** Puerto Ayacucho, T. F. **Amazonas;** and El Rosario, **Zulia.**

Comments. One host had 16 specimens, one had 3 specimens, and one had a single female.

Genus *Aotiella* Eichler

Aotiella Eichler, 1949:11. Type-species: *Gyropus aotophilus* Ewing, 1924.

Aotiella aotophilus (Ewing)
(Fig. 99-102)

Gyropus aotophilus Ewing, 1924:23, Fig. II.

The holotype was taken off *Aotus boliviensis* Elliott in Bolivia. Werneck (1948) also reported it off *Aotus trivirgatus* (Humboldt) collected in **Pará,** Brazil; and *Aotus infulatus* (Kuhl) collected in **São Paulo,** Brazil.

VENEZUELAN RECORDS

A. aotophilis was taken off seven specimens of *Aotus trivirgatus* collected at Puerto Ayacucho, Boca Mavaca, and San Juan Río Manapiare, T. F. **Amazonas.**

Comments. One host had 17 specimens, one 13, and the others fewer than 5.

Family Trichodectidae

Genus *Lymeon* Eichler

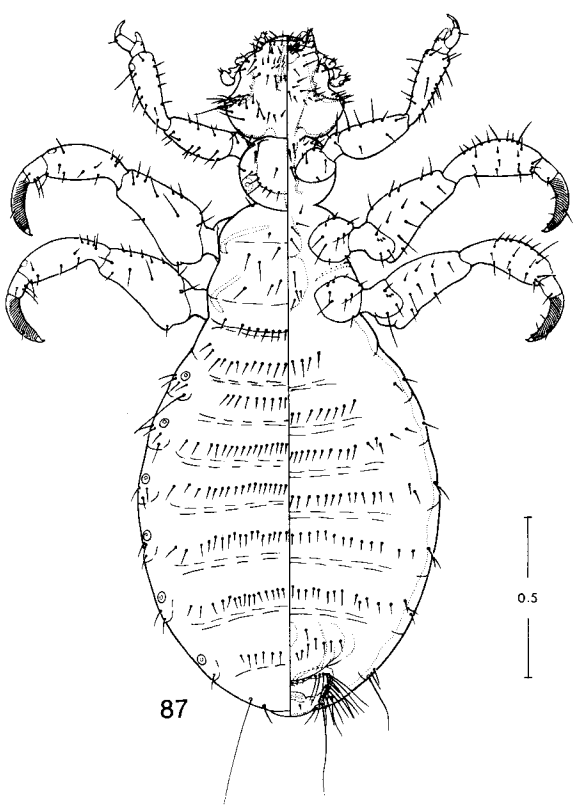
Lymeon Eichler, 1940:158. Type-species: *Trichodectes gastrodes* Cummings, 1916.

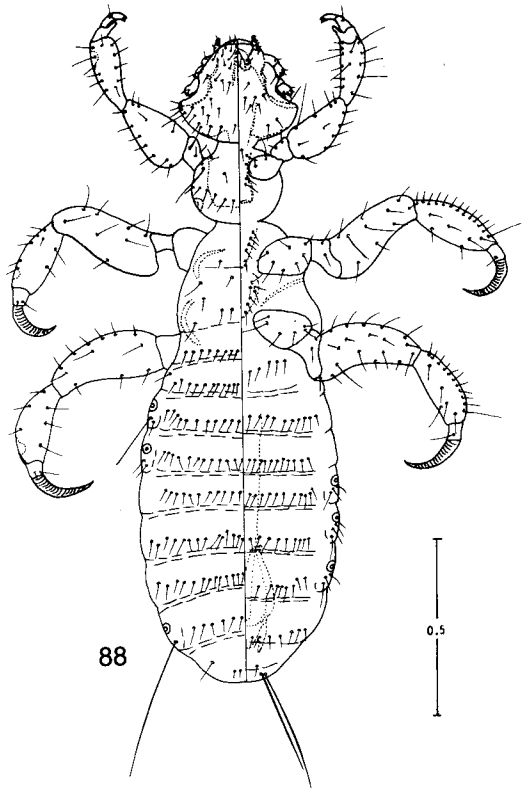
Lymeon gastrodes (Cummings)
(Fig. 103-106)

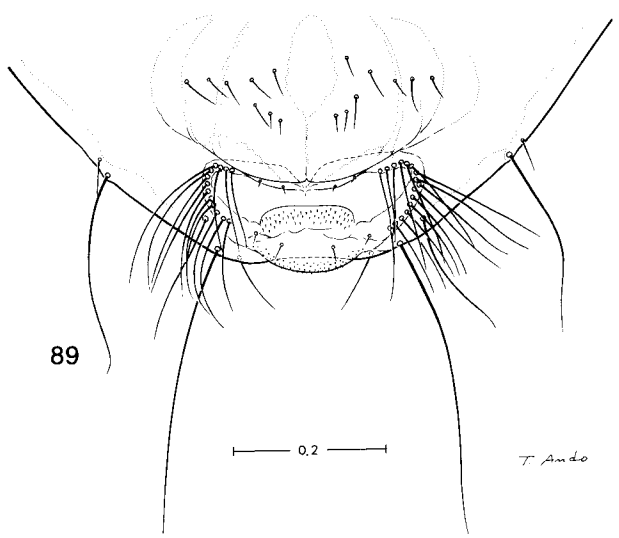
Trichodectes gastrodes Cummings, 1916:94, Fig. 2-4.

The holotype was collected off *Choloepus didactylus* (Linnaeus) in Río Supinaam, Guyana.

Fig. 87-90. *Macrogyropus amplexans amplexans* (Neumann), from *Dasyprocta aguti*, Carabobo: 87, dorsal-ventral view of female; 88, dorsal-ventral view of male; 89, ventral view of female terminalia; 90, male genitalia.







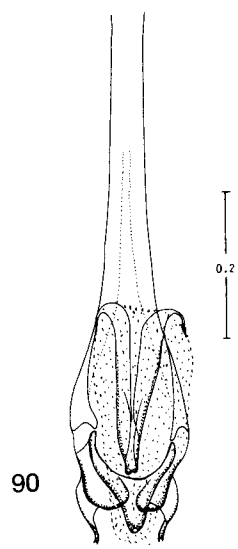


Fig. 91-94. *Macrogyropus amplexans longisetis* Werneck, from *Myoprocta pratti*, T. F. Amazonas: 91, dorsal-ventral view of female; 92, dorsal-ventral view of male; 93, ventral view of female terminalia; 94, male genitalia.

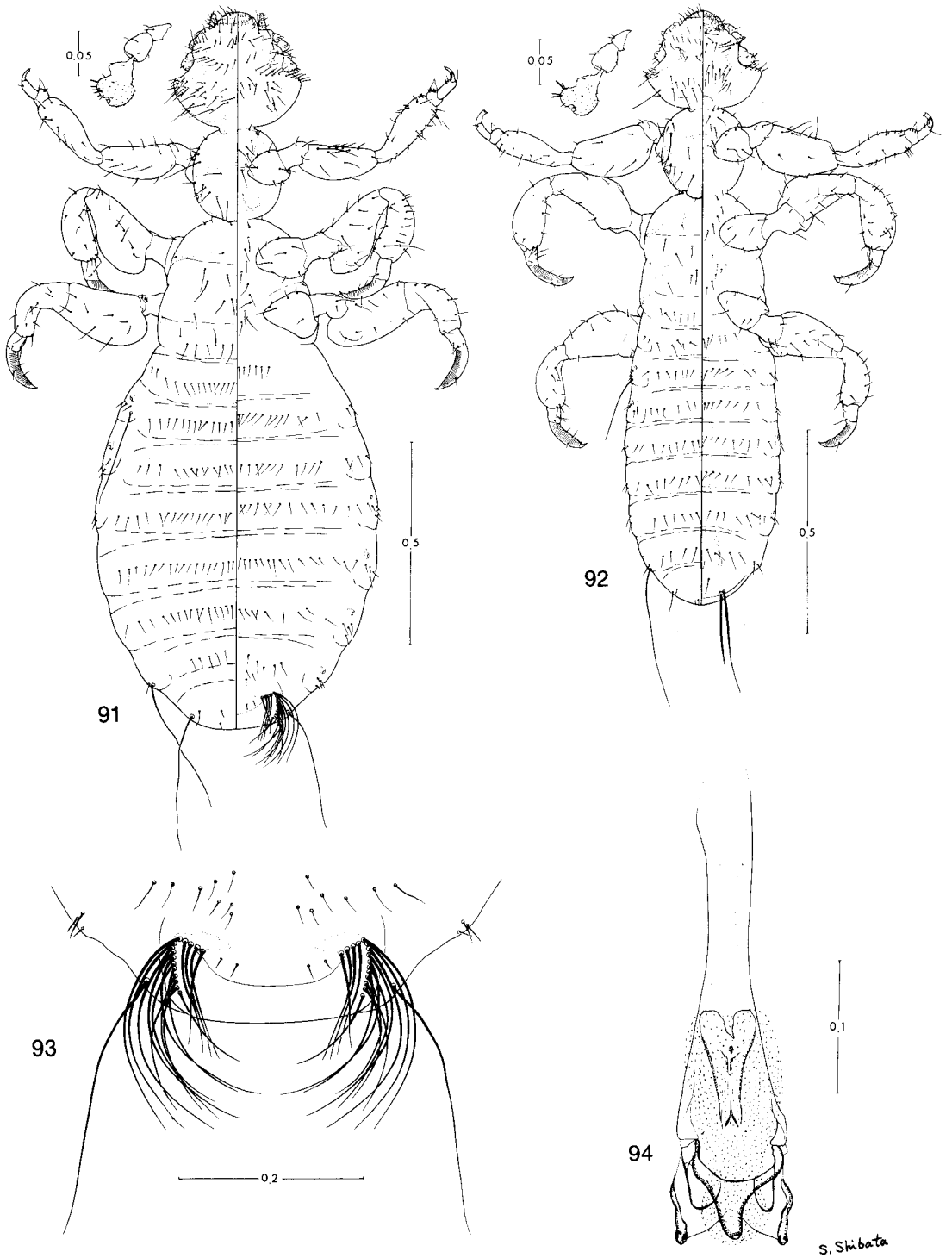
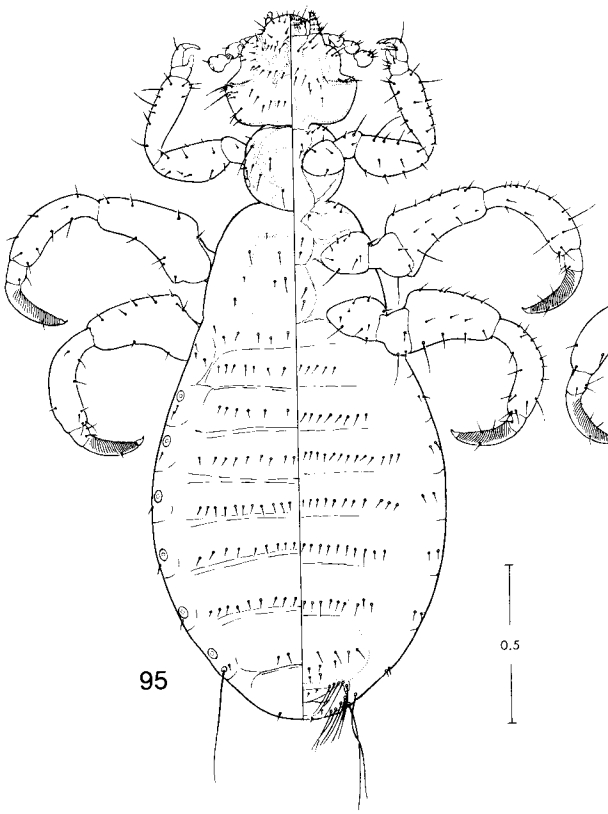
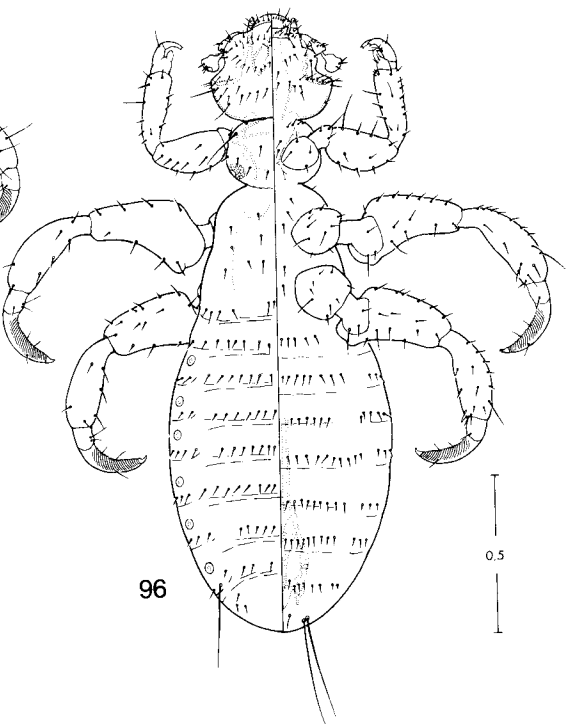
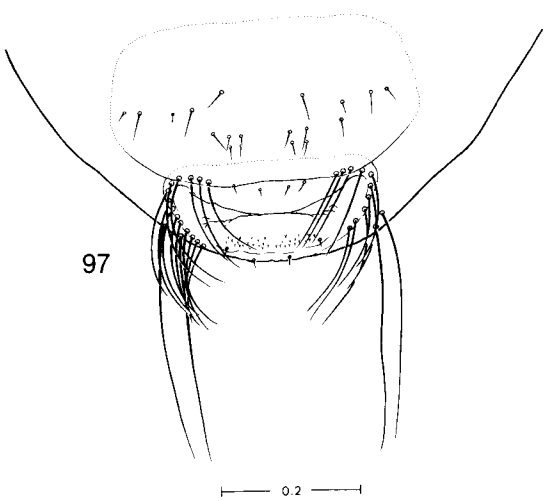


Fig. 95-98. *Macrogyropus costalimai* (Werneck), from *Agouti paca*, Zulia: 95, dorsal-ventral view of female; 96, dorsal-ventral view of male; 97, ventral view of female terminalia; 98, male genitalia.







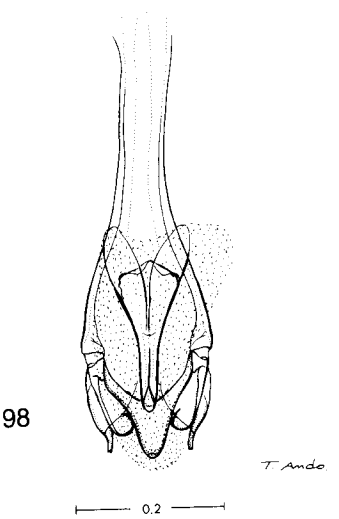


Fig. 99-102. *Aotiella aotophilus* (Ewing), from *Aotus trivirgatus*, T.F. Amazonas: 99, dorsal-ventral view of female; 100, dorsal-ventral view of male; 101, ventral view of female terminalia; 102, male genitalia.

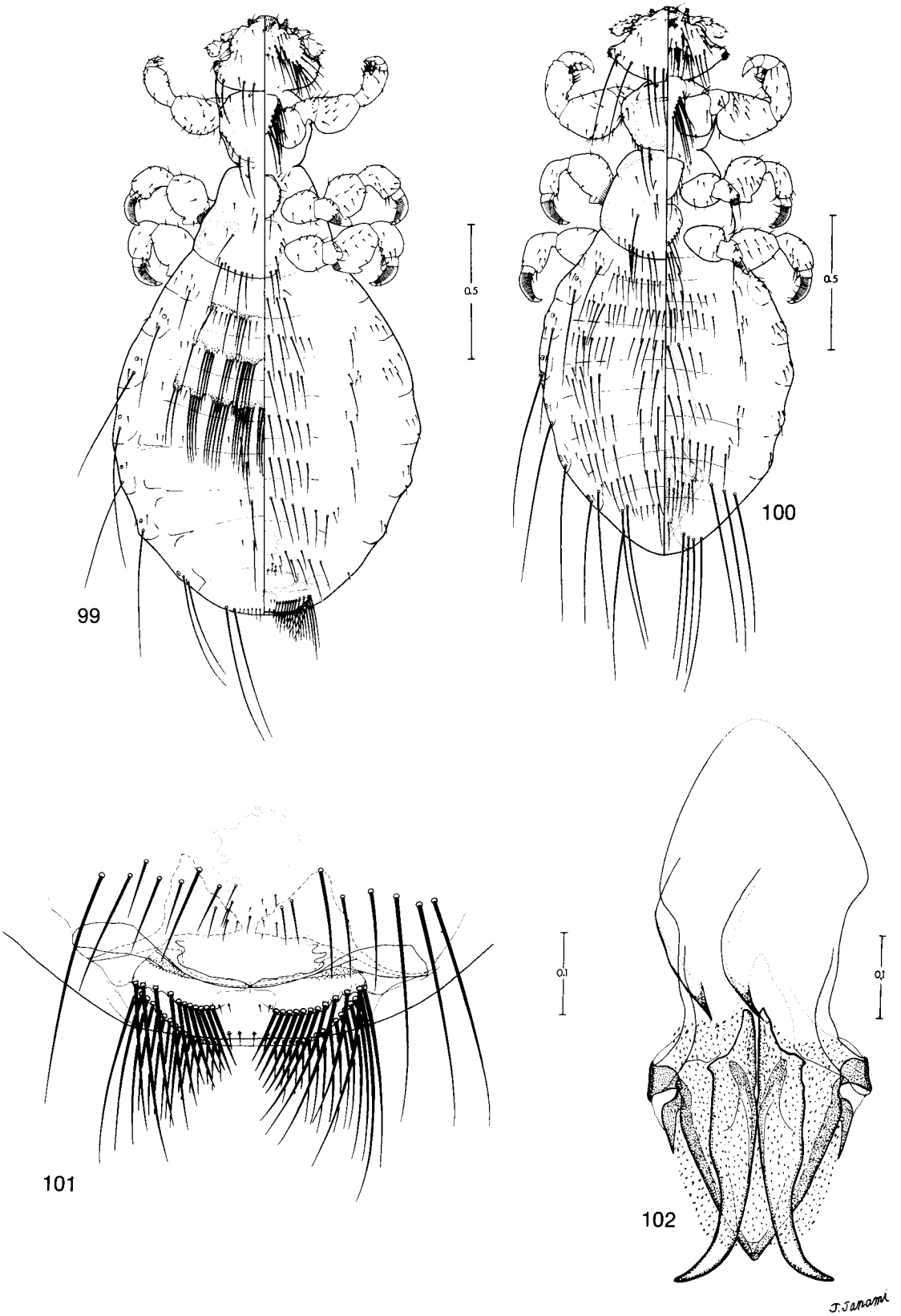
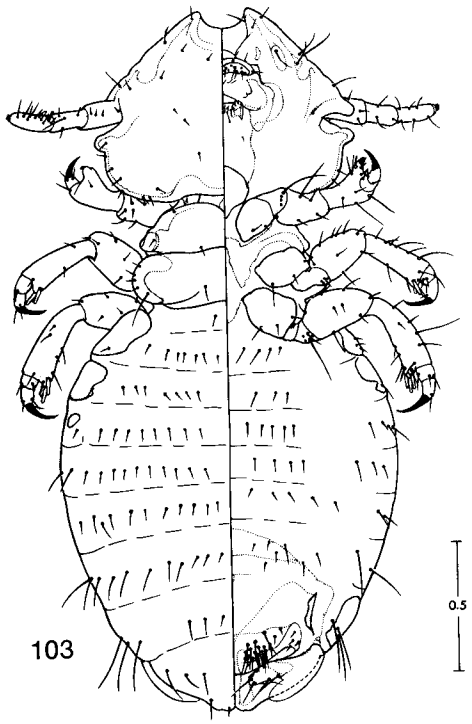
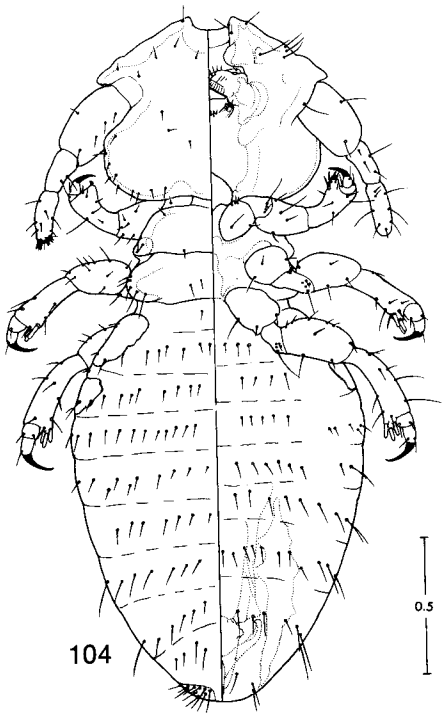
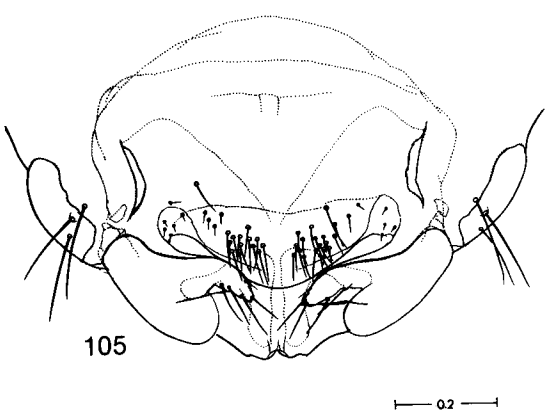
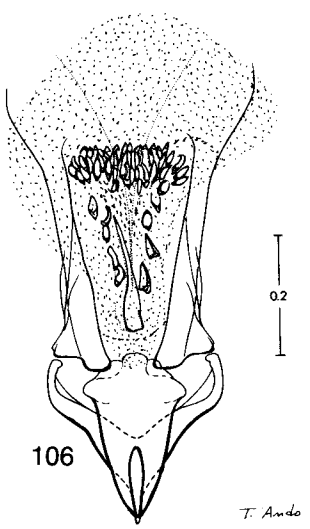


Fig. 103-106. *Lymeon gastrodes* (Cummings), from *Choloepus didactylus*, T.F. Amazonas: 103, dorsal-ventral view of female; 104, dorsal-ventral view of male; 105, ventral view of female terminalia; 106, male genitalia.









VENEZUELAN RECORDS

Two males and two females were collected off *C. didactylus* at Belén, T. F. **Amazonas.** This is the first record since the description of the species.

Genus *Neotrichodectes* Ewing

Neotrichodectes Ewing, 1929:194. Type-species: *Trichodectes mephitidis* (Packard, 1872).

Neotrichodectes minutus (Paine) (Fig. 107-110)

Trichodectes minutus Paine, 1912b:439, Pl. 20, Fig. 4.

The holotype was collected off *Mustela frenata noveboracensis* (Emmons) taken at Marshall, Illinois. It is common on *M. frenata* Lichtenstein in North America and probably occurs in Venezuela but it has not been reported there.

Neotrichodectes pallidus (Piaget) (Fig. 111-114)

Trichodectes pallidus Piaget, 1880:405, Pl. 32, Fig. 9.
Trichodectes nasuatis Osborn, 1902:178, Pl. II, Fig. 3.

The holotype was collected off *Nasua fusca* Desmarest living in a zoo in Rotterdam. Werneck (1948) recorded it off *Nasua narica* (Linnaeus), *Nasua rufa* Desmarest, and *Nasua candace* Thomas taken in **Amazonas, Pará, Rio de Janeiro, São Paulo, Mato Grosso, Paraná Santa Catarina,** and **Distrito Federal,** Brazil. He also recorded it from Sta. Cruz de la Sierra, and Paraguai, Bolivia; Muzo, Colombia; **Cuernavaca,** México; and **Chiriquí,** Panamá. Emerson (1966) recorded it off *Nasua nasua* (Linnaeus) (= *Nasua narica* [Linnaeus]) taken at Almirante, **Bocas del Toro,** Panamá. Emerson (1971) also recorded it off *Nasua narica* (Linnaeus) taken at El Recreo, **Zelaya,** Nicaragua.

VENEZUELAN RECORDS

Three males and one female of *Neotrichodectes pallidus* were taken off a specimen of *Nasua nasua* at El Manaco, **Bolívar.**

Neotrichodectes semistriatus, new species (Fig. 115-118)

Holotype male. External morphology and chaetotaxy as shown in Fig. 116. Head width 0.59 mm. Total length 1.87 mm. Genitalia (Fig. 118) 0.18 mm wide and 0.74 mm long; endomeral plate broadly bifurcate; parameral arch with very long medioposterior process, extending beyond endomeral plate by approximately length of plate; genital sac without evident sclerites.

Allotype female. External morphology and chaetotaxy as shown in Fig. 115. Head width 0.65 mm. Dorsal pigmentation of last segment only partially surrounding group of three setae on each side. Ventral terminalia as in Fig. 117; gonapophyses with median margin angulate and bearing setae, and with tips smoothly tapered; subgenital plate with cluster of long setae on each side; medioposterior margin of abdomen evenly rounded, with one seta on each side. Total length 1.65 mm.

Discussion. This species appears to be closest to *N. arizonae* (Werneck) collected off *Conepatus mesoleucus* (Lichtenstein) in Arizona. The gonapophyses of *N. arizonae* are broadly spatulate and irregular at the tip, even though Werneck (1948) illustrated them as tapered and regular. Examination of the type-material, as well as additional specimens of *N. arizonae,* confirmed that the female was erroneously illustrated in this feature. In determining this, we also confirmed the correctness of placing *N. spatulatus* Cook as a junior synonym of *N. arizonae.* Contrasted to this, the gonapophyses of *N. semistriatus* are tapered and regular, as in Fig. 117. An additional difference in the female concerns the dorsal pigmentation pattern of the last segment only partially surrounding the three setae in *N. semistriatus,* but completely surrounding these setae in *N. arizonae.* Also, the terminal seta on *N. arizonae* is on a distinct tuberculate protuberance, while that of *N. semistriatus* is on a gently rounded portion. The males of these two species are close, but the genitalic sclerites of *N. semistriatus* are larger than those of the other species.

Type-material. Holotype male, allotype female, and paratypes off *Conepatus semistriatus* (Boddaert) collected August 2, 1966, at Hato Mata de Bejuco, **Monagas,** Venezuela.

VENEZUELAN RECORDS

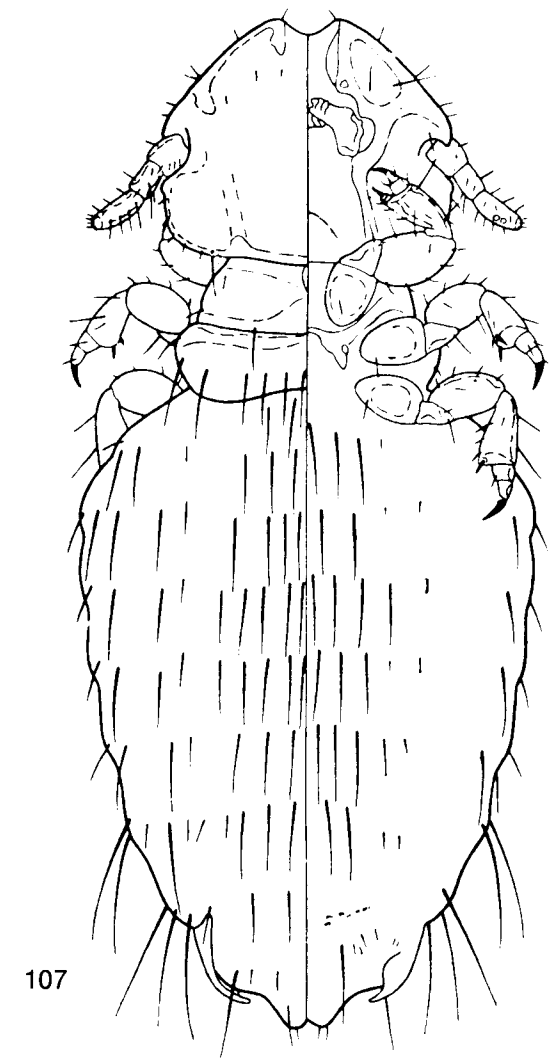
Type-material only.

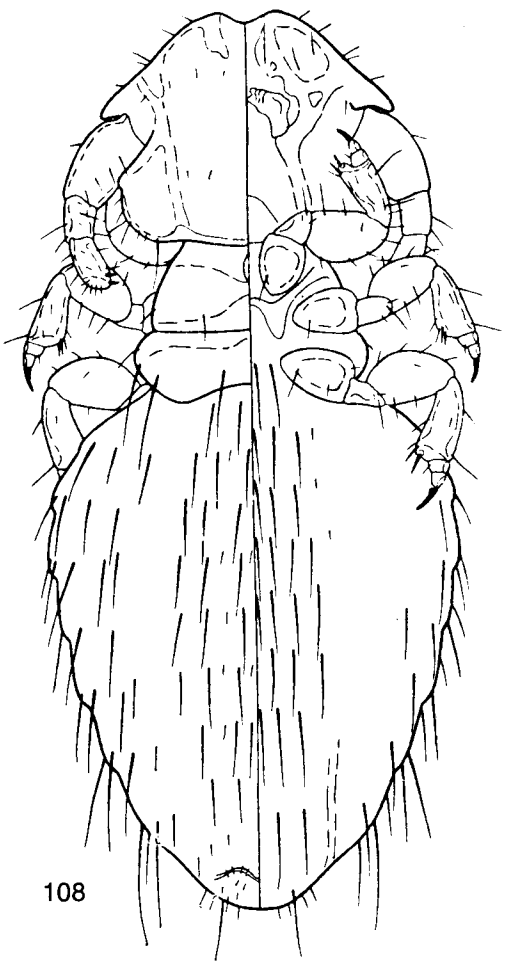
Genus *Trichodectes* Nitzsch

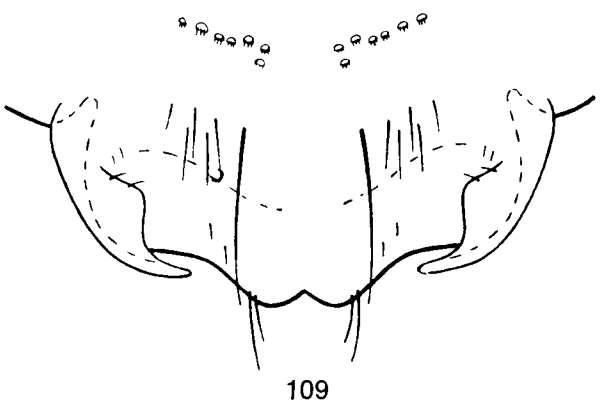
Trichodectes Nitzsch, 1818:294.
Ursodectes Keler, 1938a:428.
Grisonia Keler, 1938a:464.
Galictobius Keler, 1938b:228.
Potusdia Conci, 1942:141.
Trigonodectes Keler, 1944:179 and 185.
Werneckodectes Conci, 1946:59.

Type-species: *Ricinus canis* DeGeer, 1778.

Fig. 107-110. *Neotrichodectes minutus* (Paine), from *Mustela frenata*. From Werneck, 1948:107, dorsal-ventral view of female; 108, dorsal-ventral view of male; 109, ventral view of female terminalia; 110, male genitalia.







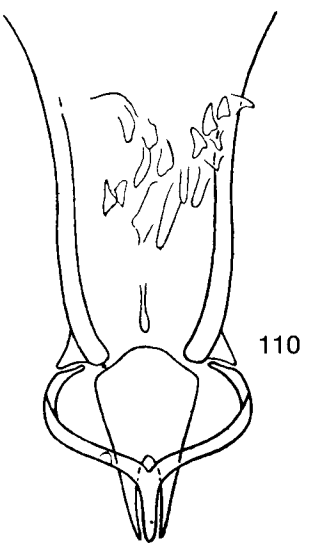
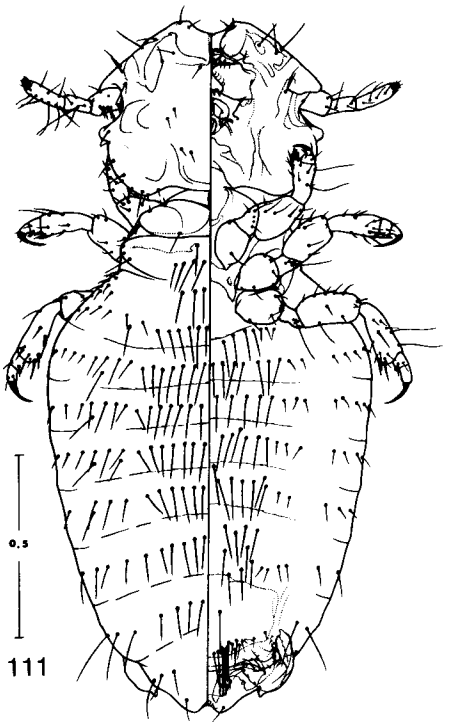
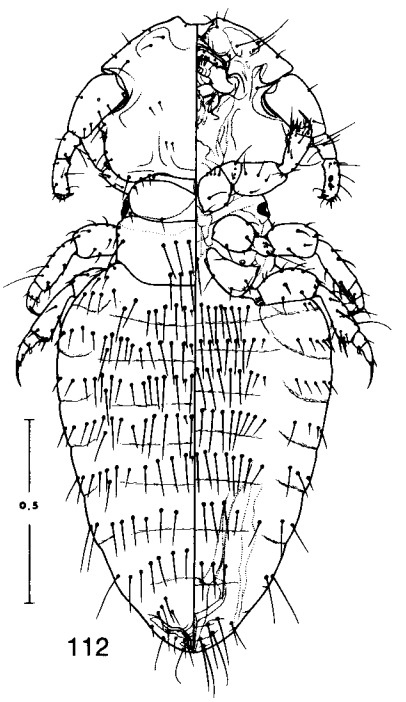
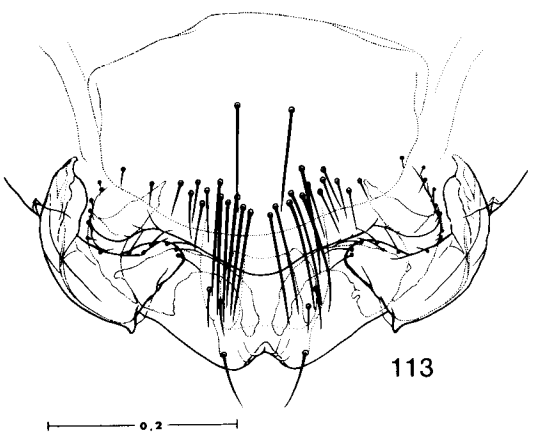


Fig. 111-114. *Neotrichodectes pallidus* (Piaget), from *Nasua narica*, Canal Zone, Panama: 111, dorsal-ventral view of female; 112, dorsal-ventral view of male; 113, ventral view of female terminalia; 114, male genitalia.







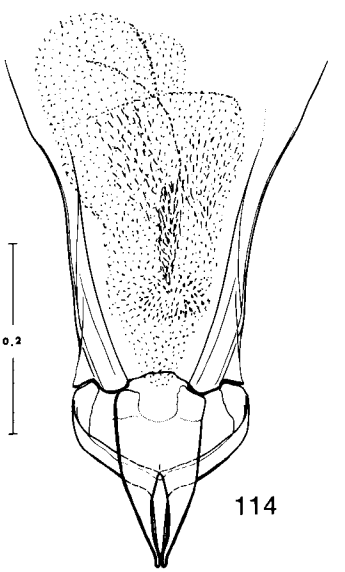


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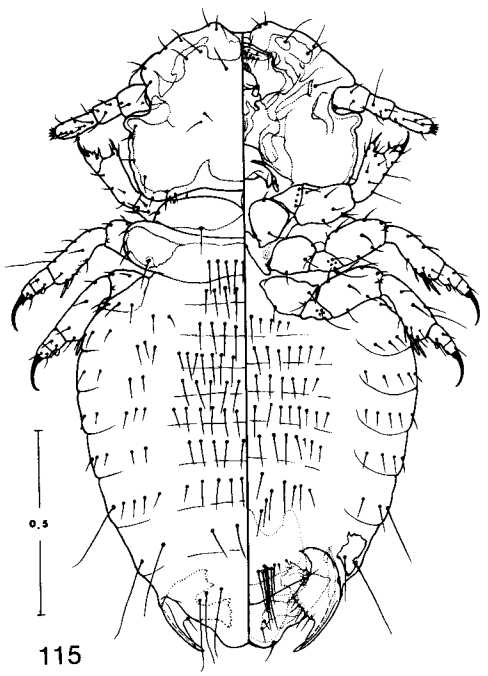
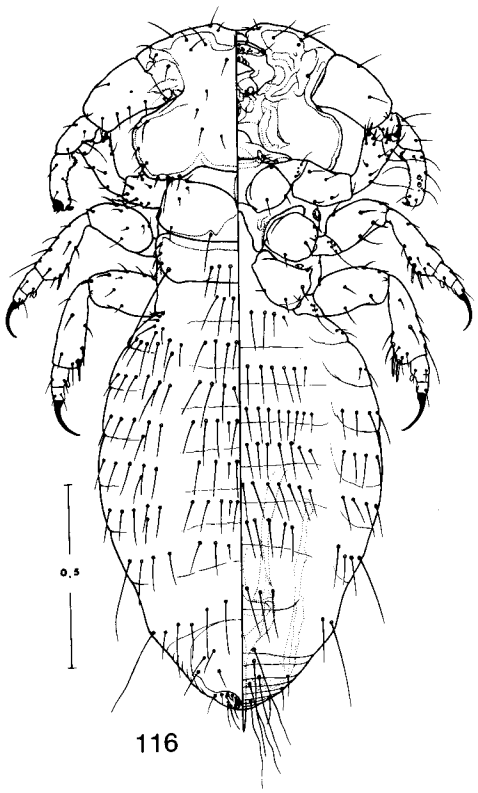
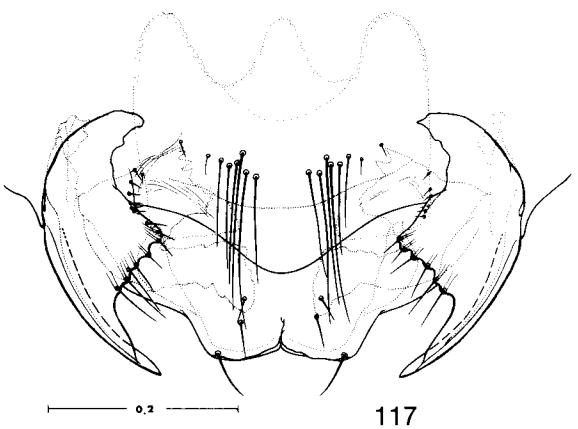
Fig. 115-118. *Neotrichodectes semistriatus*, new species, from *Conepatus semistriatus*, Monagas: 115, dorsal-ventral view of female; 116, dorsal-ventral view of male; 117, ventral view of female terminalia; 118, male genitalia.



115



116



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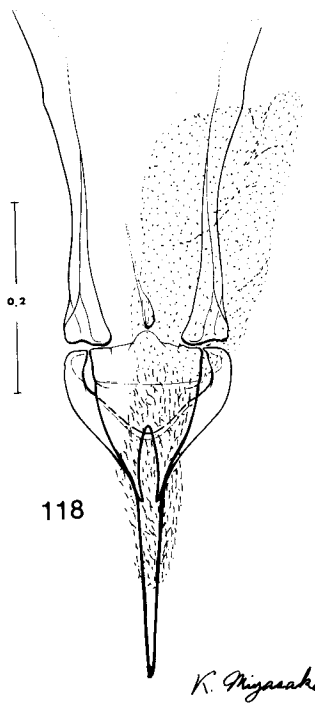

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Trichodectes canis (DeGeer)
(Fig. 119-122)

Ricinus canis DeGeer, 1778:81, Pl. 4, Fig. 16.
Trichodectes latus Nitzsch, 1818:296.
Trichodectes octopunctatus Denny, 1852:29.
Trichodectes riveti Neumann, 1913:614, Fig. 7-8.
Trichodectes floridanus McGregor, 1917:168, Pl. 16, Fig. 3 and 5.
Trichodectes latifrans Fahrenholz, 1919:363.

The holotype was collected off a domestic dog, *Canis familiaris* Linnaeus, in Europe. It has since been recorded off domestic and several species of wild dogs and wolves (genus *Canis*) in North America, Australia, China, Russia, Ecuador, and Brazil. This parasite probably also occurs in Venezuela, but it has not been recorded there.

Trichodectes barbarae Neumann
(Fig. 123-126)

Trichodectes barbarae Neumann, 1913:616, Fig. 9.

The holotype was collected off *Eira barbara* (Linnaeus) in Brazil. Werneck (1948) has recorded it off the type-host collected at Catende, **Pernambuco;** Santos, **São Paulo;** Alto Rio Doce, **Minas Gerais;** and Rio Cuyabá, **Mato Grosso,** in Brazil. He also recorded it off *Galera biologiae* (Thomas) (= *Eira barbara*) collected at San Juan, Costa Rica.

VENEZUELAN RECORDS

Two males and two females of *T. barbarae* were off a specimen of *Eira barbara* collected at El Rosario, **Zulia.**

Trichodectes fallax Werneck
(Fig. 127-130)

Trichodectes fallax Werneck, 1948:122, Fig. 159-165.

The holotype was collected off *Procyon cancrivorus* G. Cuvier at Guariba, **São Paulo,** Brazil. Werneck (1948) also recorded it off the same host collected at **Jujuy,** Argentina; and **Rio de Janeiro,** and **Mato Grosso,** Brazil. This parasite probably also occurs in Venezuela, but it has not been collected there.

Trichodectes galictidis Werneck
(Fig. 131-134)

Trichodectes mephitidis Neumann, 1913:618, Fig. 10 (*nec* Packard, 1872).
Trichodectes galictidis Werneck, 1934a:161, Fig. 1-5.
Trichodectes paranensis Keler, 1934:333, Fig. 55-57.

The holotype was collected off *Galictis vittata* Schreber in Manguinhos, **Distrito Federal,** Brazil. Keler collected his types off *Grisonella furax* Thomas at Rio de Areia, **Paraná,** Brazil. Werneck (1948) also recorded the species off the type-host collected in **Minas Gerais, São Paulo,** and **Santa Catarina** in Brazil; and Los Andes, Chile; and off *Grison canaster* Nelson (= *Galictis vittata* Schreber) collected at Pacora, Panamá. This species probably occurs in Venezuela, but it has not been reported there.

Trichodectes ferrisi Werneck
(Fig. 135-138)

Trichodectes ferrisi Werneck, 1944b:257, Fig. 1-4.

The holotype was collected off *Tremarctos ornatus majori* Thomas at Rubío, **Tachira,** Venezuela. It has not been recorded since the description was published.

Trichodectes potus Werneck
(Fig. 139-142)

Trichodectes potus Werneck, 1934b:171, Fig. 7-10.

The holotype was collected off *Potos flavus* Schreber in Servia do Tingua, **Rio de Janeiro,** Brazil. Werneck (1948) also recorded it off the type-host collected at Abaete, **Pará,** Brazil, and Tuxpana, **Campeche,** México; and off *P. flavus meridensis* Thomas collected at Sierra de Mérida, Venezuela.

VENEZUELAN RECORDS

Thirty-three males and 54 females of *T. potus* were collected off 23 specimens of *P. flavus* collected at El Rosario, **Zulia;** near Icabarú, **Bolívar;** Nulita, **Apure;** and Alto ño León, **Distrito Federal.**

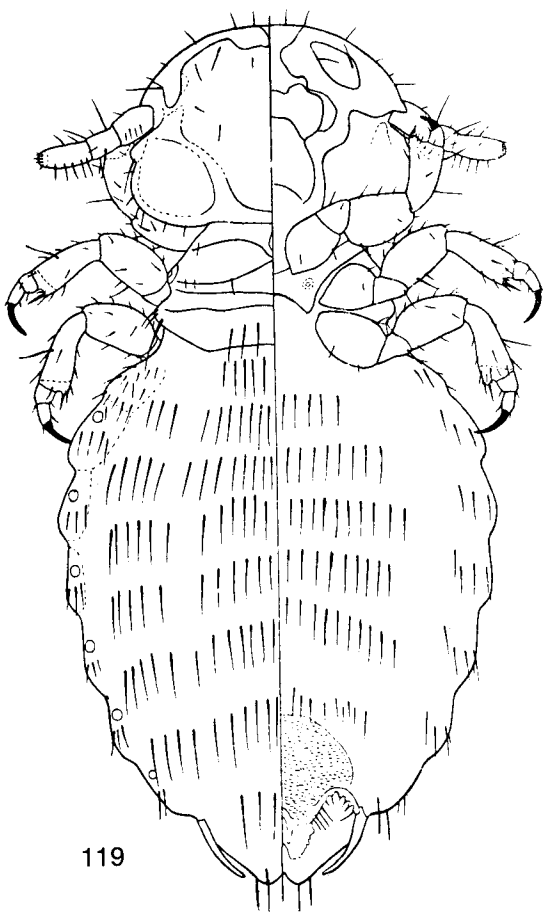
Comments. One host had 28 parasites, most had fewer than 6, and eight had only 1.

Genus *Suricatoecus* Bedford

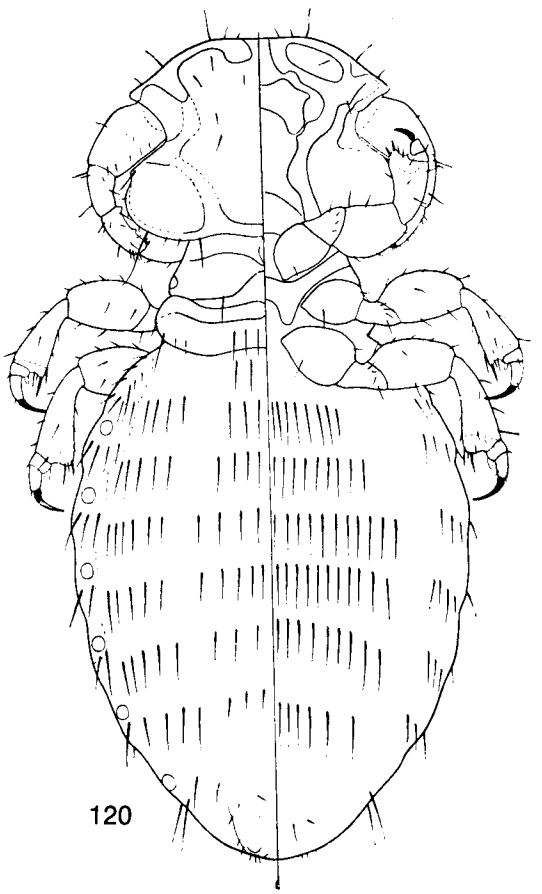
Suricatoecus Bedford, 1932:354.
Bedfordia Keler, 1938a:463 (*nec* Fahrenholz).
Fastigatosculum Keler, 1939:11.
Eichlerella Conci, 1942:140.

Type-species: *Trichodectes cooleyi* Bedford, 1929.

Fig. 119-122. *Trichodectes canis* (DeGeer), from *Canis familiaris*. From Werneck, 1948:119, dorsal-ventral view of female; 120, dorsal-ventral view of male; 121, ventral view of female terminalia; 122, male genitalia.



119



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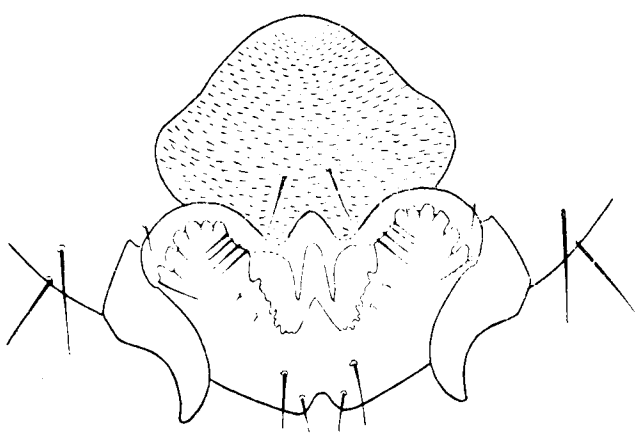

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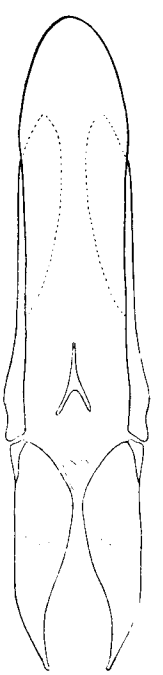
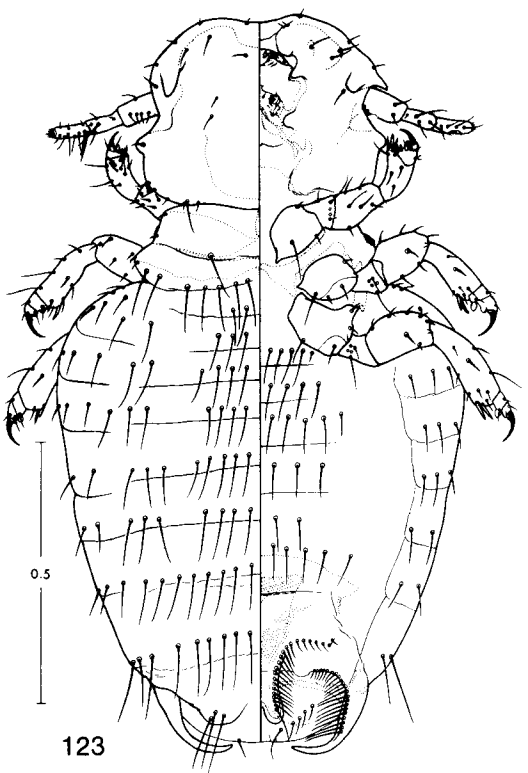
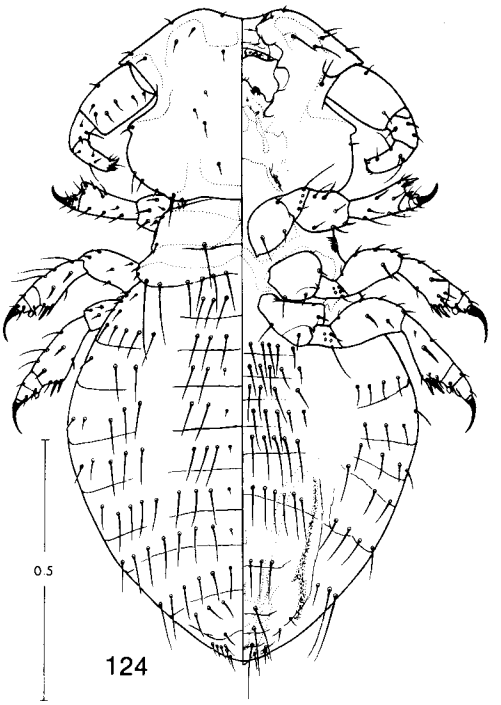
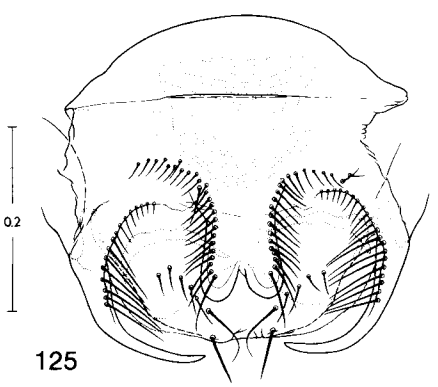


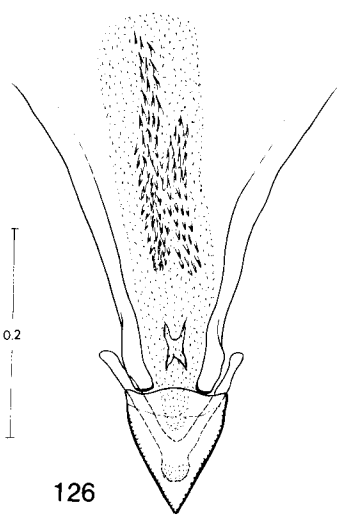
122

Fig. 123-126. *Trichodectes barbarae* Neumann, from *Eira barbara*, Zulia: 123, dorsal-ventral view of female; 124, dorsal-ventral view of male; 125, ventral view of female terminalia; 126, male genitalia.



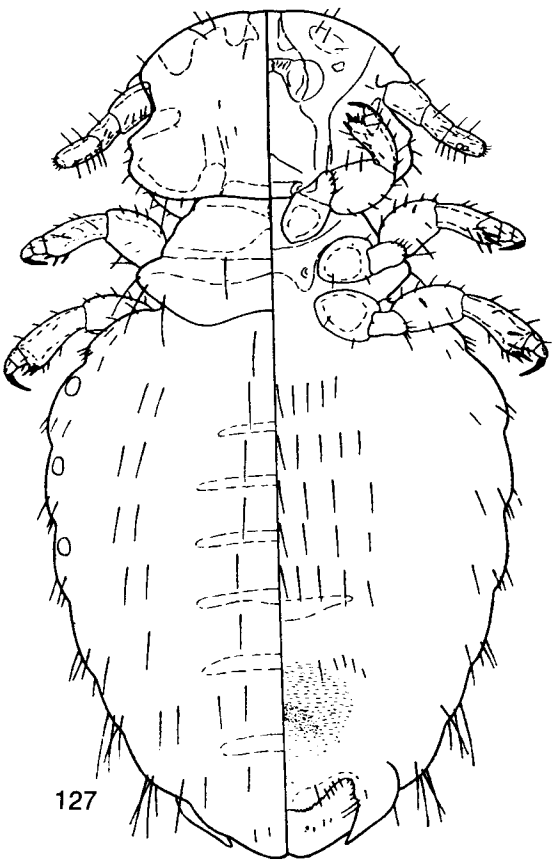


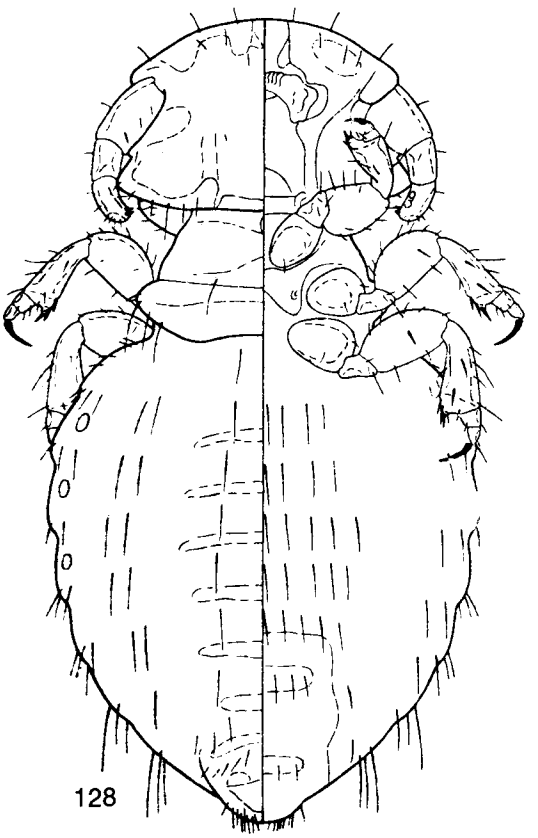


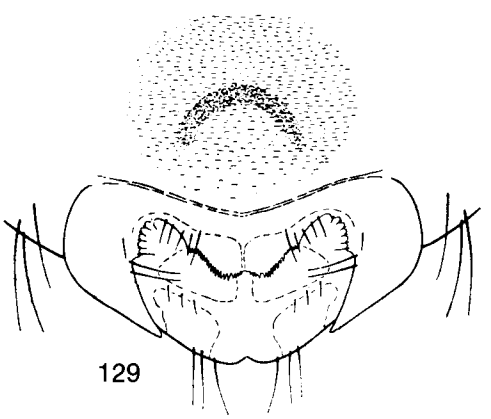


M. Misaki

Fig. 127-130. *Trichodectes fallax* Werneck, from *Procyon cancrivorus*. From Werneck, 1948: 127, dorsal-ventral view of female; 128, dorsal-ventral view of male; 129, ventral view of female terminalia; 130, male genitalia.







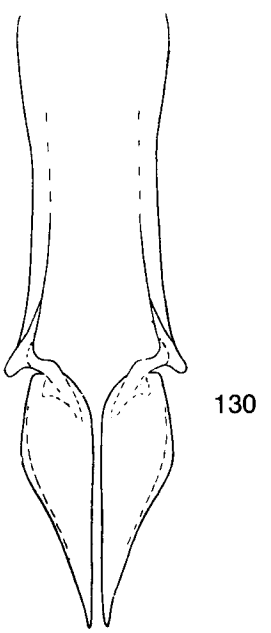
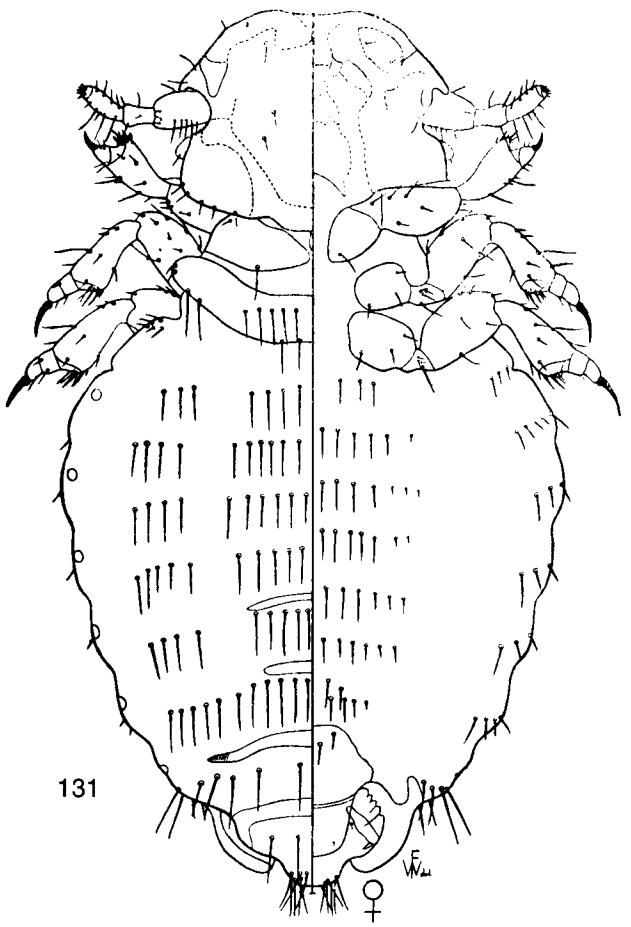
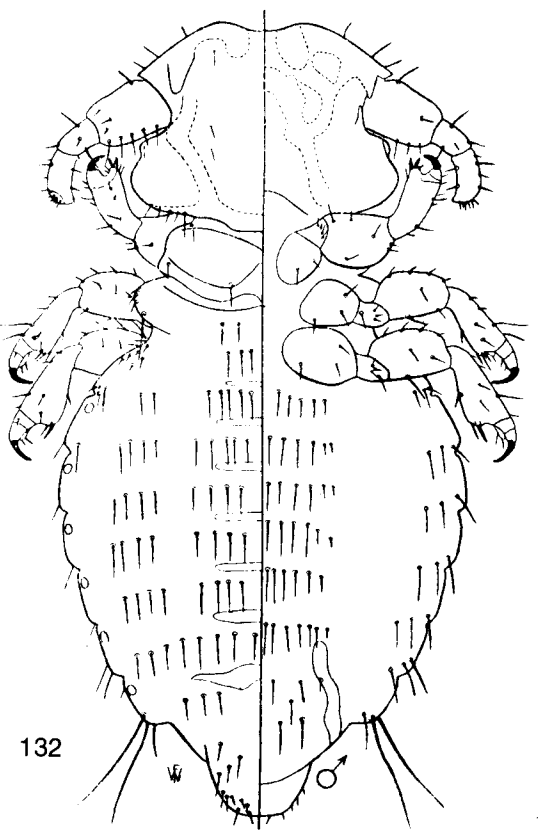


Fig. 131-134. *Trichodectes galictidis* Werneck, from *Galictis vittata*. From Werneck, 1943a:131, dorsal-ventral view of female; 132, dorsal-ventral view of male, 133, ventral view of female terminalia; 134, male genitalia.





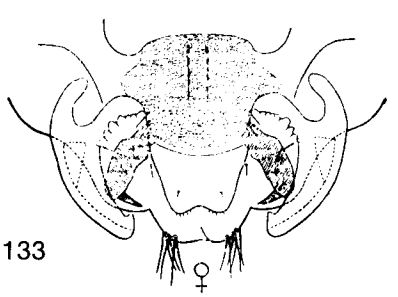
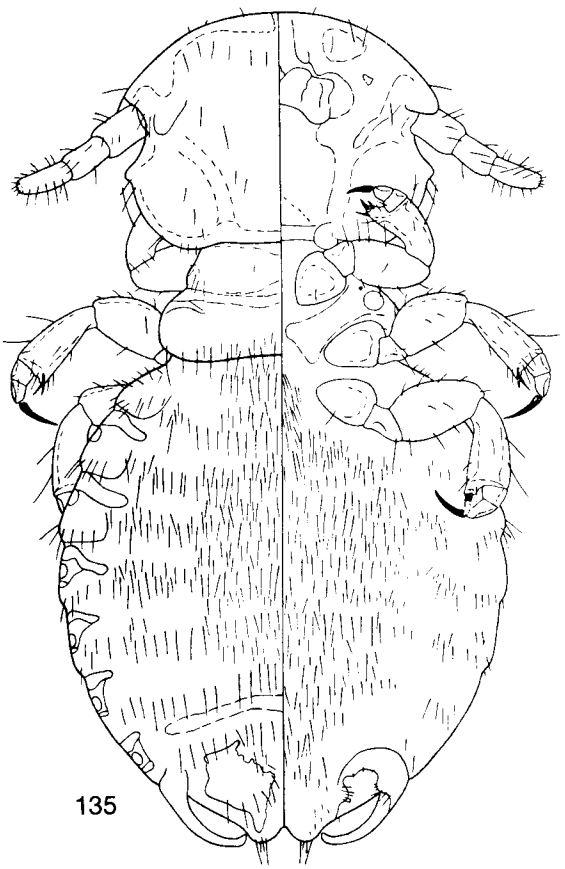


Fig. 135-138. *Trichodectes ferrisi* Werneck, from *Tremarctos ornatus*. From Werneck, 1944b:135, dorsal-ventral view of female; 136, dorsal-ventral view of male; 137, ventral view of female terminalia; 138, male genitalia.



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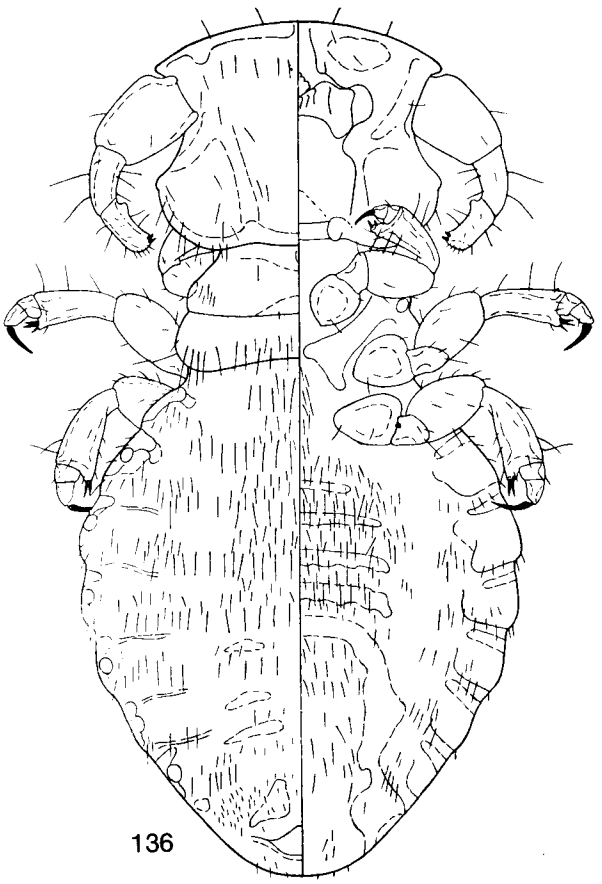

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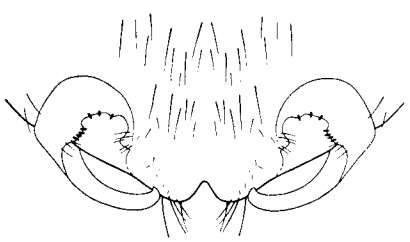

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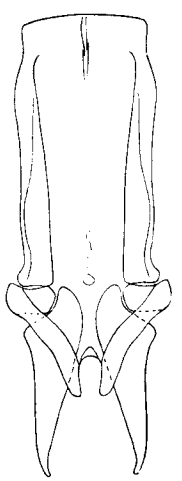

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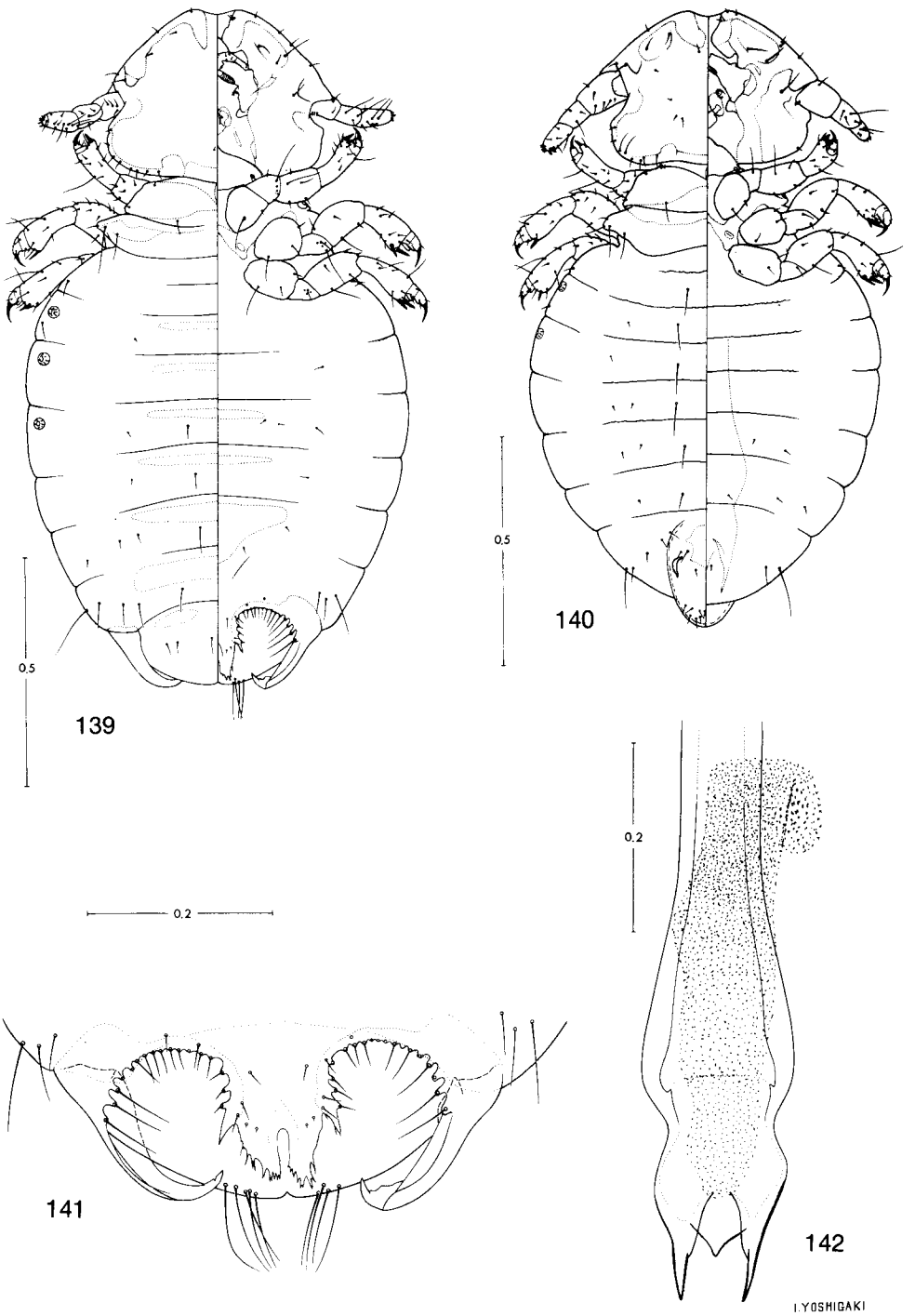
Fig. 139-142. *Trichodectes potus* Werneck, from *Potos flavus*, Trujillo: 139, dorsal-ventral view of female; 140, dorsal-ventral view of male; 141, ventral view of female terminalia; 142, male genitalia.



Suricatoecus quadraticeps (Chapman)
(Fig. 143-146)

Trichodectes quadraticeps Chapman, 1897:185, Pl. 9, Fig. 2.

The holotype was collected off *Urocyon cinereoargenteus sequoiensis* Dixon taken at Freestone, California. It is a common parasite on *U. cinereoargenteus* (Schreber) in North America and probably occurs in Venezuela, but it has not been recorded there.

Genus *Felicola* Ewing

Felicola Ewing, 1929:192.
Felicinia Bedford, 1929:519.
Protelicola Bedford, 1932:354.
Paradoxuroecus Conci, 1942:141.

Type-species: *Trichodectes subrostratus* Burmeister, 1838.

Felicola subrostratus (Burmeister)
(Fig. 147-150)

Trichodectes subrostratus Nitzsch, 1818:296 (*nomen nudum*).
Trichodectes subrostratus Stephens, 1829:330 (*nomen nudum*).
Trichodectes subrostratus Burmeister, 1838:436.
Felicola rostrata Bedford, 1932:360, Fig. 6a-c.

The holotype was collected off a domestic cat (*Felis catus* Linnaeus) in Europe. It is distributed worldwide on that host. Werneck (1948) recorded it off the domestic cat in Brazil and Guyana; it probably also occurs in Venezuela, but it has not been recorded there.

Felicola felis (Werneck)
(Fig. 151-154)

Trichodectes felis Werneck, 1934c:282, Fig. 11-14.

The holotype was collected off *Felis chibigouazou* Gray (=*Felis pardalis* Linnaeus) at Rio Cuiabá, **Mato Grosso,** Brazil. Werneck (1948) recorded it off *Felis concolor* Linnaeus, *Felis geoffroyi* D'Orbigny and Gervais, *Felis pajeros* Desmarest (=*Felis colocolo* Molina), and *Felis yagouaroundi* E. Geoffroy collected in various localities in Brazil; and off *Lynx rufus* (Schreber) in the United States.

VENEZUELAN RECORDS

Two females were taken off *F. yagouaroundi* collected at Hato Mata de Bejuco, 55 km SSE Maturín, **Monagas.** Illustrations of the male are of specimens taken off *F. yagouaroundi* collected at Juan del Zalazar, **Boquerón,** Paraguay. Specimens from each of the hosts listed by Werneck have not been studied by the authors, so it cannot be determined if they are conspecific.

Genus *Cebidicola* Bedford

Cebidicola Bedford, 1936:52.
Meganarion Keler, 1938a:465.

Type-species: *Trichodectes armatus* Neumann, 1913.

Cebidicola armatus (Neumann)
(Fig. 155-158)

Trichodectes armatus Neumann, 1913:608, Fig. 1-3.

The holotype was collected off *Eriodes arachnoids* E. Goeffroy (= *Brachyteles arachnoides* [E. Geoffroy]) in Brazil, without specific locality. Werneck (1950) recorded the species off the type-host and "*Cebus fuscus* E. Geoffroy" (=?) from many localities in Brazil. It probably is found in Venezuela on hosts of the genus *Cebus*, but it has not been reported there.

Cebidicola semiarmatus (Neumann)
(Fig. 159-162)

Trichodectes semiarmatus Neumann, 1913:611, Fig. 5.

The holotype was collected off *Alouatta ursina* (Humboldt) (= *Alouatta guariba* Humboldt or *Alouatta seniculus* [Linnaeus]) in Brazil, without specific locality. Stafford (1943) recorded it off *A. seniculus* collected at San Fernando de Apure, **Apure,** Venezuela. Werneck (1950) recorded it off *A. guariba* collected in various localities in **Espirito Santo** and **São Paulo,** Brazil. He also recorded it off *A. caraya* (Humboldt) and *A. belzebul* (Linnaeus) from several localities in Brazil.

Cebidicola extrarius Werneck
(Fig. 163-166)

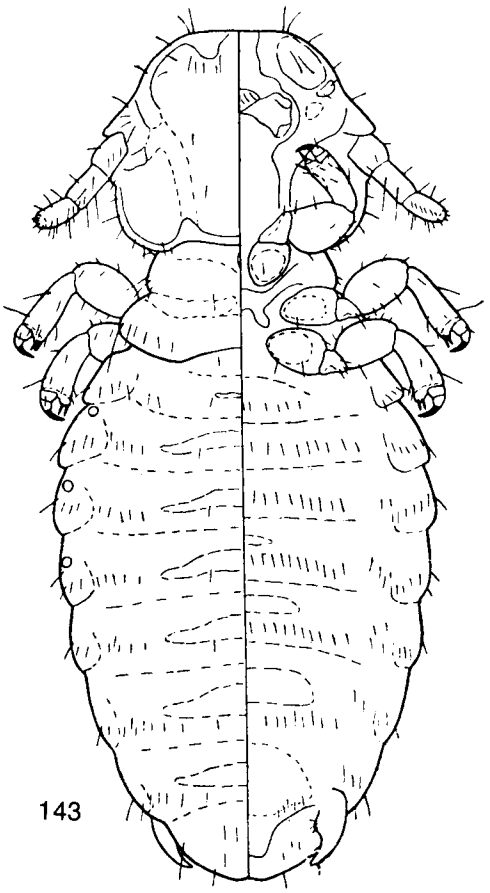
Cebidicola extrarius Werneck, 1950:8, Fig. 10-11.

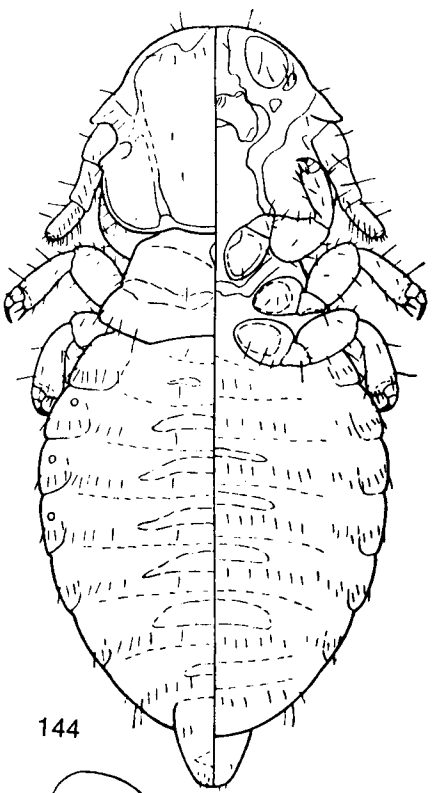
The host of the holotype and the locality where it was collected are unknown.

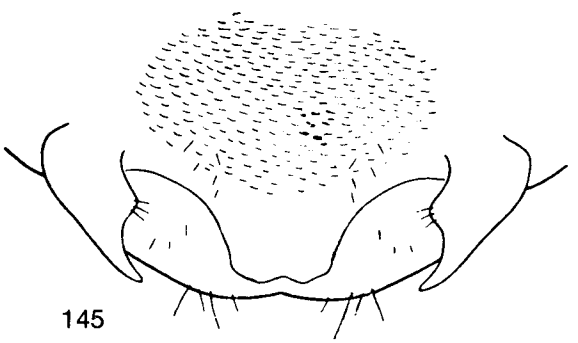
VENEZUELAN RECORDS

Nineteen males and 20 females were taken off *Alouatta seniculus* (Linnaeus) collected near Mirimiri, **Falcón;** El Rosario, **Zulia;** and Hato Mata de Bejuco, **Monagas.** Based upon

Fig. 143-146. *Suricatoecus quadraticeps* (Chapman), from *Urocyon cinereoargenteus*. From Werneck, 1948: 143, dorsal-ventral view of female; 144, dorsal-ventral view of male; 145, ventral view of female terminalia; 146, male genitalia.







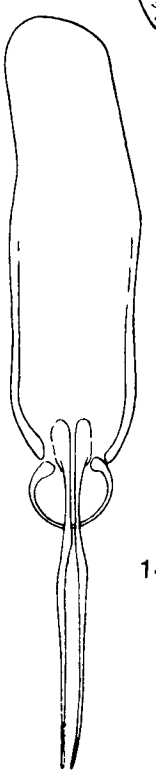
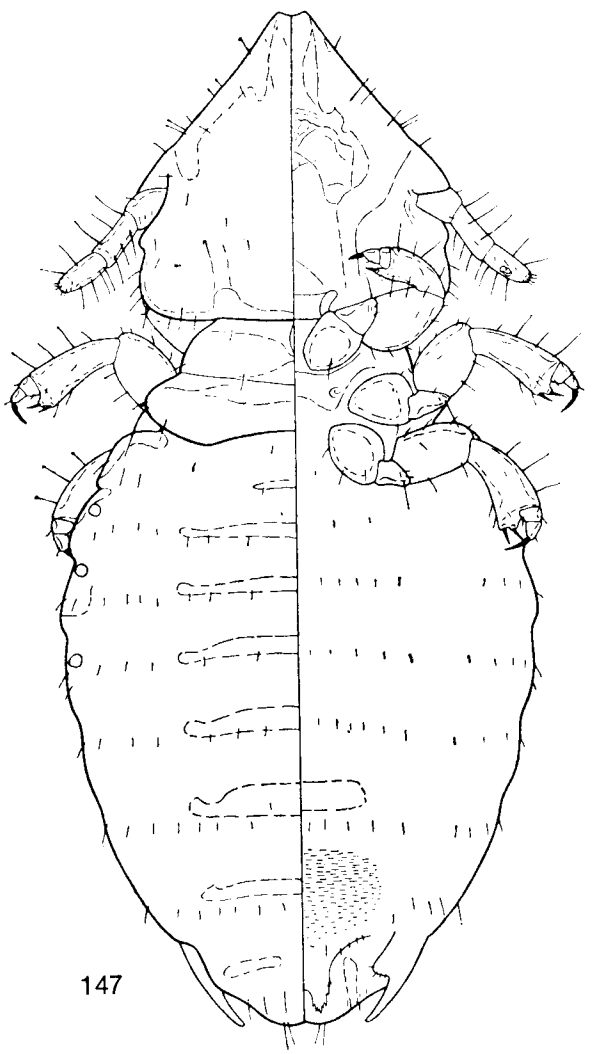


Fig. 147-150. *Felicola subrostratus* (Burmeister), from *Felis catus*. From Werneck, 1948:147, dorsal-ventral view of female; 148, dorsal-ventral view of male; 149, ventral view of female terminalia; 150, male genitalia.



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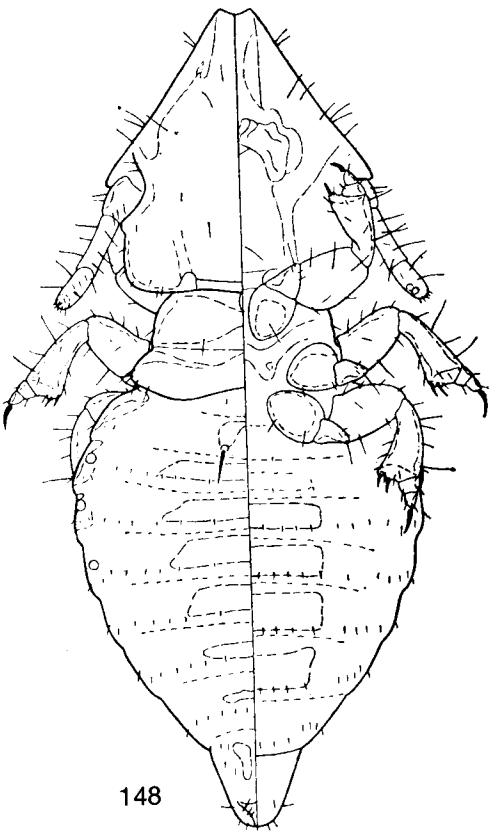

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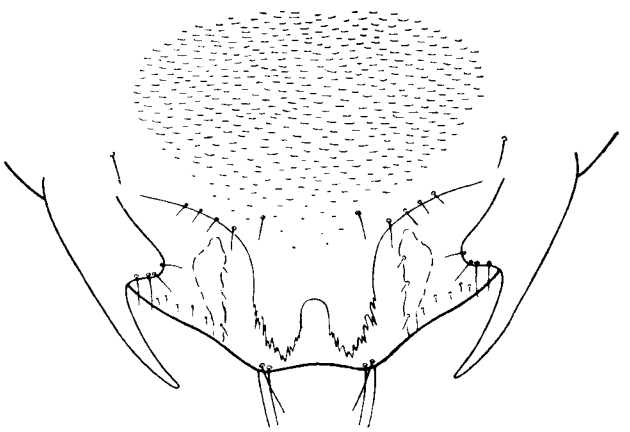

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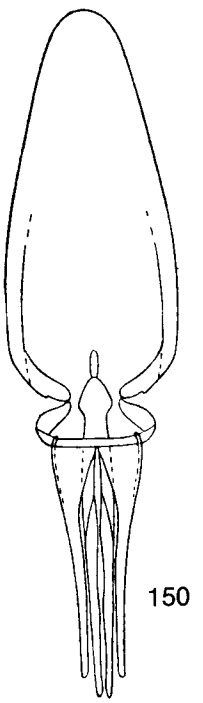

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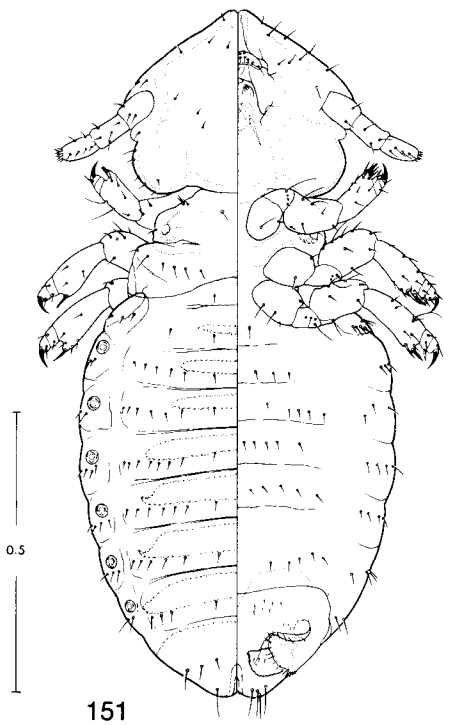
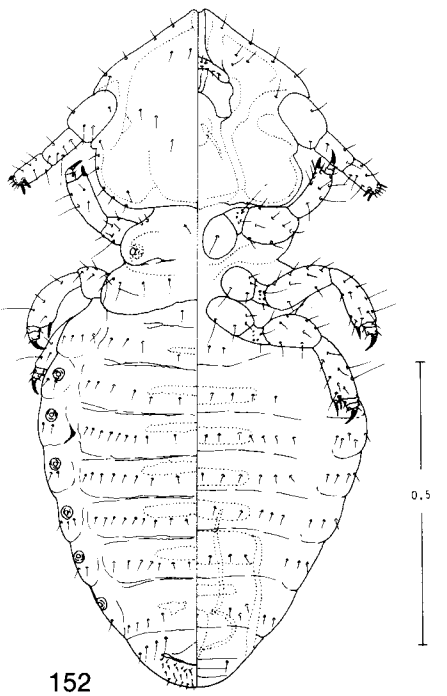
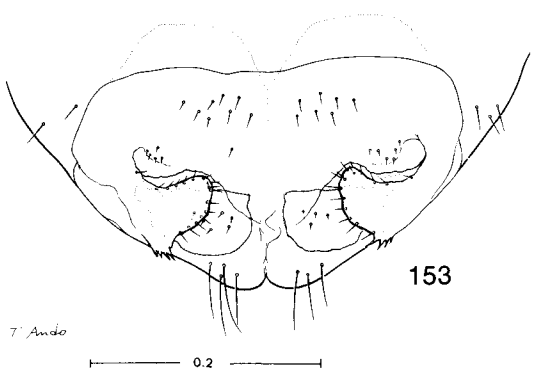
Fig. 151-154. *Felicola felis* (Werneck), from *Felis yagouaroundi*, Monagas, Venezuela, and Boqueron, Bolivia: 151, dorsal-ventral view of female; 152, dorsal-ventral view of male; 153, ventral view of female terminalia; 154, male genitalia.







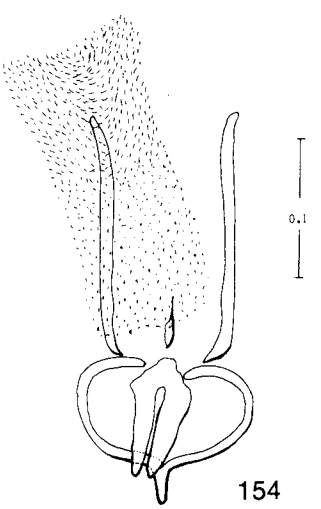
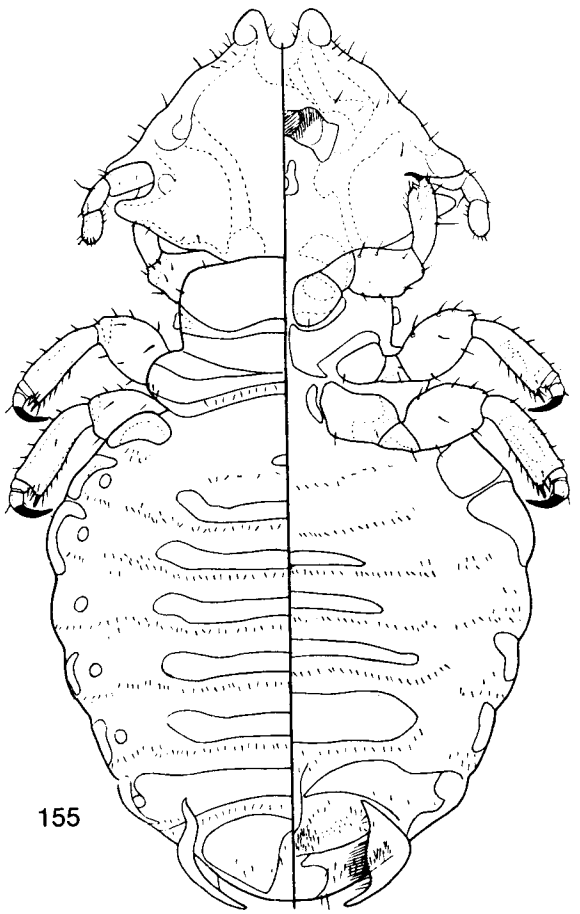


Fig. 155-158. *Cebidicola armatus* (Neumann), from *Brachyteles arachnoides*. From Werneck, 1936:155, dorsal-ventral view of female; 156, dorsal-ventral view of male; 157, ventral view of female terminalia; 158, male genitalia.



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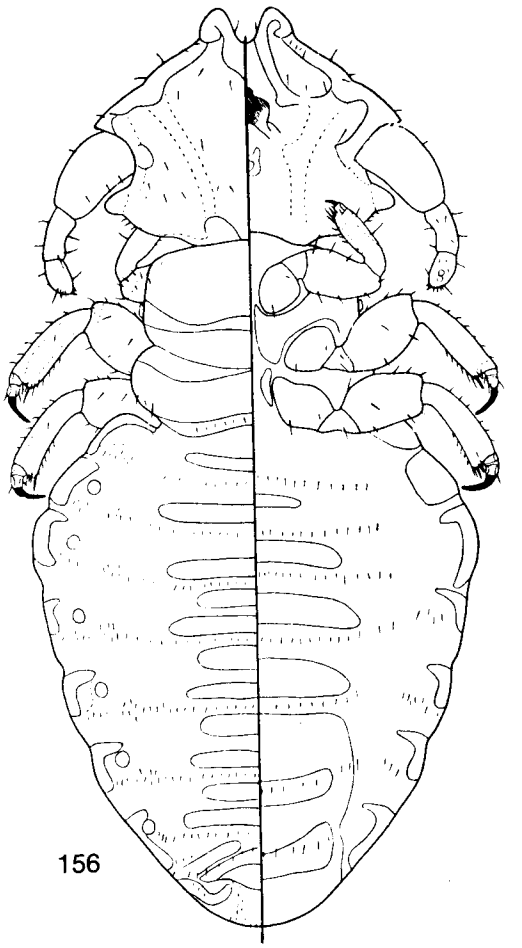

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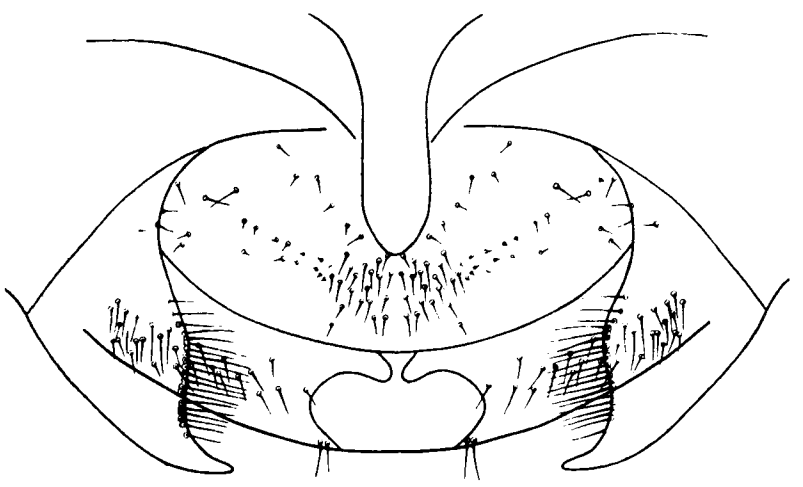

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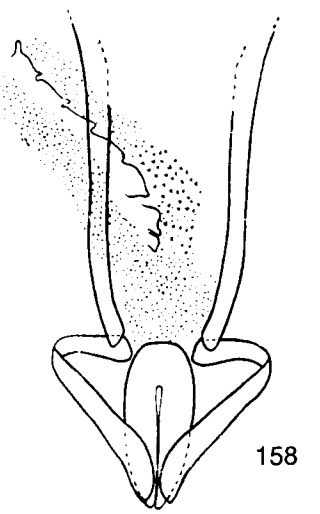

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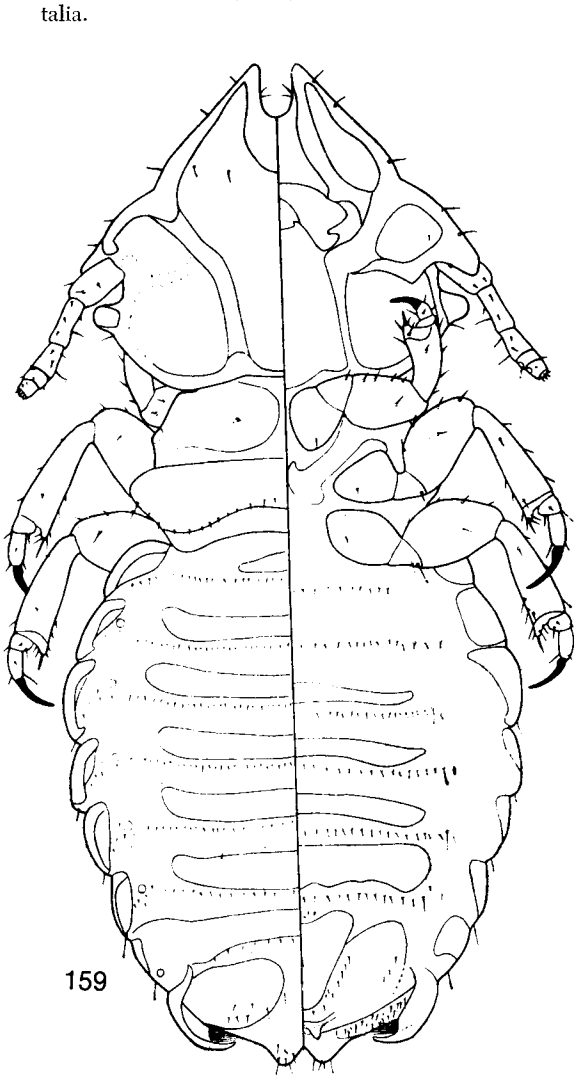
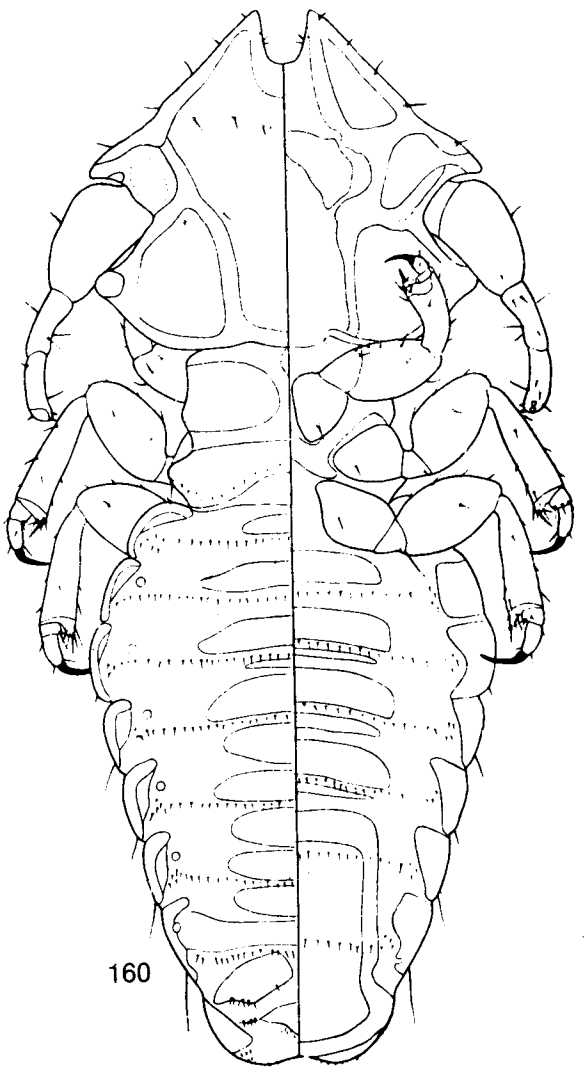
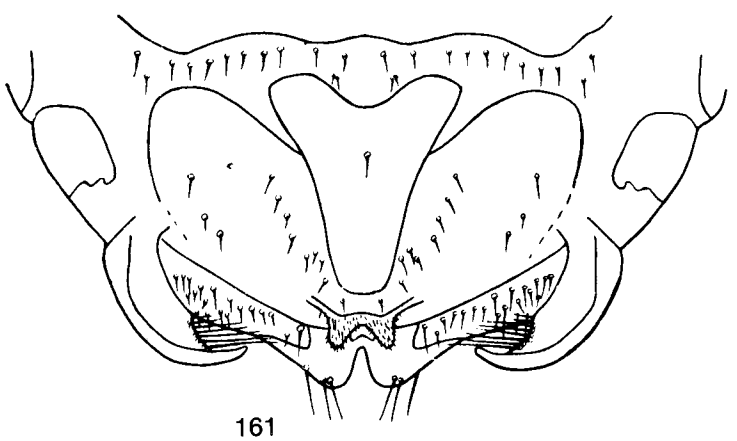
Fig. 159-162. *Cebidicola semiarmatus* (Neumann), from *Alouatta ursina*. From Werneck, 1936:159, dorsal-ventral view of female; 160, dorsal-ventral view of male; 161, ventral view of female terminalia; 162, male genitalia.







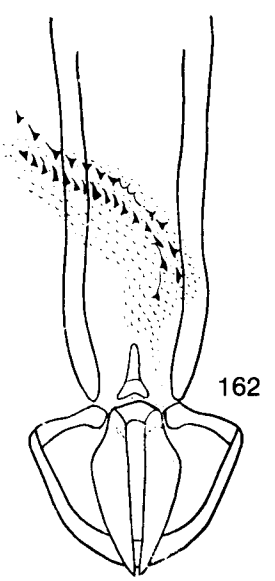
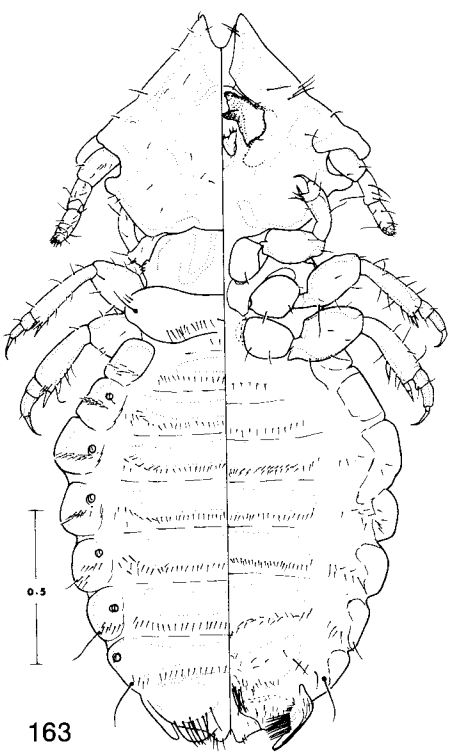


Fig. 163-166. *Cebidicola extrarius* Werneck, from *Alouatta seniculus*, Monagas: 163, dorsal-ventral view of female; 164, dorsal-ventral view of male; 165, ventral view of female terminalia; 166, male genitalia.



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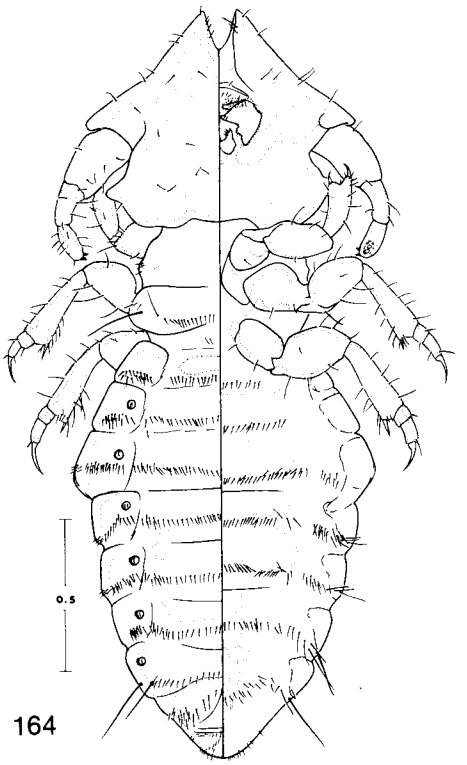

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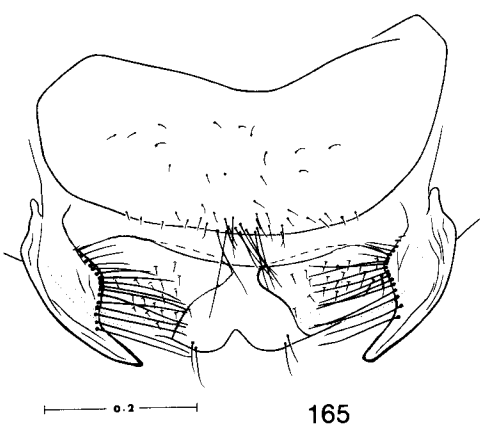

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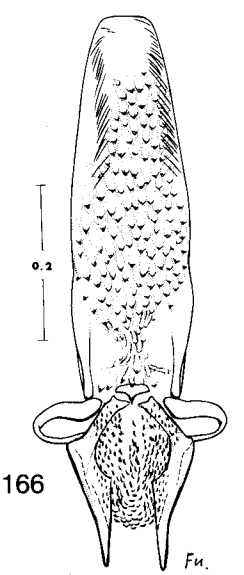

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these records it must be assumed that the true host of this species is one of the howler monkeys.

Genus *Eutrichophilus* Mjöberg

Eutrichophilus Mjöberg, 1910:71. Type-species: *Eutrichophilus cercolabes* Mjöberg, 1910.

Eutrichophilus cercolabes Mjöberg
(Fig. 167-170)

Eutrichophilus cercolabes Mjöberg, 1910:72, Pl. 4, Fig. 7-8.

The holotype was collected off *Coendou prehensilis* (Linnaeus) at Colonia de Santa Cruz, **Rio Grande do Sul**, Brazil. Werneck (1950) also recorded it off *Coendou villosus* Cuvier (=*Coendou spinosus* Cuvier) in Brazil and Paraguay. It probably is also found in Venezuela, although it has not been reported there. The authors have seen specimens from *C. villosus* collected at Villarica, Paraguay.

Eutrichophilus cordiceps Mjöberg
(Fig. 171-174)

Eutrichophilus cordiceps Mjöberg, 1910:75, Pl. 4, Fig. 5-6.

The holotype was collected off *Coendou prehensilis* (Linnaeus) at Colonia de Santa Cruz, **Rio Grande do Sul,** Brazil. Werneck (1950) also recorded it off *Coendou villosus* Cuvier (= *C. spinosus*), *C. platycentrotus* Brandt (= *C. prehensilis*), and *C. paraguayensis* Oken (=*C. insidious* Kuhl) collected in Brazil. It probably is also found in Venezuela, but it has not been reported there.

Eutrichophilus guyanensis Werneck
(Fig. 175-178)

Eutrichophilus guyanensis Werneck, 1950:49, Fig. 29-35.

The holotype was collected off *Coendou melanurus* (Wagner) in Kartabo, Guyana. The authors have seen specimens from "a porcupine" collected at Moengo, Surinam. It probably occurs in Venezuela, but there are no reports of it there.

Eutrichophilus exiguus Werneck
(Fig. 179-182)

Eutrichophilus exiguus Werneck, 1950:52, Fig. 36-41.

The holotype was collected off *Coendou melanurus* (Wagner) in Kartabo, Guyana. It probably occurs in Venezuela, although it has not been reported there.

Eutrichophilus lobatus Ewing
(Fig. 183-186)

Eutrichophilus lobatus Ewing, 1936:238, Fig. 2.

The holotype was collected off *Coendou pruinosus* Thomas taken in "South America," without specific locality. *C. pruinosus*, however, is known only from Venezuela. Werneck (1950) recorded it off the type-host collected at Mérida, Venezuela; and off *C. vestitus* Thomas collected at Bogotá, Colombia.

Eutrichophilus comitans Werneck
(Fig. 187-188)

Eutrichophilus comitans Werneck, 1950:56, Fig. 42-43.

The holotype was collected off *Coendou vestitus* Thomas in Colombia. Werneck (1950) also found it on *Coendou pruinosus* Thomas collected at Mérida, Venezuela.

Eutrichophilus minor Mjöberg
(Fig. 189-192)

Eutrichophilus minor Mjöberg, 1910:77, Fig. 44, 47, 48, 112, and Pl. 4, Fig. 3.

The holotype was collected off *Coendou prehensilis* (Linnaeus) at Colonia de Santa Cruz, **Rio Grande do Sul,** Brazil. Werneck (1950) recorded it off *Coendou villosus* Cuvier (= *C. spinosus* Cuvier) from Brazil and Paraguay and off *Coendou paraguayensis* Oken (= *C. insidious* Kuhl) from **Minas Gerais,** Brazil. It probably occurs in Venezuela, although it has not been reported there.

Genus *Bovicola* Ewing

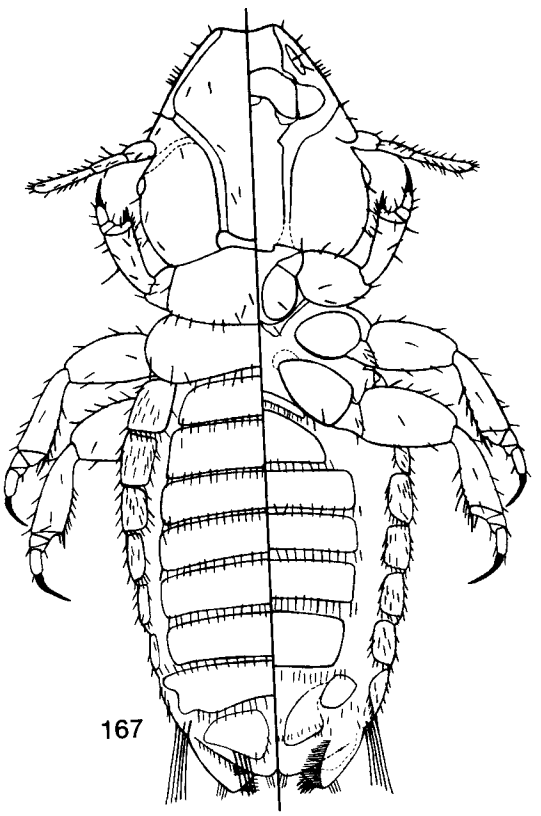
Bovicola Ewing, 1929:193.
Bovidoecus Bedford, 1929:518.
Lepikentron Keler, 1938a:452.
Rhabdopedilon Keler, 1938a:453.
Holakartikos Keler, 1938a:461.
Werneckiella Eichler, 1940:160.

Type-species: *Trichodectes caprae* Gurlt, 1843.

Bovicola caprae (Gurlt)
(Fig. 193-196)

Trichodectes climax Nitzsch, 1818:296 (*nomen nudum*).
Trichodectes caprae Gurlt, 1843:3, Pl. 1, Fig. 2.
Trichodectes climacium Giebel, 1861b:292.

Fig. 167-170. *Eutrichophilus cercolabes* Mjöberg, from *Coendou prehensilis*. From Werneck, 1936:167, dorsal-ventral view of female; 168, dorsal-ventral view of male; 169, ventral view of female terminalia; 170, male genitalia.



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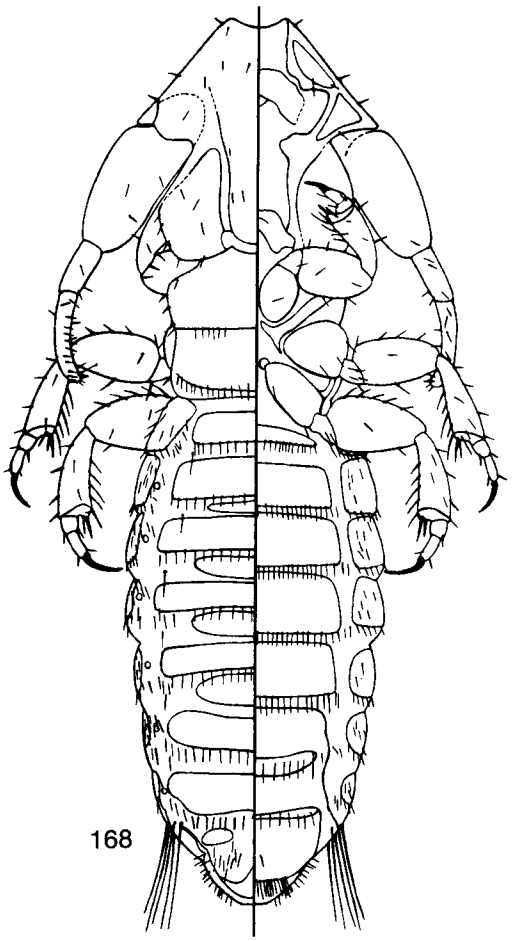

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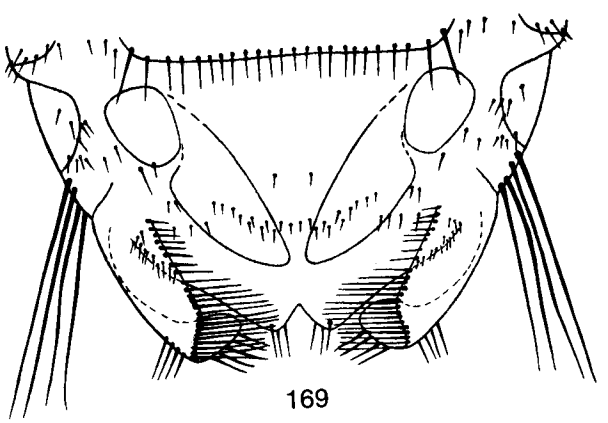

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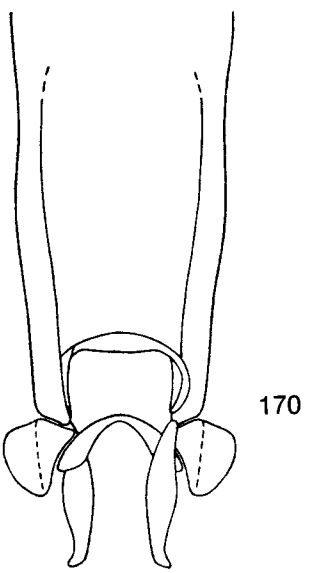

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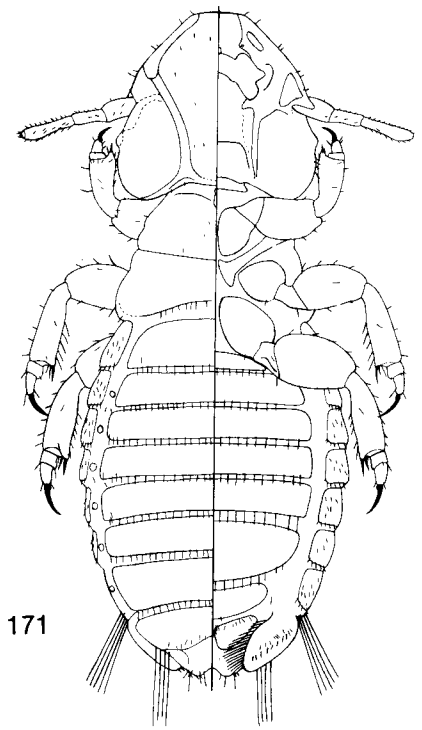
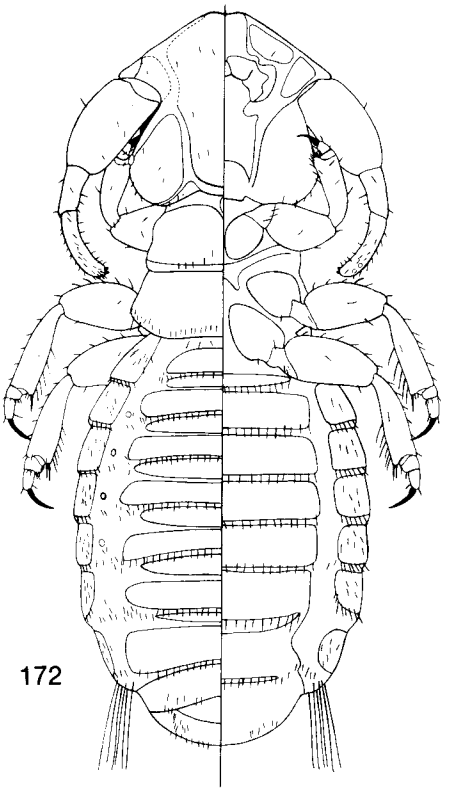
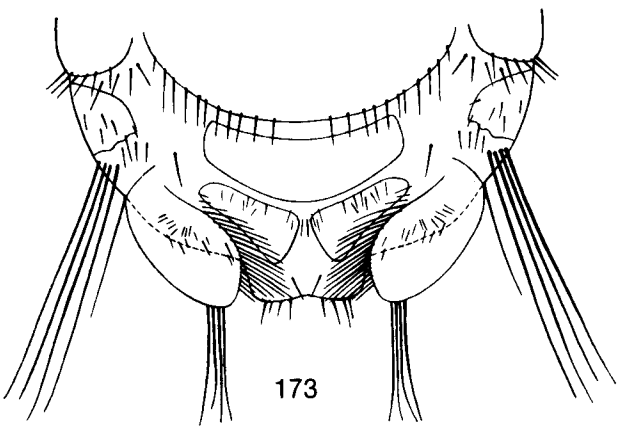
Fig. 171-174. *Eutrichophilus cordiceps* Mjöberg, from *Coendou prehensilis*. From Werneck, 1936:171, dorsal-ventral view of female; 172, dorsal-ventral view of male; 173, ventral view of female terminalia; 174, male genitalia.







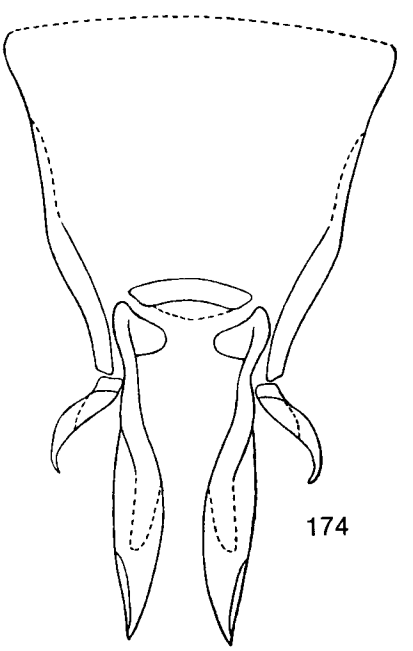
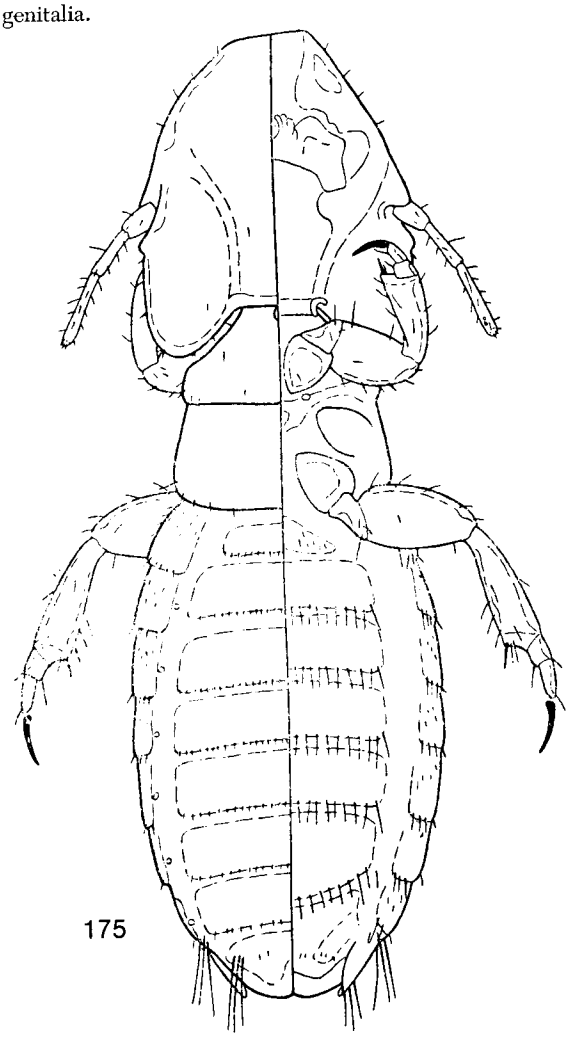


Fig. 175-178. *Eutrichophilus guyannensis* Werneck, from *Coendou melanurus*. From Werneck, 1950:175, dorsal-ventral view of female; 176, dorsal-ventral view of male; 177, ventral view of female terminalia; 178, male genitalia.



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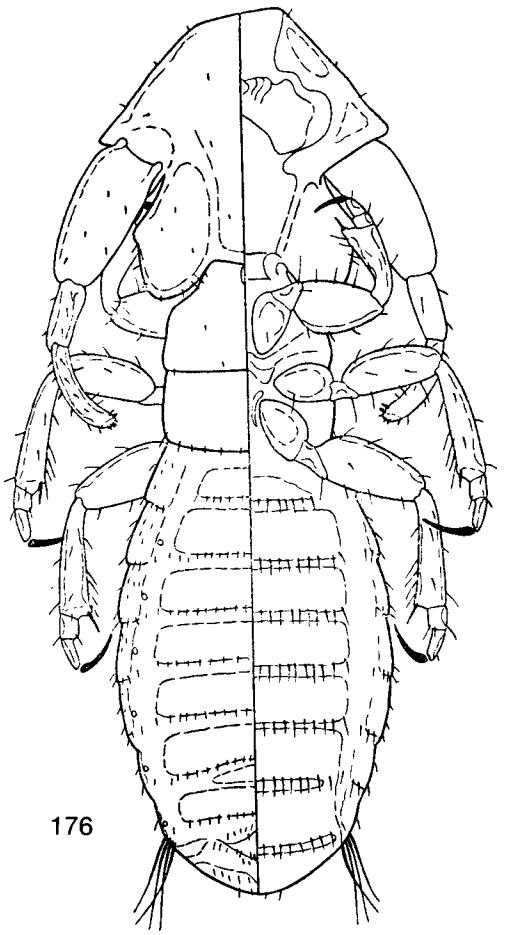

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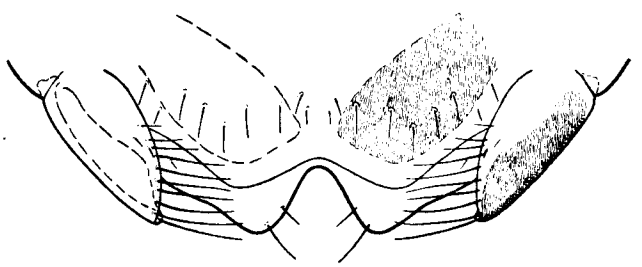

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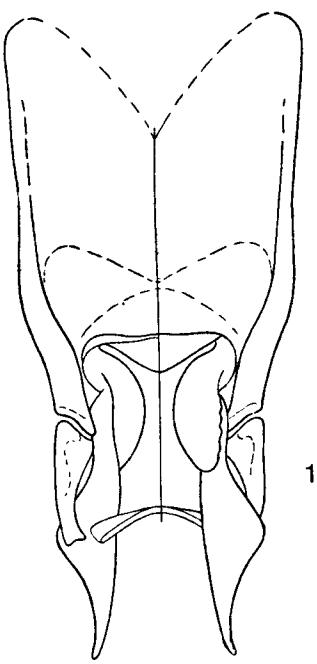

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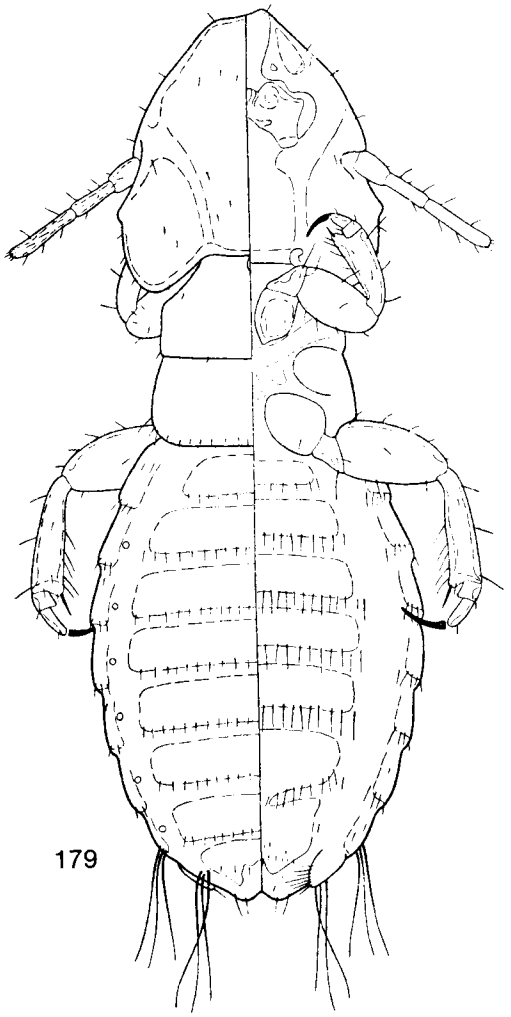
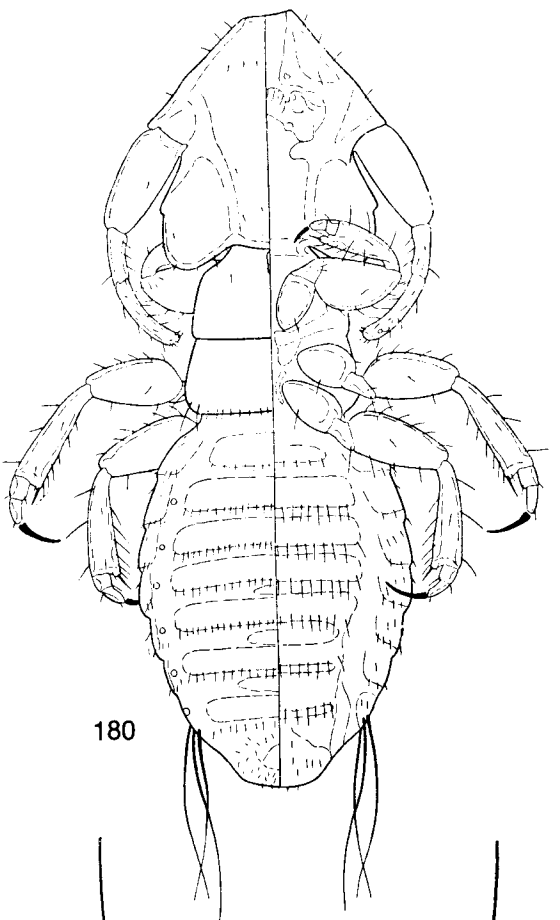
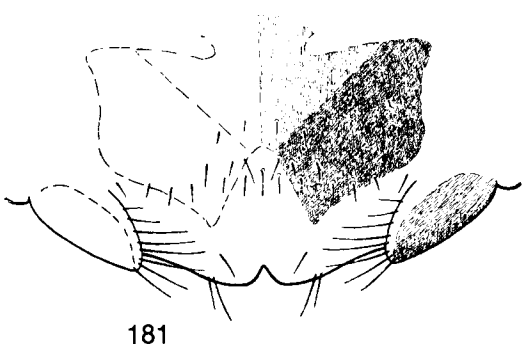
Fig. 179-182. *Eutrichophilus exiguus* Werneck, from *Coendou melanurus*. From Werneck, 1950:179, dorsal-ventral view of female; 180, dorsal-ventral view of male; 181, ventral view of female terminalia; 182, male genitalia.







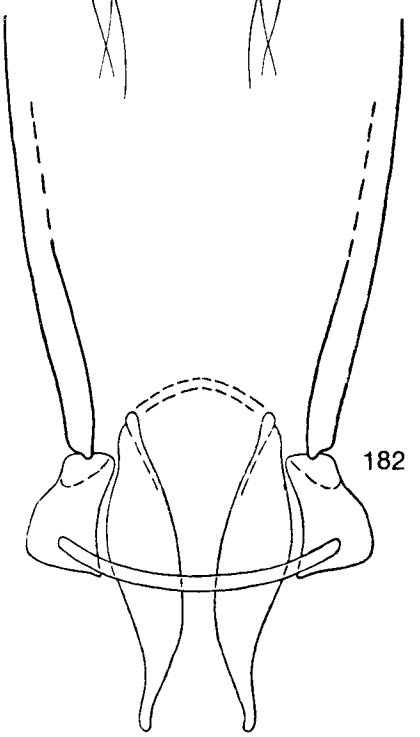
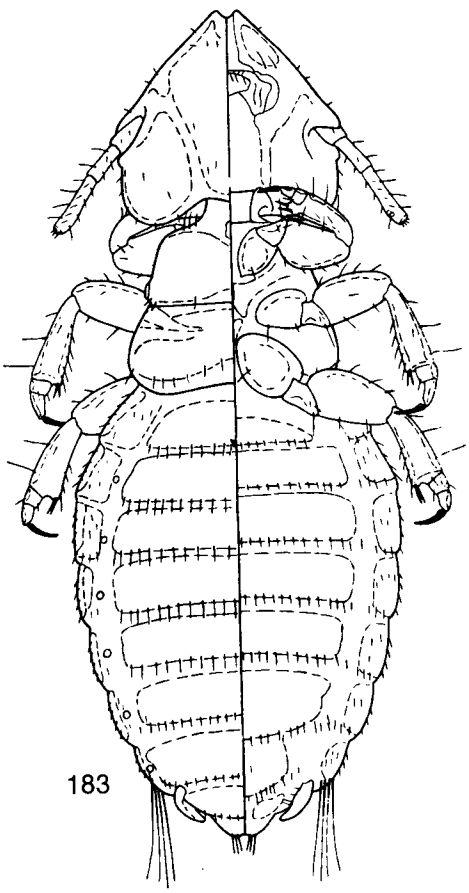
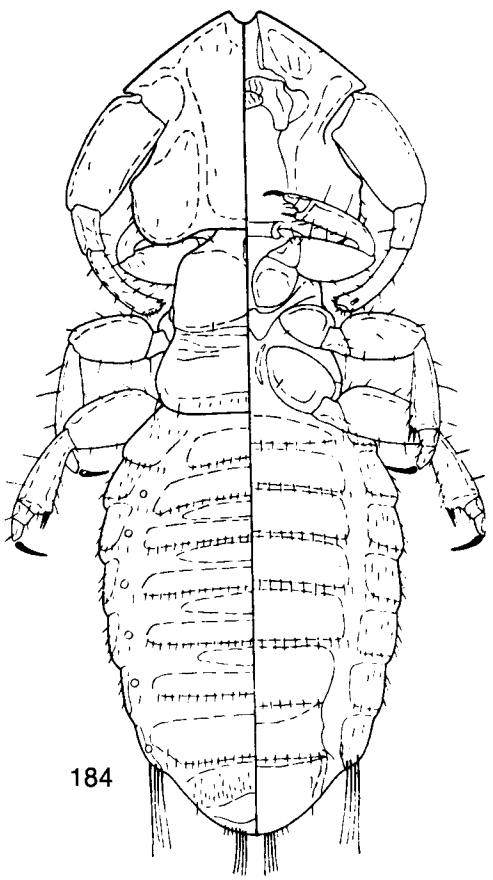
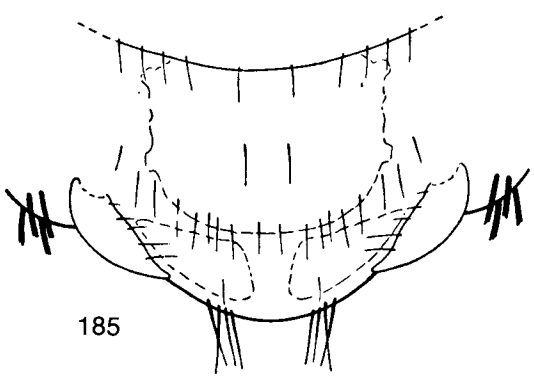


Fig. 183-186. *Eutrichophilus lobatus* Ewing, from *Coendou pruinosus*. From Werneck, 1945:183, dorsal-ventral view of female; 184, dorsal-ventral view of male; 185, ventral view of female terminalia; 186, male genitalia.







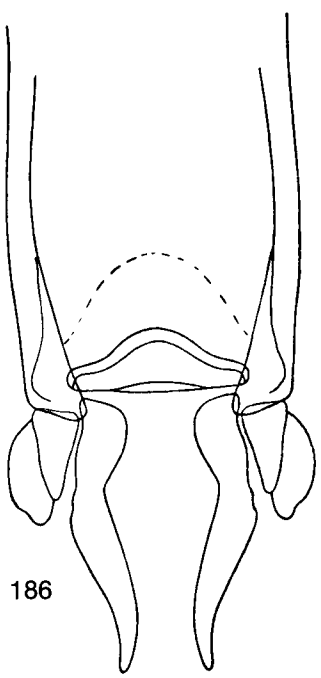
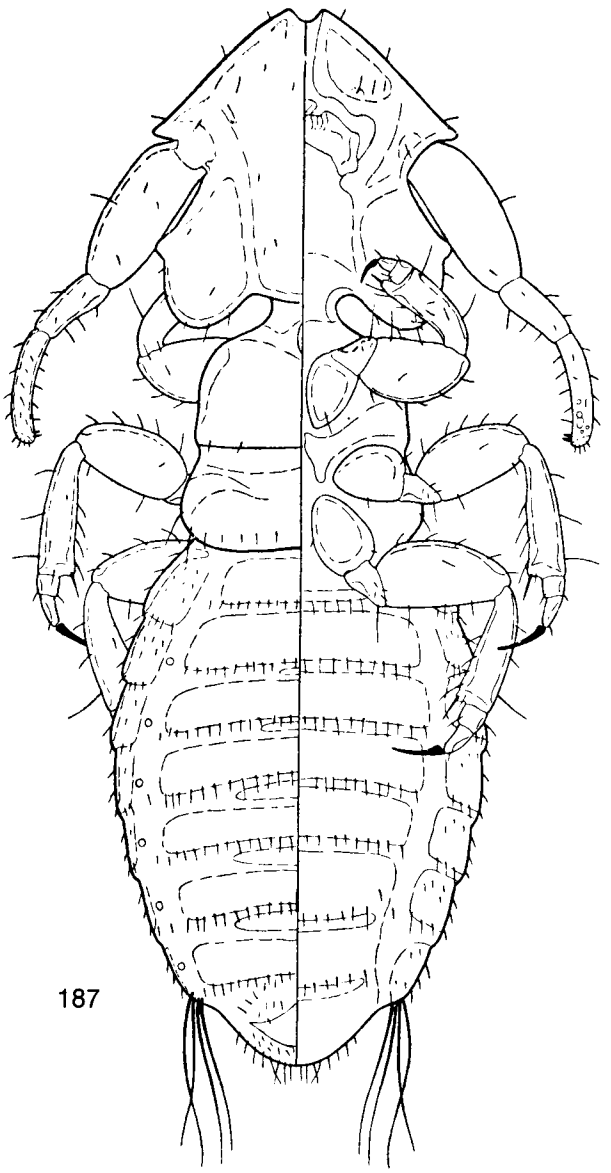


Fig. 187-188. *Eutrichophilus comitans* Werneck, from *Coendou vestitus*. From Werneck, 1950:187, dorsal-ventral view of male; 188, male genitalia.



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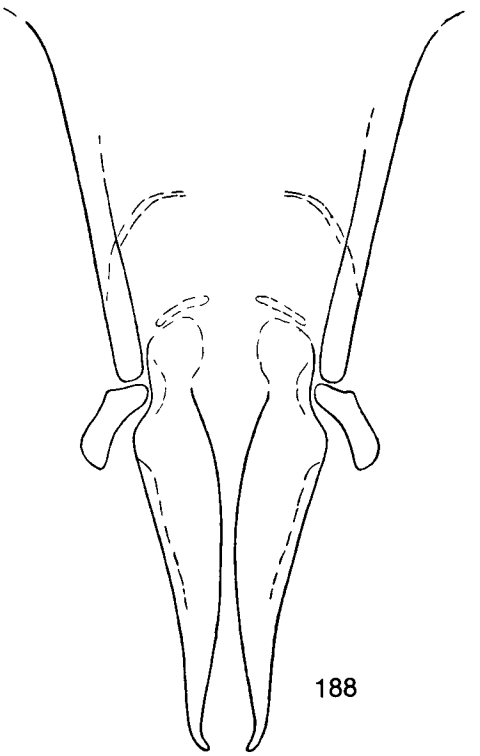
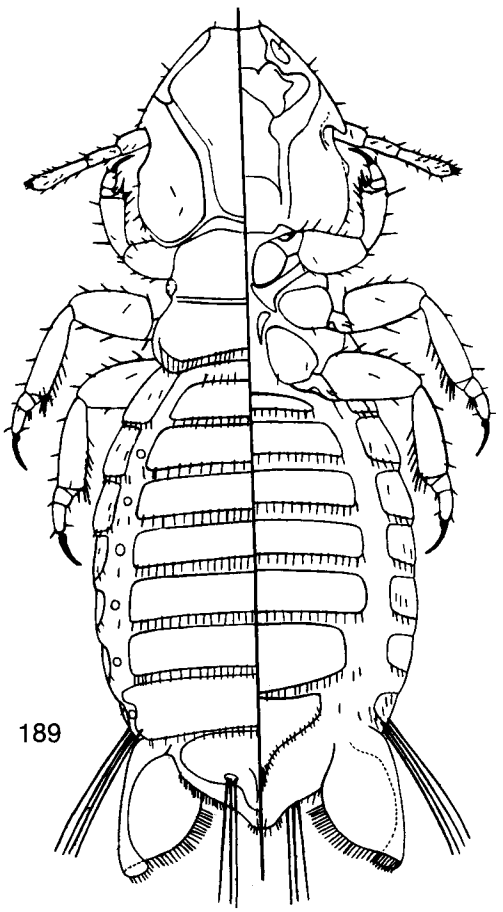
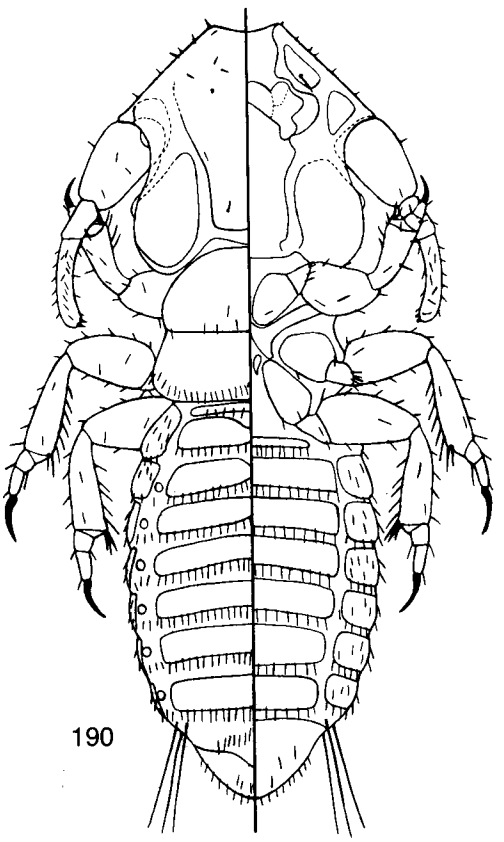
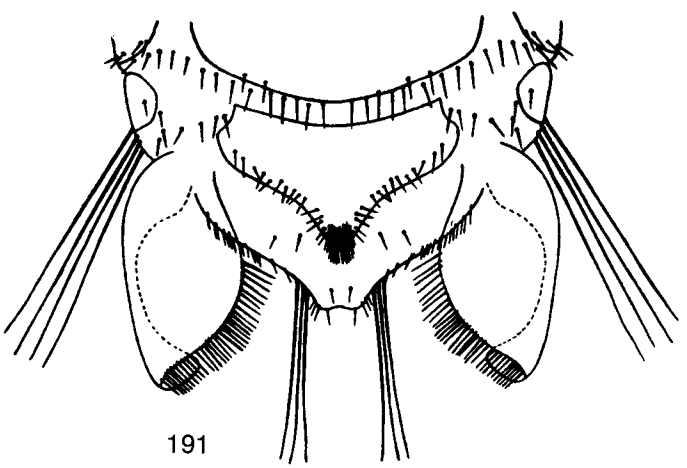


188

Fig. 189-192. *Eutrichophilus minor* Mjöberg, from *Coendou prehensilis*. From Werneck, 1936:189. dorsal-ventral view of female; 190, dorsal-ventral view of male; 191, ventral view of female terminalia; 192, male genitalia.







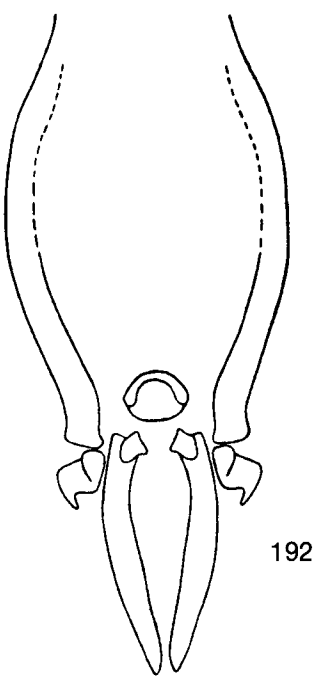
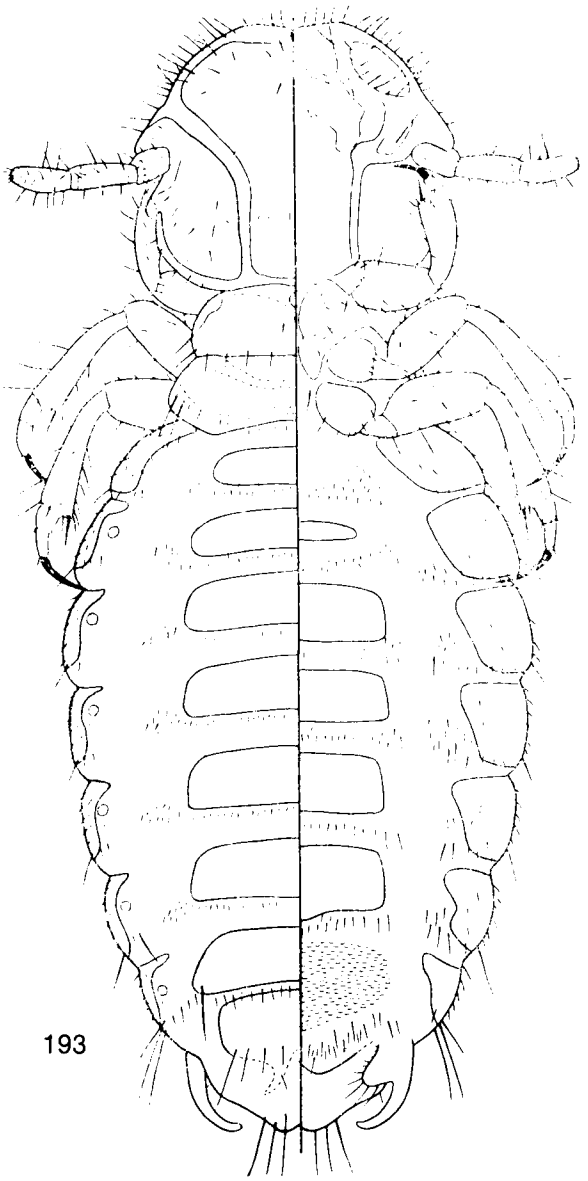


Fig. 193-196. *Bovicola caprae* (Gurlt), from *Capra hircus*. From Werneck, 1936:193, dorsal-ventral view of female; 194, dorsal-ventral view of male; 195, ventral view of female terminalia; 196, male genitalia.



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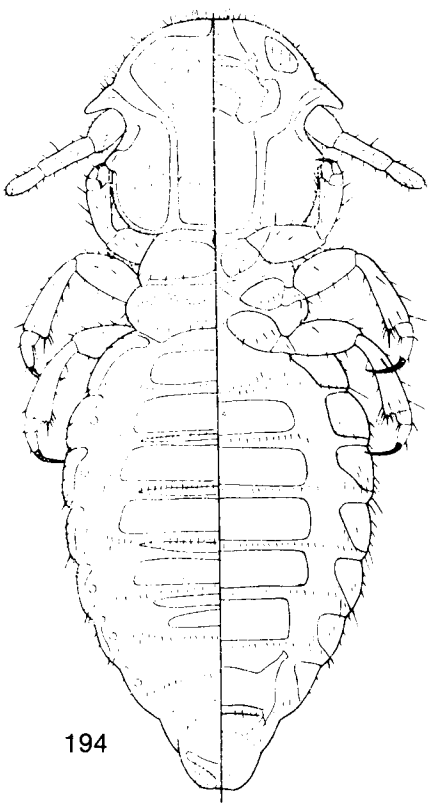

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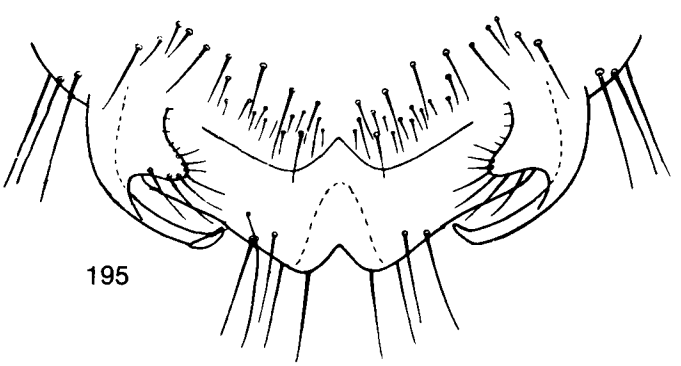

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196

Trichodectes solidus Rudow, 1866:112, Pl. 7, Fig. 2.
Trichodectes peregrinus Taschenberg, 1882: 218, Pl. 7, Fig. 10.
Trichodectes climax truncata Kellogg, 1908:6.

Found worldwide on domestic short-haired goats, the holotype was taken off *Capra hirca* Linnaeus in Europe. The fact that Werneck (1950) recorded its presence in Guyana, Brazil, Argentina, and Colómbia in South America supports the assumption that it also occurs in Venezuela, even though it has not been reported there.

Bovicola bovis (Linnaeus)
(Fig. 197-198)

Pediculus bovis Linnaeus, 1758:611.
Pediculus tauri Olfers, 1816:85.
Trichodectes scalaris Nitzsch, 1818:296.

Found worldwide on domestic cattle, the holotype was taken off *Bos taurus* Linnaeus in Europe. In 1950 Werneck recorded it from Brazil, and the species seems likely to occur also in Venezuela, although it has not been reported there.

Bovicola ovis (Linnaeus)
(Fig. 199-202)

Pediculus ovis Linnaeus, 1758:611.
Pediculus ovisarietis Schrank, 1803:187.
Pediculus sphaerocephalus Olfers, 1816:85.

The holotype was taken off domestic sheep (*Ovis aries* Linnaeus) in Europe. The species is found worldwide on domestic sheep. Werneck (1950) recorded it from Brazil, and it probably occurs in Venezuela, although there are no records of it there.

Bovicola equi (Linnaeus)
(Fig. 203-206)

Pediculus equi Linnaeus, 1758:611.
Trichodectes caballi Denny, 1852:30.
Trichodectes pilosus Giebel, 1874:59.
Trichodectes parumpilosus Piaget, 1880:397, Pl. 32, Fig. 5.
Trichodectes vestitus Railliet, 1895:835, Fig. 576.
Trichodectes pubescens Neumann, 1905:61.

The holotype was collected off a domestic horse *Equus caballus* Linnaeus in Europe. It is found worldwide on domestic horses. Werneck (1950) recorded it from horses in the **Distrito Federal, Rio de Janeiro, Minas Gerais, São Paulo** and **Rio Grande do Sul,** Brazil. He also recorded it from mules in **São Paulo,** and **Rio Grande do Sul,** Brazil. The species probably occurs in Venezuela, although it has not been reported there.

Genus *Tricholipeurus* Bedford

Tricholipeurus Bedford, 1929:514. Type-species: *Tricholipeurus aepycerus* Bedford, 1929.

Tricholipeurus albimarginatus (Werneck)
(Fig. 207-210)

Trichodectes albimarginatus Werneck, 1936: 570, Fig. 205-212.

The holotype was collected at Pullus, Rio Aripuana, T.F. **Amazonas,** Brazil, off *Mazama americana* (Erxleben). Werneck (1950) recorded it off: the type-host collected at Canaanea, **São Paulo,** Brazil; *Mazama rondoni* Miranda (= *M. gouazoubira* G. Fischer) collected at Madeira, T.F. **Amazonas,** and in the state of **Mato Grosso,** Brazil; *Mazama nemorivaga* F. Cuvier (= *M. gouazoubira* G. Fischer) collected at **Jujuy,** Argentina; *Mazama tema* Rafinesque (= *M. americana* Erxleben) collected at Nova Teutonia and Santa Catarina, Brazil; and *Mazama* sp. collected at Yacuiba, Bolivia; Rio Paraná, **Mato Grosso;** and Tabatinguera and Itapura, **São Paulo** in Brazil.

VENEZUELAN RECORDS

Two females and one male were collected near Caracas, **Distrito Federal.** Unfortunately, there was no record of the host, but it was likely a species of *Mazama.*

Tricholipeurus lipeuroides (Megnin)
(Fig. 211-214)

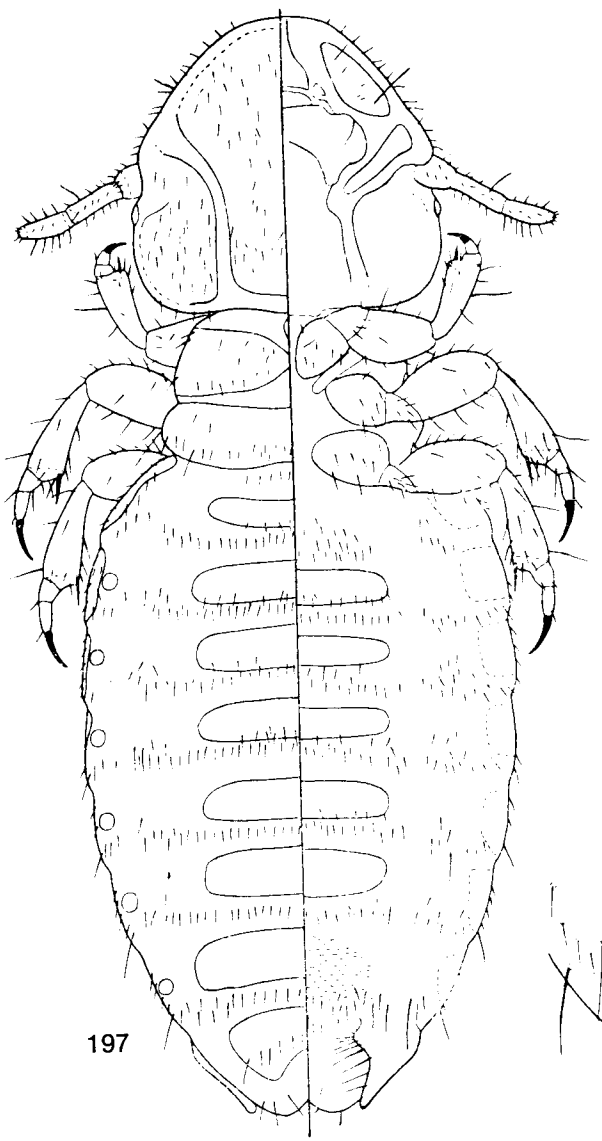
Trichodectes lipeuroides Megnin, 1884:494.
Eutrichophilus mexicanus Mjöberg, 1910:79 and 244; Fig. 49, 50, and 137; Pl. 4, Fig. 1-2.
Eutrichophilus mazama Stobbe, 1913:562.
Trichodectes virginianus Peters, 1930:76, Fig. 1-3.

The holotype was collected off *Odocoileus virginianus mexicanus* (Gmelin) in México. The species is common on *O. virginianus* (Zimmermann) in North America, and, although it has not been recorded, it probably occurs on that host in Venezuela as well.

Tricholipeurus parallelus (Osborn)
(Fig. 215-218)

Trichodectes parallelus Osborn, 1896:240, Fig. 148.

Fig. 197-198. *Bovicola bovis* (Linnaeus), from *Bos taurus*. From Werneck, 1936:197, dorsal-ventral view of female; 198, ventral view of female terminalia.



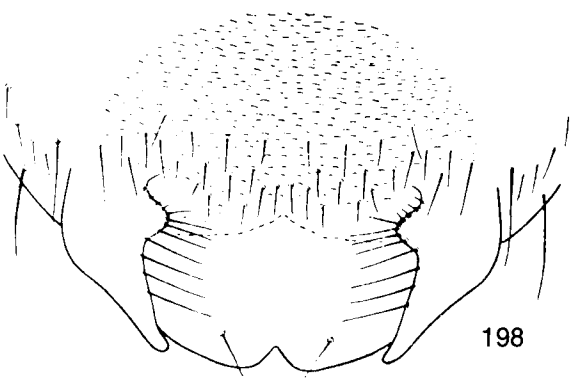
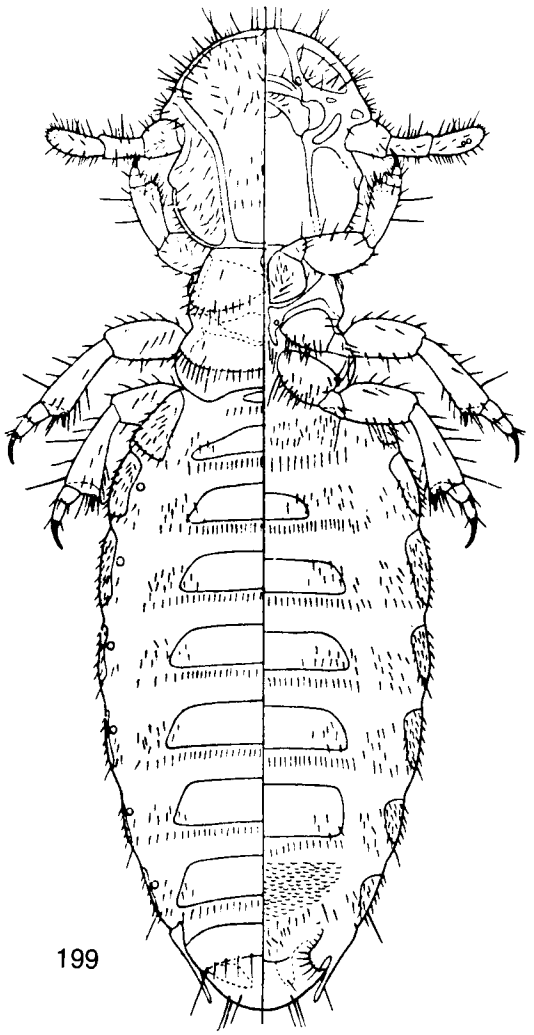
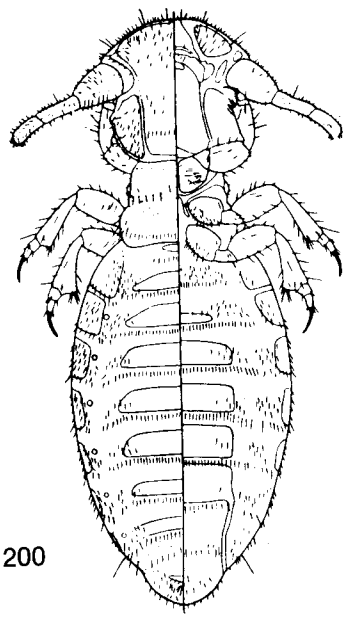
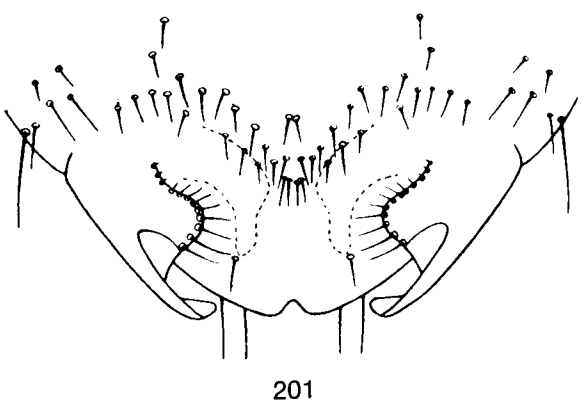


Fig. 199-202. *Bovicola ovis* (Linnaeus), from *Ovis aries*. From Werneck, 1936:199, dorsal-ventral view of female; 200, dorsal-ventral view of male; 201, ventral view of female terminalia; 202, male genitalia.







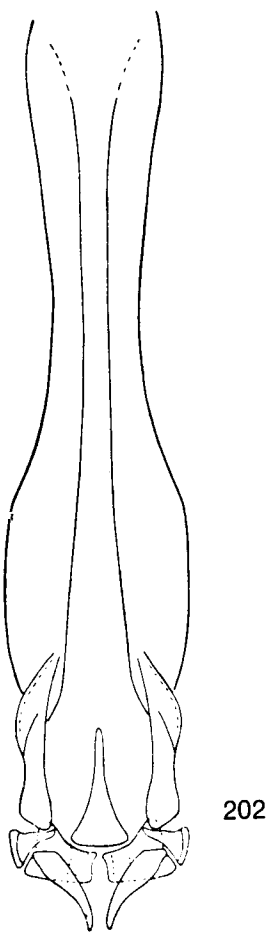
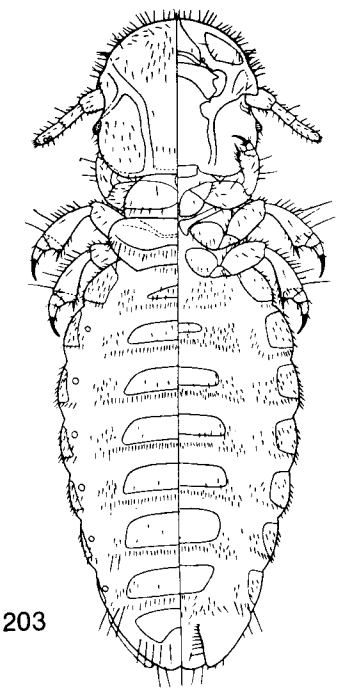


Fig. 203-206. *Bovicola equi* (Linnaeus), from *Equus caballus*. From Werneck, 1936: 203, dorsal-ventral view of female; 204, dorsal-ventral view of male; 205, ventral view of female terminalia; 206, male genitalia.



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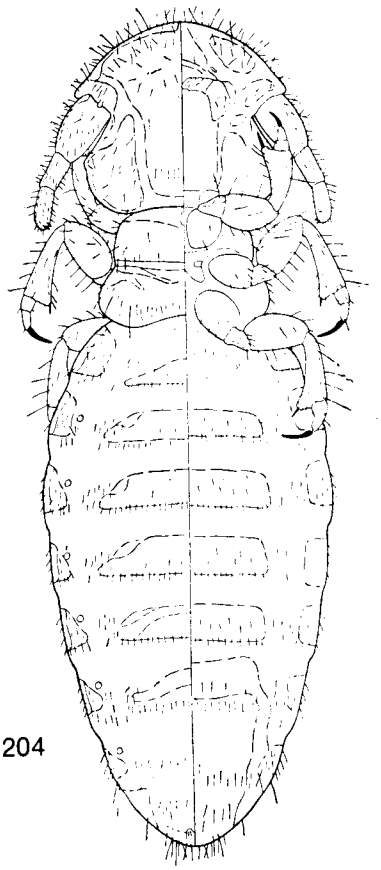

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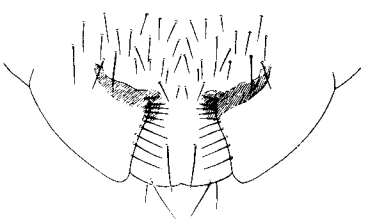

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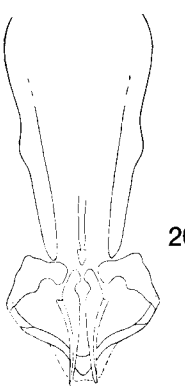

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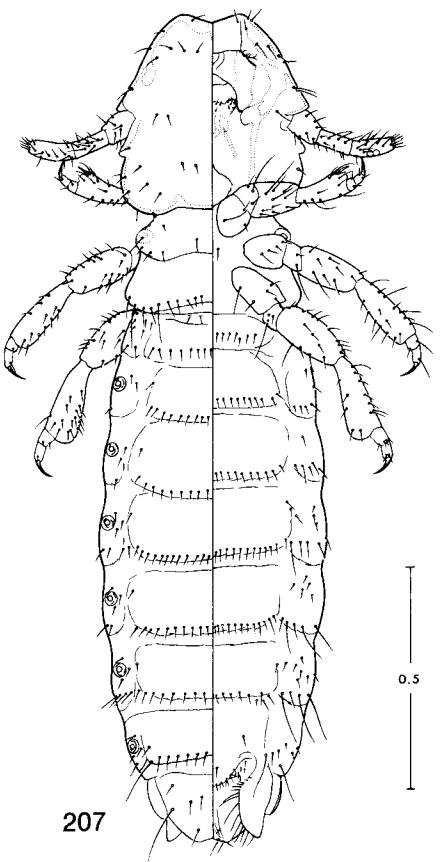
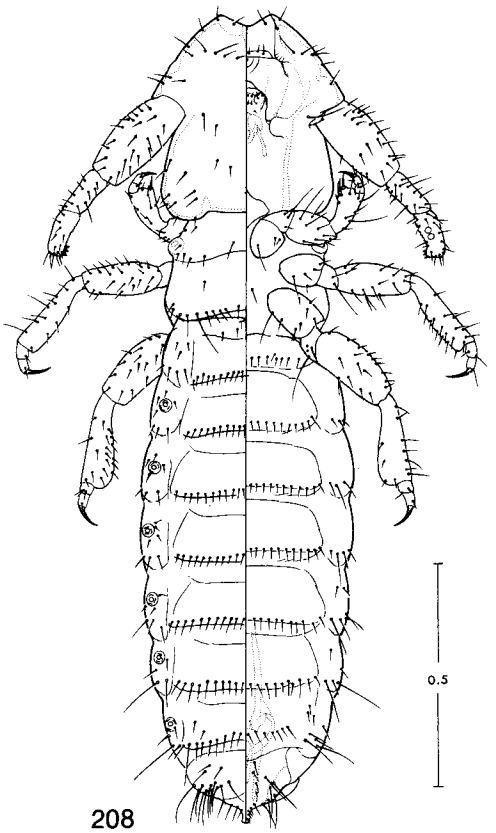
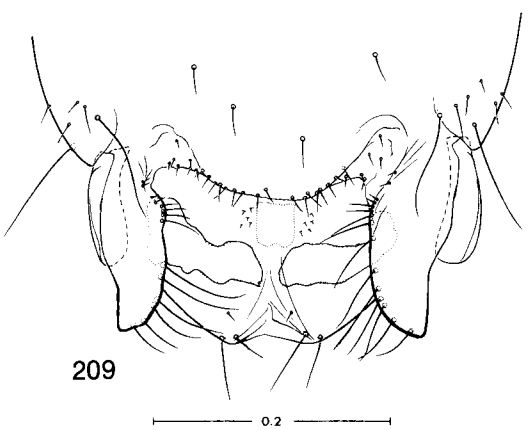
Fig. 207-210. *Tricholipeurus albimarginatus* Werneck, from *Mazama* sp., Distrito Federal: 207, dorsal-ventral view of female; 208, dorsal-ventral view of male; 209, ventral view of female terminalia; 210, male genitalia.







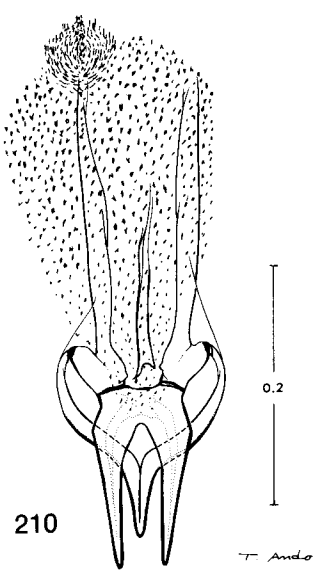
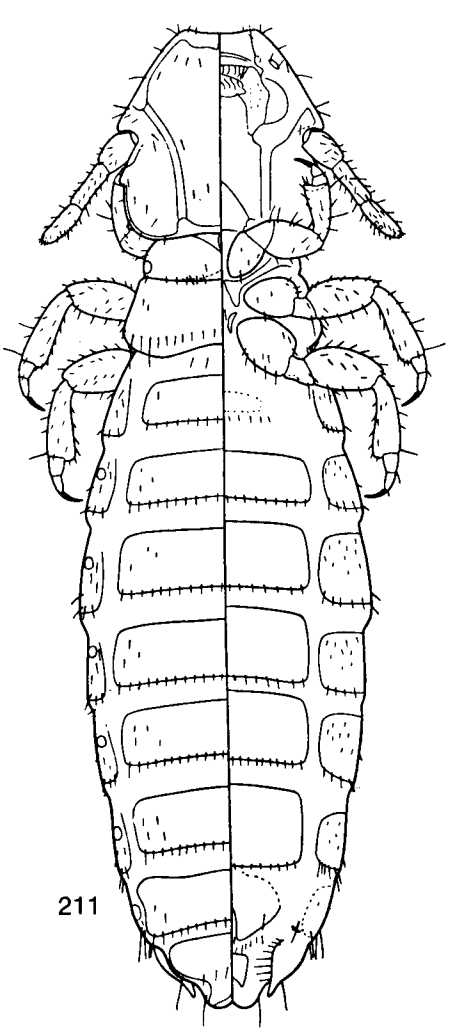
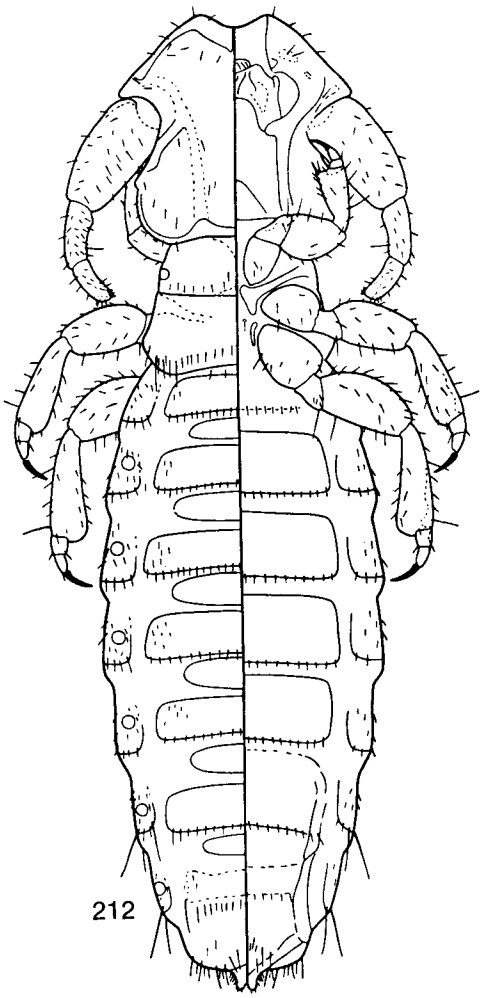
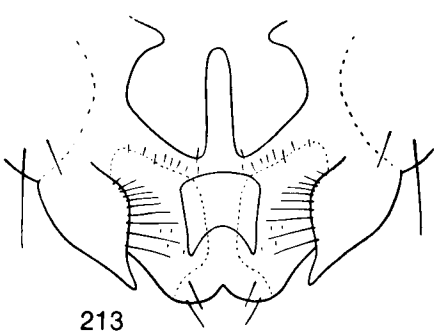


Fig. 211-214. *Tricholipeurus lipeuroides* (Megnin), from *Odocoileus virginianus*. From Werneck, 1950: 211, dorsal-ventral view of female; 212, dorsal-ventral view of male; 213, ventral view of female terminalia; 214, male genitalia.







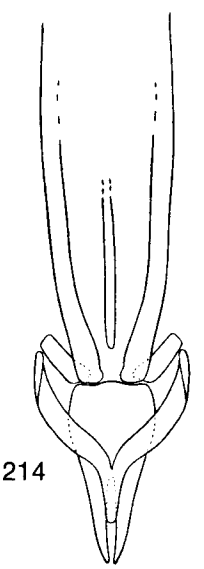
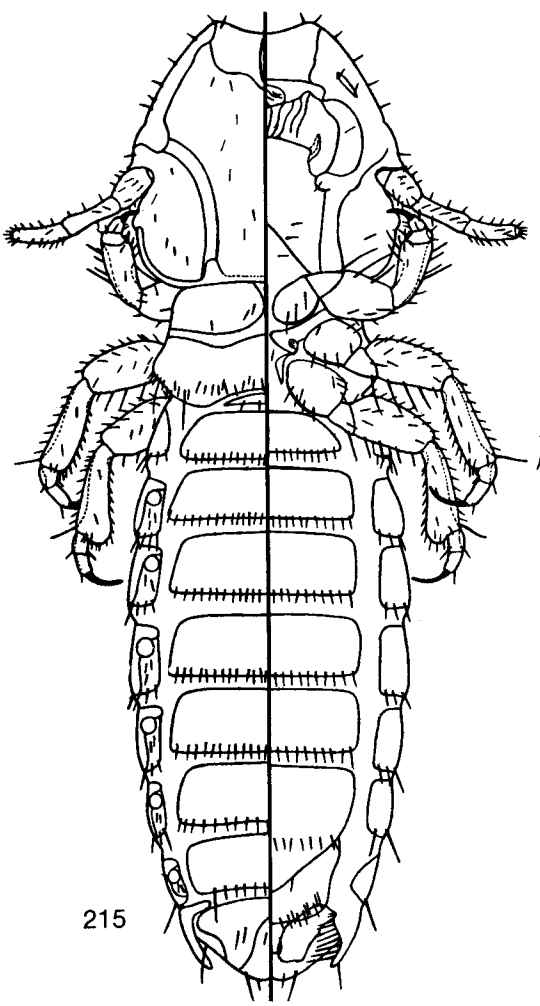
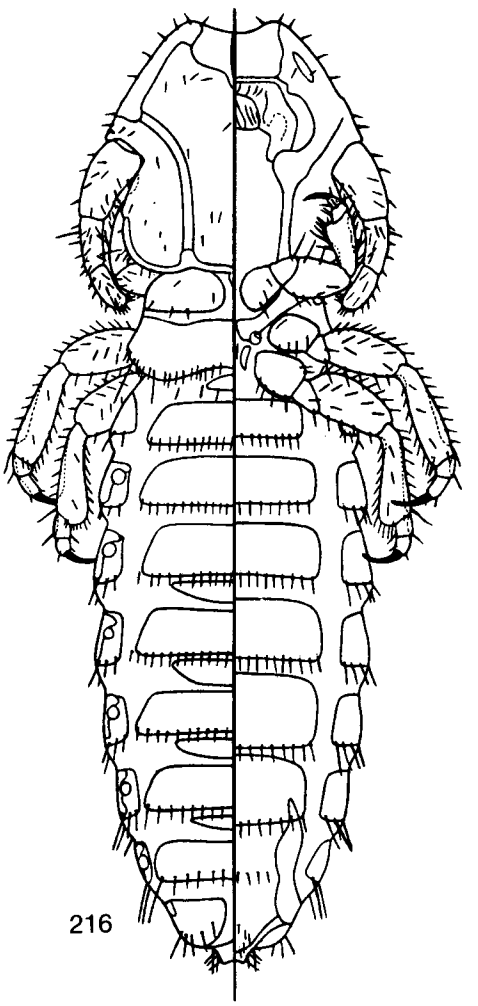


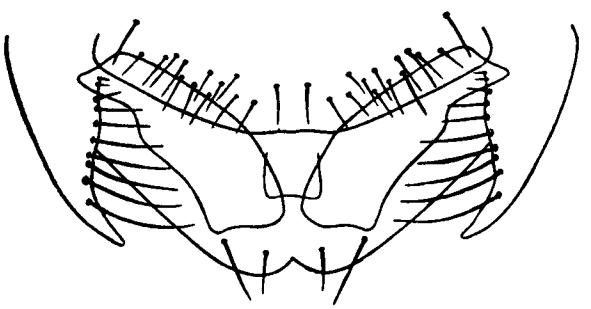
Fig. 215-218. *Tricholipeurus parallelus* (Osborn), from *Odocoileus virginianus*. From Werneck, 1950: 215, dorsal-ventral view of female; 216, dorsal-ventral view of male; 217, ventral view of female terminalia; 218, male genitalia.



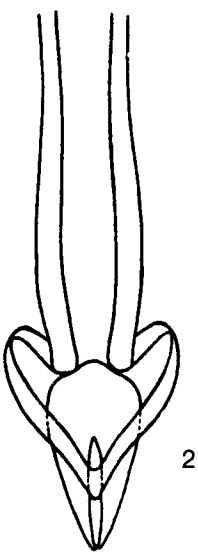
215



216



217



218

Trichodectes odocoilei McGregor, 1917:173, Pl. 17, Fig. 7.

The holotype was taken off *Odocoileus virginianus* (Zimmermann) at Ithaca, New York. It is a common parasite on this host in North America and although it has not been found in Venezuela it probably occurs there.

HOST-PARASITE RELATIONSHIPS

Mallophaga are obligatory external parasites and are usually host-specific; therefore, their distribution is dependent entirely upon distribution of the hosts. The exterior surface of the host provides an obligatory parasite a much more stable environment than the one in which the host lives. Some species of Mallophaga are restricted to a single host subspecies, and others are restricted to a host species, genus, or closely related genera. With few exceptions, the same species of Mallophaga is found on a mammal species throughout its range without regard to host subspecies. In the New World the only exception to this host specificity is in the genus *Geomydoecus* found on pocket gophers.

Mallophaga collected by personnel of the Smithsonian Venezuela Project reported in this paper confirm the above with the exception of lice found on spiny rats (*Proechimys*), and that exception might not exist if more data were available. For some time it has been known to most specialists that taxonomy and classification of the genus *Proechimys* is unsatisfactory. The Mallophaga examined to date do not confirm any known classification of *Proechimys*, not even that material used in this study. It is apparent from the data now available that species of Mallophaga, especially those in the genus *Gliricola*, are restricted in distribution by characters in the host genus *Proechimys* yet undetected by mammalogists. The data are not adequate to determine whether the host is undergoing divergent or convergent evolution. There is no doubt from the parasite data available that one of these two is occurring, probably influenced to a great extent by the habitats found at different elevations.

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