

## MALLOPHAGA (BITING LICE) AND ANOPLURA (SUCKING LICE). PART II: KEYS AND LOCALITY LISTS OF MALLOPHAGA AND ANOPLURA

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*Abstract.* Forty-two species of Mallophaga and four of Anoplura are recorded from Antarctica. Birds occurring in the area are known to be hosts to at least 60 species of Mallophaga. Keys are presented to all of these. Also included are host and locality records, some notes on synonymy, and a list of antarctic birds and mammals with the species of lice which parasitise them.

Regional lists of Mallophaga are difficult to compile as, in general, lice have a host distribution, not a geographical one,<sup>1</sup> and thus may visit more than one geographical region during a day. Further, it would give a misleading picture of the mallophagan fauna of the Antarctic if only those species taken from a bird while it was actually in the region were included. This account is therefore divided into two: the first includes the genera and species collected in Antarctica with their hosts and localities; the second is a host-parasite list giving all the species known from antarctic birds, wherever these were taken. The keys to the species in the first part include all the species in the host-parasite list and also some other genera which may be found on these birds.

Martin Holdgate has most kindly provided us with a list of birds breeding in Antarctica, and this has formed the basis of our host list; these species are marked (B). In addition, we have included those birds that breed outside Antarctica but range within the region and from which we have Mallophaga collected in Antarctica; these are marked (R).

The records are based on material in the British Museum (Natural History) (B.M.), Bernice P. Bishop Museum (Bishop), and the United States National Museum (U.S.N.M.) (through Dr. K. C. Emerson), and comprise collections from various sources including the Bernice P. Bishop Museum; U. S. Antarctic Research Program; the British, Australian, New Zealand Antarctic Research Expeditions (B.A.N.Z.A.R.E.); the Australian National Antarctic Research Expeditions (A.N.A.R.E.); the Falkland Islands Dependencies Survey (F.I.D.S.); and the British Graham Land Expedition, 1934–1937 (see Clay, 1940). The collec-

tors of this material include the following: J. L. Gressitt, R. Leech, and J. Shoup (Bishop); A. G. Bennett, G. T. Lockley, M. W. Routh, K. H. Voous, and H. M. S. Protector and Operation Tabarin (B.M.); P. Angle, O. S. Flint, R. M. Gilmore, C. C. Olrog, and G. E. Watson (U.S.N.M.), and Dr. I. F. Spellerberg.

This material has been identified by R. L. Edwards, S. von Kéler, G. Timmermann, and T. Clay. Some of the records in the literature have been included, but doubtful identifications have been ignored. The Gressitt and Weber (1959) records have not been cited separately, as these were taken from the literature and are either included in the present paper or discarded as unreliable.

Bibliographical references are given only for those genera and species not included in "A Check List of the Genera and Species of Mallophaga" (Hopkins and Clay, 1952) or "The Sucking Lice" (Ferris, 1951).

### MALLOPHAGA

#### KEY TO ANTARCTIC MALLOPHAGA

1. Maxillary palps present; 3rd antennal segment wine-glass shaped (Fig. 55) .... **AMBLYCERA: MENOPONIDAE**  
Maxillary palps absent; 3rd antennal segment not as above (Fig. 83) .... **ISCHNOCERA: PHILOPTERIDAE**

#### AMBLYCERA: Family MENOPONIDAE

##### KEY TO ANTARCTIC MENOPONIDAE

1. 3rd femur and sternite III with combs of stout setae ..... **Piagetiella caputincisa** (Fig. 51)  
3rd femur and sternite III without combs of stout setae .....
2. Laterodorsal margin of head with narrow preocular slit; antennary fossa pouchlike and closed distally (Fig. 56) (on Suloidea) .... **Eidmaniella**  
Laterodorsal margin of head and antennary fossa otherwise .....
3. Mesosternum with 2 central setae; the 2 anterior dorsal mesothoracic setae each side of midline close to

<sup>1</sup> For a discussion of geographical distribution of Mallophaga see Clay (1964: 14).

- gether (Fig. 57); laterodorsal margin of head sloping evenly to margin of temple without preocular slit or deep notch (Fig. 67), but sometimes with slight indentation ..... 4
- Mesosternum with 3 or more central setae; the 2 anterior mesothoracic setae each side of midline separated (Fig. 58); laterodorsal margin of head with definite preocular notch or if this is shallow, then temples not expanded (Fig. 54) ..... 5
- Prothorax with numerous spinelike and long marginal setae; laterodorsal margin of head with row of short fine setae (Fig. 59) ..... *Ancistrona*<sup>2</sup> (Fig. 52)
- Prothorax with 8 marginal setae each side (Fig. 63), latero-dorsal margin of head without row of short fine setae ..... *Austromenopon*
5. Seta at base of labial palp shorter than palp (Fig. 61); mesosternal plate with 1 central seta (Fig. 62); temples expanded ..... *Actornithophilus piceus* (Fig. 53)
- Seta at base of labial palp twice or more length of palp (Fig. 60); 3 or more mesosternal setae; temples not expanded. (Abdomen elongate and tubular) ..... *Longimenopon galeatum* (Fig. 54)

### Genus *Ancistrona* Westwood, 1874

#### 1. *Ancistrona* sp.? (females only)

- 62°45'S, 28°W (U.S.N.M.) on *Daption capense*  
 66°51'S, 112°05'W, Jan. 1947, Gilmore (U.S.N.M.) on *D. capense*  
 66°51'S, 112°05'W (U.S.N.M.) on *Pagodroma nivea*  
 66°51'S, 112°05'W (U.S.N.M.) on *Fulmarus glacialisoides* ("*Prionella antarctica*")  
 66°55'S, 112°0'W (U.S.N.M.) on *F. glacialisoides* ("*Prionella antarctica*")  
 62°45'S, 28°W, Feb. 1947, Gilmore (U.S.N.M.) on *Thalassioica antarctica*  
 62°00'S, 22°40'W (B.M.) on *T. antarctica*  
 63°25'S, 22°55'W (B.M.) on *T. antarctica*  
 64°01'S, 105°16'E (B.M.) on *T. antarctica*

### Genus *Austromenopon* Bedford, 1939

#### KEY TO ANTARCTIC SPECIES OF *Austromenopon*

1. 3rd seta on prothoracic margin reaches to metathorax (Fig. 63) ..... 2
- 3rd seta on prothoracic margin does not reach to end of prothorax (Fig. 64) [Sitophore of hypopharynx absent (Fig. 65)] ..... *atrofulvum*
2. Pleurite VIII without well marked internal circular thickening [Genital sac with numerous teeth (Fig. 73)] ..... 3
- Pleurite VIII with internal circular thickening (Fig. 70) ..... 4
3. Some anterior pleurites with internal semicircular thickening (inconspicuous in ♂); relative lengths of d.p.s. and m.p.s. 1 as in Fig. 66 ..... *fuscofasciatum*

- Pleurites without internal semicircular thickening; relative lengths of d.p.s. and m.p.s. 1 as in Fig. 63 ..... *transversum*
4. Female without circle of typical anal setae, terminal margins of abdomen with few widely spaced short, stout setae (Fig. 72); last 3 terga more strongly pigmented than rest. Male parameres straight and pointed, genital sac with 3-4 toothlike projections each side (Fig. 74) ..... *affine*
- Female with circle of typical setae round anus. Male genitalia otherwise ..... 5
5. Sitophore of hypopharynx large (Fig. 68); internal pleural thickening large relative to size of pleurite (Fig. 70). Male parameres both with terminal thornlike projections; genital sclerite with horizontal bar (Fig. 75) ..... *ossifragae*
- Sitophore small (Fig. 69); internal pleural thickening small (Fig. 70). Right male paramere outwardly directed with terminal thornlike projection; left paramere inwardly directed and pointed terminally ..... *oschei, daptionis*<sup>3</sup>

*Procellariphaga* Eichler was erected for the species of *Austromenopon* found on the Procellariiformes. In the original description there is no comparison with *Austromenopon sens str.*, but only with *Menopon singularis*, which is an *Eidmanniella*. The most characteristic features of the petrel-infesting species are the annulated last antennal segment and the large, strongly pigmented internal pleural thickening of the abdomen, especially that of VIII; this segment in the rest of *Austromenopon* rarely has the thickening well marked. However, *A. cursorius* (Giebel) from *Cursor cursor* has the large internal thickening of VIII but does not have the last antennal segment annulated; *A. sachelleni* from *Catoptrophorus* has the antennae annulated but the pleural thickening of VIII undeveloped. The male genitalia in species from both groups range from the comparatively simple as in *A. haematopi* from *Haematopus* and *A. paululum* from *Puffinus*, to the more complicated as in *A. transversum* from *Larus* and *A. longithoracicum* from *Puffinus*. Both symmetry (*A. affine*) and asymmetry (*A. brevifimbriatum*) of mesosome and parameres are found in the petrel-infesting species. Species from petrels may (*A. affine*) or may not (*A. paululum*) have the pre-ocular nodus strongly pigmented; the hypopharynx is probably always fully developed in the petrel-infesting species, but those from the Charadriiformes show all stages from the fully developed (*A. phaeopodus*) to those in which the sitophore and epipharyngeal crest are absent (*A. limosae*) (see Clay, 1959: 159); in both groups the length of the third marginal prothoracic seta varies

<sup>2</sup> Only females of antarctic *Ancistrona* are available; without both sexes it is not possible to identify them correctly.

<sup>3</sup> Identification of this species uncertain.

(Clay, 1959: 160). Unless a number of characters are found which are different and constant for the two groups, generic separation does not seem possible or useful.

**1. *Austromenopon affine* (Piaget, 1890)**

Type Host: *Diomedea exulans*

69°52'S, 85°13'W (Thompson, 1938: 3) recorded as *Menopon affine* Piaget

**2. *Austromenopon ?daptionis* (Eichler, 1949)**

Type Host: *Daption capense*

68°18'S, 22°30'W (B.M.) on *Pagodroma nivea* (see Timmermann, 1963: 411)

It is not possible to say from the original description what *daptionis* Eichler is, or whether it is separable from the population on *Thalassoica antarctica* described as *A. oschei*.

**3. *Austromenopon oschei* Timmermann, 1963:412**

Type Host: *Thalassoica antarctica*

65°10'S, 22°55'W (B.M.)

MacRobertson Land (B.A.N.Z.A.R.E.)

Wieneke I. Palmer Arch. (B.M.)

Genus ***Longimenopon*** Thompson, 1948

**1. *Longimenopon galeatum* Timmermann, 1957:9**

Fig. 54

Type Host: *Pelagodroma marina*

South Orkney Is. (F.I.D.S.) on *Pachyptila desolata* (see Timmermann, 1957:12)

Genus ***Piagetella*** Neumann, 1906

**1. *Piagetella caputincisa* Eichler, 1950**

Fig. 51

Type Host: *Phalacrocorax atriceps*

64°26'S, 62°27'W (nr. Buls I., Palmer Arch., 1960, Leech (Bishop))

Argentine Is., Palmer Arch. (B.M.)

Wieneke I., Palmer Arch. (B.M.)

South Orkney Is. (F.I.D.S.)

Berthelot I., Palmer Arch. (B.M.)

Five species of *Piagetella* have been described from cormorants, and, although there are excellent taxonomic characters in the ventral sterna of both males and females, they have not been fully figured even in species described as late as 1950; in fact the most useful figure is that of the first species to be described—*P. incomposita* (Kellogg and Chapman, 1902). The types of all the species will have to be examined before the *Piagetella* from cormorants can be correctly deter-

mined; in the meantime the species from *Phalacrocorax atriceps* will be called *caputincisa* Eichler.

ISCHNOCERA: Family PHILOPTERIDAE

KEY TO ANTARCTIC GENERA OF PHILOPTERIDAE

1. Preantennal region short, ventral carinae<sup>4</sup> characteristic (Fig. 94); abdominal spiracles III-VII near posterior margins of tergites, short, stout, spinelike postspiracular setae with adjacent sensillae on III-V (Fig. 95) .... *Nesiotinus* (Figs. 76-77)  
Without above combination of characters ..... 2
- 2(1). Marginal (m.c.) and ventral (v.c.) carinae entire (as in Fig. 98). Fore coxa extended posteriorly as pointed spine (Fig. 99); pteronotum without anterior setae, ♂ anogenital opening dorsal; ♀ abdomen with 8 apparent segments ..... *Austrogoniodes* (Fig. 79)  
Without above combination of characters ..... 3
- 2(2). Ventral carina (v.c.) with part flattened and parallel to that of other side (Fig. 97); pteronotum without anterior setae [Anterior plate well developed] ..... 4
- Ventral carinae otherwise; pteronotum with anterior setae ..... 7
- 4(3). Second and 3rd tibiae with lateral fringe of numerous hyaline setae (Fig. 100); many long temporal setae; 2+2 or more setae on margin of pronotum ..... *Docophoroïdes*  
Without above combination of characters ..... 5
- ♂ genital opening ventral, anal opening terminal, anal setae ventral or terminal (as in Fig. 101); ♀ has, posterior to vulva, many long inwardly directed setae with elongated alveoli (Fig. 115) [2+2 pronotal marginal setae] ..... *Pectinopygus turbinatus* (Fig. 78)  
♂ genital and anal opening and anal setae close together on dorsal surface (as in Fig. 102); ♀ without postvulval setae as above ..... 6
- 5(4). Tergum II (1st apparent tergum) without anterior setae; left mandible with tooth on molar lobe (Fig. 103); dorsal anterior plate with posterior margin pointed and characteristically thickened (Fig. 97) ..... *Saemundssonia*  
Tergum II with anterior setae; left mandible without tooth on molar lobe; anterior plate not as above ..... *Quadraceps* (Fig. 90)
- Marginal and ventral carinae entire; distal end of 2nd and 3rd tibiae with 7 hyaline setae; 3rd episternum laterally expanded (Fig. 104); exoskeleton with reticulate surface ..... *Episbates pederiformis* (Fig. 81)  
Without above combination of characters ..... 8
- Dorsum of head with stout, peglike setae; anterior region of head strongly modified (Fig. 105) ..... *Trabeculus* (Fig. 80)  
Head without these characters ..... 9

<sup>4</sup> Carina: internal ridge-like thickening of the cuticle (see Clay, 1951:176).

- 9(8). Head with a dorsal carina passing anteriorly and medianly from level of antenna (Fig. 147)  
*Pelmatocerandra*  
 Head not as above..... 10
- 10(9). Ventral carina merging with semicircular edge of sclerotization round oral cavity and not joined to marginal carina each side; carina mostly complete round anterior margin of head; hyaline margin present; no definite dorsal anterior plate; dorsal carinae pigmented, fused or approximate in midline (Fig. 128); ♂ genitalia mainly unpigmented, mesosome with vertical striations; vulva indented with horizontal row of 4–6 evenly spaced setae.  
*Perineus*  
 Without above combination of characters..... 11
- 11(10). Ventral carina as in *Perineus* above; hyaline margin present, small semicircular anterior plate; ♂ genitalia large and strongly pigmented. Vulva similar to that of *Perineus* with more setae, ♀ posterior sternites as in Fig. 83. ♂ antennae greatly enlarged (Fig. 82)  
*Haffneria grandis*  
 Ventral carinae passing forward to fuse with marginal carina each side and enclosing ventral suture (sclerotised and sculptured surface of head sometimes covers anterior part of this suture (Clay, 1951: 183)); dorsal anterior plate present. Without combination of characters for *grandis* above..... 12
- 12(11). Dorsal carinae not strongly pigmented; ventral carinae without anterior pigmented part; ♂ genitalia unpigmented; vulva indented with the inner setae each side separated from remainder (Fig. 122)  
*Paracalasis*  
 Part of dorsal carinae pigmented; ventral carinae with anterior pigmented part; and without above combination of characters..... 13
- 13(12). Large (5–10 mm), "hyaline" margin pigmented; antennae greatly enlarged (Fig. 84); ♀ vulva similar to that of *Perineus*; triangular anterior plate (Fig. 126)  
*Harrisoniella*  
 (= *Diomedicola* Kéler)  
 Without above combination of characters..... 14
- 14(13). Dorsal carinae as fused bar across head (Fig. 131)  
*Pseudonirmus*  
 Dorsal carinae otherwise..... 15
- 15(14). Marginal carina without lateral suture, dorsal preantennal suture from anterior end of marginal carinae (Fig. 149)  
*Philoceanus*  
 Marginal carina divided into pre- and postmarginal carina, dorsal preantennal suture from anterior end of postmarginal carina (Fig. 88)  
..... 16
- 16(15). Dorsal carinae pass posteriorly, close together, to less than midpoint of area between antennae and origin of dorsal carinae; shape of head as in Fig. 134. Lateral abdominal thickening as in Fig. 142  
*Bedfordiella simsi* ♂  
 Dorsal carinae, shape of head, and lateral abdominal thickening of ♂ not as above ..... 17
- 17(16). Head with dorsal posterior prolongation of ventral carina (Fig. 88). ♂ abdominal tergal thickening as in Fig. 88, ♀ as in Fig. 141; stout forms  
*Naubates*  
 Ventral carinae and abdominal thickening not as above; narrow elongate forms (Fig. 87)  
..... 18
- 18(17). Dorsal carinae reaching near or to level of mandibles (Fig. 148)  
*Halipeurus turtur*  
 (see Edwards, 1961: 149)  
 Dorsal carinae not reaching beyond midpoint of area between antennae and origin of dorsal carinae (Fig. 87)  
*H. pelagicus*  
 (see Edwards, ibid: 155)

#### NOTE ON THE PHILOPTERIDAE OF THE PROCELLARIIFORMES

The lice belonging to the groups referred to in couplets 7–18 of the above key probably originated from a single ancestral stock which diverged after it became parasitic on the Procellariiformes; the resulting groups are still rather similar, owing perhaps partly to retention of ancestral characters and partly to parallel development of similar stocks in a similar environment. Uncorrelated divergence seems to have taken place in the different groups, so that abdominal characters, for instance, may be similar in two groups whereas the head characters are different. This makes the grouping of species and the delineation of genera difficult and explains the rather long diagnoses in the key. Generic separation becomes largely a matter of opinion. It is possible to have a few large genera comprising rather diverse species or, perhaps as a necessary interim stage, many small genera. In this paper we have used the genera as accepted by Dr. von Kéler and Dr. Timmermann; we have followed Timmermann (1966: 85) in considering *grandis* as generically distinct from *Perineus* and from *Harrisoniella* (= *Diomedicola* Kéler), where it was placed by Kéler (1957: 509). The internal male genitalia of *Harrisoniella* are distinguished from those of *grandis* and other Philopteridae of which these organs are known by the presence of two large, backwardly directed diverticula from the base of the vesicular apparatus (Fig. 116). However, the phylogenetic value of the internal male genitalia is doubtful (Clay, 1958: 124).

#### Genus *Austrogoniodes* Harrison, 1915

A key to all the species of this genus is included in the preceding paper in this volume.

**1. *Austrogoniodes antarcticus* Harrison, 1937**

Type Host: *Pygoscelis adeliae*

King George V Land (Harrison, 1938:20)

Ross I., Cape Evans, Jan. 1960, Gressitt (Bishop)

**2. *Austrogoniodes cristati* Kéler, 1952**

Type Host: *Eudyptes c. crestatus*

Gibbs I., South Shetland Is., Jan. 1966, Flint & Watson (U.S.N.M.) on *Eudyptes chrysolophus*

**3. *Austrogoniodes gressitti* Clay, n. sp.**

(see preceding paper)

Type Host: *Pygoscelis p. papua*

Anvers I., Antarctic Peninsula, Jan. 1966, Gressitt, on *P. papua* and *P. antarctica*

Deception I., South Shetland Is. (Neumann, 1913: 195) on *Pygoscelis antarctica*

Deception I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *P. antarctica*

**4. *Austrogoniodes keleri* Clay, n. sp.**

(see preceding paper)

Type Host: *Eudyptes c. crestatus*

Gibbs I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *Eudyptes chrysolophus*

**5. *Austrogoniodes macquariensis* Harrison, 1937**

Type Host: *Eudyptes c. crestatus*

Elephant I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *E. chrysolophus*

Gibbs I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *E. chrysolophus*

**6. *Austrogoniodes mawsoni* Harrison, 1937**

Type Host: *Aptenodytes forsteri*

King George V Land (Harrison, 1937:15)

McMurdo Sound, Jan. 1960, Gressitt (Bishop)

Mawson (A.N.A.R.E.)

**Genus *Docophoroides* Giglioli, 1864**

**KEY TO ANTARCTIC SPECIES OF *Docophoroides***

**MALES**

1. Genitalia without terminal expansion. (Fig. 106) [Anterior plate broader than long, antennal segment III swollen distally with terminal segments set at angle] ..... *harrisoni*  
Genitalia with terminal anchor shaped expansion (Fig. 107) ..... 2
2. Anterior plate (Fig. 108) considerably broader than long; antennal segment III elongated and swollen distally with terminal segments set at angle (Fig. 111) ..... *brevis*

Anterior plate longer than broad or approximately as long as broad; antennae not as above ..... 3

3. Anterior margin of anterior plate emarginate, plate considerably longer than broad (Fig. 109) ..... *murphyi*  
Anterior margin of anterior plate straight, plate slightly longer or approximately as long as broad (Fig. 110) ..... *simplex*

**FEMALES**

1. Internal genital sclerite not apparent ..... *harrisoni*  
Internal genital sclerite present ..... 2
2. Single large internal genital sclerite (Fig. 112) ..... *brevis*  
Three internal sclerites: 2 anterior (spermathecal sclerites), and one posterior (Figs. 113-114) ..... 3
3. Anterior margin of anterior plate emarginate, plate considerably longer than broad (Fig. 109) ..... *murphyi*  
Anterior margin of anterior plate straight, plate slightly longer or approximately as long as broad (Fig. 110) ..... *simplex*

*Docophoroides chilensis* Carriker, 1964, can be mentioned here, although the host, *Diomedea epomophora*, is not found in Antarctica, as it is almost certainly a synonym of *Docophoroides brevis*. It was described from a nymph, but the description agrees in measurements and characters with nymphs of *brevis*, and the British Museum (Nat. Hist.) has many specimens of *brevis* from *Diomedea epomophora*. There seems little doubt, therefore, that *D. chilensis* is a synonym of *D. brevis* (new synonymy).

**1. *Docophoroides brevis* (Dufour, 1835)**

Type Host: *Diomedea exulans*

Deception I., South Shetland Is. (Neumann, 1913: 195)

**2. *Docophoroides harrisoni* Waterston, 1917**

Type Host: *Diomedea melanophris*

60°24'S, 62°55'W (Clay, 1940: 298)

**3. *Docophoroides murphyi* (Kellogg, 1914)**

Type Host: *Macronectes giganteus*

King George V Land (Harrison, 1937: 42) recorded as *D. hunteri* Harrison, 1937

**4. *Docophoroides simplex* (Waterston, 1914)**

Type Host: *Diomedea melanophris*

King George V Land (Harrison, 1937: 41) on *Macronectes giganteus*, probably straggler

**Genus *Haffneria* Timmermann, 1966**

**1. *Haffneria grandis* (Piaget, 1880)**

Figs. 82, 83

Type Host: *Stercorarius* sp.

King George I., South Shetland Is. (Carriker, 1958: 186); de-

- scribed as *Perineus antarcticus* Carriker, 1958, on *Catharacta maccormicki*  
 Wiencke I., Palmer Arch. (B.M.) on *Catharacta skua*  
 McMurdo Sound, Jan. 1960, Gressitt (Bishop) on *C. skua*  
 Little America, Dec. 1959, Gressitt (Bishop) on *C. skua*  
 Greenwich I., S. Shetland Is., 1960, Leech (Bishop) on *C. skua*  
 Penguin I., S. Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on  
*C. skua*  
 Weddell Sea, 61°49'S, 48°52'W, Flint & Watson (U.S.N.M.) on  
*C. skua*

*Perineus antarcticus* Carriker, 1958: 186 was based on a nymph taken from *Catharacta maccormicki* and is most probably a synonym of *grandis*.

#### Genus **Harrisoniella** Bedford, 1929

Material of this genus is insufficient to make a key to the species *ferox* and *hopkinsi* (see Kéler, 1957: 502–504) and *chilensis* Carriker, 1964.

##### 1. **Harrisoniella hopkinsi** Eichler, 1952:40

Fig. 84

Type Host: *Diomedea exulans*

Deception I., South Shetland Is. (Neumann, 1913:192), recorded as *H. ferox* (Giebel, 1867)

#### Genus **Naubates** Bedford, 1930

##### KEY TO ANTARCTIC SPECIES OF **Naubates**

- Dorsal carinae sexually dimorphic; posterior vertical part of each carina does not reach level of mandibles (Fig. 89). The 2 anterior pteronotal setae in ♂ longer than 2nd tibia..... *prioni*  
 Dorsal carinae not sexually dimorphic, posterior part reaches to level of mandibles (Fig. 88). Anterior pteronotal setae in ♂ short..... *fuliginosus*

The other species of *Naubates* (*N. testaceus* Taschenberg, 1882) recorded from an antarctic bird (*Daption capense*) was described from a nymph. It was most probably a straggler on *Daption* as there is no authenticated record of *Naubates* from this host.

##### 1. **Naubates fuliginosus** (Taschenberg, 1882)

Fig. 88

Type Host: *Diomedea exulans*

62°04'S, 87°24'E (B.M.) on *Procellaria aequinoctialis*

#### Genus **Paracclisis** Timmermann, 1965

##### KEY TO ANTARCTIC SPECIES OF **Paracclisis**

- Last 2 abdominal segments in ♂ narrowly prolonged (Fig. 119); parameres narrow (Fig. 143); ♀ edge of vulva with 3+3 setae (Fig. 122)..... *diomedaeae*  
     (Figs. 117-118)  
     Without above combination of characters..... 2
- Thickening of head scarcely pigmented; anterior plate

triangular; ♂ posterior segment of abdomen as in Fig. 120; parameres continuous with basal apodeme (Figs. 125, 144); ♀ vulva with rounded shallow indentation (Fig. 124)..... *hyalina*  
     (Fig. 85)

Thickening of head strongly pigmented; anterior plate small and oval; ♂, posterior segments of abdomen as in Fig. 121; parameres not continuous with basal apodeme (Fig. 153); ♀ vulva with deep indentation (Fig. 123)..... *obscura*

#### 1. **Paracclisis diomedaeae** (J. C. Fabricius, 1775)

Type Host: *Diomedea melanophris*

62°24'S, 62°55'W (Clay, 1940: 300)  
 63°15'S, 98°46'E (B.M.) on *Phoebetria palpebrata*  
 Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.) on *P. palpebrata*

#### 2. **Paracclisis obscura** (Rudow, 1869)

Type Host: *Macronectes giganteus*

Petermann I., Palmer Arch. (Neumann, 1913: 195) recorded as *Lipeurus gaini* Neumann  
 King George V Land (Harrison, 1937: 29)  
 69°52'S, 85°13'W (Thompson, 1938: 6)  
 62°50'S, 10°55'W (B.M.)  
 Wiencke I., Palmer Arch. (B.M.)  
 South Shetland Is. (F.I.D.S.)  
 Anvers I., Palmer Arch., Jan. 1966, Flint & Watson (U.S.N.M.)  
 Penguin I., South Shetland Is., Jan. 1966, Flint & Watson (U.S.N.M.)

#### Genus **Pectinopygus** Mjöberg, 1910

##### 1. **Pectinopygus turbinatus** (Piaget, 1890)

Fig. 78

Type Host: Unknown, but probably *Phalacrocorax atriceps* or *Phalacrocorax albiventer*  
 South Orkney Is. (F.I.D.S.) on *Phalacrocorax atriceps*  
 Wiencke I., Palmer Arch. (B.M.) on *P. atriceps*  
 64°26'S, 62°27'W, nr. Bells I., Palmer Arch., Mar. 1960, R. Leech (Bishop) on *P. atriceps*  
 Gonzales Videla, Danco Coast, Jan. 1961, R. & T. Leech (Bishop) on *P. atriceps*  
 Gaston I., Feb. 1966, Flint & Watson (U.S.N.M.) on *P. atriceps*

#### Genus **Perineus** Harrison in Thompson, 1936

##### KEY TO ANTARCTIC SPECIES OF **Perineus**

- Dorsal carinae join to form narrow, elongate V-shaped mark (Fig. 130)..... *concinnooides*  
     Dorsal carinae do not form narrow, elongate V-shaped mark..... 2
- Head as in Fig. 128<sup>3</sup>..... *nigrolimbatus*  
     Head as in Fig. 129<sup>3</sup>..... *circumfasciatus*

The type host of *circumfasciatus* is *melanophris*; specimens from *Macronectes* differ somewhat in pro-

<sup>3</sup> See also Kéler (1957).

portions but can be included as *P. circumfasciatus* *sens. lat.*

**1. *Perineus circumfasciatus* Kéler, 1957**

Type Host: *Diomedea melanophris*

Weddell Sea (U.S.N.M.) on *Phoebetria palpebrata*

**2. *Perineus nigrolimbatus* (Giebel, 1874)**

Type Host: *Fulmarus glacialis*

King George V Land (Harrison, 1937: 30) on *Priocella antarctica*

Stillwell I., King George V Land (Harrison, 1937: 30) on *P. antarctica*

Clarence I., South Shetland Is. (Clay, 1940: 299) on *P. antarctica*

Wiencke I., Palmer Arch. (B.M.) on *P. antarctica*

63°13'S, 99°27'E (B.M.) on *P. antarctica*

59°35'S, 66°33'E (B.M.) on *P. antarctica*

Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.) on *P. antarctica*

Larsen I., South Orkney Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *P. antarctica*

62°45'S, 28°W, Feb. 1947, Gilmore (U.S.N.M.) on *P. antarctica*

62°55'S, 112°0'W, Jan. 1947, Gilmore (U.S.N.M.) on *P. antarctica*

62°51'S, 112°05'W, Jan. 1947, Gilmore (U.S.N.M.) on *P. antarctica*

**Genus *Philoceanus* Kellogg, 1903**

**1. *Philoceanus fasciatus* (Carriker, 1958: 184)**

Fig. 86

Type Host: *Oceanites oceanicus* (probably error)

South Orkney Is. (F.I.D.S.) on *Fregatta tropica melanogaster*

Deception I., S. Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *Fregatta tropica*

Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.) on *Fregatta tropica*

Elephant I., S. Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.) on *Fregatta tropica*

This species was described from specimens said to have come from *Oceanites oceanicus*. However, as the figures appeared to represent specimens in the British Museum (Nat. Hist.) from *Fregatta tropica*, the collector, Dr. Olrog, was approached through the kindness of Dr. K. Hayward of the Fundacion Miguel Lillo; it was ascertained that in the collecting bag together with *Oceanites* were specimens of *Fregatta tropica* and *Sterna vittata*. There seems little doubt that the true host of *fasciatus* is *Fregatta tropica*, and that *P. wolfherrei* Timmermann, 1961, is a synonym.

**2. *Philoceanus robertsi* (Clay, 1940)**

Fig. 149

Type Host: *Oceanites oceanicus*

Argentine Is., Palmer Arch. (Clay, 1940: 313)

64°26'S, 62°27'W, nr. Buls I., Palmer Arch., Mar. 1960, R. Leech (Bishop)

**Genus *Pseudonirmus* Mjöberg, 1910**

**KEY TO ANTARCTIC SPECIES OF *Pseudonirmus***

1. Marginal carina of head divided into pre- and post-marginal carinae (Fig. 132) ..... 2
2. No definite premarginal carina (Fig. 131) ..... *charcoti*
2. Lateral internal abdominal thickening as in Figs. 137, 140; head as in Fig. 133; ..... *gurlii*
2. Lateral internal abdominal thickening as in Figs. 136, 139; head as in Fig. 132; ..... *lugubris*

*Lipeurus caudatus* from *Fulmarus glacialisoides* ("*Priocella antarctica*") was placed by Taschenberg (1882: 153), who saw a drawing by Rudow, near his species *P. gurlii*, so that it can be presumed that Rudow's species was a *Pseudonirmus*; Taschenberg considered that the species was not identifiable. The name *caudatus* should be treated as a *nomen dubium* and not used again (see also Timmermann, 1961: 31).

**1. *Pseudonirmus charcoti* (Neumann, 1907)**

Type Host: *Pagodroma nivea*

Booth-Wandel I., Palmer Arch. (Neumann, 1907: 16)

King George V Land (Harrison 1937: 26)

66°50'S, 12°22'W (B.M.)

Wiencke I., Palmer Arch. (B.M.)

South Orkney Is. (F.I.D.S.)

66°51'S, 112°05'W (U.S.N.M.)

Nelson I., South Shetland Is., Mar. 1964, Watson (U.S.N.M.)

Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.)

**2. *Pseudonirmus gurlii* (Taschenberg, 1882)**

Type Host: *Daption capense*

Petermann I., Palmer Arch. (Neumann, 1913: 192)

70°56'S, 100°17'W (Thompson, 1938: 6)

Deception I., South Shetland Is. (Clay, 1940: 298)

65°20'S, 10°30'W (B.M.)

61°25'S, 22°40'W (B.M.)

Wiencke I., Palmer Arch. (B.M.)

63°20'S, 87°39'E (B.M.)

66°51'S, 112°05'W (U.S.N.M.)

Nelson I., South Shetland Is., Mar. 1964, Watson (U.S.N.M.)

Elephant I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.)

**3. *Pseudonirmus lugubris* (Taschenberg, 1882)**

Type Host: *Thalassoica antarctica*

Stillwell I., King George V Land (Harrison, 1937: 26) as *P. antarcticus* Harrison

King George V Land (Harrison, 1937: 26) as *P. antarcticus* Harrison

61°30'S, 23°W (B.M.)

62°00'S, 22°40'W (B.M.)

63°28'S, 95°45'E (B.M.)

South Shetland Is. (B.M.)

Bellingshausen Sea (B.M.)  
 62½°S, 62½°W (B.M.)  
 Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.)  
 66°51'S, 112°05'W, Jan. 1947, Gilmore (U.S.N.M.)

Genus ***Quadraceps*** Clay and Meinertzhagen, 1939

KEY TO ANTARCTIC SPECIES OF ***Quadraceps***

1. Lateral pigmentation of abdominal segments horizontal; parameres, except tips, unpigmented (Fig. 90). ***punctatus***  
***sublingulatus***  
 Lateral pigmentation of abdominal segments either vertical or bilobed (Fig. 91); parameres pigmented ... 2
2. Gular plate strongly pigmented; ♂ basal apodeme with distal cross bar ..... 3
3. Gular plate not strongly pigmented; ♂ basal apodeme without distal cross bar ..... ***ornatus*** (Fig. 91)
3. Breadth of head over 0.50 mm ..... ***alpha*** (Fig. 93)  
 Breadth of head under 0.50 mm ..... 4
4. Head relatively broader, breadth:length = 0.90–94;  
 ♀ with pigmented meso-metasternal plate (Fig. 146) ..... ***houri***  
 Head relatively narrower, breadth:length = 0.82–85;  
 ♀ without pigmented meso-metasternal plate (Fig. 145) ..... ***sellatus***

The *Quadraceps* commonly found on *Chionis* was identified by Timmermann (1952: 218) as *Q. ornatus antarcticus*; this is near *ornatus fuscolaminulus* from *Larus dominicanus*, from which it differs mainly by the smaller and lighter areas of pigmentation (Figs. 91, 92). Timmermann suggested that this established population of a gull-infesting type of *Quadraceps* on *Chionis* was probably due to secondary infestation; the true *Quadraceps* on *Chionis* is perhaps *Q. vaginalis* (Timmermann, 1963), known only from *Chionis minor*.

1. ***Quadraceps alpha*** (Kellogg, 1914)

Type Host: *Catharacta skua antarctica*

Ross Ice Shelf, Little America, Dec. 1959, Cressitt (Bishop) on *Catharacta maccormicki*

2. ***Quadraceps antarcticus*** Timmermann, 1952

Type Host: *Gabianus scoresbyii*

Wiencke I., Palmer Arch. (B.M.) on *Chionis alba*  
 South Orkney Is. (F.I.D.S.) on *Chionis alba* (see Timmermann, 1952: 218)

3. ***Quadraceps houri*** Hopkins, 1949

Type Host: *Sterna paradisaea*

Nelson I. (U.S.N.M.) on *Sterna vittata*

Genus ***Saemundssonia*** Timmermann, 1935

KEY TO ANTARCTIC SPECIES OF ***Saemundssonia***

1. Postspiracular seta and sensillus on tergite III (2nd apparent segment); hyaline margin of head with deep median indentation (Fig. 156) ..... 2

- No postspiracular seta on tergite III (Fig. 168); hyaline margin without deep median indentation ..... 3
- 2(1). Parameres and penis long (Fig. 157); breadth of ♀ head over 0.65 mm ..... ***desolata***
- Parameres and penis short (Fig. 158); breadth of ♀ head under 0.63 mm. ***platycephalus*** Group
- 3(1). Setae of sternite II & III long [Meso- and metasternal setae present] ..... 4
- Setae of sternite II & III short and spinelike (one on III occasionally long) (Fig. 168) ..... 5
- 4(3). Endomeres as in Fig. 154; ♀ head as in Fig. 175 ..... ***nivea***
- Endomeres as in Fig. 155; ♀ head as in Fig. 176 ..... ***stammeri***
- 5(3). Tergocentral setae of IV (= 3rd apparent segment) less than 6 in number<sup>a</sup>; ♂ genitalia with toothed vestige of genital sac (Fig. 160) ..... 6
- Tergocentral setae of IV, 6 or over; ♂ genitalia without toothed vestige of genital sac ..... 7
- 6(5). Preantennal region short (Fig. 177); ♂ genitalia as in Fig. 160 ..... ***gaini***
- Preantennal region longer (Fig. 178); ♂ genitalia as in Fig. 161 ..... ***bicolor***
- 7(5). Females ..... 8
- Males ..... 9
- 8(7). Head width over 0.70 mm; normally marginal setae of penultimate tergite 3 + 3 or over ..... ***stresemanni***
- Head width under 0.70 mm; normally marginal setae of penultimate tergite 2 + 2 ..... ***lari, sterna, lockleyi***
- 9(7). Basal apodeme with distal cross bar (Fig. 162, b); mesosome with dorsal membrane (m) ..... ***stresemanni***
- Basal apodeme without cross bar and mesosome without dorsal membrane ..... 10
- 10(9). Endomeres joined anteriorly by narrow strip (Fig. 165) ..... ***lari***
- Endomeres not joined ..... 11
- 11(10). Parameres and endomeres as in Figs. 169, 171, 172 ..... ***sterna***
- Parameres and endomeres as in Figs. 170, 173, 174 ..... ***lockleyi***

*Saemundssonia antarctica* (Wood) (Harrison, 1937), said to have been taken from *Pagodroma nivea*, has the male genitalia (shown in Harrison, 1937, Pl. II, Fig. 3) similar to those of *S. lari*. It seems probable that the specimens were stragglers from one of the Laridae and that *antarctica* is a synonym of *S. lari* (Fabricius).

Since the preparation of this paper, the reference to *Docophorus bicolor* Rudow in Timmermann (1965: 75) has been seen. Timmermann considers that Rudow's species is unrecognizable and that it should be rejected as a *nomen dubium*. However, there is little

<sup>a</sup> Does not include the lateral post-spiracular seta each side.

doubt that the description, which is rather better than most of Rudow's, can apply only to the *Saemundssonia* among the species parasitic on *Priocella antarctica*. The majority of the species described by the early workers on Mallophaga are not recognizable by modern standards, and as most of the types are lost (unlike the recent unrecognizable species), it has been the practice, a most reasonable one, that the name should be applied to the species from the type host, unless there are in the description some characters quite inapplicable to the species. For these reasons, and as *bicolor* has always been used for the *Saemundssonia* species from *Priocella antarctica*, Rudow's name is here retained. *S. occidentalis* (Kellogg, 1896), parasitic on *Fulmarus glacialis*, differs from *bicolor*, at least in the proportions of the head.

The *Saemundssonia platycephalus* group comprises the population from *Oceanites gracilis* (*S. platycephalus* Kellogg & Kuawana, 1902), *Oceanites oceanicus*, and *Pelagodroma marina* (*S. marina* Timmermann, 1956). The *Saemundssonia* males from *Oceanites oceanicus* listed below appear to be the same as the male type of *S. marina*, and both may be *S. platycephalus*. Only a single male, the lectotype, has been seen from the type host of this latter species, and it is not possible to see the details of the genitalia in this specimen. Further material is needed from *Pelagodroma marina* and *Oceanites gracilis* to decide the status of these populations. In this paper the specimens from *Oceanites oceanicus* are called *Saemundssonia marina* Timmermann.

### 1. *Saemundssonia bicolor* (Rudow, 1870)

Type Host: *Priocella antarctica*

Clarence I., South Shetland Is. (Clay, 1940: 297)

62°S, 26°W (B.M.)

63°13'S, 99°27'E (B.M.)

Wiencke I., Palmer Arch. (B.M.)

Larsen I., South Orkney Is., Feb. 1966, Flint & Watson (U.S.N.M.)

Weddell Sea (U.S.N.M.)

### 2. *Saemundssonia desolata* Timmermann, 1959:151

Type Host: *Pachyptila desolata*

61°59'S, 85°54'E (Timmermann, 1959: 153)

### 3. *Saemundssonia gaini* (Neumann, 1913)

Type Host: *Macronectes giganteus*

Petermann I., Palmer Arch. (Neumann, 1913: 169)

### 4. *Saemundssonia lari* (O. Fabricius, 1780)

Type Host: *Larus hyperboreus*

Petermann I., Palmer Arch. (Neumann, 1913: 188) on *Larus dominicanus*

South Orkney Is. (F.I.D.S.) on *L. dominicanus*

Wiencke I., Palmer Arch. (B.M.) on *L. dominicanus*

Deception I., South Shetland Is. (B.M.; Bishop)

Avian I., nr. Adelaide I., off Palmer Peninsula, Jan. 1966, Flint & Watson (U.S.N.M.) on *L. dominicanus*

Litchfield I., off Anvers I., Ant. Peninsula, Jan. 1966, Flint & Watson (U.S.N.M.) on *L. dominicanus*

### 5. *Saemundssonia lockleyi* Clay, 1949

Type Host: *Sterna vittata*

Petermann I., Palmer Arch. (Neumann, 1913: 188) recorded as *Philopterus melanocephalus* Nitzsch

Wiencke I., Palmer Arch. (Clay, 1949: 11)

Greenwich I., S. Shetland Is., 1960, R. Leech (Bishop)

Penguin I., South Shetland Is., Feb. 1966, Flint & Watson (U.S.N.M.)

Nelson I., South Shetland Is., Mar. 1964, Watson (U.S.N.M.)

### 6. *Saemundssonia ?marina* Timmermann, 1956:191

Type Host: *Pelagodroma marina*

65°18'S, 10°30'W (B.M.) on *Oceanites oceanicus*

### 7. *Saemundssonia nivea* Timmermann, 1956:190

Type Host: *Pagodroma nivea*

63°18'S, 22°30'W (B.M.)

63°13'S, 99°27'E (B.M.)

South Orkney Is. (F.I.D.S.)

Wiencke I., Palmer Arch. (B.M.)

Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.)

66°51'S, 112°05'W, Jan. 1947, Gilmore (U.S.N.M.)

61°30'S, 23°W (B.M.) on *Thalassoica antarctica*

### 8. *Saemundssonia stammeri* Timmermann,

1959:149

Type Host: *Daption capense*

63°21'S, 87°39'E (Timmermann, 1959: 151)

62°25'S, 9°20'W (B.M.)

65°20'S, 10°30'W (B.M.)

61°25'S, 22°40'W (B.M.)

Clarence I., South Shetlands (B.M.)

Nelson I., South Shetland Is., Mar. 1964, Watson (U.S.N.M.)

### 9. *Saemundssonia stresemanni* Timmermann,

1949

Type Host: *Catharacta skua*

Cape Royds, 77°32'S, 166°12'E (Neumann, 1911: 20) on *C. maccormicki* recorded as *Docophorus lari* (O. Fabricius)

King George V Land (Harrison, 1937: 22) recorded as *Philopterus pustulosus* (Nitzsch)

Wieneke I., Palmer Arch. (B.M.)

Greenwich I., S. Shetland Is., Feb. 1960, Leech (Bishop)

Little America, Ross Ice Shelf, Dec. 1959, Gressitt (Bishop) on *C. maccormicki*

Cape Royds, 19–23 Dec. 1963, I. F. Spellerberg on *C. maccormicki*

Weddell Sea, Feb. 1966, Flint & Watson (U.S.N.M.)

Genus *Trabeculus* Rudow, 1866KEY TO ANTARCTIC SPECIES OF *Trabeculus*

1. 2 stout peglike spines on dorsum of head in ♂ and ♀; 3 long setae on each temple; ♂ 1st antennal segment enlarged (Fig. 150); genitalia as in Fig. 151 ..... *heteracanthus* (=schillingi)
- 6 (♂), 4 (♀) stout peglike spines on dorsum of head; 2 long setae on each temple; ♂ 1st antennal segment not enlarged; genitalia as in Fig. 152 ..... *hexacon* (Fig. 80)

*Trabeculus heteracanthus* (Waterston) was described from specimens taken from *Macronectes giganteus* and *Oceanites oceanicus*. As there are no other records of *Trabeculus* from these two hosts, it seems possible that the original specimens were stragglers. The type material of *T. heteracanthus* appears to be the same as *schillingi* Rudow, 1866, although specimens are somewhat larger and can be included as *schillingi* *sens lat.*

1. *Trabeculus hexacon* (Waterston, 1914)Type Host: *Procellaria aequinoctialis*

66°04'S, 87°24'E (B.M.)

## ANOPLURA

## Family ECHINOPHTHIRIDAE Enderlein

This family is found only on the Pinnipedia (seals) of the order Carnivora.

## KEY TO ANTARCTIC GENERA OF Echinophthiridae

1. Antennae 5-segmented ..... *Antarctophthirus*
- Antennae 4-segmented ..... *Lepidophthirus*

Genus *Antarctophthirus* Enderlein, 1906KEY TO ANTARCTIC SPECIES OF *Antarctophthirus*

1. Pro and mesosternite with a pair of setae<sup>7</sup>. [Metasternite without setae (according to Harrison (1937))]. *mawsoni*  
Pro- and mesosternite without setae ..... 2
2. Metasternum with setae ..... *lobodontis* (Fig. 180)  
Metasternum without setae ..... *ogmorrhini* (Fig. 179)

1. *Antarctophthirus lobodontis* Enderlein, 1909Type Host: *Lobodon carcinophagus*

Booth-Wandel I., Palmer Arch. (Neumann, 1907: 13), recorded as *A. ogmorrhini*  
Argentine Is., Palmer Arch. (Clay, 1940: 296)  
Coulman I., Victoria Land, 18 Jan. 1965, J. Shoup (Bishop)

2. *Antarctophthirus mawsoni* Harrison, 1937Type Host: *Ommatophoca rossi*

King George V Land (Harrison, 1937: 11)

3. *Antarctophthirus ogmorrhini* Enderlein, 1906Type Host: *Hydrurga leptonyx*

- Victoria Land (Enderlein, 1909: 476)  
Argentine Is., Palmer Arch. (Clay, 1940: 296) on *Leptonychotes weddelli*  
Wilkes Station (B.M.) on *L. weddelli*  
McMurdo Sound, Jan. 1960, Gressitt, Leech (Bishop) on *L. weddelli*  
Franklin I., Ross Sea, Jan. 1965, Shoup (Bishop) on *L. weddelli*

Genus *Lepidophthirus* Enderlein, 1904*Lepidophthirus macrorhini* Enderlein, 1904

Fig. 181

Type Host: *Mirounga leonina*

Wiencke I., Palmer Arch. (B.M.)

This is the only species in the genus.

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## R E F E R E N C E S

- Carriker, M. A. 1958. Neotropical Mallophaga miscellany, No. 7: New Mallophaga from the Antarctic. *Acta Zool. Lill.* 15: 183-188.
1964. Descriptions of new and little known species of Mallophaga (Insecta) from maritime hosts of Chile, South America. *Publ. Cent. Estud. Entomol. Univ. Chile* 6: 1-26.
- Clay, T. 1940. Anoplura. *Sci. Rep. Br. Graham Ld. Exped.* 1: 295-318.
1949. Species of the genus *Saemundssonia* (Mallophaga from the Sterninae). *Amer. Mus. Novit.*, No. 1409: 1-25.
1954. The post-spiracular seta and sensillus in the Mallophaga (Insecta). *Ann. Mag. Nat. Hist.* (12), 7: 716-718.
1957. Mallophaga from Tristan da Cunha. Part I. Res. Norw. Sci. Exped. Tristan da Cunha, 1937-1938, No. 40, pp. 1-6.
1958. Revisions of Mallophaga genera. *Degeeriella* from the Falconiformes. *Bull. Brit. Mus. Nat. Hist., Entomol.* 7: 123-207.
1964. Geographical distribution of the Mallophaga (Insecta). *Bull. Brit. Ornithol. Club* 84: 14-16.
- Clay, T., and G. H. E. Hopkins. 1955. Notes on the Rudow Collection of Mallophaga at Hamburg. *Mitt. Hamb. Zool. Mus. Inst.* 53: 49-73.
- Eichler, W. 1949. Phthirapterorum Nova Genera. *Boll. Soc. Ent. Ital.* 79: 11-13.

<sup>7</sup> See Harrison (1937:12) for definition of scales and setae.

1949. Notulae Mallophagologicae. XV. Sturmvogel-Federlinge. Rev. Brasil. Biol. 9: 337-347.
1952. Mallophagen-Synopsis 25, Genus *Harrisoniella*. Beitr. Vogelk. 2: 40-43.
- Edwards, R. L. 1961. Studies of the Philopteridae (Mallophaga) from birds of the order Procellariiformes. I. The genus *Halipeurus* Thompson. J. Parasitol. 47: 125-157.
- Enderlein, G. 1909. Die Insekten des Antarktischen Gebietes. Deutsches Südpol.-Exped. 10: 361-528.
- Ferris, G. F. 1934. Contributions towards a monograph of the sucking lice. Pt. VII, Stanford Univ. Publ., pp. 473-526.
1951. The Sucking Lice. Mem. Pacific Coast. Entomol. Soc. 1: 1-320.
- Gressitt, J. L., and N. A. Weber. 1959. Bibliographic introduction to Antarctic-Subantarctic entomology. Pacific Ins. 1: 441-480.
- Harrison, L. 1937. Mallophaga and Siphunculata. Sci. Rep. Australas. Antarct. Exped. (C) 2: 1-47.
- Hopkins, G. H. E., and T. Clay. 1952. Checklist of Mallophaga. Brit. Mus. (N.H.).
- Kéler, S. von. 1953. Resultados de um reconhecimento zoológico no Alto Limpopo effectuado pelos Drs. F. Zumpt e J. A. T. Santos Dias. IV: Notes on some Mallophages from mammals and gallinaceous birds in Mocambique and South Africa. Document "Mocambique", No. 72: 13-62.
1954. The Mallophaga from *Eudyptes chrysolophus* (Brandt) And *E. cristatus* (Miller). Proc. Roy. Entomol. Soc. Lond. (B) 23: 49-59.
1957. Die Mallophaga von Sturmvägeln und Ruderfussern. I. *Harrisoniella* Bedford und *Perineus* Thompson (Mallophaga). Beitr. Entomol. 7: 493-527.
- King, J. 1964. Seals of the World. Brit. Mus. (N.H.): 1-154.
- Neumann, L. G. 1907. Pédiculidés, Mallophages, Ixodidés. Expéd. Antarct. Française, Arthropoda: 13-17.
1911. Mallophages. Brit. Antarct. Exped. Biol. Rep. Sci. Inv. 2(3): 19-22.
1913. Mallophaga. Deuxième Antarct. Expéd. Française, Anthroponda: 187-196.
- Thompson, G. B. 1938. Résultats du voyage de la Belgica en 1897-99. Zoologie. Mallophaga. Rap. Sci. Expéd. Antarct. Belg., Anvers: 1-6.
- Timmermann, G. 1952. The species of the genus *Quadraceps* (Mallophaga) from the Larinae, with some remarks on the systematics and the phylogeny of the gulls. Part I. Ann. Mag. Nat. Hist. (12) 5: 209-222.
1956. *Quadraceps niethammeri* n.sp. und andere neue Federlinge aus den Gattungen *Quadraceps*, *Saemundssonia* und *Austromenopon*. Bonn. zool. Beitr. 7: 186-192.
1957. Mallophaga from Tristan da Cunha. Part II. Some remarks on the genus *Longimenopon* Thompson, 1948. Res. Norw. Sci. Exped. Tristan da Cunha 1937-1938, No. 41: 7-12.
1959. Drei neue Sturmvägel federlinge. Zool. Anz. 162: 148-153.
1961. Gruppen-Revisionen bei Mallophagen. I. Genus *Nau-bates* Bedford, 1930. Zool. Anz. 166: 173-191.
1961. Gruppen-Revisionen bei Mallophagen. IV. Genera *Pseudonirmus* Mjöberg, 1910, *Bedfordiella* Thompson, 1937 und *Episbates* Harrison, 1935. Z. Parasitenk. 21: 30-45.
1963. Gruppen-Revisionen bei Mallophagen. VI. Die *Austromenopon*-Arten der Sturmvägel. Z. Parasitenk. 22: 401-427.
1963. A new *Quadraceps* (Mallophaga, Ischnocera) parasitizing sheathbills (*Chionis*). Proc. Linn. Soc. N.S.W. 88: 161-3.
1964. Gruppen-Revisionen bei Mallophagen. VII. Die *Pectinopygus*-Arten der Grosskormorane. (Gen. *Phalacrocorax* Brisson, 1760 s.str.) Mitt. Hamburg Zool. Mus. Inst.: 271-284.
1965. Die Federlingsfauna der Sturmvägel und die Phylogenies des procellariiformen Vogelstammes. Abh. Verh. Naturw. Ver. Hamburg (8 suppl.): 1-249.
1966. *Haffneria* nov. gen., ein neues Mallophagengenuss von Raubmöwen. Mitt. Hamburg Zool. Mus. Inst. 63: 85-89.

## HOST - PARASITE LIST

(Asterisk indicates species from type-host. (B) = breeds in Antarctica. (R) = ranges in Antarctica)

## HOST (BIRDS)

## SPHENISCIFORMES

- (B) *Aptenodytes forsteri* Gray, 1844
- (B) *Pygoscelis papua* (Forster, 1781)
- (B) *Pygoscelis adeliae* (Hombron & Jacquinot, 1841)
- (B) *Pygoscelis antarctica* (Forster, 1781)
- (B) *Eudyptes chrysolophus* (Brandt, 1837)

## MALLOPHAGA

- \**Austrogoniodes mawsoni* Harrison, 1937
- \**Austrogoniodes gressitti* Clay, n. sp.
- \**Austrogoniodes antarcticus* Harrison, 1937
- Austrogoniodes gressitti* Clay, n. sp. [Bishop, B.M.]
- \**Austrogoniodes bicornutus* (Kéler, 1954:56)
- Austrogoniodes cristati* Kéler, 1952:230 [Kéler, 1954:49]
- Austrogoniodes hamiltoni* (Harrison, 1937) [B.M.]
- Austrogoniodes macquariensis* (Harrison, 1937) [B.M.]
- Austrogoniodes keleri* Clay, n. sp. [U.S.N.M.]

## PROCELLARIIFORMES

- (R) *Diomedea exulans* Linné, 1758
- (R) *Diomedea melanophris* Temminck, 1828
- (R) *Phoebetria palpebrata* (Forster, 1785)
- (B) *Macronectes giganteus* (Gmelin, 1789)
- (B) *Daption capense* (Linné, 1758)
- (B) *Pachyptila desolata* (Gmelin, 1789)
- (B) *Fulmarus glacialisoides* ("*Priocella antarctica*") (Stephens, 1826)
- (B) *Thalassoica antarctica* (Gmelin, 1789)
- (R) *Procellaria aequinoctialis* Linné, 1758
- (B) *Pagodroma nivea* (Forster, 1777)
- \**Austromenopon affine* (Piaget, 1890)
- \**Perineus concinnoides* Kéler, 1957:521
- \**Paracopsis hyalina* (Neumann, 1911)
- \**Naubates fuliginosus* (Taschenberg, 1882)
- \**Harrisoniella hopkinsi* Eichler, 1952:40
- \**Docophoroides brevis* (Dufour, 1835)
- \**Episbates pederiformis* (Dufour, 1835)
- \**Perineus circumfasciatus* Kéler, 1957:525
- \**Paracopsis diomedae* (J. C. Fabricius, 1775)
- \**Harrisoniella ferox* (Giebel, 1867)
- \**Docophoroides harrisoni* Waterston, 1917
- \**Docophoroides simplex* (Waterston, 1914)
- Perineus circumfasciatus* Kéler, 1957 [Kéler, 1957:525]
- Paracopsis diomedae* (J. C. Fabricius, 1899) [Clay, 1940:300]
- \**Austromenopon ossifragae* (Eichler, 1949:12)
- \**Paracopsis obscura* (Rudow, 1869)
- Perineus circumfasciatus* Kéler, 1957 *sens. lat.* [B.M.]
- \**Docophoroides murphyi* (Kellogg, 1914)
- \**Trabeculus heteracanthus* (Waterston, 1912)
- = *T. schillingi* Rudow, 1866 *sens. lat.*
- \**Saemundssonia gaini* (Neumann, 1913)
- \**Austromenopon daptionis* (Eichler, 1949: 344)
- \**Ancistriona procellariae* Westwood, 1874
- \**Naubates testaceus* (Taschenberg, 1882)
- \**Pseudonirmus gurli* (Taschenberg, 1882)
- \**Saemundssonia stammeri* Timmermann, 1959: 149
- \**Naubates prioni* (Enderlein, 1909)
- Halipeurus turtur* Edwards, 1961:149 [B.M.]
- \**Saemundssonia desolata* Timmermann, 1959:151
- Longimenopon galeatum* Timmermann, 1957:9
- [Timmermann, 1957:12]
- Ancistriona* sp.
- Perineus nigrolimbatus* (Giebel, 1874) [Kéler, 1957:513]
- \**Harrisoniella chilensis* Carriker, 1964:16
- \**Saemundssonia bicolor* (Rudow, 1870)
- Ancistriona* sp.
- \**Austromenopon oschei* Timmermann, 1963:412
- \**Pseudonirmus lugubris* (Taschenberg, 1882)
- Saemundssonia nivea* Timmermann, 1956
- Naubates fuliginosus* (Taschenberg, 1882)
- [Timmermann, 1961:177]
- \**Trabeculus hexacon* (Waterston, 1914)
- Ancistriona* sp.
- Austromenopon ?daptionis* (Eichler, 1949)
- [Timmermann, 1963: 411]
- \**Pseudonirmus charcoti* (Neumann, 1907)
- \**Saemundssonia nivea* Timmermann, 1956:190

- (B) *Oceanites oceanicus* (Kuhl, 1820)      *Halipeurus pelagicus* (Denny, 1842) [Edwards, 1961:155]  
 (B) *Fregetta tropica* (Gould, 1844)      *Philoceanus robertsi* (Clay, 1940)  
*Saemundssonia marina* Timmermann, 1956:191 [B.M.]  
*Halipeurus pelagicus* (Denny, 1842) [Edwards, 1961:156]  
*Philoceanus fasciatus* (Carriker, 1958:184) [B.M.]

## PELECANIFORMES

- (B) *Phalacrocorax atriceps* (King, 1828)

- \**Piagetiella caputincisa* (Eichler, 1950)  
*Pectinopygus turbinatus* (Piaget, 1890) [Timmermann, 1964:280]

## CHARADRIIFORMES

- (B) *Chionis alba* (Gmelin, 1789)

- Quadraceps antarcticus* Timmermann, 1952:218  
 [Timmermann, 1952:218]

- (B) *Catharacta skua* (Brünnich, 1764)

- Harrisoniella grandis* (Piaget, 1880) [Kéler, 1957:509]  
 \**Saemundssonia stresemanni* Timmermann, 1949

- (B) *Catharacta maccormicki* (Saunders, 1893)

- \**Quadraceps alpha* (Kellogg, 1914)  
*Harrisoniella grandis* (Piaget, 1880) [B.M.]  
*Saemundssonia stresemanni* Timmermann, 1949  
 [I. F. Spellerberg coll. 1964]

- (B) *Larus dominicanus* (Lichtenstein, 1823)

- Actornithophilus piceus* (Denny, 1842) *sens. lat.* [B.M.]  
*Austromenopon transversum* (Denny, 1842) [B.M.]  
*Saemundssonia lari* (O. Fabricius, 1780) [B.M.]  
 \**Quadraceps ornatus fuscolaminulatus* (Enderlein, 1908)  
*Quadraceps punctatus sublingulatus* Timmermann, 1952:  
 215 [Timmermann, 1952:215]

- (B) *Sterna vittata* Gmelin, 1789

- \**Saemundssonia lockleyi* Clay, 1949  
*Quadraceps houri* Hopkins, 1949 [Clay, 1957:4]  
*Quadraceps sellatus* (Burmeister, 1838) [Clay, 1957:4]

## HOST (MAMMALS)

## ANOPLURA

No records

## CARNIVORA (PINNIPEDIA)

## Otariidae

- Arctocephalus tropicalis* (Gray, 1872)

- Antarctophthirus ogmorrhini* Enderlein, 1906 [Clay, 1940:296]

## PHOCIDAE (MONACHINAE)

- Leptonychotes weddelli* (Lesson, 1826)

- \**Antarctophthirus lobodontis* Enderlein, 1909

- Lobodon carcinophagus* (Hombron &

- \**Antarctophthirus ogmorrhini* Enderlein, 1906

Jacquinot, 1842)

- \**Antarctophthirus mawsoni* Harrison, 1937

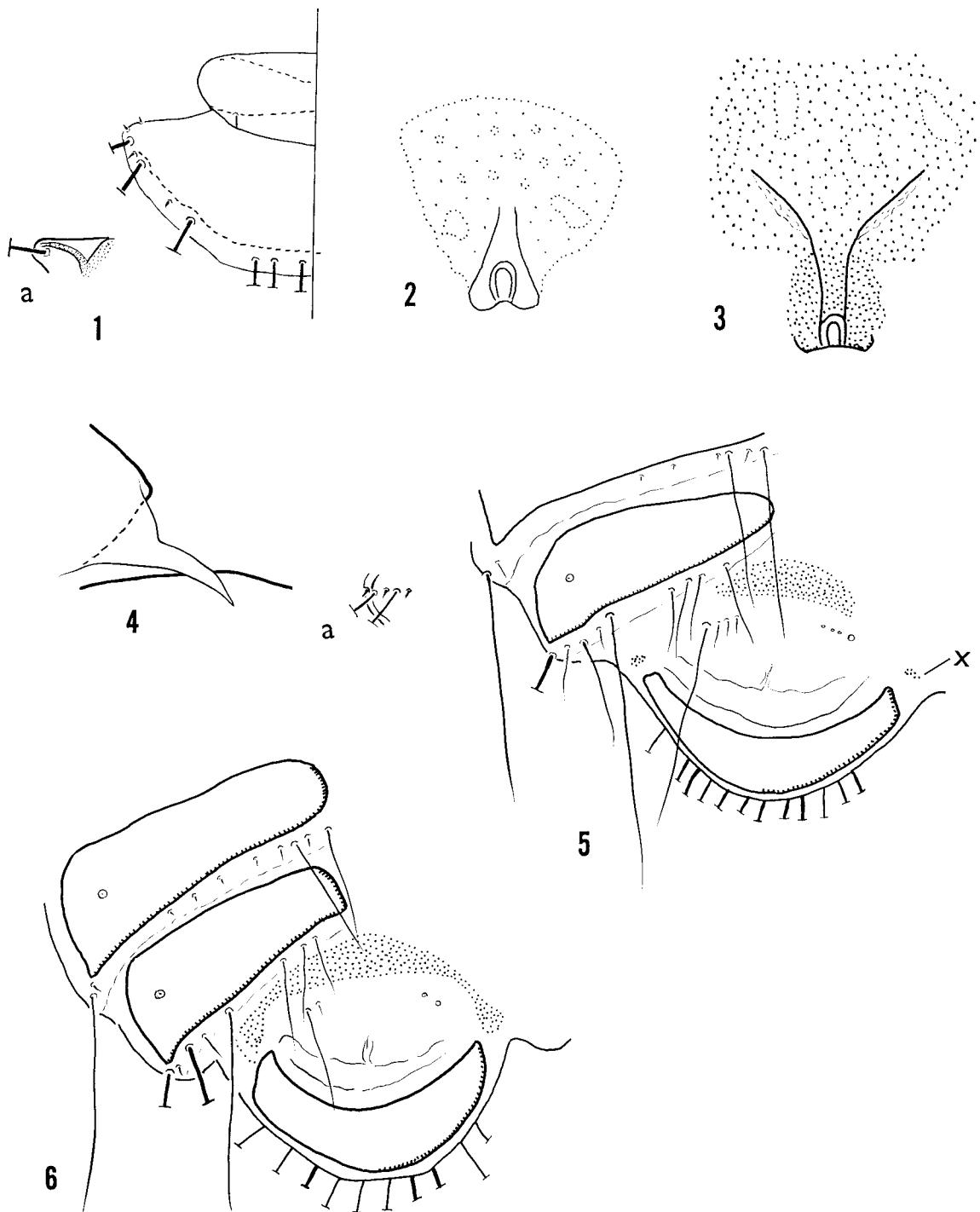
- Hydrurga leptonyx* (Blainville, 1820)

- \**Lepidophthirus macrorhini* Enderlein, 1904

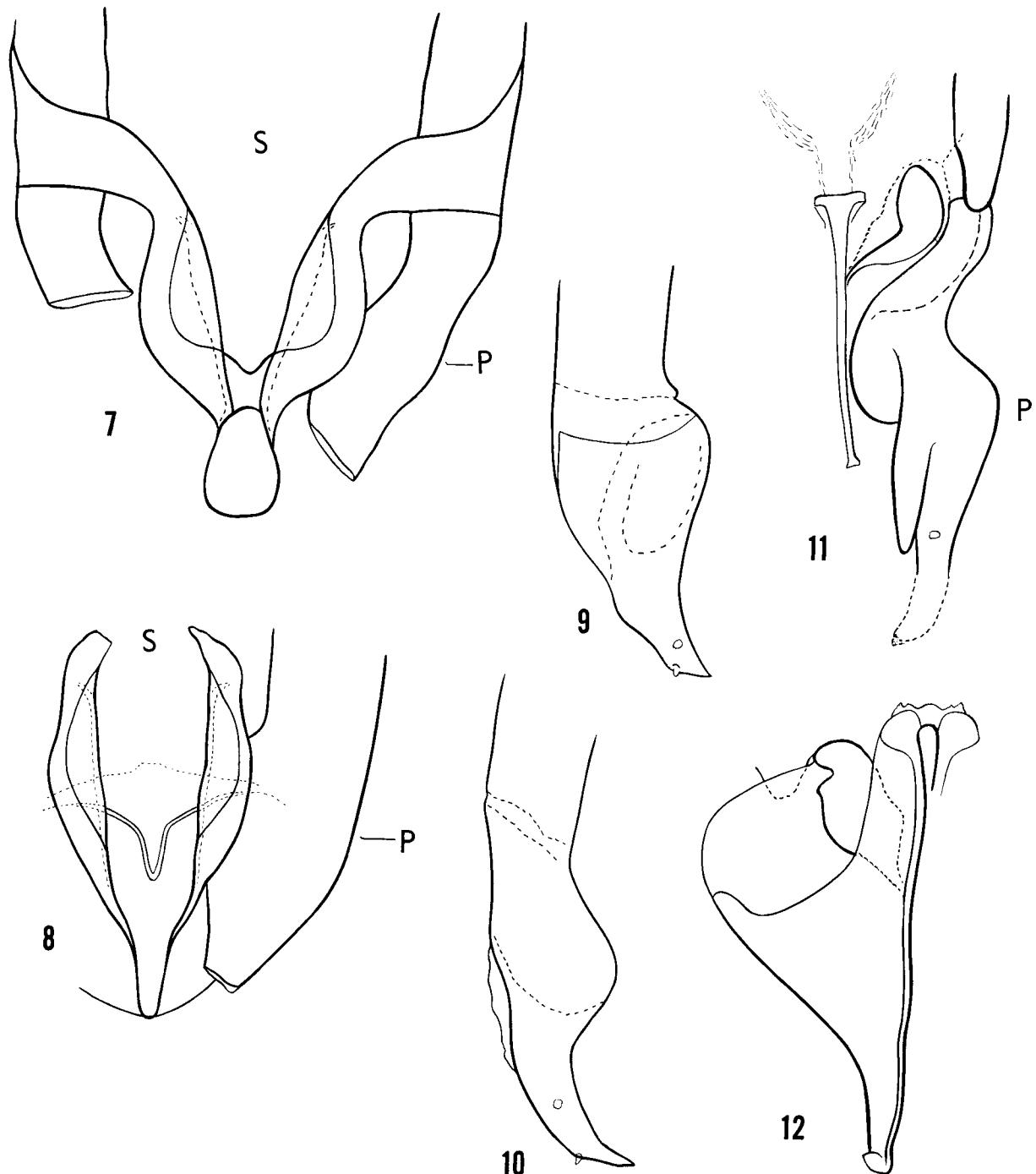
- Ommatophoca rossi* (Gray, 1844)

## PHOCIDAE (CYSTOPHORINAE)

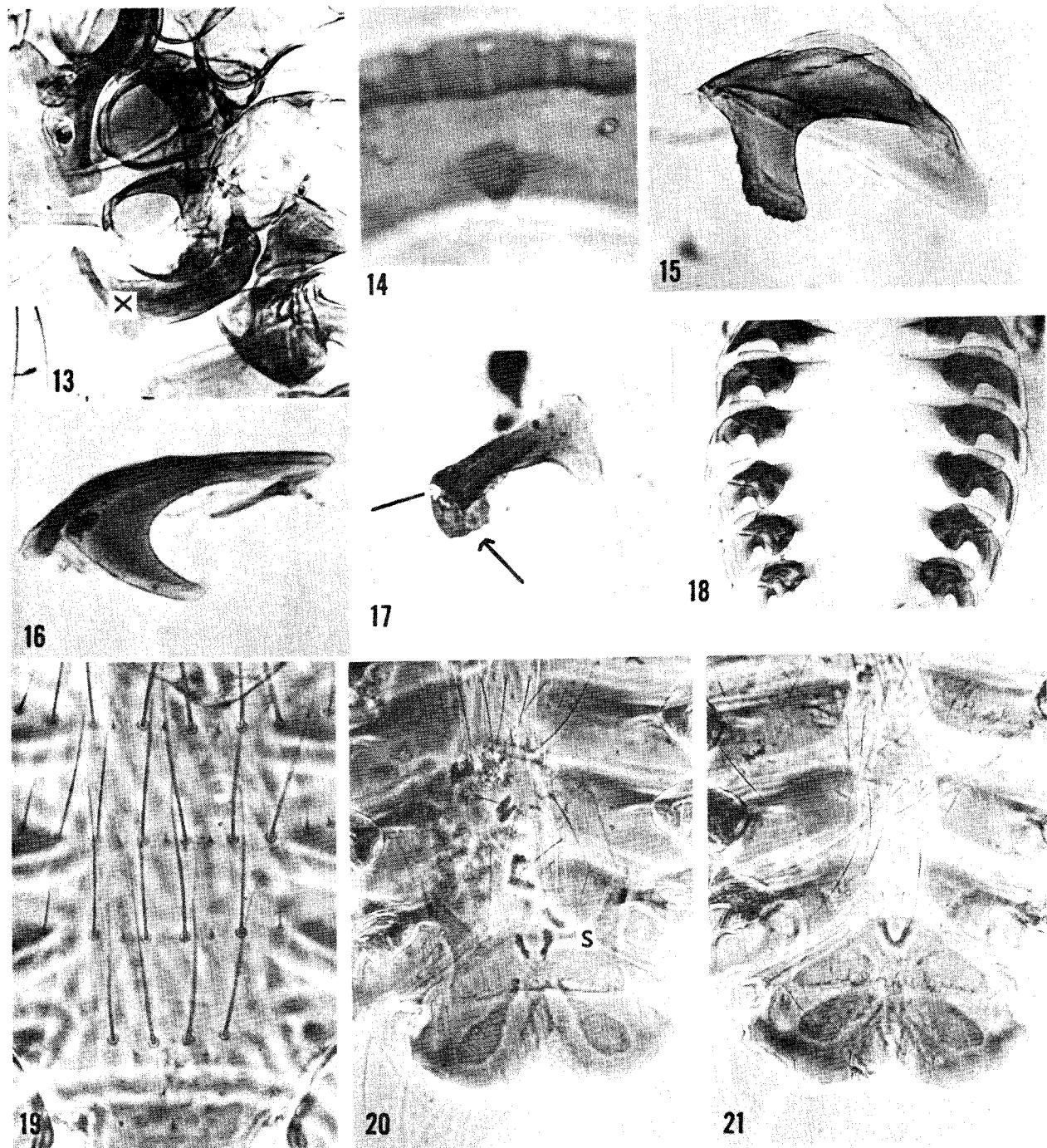
- Mirounga leonina* (Linné, 1758)



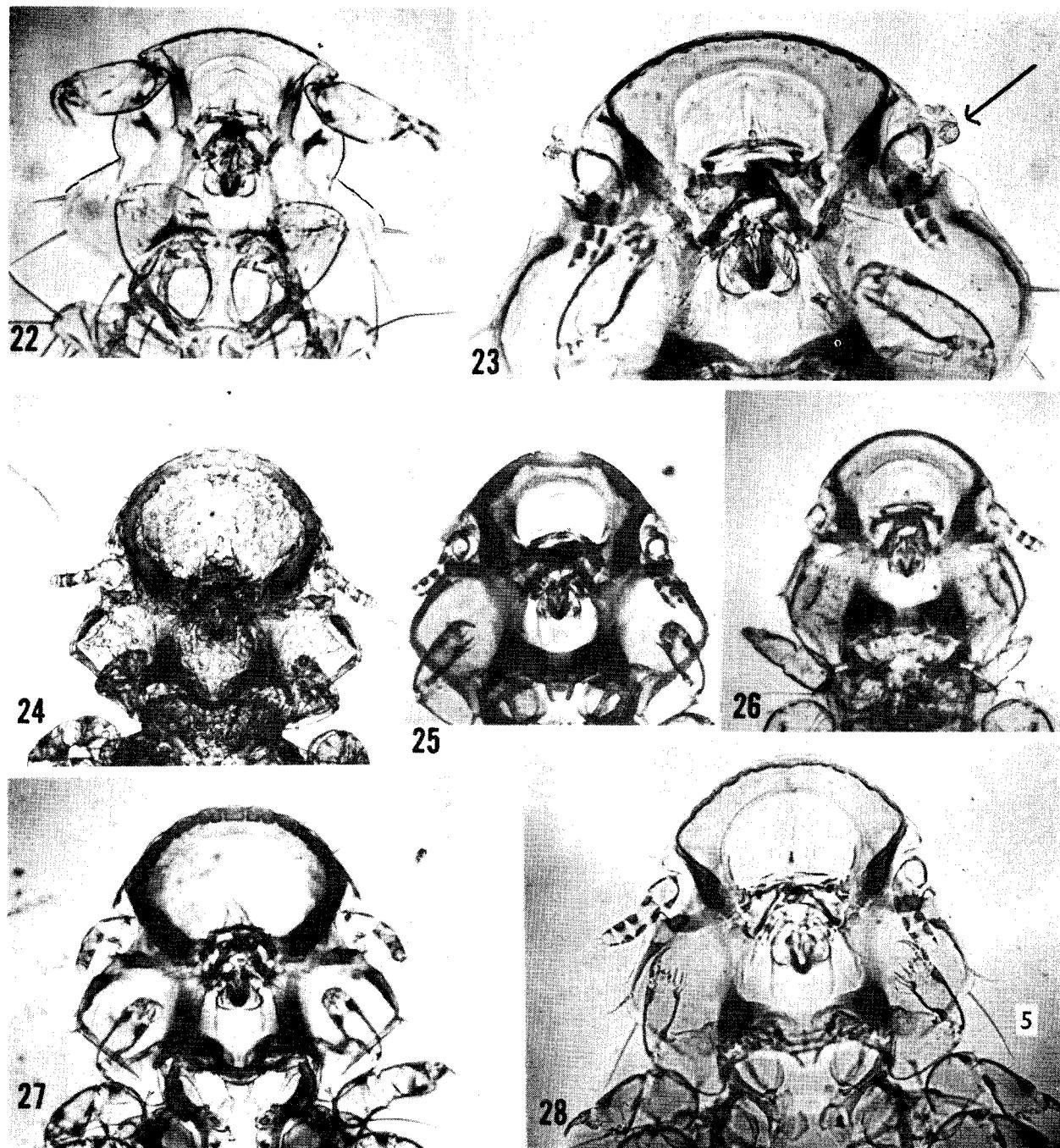
Figs. 1-6, *Austrogoniodes* spp. 1, *A. antarcticus*, thorax (a, ventral pterothoracic seta); 2, *A. antarcticus*, median penial sclerite; 3, same, *A. gressitti*; 4, *A. keleri*, attenuated conus (appendix coni sens. Kéler, 1952); 5, terminal terga of ♂ abdomen, *A. gressitti* (a, pleural setae of VII); 6, same, *A. antarcticus*.



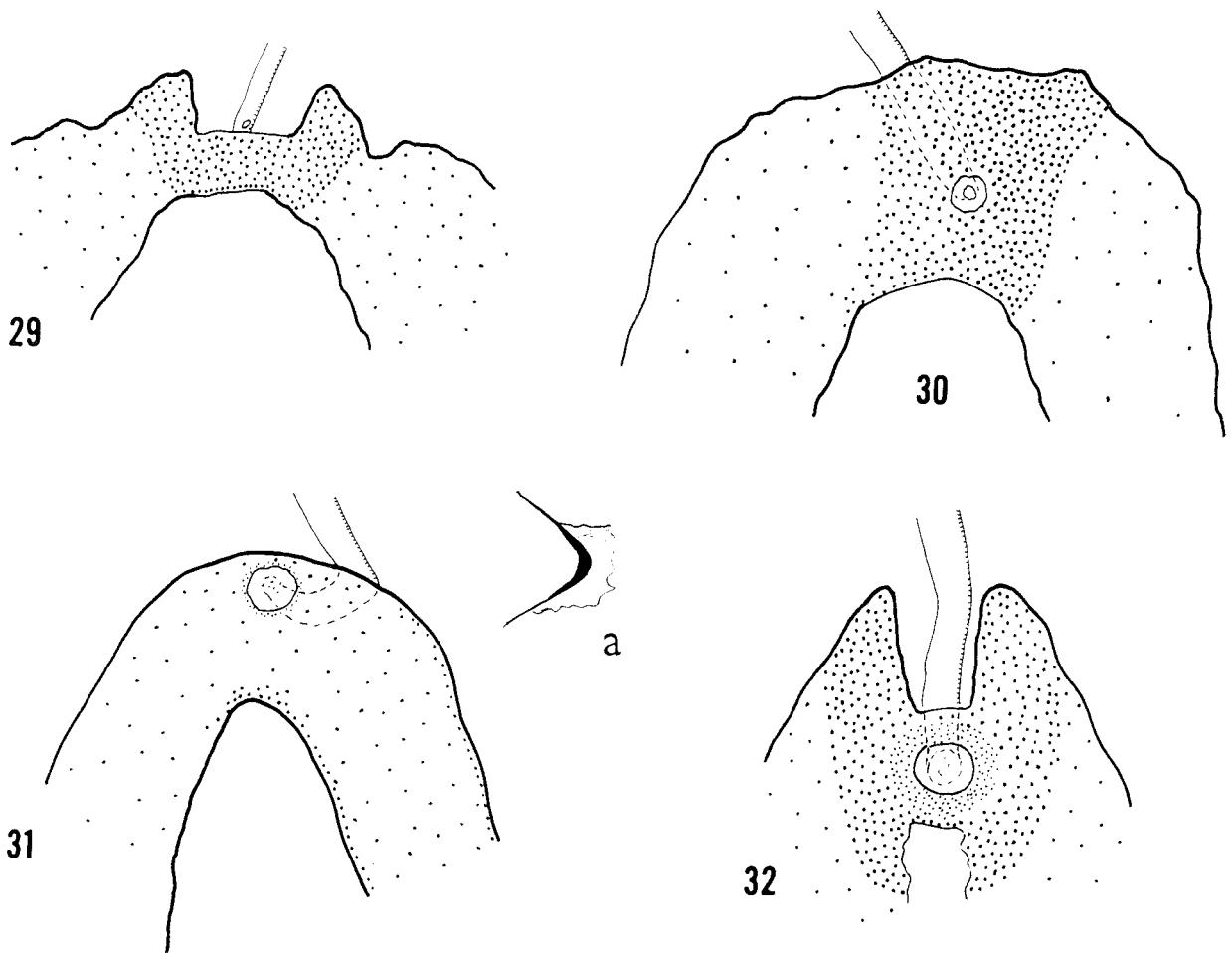
Figs. 7-12, ♂ genitalia of *Austrogoniodes* spp. 7, *A. gressitti*; 8, *A. antarcticus*; 9, *A. antarcticus*, paramere; 10, *A. gressitti*, same; 11-12, *A. keleri*; position of median penial sclerite; p, paramere. Dotted end of paramere in Fig. 11 taken from specimen from *E. chrysolophus*.



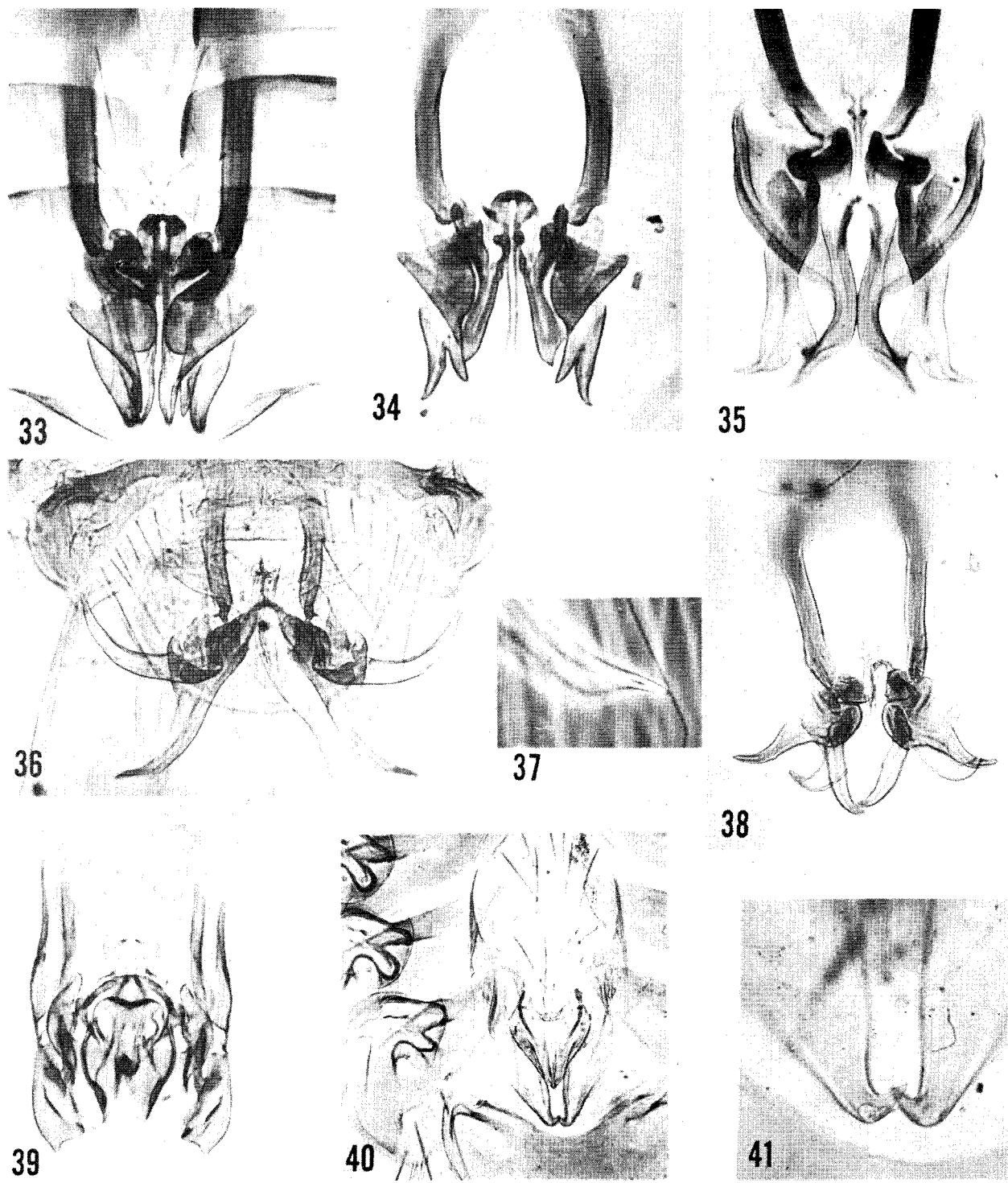
Figs. 13-21. *Austrogoniodes* spp. 13, *A. maesoni* ♀ (♂), internal sclerite of II; 14, *A. waterstoni* ♀, part of dorsum of pre-antennal region; 15, internal flap of tergite II, *A. hamiltoni*; 16, same, *A. antarcticus*; 17, sclerite X of Fig. 13; 18, *A. antarcticus*, ♀, pleural thickening of II-VII; 19, *A. antarcticus*, ♂, sternal chaetotaxy; 20, terminal segments, ♀, abdomen, *A. antarcticus* (S, spermathecal sclerite); 21, same, *A. gressitti*.



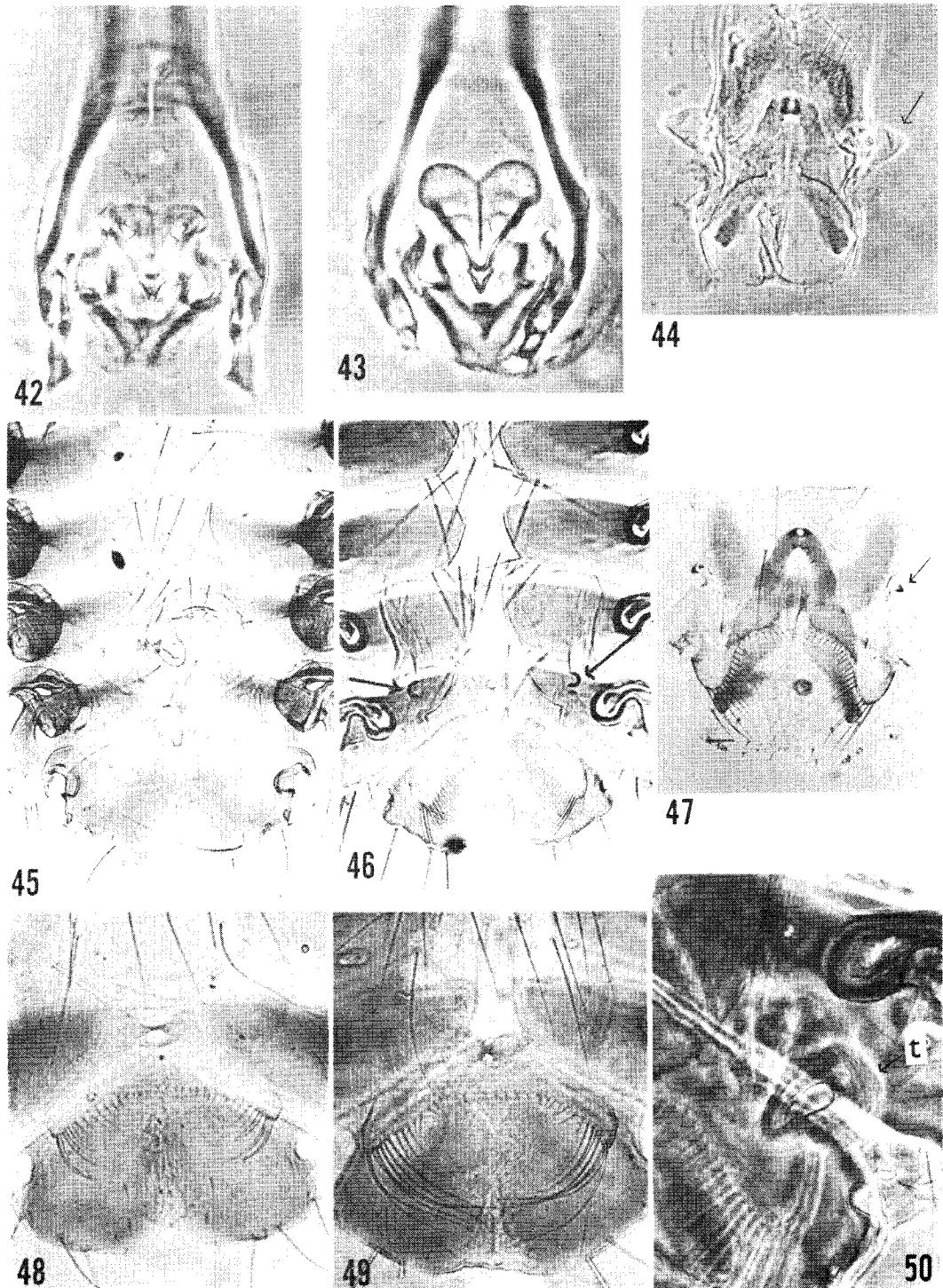
Figs. 22-28, *Austrogoniodes* spp., heads. 22, *A. keleri* ♂; 23, *A. hamiltoni* ♀, arrow shows hyaline outgrowth from antennal fossa; 24, *A. breripes* ♀, lectotype; 25, *A. demersus* ♀; 26, *A. betasciatius* ♀; 27, *A. maesoni* ♀; 28, *A. antarcticus* ♂ (5, temple seta 5x).



Figs. 29-32, *Austrogoniodes* spp., ♀—spermathecal sclerites. 29, *A. concisus*; 30, *A. hamiltoni*; 31, *A. macquariensis* (a, lateral pouch, see Fig. 17); 32, *A. bicornutus*.



Figs. 33-41. *Austrogoniodes* spp., ♂ genitalia. 33, *A. keleri*; 34, *A. macquariensis*; 35, *A. hamiltoni*; 36, *A. conci*; 37, tip of paramere of 36; 38, *A. bicornutus*; 39, *A. waterstoni*; 40, *A. mawsoni*; 41, tips of parameres of 40.



Figs. 42-50. *Austrogoniodes* spp. 42, ♂ genitalia, *A. cristatus*; 43, same, *A. bifasciatus*; 44, genital sclerites of ♀, *A. hamiltoni*; 45, same, *A. macsoni*; 46, same, *A. bicornutus* (arrows point to lateral pouches); 47, same, *A. macquariensis*; 48, same, *A. cristatus*; 49, same, *A. bifasciatus*; 50, ♀, *A. macquariensis*, to show internal pleural thickening of IX, t.

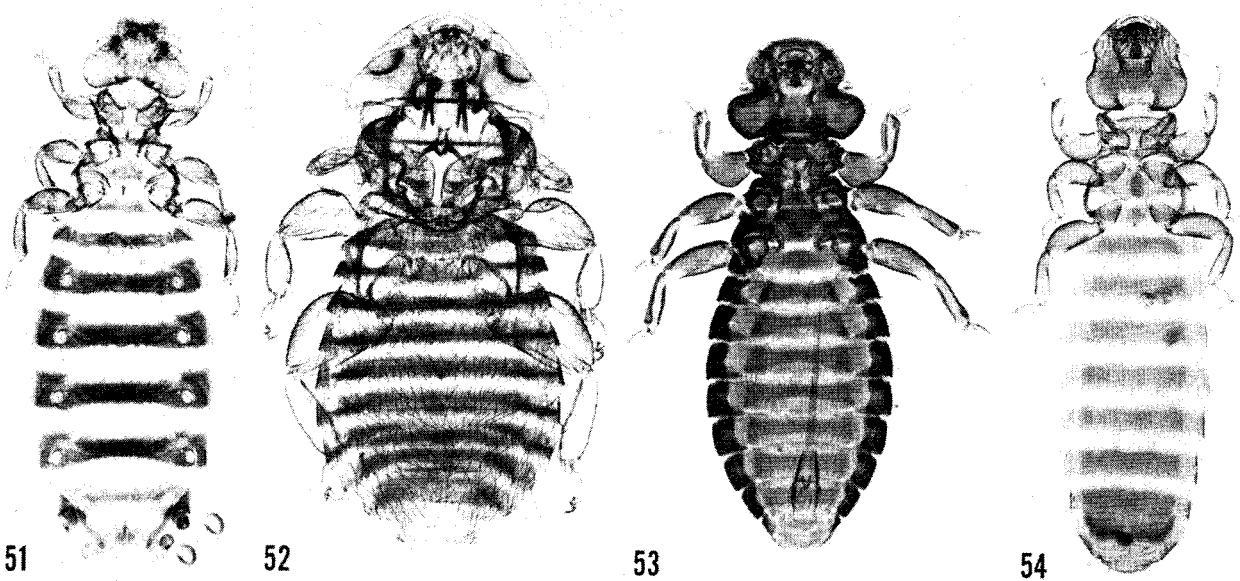


Fig. 51. *Piagetiella caputineisa* ♂.  $\times 28$  (B.M.10030); Fig. 52. *Ae. strona procellariae* ♀.  $\times 25$  (B.M.30017); Fig. 53. *Tetromithophilus piceus* ♂.  $\times 45$  (B.M.10026); Fig. 54. *Longmenopon galeatum* ♀.  $\times 61$  from *Pachyptila desolata* (B.M.10027).

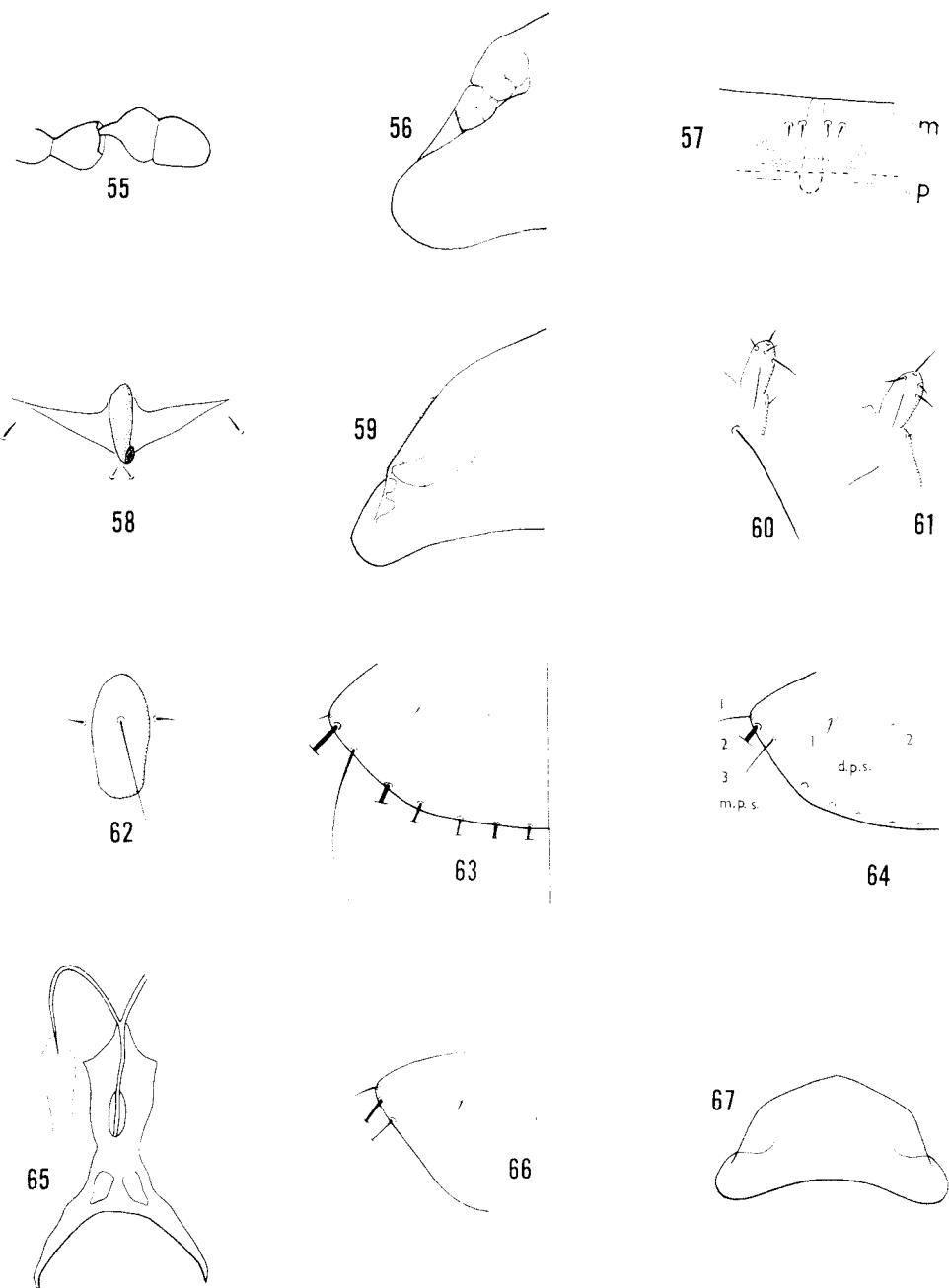
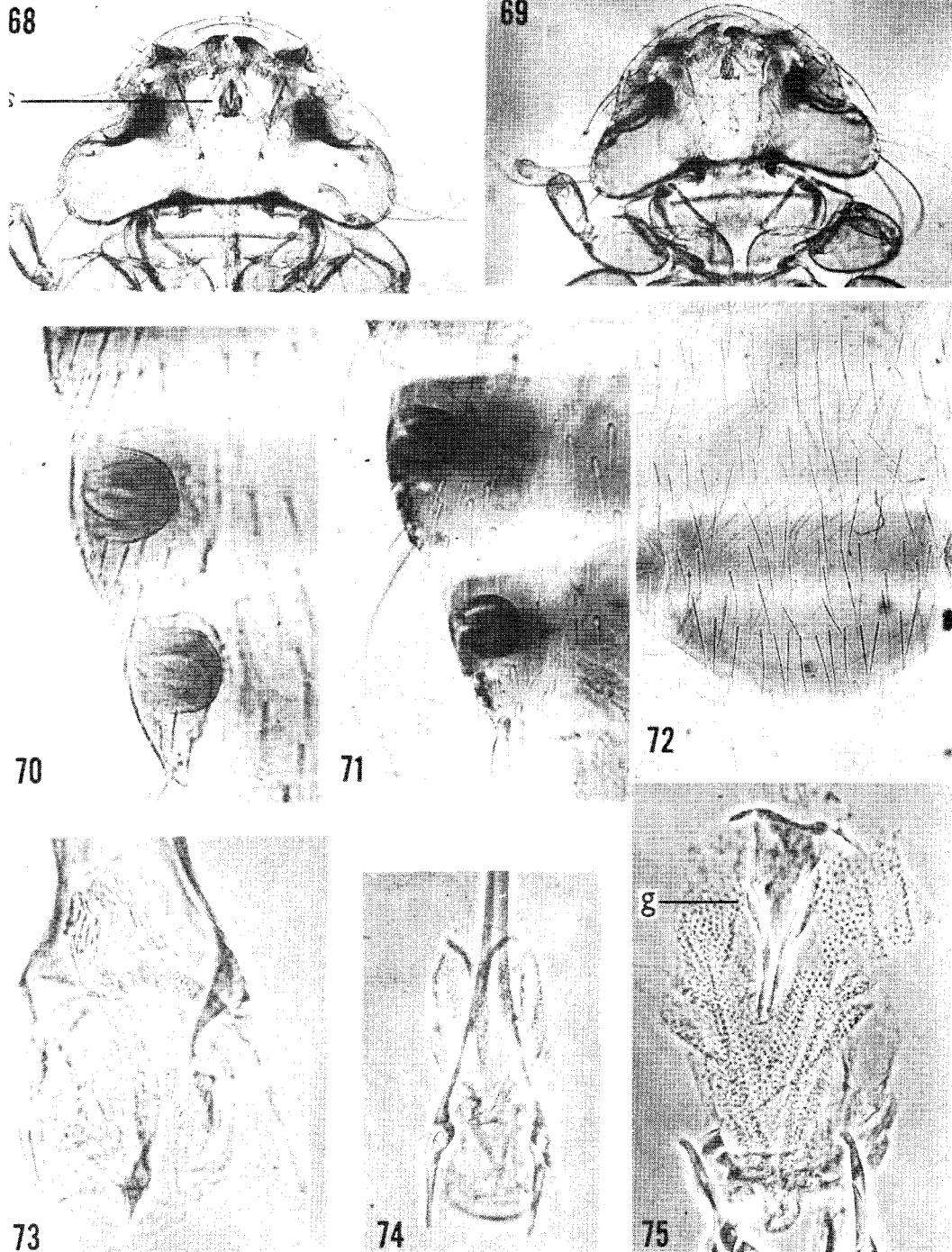
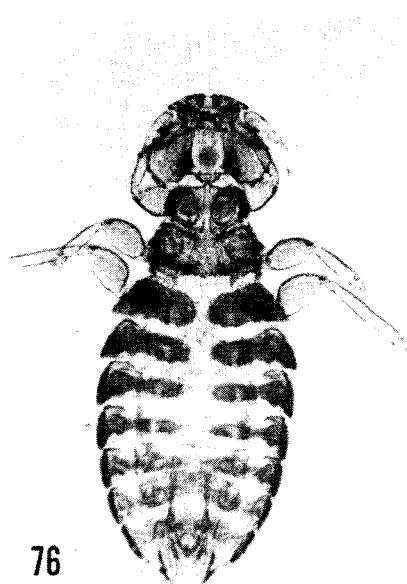


Fig. 55. Amblyceran antenna; Fig. 56, *Eidmannella* sp., laterodorsal margin of head; Fig. 57, the 3 anterior mesothoracic setae in Menoponidae (m, anterior margin of mesothorax lying ventral to prothorax; p, posterior margin of prothorax with 2 of the prothoracic setae); Fig. 58, anterior mesothoracic setae in *Actornithophilus*; Fig. 59, *Incistrina* sp., laterodorsal margin of head; Fig. 60, labial palp and seta, *Actornithophilus totani*; Fig. 61, same, *A. incisus*; Fig. 62, *Actornithophilus piceus*, mesosternite; Fig. 63, *Austromenopon transversum*, prothorax; Fig. 64, *Austromenopon* sp., prothorax (m.p.s., marginal prothoracic setae 1-3; d.p.s., dorsal prothoracic setae 1-2); Fig. 65, *Austromenopon* sp., hypopharynx; Fig. 66, *Austromenopon tuscotasciatum*, prothorax; Fig. 67, *Austromenopon atrotulatum*, outline of head.



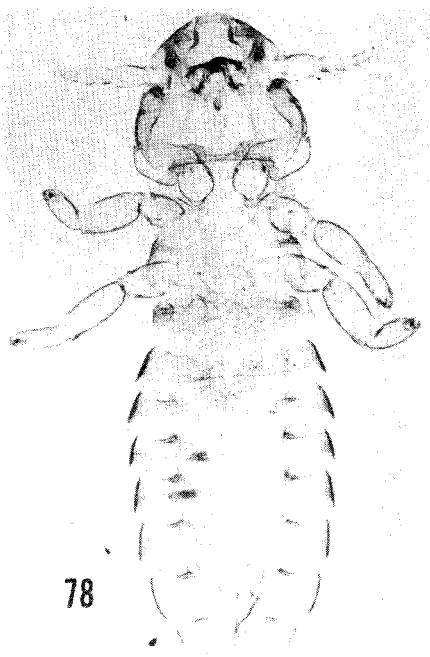
Figs. 68-75. *Austromenopon* spp. 68, ♂, head, *A. ossitragae* (s., sitophore sclerite of hypopharynx); 69, same, *A. oschei*; 70, ♀, lateral margins of segments VII-VIII, *A. ossitragae*; 71, same, *A. oschei*; 72, *A. affine*, ♀, terminal segments of abdomen; 73, ♂, genitalia, *A. transversum*; 74, same, *A. affine*; 75, same, *A. ossitragae* (g, genital sclerite).



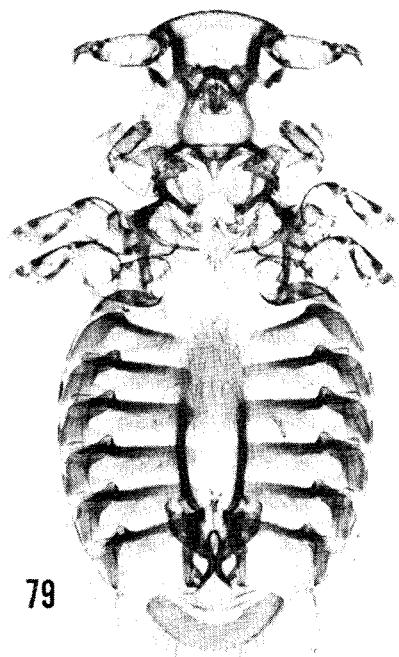
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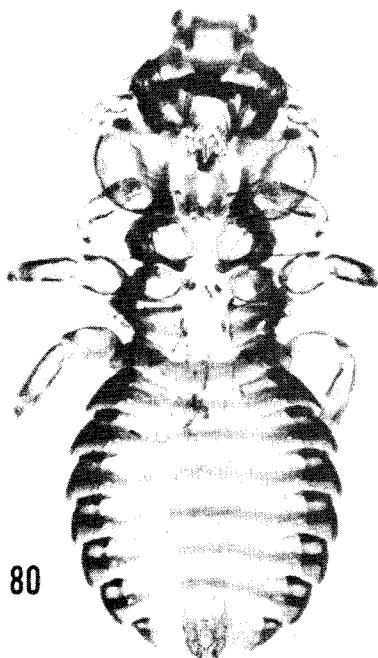
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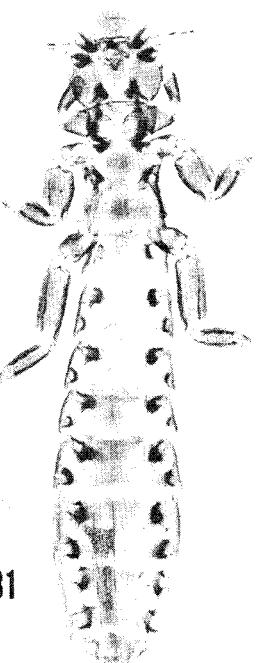
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Fig. 76. *Vesiotinus demersus* Kellogg ♂ × 21.6 (B.M.40027); Fig. 77. *V. demersus* ♂, genitalia; Fig. 78. *Pectinopygus turbinatus* ♂ × 53.5 (B.M.40012); Fig. 79. *Austrogoniodes hamiltoni* ♂ × 59 (B.M.40022); Fig. 80. *Trabeculus hexagonus* ♂ × 85 (40021); Fig. 81. *Episbates oderiiformis* ♂ × 36 (B.M.40009).

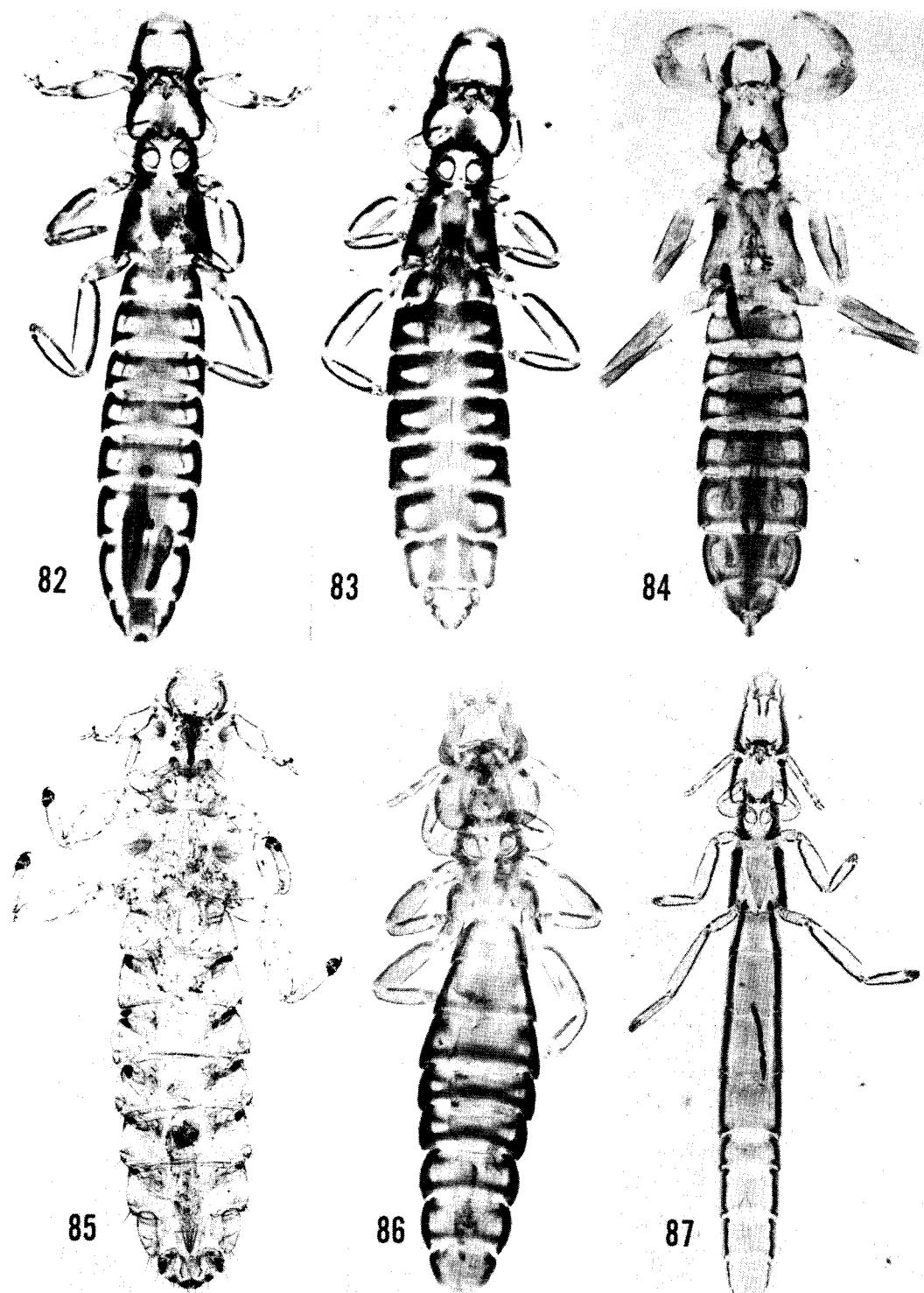
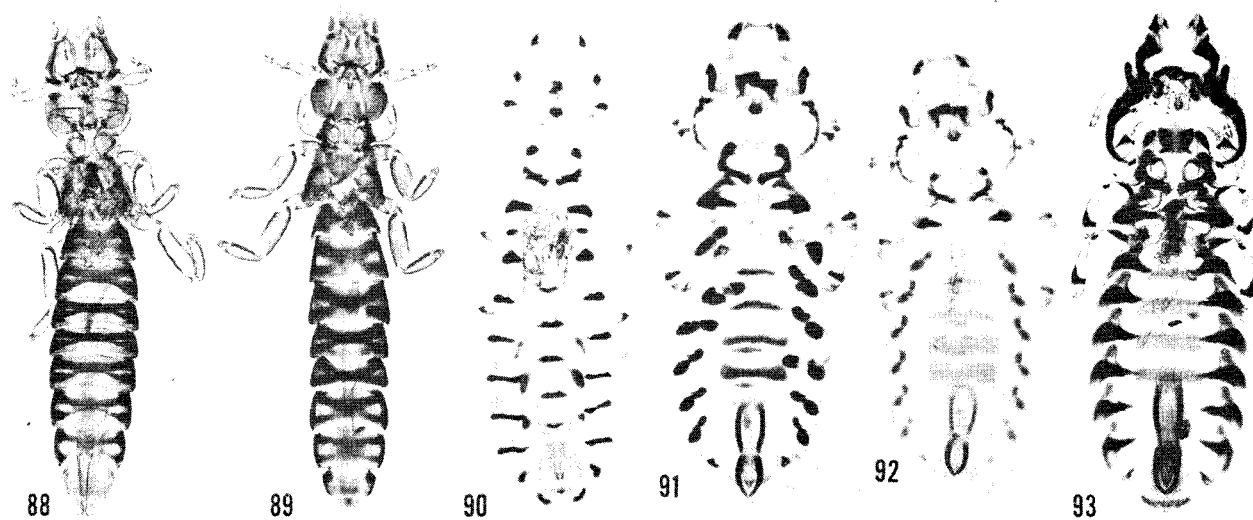
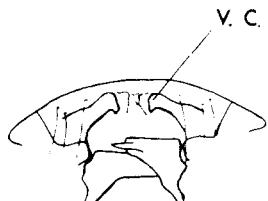


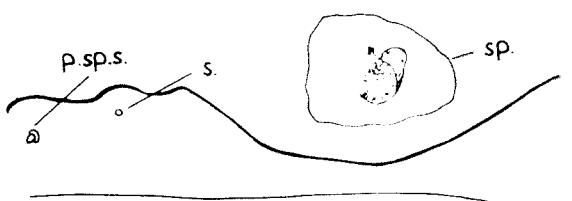
Fig. 82, *Haffneria grandis* ♂  $\times$  31 (B.M.40019); Fig. 83, same, ♀  $\times$  30.5 (B.M. 40018); Fig. 84, *Harrisoniella hopkinsi* ♂  $\times$  15 (40033); Fig. 85, *Paraclysis hyalina* ♂  $\times$  27 (B.M.40032); Fig. 86, *Philoceanus fasciatus* ♂  $\times$  74 (B.M.40020); Fig. 87, *Halipeurus pelagicus* ♂  $\times$  39 (B.M.40028).



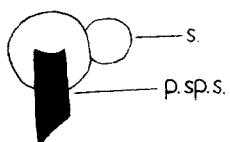
Figs. 88-89, *Vauvates* spp. 88, *V. fuliginosus* ♂  $\times 38$  from *Piocellaria aequinoctialis* (B.M. 40035); 89, *V. prioni* ♂  $\times 59$  (B.M. 40028). Figs. 90-93, *Quadraeeps* spp. 90, *Q. punctatus subtingulatus* ♂  $\times 67$  (B.M. 40010); 91, *Q. ornatus tuscolaminatus* ♂  $\times 66$  (B.M. 40011); 92, *Q. ornatus antarcticus* ♂  $\times 12$  (B.M. 40009); 93, *Quadraeeps alpha* ♂ (B.M. 40802).



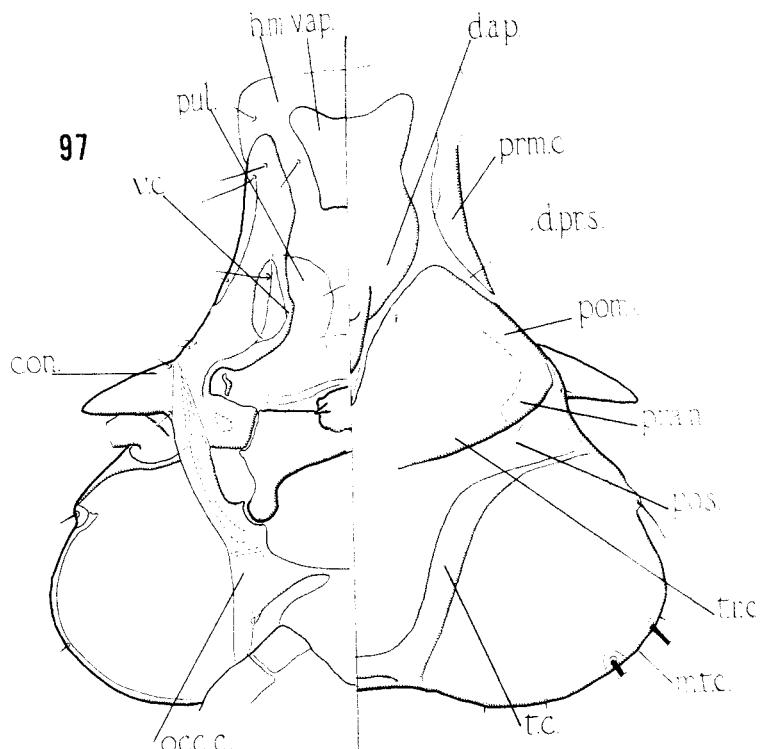
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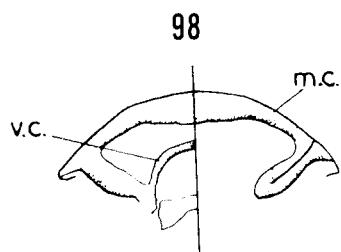
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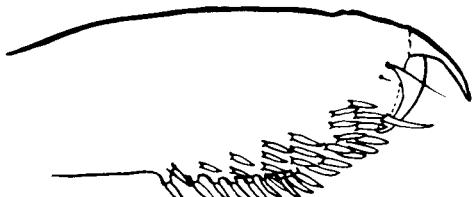


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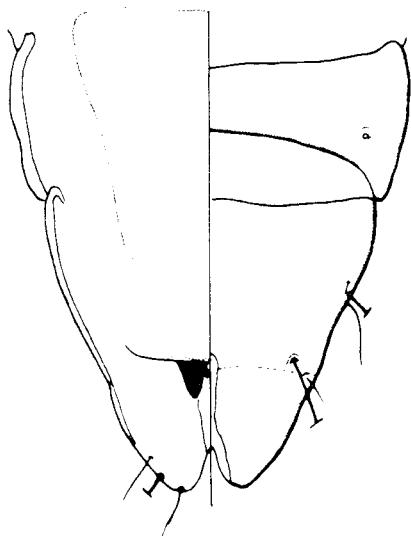
Figs. 94-95, *Vesiotinus demersus*. Fig. 94, preantennal region of head, ventral; 95, part of tergite IV (p.s.p.s., post-spiracular seta; s, post-spiracular sensillus; sp, spiracle). Fig. 96, *Saemundssonia* sp., post-spiracular seta and sensillus. Figs. 97-98, types of internal carinae in the Philopteridae (con., Conus; d.a.p., dorsal anterior plate; d.prs., dorsal preantennal suture; h.m., hyaline margin; m.c., marginal carina; mtd., mandible; m.t.c., marginal temporal carina; occ.c., occipital carina; poan., postocular nodus; pom.c., postmarginal carina; pos., postantennal suture; pran., preantennal nodus; prm.c., premarginal carina; pron., preocular nodus; pul., pulvilli; t.c., temporal carina; t.mc., transverse carina; v.c., ventral carina).



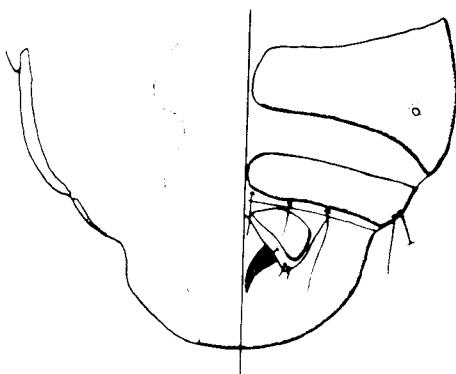
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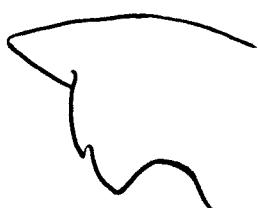
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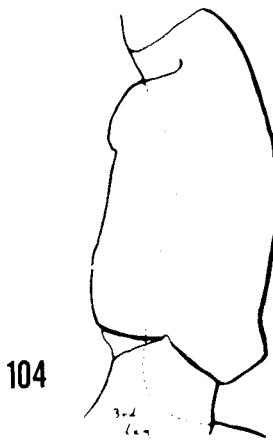
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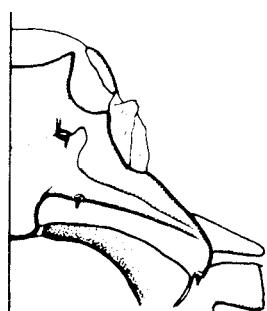
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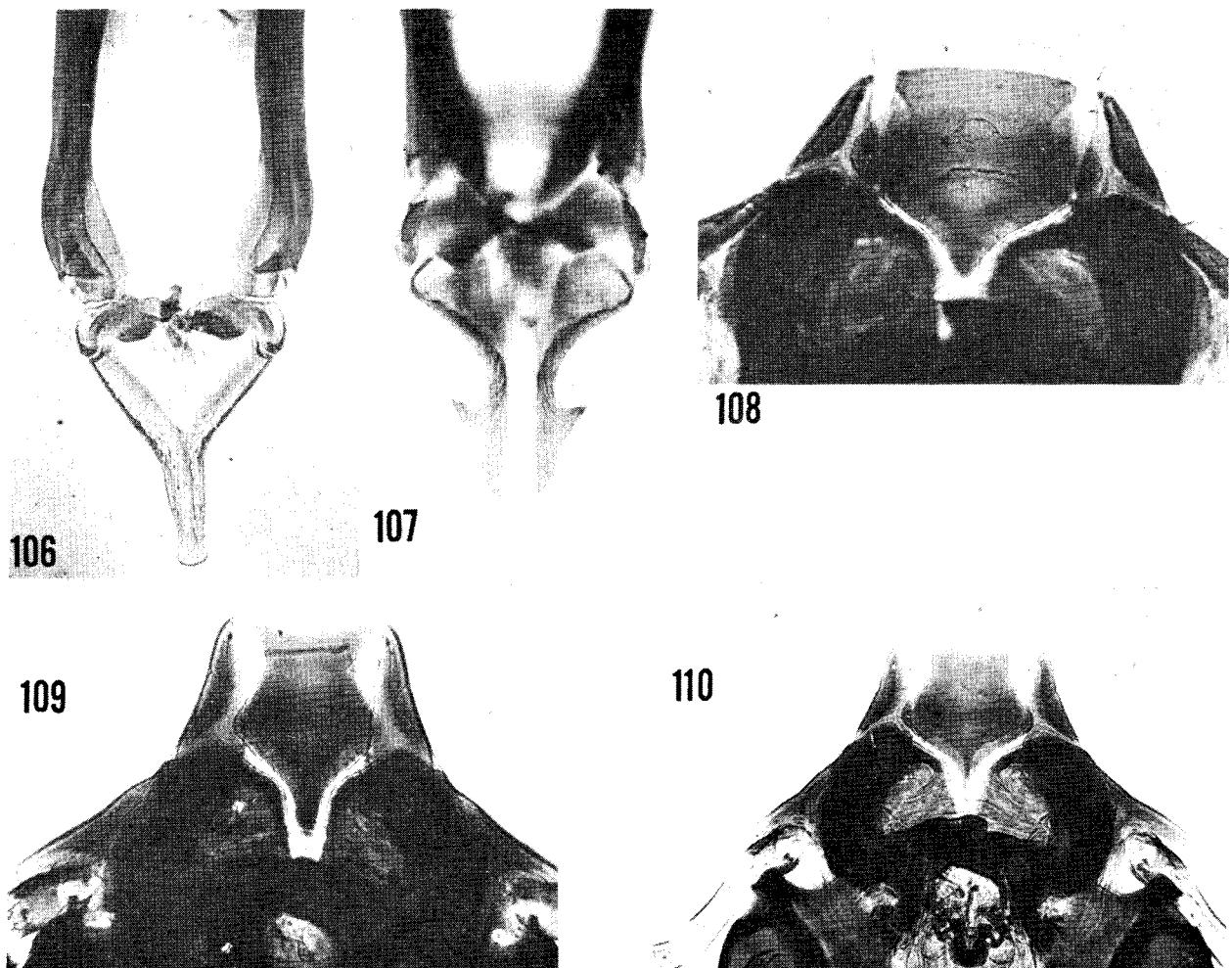


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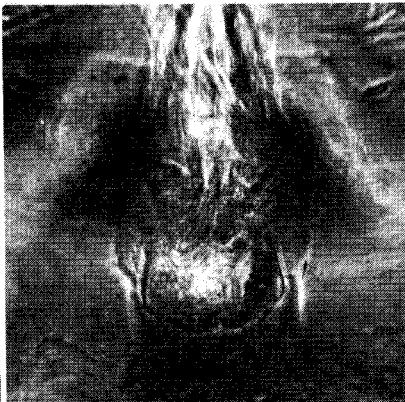
Fig. 99, *Austrogoniodes* sp., fore coxa; Fig. 100, *Dorophocodes* sp., distal end of tibia and tarsus; Figs. 101-102, types of  $\beta$  ano-genital openings; Fig. 103, *Saemundssonia* sp., left mandible; Fig. 104, *Episbates* sp., 3rd episternum; Fig. 105, *Trabeculus* sp., preantennal region.



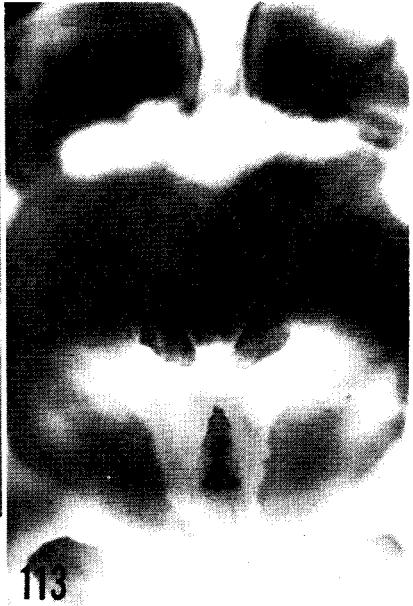
Figs. 106-110. *Docophoroides* spp. 106, ♂ genitalia, *D. harrisoni*; 107, same, *D. murphyi*. 108, ♂ anterior dorsal plate of head, *D. bretis*; 109, same, *D. murphyi*; 110, same, *D. simplex*.



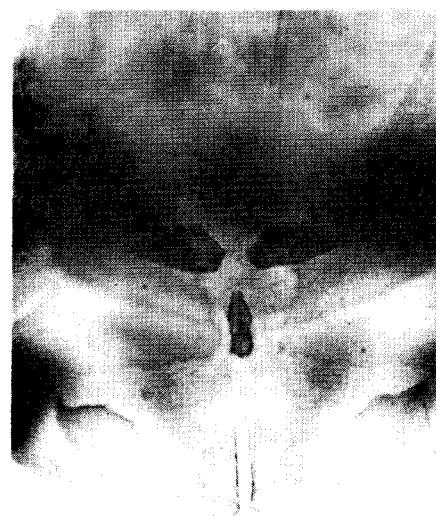
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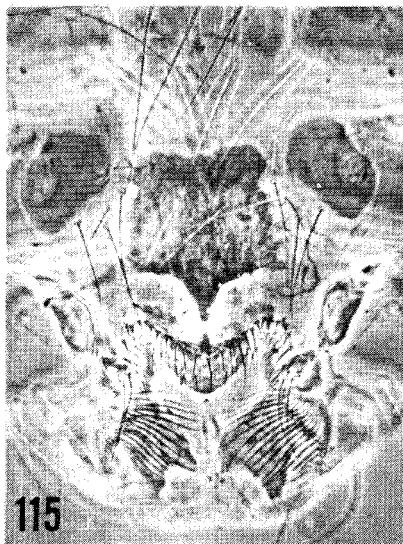
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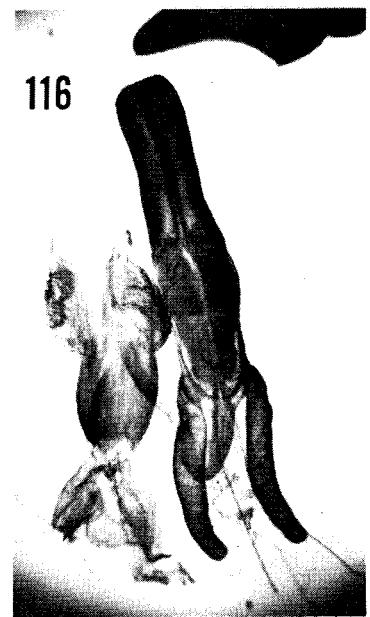
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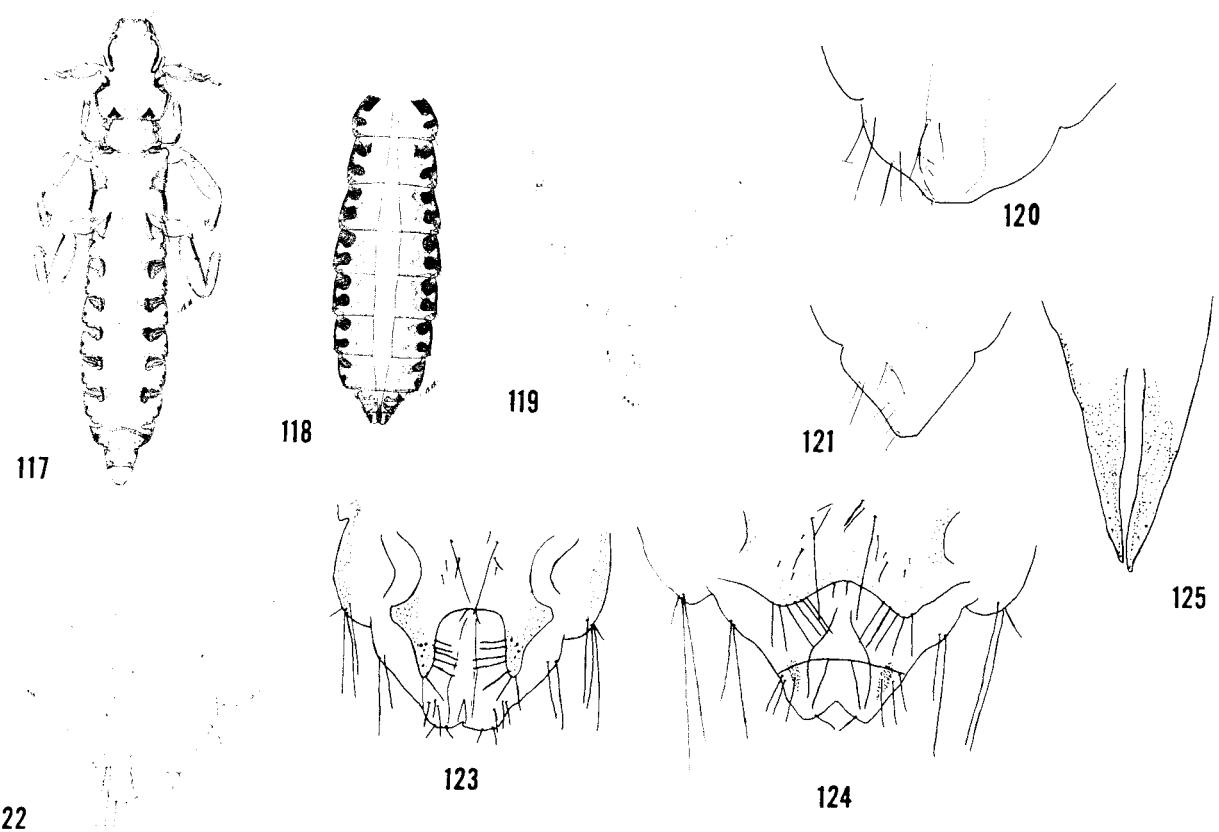


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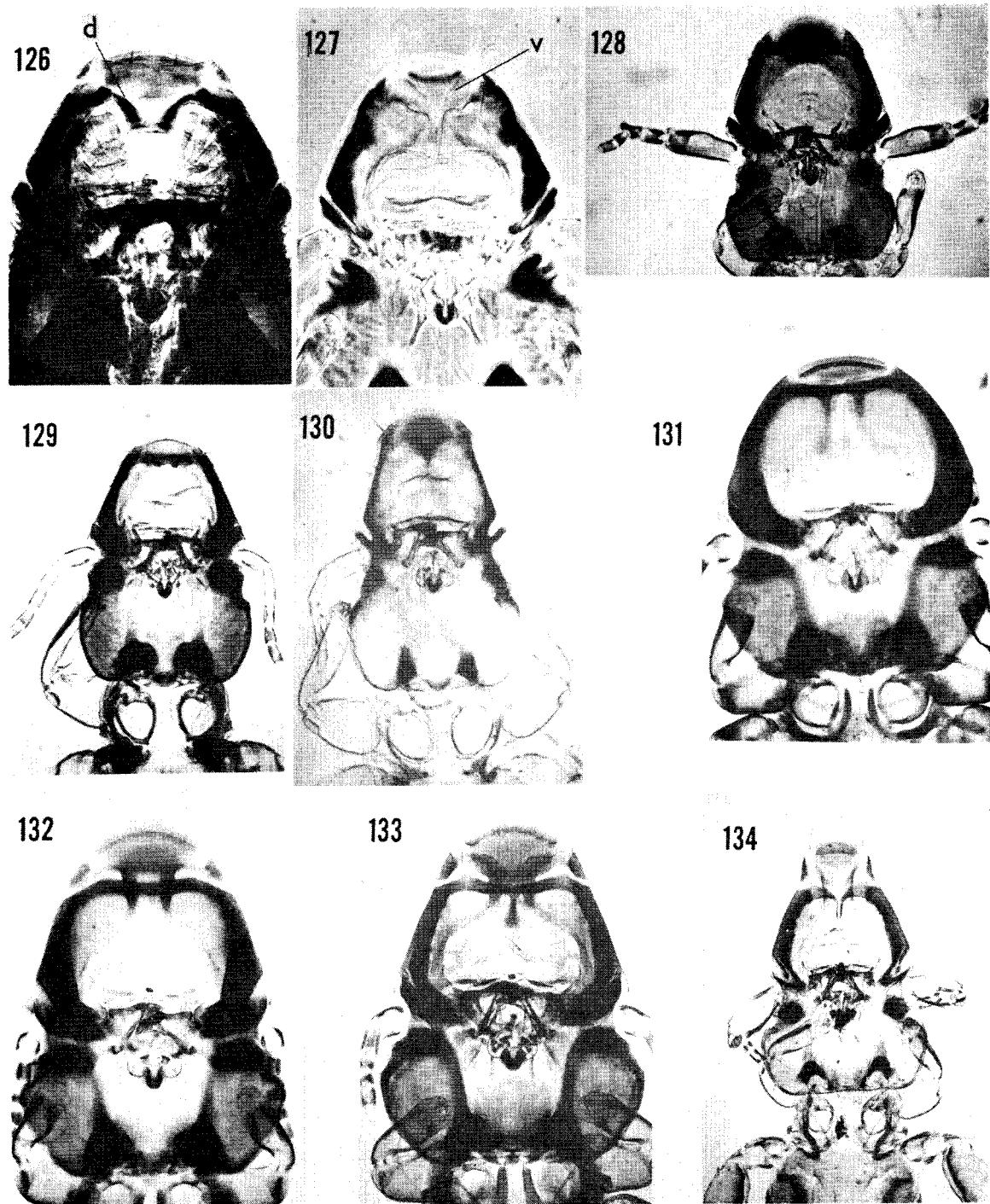


116

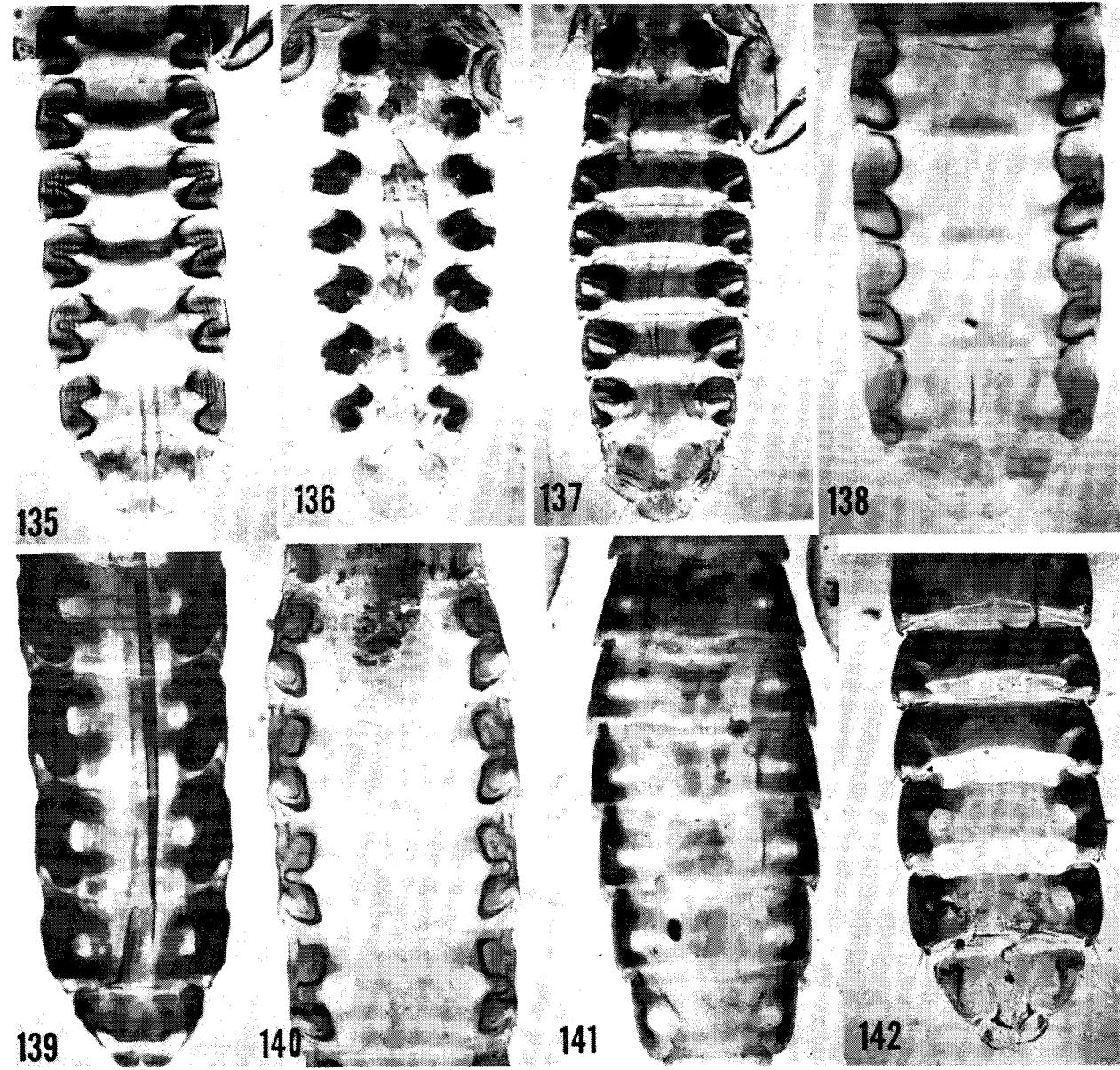
Figs. 111-114, *Docophoroides* spp., 111, *D. brevis*, ♂, head; 112, ♀, internal sclerites, *D. brevis*; 113, same, *D. murphyi*; 114, same, *D. simplex*. Fig. 115, *Pectinopygus turbinatus*, terminal sterna of abdomen. Fig. 116, *Harrisoniella hopkinsi*, ♂, internal genitalia.



Figs. 117-125. *Paraclysis* spp. 117, *P. diomedae* ♂; 118, same, ♀, abdomen; 119, terminal segments of ♂ abdomen, *P. diomedae*; 120, same, *P. hyalina*; 121, same, *P. obscura*; 122, terminal segments of ♀ abdomen, *P. diomedae*; 123, same, *P. obscura*; 124, same, *P. hyalina*; 125, *P. hyalina*, parameres.



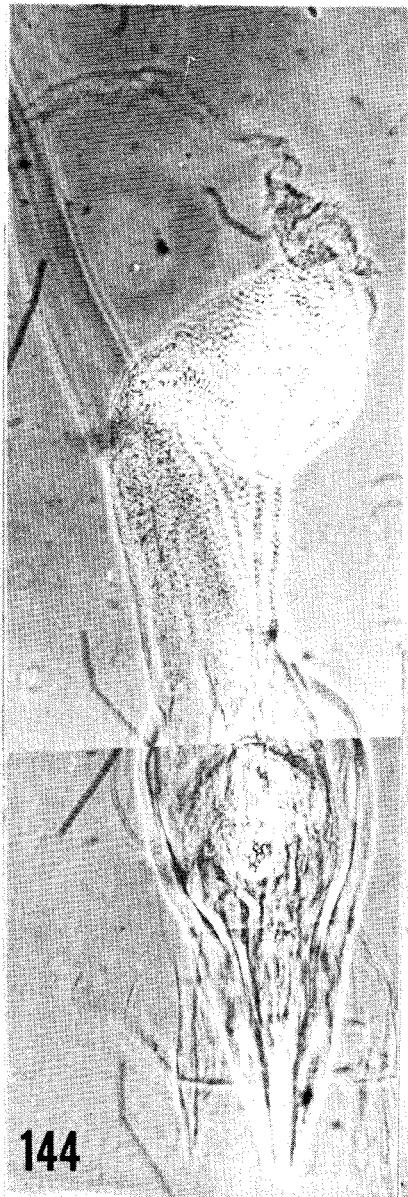
Figs. 126-134, heads. 126, *Harrisoniella hopkinsi* ♀ (d, dorsal carina); 127, *Paraclytus obscura* ♂ (v, ventral carina); 128, *Perineus nigrolimbatus* ♂ from *Priocella glacialisoides*; 129, *Perineus circumfasciatus* ♂ from *Diomedea melanophrys*; 130, *Perineus concinnooides* ♂; 131, *Pseudonirmus charcoti* ♀; 132, *Pseudonirmus lugubris* ♂; 133, *Pseudonirmus gurli* ♂; 134, *Bedfordiella simsi*.



Figs. 135-142, abdomen. Figs. 135-140, *Pseudonirmus* spp.; 135, *P. charcoti* ♂; 136, *P. lugubris* ♂; 137, *P. gurli* ♂; 138, *P. charcoti* ♀; 139, *P. lugubris* ♀; 140, *P. gurli* ♀; 141, *Vaubates fuliginosus*, ♀ from *Procellaria aequinoctialis*; 142, *Bedfordiella simsii* ♂.



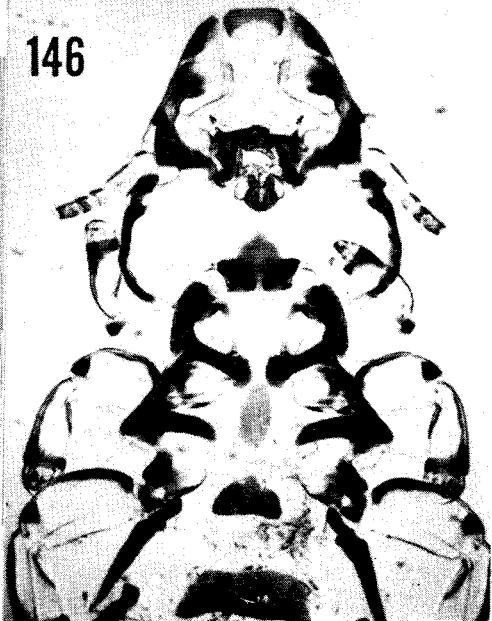
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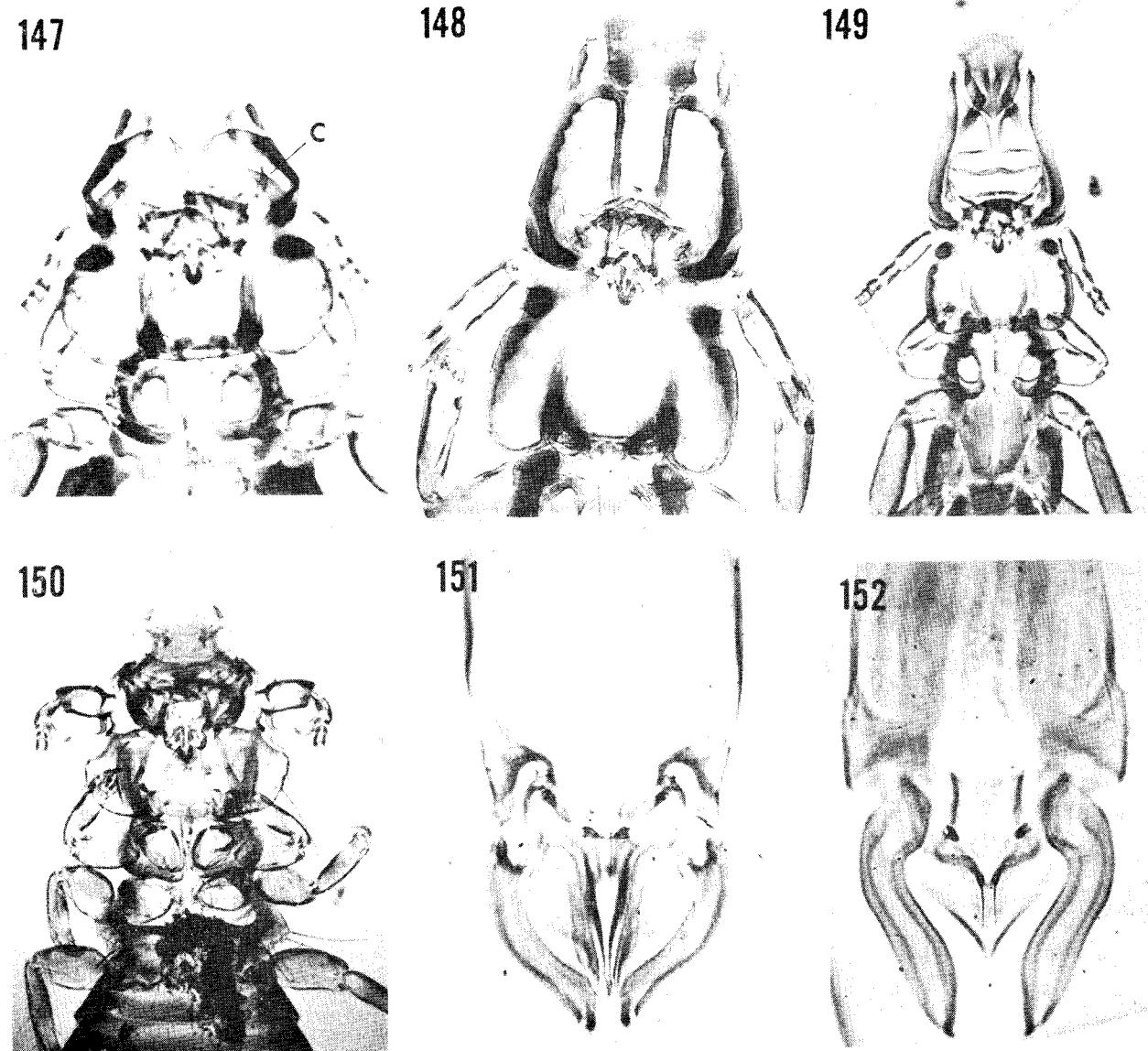


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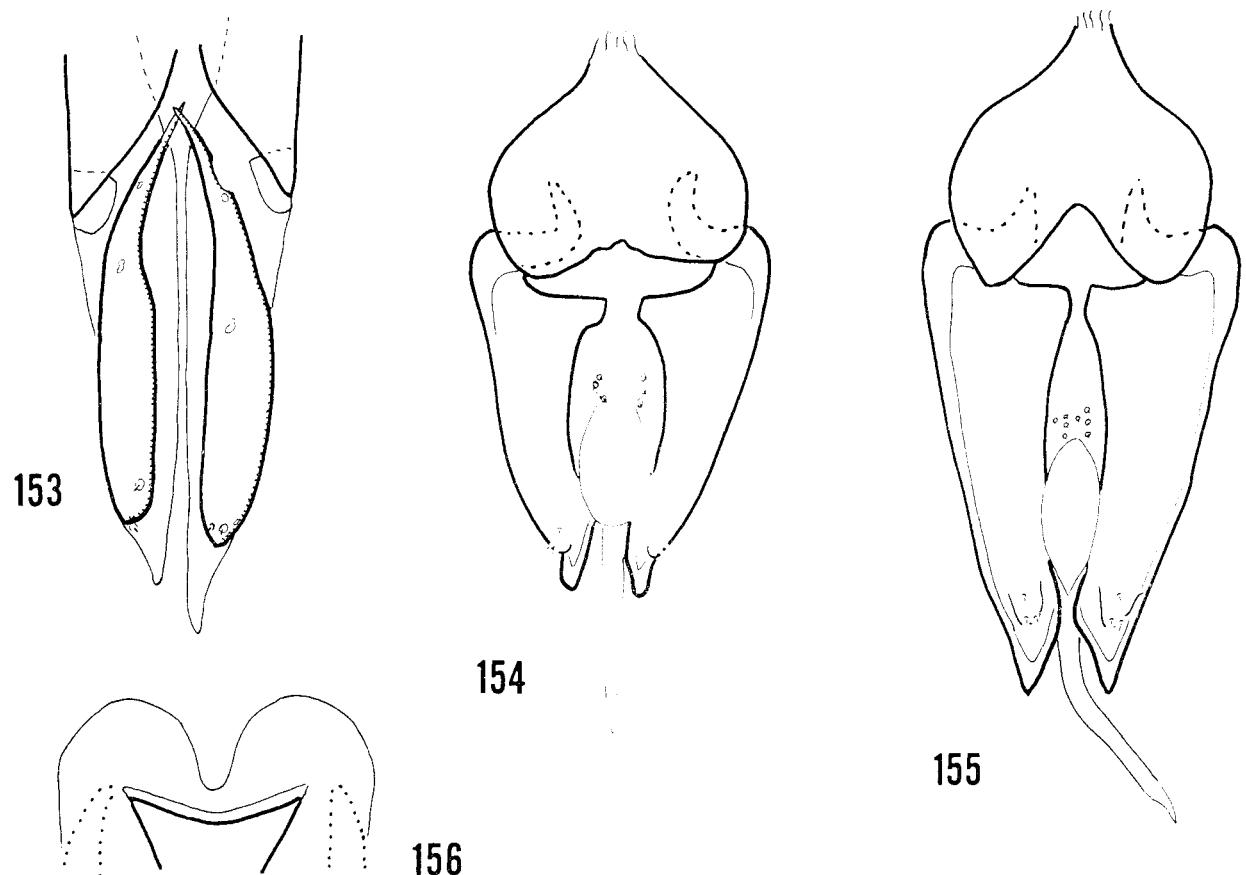


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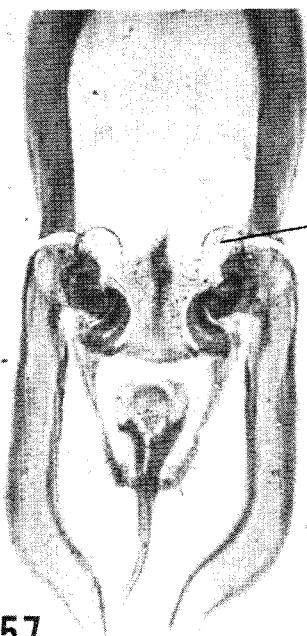
Figs. 143-144, *Paraclisis* spp., ♂ genitalia. 143, *P. diomedea*; 144, *P. hyalina*. Figs. 145-146, *Quadraiceps* spp., ♂. 145, *Q. sellatus*; 146, *Q. horii*.



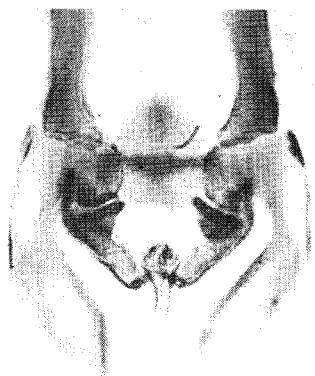
Figs. 147-150, heads. 147, *Pelmatocerandra setosa* ♀ (c, the posterior dorsal carina); 148, *Halipeurus turtur* ♂ (posterior margin of anterior plate distorted); 149, *Philoceanus robertsi* ♂; 150, *Trabeculus schillingi*, ♂ from *Pterodroma mollis*. Figs. 151-152, *Trabeculus* spp., ♂ genitalia. 151, *T. schillingi*; 152, *T. hexagon*.



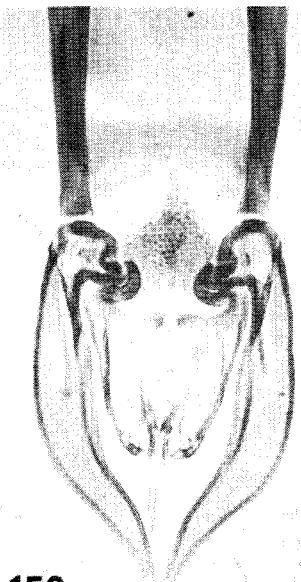
Figs. 153-155. ♂ genitalia. 153, *P. obscura*; 154, *Saemundssonia nivea*; 155, *Saemundssonia stammeri*. Fig. 156, *S. desolata*.  
hyaline margin of head.



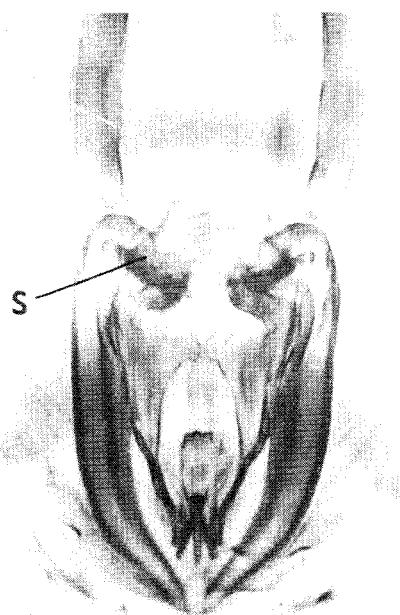
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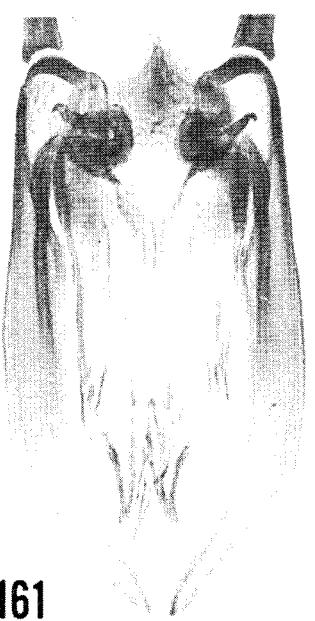
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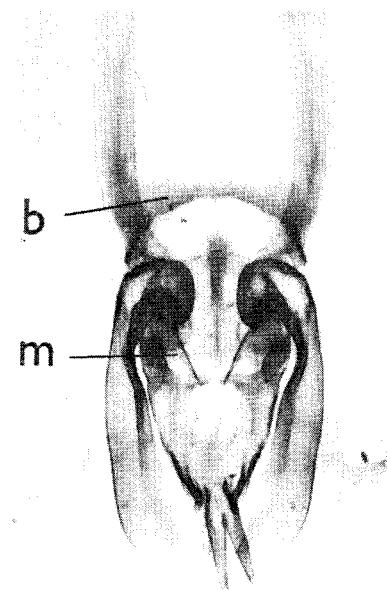
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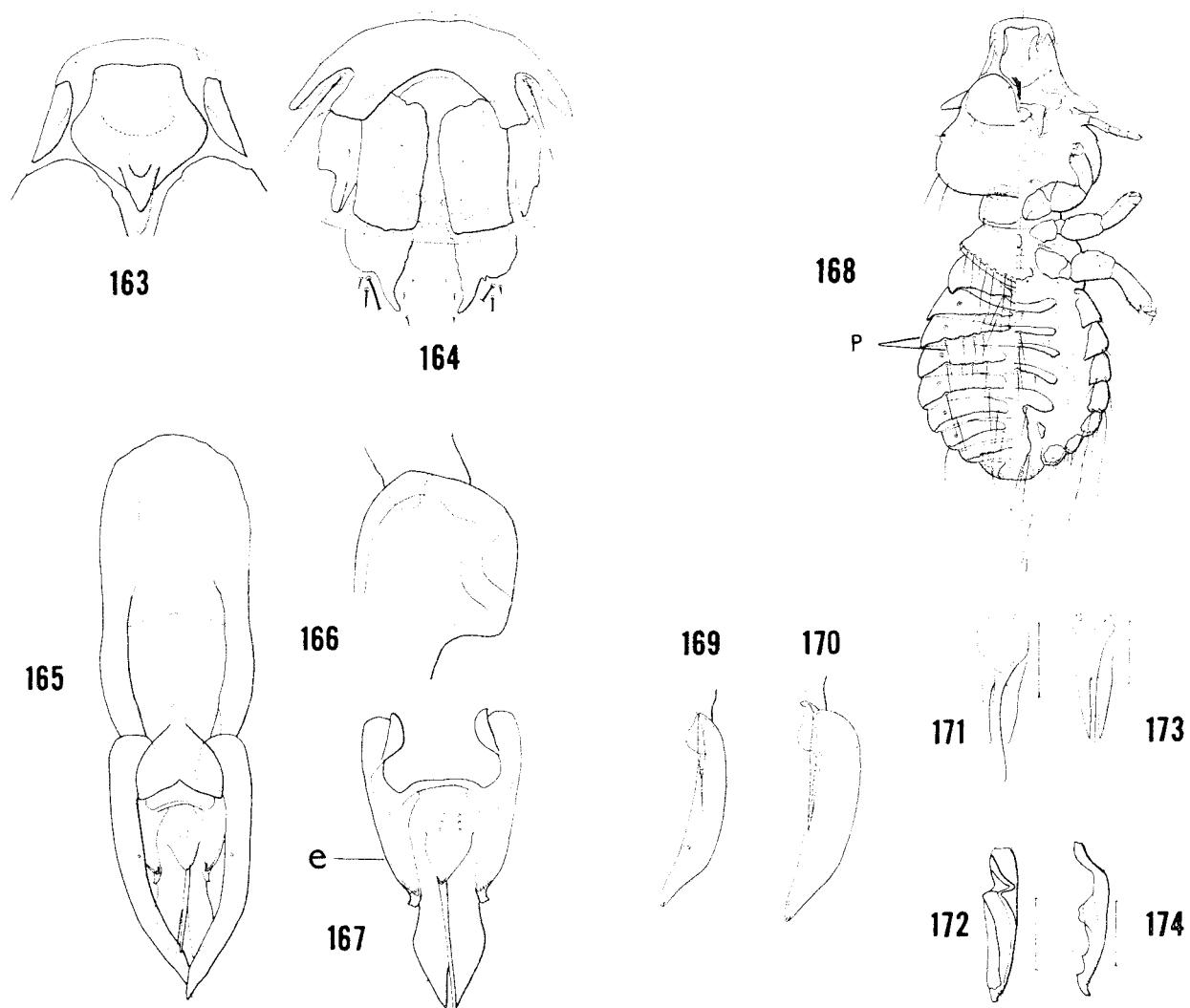


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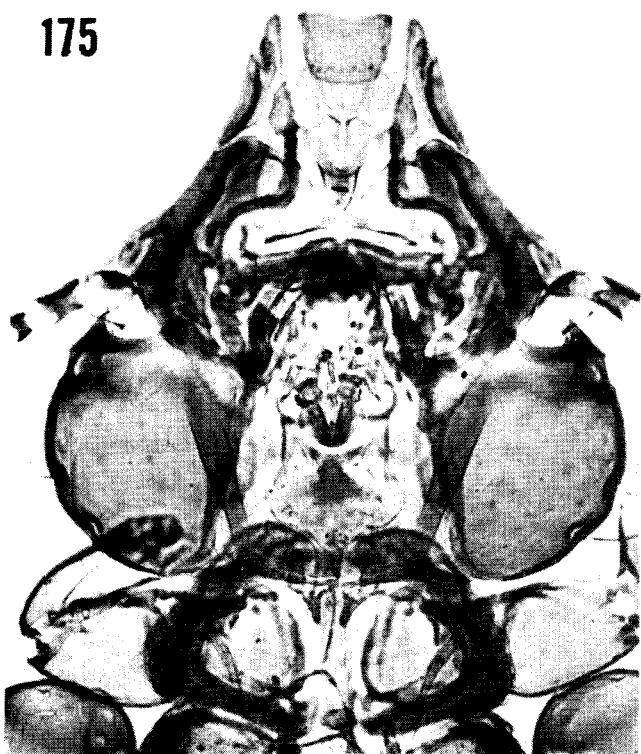
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Figs. 157-162. *Saemundssonia* spp.: 1. genitalia (s, vestige of genital sac); b, cross bar of basal apodeme; m, dorsal membrane of mesosome; 157, *S. desolata*; 158, *S. ? marina* from *Oceanites oceanicus*; 159, *S. nivea*; 160, *S. gaini*; 161, *S. bicolor*; 162, *S. stresmanni*.



Figs. 163-174. *Saemundssonia* spp. Figs. 163-167, *Saemundssonia lari*. 163, anterior region of  $\delta$  head, dorsal; 164, genital region of  $\delta$ ; 165,  $\varphi$  genitalia, whole organ; 166, same, paramere head enlarged; 167, same, mesosome enlarged (from another specimen). Figs. 168-169, 171-172, *Saemundssonia sternae*. 168,  $\delta$  (p. post-spiracular seta on tergum IV (3rd apparent segment)); 169, paramere; 171-172, mesosomal parts of  $\varphi$  genitalia. Figs. 170, 173-174, *Saemundssonia lockleyi*. 170, paramere; 173-174, mesosomal parts of  $\varphi$  genitalia.

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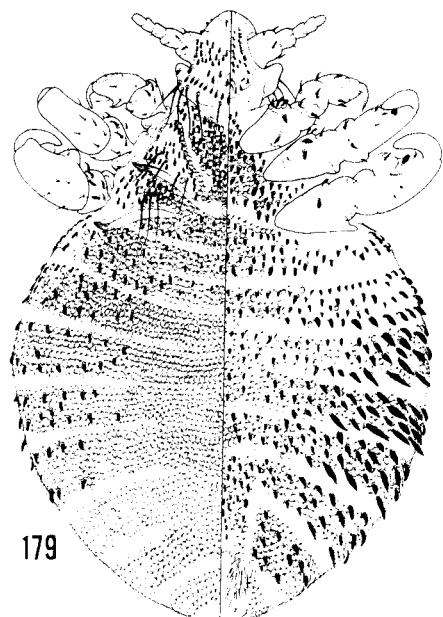
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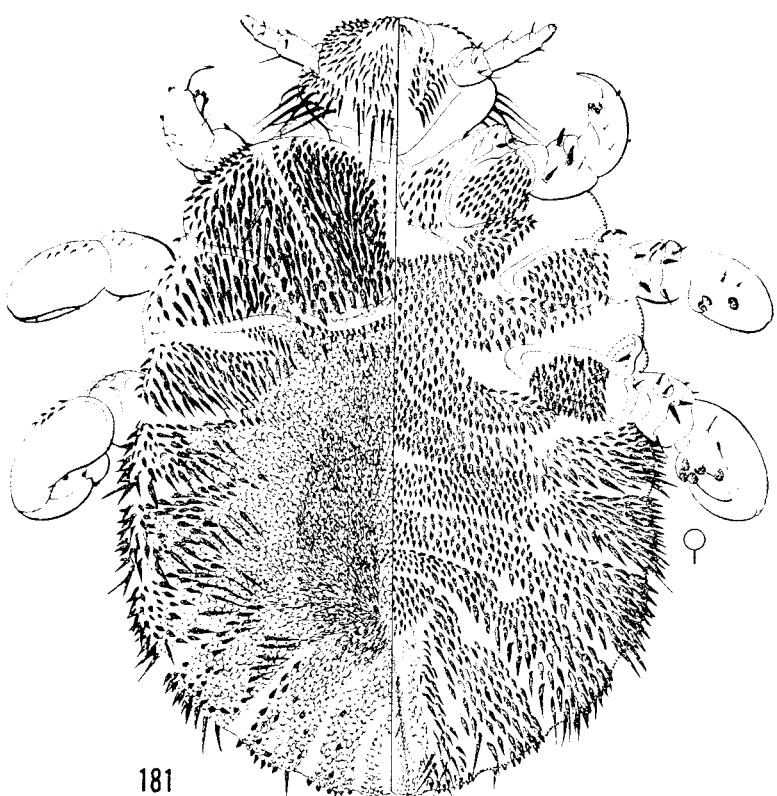
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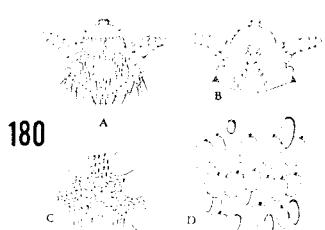
Figs. 175-178. *Suemundssonia* heads. 175, *S. nivea* ♀; 176, *S. stammeri* ♀; 177, *S. gaini* ♂; 178, *S. bicolor* ♂.



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Figs. 179-180. *Antaretophthirus* spp. 179. *A. ogmophini* ; 180. *A. lobodontis* (A, dorsal aspect of head; B, ventral aspect of head; C, thoracic sternum; D, types of scales from abdomen). Fig. 181. *Lepidophthirus macrorhini* ♀. (From Ferris, 1931: 186, 433, 500).