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A new genus and two new species of Menoponidae (Insecta: Mallophaga) from New Guinea

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The new genus *Cavifera* is described to include two species, both new—*C. abdita* and *C. senta*. The hosts for these are from New Guinea and are believed to belong to the Columbiformes. The females are characterized by having a pair of abdominal tergal sense organs of a type unknown elsewhere in the Mallophaga or possibly in the insects.

CONTENTS

	PAGE
Introduction	335
Description of new genus <i>Cavifera</i>	336
Description of new species	336
<i>C. abdita</i>	337
<i>C. senta</i>	341
Remarks	342
Acknowledgements	343
References	343

INTRODUCTION

Clay (1947), in a key to the genera of the Menoponidae, separated the genus described below as 'New Genus A' in couplets 2 and 54, stating in the notes that this genus was 'shortly to be described'. However, the uncertainty created by having only two females and no males and by being unable to find additional specimens on skins of the presumed host, *Ptilinopus bellus* (Sclater), resulted in the publication of a description of the tergal sense organ (Clay, 1948) without describing the new genus and species.

This genus was also included as 'New Genus (in press)' in a revised key to the genera of the Menoponidae (Clay, 1969); it was thought to be too distinctive to omit from the key and to leave it undescribed any longer. Concurrent with this decision, a second series of New Guinea lice, obviously of this same genus but of a different species and including both sexes, was sent to us by Dr K. C. Emerson. These two series of lice are used here for the basis of the description of a new genus and two new species.

DESCRIPTION

Genus *Cavifera* gen. nov.

Head (Fig. 3) without preocular notch or slit. Two of marginal temple setae (26 and 27) with contiguous alveoli (numbers for head setae as in Clay (1969)); mid-dorsal setae (17 and 18) short and approximately on same horizontal level; preocular seta (11) short and fine; occipital setae (21 and 22) very long and in line with adjacent seta (23); setae 24 and 25 short. Sensillum *c*, usually associated with setae 14 and 15, absent. With 4 or 5 setae anterior to subocular comb row, seta nearest comb row longer than others and having slight basal unilateral protuberance. Alveoli of 2 subterminal setae of maxillary palpus contiguous (Fig. 4). Terminal segment of antenna long and cylindrical (Fig. 5), not concealed beneath head; the 2 sensilla coeloconica of last antennal segment terminal and adjacent.

Thorax with 2 pairs of central pronotal setae on or near transverse pronotal carina; prosternal plate moderately developed, with blunt short medioposterior process and lateral thickened area each side (Fig. 7); with 2 central prosternal setae. Typical oblong well-pigmented postnotum present. Mesonotum with 4 medio-anterior setae, 2 close together each side; relatively large triangular mesosternal plate, separate from mesopleurites, and with more than 2 setae. Small circular metasternal plate. Venter of third femur with at least 3 loosely organized comb-like rows of rather widely-spaced setae and a few scattered setae; euplantula banded.

Female abdomen (Plate 1B; Fig. 2) with tergite I much longer than II and fused medially with metanotum; no tergites medially divided; short accessory tergal plate between tergite VI and VII. Tergite VI with comb of long setae each side, the ends of these setae held in pocket in tergite VII (Plate 1F). Postspiracular seta with associated seta of II to VI submarginal to row of tergoventral setae. Rib-like internal tergal thickening. No evidence of sternite I or associated setae; sternites IV and V with lateral brush of setae each side, VI with smaller brush of more scattered setae. Without typical anal corona; dorsal anal margin with spine-like processes and fine setae (Plate 1G; Fig. 11). Internal genital chamber structure particulate (Fig. 8).

Male abdomen (Plate 1A; Fig. 1) with tergite I longest, II to VIII of approximately equal length; no tergites medially divided. Postspiracular seta with associated seta of II to VIII submarginal to row of tergoventral setae. Internal tergal thickening shorter and more rounded. No evidence of sternite I or associated setae; sternites IV to VI with lateral brush of setae each side.

Type species: Cavifera abdita sp. nov. Derivation: cavity bearer; feminine.

The most remarkable feature of this genus is the possession by the female of a group of 13–15 long setae each side of tergite VI, the ends of the setae being held in a pocket in tergite VII (Plate 1F). Each seta has a spatulate end and is smooth, not ribbed as are the other abdominal setae. As the bases of the setae are on a different segment from the pocket, their ends can presumably be withdrawn from the pocket by the flexing of the abdomen. Clay (1948) suggested that these organs might have either a proprioceptive function or be associated with the openings of an odiferous gland. At that time only females had been seen; now that the organs are known to be absent in the male, it seems probable that they act as a distributor of a sex-attractant substance.

The affinities of the genera within the Menoponidae are difficult to assess due to their basic similarity in many cases and to the uncertainty of which characters show phylogenetic relationships (see Clay, 1969). Taking the overall characters, *Cavifera* can be compared with *Menopon* Nitzsch (parasitic on the Galliformes) and with *Hohorstiella* Eichler (parasitic on the Columbiformes). It agrees with *Menopon* in the absence of a preocular slit or notch; the long and cylindrical terminal antennal segment; in the female by the absence of a typical anal corona and by the elongated internal tergal thickening; also in a number of the setal characters of the head. It can be distinguished in both sexes by the presence of brushes on more than one abdominal sternite. *Cavifera* resembles *Hohorstiella* in some of the setal characters of the head, the presence of brushes on more than one abdominal sternite and especially in the form of the prosternal plate; it is distinguished by the absence of a preocular slit. *Cavifera* is separable in the female from all other known genera by the presence of the tergal sense organ and in the male by the combination of the characters already given.

Cavifera abdita sp. nov.

(Plate 1, Figs 1 to 11)

Holotype ♀ in Bernice P. Bishop Museum, Honolulu (Bishop 8865). No host designation, Archbold Lake, Neth. New Guinea, 29 Nov. 1961, L. W. Quate, colr., BBM-NG 439; Paratypes, 6 ♀, 7 ♂, same data as Holotype.

Female. As in Plate 1B and Fig. 2. Frontal portion of head gently tapered. Hypopharynx well developed, with sitophore sclerite as in Fig. 6. Margin of pronotum with 19 to 21 setae, 13 to 15 of these long, 6 short. Mesosternal plate with 5 to 6 setae. Metanotum marginally and anteriorly with mostly short setae; metasternal plate with 2 short setae anteriorly and 2 longer posteriorly, 3 in one female. Tergites weakly sculptured as in Plate 1E. Marginal tergal setae, including postspiracular and associated setae, with lengths as shown: I, 41–45; II–IV, 34–45; V, 41–49; VI, 27–33, in addition to 13–15 in setal organ each side; VII, 3–5 laterally each side, 15–18 medially in area delimited by inner dotted lines (Fig. 11); VIII, 20–25. Anterior tergal setae, exclusive of those along lateral margin: I, 7–10 each side; II–VI, 0; VII, 15–22 each side adjacent to or mediad to inner dotted lines (Fig. 11), giving total of 46–61 marginal and anterior setae in this area; VIII, 0–4, giving total of 15–23 marginal and anterior setae mediad to inner dotted lines (Fig. 11). Postspiracular setae very long on II–VIII, shorter on I. Last segment as in Fig. 11. Sternal setae: II, 5–7; III, 10–13; IV, 15–21 in each brush, 9–12 mediad; V, 18–26 in each brush, 9–11 mediad; VI, 6–10 in each brush, 12–17 mediad. Sternites VII, VIII, and IX(?) mostly fused to form subgenital plate (Fig. 11); 4–7 setae each side at level of VII, the posterior 2–3 typically close-set and relatively short and stout; posterior margin with 27–37 medium to long setae, submarginally with 10–14 minute to long setae each side.

Male. As in Plate 1A and Fig. 1. Head and thorax much as for female, except frontal portion of head broadly rounded, metanotum distinctly separated from abdominal tergite I and with 18 to 22 marginal setae, including 12 to 13 long ones, and only 1 medio-anterior seta each side. Tergites more clearly sculptured as in Plate 1C,D. Marginal tergal setae, including postspiracular and associated setae, with short among

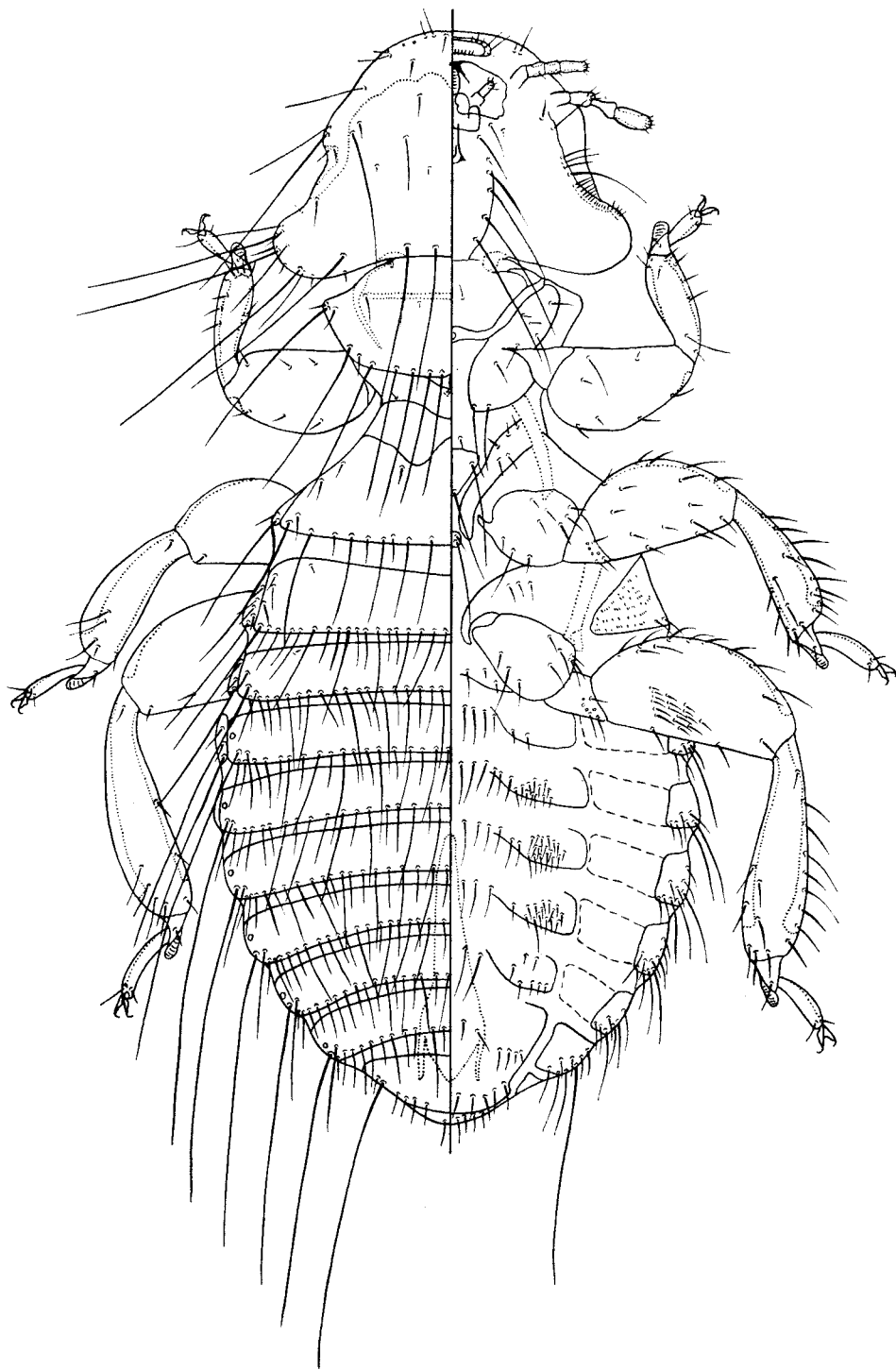


FIGURE 1. *Cavifera abdita* sp. nov. Male.

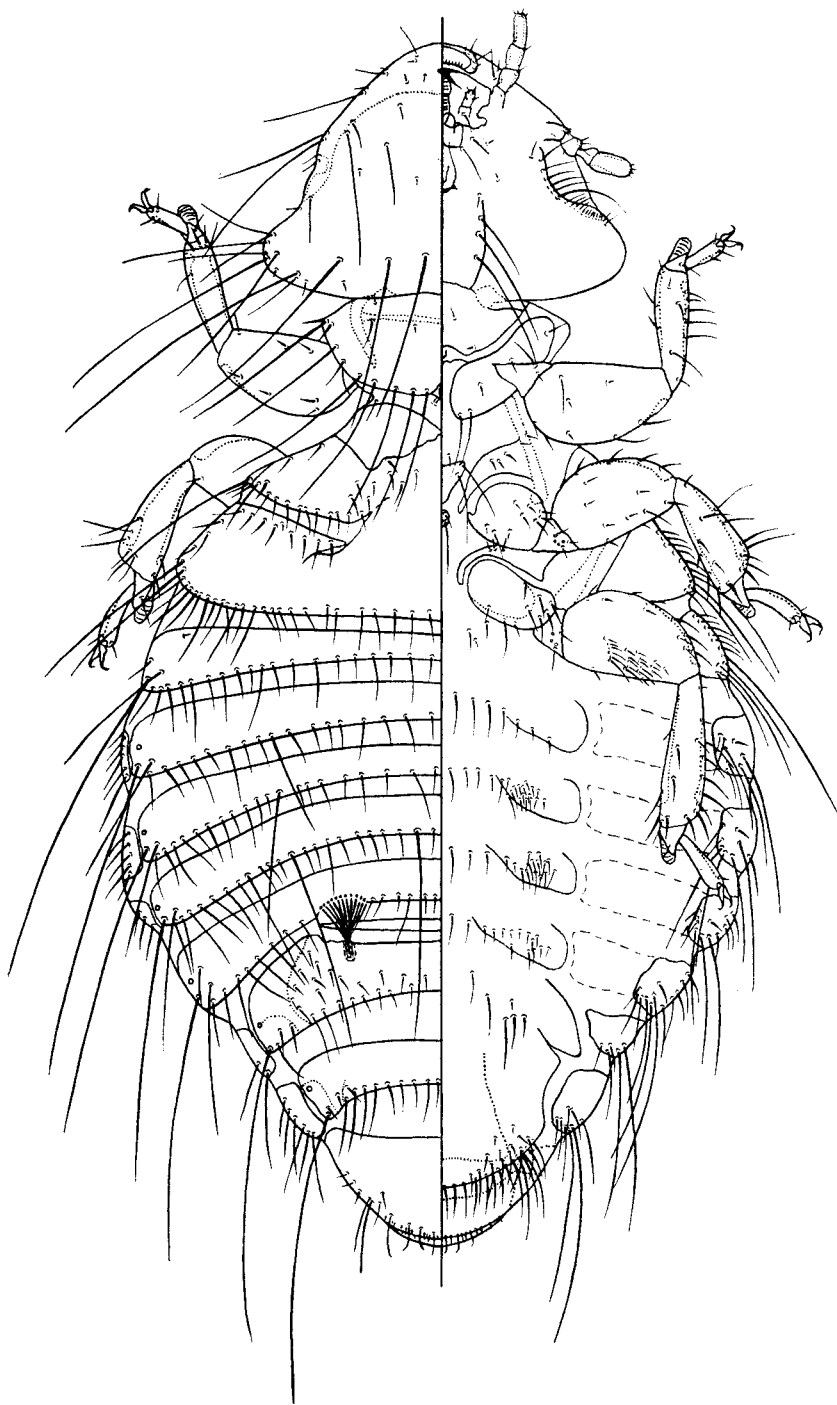


FIGURE 2. *Cavifera abdita* sp. nov. Female.

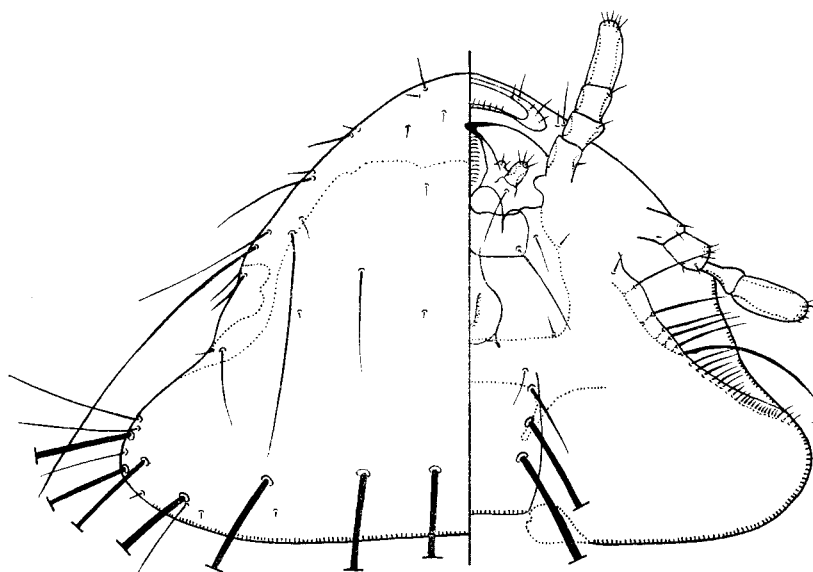
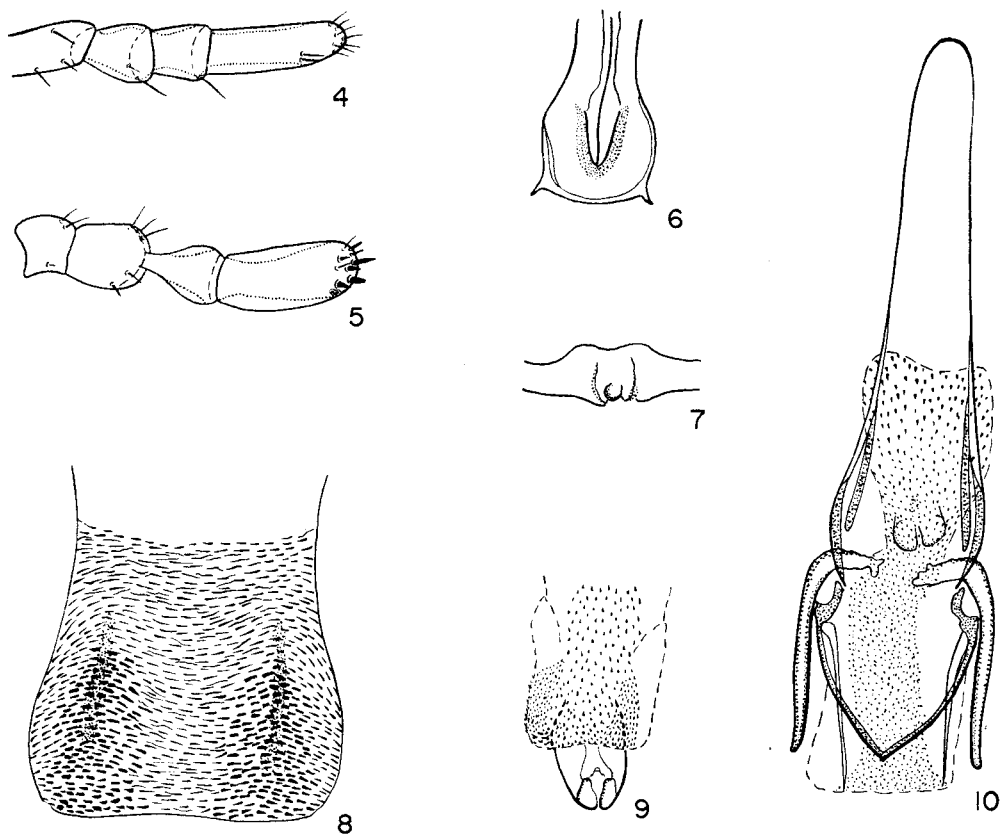


FIGURE 3. *Cavifera abdita* sp. nov. Female head.



FIGURES 4 to 10. *Cavifera abdita* sp. nov. 4, Maxillary palpus; 5, antenna; 6, sitophore sclerite of hypopharynx; 7, prosternal plate; 8, internal structure of female genital chamber; 9, genital sclerite of extended male sac; 10, male genitalia.

long setae: I, 33–39; II–IV, 36–39; V–VI, 38–42; VII, 31–35; VIII, 22–25. Without anterior tergal setae. Postspiracular setae as for female. Last tergite with 1 very long seta each side, 1 short seta latero-anterior to this, and total of 8 subterminal inner posterior setae and 2 at median margin. Sternites II–V essentially as for female, VI with 13–18 setae in each brush, 11–12 mediad; VII, 15–20; VIII, 9–10; VII and VIII not obviously fused. Genital plate of fused VIII and IX(?), with 11–12 submarginal setae. Posteroventral margin of abdomen with 8–9 short setae. Genitalia as in Fig. 10, 0.40–

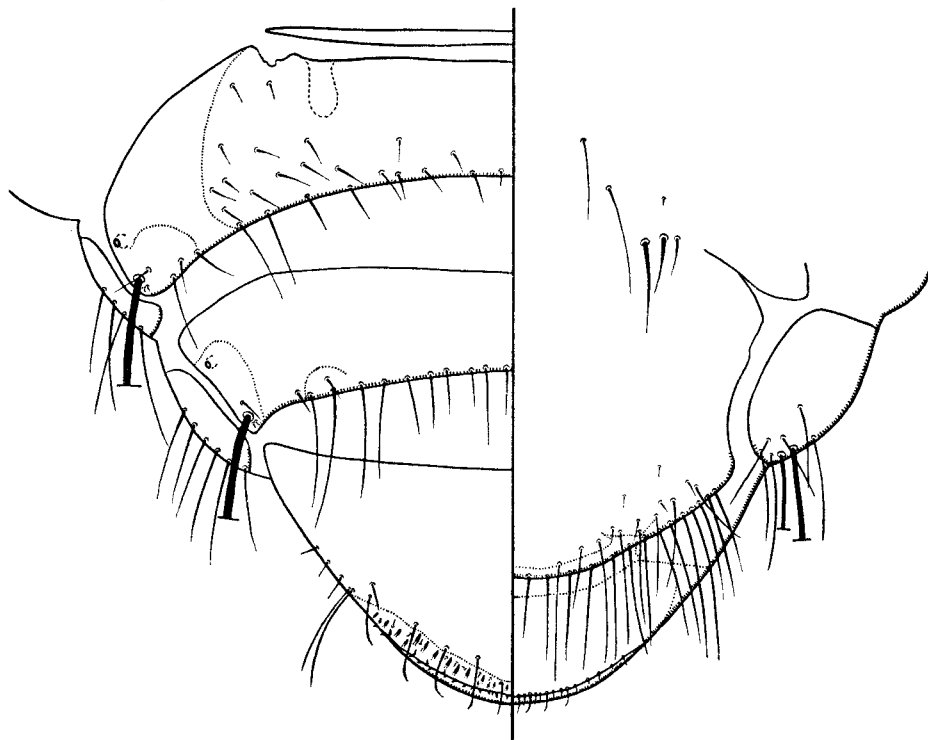


FIGURE 11. *Cavifera abdita* sp. nov. Female terminalia.

0.45 mm long, 0.08–0.09 mm wide; with rather broad basal apodeme, pointed endomeral plate, relatively straight parameres extending as far as endomeral plate, and spiculate genital sac with small lightly pigmented rather indefinite sclerites medially located and inconspicuous in situ but apical on extruded sac (Fig. 9).

Dimensions (in mm): preocular width, ♀ 0.34–0.35, ♂ 0.35–0.38; temple width, ♀ 0.50–0.52; ♂ 0.50–0.53; prothorax width, ♀ 0.32–0.34, ♂ 0.35–0.38; metathorax width, ♀ 0.53–0.55, ♂ 0.51–0.56; total length, ♀ 1.67–1.71, ♂ 1.55–1.62.

***Cavifera senta* sp. nov.**

(Fig. 12)

Holotype ♀ in British Museum (Natural History) (706). Host: *Ptilinopus bellus* (Sclater), Kunupi, New Guinea, Meinertzhagen 10792; *Paratype* ♀, same data as *Holotype*.

Female. Very close to that of *C. abdita*, but differing in the following features. More and generally longer, especially laterally, marginal setae on abdominal tergite VII, with 21 mediad to inner dotted lines (Fig. 12). Tergite VIII with 27 to 30 marginal setae, giving total of 26 marginal and anterior setae mediad to dotted lines (Fig. 12); apparently with tendency for more longer setae laterally. Fewer anterior tergal setae on I, with only 4-6 each side, and on VII, with only 8 each side mediad to inner dotted lines, and total of 37 marginal and anterior setae in this area. Sternite VII each side with the 3 most

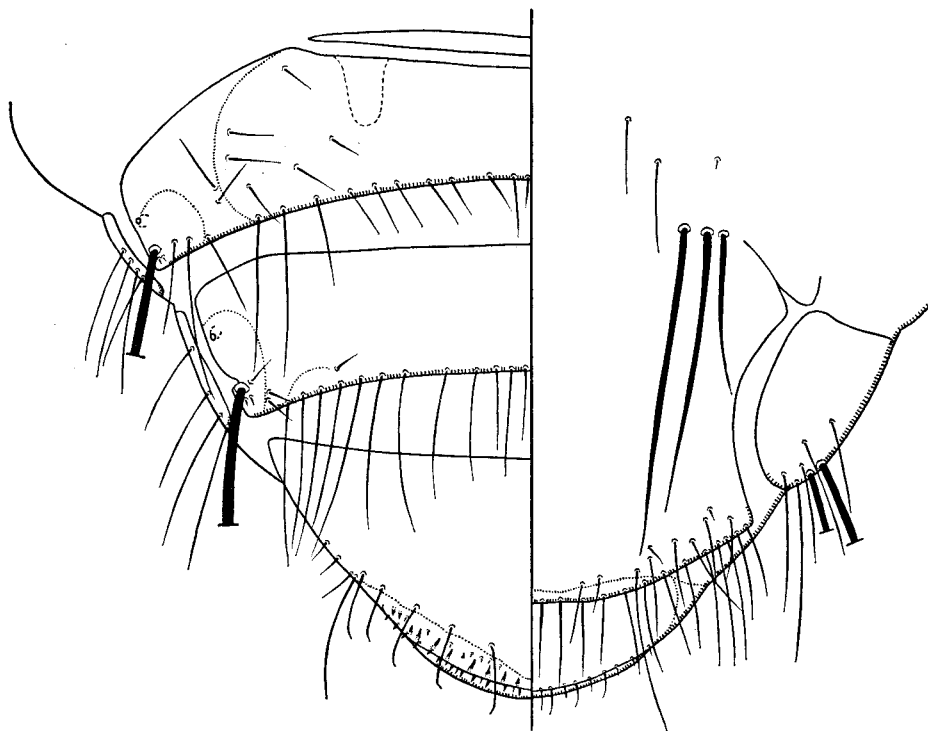


FIGURE 12. *Cavifera abdita* sp. nov. Female terminalia.

posterior setae very long and prominent, the longest extending near to posterior margin of subgenital plate (Fig. 12); these setae provide the most outstanding feature for separating *C. senta* from *C. abdita*.

Male. Unknown.

Dimensions (in mm): preocular width, 0.32-0.34; temple width, 0.47-0.51; prothorax width, 0.32; metathorax width, 0.52; total length, 1.41 (telescoped abdomen).

REMARKS

A point of much concern to us is the absence of host information for the type species of *Cavifera*. We suggest that the host is probably a member of the New Guinea Columbiformes. This is based on the assumption that *Ptilinopus* is the correct host of *C. senta*.

To describe a louse without a host designation is almost as unheard of now in mallophagan taxonomy as it is to describe a free-living animal without a locality. One of the

reasons why taxa described without a host name, or with the wrong host name, have caused so much trouble is that these descriptions have generally been so poor that the taxon cannot be recognized without specimens available from the type host. However, if an adequate morphological evaluation is given, then the new taxon may be separated from related taxa without knowledge of the host.

It can be argued that, if mallophagan taxonomy is placed on a sound morphological basis, species and genera should be recognizable on their own features and accompanying host information would not be necessary. However, such studies as relation between host size and parasite size and host-parasite phylogenetic relationships are impossible when the host is unknown, as are zoogeographical deductions of the hosts themselves if they are without locality data. In general, therefore, we will continue to deprecate the description of new taxa based on specimens for which the host is unknown, but the genus and species described herein have an organ unique among the known lice and we believe it best to name them now. It is our hope that we have given descriptions and figures sufficiently detailed to make identification of subsequent specimens certain.

ACKNOWLEDGEMENTS

We would like to thank the Bishop Museum for the collection of lice representing the type species of *Cavifera*; Dr K. C. Emerson, Arlington, Virginia, for forwarding these lice to us for study; and the staffs of the British Museum (N.H.) Electron Microscope Unit for the photographs in Plate 1 **C–G** and of the Photographic Studio, British Museum (N.H.) for those in Plate 1 **A, B**.

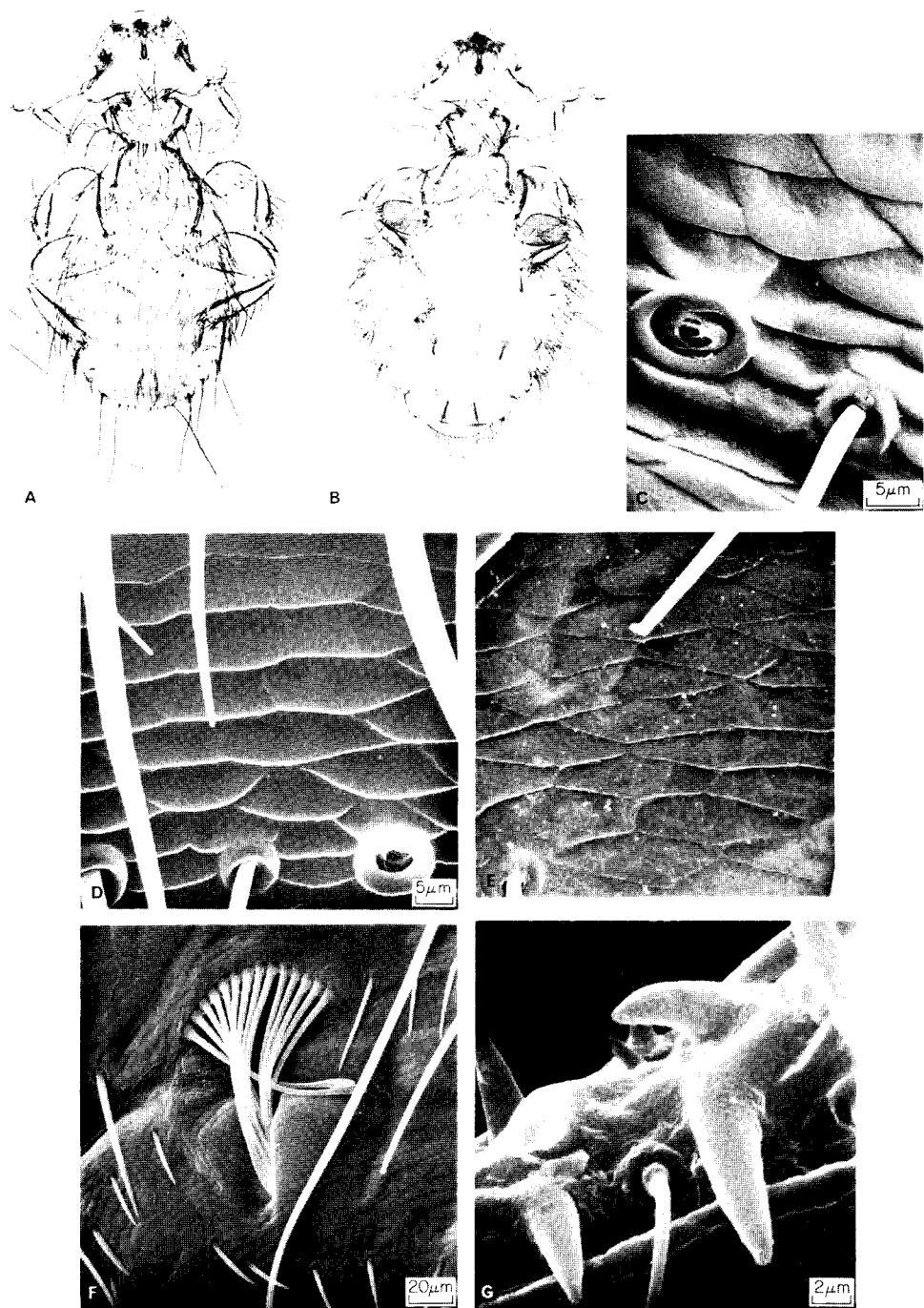
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EXPLANATION OF PLATE

PLATE 1

Cavifera abdita sp. nov. **A**, Male; **B**, female; **C–E**, part of tergite VII: **C, D**, male, **E**, female; **F**, female tergal sense organ; **G**, processes associated with female anal margin.
A, B, Light microscope; **C–G**, scanning electron microscope; **D, E**, at same magnification.



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