

Diversity of *Manota* Williston (Diptera: Mycetophilidae) in a Malaysian rainforest: description of twenty-seven new sympatric species

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Abstract

The following 27 strictly sympatric, new species of *Manota* are described from Malaysia: *M. acutangula*, *M. angustata*, *M. biloba*, *M. calcarata*, *M. cerciflex*, *M. clausa*, *M. curvata*, *M. duplex*, *M. fera*, *M. ferrata*, *M. globigera*, *M. heptacantha*, *M. horrida*, *M. oligochaeta*, *M. ovata*, *M. pappi*, *M. pectinata*, *M. perpusilla*, *M. plusiochaeta*, *M. pollex*, *M. procera*, *M. roslii*, *M. simplex*, *M. spadix*, *M. transversa*, *M. ulu*, and *M. yongi*. A key for the identification of all the Oriental and Palaearctic species of *Manota* is given.

Key words: Mycetophilidae, *Manota*, morphology, new species, Oriental region, taxonomy

Introduction

In recent years, the Manotinae (Mycetophilidae) have been the subject of intensive study and the true diversity of this previously species-poor group is now becoming evident. Of the four included genera, *Paramanota* Tuomikoski (with 4 species) and *Promanota* Tuomikoski (2 species) are restricted to the Oriental Region, and *Eumanota* Edwards (7 species) is Oriental–Australian. These genera were recently revised and reviewed by Papp (2004) and Hippa & al. (2005). The fourth genus, *Manota* Williston (1896), is worldwide in distribution. Bechev (2000) gave the number of 27 species, divided between the biogeographical regions as follows: Afrotropical 18, Australian 3, Nearctic 1, Neotropical 3, Oriental 1, and Palaearctic 1. The Nearctic species is the unnamed species mentioned by Sherman (1920) and later, for example, by Vockeroth (1981). The two described species from New Caledonia (Matile 1993) were not included in Bechev's (2000) enumeration (Bechev in litt.). Ševčík (2002) subsequently described a second Palaearctic species and Papp (2004) a third one together with two additional Oriental species. Jaschhof & Hippa (2005) doubled the number of known species of *Manota* by describing 27 species from Costa Rica.

The Oriental fauna of *Manota* is extremely poorly known, with only Senior-White's (1922) *M. orientalis* from Sri Lanka and Papp's (2004) *M. bilobata* and *M. meilingae* from Taiwan being known to date. In addition, an unnamed species from Sulawesi similar to *M.*

orientalis was mentioned by Matile (1993). The aim of the present paper is to demonstrate the high species diversity of *Manota* in the Oriental Region. The 27 species described in this paper were collected in a very restricted area, less than one square kilometer, of secondary lowland rainforest at Ulu Gombak Field Study Centre (University of Malaya) near Kuala Lumpur, Selangor, Malaysia. Even more species than this were collected, but the poor condition of the specimens prevents their being described. In addition to the species described in this paper, I have in my possession or have seen material of numbers of additional species of *Manota* from the Oriental Region.

Material and methods

Specimens were selected from ethanol-preserved samples from Malaise traps. The specimens were mounted in Canada balsam after maceration in warm potassium hydroxide (10% KOH), step-wise dehydration in ethanol, and brief treatment with beechwood creosote. All the material is in the Swedish Museum of Natural History, Stockholm. The female holotype of *Manota orientalis*, obtained on loan from The Natural History Museum, London, is a dry pinned specimen. It was studied only under the stereomicroscope (Wild M5). The morphological terminology mostly follows that of Söli (1997) and Jaschhof & Hippa (2005) except that the male terminalia are called the “hypopygium”. Additional terms are explained in the text and, in a few cases, parallel terms are used for clarity. Illustrations were made by the author with a drawing tube attached to a Leitz Diaplan compound microscope.

The following abbreviations for parts of the hypopygium are used in the figures: cr = cercus, gs = gonostylus, gx = gonocoxa, gx a = gonocoxal apodeme, gx l = apicolateral lobe of gonocoxa, gx d = dorsomesial margin of gonocoxa, gx v = ventromesial margin of gonocoxa, I = position I seta/megaseta, II = position II seta/megaseta, III = position III seta/megaseta, IV = position IV seta/megaseta, ps l = parastylar lobe, st 9 = sternite 9, st 10 = sternite 10, tg 9 = tergite 9, tm = tegmen, tm a = apodeme of tegmen.

The characters of Oriental *Manota* and notes on the descriptions

The characterisation of *Manota* given by Jaschhof & Hippa (2005) and based on Costa Rican species applies well to the Oriental species described here. However, there are some characters and details that require discussion and comment, as follows:

A rough size for the flies is expressed on the basis of their wing length: “small-sized” *Manota* when the wing length is 1.8 mm or less, and “large-sized” *Manota* when it is 1.9 mm or more. After the rather long preservation in ethanol and the mounting procedure, the colour in all the species is largely the same, a more or less unicolorous pale brown.

Male. **Head.** The antennal flagellomere 4 is illustrated for every species. There is

some slight infraspecific variation, but it has not been measured exactly and given in the descriptions. The diagnostic value of the length/width ratio of the flagellomeres is limited in the present material. The relative length of the palpomeres in the maxillary palp (Fig. 1A) is approximately the same throughout. Precise measurements for most of the species have not been possible with the present material and have even been regarded as unnecessary. The curved sensilla on palpomere 3 appear in rather different shapes (Figs. 3A, B, C, D). There seems to be variation among species, but their appearance is also affected by the angle of view and special mounts would be needed to study this character carefully and in detail. In addition to the curved sensilla, there is another type of unusual sensilla, in a row more or less parallel to the row of curved sensilla. These look like normal setae, but are blunt and are transversely truncated apically. Like the curved sensilla, their number is infra- and interspecifically variable. Their exact number is difficult to count in most mounts and so it is not mentioned in the descriptions. Palpomere 4 probably always has an apical parasegment (Fig. 1A) even if it has not been possible to detect it with certainty in some slides. **Thorax.** The anepisternum, anterior basalare, preepisternum 2, and laterotergite are either setose or non-setose, and different combinations of these characters provide good key characters. Episternum 3 is always setose, but it has not been possible to describe the detailed pattern of the setosity from the present material. Söli (1993) was able to use this character in diagnosing the African species. There are slight differences between species in the chaetotaxy of the legs, especially in the anteroapical depressed area, or in the tibial organ (Fig. 1E), but it has not been possible to study them consistently in the present material. **Wing.** Vein Sc distally of h is non-setose on both sides in all the species studied here, but this character is mentioned in all the descriptions to keep them comparable with earlier descriptions. The sclerotized parts of M, apical part of M1 and almost all of M2 are similar in all the species, but there are rather large differences between the species as to how much of the basal part of M (stM) can be traced on the basis of the prevailing dorsal setae (Fig. 2); in some cases almost the whole of M can be traced (Fig. 2B). The setae on the unsclerotized parts of M are extremely difficult to see and they are omitted from the descriptions. The CuA fork is complete (Fig. 2A) or incomplete (2B), and in the latter case CuA2 appears to be detached from CuA1. In many cases the condition has been difficult to see and quite clearly there is some infraspecific variation; because of its obscurity, the character has not been included in the descriptions. Vein A1 is always unsclerotized (Fig. 2), but in many species it is indicated by a few to many setae (Fig. 2B). This character is mentioned in the descriptions, but there remains some uncertainty in those cases where these setae have not been observed. **Hypopygium (terminalia).** Tergite 9 is usually wholly membranous except for a transverse sclerotization where the basal margin of the tergite might be expected to be situated, and in a few cases there is a seta on the membranous area between the dorsomesial margins of the gonocoxa which must belong to tergite 9 (Fig. 8F). Sternite 9 is distinct, laterally well separated from the gonocoxa (e.g. Fig. 1B) except for those cases where it is very large, as

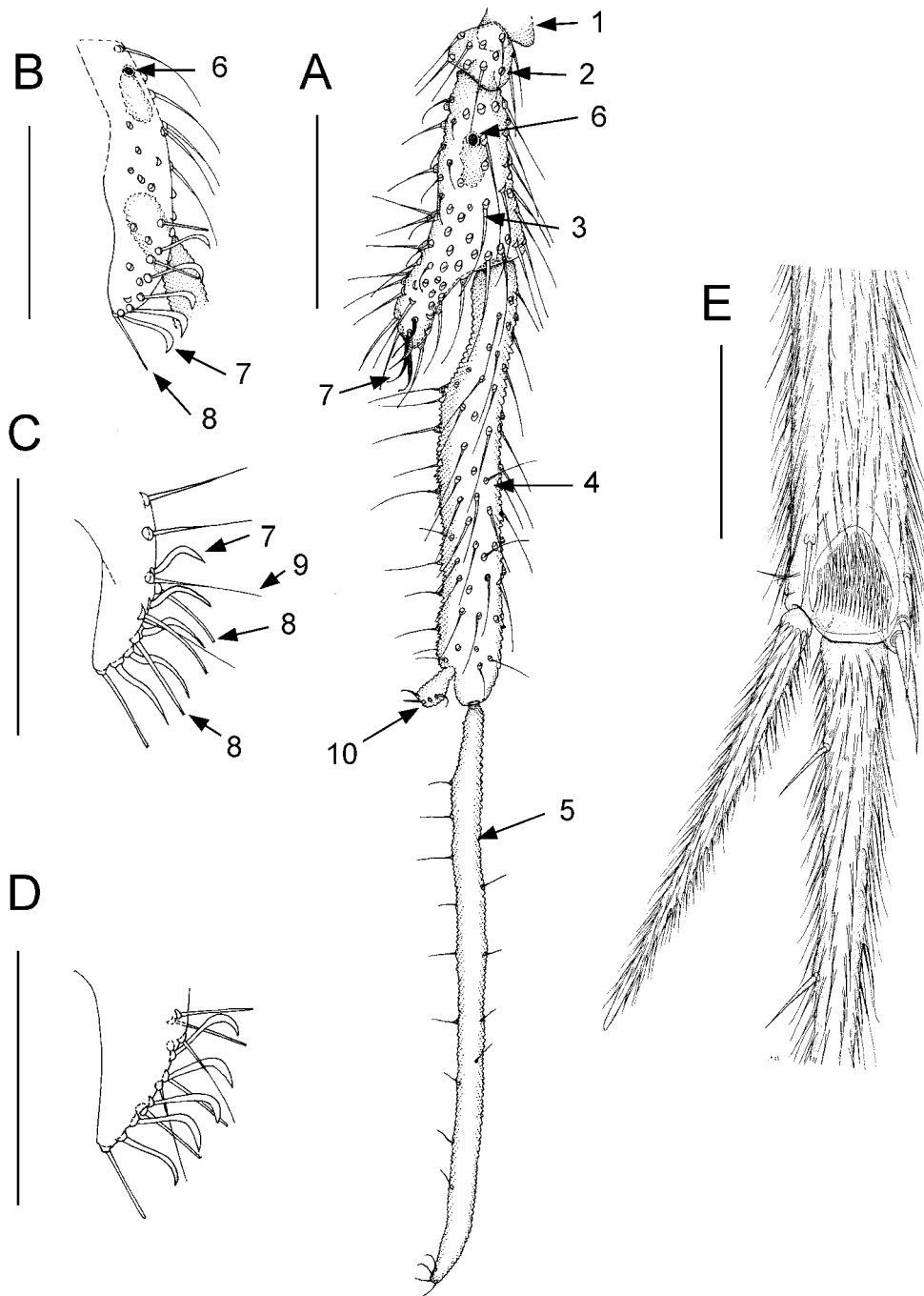


FIGURE 1. Left palp, dorsal view (A); apical part of palpomere 3, lateral view (B, C, D); and apical part of tibia 1 with basal part of tarsomere 1, prolatral view (E). **A, C.** *Manota heptacantha* sp. n. (paratypes). **B.** *Manota pappi* sp. n. (paratype). **D.** *Manota spadix* sp. n. (paratype). **E.** *Manota angustata* sp. n. (paratype). Scale 0.1 mm. 1 = palpomere 1, 2 = palpomere 2, 3 = palpomere 3, 4 = palpomere 4, 5 = palpomere 5, 6 = sensory pit, 7 = curved sensillum, 8 = blunt-ended sensillum, 9 = seta, 10 = parasegment.

long as the ventral part of the gonocoxa (e.g. Fig. 6E). In many cases (e.g., Figs. 5B, E), the posterior margin of tergite 9 is not sharply separated from the more posterior and dorsal membranous medial structures of the hypopygium. The gonostylus is always well developed and large. The parastylar lobe is present (e.g. Fig. 3B) or absent (e.g. Fig. 1B). In the descriptions, the “apex of the parastylar lobe” refers to the usually produced, lobe-like part bearing the setae; in a few cases there is no distinct apex (e.g. Fig. 12B). When needed, the dorsal chaetotaxy of gonocoxa is described by using the following rough positions: I at the middle of dorsomesial margin, II subapically on the same margin, III by II but slightly more posterior and more ventral, and IV more posterior than the two latter positions. In many species there is a larger or smaller apicolateral lobe or apophysis on the gonocoxa. It may be directed posteriorly (e.g., Fig. 8E, F) or it may be directed obliquely or even transversely mesiad (e.g., Fig. 15C). The gonocoxal apodemes are separate and rather weak, and in dorsal or

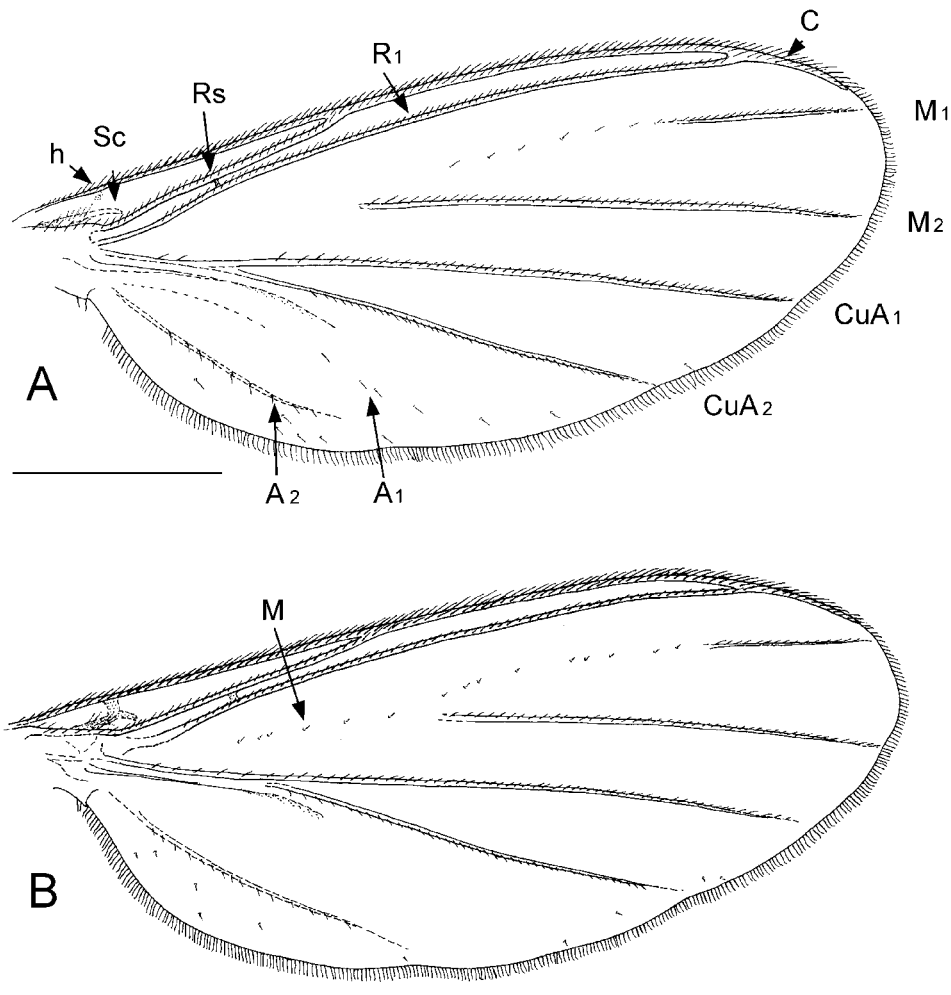


FIGURE 2. Wing, dorsal view. **A.** *Manota yongi* sp. n. (holotype). **B.** *Manota oligochaeta* sp. n. (paratype). Scale 0.50 mm.

ventral view they cross the parameral apodemes (e.g., Fig. 3D). The parameres and aedeagus are united to form a sclerotized median plate, which is here called the tegmen (e.g., Fig. 3B, D). The relative size of the tegmen varies between species. The shape is roughly triangular, usually with lateral shoulders where the broader basal part changes to the narrower apical part. Apically, the tegmen has a ventrally-directed process where the ejaculatory duct terminates. The aedeagal apodeme is exceedingly weak or absent in all species. The distinction between sternite 10 and the hypoproct is obscure. What is here called sternite 10 is probably a combination of both sclerites. In many species, there is a paired row or an elongated zone of setae medially on this part that probably belongs to the true sternite 10 (e.g., Figs. 9B and D), while the more peripheral setae probably belong to the hypoproct. The cerci are separate (e.g., Fig. 14C) or more or less fused medially (Figs. 3E, 14F), and in at least one species they are unusual in shape (Fig. 14C).

Female. There are a number of females in the present material, still mostly in ethanol. There are differences among them in thoracic chaetotaxy, as in the males. The terminalia are similar to those described by Söli (1993), with small differences in the chaetotaxy and the relative size of the different sclerites, but at present I have found no way of associating females with conspecific males.

Preimaginal stages and biology. Nothing is known about the preimaginal stages. The biology is also unknown except for the rough habitat. The larva and larval habits are only known for one species of *Manota*, the Palaearctic *M. unifurcata* Lundström. Zaitzev (1990) found the larvae on the surface of wet, rotten, birch wood with a greyish coating of an unidentified fungus, and Chandler (1978) reported *M. unifurcata* emerging from rotten beech wood bearing a myxomycete.

Key to the Oriental and Palaearctic species of *Manota* Williston

This key is based only on males. For *M. orientalis*, the thoracic chaetotaxy is based on the holotype female, and the characters of the male hypopygium on the illustration by Edwards (1928).

1. Laterotergite setose.....2
- Laterotergite non-setose 12
2. Preepisternum 2 (katepisternum) setose; tergite 9 distinct, short, extending posteriorly at most to half length of gonocoxae on ventral side; gonocoxa with position III megaseta/e present..... 3
- Preepisternum 2 (katepisternum) non-setose; tergite 9 indistinct, united laterally with gonocoxae, extending posteriorly as far as gonocoxae on ventral side; gonocoxa with position III megaseta/e absent 8
3. Tegmen unusual, long, extending more posteriorly than gonocoxa, its median part strongly constricted giving tegmen a spoon- or spade-like appearance (Fig. 3B)
..... *M. spadix* **sp. n.**
- Tegmen normal, short, extending less posteriorly than gonocoxa, elongate-subtriangu-

- lar in shape (e.g., Fig. 3D) 4
4. Gonocoxa in position III with 1 stout megaseta; parastylar lobe absent (Figs. 4B, D) 5
- Gonocoxa in position III with 2 slender megasetae; parastylar lobe present (Figs. 5B, E) 7
5. Rounded lobe on dorsal mesial margin of gonocoxa with few subequal normal setae (Fig. 3D)..... *M. roslii* **sp. n.**
- Rounded lobe on dorsal mesial margin of gonocoxa with few subequal normal setae and long megaseta (Figs. 4B, D) 6
6. Stronger dorsally-directed setae subapically on ventral mesial margin of gonocoxa arising from small lobe, all setae in 1 group (Fig. 4D) *M. pollex* **sp. n.**
- Stronger dorsally-directed setae subapically on ventral mesial margin of gonocoxa not arising from lobe as margin is evenly curved, 1 seta displaced from group more laterally (Fig. 4 B)..... *M. yongi* **sp. n.**
7. Gonostylus elongate-oval, without mesial subapical lobe (Fig. 5B) *M. ovata* **sp. n.**
- Gonostylus narrow, almost parallel-sided on basal three-quarters, with mesial subapical lobe (Fig. 5E)..... *M. angustata* **sp. n.**
8. Gonostylus bilobed; gonocoxa with 3 + 1 megasetae in position I (Figs. 5B, C) *M. biloba* **sp. n.**
- Gonostylus one-lobed (e.g. Fig. 6E); gonocoxa with 7 or more strengthened setae or megasetae in position I in straight or curved comb-like row (Figs. 6E; 7B, E; 8C) 9
9. Gonocoxa with 7 megasetae in position I; apex of megasetae roundly expanded (Fig. 6F)..... *M. heptacantha* **sp. n.**
- Gonocoxa with 10 or more strengthened setae in position I; apex of setae sharp (Figs. 7B, E; 8C) 10
10. Gonocoxa apicolaterally with exceedingly long and strong sigmoid setae (Fig. 7E) *M. ulu* **sp. n.**
- Gonocoxa apicolaterally with short normal setae only (Figs. 7B, 8B) 11
11. Gonocoxa with 2 strong setae in position II, setae equal in size to those in position I, gonocoxal margin roundly angulate at this point (Figs. 7B, C) *M. simplex* **sp. n.**
- Gonocoxa without strong setae in position II, gonocoxal margin evenly curved at this point (Fig. 8C)..... *M. clausa* **sp. n.**
12. Katepisternum setose 13
- Katepisternum non-setose 32
13. Gonocoxa dorsally with long, apicolaterally attenuating and posteriorly directed setigerous lobe which is contiguous with lateral margin of gonocoxa, the lobe extending much more posteriorly than mesial or apicomesial margin of gonocoxa (e.g., Figs. 8E, F) 14
- Gonocoxa dorsally without long apicolateral lobe (e.g., Figs. 14C, F), but if lobe is present in this position, it is transverse and with basal part wholly overlapped by apicomesial margin of gonocoxa (e.g., Fig. 15C) 24

14. Gonocoxal megasetae in position III directed obliquely anteriorly.....*M. delyorum* Papp
 - Gonocoxal megasetae in position III directed transversely or obliquely posteriorly (e.g., Fig. 8E)..... 15
15. Gonostylus with apicolateral angle and straight, obliquely truncated apex (Figs. 8E; 9B, D; 10A, B, C)..... 16
 - Gonostylus without apicolateral angle, entire apex rounded (e.g., Figs. 11B, E)..... 18
16. Gonostylus short, mesial ventral margin convex, apicomèsial angle produced as small lobe (Figs. 8E, 10B) *M. calcarata* **sp. n.**
 - Gonostylus long, mesial ventral margin concave, apicomèsial angle not produced (Figs. 9B, D; 10A, C) 17
17. Lateral margin of gonostylus nearly straight, apex of gonostylus much broader than medial width of gonostylus, setae at apicomèsial angle of gonostylus in longitudinal rows (Figs. 9B, 10A)..... *M. procera* **sp. n.**
 - Lateral margin of gonostylus convex, parallel with concavity of the mesial margin, apex of gonostylus only slightly broader than medial width of gonostylus, setae at apicomèsial angle of gonostylus arranged in 2 short transverse rows on dorsal side (Figs. 9D, 10C) *M. transversa* **sp. n.**
18. Gonostylus with 1 or 2 setose mesial lobes (Fig. 11E, Edwards 1928: Fig. 2a)..... 19
 - Gonostylus without mesial lobes (e.g., Fig. 11B) 21
19. Gonostylus with 2 small mesial lobes, 1 on basal half, the other on apical half (Edwards 1928: Fig. 2a) *M. orientalis* Senior-White
 - Gonostylus with 1 large mesial lobe (Fig. 11E) 20
20. Dorsal mesial margin of gonocoxa acutely angulate subapically (Fig. 11F)
 *M. acutangula* **sp. n.**
 - Dorsal mesial margin of gonocoxa rounded subapically *M. bilobata* Papp
21. Gonostylus straight (Figs. 11B, 12D)..... 22
 - Gonostylus curved (Figs. 12A, 13D) 23
22. Dorsal mesial margin of gonocoxa subapically with angulate lobe with row of marginal setae (Figs. 11B, C); subbasal mesial setae of gonostylus all similar to other ventral and mesial setae of gonostylus (Fig. 11B) *M. pectinata* **sp. n.**
 - Dorsal mesial margin of gonocoxa subapically rounded (Fig. 12 E); gonostylus with 2 subbasal mesial setae that are stronger than other ventral or mesial setae of gonostylus (Fig. 12 D) *M. ferrata* **sp. n.**
23. Gonostylus broad, 3 times as long as wide; sternite 10 large, halves with ca. 30 setae (Fig. 12B) *M. fera* **sp. n.**
 - Gonostylus narrow, over 5 times as long as wide; sternite 10 small, halves with ca. 15 setae (Fig. 13D).....*M. curvata* **sp. n.**
24. Gonocoxa dorsally in position I with group of blunt megasetae (Fig. 13B)
 *M. globigera* **sp. n.**
 - Gonocoxa with the usual sharp setae in position I (e.g., Figs. 14C, F) 25

25. Gonostylus with large, trapezoidal, non-setose, striated plate on mesial side *M. chinensis* Ševčík
 - Gonostylus without non-setose striated mesial plate 26
26. Dorsal mesial margin of gonocoxa produced as large lobe on apical part (Fig. 14C) 27
 - Dorsal mesial margin of gonocoxa straight or evenly rounded (e.g. Fig. 15C) or with only small step-like discontinuity (Fig. 15F) 28
27. Gonostylus 1.5 times as long as wide; parastylar lobes present; setae on position III arising from long common basal body (Fig. 14B); lobe on dorsal mesial margin of gonocoxa narrow, without strong setae on posterior margin (Fig. 14C) *M. cerciflex* **sp. n.**
 - Gonostylus nearly 3 times as long as wide; parastylar lobes absent; setae on position III arising nearly separately (Figs. 14E, F); lobe on dorsal mesial margin of gonocoxa broad, with strong setae on posterior margin (Fig. 14F).....*M. pappi* **sp. n.**
28. Gonostylus long and narrow, 4 or more times as long as broad, curved on apical part (Figs. 15B, E) 29
 - Gonostylus short and broad, at most 3 times as long as broad, not curved on apical part (Figs. 16B, D; 17B)..... 30
29. Gonostylus with long apical megaseta and with row of long flattened setae apicodorsally; setae in positions III and IV with short basal bodies (Fig. 15B, C) *M. horrida* **sp. n.**
 - Gonostylus without apical megaseta, with normal setae apicodorsally; setae in positions III and IV with very long basal bodies (Figs. 15E, F) *M. duplex* **sp. n.**
30. Gonostylus at basomesial corner with 1 or 2 strong and long setae deviating from other marginal setae; setae on position III arising from basal body that is several times longer than broad, and dorsal to this, in position IV, with similar body with 1 seta (Fig. 16B) *M. perpusilla* **sp. n.**
 - Gonostylus at basomesial corner with setae similar to its other marginal setae; setae in position III with short basal body that is only twice as long as broad basally, dorsal to this, in position IV, with short oblique lobe with several setae (Figs. 16D, E) 31
31. Gonostylus twice as long as broad, with small mesial lobe just in apical half with long straight seta, the mesial margin of gonostylus with ca. 5 long setae on basal half (Fig. 16D) *M. oligochaeta* **sp. n.**
 - Gonostylus ca. 2.5 times as long as broad, without lobe on mesial margin, with ca. 10 long setae on basal half of mesial margin (Fig. 17B) *M. plusiochaeta* **sp. n.**
32. Anepisternum non-setose *M. unifurcata* Lundström
 - Anepisternum setose *M. meilingae* Papp

Description of species

Manota spadix sp. n.

(Figs. 1D; 3A, B)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 3A. Maxillary palpus with palpomere 3 bearing 4 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 with few setae. **Wing.** Length 1.5–1.7 mm. Membrane with few setae at posterior margin. Vein 1A indicated by few setae. Sc distally of h non-setose. **Hypopygium.** (Fig. 3B). Sternite 9 large, posteriorly extending nearly as far as ventral part of gonocoxa, laterally sharply separated from gonocoxa, apically deeply notched so that sternite is almost divided into 2 separate halves, setae similar to ventral setae of gonocoxa. Gonocoxa in position III with 2 stout curved and apically flattened megasetae, dorsally from these there is a finger-like lobe (not visible in Fig. 3B) with long setae at apex. Gonostylus short, strongly widening toward apex, the apex with a concave excision. Parastylar lobe absent. Tegmen unusual, with short broad basal part which beyond the very strong lateral shoulders forms a long and narrow, apically expanded apical part, and which posteriorly extends beyond other parts of hypopygium.

Female and preimaginal stages unknown.

Discussion

Manota spadix is highly dissimilar to all other known *Manota*. It is immediately distinguished by the exceptional length and shape of the tegmen.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. Paratypes. 1 male with same data as holotype; 1 male with same data as holotype except for 24. Feb.–21. March.

Manota roslii sp. n.

(Figs. 3C, D, E)

A large-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 3C. Maxillary palp with palpomere 3 with 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 setose. **Wing.** Length 2.0 mm. Wing membrane dorsally with few setae at

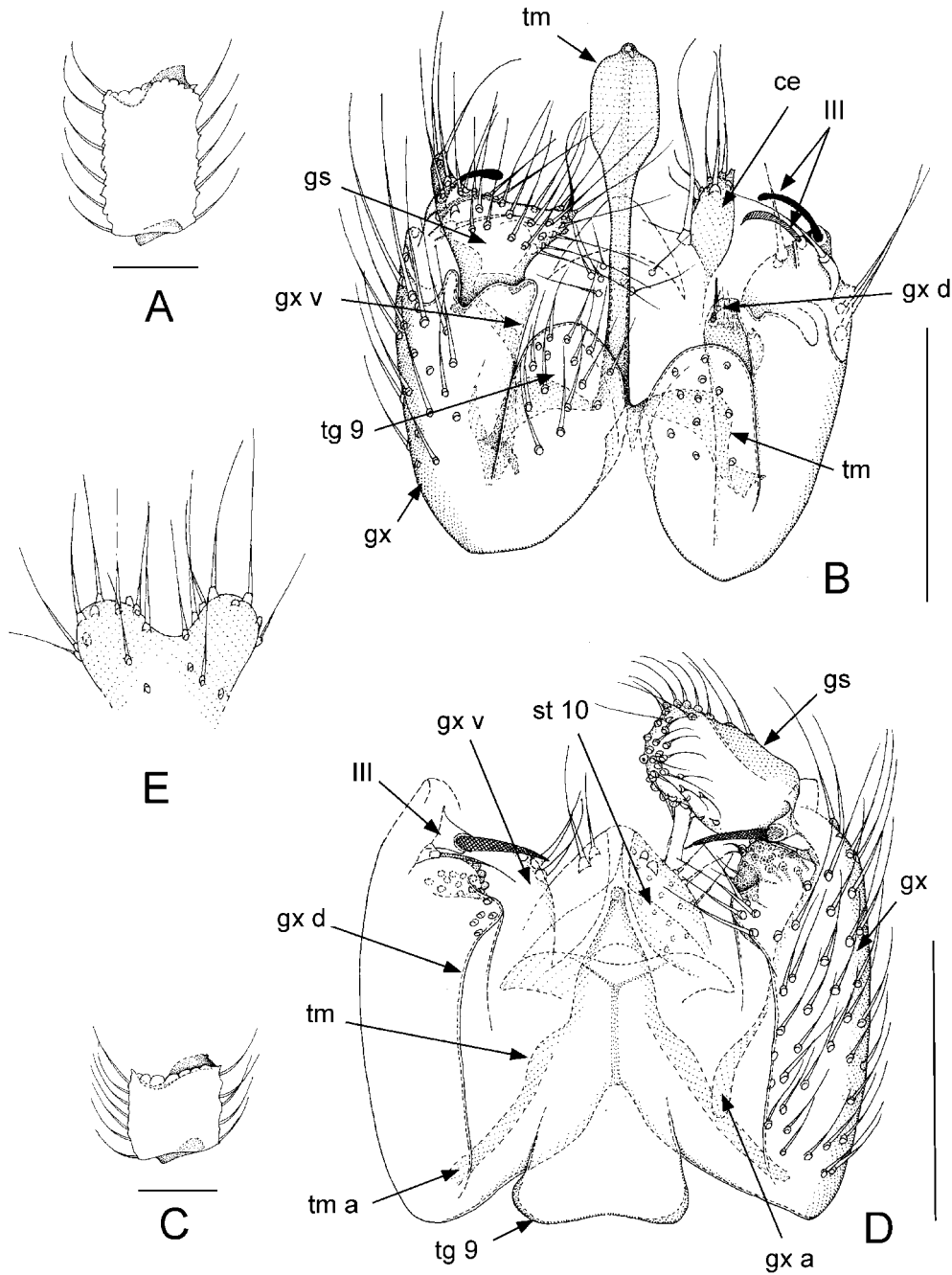


FIGURE 3. Antennal flagellomere 4, lateral view (A, C); hypopygium ventral (B) and dorsal (C) view; and cerci, dorsal view (E). **A, B.** *Manota spadix* **sp. n.** (holotype). **C, D, E.** *Manota roslii* **sp. n.** (holotype). Scale for A and C 0.05 mm; for B, D, and E 0.10 mm. For abbreviations, see under Material and methods.

posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 3D, E). Ventral aspect similar to Fig. 4, but sternite 9 longer, almost half length of gonocoxa and with more widely spread setosity. Gonocoxa ventrally evenly rounded apicomesially, with 3 stronger setae deviating from adjacent setosity at margin; dorsally in position I with rounded lobe bearing few strong setae, 1 apparently non-flattened unbranched megaseta in position III, no apicolateral triangular lobe; gonocoxal apodeme small, crossing parameral apodeme in dorsal or ventral view. Gonostylus broad, subquadrangular. Parastylar lobe lacking. Tegmen long, elongate-triangular, with slight lateral shoulders. Setae on sternite 10 scattered.

Female and preimaginal stages unknown.

Discussion

Manota roslii is similar to *M. pollex* and *M. yongi*, but is distinguished by having a longer sternite 9, extending nearly to the middle length of the gonocoxa, by having only strong setae, not megasetae, in position I on the gonocoxa, by having the megaseta in position III round in cross section, not flattened, and by having the gonostylus broad.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hipa, M. Jaschhof and B. Viklund. Paratype. 1 male with same data as holotype.

Etymology

The species is named in honor of Dr. Rosli Hasim, University of Malaya, for his invaluable help in collecting the species.

***Manota pollex* sp. n.**

(Figs. 4C, D)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 4C. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 setose. **Wing**. Length 1.7 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Fig. 4D). Sternite 9 short, one-fourth of ventral length of gonocoxa, laterally sharply delimited, posterior margin not clearly contiguous so that sternite gives impression of being medially divided, setae stronger than ventral setae of gonocoxa. Gonocoxa ventrally with rounded lobe apicomesially, lobe with stronger setae deviating from adjacent setosity; dorsally in position I with rounded lobe bearing 1 megaseta, 1 flattened megaseta in

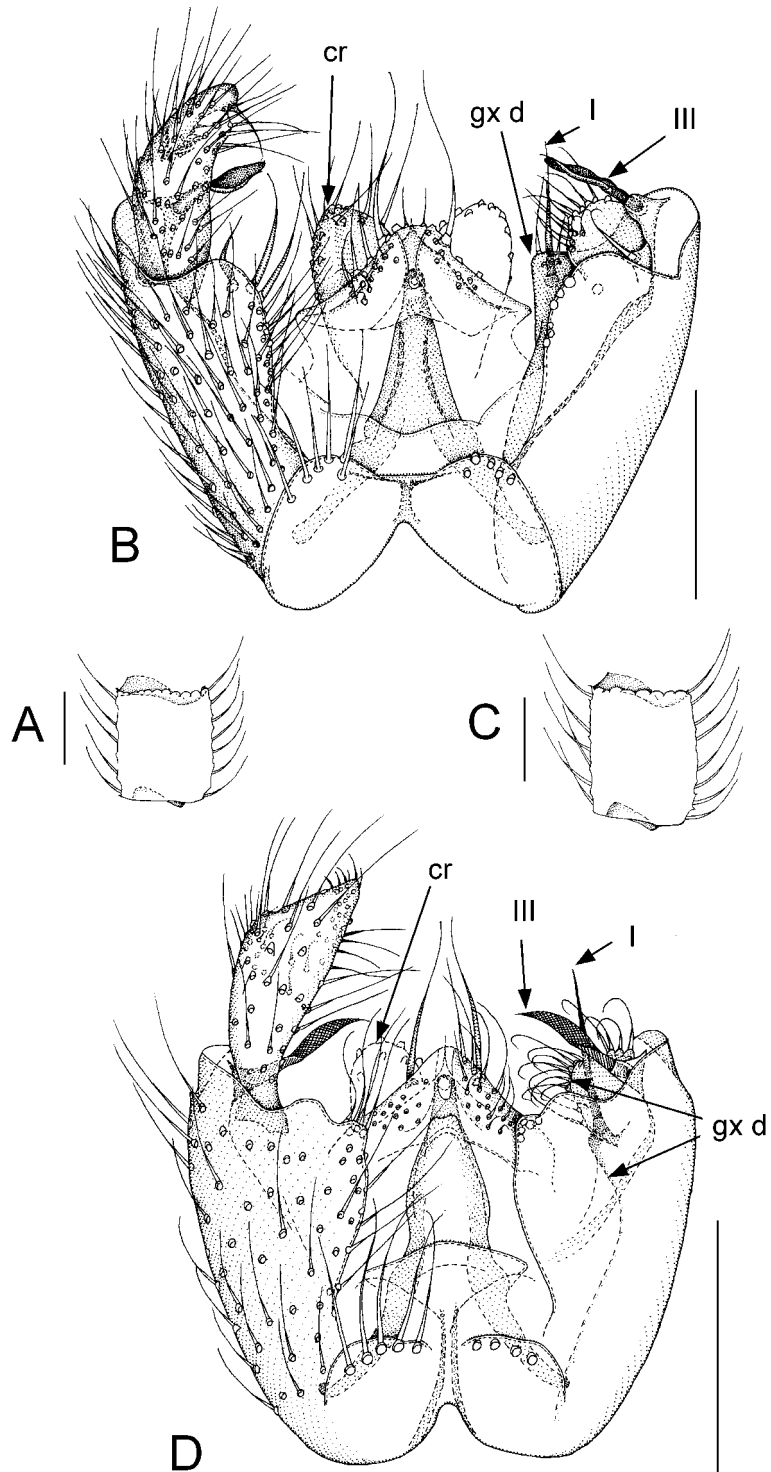


FIGURE 4. Antennal flagellomere 4, lateral view (A, C) and hypopygium, ventral view (C, D). **A, B.** *Manota yongi* **sp. n.** (holotype). **C, D.** *Manota pollex* **sp. n.** (holotype). Scale for A and C 0.05 mm, for B and D 0.10 mm.

position III which basally may have a branch, no apicolateral triangular lobe. Gonostylus elongate, laterally angularly convex, mesially nearly straight, apically almost pointed. Parastylar lobe lacking. Tegmen long and unusually narrow, with slight lateral shoulders. Setae on sternite 10 scattered.

Female and preimaginal stages unknown.

Discussion

Manota pollex is similar to *M. yongi*. It differs from the latter by having the group of stronger setae apicomesially on the ventral side of the gonocoxa on a small rounded lobe. Furthermore, the apical part of the gonostylus is less narrowed or pointed and the lobe dorsally on the gonocoxa in position I is narrower. Both species are rather similar to *M. roslii*. For further discussion, see under *M. roslii*.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hipa, M. Jaschhof and B. Viklund. Paratype. 1 male with same data as holotype except for 22. Feb.–21. March.

Manota yongi sp. n.

(Figs. 2A; 4A, B)

A large-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 4A. Number of curved sensilla on maxillary palpomere 3 uncertain because of unsuitable angle of view in single specimen, only 1 is clearly identifiable; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 setose. **Wing**. Length 2.0 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by 1 (observable) seta. **Hypopygium** (Fig. 4B). Sternite 9 short, one-third of ventral length of gonocoxa, laterally sharply delimited, posterior margin deeply notched, setae stronger than ventral setae of gonocoxa. Gonocoxa ventrally evenly rounded apicomesially, with 3 stronger setae deviating from adjacent setosity, 2 of these at margin, 1 displaced laterad on inner side of gonocoxal sclerite; dorsally in position I with rounded lobe bearing 1 megaseta, 1 flattened megaseta in position III which has narrow branch subbasally, no apicolateral triangular lobe. Gonostylus elongate, laterally convex, mesially shallowly concave, apically narrowed but rather broadly rounded. Parastylar lobe lacking. Tegmen long, subtriangular, with slight lateral shoulders. Setae on sternite 10 scattered.

Female and preimaginal stages unknown.

Discussion

Manota yongi is similar to *M. pollex*. For distinguishing characters, see under the latter species. With a wing length of 2 mm, *M. yongi* is the largest *Manota* in the present material.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund.

Etymology

The species is named in honor of Professor Yong, University of Malaya, for his invaluable help in collecting the species.

***Manota ovata* sp. n.**

(Figs. 5A, B, C)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 5A. Maxillary palpus with palpomere 3 bearing 4–6 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 setose. **Wing**. Length 1.4–1.5 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 from few to many. **Hypopygium** (Figs. 5B, C). Sternite 9 large, laterally sharply delimited but posterior margin weakly indicated, setae subequal to ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, without apicolateral triangular lobe but with subapical setose transverse lobe covered by mesial margin, with 2 long sigmoid megasetae in position III, arising from common basal body. Gonostylus elongate-oval with characteristic marginal setosity on mesial side. Parastylar lobe well exposed, directed obliquely anteriorly, with couple of apical setae. Tegmen rather short, triangular, with slight lateral shoulders. Setae on sternite 10 in densely placed patch or in 2 short rows near apex of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota ovata resembles *M. plusiochaeta* and *M. oligochaeta*, but has the laterotergite setose. Furthermore, it can be distinguished from both by the roughly oval outline of its gonostylus and by having the setae on sternite 10 in a short two-rowed group rather than in one row. *Manota ovata* is similar to *M. angustata* from which it differs by the simple ovate gonostylus. In *M. angustata* the gonostylus is narrow, parallel-sided and with an apicomesial lobe.

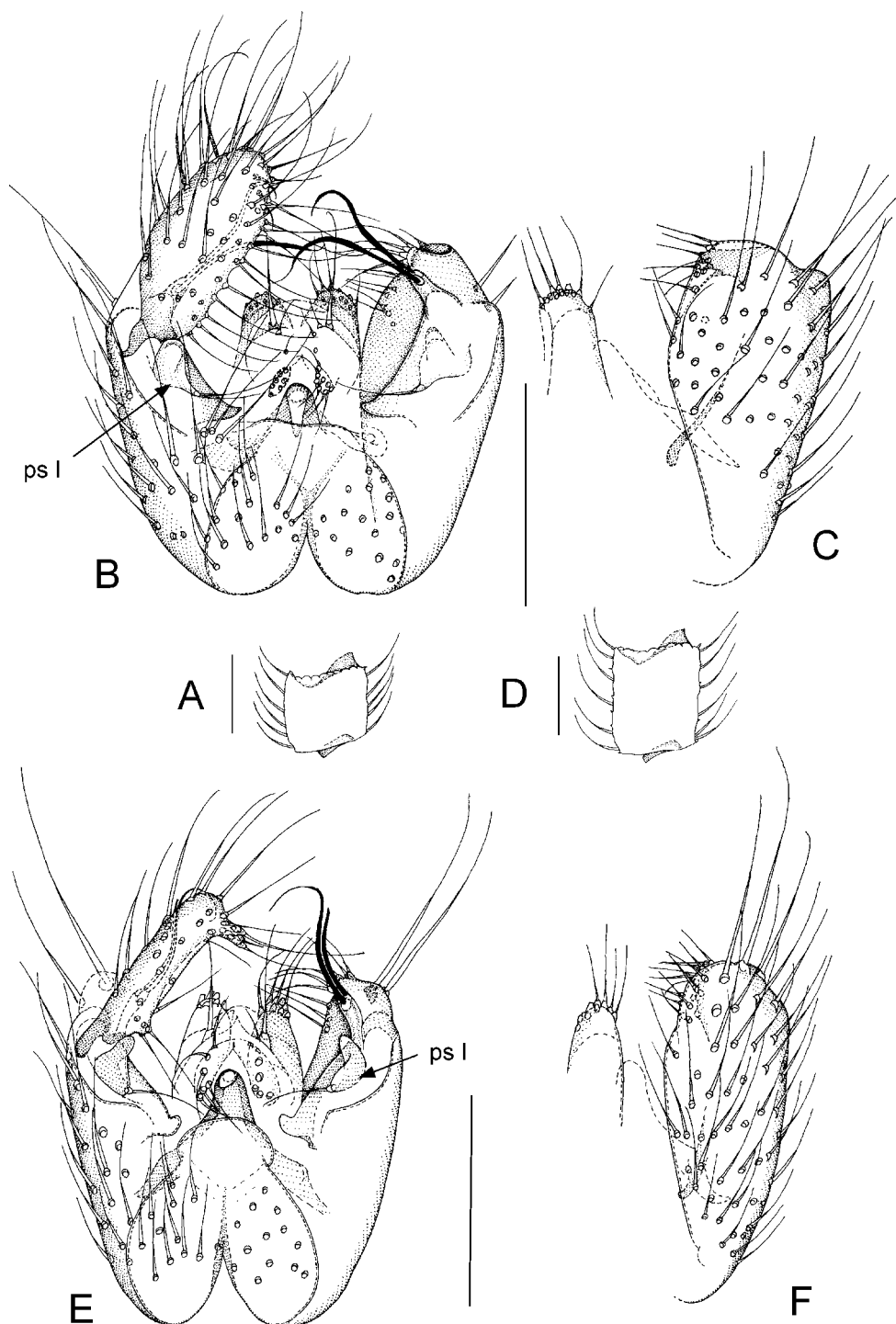


FIGURE 5. Antennal flagellomere 4, lateral view (A, D); hypopygium, ventral (B, E) and dorsal view (C, F). **A, B, C.** *Manota ovata* **sp. n.** (A, C paratype; B holotype). **D, E, F.** *Manota angustata* **sp. n.** (D, E holotype; F paratype). Scale for A and D 0.05; for B, C, E, and F 0.10 mm.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. Paratypes. 8 males with same data as holotype; 3 males with same data as holotype except for 22. Feb.–21. March.

***Manota angustata* sp. n.**

(Figs. 1E; 5D, E, F)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 5D. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla: palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite setose. Episternum 3 setose. Front leg, Fig. 1E. **Wing**. Length 1.3–1.5 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 not observed. **Hypopygium** (Figs. 5E, F). Sternite 9 large, laterally sharply delimited but posterior margin weakly indicated, setae subequal to ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, without apicolateral triangular lobe but with small subapical mesial rounded lobe covered by mesial margin, with 1 long sigmoid megaseta and 1 shorter less sigmoid one in position III, both arising from long common basal body; in 1 paratype, the difference between these 2 setae is not as great as in Fig. 5E, but the shorter one, too, is curved in the apical part. Gonostylus elongate, parallel-sided, with subapical process on the mesial side. Parastylar lobe well exposed, directed obliquely anteriorly, with 1 apical setae. Tegmen rather short, triangular, with slight lateral shoulders. Setae on sternite 10 about 7 in number, in scattered row extending anteriorly to level of apical part of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota angustata is similar to *M. ovata*, but is distinguished by its narrow parallel-sided gonostylus with a mesial subapical lobe.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. Paratypes. 4 males with same data as holotype; 1 male with same data as holotype except for 22. Feb.–21. March.

***Manota biloba* sp. n.**

(Figs. 6A, B, C)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 6A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare setose. Preepisternum 2 non-setose. Laterotergite setose. Episternum 3 setose. **Wing.** Length 1.4 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 not observed. **Hypopygium** (Figs. 6B, C). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa; setosity similar to ventral setosity of gonocoxa (similar to Fig. 8B). Gonocoxa dorsally in position I with rounded lobe bearing 3 megasetae, in position II with 2 strong setae/megasetae ventrad of which there are 2 megasetae that may be those called position III megasetae, no megasetae in position IV; no prominent apical lobes. Gonostylus rather small, bilobed, with some strong setae, with very strong apical seta. Parastylar lobe present, directed posteriad, with about 4 unusually strong setae on apical part. Tegmen long, with strong shoulders. Sternite 10 unusually large, extending posteriorly nearly as far as gonostyli, setae scattered. Apical setae of cercus unusually strong.

Female and preimaginal stages unknown.

Discussion

Manota biloba is similar to *M. clausa*, *M. heptacantha*, *M. ulu*, and *M. simplex* but is easily distinguished by its bilobate or biramous gonostylus. It is also similar to *M. globigera* but has a non-setose laterotergite. For further distinguishing characters, see under *M. globigera*.

Manota biloba resembles several Afrotropical *Manota*, especially *M. flavipes* (Enderlein) from the Seychelles, but it has three megasetae on the gonocoxa in position I instead of only one (see Edwards 1928: Fig. 2a, and Matile 1972: Fig. 1). *M. teocchi* Matile from Central Africa may also be very similar. *M. biloba* differs from it, for example, by having three megasetae in position I instead of two. All the above-mentioned species have a general resemblance to the Afrotropical species *M. serrata* Söli and *M. sespinea* Söli, but have the position III seta less modified and the arrangement of the dorsal gonocoxal setae and megasetae very different. For further discussion, see under *M. simplex*.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund.

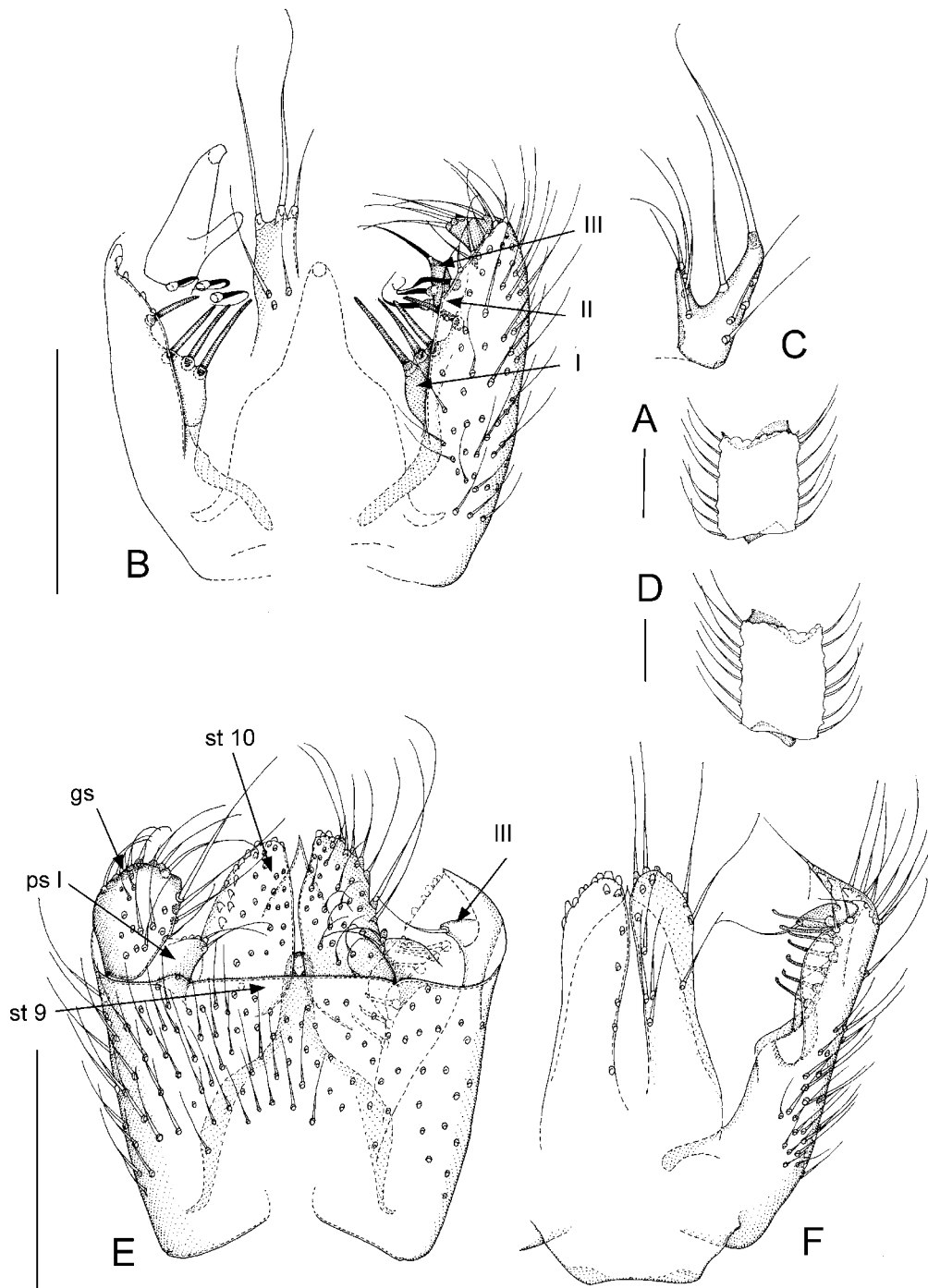


FIGURE 6. Antennal flagellomere 4, lateral view (A, D); hypopygium, dorsal view (B, F) and ventral view (E); and gonostylus, dorsal view (C). **A, B, C.** *Manota biloba* **sp. n.** (holotype). **D, E, F.** *Manota heptacantha* **sp. n.** (D, F paratype; E holotype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

***Manota heptacantha* sp. n.**

(Figs. 1A, C; 6D, E, F)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 6D. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare setose. Preepisternum 2 non-setose. Laterotergite setose. Episternum 3 setose. **Wing.** Length 1.4–1.6 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by 0 to few setae. **Hypopygium** (Figs. 6E, F). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa; setosity similar to ventral setosity of gonocoxa. Gonocoxa dorsally in positions I–II with row of 7–12 megasetae with flattened rounded tips, no megasetae present in positions III and IV, in position III with rather strong normal seta, apicolateral part of gonocoxa simple, apicolateral setae of gonocoxa numerous, curved and rather strong, stronger than they appear in Fig. 6F. Gonostylus rather small, short to elongate-oval depending on angle of view, with some very strong setae apically and apicomesially and dorsally. Parastylar lobe present, directed posteriad, with several setae on apical part. Sternite 10 unusually large, extending nearly as far posteriorly as gonostylus, setae scattered.

Female and preimaginal stages unknown.

Discussion

Manota heptacantha is more or less similar to *M. ulu*. In both species there is a dorsal mesial row of setae on gonocoxa in positions I–II. In *M. heptacantha*, these setae are strong, blunt megasetae, whereas in *M. ulu*, they are only slightly strengthened, pointed setae. Furthermore, in *M. heptacantha* the apicolateral setae of the gonocoxa are normal, but are very strong and sigmoid in *M. ulu*. By having megasetae dorsomesially on the gonocoxa, *M. heptacantha* resembles *M. biloba* but is distinguished, for example, by the simple, not biramous, gonostylus.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratypes.* 4 males with same data as holotype except for 24. Feb.–21. March.

***Manota ulu* sp. n.**

(Figs. 7D, E)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 7D. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment, in some specimens difficult to see with certainty. **Thorax.** Anepisternum setose. Anterior basalare setose. Preepisternum 2 non-setose. Laterotergite setose. Episternum 3 setose. **Wing.** Length 1.5 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Fig. 7E). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa; setosity similar to ventral setosity of gonocoxa. Gonocoxa dorsally in positions I–II with elongated area of many sharp setae, no megasetae present in positions I–IV, in position III with rather strong normal seta; apicolateral part of gonocoxa simple, gonocoxa apicolaterally with row of ca. 6 very strong and long sigmoid setae. Gonostylus rather small, elongate-oval, with some very strong setae mesially and dorsally. Parastylar lobe present, directed posteriad, with 3 or 4 setae apically. Tegmen long, with strong shoulders. Sternite 10 unusually large, extending nearly as far posteriorly as gonostylus, setae scattered.

Female and preimaginal stages unknown.

Discussion

Manota ulu is similar to *M. heptacantha*. For further discussion, see under that species.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund.

Manota simplex sp. n.

(Figs. 7A, B, C)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 7A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare setose. Preepisternum 2 non-setose. Laterotergite setose. Episternum 3 setose. **Wing.** Length 1.5–1.6 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 not indicated by setae. **Hypopygium** (Figs. 7B, C). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa; setosity similar to ventral setosity of gonocoxa (similar to Fig. 8B). Gonocoxa dorsally in position I with rounded lobe bearing curved row/zone of many strong sharp setae, in position II with couple of angled strong setae/megasetae, no megasetae present in positions III and IV; apicolateral part of gonocoxa

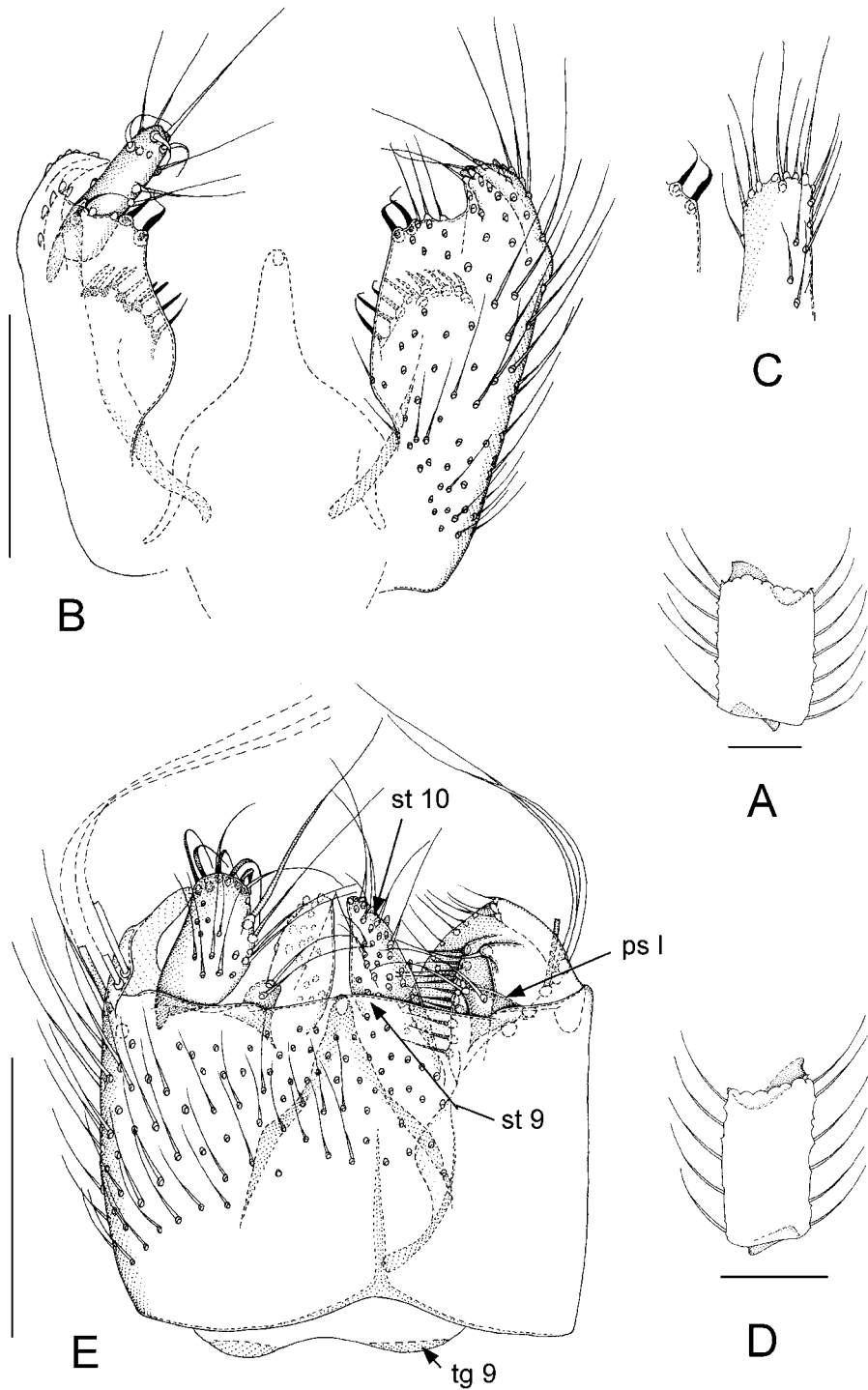


FIGURE 7. Antennal flagellomere 4, lateral view (A, D); hypopygium, dorsal view (B); cercus and apicomesial part of gonocoxa, dorsal view (C); and hypopygium, ventral view (E). **A, B, C.** *Manota simplex* **sp. n.** (holotype). **D, E.** *Manota ulu* **sp. n.** (holotype). Scale for A and D 0.05 mm; for B, C, and E 0.10 mm.

simple, apicolateral setae of gonocoxa not remarkably stronger than the other setae. Gonostylus rather small, elongate-oval, with strong setae, with very strong apical seta. Parastylar lobe present, directed posteriad, with 3 or 4 setae on apex. Tegmen long, with strong shoulders. Sternite 10 unusually large, extending nearly as far posteriorly as gonostyli, setae scattered.

Female and preimaginal stages unknown.

Discussion

Manota simplex is similar to *M. clausa*. For the distinguishing characters, see under that species. *Manota simplex* and *M. clausa*, and to a lesser extent also *M. biloba*, *M. heptacantha*, and *M. ulu*, are reminiscent of the Neotropical *M. squamulata* Jaschhof & Hippa and *M. major* Jaschhof & Hippa but differ, for example, by lacking a long and strong group III megaseta.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratypes*. 1 male with same data as holotype, 1 male with same data except for 22. Feb.–21. March.

Manota clausa sp. n.

(Figs. 8A, B, C)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 8A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare setose. Preepisternum 2 non-setose. Laterotergite setose. Episternum 3 setose. **Wing**. Length 1.4–1.5 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by 1 to few setae. **Hypopygium** (Figs. 8B, C). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa; setosity similar to ventral setosity of gonocoxa. Gonocoxa dorsally in position I with rounded lobe bearing curved row or zone of short strong setae, no megasetae present, not even in position III, no prominent apical lobes. Gonostylus rather small, elongate-oval, with some very strong setae apically and apicomesially. Parastylar lobe present, directed posteriad, with several setae on apical part. Tegmen long with strong shoulders. Sternite 10 unusually large, extending posteriorly nearly as far as gonostyli, setae scattered.

Female and preimaginal stages unknown.

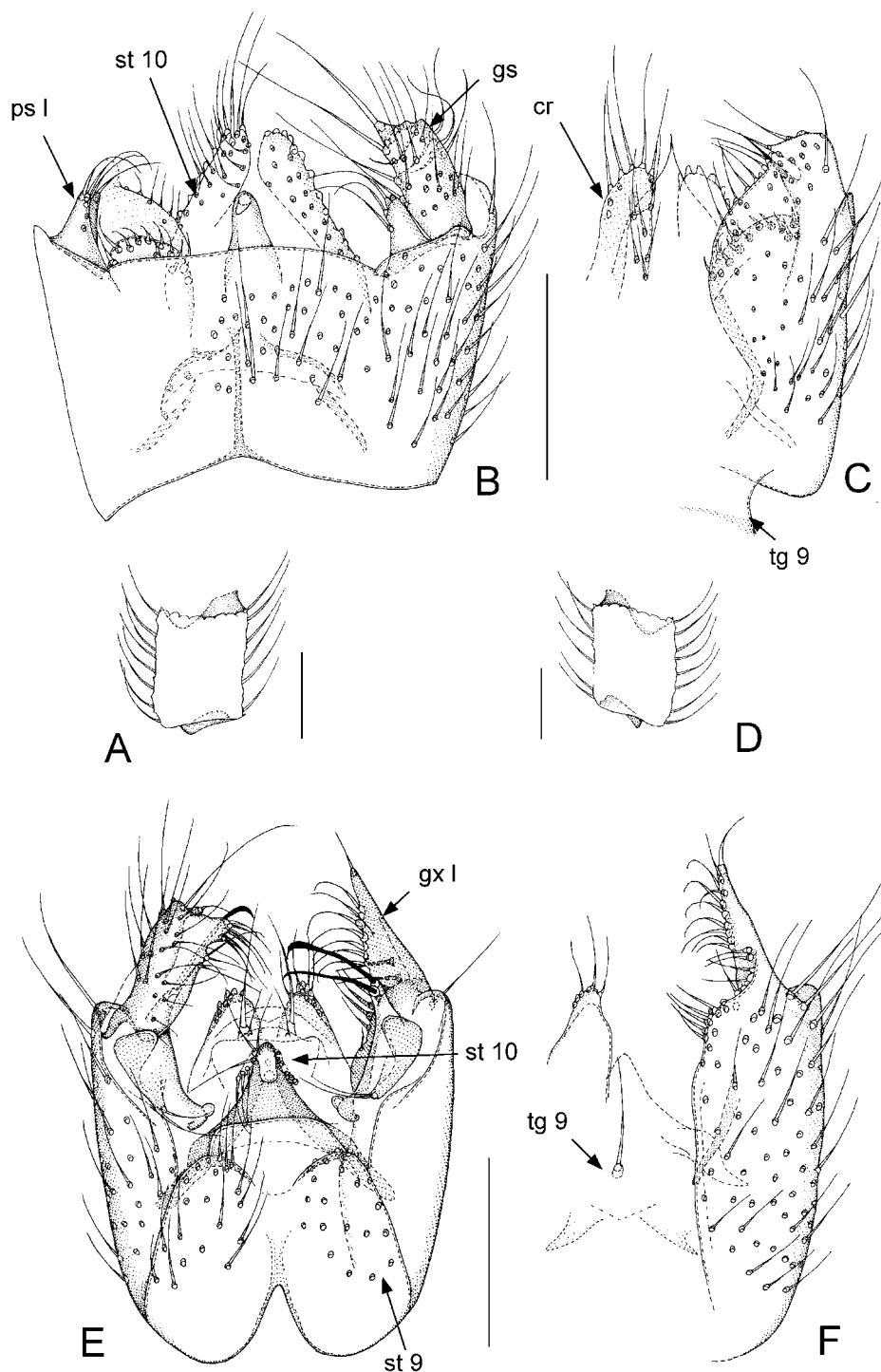


FIGURE 8. Antennal flagellomere 4, lateral view (A, D); hypopygium, ventral (B and E) and dorsal view (C and F). **A, B, C.** *Manota clausa* sp. n. (A, B holotype; C paratype). **D, E, F.** *Manota calcarata* sp. n. (D, E holotype; F paratype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

Discussion

Manota clausa is similar to *M. simplex*, but can be distinguished by the characters of the dorsal mesial margin of gonocoxa: in *M. clausa* the apical/posterior part of the margin is oblique and nearly straight and with normal setae, whereas in *M. simplex* there is an apicomesial angle with a couple of short strong setae.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratype*. 1 male with same data as holotype.

***Manota calcarata* sp. n.**

(Figs. 8D, E, F; 10B)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 8D. Maxillary palpus with palpomere 3 bearing 4–6 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.6–1.8 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 8E, F). Sternite 9 large, extending posteriorly to halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin deeply notched but margin medially confluent with more posterior membranous part with convex margin, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, few strong setae at apicomesial rounded corner, in position III 2 sigmoid or curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe which extends posteriorly to or over apex of gonostylus. Gonostylus elongate-quadrangular in outline, slightly convex on lateral and mesial margin, concave on apical margin, apicomesial angle produced lobe-like, with strong setae on margin (Fig. 10B). Parastylar lobe present, directed anteriorly, with 2 or 3 apical setae. Tegmen short and broad, subtriangular but with marked lateral shoulders. Setae on sternite 10 in single row or partly double row on each half, close to sides of apical part of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota calcarata is similar to *M. procera* and *M. transversa*. It can be distinguished from both by its shorter gonostylus which, unlike the other species, has the apicomesial angle produced lobe-like. The mesial margin of the gonostylus is also convex on its basal part, unlike the other species which have the whole mesial side concave.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. Paratypes. 9 males with same data as holotype; 2 males with same data as holotype except for 22. Feb.–21. March.

***Manota procera* sp. n.**

(Figs. 9A, B; 10A)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 9A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.8 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 not observed with certainty. **Hypopygium** (Figs. 9B, 10A). Sternite 9 large, extending posteriorly to halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin indistinct, medially confluent with more posterior membranous part with transverse straight margin, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, few stronger setae at apicomesial rounded corner, in position III 2 sigmoid or curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe that extends posteriorly as far as apex of gonostylus. Gonostylus elongate-quadrangular in outline, slightly convex on lateral margin, concave on mesial margin, transversely truncated on apical margin, at apicomesial angle, on margin and on dorsal side group of strong setae arranged in 2 indistinct longitudinal rows (Fig. 10A). Parastylar lobe present, directed anteriorly, with 4 apical setae. Tegmen short and broad, subtriangular but with marked lateral shoulders. Setae on sternite 10 in indistinct double row on each half, close to sides of apical part of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota procera is similar to *M. transversa*. For the distinguishing characters, see under the latter species.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund.

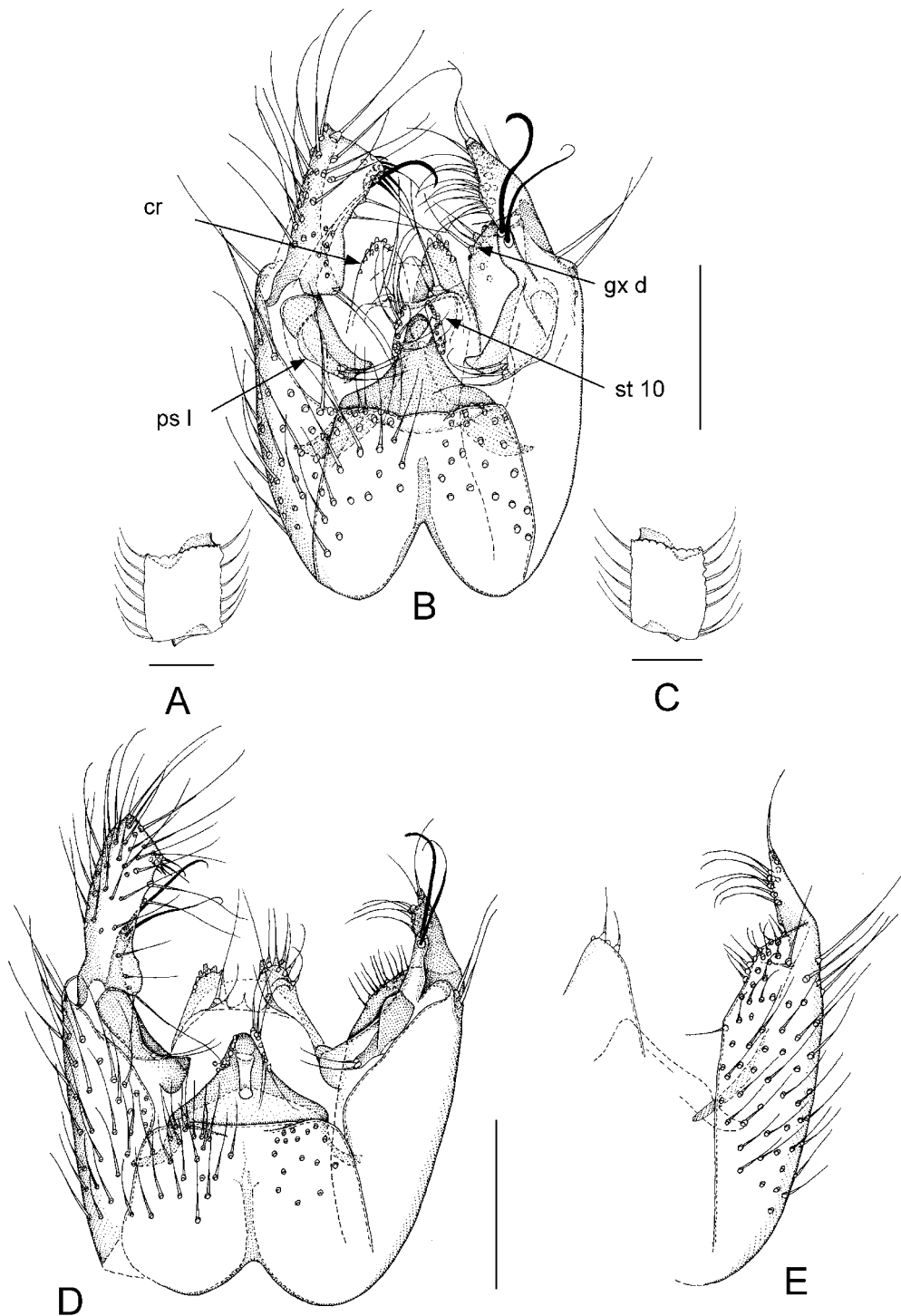


FIGURE 9. Antennal flagellomere 4, lateral view (A and C); hypopygium, ventral (B and D) and dorsal view (E). **A, B.** *Manota procera* sp. n. (holotype). **C, D, E.** *Manota transversa* sp. n. (holotype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

***Manota transversa* sp. n.**
(Figs. 9C, D, E; 10C)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 9C. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.4–1.5 mm. Wing membrane dorsally with few setae on posterior margin. Sc distally of h non-setose. Setae indicating A1 not observed with certainty. **Hypopygium** (Figs. 9D, E; 10C). Sternite 9 large, extending posteriorly nearly to halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin indistinct, medially confluent with more posterior membranous part with transverse straight margin, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, few stronger setae at apicomesial rounded corner, in position III 2 sigmoid or curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe that does not extend posteriorly as far as apex of gonostylus. Gonostylus elongate curved quadrangular in outline, convex on lateral margin, concave on mesial margin, obliquely truncated on apical margin, at apicomesial angle on dorsal side with 2 transverse parallel rows of strong setae (Fig. 10C). Parastylar lobe present, directed anteriorly, with 2 or 3 apical setae. Tegmen short and broad, subtriangular but with marked lateral shoulders. Setae on sternite 10 in single row or partly double row on each half, close to sides of apical part of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota transversa is similar to *M. procera* and *M. calcarata*. For the distinguishing characters from *M. calcarata*, see under that species. *Manota transversa* and *M. procera* differ as follows: in *M. transversa* the gonostylus is narrower or less expanded at the apex, the dorsal setae at the apicomesial corner are in two short transverse rows, not in longitudinal rows or without clear arrangement, and the apicolateral lobe of the gonocoxa is short, posteriorly not extending to the level of the apex of the gonostylus as it does in *M. procera*. The difference in the shape of the apicolateral lobe of the gonocoxa between the two species (Figs. 9B, E) may also be significant.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratype.* 1 male with same data as holotype except for 22. Feb.–21. March.

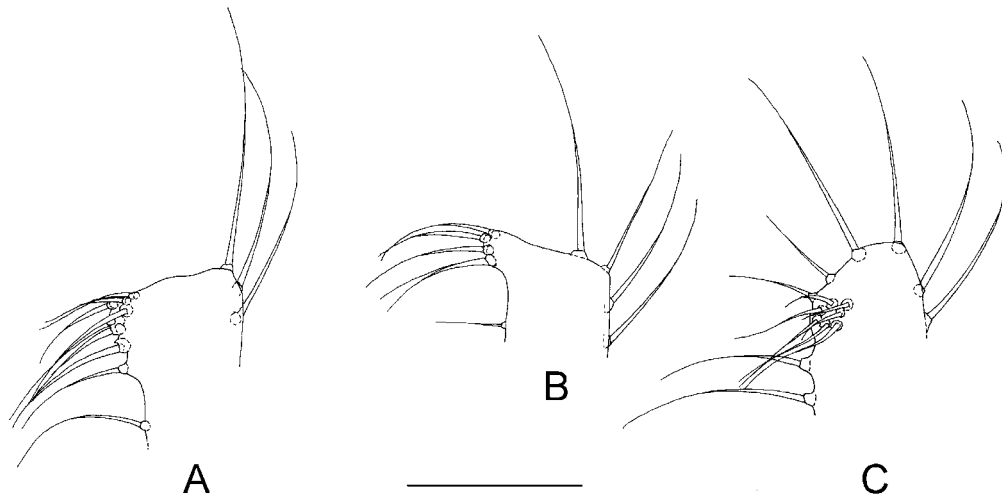


FIGURE 10. Apical part of gonostylus, dorsal view. **A.** *Manota procera* **sp. n.** (holotype). **B.** *Manota calcarata* **sp. n.** (paratype). **C.** *Manota transversa* **sp. n.** (holotype). Scale 0.05 mm.

***Manota acutangula* sp. n.**

(Figs. 11D, E, F)

A small-sized *Manota*.

Male. Head. Flagellomere 4, Fig. 11D. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.5–1.8 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 11E, F). Sternite 9 large, extending posteriorly to halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin indistinct, confluent with more posterior membranous structures, setae similar to adjacent ventral setae of gonocoxa. The dorsomesial margin of gonocoxa apically strongly and sharply angled, with normal setae, in position III with 2 curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe. Gonostylus elongate-oval in outline with wide lobe on mesial side, lobe dorsally on apical side with 2 oblique rows of strong setae. Parastylar lobe present, directed anteriad, with 2 apical setae. Tegmen rather short and broad, subtriangular with concave sides. Setae on sternite 10 in long row on each half, mostly posteriorly of apex of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota acutangula is more or less similar to *M. transversa*, *M. procera*, *M. calcarata*, *M. ferrata*, and *M. pectinata*. It differs from all these by the acutely angulate dorsomesial corner of the gonocoxa and by having a broad lobe-like widening on the mesial side of the gonostylus. *Manota acutangula* also resembles *M. orientalis* but differs by having one large lobe mesially on the gonostylus instead of two small ones and by having the dorsomesial corner of the gonocoxa acutely angulate instead of having a narrow rectangular lobe (see Edwards 1928: Fig. 2a).

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. Paratypes. 1 male with same data as holotype; 11 males with same data as holotype except for 24. Feb.–21. March.

Manota pectinata sp. n.

(Figs. 11A, B, C)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 11A. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.6–1.8 mm. Wing membrane dorsally with a few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 11B, C). Sternite 9 large, but extending posteriorly less than halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin distinct, confluent with more posterior membranous structures, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa apically with long slightly angulate lobe with row of strong marginal setae, in position III with 2 curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe. Gonostylus long, narrow, slightly curved in outline. Parastylar lobe present, narrow, without distinct apex, its 2 setae directed transversely mesiad. Tegmen rather short and broad, subtriangular with concave sides, with distinct shoulders. Setae on sternite 10 in row on each half, parallel to sides of apical part of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota pectinata is more or less similar to *M. transversa*, *M. procera*, *M. calcarata*, *M. ferrata*, and *M. acutangula*, especially to the latter species which it resembles by having a lobe on the dorsomesial angle of the gonocoxa. It differs from *M. acutangula* by having the gonocoxal lobe with a long edge armed with a comb-like row of setae; in *M.*

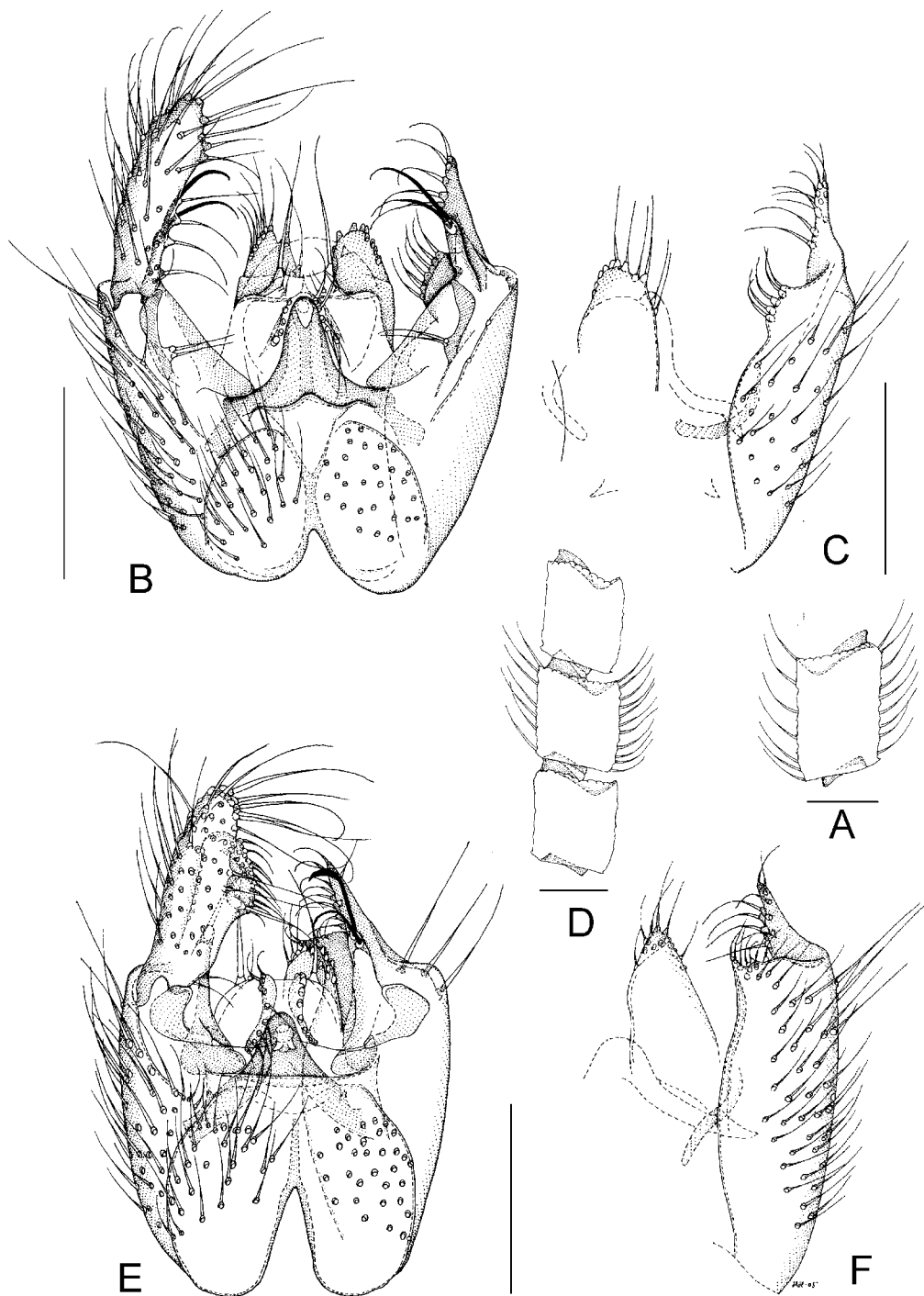


FIGURE 11. Antennal flagellomere 4 (A) and flagellomeres 3, 4, and 5 (D), lateral view; and hypopygium in ventral (B, E) and in dorsal (C, F) view. **A, B, C.** *Manota pectinata* sp. n. (A, B holotype; C paratype). **D, E, F.** *Manota acutangula* sp. n. (D, E holotype; F paratype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

acutangula the lobe is pointed and the setae are on its posterior margin. *Manota pectinata* also differs from *M. acutangula* by lacking the lobe on the mesial side of the gonostylus. *Manota pectinata* is also similar to *M. orientalis* but can be distinguished by lacking the two lobes mesially on the gonostylus that are present in that species (see Edwards 1928: Fig. 2a).

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24 Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratypes*. 4 males with same data as holotype; 1 male with same data as holotype except for 22. Feb.–21. March.

Manota ferrata sp. n.

(Figs. 12C, D, E)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 12C. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.5–1.7 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 12D, E). Sternite 9 large, extending posteriorly to halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin distinct, slightly curved, setae similar to adjacent ventral setae of gonocoxa except for posteriorly where setae are stronger. Dorsomesial margin of gonocoxa simple, few stronger setae at apicomesial rounded corner, in position III 2 sigmoid or curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with long, tapering, mesially setose, subtriangular lobe. Gonostylus narrow, elongate-oval in outline, at basomesial angle with 2 very strong setae. Apicodorsally with 2 transverse rows of strong setae. Parastylar lobe present, directed anteriorly, with 2 or 3 apical setae. Tegmen rather short and broad, subtriangular but with marked lateral shoulders. Setae on sternite 10 in long indistinct double row on each half, mostly posteriorly of apex of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota ferrata is more or less similar to *M. transversa*, *M. procera*, *M. calcarata*, *M. acutangula*, and *M. pectinata*, especially the first four, which have a simple dorsal apicomesial angle of gonocoxa. All the species have a similar general type of gonostylus. *Manota ferrata* differs by the elongate-oval form of the gonostylus and by having two long, strong setae at its basomesial corner.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. Paratypes. 3 males with same data as holotype except for 22. Feb.–21. March.

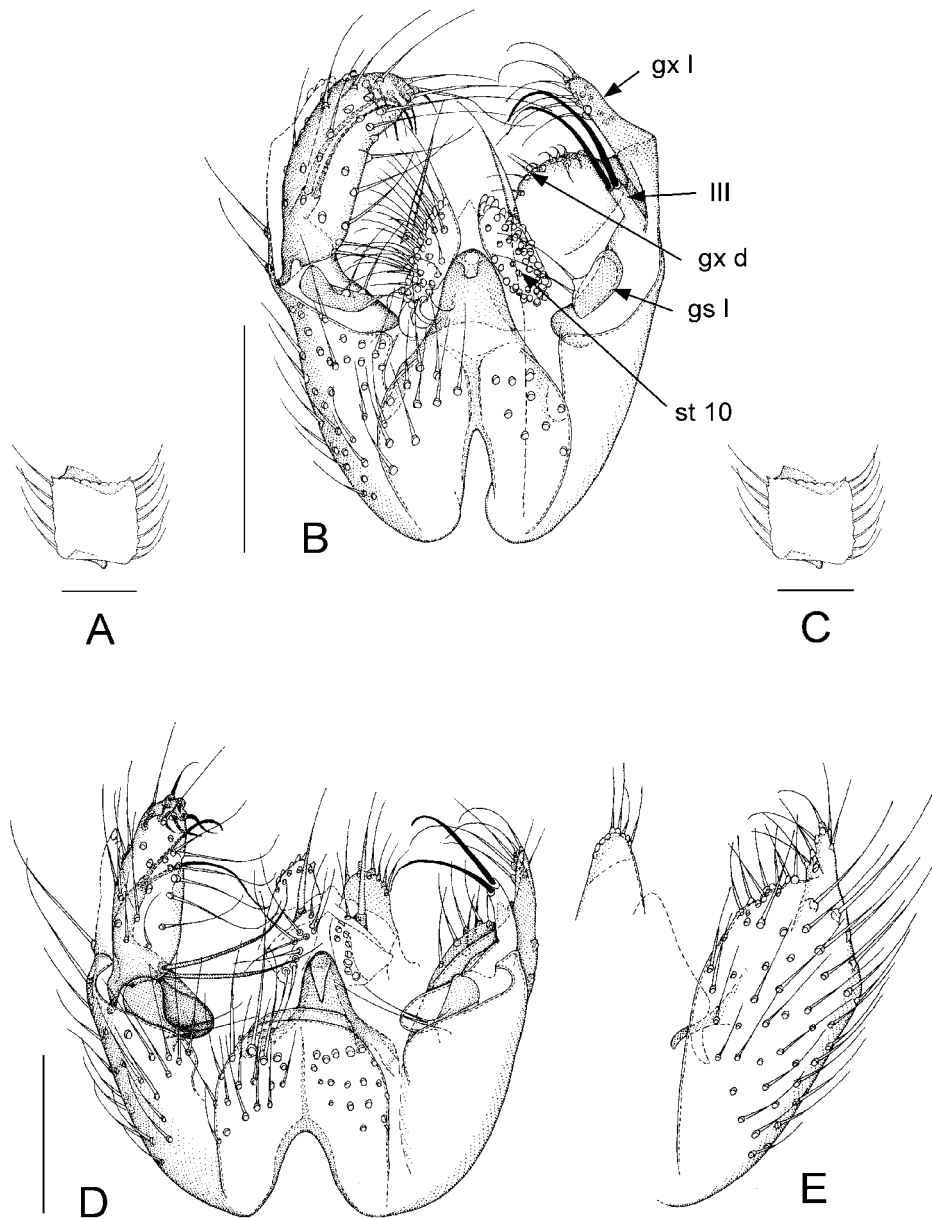


FIGURE 12. Antennal flagellomere 4, lateral view (A, C); hypopygium, ventral (B, D) and dorsal view (E). **A, B.** *Manota fera* sp. n. (holotype). **C, D, E.** *Manota ferrata* sp. n. (C, D holotype; E paratype). Scale for A and C 0.05 mm; for B, D, and E 0.10 mm.

***Manota fera* sp. n.**

(Figs. 12A, B)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 12A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.4 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 12B). Sternite 9 large, extending posteriorly over half of ventral length of gonocoxa, laterally sharply delimited, apically confluent with membranous more posterior structures, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple except for large rounded lobe apically with rather normal short setae, in position III with 2 curved simple megasetae arising from common long basal body; gonocoxa apicolaterally with tapering but blunt, mesially setose, subtriangular lobe. Gonostylus long, narrow, slightly apically curved, apicodorsally with crest with strong setae. Parastylar lobe present, broad, without distinct apex, with 2 setae directed obliquely posteriad. Tegmen rather long, subtriangular, with distinct shoulders. Setae on sternite 10 widely scattered.

Female and preimaginal stages unknown.

Discussion

Manota fera is not very similar to any of the other species. It is the only species which has a long apicolateral lobe on the gonocoxa together with a broadly ventrally setose sternite 10.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22 Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund.

***Manota curvata* sp. n.**

(Figs. 13C, D, E)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 13C. Maxillary palpus with palpomere 3 bearing 5–6 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.4–1.7 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae.

Hypopygium (Figs. 13D, E). Sternite 9 large, extending posteriorly over half of ventral length of gonocoxa, laterally and posteriorly sharply delimited, almost round, setae similar to adjacent ventral setae of gonocoxa except at posterior margin where they are twice as large. The dorsomesial margin of gonocoxa simple, in position III with 2 curved or sigmoid simple megasetae arising from common rather low basal body; gonocoxa apicolaterally with tapering, mesially setose, subtriangular lobe, some setae conspicuously flattened. Gonostylus long, narrow, strongly curved in outline, apicodorsally with crest with strong setae. Parastylar lobe present, broad, without distinct apex, with 2 or 3 setae directed transversely mesiad. Tegmen rather short and broad, subtriangular, with distinct shoulders. Setae on sternite 10 in 3 rows on each half, mostly posteriorly of apex of tegmen.

Female and preimaginal stages unknown.

Discussion

Manota curvata is not especially similar to any of the other species. Its hypopygium resembles that of many of the species that have an apicolateral subtriangular lobe on the gonocoxa, especially those that also have the dorsal apicomesial corner of the gonocoxa unmodified and rounded (e.g., *M. ferrata*). *Manota curvata* differs from all such species by its narrow, curved gonostylus and by having the setae on the apicolateral lobe of the gonocoxa flattened.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24 Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. *Paratypes*. 7 males with same data as holotype; 6 males with same data as holotype except for 22. Feb.–21. March. *Other material*. 2 males with same data as holotype.

***Manota globigera* sp. n.**

(Figs. 13A, B)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 13A. Maxillary palpus with palpomere 3 bearing 4 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.3 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 not observed. **Hypopygium** (Fig. 13B). Sternite 9 large, laterally united with gonocoxa and posteriorly extending nearly as far as ventral part of gonocoxa, posterior margin almost angularly convex; setosity similar to ventral setosity of gonocoxa. Gonocoxa dorsally in position I

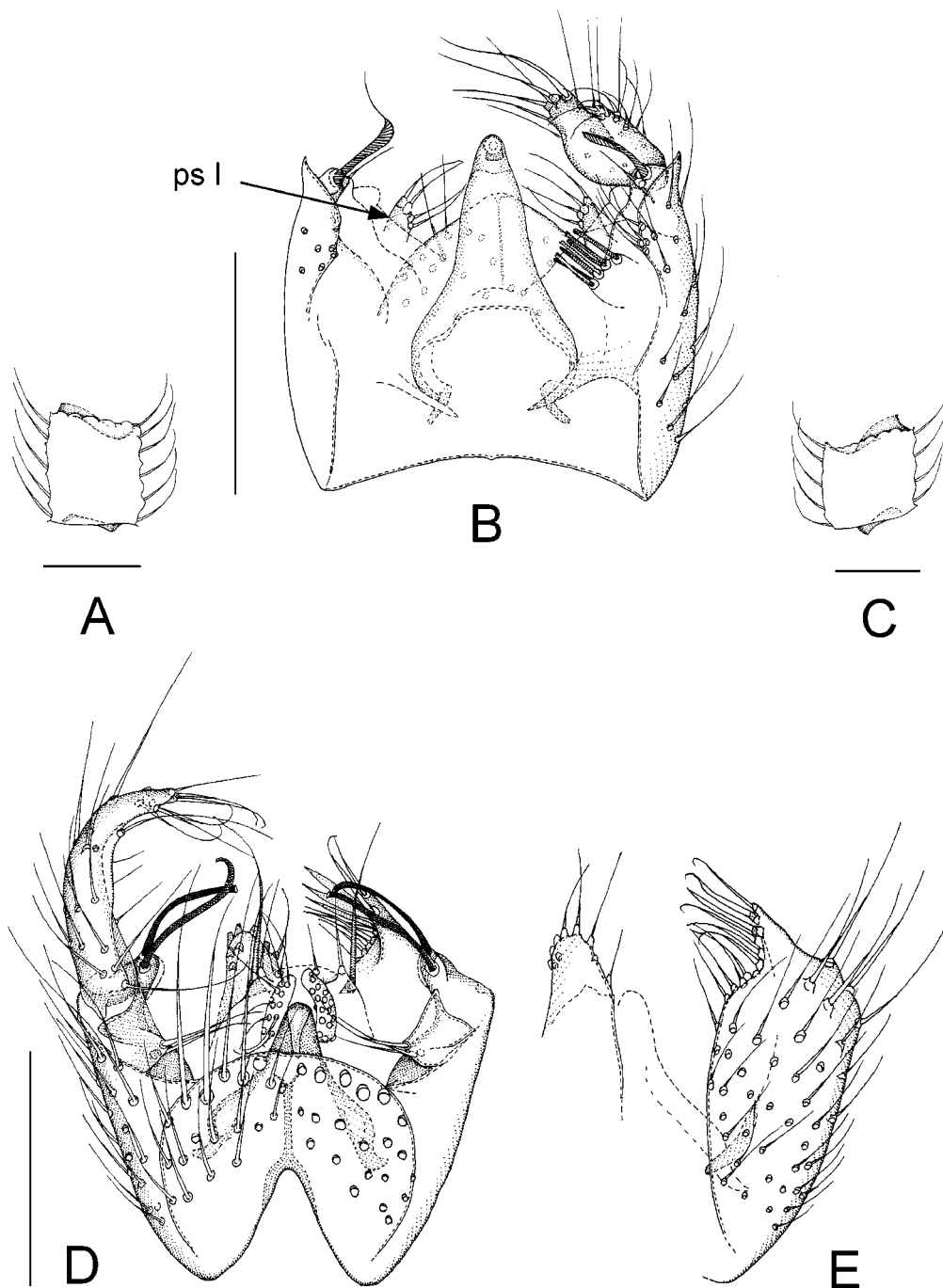


FIGURE 13. Antennal flagellomere 4, lateral view (A, C); hypopygium, dorsal (B, E) and ventral view (D). **A, B.** *Manota globigera* **sp. n.** (holotype). **C, D, E.** *Manota curvata* **sp. n.** (D holotype, E paratype). Scale for A and C 0.05 mm; for B, D, and E 0.10 mm.

with rounded lobe bearing many strong setae or megasetae with blunt tips, in position III with 1 flattened megaseta together with normal seta, both arising from common basal body, no megasetae in position IV; no prominent apical lobes or apicolateral setae. Gonostylus rather small, bilobed with larger ventral and smaller dorsal lobe, apical setae of ventral lobe very strong. Parastylar lobe present, directed posteriad, with several setae on apical part. Tegmen unusual in shape with basal part narrow and with convex sides. Sternite 10 large, details difficult to see in the single specimen because of dissection and separate mounting of parts, setae scattered.

Female and preimaginal stages unknown.

Discussion

Structurally *M. globigera* is reminiscent of *M. clausa*, *M. heptacantha*, *M. ulu*, *M. simplex*, and *M. biloba*, but it differs by having a non-setose laterotergite. Furthermore, it differs from all these species by having the posterior margin of tergite 9 convex, not transversely straight, and by having a distinct flattened group III megaseta. The shape of the tegmen is also unique. The bilobate gonostylus of *M. globigera* resembles that of *M. biloba*.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hipa, M. Jaschhof and B. Viklund.

Manota cerciflex sp. n.

(Figs. 14A, B, C)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 14 A. Maxillary palpus with palpomere 3 bearing 3–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.7–1.8 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 14B, C). Sternite 9 large, extending posteriorly over half ventral length of gonocoxa, laterally sharply delimited, posterior margin deeply notched but indistinctly indicated, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple except for prominent setose lobe apically, other apical structures simple, 2 rather short sigmoid megasetae in position III, arising from common basal body, no other megasetae. Gonostylus large, angulate-oval in ventral outline, with small setigerous tubercle on basal part of mesial side, gonostylus flat and strongly concave on dorsal or dorsomesial side, dorsally curved marginal setae strong apically and

apicomesially. Parastylar lobe present, directed obliquely anteriorly, with 1 to few apical setae. Tegmen rather short, subtriangular, with lateral shoulders. Setae on sternite 10 in row on each half. Cercus unusual in shape, apically slightly angled.

Female and preimaginal stages unknown.

Discussion

Manota cerciflex is more or less similar to *M. oligochaeta* but is distinguished, for example, by the presence of an apicomesial setose lobe dorsally on the gonocoxa, by the tubercle on the ventral mesial margin of the gonostylus, and by the apically angled or curved cercus.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. Paratypes. 2 males with same data as holotype; 1 male with same data as holotype except for 22. Feb.–21. March.

Manota pappi sp. n.

(Figs. 1B; 14D, E, F)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 14D. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.5–1.6 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h setose. A1 not indicated by setae. **Hypopygium** (Figs. 14E, F). Sternite 9 rather large, one-third of ventral gonocoxal length, basolaterally not distinctly separated from gonocoxa, divided into 2 halves, setae similar to adjacent gonocoxal setae. Gonocoxa dorsally with rounded lobe in position I with row of strong setae along posterior margin, position II and IV megasetae absent, in position III with 2 megasetae which are directed transversely or slightly anteriorly, setae without larger common basal body; apical part of gonocoxa simple. Gonostylus elongate-oval, with indication of low mesial lobe, with separate small subbasal mesial lobe, with strong apical and mesial setae. Parastylar lobe absent. Tegmen long and narrow, subtriangular, rather abruptly widening where lateral shoulders are usually situated and where tegmen usually narrows. Setae on sternite 10 few, medially largely absent, basomedially with pair of strong setae that pass sides of tegmen.

Female and preimaginal stages unknown.

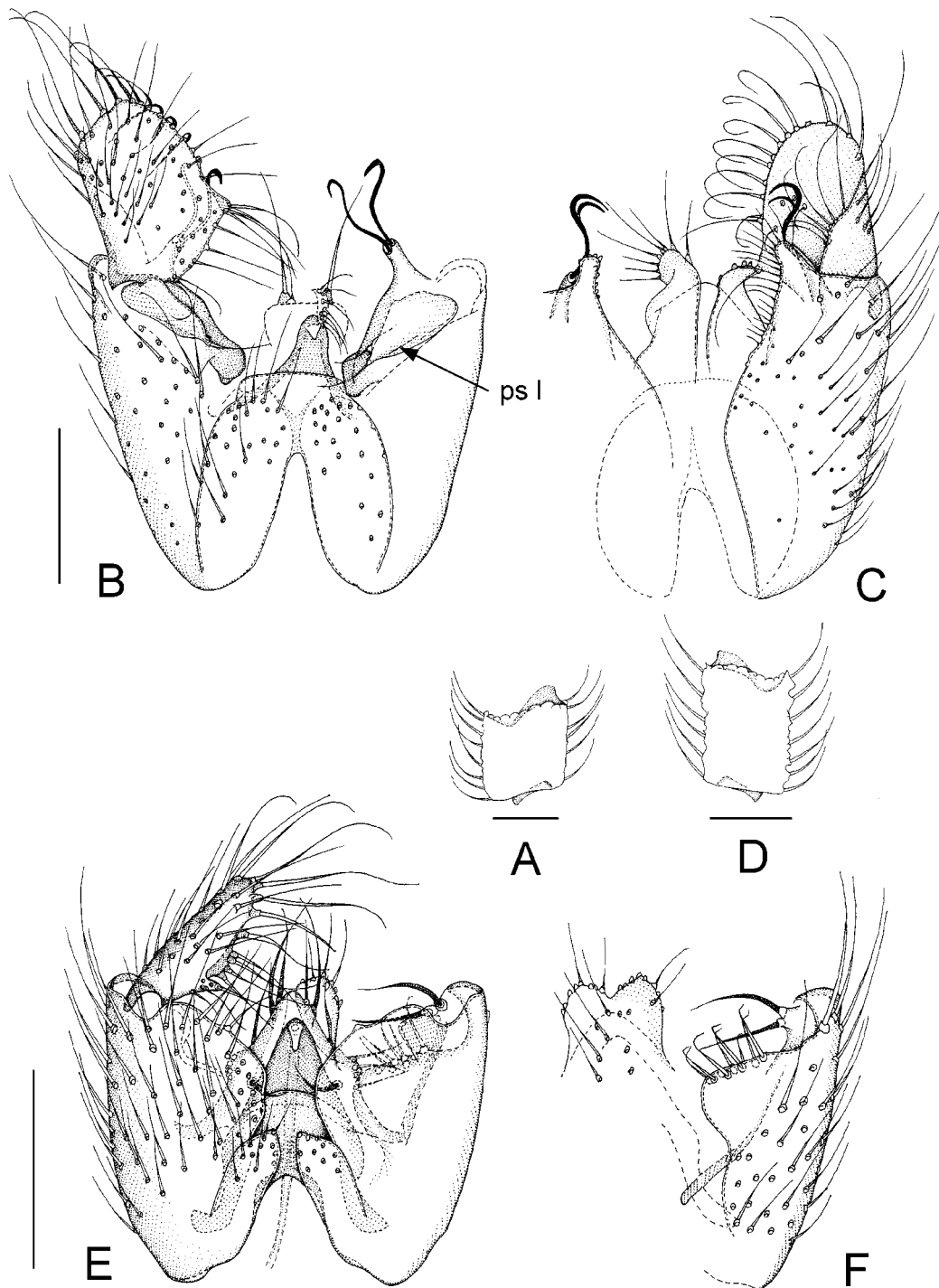


FIGURE 14. Antennal flagellomere 4, lateral view (A, D); hypopygium, ventral (B, E) and dorsal view (C, F). **A, B, C.** *Manota cerciflex* sp. n. (A, B holotype; C paratype). **D, E, F.** *Manota pappi* sp. n. (A, C paratype; B holotype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

Discussion

Manota pappi is not very similar to any other *Manota*. In the absence of the parastylar lobe, it is similar to *M. spadix*, *M. rosliei*, *M. yongi*, *M. pollex*, and *M. delyorum*. It differs from these except for the last-mentioned by the non-setose laterotergite. From *M. delyorum* it differs by having a large rounded lobe dorsally on the mesial margin of the gonocoxa, in position I, which in *M. delyorum* is straight. Furthermore, the gonocoxal setae in position III are transverse, not directed anteriorly.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hipka, M. Jaschhof and B. Viklund. Paratypes. 1 male with same data as holotype, 4 males with same data except for 24. Feb.–21.

Etymology

The species is named in honor of Dr. Laszlo Papp, Department of Zoology, Hungarian Natural History Museum, for his contribution to the study of the Manotinae.

Manota horrida sp. n.

(Figs. 15A, B, C)

A small-sized *Manota*.

Male. Head. Flagellomere 4, Fig. 15A. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basallare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.3–1.5 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by few setae. **Hypopygium** (Figs. 15B, C). Sternite 9 large, extending posteriorly to nearly halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin transverse, straight but rather indistinctly indicated, setae similar to adjacent ventral setae of gonocoxa. The dorsomesial margin of gonocoxa simple, other apical structures simple except for transverse lobe bearing 3 strong apical setae, 2 long curved megasetae in position III, arising from common basal body, no other megasetae. Gonostylus long and narrow, curved especially on apical part, with unusually strong and long seta apically, with row of about 5 large apically angulate, flattened setae apicolaterally on dorsal side. Parastylar lobe present, directed obliquely anteriorly, with couple of apical setae. Tegmen long, with strong lateral shoulders. Setae on sternite 10 in 2 rows on each half.

Female and preimaginal stages unknown.

Discussion

Manota horrida is more or less similar to *M. plusiochaeta*, but has the transverse lobe apicodorsally on the gonocoxa larger and with stronger setae, and a quite different gonostylus (Figs. 15B, 17B) which does not resemble any other described species in its apical and apicodorsal armature.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 22. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. Paratypes. 2 males with same data as holotype; 1 male with same data as holotype except for 24. Feb.–21. March.

Manota duplex sp. n.

(Figs. 15D, E, F)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 15D. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.6–1.8 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. A1 indicated by no or few setae. **Hypopygium** (Figs. 15E, F). Sternite 9 large, extending posteriorly to nearly halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin confluent with more posterior membranous part with convex margin, setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, with weak lobes, without megasetae, in position III with 2 sigmoid simple setae arising from common basal body that is as long as setae, in position IV with few setae on long clavate basal body, roundish lobe with long setae near base of latter; gonocoxa apicolaterally with strong setae. Gonostylus long and narrow, curved especially on apical part. Parastylar lobe present, directed obliquely posteriad, with 3 apical setae. Tegmen short and broad, subtriangular, with weak lateral shoulders, which in some slides are not visible at all. Setae on sternite 10 in small oval patch (lobe) on each half.

Female and preimaginal stages unknown.

Discussion

Manota duplex is reminiscent at least superficially of *M. perpusilla*, especially in the apicodorsal structures of the gonocoxa. The long, curved, not elongated, oval gonostylus; posteriorly directed parastylar lobe; and strong, apicolateral setae of the gonocoxa distinguish *M. duplex*. For further discussion, see under *M. perpusilla*. The gonostylus of *M. duplex* is rather similar to that of *M. curvata*, but otherwise the species are abundantly

different. The clavate lobe at the apex of the gonocoxa is certainly homologous with a similar lobe in *M. perpusilla*, the triangular posteriorly-directed lobe with that in *M. acutangula* and similar species, and the transverse lobe with that in species such as *M. horrida* and *M. plusiochaeta*.

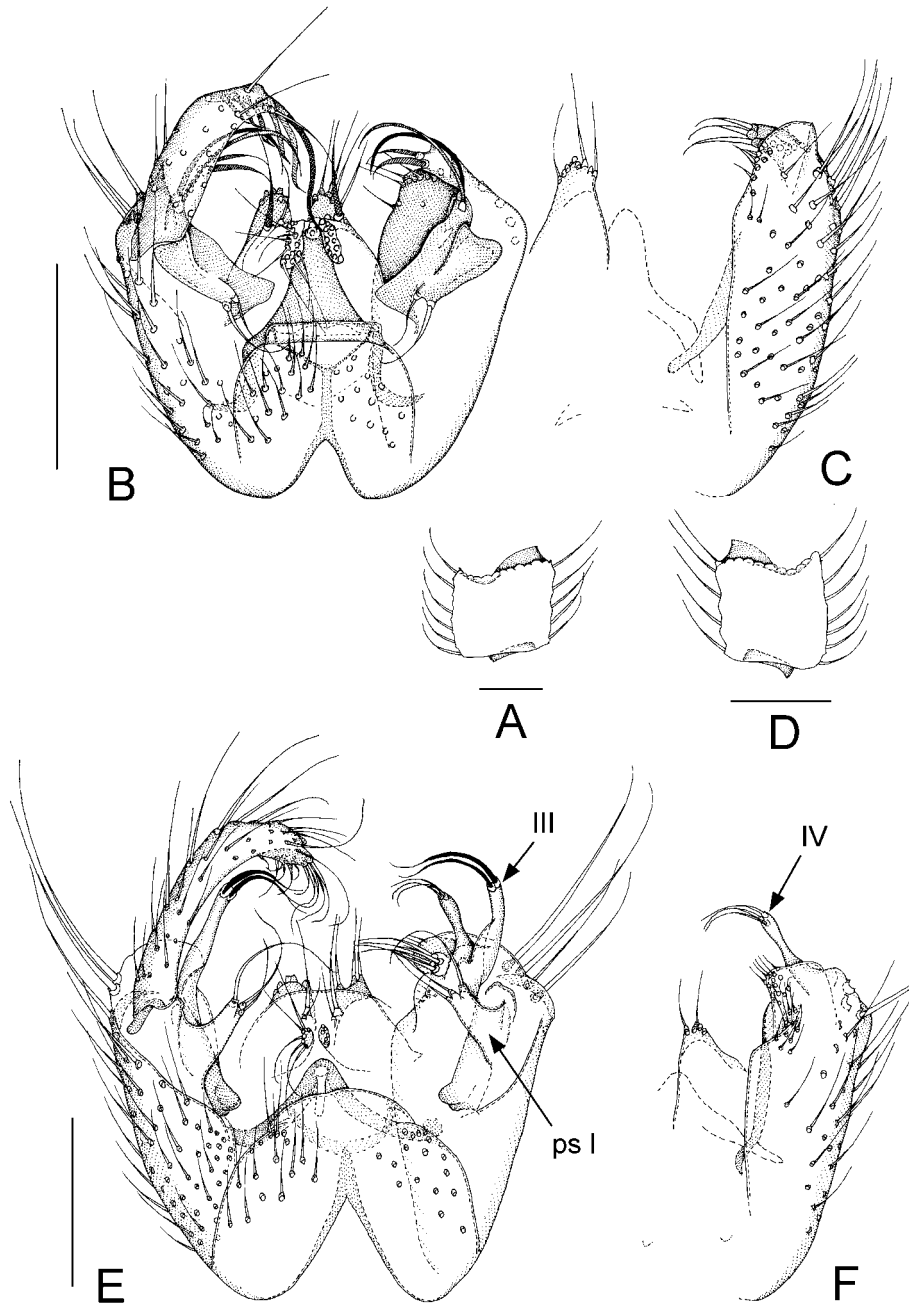


FIGURE 15. Antennal flagellomere 4, lateral view (A, D); hypopygium, ventral (B, E) and dorsal view (C, F). **A, B, C.** *Manota horrida* sp. n. (A, B holotype; C paratype). **D, E, F.** *Manota duplex* sp. n. (D, F paratype; E holotype). Scale for A and D 0.05 mm; for B, C, E, and F 0.10 mm.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippha, M. Jaschhof and B. Viklund. Paratypes. 5 males with same data as holotype; 1 male with same data as holotype except for 22. Feb.–21. March.

Manota perpusilla sp. n.

(Figs. 16A, B)

A small-sized *Manota*.

Male. **Head**. Flagellomere 4, Fig. 16B. Maxillary palpus with palpomere 3 bearing 5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax**. Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing**. Length 1.3 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Possible setae indicating A1 not seen with certainty. **Hypopygium** (Fig. 16B). Sternite 9 large, extending posteriorly to about halfway along ventral length of gonocoxa, laterally sharply delimited, posterior margin with V-shaped notch but not distinctly separated from more posterior membranous part, which has convex margin; setae similar to adjacent ventral setae of gonocoxa. Dorsomesial margin of gonocoxa simple, in position III with broad flat megaseta and long seta, both arising from very long basal body, dorsally of these with similar large body bearing seta (position IV seta), other apical structures simple. Gonostylus elongate-oval in ventral outline, with long flattened seta at basomesial angle. Parastylar lobe present, directed obliquely anteriorly, with 3 or 4 apical setae. Tegmen short and broad, subtriangular with concave sides, with indistinct lateral shoulders. Setae on sternite 10 apparently in 2 short parallel rows on each half (not clearly visible in single specimen).

Female and preimaginal stages unknown.

Discussion

In *M. perpusilla* the gonostylus is of the rather common elongate-oval type without special modifications. Among these species, *M. perpusilla* is unique in having a conspicuous long, flattened seta at the basomesial angle. At least on slides, the seta is spiralled, screw-like. In the apical structures of the gonocoxa, *M. perpusilla* resembles *M. duplex* in having the position III and IV megasetae/setae on very long basal bodies, the bodies being nearly as long as the setae they bear. *M. perpusilla* differs from *M. duplex*, for example, by having one of the position III setae flattened. The two species differ greatly in their parastylar lobe: in *M. perpusilla* it is directed anteriorly, in *M. duplex* posteriorly.

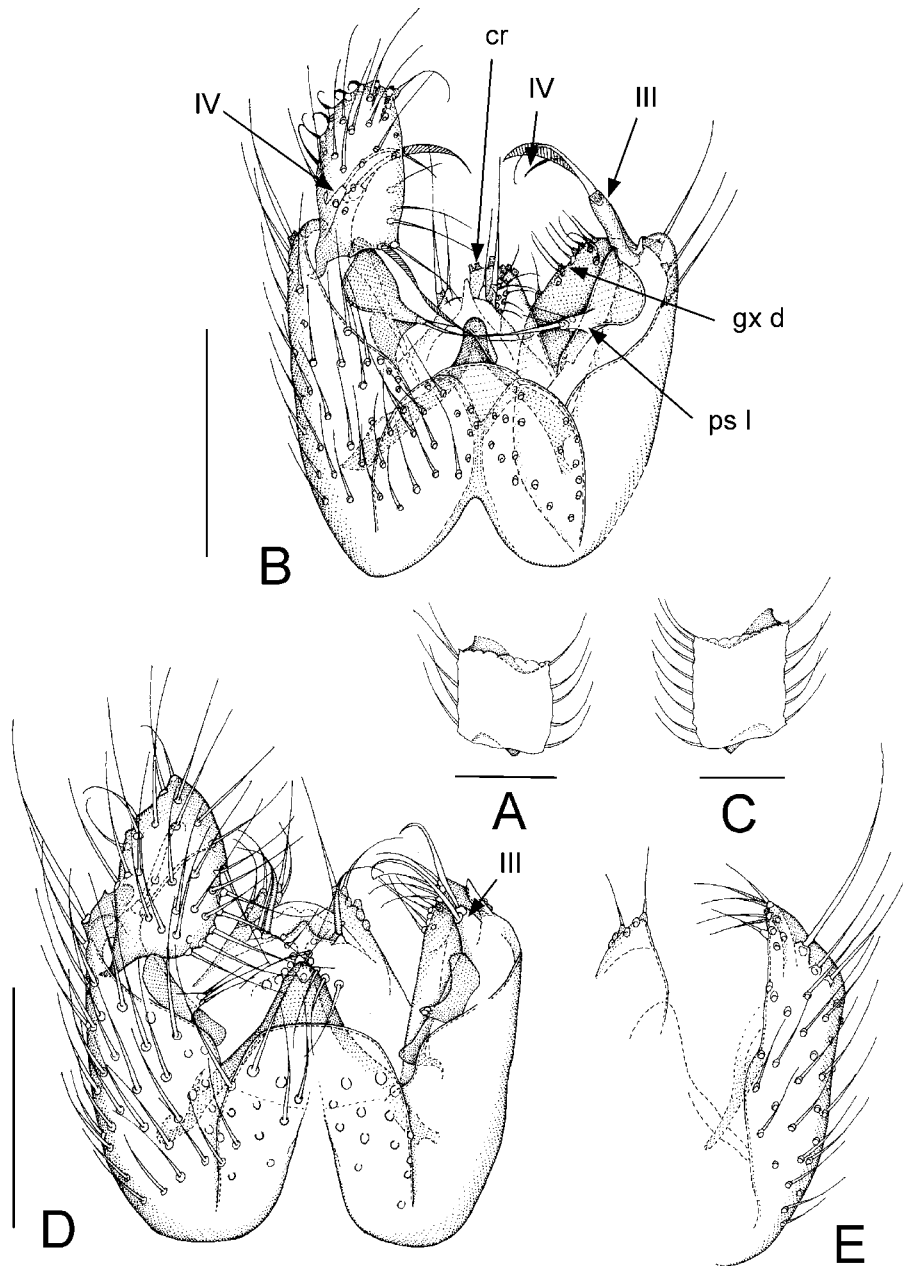


FIGURE 16. Antennal flagellomere 4, lateral view (A, C); hypopygium, ventral (B, D) and dorsal view (E). **A, B.** *Manota perpusilla* **sp. n.** (holotype). **C, D, E.** *Manota oligochaeta* **sp. n.** (C, D holotype; E paratype). Scale for A and C 0.05 mm; for B, D, and E 0.10 mm.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund.

***Manota oligochaeta* sp. n.**

(Figs. 2B; 16C, D, E)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 16C. Maxillary palpus with palpomere 3 bearing 5–6 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.4–1.6 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 from none to few. **Hypopygium** (Figs. 16D, E). Sternite 9 large, extending posteriorly over half ventral length of gonocoxa, laterally sharply delimited, posterior margin sharply delimited, rounded, setae subequal to adjacent ventral setae of gonocoxa, posteriorly couple of stronger setae on each side. Dorsomesial margin of gonocoxa simple, apical structures simple, with inconspicuous mesially directed setose transverse lobe covered by more dorsal part of gonocoxa, 2 long sigmoid megasetae in position III, arising from common basal body, no other megasetae. Gonostylus elongate-oval with characteristic strong marginal setosity on mesial side. Parastylar lobe present, directed obliquely anteriorad, with about 3 apical setae. Tegmen of medium length, subtriangular, with weak lateral shoulders. Setae on sternite 10 in row on each half.

Female and preimaginal stages unknown.

Discussion

Manota oligochaeta is similar to *M. plusiochaeta*. For further discussion, see under that species.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hipa, M. Jaschhof and B. Viklund. Paratypes. 11 males with same data as holotype; 2 males with same data as holotype except for 22. Feb.–21. March.

***Manota plusiochaeta* sp. n.**

(Figs. 17A, B, C, D)

A small-sized *Manota*.

Male. **Head.** Flagellomere 4, Fig. 17A. Maxillary palpus with palpomere 3 bearing 4–5 apically expanded curved sensilla; palpomere 4 with parasegment. **Thorax.** Anepisternum setose. Anterior basalare non-setose. Preepisternum 2 setose. Laterotergite non-setose. Episternum 3 setose. **Wing.** Length 1.4–1.6 mm. Wing membrane dorsally with few setae at posterior margin. Sc distally of h non-setose. Setae indicating A1 from

none to few. **Hypopygium** (Figs. 17B, C, D). Sternite 9 large, extending posteriorly over half ventral length of gonocoxa, laterally sharply delimited, posterior margin sharply demarcated, rounded, setae subequal to adjacent ventral setae of gonocoxa, posteriorly couple of stronger setae on each side. Dorsomesial margin of gonocoxa simple, apical structures simple, with inconspicuous mesially directed setose transverse lobe covered by more dorsal part of gonocoxa, 2 long sigmoid megasetae in position III, arising from common basal body, no other megasetae. Gonostylus elongate-oval with characteristic strong marginal setosity on mesial side, apicodorsally with characteristic transverse crest with strong setae (marked in Fig. 17B). Parastylar lobe present, directed obliquely anteriorad, with 1 to few apical setae. Tegmen of medium length, subtriangular, with weak lateral shoulders. Setae on sternite 10 in row on each half.

Female and preimaginal stages unknown.

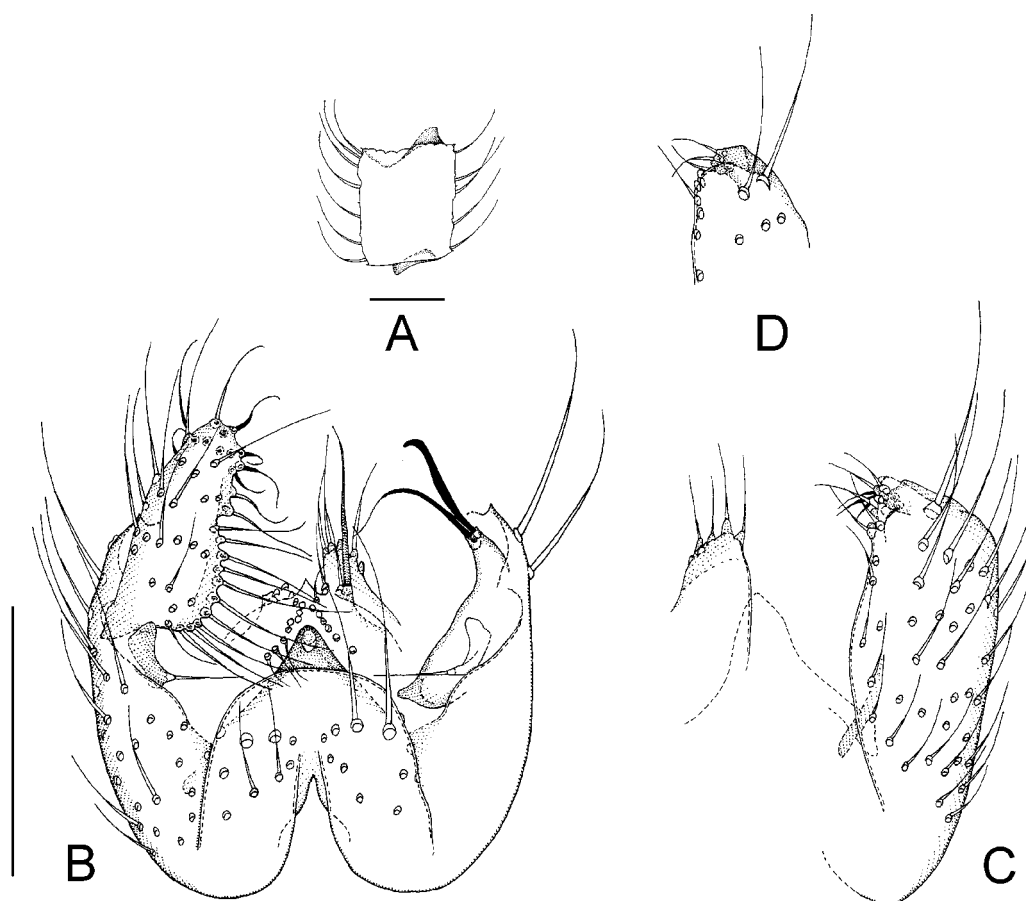


FIGURE 17. *Manota plusiochaeta* sp. n. (A, C, D paratypes; B holotype). **A.** Flagellomere 4. **B.** Hypopygium, ventral view. **C.** Hypopygium, dorsal view. **D.** Apical part of gonocoxa, dorsal view. Scale for A 0.05 mm; for B, C, and D 0.10 mm.

Discussion

Manota plusiochaeta is similar to *M. oligochaeta* but is distinguished by its gonostylus, which is much longer and which has about 10 long setae on the basal half of the mesial margin instead of only about 5. *Manota plusiochaeta* is also similar to *M. ovata*, but the latter has a setose laterotergite. For further discussion, see under *M. ovata*.

Types

Holotype. Male, West Malaysia, Selangor, Ulu Gombak, University of Malaya Field Study Centre, 800 ft, Malaise in jungle, 24. Feb.–21. March 1997, H. Hippa, M. Jaschhof and B. Viklund. *Paratypes*. 6 males with same data as holotype; 1 male with same data as holotype except for 22. Feb.–21. March.

Acknowledgements

I thank Prof. H. Yong and Dr. Rosli Hasim, University of Malaya, Kuala Lumpur, for arranging for the collection of the material; Ms Ingegerd Mattsson, Stockholm, for sorting out the *Manota* species from Malaise trap samples; Dr. Mathias Jaschhof, Stockholm, for slide mounting the material; Mr. Jarmo Pelli, Stockholm, for Fig. 1E and for assistance in compiling the plates; Mr. Nigel P. Wyatt, London, UK, for the loan of the holotype of *Manota orientalis*; and Dr. Adrian Pont, Oxford, UK, for checking the English language.

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