

A New Species of *Culex* (*Eumelanomyia*) Theobald
From Manus Island, Papua-New Guinea (Diptera: Culicidae)¹

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ABSTRACT. The female, male, pupa and fourth instar larva of *Culex* (*Eumelanomyia*) *manusensis* n. sp. from Manus Island, Bismarck Archipelago, Papua-New Guinea are described, the male genitalia, pupa and larva are illustrated and its identity and affinity are discussed.

The subgenus *Eumelanomyia* as currently interpreted (Sirivanakarn 1971, 1972), comprises approximately 66 species, most of which occur in the Oriental region (27 species) and the Ethiopian region (37 species). In the Australasian region, the subgenus has been recorded only from the Papuan subregion (New Guinea, Bismarck Archipelago and adjacent islands) where 3 species occur. These include *brevipalpis* Giles (Lee 1944, Bonne-Wepster 1954), *malayi* Leicester (Brug and Bonne-Wepster 1947, Bonne-Wepster 1954) and *catarractarum* Edwards (Edwards 1923, Brug and Bonne-Wepster 1947) which are also present in the Oriental region. To contribute further to the taxonomic knowledge of the subgenus, a new species is described, bringing the total up to 4 for the Australasian region and to 67 for all zoogeographic regions.

The material described as *Culex* (*Eumelanomyia*) *manusensis* n. sp. was collected during my brief visit to Manus Island in March 1966 in connection with the field work for the taxonomic revision of New Guinea *Lophoceraomyia* (Sirivanakarn 1968). Numerous specimens of this new species, largely obtained from individual and mass rearing of larvae and pupae, were found twice in decayed sago stumps in association with *Culex* (*Lophoceraomyia*) *cottlei* Sirivanakarn. These specimens were tentatively identified as a *Culex* (*Mochthogenes*), but no further attempt was made to determine their specific status (Sirivanakarn 1968: 183). Recently, most of these specimens have been borrowed from the Bishop Museum, Honolulu for re-examination and description.

Culex (*Eumelanomyia*) *manusensis* n. sp.
(Figs. 1, 2)

FEMALE. Wing: 2.2 mm. Forefemur: 1.05 mm. Proboscis: 1.35 mm. Abdomen: 1.4 mm. Rather small or minute, brownish to blackish species; in general conforms to the description of subgenus (Sirivanakarn 1968: 3-4) with the following diagnostic features. *Head*. Decumbent scales on dorsum of vertex entirely broad, appressed, predominantly dark brownish or sometimes partially pale on anterior margin along upper eye border; erect scales dark

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brown, slender, scanty or relatively few, largely restricted to posterolateral areas; lateral patch of broad appressed scales at side of the eye dark brownish or grayish. Palpus dark scaled, apparently 3-segmented, very short, about 0.10-0.15 of proboscis length. Proboscis dark, slender; 2 labial basal setae present, as long as palpus. Antenna as long as or slightly longer than proboscis, flagellum very weakly plumose, flagellar whorl with 5, 6 weak bristles. *Cibarial Armature* (Fig. 1). Cibarial bar with a close-set, concave row of about 36 narrow acute subequal teeth. *Thorax*. Mesonotal integument brownish to blackish; all scales dark brown, narrow, linear and moderately dense; acrostichal bristles not developed except on extreme anterior promontory; dorsocentral, supra-alar and scutellar bristles strong. Pronotum and pleuron same color as mesonotum; *apn* with a few weak bristles; *ppn* with 2, 3 strong posterior bristles, anterior surface without any setae or scales. Scales on pleuron practically absent *ppl* bristles 2, 3; 1 lower *mep* bristle present; upper *mep* bristles 3, 4. *Legs*. Forecoxa with relatively few setae on anterior surface; anterior surface of hindfemur with longitudinal pale stripe from base to near apex, rest of legs entirely dark scaled; all pretarsal claws small, equal and simple. *Wing*. Scales narrow, linear, dark and moderately dense. Halter knob dark scaled. *Abdomen*. Terga entirely dark brown or black; sterna as dark as or slightly paler than terga.

MALE. Exceedingly similar to female in general facies; sexual dimorphism not developed, especially in features of palpus and antenna. *Palpus*. Apparently 2-segmented, about 0.1 proboscis length. *Proboscis*. Labial basal setae weak, short, apparently 4 in number. *Antenna*. Essentially similar to female. *Legs*. Pretarsal claws of fore- and midlegs unequal, external one larger than internal, both simple or without subbasal denticle; claws of hindleg small, equal and simple.

MALE GENITALIA (Fig. 1). Rather small. *Segment IX*: Tergal lobe poorly developed, with a row of 3, 4 strong setae; sternum without any setae or scales. *Basimere*. Small, typically conical in lateral tergal aspect, its length about 0.24 mm; lateral tergal surface with several moderately long setae and weak, undifferentiated setae. *Subapical Lobe*. Small, short, bearing 3 stout, closely packed subequal rodlike setae, 2 of which are apically hooked, 1 with abruptly pointed apex, followed distally by 1 strong seta on lateral surface and by a row of 3, 4 strong setae on mesal surface; leaflets not developed. *Distimere*. Slender, simple, weakly curved at middle, about 0.5 of length of basimere, apical 0.5 gradually tapered into a blunt apex; subapical claw relatively long, more or less dark pigmented; dorsal and ventral subapical setae present, subequal, dorsal distad of ventral. *Phallosome*. Aedeagus relatively simple; lateral plates connected by a broad upper tergal bridge at about middle, apical portion of plate forked into 2 short acute spinelike processes; internal apical process shorter than external, weakly or strongly projecting tergal, external apical process straight or slightly curved mesad; accessory small denticles or teeth entirely absent. *Proctiger*. Apical crown of spicules absent or represented by a stout, laterally divergent apical spine of paraproct, latter well sclerotized and dark pigmented, basal sternal process absent; cercal sclerite largely membranous, cercal setae strong, 4, 5.

PUPA (Fig. 1). Abdomen: 2.2 mm. Paddle: 0.65 mm. Trumpet: 0.60 mm; index 9, 10. Integument of cephalothorax and abdomen uniformly pale, yellowish with variable amount of brownish tinge. *Trumpet*. Long, cylindrical; basal 0.5 of meatus annulate and dark-pigmented, apical 0.5 lightly to moderately spiculated and pale yellowish; pinna with a distinct slit extended into meatus, apical margin truncate. Complete chaetotaxy as figured, in general very similar to *Lophoceraomyia*, the following setae are diagnostic. *Cephalothorax*. Seta 1-C usually 4 branched (3, 4); 5-C usually 5 branched (4, 5), as long as 7-C; 8-C 3, 4 branched; 9-C usually triple (2, 3), subequal to 8-C. *Metanotum*. Seta 10-C 3, 4 branched; 11-C usually double (1, 2); 12-C usually 5 branched (5, 6). *Abdomen*. Seta 5-IV 3-5 branched, slightly longer than segment following; 5-V double, very strong and long, 1.5-2.0 times as long as segment following; 5-VI double, subequal to 5-IV; 6-III-VI usually triple (2, 3); 9-VII 3, 4 branched; 4-VIII double; 9-VIII 6, 7 branched, as long as 9-VII. *Paddle*. Broad, whitish to almost transparent; midrib lightly pigmented; apical setae 1, 2-P present, minute, single.

LARVA (Fig. 2). Head: 0.75 mm. Siphon: 2.0-2.4 mm; index 12-14. Saddle: 0.32 mm; siphon/saddle ratio 7-8. As figured; in general very similar to most species of *Lophoceraomyia*. *Head*. Integument yellowish to brownish; seta 1-C dark, stout, spiniform; 4-C single, long, about 1.5 times as long as distance between bases of the pairs; 5, 6-C double, strong, subequal, apices reaching beyond mouthbrush filaments; 13-C usually 12 branched (8-14); 14-C double; 16, 17-C present. Antenna as long as head, proximal portion of shaft yellowish to brownish; spicules numerous and rather fine; seta 1-A large fan-shaped, multi-branched; 2, 3-A stout, bristlelike, situated subapically. Mental plate with 7 lateral teeth on each side of median tooth. *Thorax*. Dark blue in live specimen; spiculation absent; seta 3-P single, about 0.4 of the length of 1, 2-P; 4-P double, strong, of the same magnitude as 7, 8-P; 7-P usually double, sometimes triple; 8-P double; 14-P double; 1-M, T short, minute, single. *Abdomen*. Color in live specimen same as thorax; setae 6-I, II triple; 7-I double; 6-III-VI triple; 1-III-VI 0.75 of 6-III-VI, usually triple, sometimes double. Comb scales 50-60, aggregating into a broad oval patch, all subequal, with broad, rounded apical fringes of evenly fine spicules; seta 2-VIII single. Saddle complete, same color as head capsule; caudal margin weakly spiculate; seta 2-X single; ventral brush (4-X) with 6 pairs of setae, all inserted within grid; anal gills slender, short, as long as or shorter than saddle. *Siphon*. Very slender, more or less cylindrical, usually 2.0 mm; integument largely yellowish except for basal dark ring; pecten teeth 12, 4, 5 distal teeth narrow, elongate, 2, 3 times as long as basal, lateral margin with a fine barb of about 20 graded denticles; subventral tufts 5 pairs, all rather weak, subequal and widely spaced, placed beyond pecten; first 3 proximal pairs usually triple (2, 3), as long as or slightly longer than siphonal width at point of attachment, sometimes longer; next 2 distal pairs closed together, usually double (2, 3) and gradually reduced in length; seta 2-S short, slender, spiniform; median caudal filament not developed.

TYPE-DATA. Holotype ♂ (MN 15-13) with associated pupal and larval skin and slide of genitalia. PAPUA-NEW GUINEA, Manus Island, Manus District, Lorengau Village, larvae from decayed sago stump in mixed sago and tree swamp,

sea level, 13 March 1966, S. Sirivanakarn, deposited in B. P. Bishop Museum, Honolulu. Allotype ♀ (MN 15-21) with associated pupal and larval skins, same data and depository as holotype. Paratypes: 3 1p♂ (MN-15-10, 14, 15), 5 p♂ (MN 15-100, 101, 103, 105, 107), 5 1p♀ (MN 15-17, 19, 24, 25, 26), 2 p♀ (MN 15-20, 104), 23♂, 8♀, 29p, 26L (all from mass rearing in collection MN 15), same data as holotype, to be deposited in B. P. Bishop Museum, U. S. National Museum and British Museum (Natural History).

DISTRIBUTION. Known only from Manus. Material examined: 32♂, 17♀, 29P, 26L; 18 with associated immature skins (7p, 11 1p).

PAPUA-NEW GUINEA. *Manus*: Lorengau Village (MN 15-type series, specimens as indicated in the TYPE-DATA); *Loniu Village*; 1♀, 4p, 1 1p (collection MN 10; 11 March 1966, other data as in collection MN 15).

TAXONOMIC DISCUSSION. This small *Eumelanomyia* species is perhaps the most remarkable of all known members in the subgenus. The adults of both sexes are identical, exhibiting no sexual dimorphism, especially in the features of the antenna and palpus. Of all stages of *manusensis*, the male genitalia are most diagnostic. It can be readily differentiated from all known *Eumelanomyia* species by the complete absence of spicules in the proctiger crown, the peculiar development of a stout spinelike process on the apex of the paraproct and the characteristic fork of the lateral plate of the phallosome. The females are exceedingly similar to other species of *Eumelanomyia* or even to *Lophoceraomyia*. It can, however, be separated from most members of *Eumelanomyia* by the absence of acrostichal bristles on the mesonotal disc and from *Lophoceraomyia* by the entirely broad, flat, appressed decumbent scales in the center of vertex. The pupa and larva are apparently more similar to the general ground pool species in the *Fraudatrix* Group of *Lophoceraomyia* than to other known members of *Eumelanomyia* in general features and chaetotaxy. The pupa can be separated from *Lophoceraomyia* particularly by having setae 8 and 10-C 3, 4 branched and the larva by the usually double seta 7-P, double seta 14-P, single seta 2-VIII, single saddle seta 2-X, narrow, elongate, finely barbed distal teeth of pecten and siphon with 5 pairs of weak subventral tufts.

On the basis of the comparative male genitalia, *manusensis* apparently belongs to the *hinglungensis* subgroup of the *Mochthogenes* Group (Sirivanakarn 1972: 31-36). As previously interpreted, this subgroup comprises 4 minute species: *hinglungensis* Chu, *castrensis* Edwards, *cataractarum* and *baisasi* Sirivanakarn. Except for the diagnostic and specific differences as discussed above, *manusensis* apparently exhibits closer affinity with *castrensis* and *cataractarum* than to the other 2 members of the subgroup. For the clarification of the identity of these species, consult the descriptions and the figures of the male genitalia in the earlier paper of the author (Sirivanakarn loc. cit).

BIONOMICS. The immatures of *manusensis* were collected twice from decayed sago stumps in a mixed sago and tree swamp under heavy shade along the coastal margin in the vicinity of a beach. The larvae and pupae were abundant.

The water in the breeding site was fresh, containing numerous fallen leaves and sago shreds. Most adults were obtained from individual or mass rearing of the larvae and pupae and only a few were collected while resting near the breeding sites. The female did not appear to bite or feed on man.

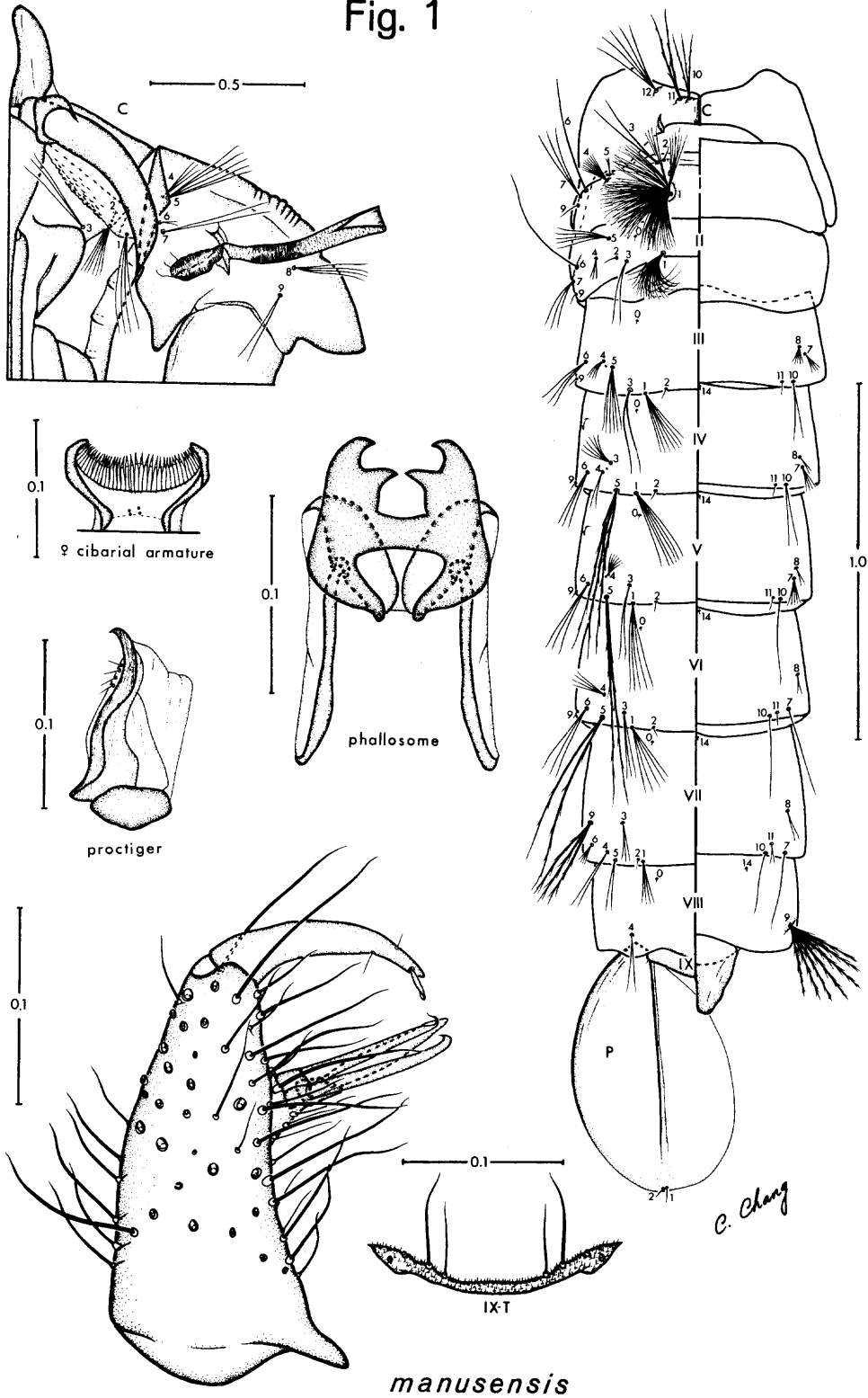
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REFERENCES CITED

- Bonne-Wepster, J. 1954. Synopsis of a hundred common non-anopheline mosquitoes of the greater and lesser Sundas, the Moluccas and New Guinea. Spec. Publ. R. Trop. Inst. Amsterdam 111: 1-147.
- Brug, S. L. and J. Bonne-Wepster. 1947. The geographical distribution of mosquitoes of the Malay Archipelago. Chron. Nat. 103: 179-197.
- Edwards, F. W. 1923. Mosquito Notes. IV. Bull. Entomol. Res. 14: 1-9.
- Lee, D. J. 1944. An atlas of the mosquito larvae of the Australasian region. Tribes Megarhinini and Culicini. Aust. Military Forces, 119 p.
- Sirivanakarn, S. 1968. The *Culex* subgenus *Lophoceraomyia* in New Guinea and Bismarck Archipelago (Diptera: Culicidae). Pac. Insec. Monogr. 17: 75-186.
- _____. 1971. Contributions to the mosquito fauna of Southeast Asia. X. A proposed reclassification of *Neoculex* Dyar based principally on the male terminalia. Contrib. Amer. Entomol. Inst. (Ann Arbor) 7(3): 62-85.
- _____. 1972. Contributions to the mosquito fauna of Southeast Asia. XIII. The genus *Culex*, subgenus *Eumelanomyia* Theobald in Southeast Asia and adjacent areas. Contrib. Amer. Entomol. Inst. (Ann Arbor) 8(6): 1-86.

Fig. 1



manusensis

Fig. 2

