

# Ethiopian Culicidae (Diptera)

A NEW SPECIES OF *CULEX* FROM TANGANYIKA, THE DESCRIPTION OF THE PUPA OF *AEDES USAMBARA* MATTINGLY AND THE EARLY STAGES OF *ERETMAPODITES TONSUS* EDWARDS

by

E. C. C. van SOMEREN

Division of Insect Borne Diseases, Nairobi, Kenya

and

J. HAMON

Medical Entomologist, O. R. S. T. O. M., France

This paper is based on material collected by J. Hamon during a visit to the East African Institute of Malaria and Vector-borne Disease at Amani, Tanganyika, in March 1959. In addition to the new species and the early stages dealt with here, the collection contained two new *Eretmapodites* and one new *Culicomyia* species which have been described elsewhere (Hamon & van Someren, 1961).

*Culex (Neoculex) amaniensis* spec. nov., fig. 1a and b

The following description is based on adult material collected in a forest at Amani, in March 1959. The early stages are not known.

**MALE:** *Head:* Decumbent scales creamy-white; upright scales largely white dorsally, but a patch of dark scales is present on either side. Proboscis and palpi dark brown; palpi exceeding proboscis by less than half the length of the terminal segment, which is not more than three-fourths the length of the penultimate. *Thorax:* Scutal integument brown dorsally with pale lateral margins. Scutum sparsely covered with narrow scales, mainly light brown, but with a distinct band of whitish scales round front margin and along lateral borders; pale scales (not forming distinct lines on the specimens examined) present round bare space and along line of dorsocentral bristles. *Pleura:* integument pale with two dark stripes posteriorly, these run across the upper and lower edge of the mesepimeron leaving the middle pale. Few pale scales present, along upper edge of *hyp* and posterior edge of sternopleura; bristles few, short and fine except for one long, strong bristle on sternopleura, about halfway down, and two to three long but fine hairs on upper edge; one lower mesepimeral bristle present. *Abdomen:* Tergites dark brown, with broad, creamy-white, apical bands on segments II-V, a

O. R. S. T. O. M.

Collection de Référence

n° 10374

11 FEVR 1966

median pale patch on first tergite and a narrow apical pale band on the sixth; scales on eighth tergite all creamy-white. Apical lateral white patches also present on tergites III-VII. Sternites mainly dark but with narrow bands and small median patches of white scales on apical edges of distal segments. *Legs*: Coxae pale; fore coxa with a small patch of dark scales above. Tibiae and tarsi all dark brown. Fore and mid femora largely dark, but each with a narrow pale ventral line, expanding onto the lateral surfaces towards the base. Basal half of hind femora creamy-white with a narrow, dark, dorsal line which does, or does not, reach the base and the basal fourth may be pale all round; apical half dark with a pale ventral line narrowing towards tip, leaving the apical fourth dark all round. *Terminalia*: Coxite and appendages (fig. 1a) differ little, if at all, from those of *C. wigglesworthi* as illustrated by Hamon *et al.* (1955). Since the fine hair associated with the three barded rods and the fine, very narrow, leaflet on the external aspect can be seen only if they happen to lie free of the other appendages, the usual appearance is as illustrated for *C. wigglesworthi* by Edwards (1941). The phallosomes (fig. 1b) have a long finger-like terminal portion with a row of sharp-pointed tubercles on the outside edge; similar tubercles are scattered over the surfaces and occur lower down on the inside edge.

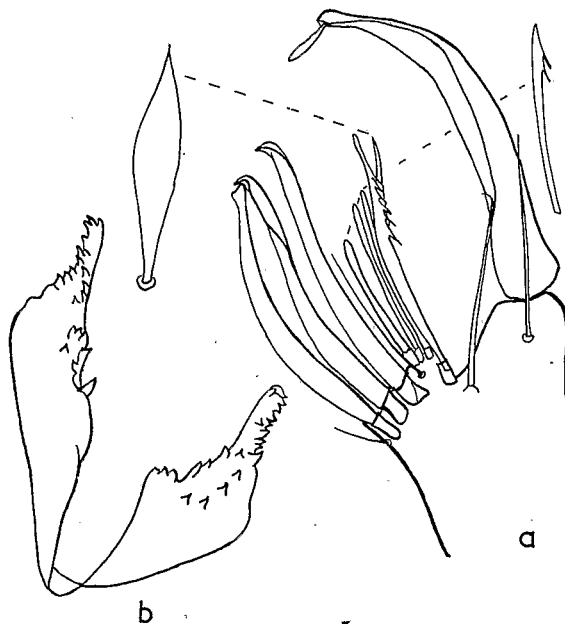


Fig. 1. *Culex (N.) amaniensis* spec. nov., male terminalia: a. coxite, b. phallosomes.

FEMALE: Two females taken with the males have a similar ornamentation, particularly in having the hind femur largely pale creamy-white on the basal half. These specimens differ slightly from the males as follows: On the scutum of the unrubbed specimen, the pale scales along the line of the dorsocentral bristles form distinct lines and there is a double line of pale scales medially on the anterior of the scutum. Both specimens have the apical pale bands of the tergites narrow and the sternites white, with only a few dark scales in the middle of the distal edge of the segments; one specimen has no pale patch on the first tergite nor any pale scales on the apical edge of the sixth. Both specimens have the basal fourth of the hind femora pale all round. Palpi dark, about one-fifth the length of the proboscis, with the second segment about twice as long as the first. The pharangeal armature of the female examined appears to be exactly as figured for *C. wigglesworthi* by Edwards (1941).

*Material examined*: ♂-Holotype, four ♂ - and two ♀ - paratypes: Tanganyika Amani, March 1959, 1000 m, in forest along stream, J. Hamon.

The ornamentation of this species is very similar to *C. wigglesworthi* but the male terminalia differ, the phallosomes having a long, blunt, terminal projection in contrast to the rounded phallosomes of *C. wigglesworthi*. Having two distinct dark lines on the otherwise pale pleura *C. amaniensis* belongs to the *rima* Edwards group of *Neoculex* Edwards (1941). It differs from the other members of this group, except *C. wigglesworthi*, by having all, or almost all, the upright scales on the vertex pale creamy-white. From *C. wigglesworthi* it is distinguished on the character of the phallosomes of the male terminalia and also by the shorter palpi which are little longer than the proboscis. In *C. wigglesworthi* the palpi exceed the length of the proboscis by nearly the whole length of the terminal segment. In addition the relative length of the ultimate and penultimate segments differ, these two segments being of practically the same length in *C. wigglesworthi* but in *C. amaniensis* the ultimate is shorter, being not more than three-fourths as long as the penultimate. The females may perhaps be distinguished by the pale hind femora which are creamy-white all round on at least the basal fourth but as this character is variable in the males it may not be reliable. In the male the narrow dark dorsal line on the femora sometimes reaches the base and such specimens could be confused with specimens of *C. wigglesworthi* which have (? always) a broad dark dorsal line reaching the base of the hind femora.

*Material examined of C. wigglesworthi*: one ♂ and three ♀♀: Kenya, Shimba Hills, July 1939, 400 m; three ♂♂ and two ♀♀: Kwale, 1951, 400 m; three ♂♂ : Kakamega, November 1948, 1500 m; one ♂: Tanganyika, Amani Forest, Old railway terminus, March 1959, 400 m, J. Hamon.

*Aedes (Stegomyia) usambara* Mattingly, fig. 2

Two pupal skins with associated adults were obtained at Amani, in May 1959. The description of the pupa is as follows:

PUPA: *Thorax*: Trumpets short and infusate. All setae poorly developed but hair 6 longer and stronger than the rest; dorsal hair 8 behind base of trumpets.

*Abdomen* (fig. 2): very like *A. dendrophilus* (Edwards, 1941) with all setae rather poorly developed. The paddle fringe is rather long but not as long as that in *A. africanus* Theo. and allied species. There are minute spicules scattered over the whole surface of the paddles; these increase in size and are more numerous towards the apical borders. An examination of the pupal skins of 22 other Ethiopian *Stegomyia* species revealed that these spicules do not occur on any other species except *A. vittatus* Big. which is distinguished by having the distal edge of the paddles smooth.

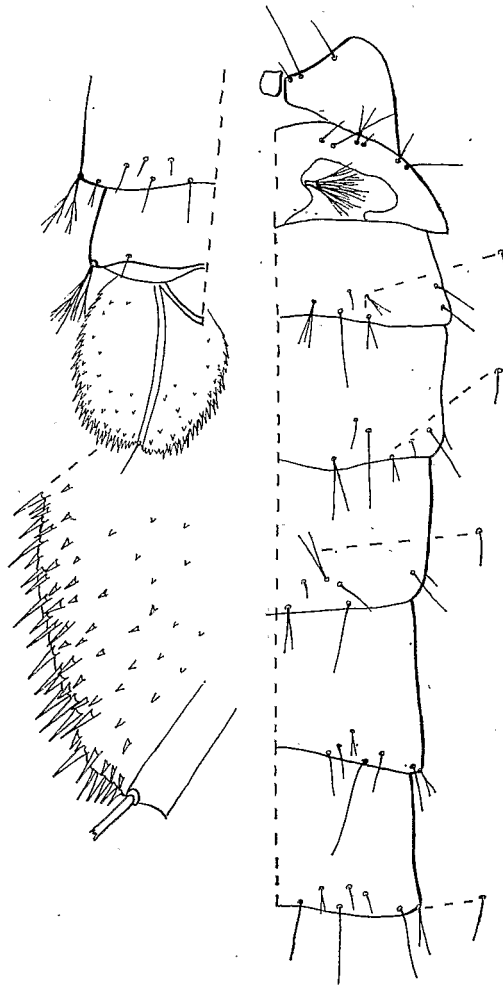


Fig. 2. *Aedes (S.) usambara* Mattingly, pupa.

*Eretmapodites tonsus* Edwards, fig. 3Aa-c

The early stages described below were collected from a snail shell, in forest, Mount Meru, Tanganyika, May 1959. Four larvae were reared to maturity. The four females hatched from the pupae have a pattern of narrow yellow lines on the thorax as in the *inornatus*-group but the postnotum is bare; this combination being characteristic of *E. tonsus*.

PUPA:\*) *Thorax*: Trumpets (fig. 3Aa) short and dark. Thoracic setae mostly small and inconspicuous but hairs 8, 10, and 12 are each longer and stronger and hair 1 is stout, black and plumose, single or bifid, and sometimes with the branches divided again apically. *Abdomen*. Paddles short, oblong-ovate, with a weakly chitinized mid rib, a long fringe and large fan-like paddle setae, which are only a little longer than the paddles and with 10-17 branches. Hair 7 on seventh and eighth tergites similar to paddle setae, with five to 13 and 10 to 14 branches respectively; about the same length as the paddle setae on tergite VII and longer than this seta on the tergite VIII. Hair 5 on segments IV-VI, hairs 3 and 5 on III, and hairs 1 and 3 on II single, stout, black, plumose and not longer than the length of the segment. Float hair with four to 10 plumose branches and hair 3 on first tergite stout, long and plumose (fig. 3Ac). All other abdominal setae small and inconspicuous.

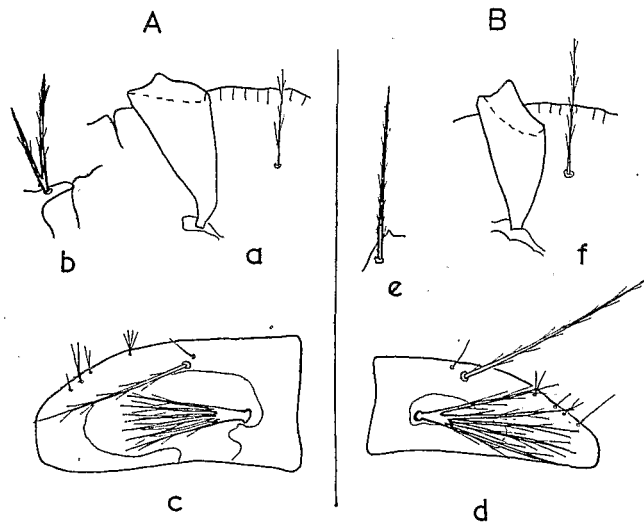


Fig. 3. (A) *Eretmapodites tonsus* Edw. and (B) *E. quinquivittatus* Theo., pupa: **b.** and **e.** thoracic hair 1; **a.** and **f.** trumpets; **c.** and **d.** abdominal tergite I.

\*) Nomenclature of Belkin, 1953.

This pupa is very similar to that of *E. inornatus* Newst. and *E. quinquivittatus* Theo. and like them differs from all other known pupae of the genus by having large fan-like paddle setae. The terminal segments are like those figured for *E. inornatus* by Haddow (1946) and it may not be possible to distinguish the pupae of these two species. From East African specimens of *E. quinquivittatus* the present species can be distinguished on a number of small differences set out in the following table.

	<i>E. quinquivittatus</i>	<i>E. tonsus</i>
Thoracic hair 1	equal to the length of the trumpets (fig. 3 Be)	Shorter than the length of the trumpets (fig. 3 Ab).
Float hair	length of branches approx. equal to distance from base of seta to edge of tergite.	length of branches equal to about one-half distance from base of seta to edge of segment.
Tergite, I, hair 3	considerably longer than distance from base of float hair to edge of tergite (fig. 3 Bd).	not longer than distance from base of float hair to edge of tergite (fig. 3 Ac.)
Tergite VIII hair 7.	equal in length to paddle seta.	longer than paddle seta.
Paddle seta	about twice length of paddles.	very little longer than paddles.
Paddles	rounded	oblong-ovate

**LARVA:** *Head* about as broad as long. Antennae very short and cylindrical with a short, fine, single seta placed just above a half. Head setae inconspicuous, arranged as in *E. chrysogaster* Graham (Hopkins, 1952), single or with seta A and B bifid. Mentum not seen. *Thorax:* Hairs of meso- and metapleural groups strong black, setae arising from smooth chitinized bosses; mesopleural group with two, long, bifid, plumose hairs and a much shorter seta divided into 18-25 stiff needle-like branches. *Abdomen:* Lateral setae strong, dark and borne on small, smooth bosses. Two setae arise from the bosses on segments I and II and one or both may be single or bifid. The setae decrease in length on succeeding segments with that on sixth segment very short and spine-like. On segments III-VI the bosses carry only one seta which is sometimes bifid on segments III and IV. Tuft B of eighth segment arising from a sclerotized tubercle and consisting of a single, stout, highly sclerotized, finely plumose seta, distally split into two branches which may be divided again apically; hair C similar in character to B, equal in length to this seta and single or bifid. Comb with 12-14 small, pale broad, finely fringed scales. Upper caudal seta single or bifid; lower bifid. Hairs of ventral brush single; plumose setae, but one hair in either group may be bifid. Saddle small; dorsal and lateral edges with a row of strong, sharp-pointed spines, each with a few minute

lateral denticles. Saddle seta not seen. Gills appear as long as saddle and sausage-shaped. Siphon short and sclerotized; no pecten spines. Subventral tuft about half the length of the siphon, single, finely plumose, and placed at a fourth.

Like *E. quinquivittatus* this larva is distinguished from others of the genus having weakly sclerotized comb scales, on the character of tuft B of the eighth abdominal segment. From *E. quinquivittatus* (fig. 5a-b) it is distinguished in the form of the spines on the distal edge of the saddle (fig. 4d), by having hair C on the eighth segment as long as and similar to tuft B (fig. 4b) and on the character of the lateral setae of the abdominal segments which are strong, sclerotized and shorter than in *E. quinquivittatus* (fig. 4c).

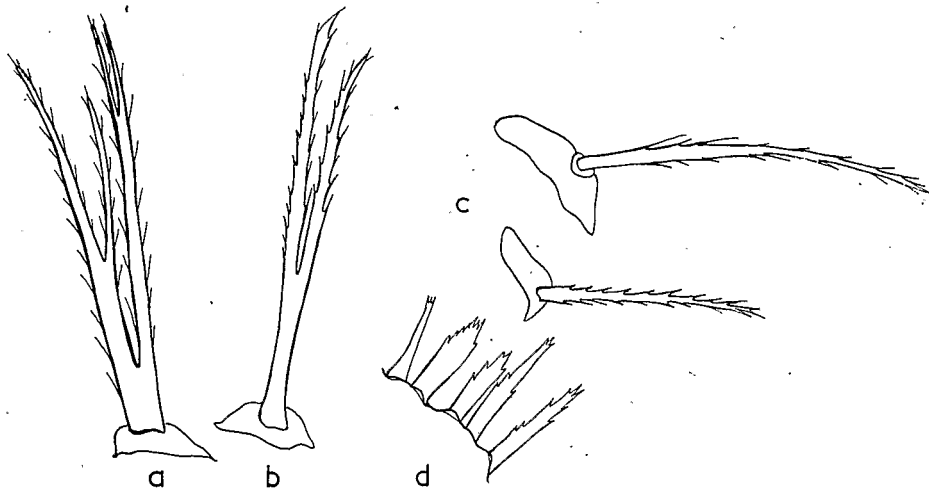


Fig. 4. *Eretmapodites tonsus* Edw., larva: a. tuft B and b. tuft C of eighth segment; c. lateral setae; d. spines on distal edge of saddle.

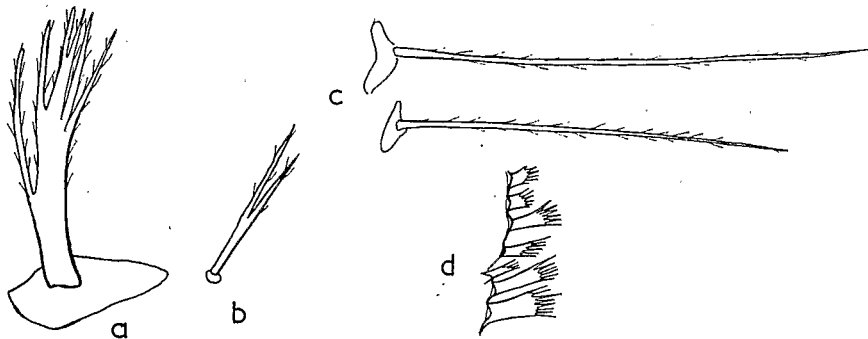


Fig. 5. *E. quinquivittatus* Theo., larva: a. - d. as in fig. 4.

## REFERENCES

- BELKIN, J. N., 1953. Corrected interpretations of some elements of the abdominal chaetotaxy of the mosquito larva and pupa. *Proc. ent. Soc. Wash.* **55**: 318-24.
- EDWARDS, F. W., 1941. Mosquitoes of the Ethiopian Region. III. - Culicine adults and pupae. London, British Museum (Nat. Hist.).
- HADDOW, A. J., 1949. The mosquitoes of Bwamba County, Uganda. IV. - Studies on the genus *Eretmapodites* Theobald. *Bull. ent. Res.* **37**: 57-82.
- HAMON, J. et RICKENBACH, A., 1955. Contribution à l'étude des *Neoculex* (Diptères: Culicidés) de la région éthiopienne. 1. Corrections de quelques descriptions de terminalia mâles données par Edwards, avec une étude d'une nouvelle variété. *Bull. Soc. Pat. exot.* **48**: 848-59.
- HAMON, J. et VAN SOMEREN, E. C. C., 1961a. Description de deux nouveaux moustiques du Tanganyika: *Culex (Culicomyia) gilliesi* sp. n. et *Eretmapodites mattinglyi* sp. n. *Ibidem* **54**: 724-31.
- , 1961b. Les *Eretmapodites* du groupe *oedipodius* Graham. II. - Description de *E. grenieri* sp. n. et clé de détermination des espèces et sous-espèces du groupe *oedipodius*. *Ibidem* **54**: 907-913.
- HOPKINS, G. H. E., 1952. Mosquitoes of the Ethiopian Region. I. - Larval bionomics of mosquitoes and taxonomy of Culicine larvae. London, British Museum (Nat. Hist.).