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NOTES ON THE EARLY STAGES OF CERTAIN ETHIOPIAN MOSQUITOES, WITH SOME LOCALITY RECORDS FROM BRITISH WEST AFRICA

BY

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NOTES ON THE EARLY STAGES

Anopheles domicolus Edwards

The unassociated larvae attributed to this species by Evans (1938) are now known to have belonged to some other species. The larva described by the present author as possibly that of *A. theileri* var. *brohieri* (Mattingly, 1944) has been shown to belong to *A. domicolus* by Mr. F. Y. Brown and Dr. G. A. Walton, who bred out identical larvae in Nigeria and Sierra Leone respectively. The descriptions which follow are based on two larval and three pupal pelts from Lokoja, Nigeria (F. Y. Brown), two whole larvae taken by M. D. Froud and the author at Kaduna, Nigeria, a pelt of the author's from Kintampo, Gold Coast, and a description and drawings received from Dr. G. A. Walton of 30 larvae collected and bred out by him from the Orugu River below Speke Hill near Freetown, Sierra Leone. The description and drawings agree closely with the remaining material, which is now in the British Museum.

LARVA (fig. 1). *Colour.* ' Dark green, speckled with black pigment, a closer concentration of dark pigment down the centre of the abdomen divides into two arms on the thorax extending from the centre of the posterior thoracic margin to the shoulders. A paler area on either side of the thorax contains a dense black spot. Sides of abdomen darker when seen from above ' (Walton). Head brownish-yellow, with two transverse brown bands and a small brown triangle posteriorly. The anterior transverse band is apparently darker and more uniform in Sierra Leone specimens than in Gold Coast and Nigerian material, and the posterior triangle is connected to the posterior transverse band in the former but not in the latter. The edges of the posterior half of the epicranial suture are pigmented in all cases.

Head. Clypeal Hairs. Inner long, slender, simple, their bases widely separated; *outer* slender, 2–3 branched, about 1/2 the length of the inner; *posterior* slender, bifid, their tips reaching just beyond the bases of the inner. *Pre-clypeals* rather long and slender. *Mid-frontal hairs* with 6–12 branches, the two inner about twice as long as the four outer or more. *Post-frontal hairs* slender, simple, their tips not quite reaching the bases of the mid-frontals. *Vertical hairs* short, trifid. *Antenna* cylindrical, not markedly swollen, dark brown, with short stout spicules on the inner aspect rather more numerous towards the lower end. *Shaft hair* minute, simple, situated about 1/3 the distance from the base. *Apical hair* slightly longer than the paired blades, with about 2–5 very delicate branches.

Thorax. Inner and middle *shoulder hairs* with well-developed, fused chitinous bases. *Inner shoulder hair* rounded, with 20–30 branches. *Middle shoulder hair* more elongated, with 13–18 branches. *Outer shoulder hair* short, simple. *Thoracic palmate hair* well

developed, with 21–26 narrow leaflets which may be shouldered or serrated. Filaments about as long as blades. Between the thoracic palmate hairs lie two small, dark, oval *sclerotized plates*. *Pleural hairs* with medium-sized basal tubercles, spines short. Long *prothoracic* two simple and one feathered. *Mesothoracic* both simple or one with slight branching. *Metathoracic* one simple, one feathered. *Integument* without obvious spicules.

Abdomen. *Integument* without obvious spicules. *Palmate hairs* on segments I–VII all well developed. I with 15–16 shouldered leaflets, the filaments about 2/3 the length of the blades. II–VII with 15–20 broad leaflets, the filaments often as long as the blades.

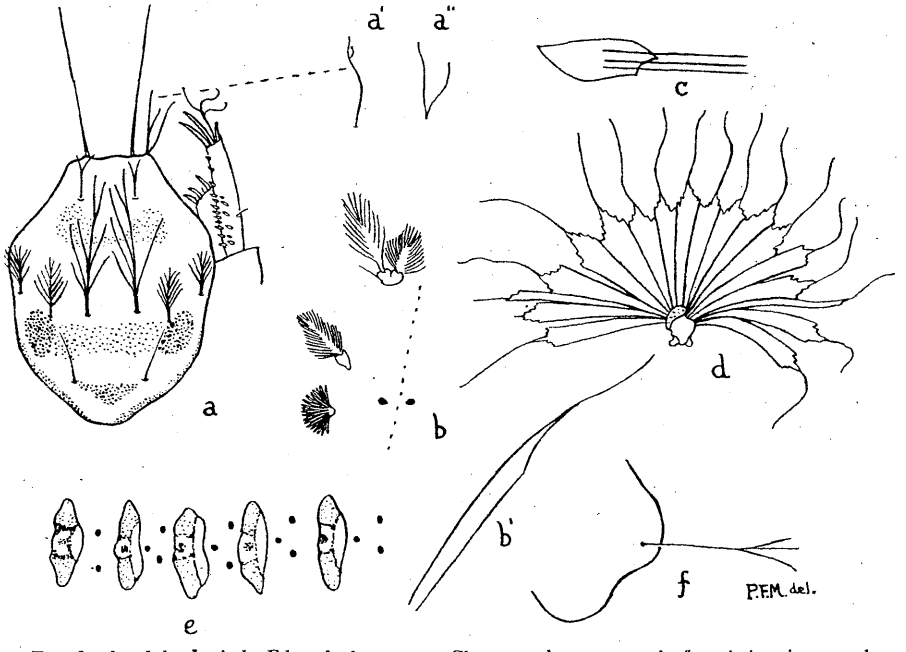

FIG. 1. *Anopheles domicolus* Edwards, larva. *a*.—Clypeus and antenna; *a'*, *a''*, variations in outer clypeal bristle in Kintampo and Kaduna specimens. *b*.—Thorax, showing position of shoulder hairs, thoracic palmate hair and metathoracic plates; *b'*, filament from thoracic palmate hair. *c*.—Base of metathoracic pleural hairs. *d*.—Typical abdominal palmate hair. *e*.—Tergal plates, segments I–V. *f*.—Saddle hair.

Average length of blade plus filament about 0·10–0·12 mm. *Lateral hairs* (hair 6) on segments IV–VI with 7–10 branches. Saddle hair split apically into 3–4 branches. The width of the *tergal plates* is about equal to the distance between the palmate hairs on segments VI and VII and about 5/6 of this distance on segments I–V. There are three *accessory tergal plates* on segments II–VII and two on segment I. The concave shape of the posterior border of the main tergal plates in the Kintampo specimen (Mattingly, 1944) is not apparent in the other specimens and appears to be an artefact due to crumpling of the pelt. *Pecten* dark and heavily sclerotized, with about 4–6 long teeth interspersed with 6–9 short ones, the latter mostly spiculate to half-way or beyond, the former with spicules present, if at all, only near the base. *Saddle hair* with 3–4 branches.

BREEDING-PLACES. Vegetation at stream edges. Dr. Walton informs me that he found the larvae also among long weeds in mid-stream in a remarkably rapid current.

PUPA (fig. 2). The nomenclature used in the following account is that employed by Evans (1938). *Paddle* with external border bare on about the basal half. Fringe spines slender, gradually passing into fine hairs towards the apex. No hairs visible beyond the terminal bristle. *Terminal bristle* hooked, between 2/5 and 1/2 the length of the paddle when fully extended. *Accessory paddle hair* short, with up to six very delicate branches. *Spine* ' *A* ' on segment VIII with normal branching ; on IV–VII very dark, sharp-pointed, not very strongly curved ; on VII about 1/2 as long as segment VIII ; on VI about the same length as on VII ; on V about 5/6 as long as on VI ; on IV about 7/10 as long as

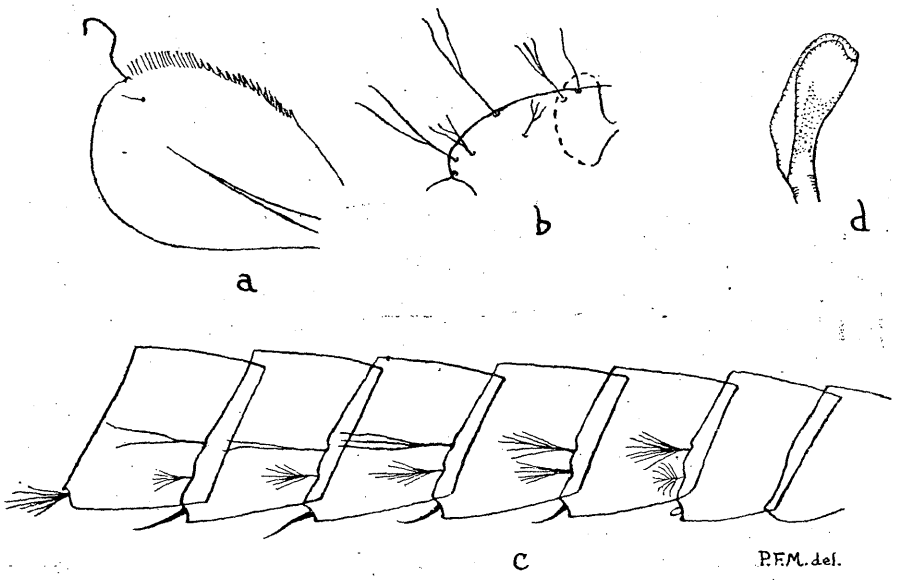

FIG. 2. *Anopheles domicolus* Edwards, pupa. *a.*—Paddle. *b.*—Segment I of abdomen. *c.*—Abdomen, segments II–VIII. *d.*—Respiratory trumpet.

on V ; on III very small, blunt, pale in colour. *Seta* ' *B* ' on VII with 6–7 branches, on VI with 6–8, on V with 6–9, on IV with 8–9, on III with 10–12. In all cases somewhat shorter and more slender than seta ' C.' *Seta* ' *C* ' on V–VII dark and fairly stout, about 3/4 the length of the following segment ; on IV rather more than 1/2 the length of the following segment ; on III rather less ; on VII single or bifid ; on V and VI single to trifid ; on IV with 5–7 branches ; on III with 8–9 branches. *Segment I* with seta ' H ' short and simple ; ' K ' with 2–5 branches, about equal in length to ' H ' ; ' L ' very short, with 3–4 branches ; ' M ' bifid, of moderate length ; ' S ' 3–4 branched ; ' T ' 2–3 branched ; ' U ' short and simple. *Respiratory trumpet* slightly infuscated, especially in the region midway between base and apex. Meatus about 1/5 the length of the whole or rather less.

RELATIONSHIPS. Both the larva and pupa closely resemble the published descriptions of those of *A. michaeli* De Meillon and Leeson. The larva differs mainly in the clypeal markings, longer outer anterior clypeal hairs and better-developed abdominal palmate hairs, and in the possession of chitinized plates on the metathorax. The pupa differs mainly in having seta ' C ' on segments VI and VII shorter than the following segments.

Anopheles wilsoni Evans (fig. 3)

The following account of the pupa is intended to supplement that given by Evans (1938), who mentions only setae ' B ' and ' C ' and the apical paddle hair. The description is based on a single pelt from Amani, Tanganyika Territory (Bagster Wilson). *Paddle* with narrow spines on the outer border down to about 1/3 the distance from the base, passing into fine hairs towards the apex. No hairs visible beyond the terminal bristle. *Terminal bristle* short and almost straight. *Accessory paddle hair* branched at half-way into four very delicate branches. *Spine* ' *A* ' on segment VIII with normal branching ;

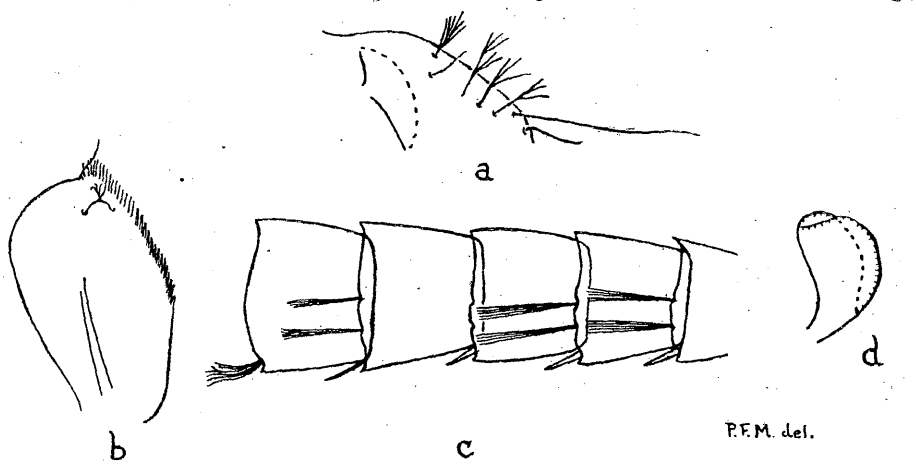

FIG. 3. *Anopheles wilsoni* Evans, pupa. *a*.—Segment I of abdomen. *b*.—Paddle. *c*.—Abdomen, segments II–VIII. *d*.—Respiratory trumpet.

on IV–VII dark, sharp-pointed, unusually straight ; on III minute or absent. This spine on segment VII about 1/3 the length of the following segment, on VI about as long as on VII, on IV and V about 5/6 as long as on VI. *Seta* ' *B* ' on VII about 2/3 the length of the following segment, on VI missing, on IV and V about as long as the following segments, on III rather shorter. All these with numerous, long, very fine branches. *Seta* ' *C* ' about equal in length to ' B ' on all segments on which the latter is present ; on VI about 3/4 the length of the following segment. On *Segment I* seta ' U ' short and simple, seta ' T ' very long and simple. *Respiratory trumpet* short and broad.

Anopheles nili Theobald (fig. 4, *a*)

Two pupal pelts from a collection of 15 made by Dr. J. Schwetz at Stanleyville, Belgian Congo, and presented by him to the British Museum, show a type of paddle fringe differing markedly from that normally encountered in this species. In these

specimens the whole of the paddle fringe on the outer side of the terminal bristle consists of stout spines, instead of the very slender, hairlike spines which are normally encountered. In the latter the base is relatively stout and spine-like, while the apex is drawn out into a long, very fine filament. When these filaments are broken off, the bases which remain look like short spines, although they are very much smaller than those noted in Dr. Schwetz's specimens. Dr. De Meillon informs me that he has a pelt resembling the latter and also from Stanleyville in the collection of the South African Institute for Medical Research at Johannesburg.

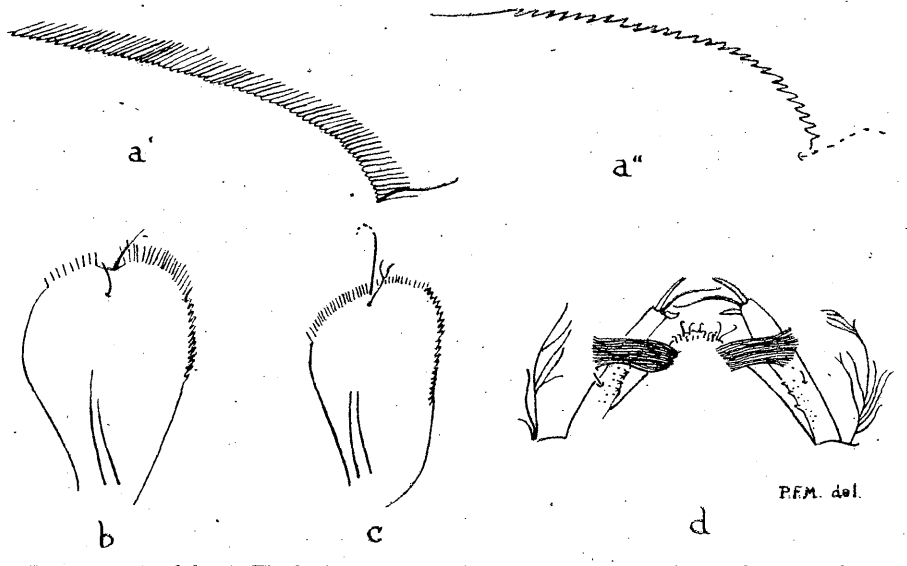

FIG. 4. *a.—Anopheles nili* Theobald, pupal paddle fringe; *a'*, normal, *a"*, aberrant form from Stanleyville. *b.—Anopheles hargreavesi* Evans, pupal paddle. *c.—Anopheles argenteolobatus* Gough, pupal paddle. *d —Anopheles turkhudi* Liston, larval mouthbrushes.

Anopheles hargreavesi Evans and **Anopheles argenteolobatus** Gough

In their original descriptions of the pupae of these species Evans (1938) and De Meillon (1929) suggest that the paddle fringe does not extend beyond the terminal bristle. Specimens now in the British Museum clearly show that it does so (fig. 4, *b-c*). It is not known whether this condition is constant, but it should be noted that in balsam mounts these very fine hairs are often difficult, if not impossible, to see. They can be seen clearly in mounts made with Puri's medium, of which the formula is given by Hopkins (1936).

Anopheles multicolor Cambouliu

Senevet (1931) erred in his description of the third segment of the pupal abdomen. He has been followed by Christophers (1933) and Evans (1938). The true condition has been described and figured by Kirkpatrick (1925).

Anopheles turkhudi Liston (fig. 4, *d*)

Edwards, in a footnote to Evans (1938), suggests that *A. hispaniola* Theobald is a synonym of *A. turkhudi*. He bases this opinion on the non-existence of a supposed difference between the eggs, but ignores the very well-marked differences between the larvae and pupae of the two species. These differences, which appear to be both constant and significant, are as follows. PUPA with hairs clearly visible in the paddle fringe between the last spine and the terminal bristle in *A. hispaniola*; no hairs in this position in *A. turkhudi*. LARVA with the *head* normally very dark in *hispaniola*, although pale specimens are occasionally met with; in *turkhudi* the head is pale. In the latter species the *mouth-brushes* have a very peculiar and distinctive appearance, being shifted laterally so that they resemble those of some Culicini (see fig. 4, *d*, and an excellent photograph in Iyengar, 1930); in *hispaniola* they are of normal anopheline type. In *turkhudi* the *frontal hairs* have 2–6 branches; in *hispaniola* they have 6–13. In *turkhudi* the *palmate hairs* are very small, and are well developed only on abdominal segments IV–VI;* in *hispaniola* they are larger, and are well developed on segments III–VII and present in a rudimentary condition on segment II. In the latter species the terminal filaments are more sharply pointed, and other minor differences have been noted. Edwards has been followed by Russell, Rozeboom and Stone (1943), who treat *hispaniola* as a synonym of *turkhudi*. In view of the existence of so many differences in the early stages this view does not appear to be tenable. Nor does it seem to be held by those who have recently encountered the two species in the field (Lumsden, 1944).

Aëdes (Mucidus) grahami Theobald

Two conflicting accounts of the larva of this species have been published by Shield (1944) and Wolfs (1945). A pelt obtained by the present author at Takoradi, Gold Coast, is in some respects intermediate between the two, having about 40 comb-scales and the siphonal tuft almost exactly half-way along the siphon. It appears that the characters on which the larvae of this subgenus are usually separated are more variable than had previously been believed, and it is improbable that sufficient material is at present available for the construction of an absolutely reliable key. This is unfortunate, as *Aëdes grahami*, although not very numerous in catches made in East Africa (Haddow *et al.*, 1947), has proved an important tree-top biter in Nigeria, and is accordingly of considerable interest to students of yellow fever. Wolfs (1945) suggests various criteria for distinguishing the larvae of *Aëdes grahami* from those of other members of the group, but they do not appear to be reliable in all cases.

LOCALITY RECORDS

The following records are the present author's, except where otherwise stated. The majority resulted from surveys carried out on behalf of No. 7 Malaria Field Laboratory, West African Force, between September, 1942, and December, 1944. New West African records of Anophelini resulting from such surveys and published by the author in a previous paper (Mattingly, 1944) are not repeated here. Separation into type-forms and varieties can only be assumed where the varietal name is given or the letters 't.f.' are appended to the specific name. Authorities for the names employed are in all cases those given by Edwards (1941).

* Evans (1938), Christophers (1933) and Iyengar (1930) are all misleading on this point. The best account is given by Puri (1931).

Northern Nigeria

Ilorin

Anopheles funestus (M. D. Froud)

Kaduna

Anopheles brunnipes
„ *coustani*
„ *domicolus*
„ *funestus*
„ *hancocki*
„ *maculipalpis*
„ *nili*
„ *pharoensis*
„ *pretoriensis*
„ *rufipes*
„ *squamosus*
Uranotaenia mashonaensis
Taeniorhynchus africanus
„ *uniformis*
Aëdes aegypti
„ *simpsoni*
Culex annulioris
„ *cinereus*
„ *decens*
„ *duttoni*
„ *guiarti*
„ *inconspicuosus*
„ *insignis*
„ *nebulosus*
„ *perfuscus*
„ *perfidiosus*
„ *tigripes*

Kano

Anopheles gambiae
„ *obscurus*
Anopheles rufipes
Ficalbia splendens

Lokoja

Anopheles domicolus (J. Y. Brown)
Megarhinus viridibasis (P. J. Roche)

Maiduguri (J. D. Robertson)

Anopheles coustani var. *ziemanni*
„ *funestus*
„ *gambiae*
„ *pharoensis*
„ *rufipes* t.f.
„ *squamosus*
„ *wellcomei*
Aëdes aegypti
„ *metallicus*
Culex annulioris
„ *decens*
„ *guiarti*
„ *poicilipes*
„ *tigripes*
„ *univittatus*
Ficalbia mimomyiaformis
„ *plumosa*
Taeniorhynchus africanus
„ *uniformis*
Uranotaenia balfouri

Southern Nigeria

Aba

Anopheles gambiae
Aëdes aegypti
„ *africanus*
„ *apicoargenteus*
Culex cinereus
„ *duttoni*
„ *nebulosus*

Awba

Anopheles funestus (M. D. Froud)

Enugu

Anopheles coustani
„ *funestus*
„ *gambiae*
„ *hancocki*
„ *moucheti* var. *nigeriensis*
„ *nili*
Megarhinus brevipalpis spp. *conradti*
Hodgesia nigeriae
Uranotaenia alboabdominalis
„ *bilineata*
Taeniorhynchus cristatus
„ *uniformis*
Aëdes aegypti
„ *vittatus*
Culex annulioris
„ *cinereus*
„ *decens*
„ *duttoni*
„ *nebulosus*
„ *perfidiosus*
„ *tigripes*
„ *tritaeniorhynchus*

IBADAN (J. D. Robertson)

Anopheles funestus
„ *gambiae*
„ *nili*
Aëdes aegypti
„ *apicoargenteus*
„ *centropunctatus*
„ *luteocephalus*
„ *vittatus*
Culex annulioris
„ *decens*
„ *duttoni*
Culex guiarti
„ *invidiosus*
„ *moucheti*
„ *nebulosus*
„ *poicilipes*
„ *pruina*
„ *rima*
„ *tigripes*
Eretmapodites chrysogaster gp.
Ficalbia mimomyiaformis
Taeniorhynchus africanus
Uranotaenia annulata

IJEBU ODE

Anopheles cinctus
„ *obscurus* var. *nowlini* (J. Y. Brown)
Anopheles funestus (M. D. Froud)

OSHOGBO

Anopheles funestus
„ *gambiae*
„ *hargreavesi*
„ *nili*
Uranotaenia fusca
„ *mashonaensis*
Ficalbia mimomyiaformis
„ *uniformis*
Aëdes fowleri
„ *vittatus*
Culex cinereus
„ *cinerellus*
„ *duttoni*
„ *inconspicuosus*
„ *ingrami* and var.
„ *perfidiosus*
„ *poicilipes*
„ *pruina* and var. *eschirasi*
„ *tigripes*

PORT HARCOURT

Anopheles gambiae
„ *moucheti* var. *nigeriensis*
„ *obscurus*
Uranotaenia balfouri
„ *chorleyi*
„ *ornata*
„ *pallidocephala*
Ficalbia mimomyiaformis
„ *plumosa*
Aëdes aegypti
„ *simpsoni*
Eretmapodites dracaenae
Culex annulioris
„ *cinerellus*
„ *decens*
„ *duttoni*
„ *macfiei*
„ *nebulosus*
„ *perfidiosus*
„ *perfuscus*
„ *tigripes*

LAGOS COLONY

APAPA (J. D. Robertson)

Anopheles coustani var. *ziemanni*
„ *gambiae*
„ *melas*
„ *obscurus*
„ *pharoensis*
Uranotaenia annulata
„ *balfouri*
Ficalbia plumosa
Taeniorhynchus africanus
„ *annetti*
„ *uniformis*
Aëdes aegypti
„ *africanus*
„ *albocephalus*
„ *argenteopunctatus*
„ *domesticus*
Aëdes irritans
„ *nigricephalus*
„ *palpalis*
Culex cinerellus
„ *decens*
„ *duttoni*
„ *fatigans*
„ *insignis*
„ *invidiosus*
„ *nebulosus*
„ *philipi*
„ *poicilipes*
„ *rima* gp.
„ *thalassius*
„ *tigripes*
„ *tritaeniorhynchus*

IKEJA

Anopheles cinctus (J. Y. Brown)
„ *gambiae*
„ *jebudensis*
„ *moucheti* var. *nigeriensis*
Megarhinus brevipalpis ssp. *conradti*
Hodgesia nigeriae
Uranotaenia balfouri
„ *chorleyi*
„ *pallidocephala*
Ficalbia uniformis
Aëdes aegypti
„ *africanus*
„ *apicoargenteus*
„ *argenteoventralis* var. *dunni*
„ *kummi*
„ *longipalpis*
Aëdes luteocephalus
„ *simpsoni*
Eretmapodites chrysogaster
Culex albiventris
„ *annulioris*
„ *cinereus*
„ *decens*
„ *duttoni*
„ *grahami*
„ *horridus*
„ *ingrami* var.
„ *invidiosus*
„ *perfidiosus*
„ *pruina* and var. *eschirasi*
„ *tigripes*

YABA

Anopheles coustani
„ *gambiae*
„ *obscurus*
Hodgesia nigeriae
Uranotaenia alboabdominalis
„ *balfouri*
„ *caliginosa*
„ *coeruleocephala*
„ *fusca*
„ *nigromaculata*
„ *pallidocephala*
„ *philonuxia*
Aëdomyia africana
Ficalbia mimomyiaformis
„ *nigra*
„ *uniformis*
Taeniorhynchus africanus
„ *annetti*
Taeniorhynchus aurites
„ *metallicus*
Aëdes aegypti
„ *africanus*
„ *apicoargenteus*
„ *circumluteolus*
„ *domesticus*
„ *longipalpis*
„ *luteocephalus*
„ *simpsoni*
Eretmapodites chrysogaster gp.
Culex annulioris
„ *cinereus* var. *uniformis*
„ *decens*
„ *fatigans*
„ *guiarti*
„ *nebulosus*
„ *thalassius*
„ *tigripes*

GOLD COAST, NORTHERN TERRITORIES

DABOYA

Anopheles gambiae
„ *wellcomei* (L. Berners)
Culex annulioris
„ *decens*
„ *univittatus*

KINTAMPO

Anopheles coustani
„ *domicolus*
„ *freetownensis*
„ *funestus*
„ *gambiae*
„ *maculipalpis*
„ *rufipes* var. *ingrami*
Uranotaenia annulata var. *apicotaeniata*
„ *balfouri*
„ *mashonaensis*
Aëdes tarsalis
Culex annulioris
„ *decens*
„ *duttoni*
„ *ingrami*
„ *tigripes*

NASIA

Anopheles wellcomei (L. Berners)

NUNGWA

Anopheles squamosus (L. Berners)

PONG TAMALE

Anopheles gambiae

TAMALE

Anopheles funestus
„ *gambiae*
Culex annulioris
„ *univittatus*

YEJI

Anopheles wellcomei (L. Berners)

ASHANTI

KUMASI

Anopheles cinctus
„ *coustani* and var. *ziemanni*
„ *funestus*
„ *gambiae*
„ *obscurus*
Megarhinus brevipalpis ssp. *conradti*
Hodgesia nigeriae
Ficalbia hispida var. *sunyaniensis*
Aëdes abnormalis
„ *aegypti*
„ *centropunctatus*
„ *cumminsi*
„ *grahami*
„ *palpalis*
Aëdes punctothoracis
„ *simpsoni*
„ *tarsalis*
Eretmapodites chrysogaster gp.
„ *grahami*
Culex albiventris
„ *annulioris* and var. *consimilis*
„ *grahami*
„ *ingrami*
„ *invidiosus*
„ *nebulosus*
„ *perfuscus*
„ *tigripes*

GOLD COAST COLONY

ACCRA

Aëdes circumluteolus
„ *cumminsi*
„ *? dalzieli*
„ *hirsutus*
„ *scatophagoides*
Culex ethiopicus
„ *fatigans*
„ *perfidiosus*
„ *univittatus*
(J. D. Robertson)
Anopheles coustani
„ *funestus*
„ *gambiae*
Anopheles hargreavesi
„ *pharoensis*
Uranotaenia balfouri
Aëdomyia africana
Ficalbia mimomyiaformis
Taeniorhynchus africanus
Aëdes aegypti
„ *albocephalus*
„ *fowleri*
Culex inconspicuosus
„ *invidiosus*
„ *poicilipes*
„ *thalassius*

ASUBOI

Anopheles funestus
„ *gambiae*
„ *hargreavesi*
Uranotaenia annulata var. *apicotaeniata*
„ *ornata*
Ficalbia mimomyiaformis
„ *pallida*
„ *uniformis*
Taeniorhynchus africanus
Aëdes aegypti
„ *apicoargenteus*
Aëdes metallicus
„ *simpsoni*
Eretmapodites chrysogaster
„ *dracaenae*
„ *quinquevittatus*
Culex albiventris
„ *gaiarti*
„ *ingrami*
„ *invidiosus*
„ *nebulosus*
„ *tigripes*

AXIM (M. D. Froud)

Anopheles cinctus
„ *funestus*
„ *gambiae*
„ *hargreavesi*
„ *obscurus* and var. *nowlini*
Uranotaenia balfouri
„ *bilineata*
„ *chorleyi*
„ *mashonaensis*
Hodgesia nigeriae

AXIM (*con.*)

Ficalbia mimomyiaformis
„ *splendens*
Eretmapodites chrysogaster
„ *grahami*
Culex guiarti
„ *grahami*
„ *inconspicuosus*
Culex ingrami
„ *nebulosus*
„ *pruina* var. *eschirasi*
„ *rima*
„ *thalassius*

TAKORADI

Anopheles coustani var. *ziemanni*
„ *obscurus*
„ *paludis*
Hodgesia psectropus
Aëdes domesticus
„ *palpalis* ssp. *carteri* (J. D. Robertson)
Anopheles funestus
„ *gambiae*
„ *pharoensis*
Uranotaenia annulata var. *apicotaeniata*
„ *balfouri*
„ *nigromaculata*
Taeniorhynchus africanus
Aëdes aegypti
„ *albocephalus*
„ *cumminsi*
„ *fowleri*
„ *fraseri*
Aëdes furcifer (or *taylori*)
„ *grahami*
„ *irritans*
„ *nigricephalus*
„ *punctothoracis*
„ *scatophagoides*
„ *stokesi*
Eretmapodites dracaenae
Culex annulioris and var. *consimilis*
„ *duttoni*
„ *fatigans*
„ *guiarti*
„ *horridus*
„ *inconspicuosus*
„ *ingrami*
„ *invidiosus*
„ *nebulosus*
„ *philipi*
„ *thalassius*

SIERRA LEONE

BO

Aëdes argenteopunctatus (J. D. Robertson)

FREETOWN (G. A. Walton)

Anopheles domicolus
Anopheles marshalli
(See also under *Uranotaenia mashonaensis* below)

NOTES

Anopheles cinctus. Mr. Froud's record from Axim is the first from Gold Coast Colony.

Anopheles coustani. The record of the type-form from Kumasi is the first from Ashanti.

Anopheles domicolus. Dr. Walton's record from Freetown appears to be the first from Sierra Leone.

Anopheles jebudensis. This species was taken for the first time at Ijebu Ode, Southern Nigeria, by Froud (1944). It has since been found again by the author breeding in a heavily shaded stream-edge at the bottom of a ravine near Ikeja.

Anopheles marshalli. Dr. Walton informs me that he bred out type-form *A. marshalli* Theo. from larvae taken together with those of *A. hancocki* among floating vegetation in clean water with some current in the reservoir at Waterloo aerodrome near Freetown. Mr. Brown's record from Nigeria (Mattingly, 1944) and a doubtful one from the same colony given by Evans (1938) are the only previous notifications of this species from West Africa.

Anopheles melas. It is understood from Dr. Robertson that his diagnostic character for this species is intended to apply only to the fore tarsus when viewed from the dorsal surface, and not to the hind tarsus, as stated by the author (Mattingly, 1944). The error is regretted.

Anopheles wellcomei. The records of this species from Daboya, Nasia and Yeji are due to Major Lewis Berners, of the United States Army. They are believed to be the first from the Gold Coast.

Hodgesia nigeriae. Edwards (1941) gives records of this species from Nigeria only, apart from a doubtful one from Sierra Leone (Freetown, Fraser). Davey (1939) gives another record from the latter colony which Edwards apparently overlooked. Adults were bred out from larvae taken by the present author at Kumasi, Gold Coast, and Dr. Robertson states in a personal communication that he has had larvae from Kumasi which appeared to be *nigeriae.* Froud's record from Axim is based on larvae, one of which is now in the British Museum.

Hodgesia psectropus. Dr. Robertson's record of this species from the Gold Coast is believed to be the first from outside the Belgian Congo.

Uranotaenia alboabdominalis. Larvae of this species were taken at Enugu, Nigeria, and a single adult in a house at Yaba. The only previous West African record is from the Gold Coast.

Uranotaenia balfouri. Dr. Robertson's record from Maiduguri appears to be the first from Northern Nigeria.

Uranotaenia bilineata. The record from Enugu is the first from Nigeria.

Uranotaenia chorleyi. Larvae of this species taken by Froud at Axim and Ijebu Ode (Froud, 1944) and by the author at Ikeja and Port Harcourt are the first recorded from West Africa. All the records are based on larvae only and require confirmation, as there are several West African *Uranotaenia* whose larvae have yet to be described.

Uranotaenia mashonaensis. Edwards (1941) does not list this among the West African species, although Ingram and Macfie (1924) recorded it from Accra and Davey (1939) from Sierra Leone. Other Sierra Leone records by Davey omitted by Edwards from his table are *Ficalbia splendens, Aëdes filicis* and *haworthi,* and *Culex guiarti, moucheti* and *weschei.* Large numbers of adult *U. mashonaensis* were bred out by the author at Oshogbo, Nigeria, and the records from Kaduna in Northern Nigeria, Axim in Gold Coast Colony and Kintampo on the northern border of Ashanti appear to indicate that it is widespread in British West Africa.

Uranotaenia ornata. The record from Asuboi appears to be the first from Gold Coast Colony.

Uranotaenia pallidocephala. Of this species Edwards (1941) says that ' records require confirmation.' Larvae were taken by the author at Yaba, Ikeja and Port Harcourt.

Ficalbia splendens. Larvae taken from a weedy borrow-pit at Kano are believed to be the first from Northern Nigeria.

Taeniorhynchus cristatus. Adults of this species were taken in European quarters at Enugu during November, 1942. The only previous West African record is from Sierra Leone.

Aëdes cumminsi and *hirsutus.* Dr. Robertson's records from Accra are the first from Gold Coast Colony.

Aëdes dalzieli. Dr. Robertson's record from Accra, the first from the Gold Coast, is a doubtful one and requires confirmation.

Aëdes fowleri. The records from Takoradi and Accra are the first from Gold Coast Colony, although the species has been recorded from the Northern Territories.

Aëdes furcifer. In Southern Nigeria, as in the Sudan (Lewis, 1945) and Northern Rhodesia (De Meillon, 1943), adult females of this species have proved indistinguishable from those of *A. taylori.* The record from Takoradi therefore requires confirmation.

Aëdes mucidus. Dr. Robertson's record from Takoradi is based on larvae only. In view of the similarity now known to exist between the larva of this species and that of *A. grahami*, and the fact that *A. mucidus* has not previously been recorded from West Africa, this record requires confirmation.

Aëdes punctothoracis. The record from Kumasi is the first from Ashanti.

Eretmapodites dracaenae. The records from Asuboi and Takoradi are the first from Gold Coast Colony.

Culex albiventris. The record of this species from Ikeja is believed to be the first from Nigeria.

Culex annulioris. The records from Kaduna and Maiduguri are the first from Northern Nigeria. The record of the type-form from Kumasi is the first from Ashanti.

Culex ethiopicus. Dr. Robertson's record from Accra is the first from Gold Coast Colony.

Culex ingrami. Larvae both of the Gold Coast type and of the Kampala variety (Hopkins, 1936) were taken and bred out at Oshogbo. Larvae of the Gold Coast type were taken at Asuboi and Takoradi. It appears, therefore, that the Gold Coast type occurs in Gold Coast Colony as well as in Ashanti, and that both type-form and variety occur in Nigeria. Previous records are from Ashanti only.

Culex macfiei. The record from Port Harcourt is the first from Southern Nigeria.

Culex pruina var. *eschirasi.* Numerous larvae were taken together with those of the type-form at Oshogbo and Ikeja, Southern Nigeria. Previous records are from Gaboon only.

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