

THE AFRICAN SPECIES OF CULEX AND ALLIED GENERA.

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The writer's original intention in publishing this paper was to give a key for the identification of those African mosquitos which might be taken by the non-specialist for species of *Culex*, without attempting to form any opinions as to the value or limits of allied genera. A study of the insects, however, led to the realisation that scale characters, in this group at least, are not of very great value for separating genera, and consequently the present paper gives the author's views of the classification of the *Culex* group, and is more complete than it might otherwise have been. Time has not yet been available to deal with those species which have flat scales on the top of the head or on the scutellum (*Stegomyia* group).

It will be noticed at once that a large number of names (nearly seventy) have been sunk as synonyms, and it may be as well to point out that this has, as a rule, only been done after a careful comparison of the types. Where there is room for doubt as to the synonymy of two names, this has been freely admitted.

All that is claimed for this paper is that it may make the determination of good specimens a little easier than up to the present. The group of species including *Culex invidiosus*, and some other species, are very difficult to classify, and the author has not been able, much to his regret, to find any clearly marked distinctions.

The CULICIDAE as a whole are classified as follows by Lt.-Col. Alcock (Ann. Mag. Nat. Hist. (8) viii., p. 241, 1911):—

Sub-family A. **Corethrinae**. (Proboscis short.)

Sub-family B. **Culicinae**. (Proboscis long.)

Section 1. **MEGALORHINI**. (Proboscis very long and bent downwards.
Usually large metallic species.)

Section 2. **EPIALURGI** = Anophelinae of Theobald. (Palpi long in ♀.)

Section 3. **CULICALES**, comprising Culicinae, Heptaphlebomyinae,
Dinoceratinae, Aedinae and Uranotaeniinae of Theobald.
(Metanotum bare.)

Section 4. **METANOTOTRICHA**, comprising Trichoprosoponinae, Den-
dromyinae and Limatinae of Theobald. (Metanotum
bearing bristles.)*

This grouping of the main divisions of the family is in the present writer's opinion the best that has yet been proposed. Many recent authors have adopted an essentially similar plan, but have made only three divisions of the CULICINAE (or, where the CORETHRINAE are regarded as a separate family, three sub-families of CULICIDAE), the MEGALORHINI (Megarhininae of Theobald) being included with the CULICALES. It seems better, however, owing to the many differences of structure between the two groups, to keep them separate.

* [It has very reasonably been suggested to me that it is advisable to use similar terminations for the names given to groups of equal value; and further, that it is inadvisable to interfere with the established name of "Anopheline" for the malaria-carrying mosquitos. Mr. Guy Marshall proposes the names (1) *Megalorhinina*, (2) *Anophelina*, (3) *Culicina*, and (4) *Metanototrichina*, for the four sections of CULICINAE, and with this proposal I entirely concur.—A. Alcock.]

The CULICALES may be divided further into two main groups as follows:—

Sub-section I. CULICIDES. Palpi of ♂ longer than those of ♀.

Sub-section II. AEDIDES. Palpi similar in both sexes.

Further sub-division, except into genera, is unnecessary, and probably not advisable.

In the following table are included all those forms of the CULICIDES (Theobald's sub-families *Culicinae* and *Heptaphlebomyinae*) which have no flat scales on the scutellum or on the middle part of the head. The genus *Ludlowia* has also been included owing to the similarity of the females to *Culex*, and the fact that not all the species have a flat-scaled head.

Table of Genera.

- | | | | | | |
|--|-----|-----|-----|-----|----------------------------|
| 1. Male palpi much shorter than proboscis | ... | ... | ... | ... | 2. |
| " never much shorter than proboscis (in <i>Theobaldia</i> | | | | | |
| <i>spathipalpis</i> they often shrink and curl up, so as to | | | | | |
| appear shorter than the proboscis) | ... | ... | ... | ... | 3. |
| 2. Ungues all simple in both sexes | ... | ... | ... | ... | PROTOMELANOCONION, p. 244. |
| Fore and mid ungues dentate in both sexes | ... | ... | ... | ... | [two undescribed species]. |
| 3. Male palpi apparently 2-jointed | ... | ... | ... | ... | 4. |
| " " 3-jointed | ... | ... | ... | ... | 5. |
| 4. Fore and mid ungues of female simple; first fork-cell in female | | | | | |
| shorter than second; wings nearly bare on lower half | | | | | |
| | | | | | LUDLOWIA, p. 244. |
| Fore and mid ungues of female dentate; first fork-cell in female | | | | | |
| longer than second; thorax deep yellow at sides | | | | | BANKSINELLA, p. 245. |
| 5. Last two joints of male palpi thickened, terminal usually shorter | | | | | |
| than penultimate and turned slightly downwards (fig. 1) ... | ... | ... | ... | ... | 6. |
| Last two joints of male palpi thin, mucronate and curved upwards | | | | | 9. |
| 6. Fore and mid ungues of male and female dentate (both claws) | ... | ... | ... | ... | 7. |
| All ungues of female, and hind pair of male, simple | ... | ... | ... | ... | 8. |
| 7. Female palpi more than half as long as proboscis; wing-scales | | | | | |
| broad, legs densely clothed with outstanding scales | | | | | MUCIDUS, p. 246. |
| Female palpi less than half as long as proboscis; wing-scales | | | | | |
| mostly narrow; legs without outstanding scales | | | | | OCHLEROTATUS, p. 246. |
| 8. Smaller claw on fore and mid tarsi of male toothed; large species | | | | | |
| | | | | | THEOBALDIA, p. 251 |
| Smaller claw on fore and mid tarsi of male not toothed; medium- | | | | | |
| sized, usually yellow species | ... | ... | ... | ... | TAENIORHYNCHUS, p. 251. |
| 9. Terminal joint of male palpi very short (fig. 2); wing-scales all | | | | | |
| broad ... | ... | ... | ... | ... | MANSONIOIDES, p. 253. |
| Terminal joint of male palpi nearly as long as or longer than | | | | | |
| penultimate; wing-scales mostly narrow | ... | ... | ... | ... | 10. |
| 10. Male palpi with a row of outstanding transparent whitish scales; a | | | | | |
| row of flat opalescent scales round the eye-margins in both sexes | | | | | |
| | | | | | CULICIOMYIA, p. 254. |
| Male palpi without such scales (fig. 3); flat scales not continuous | | | | | |
| round eye-margins | ... | ... | ... | ... | CULEX, p. 256. |

Table of Females.

(Species of the *Aedes* group (not included in this table), though obscure-looking, nearly always have a flat-scaled head).

1. Fore and mid ungues toothed 2.
- All ungues simple 5.
2. Hind ungues toothed 3.
- " " simple 4.
3. Palpi more than half length of proboscis; wing scales broad;
 legs shaggy MUCIDUS, p. 246.
- Palpi less than half length of proboscis; wing scales narrow;
 legs not shaggy OCHLEROTATUS, p. 246.
4. Thorax bright yellow at the sides BANKSINELLA, p. 245.
- " not bright yellow at sides OCHLEROTATUS, p. 246.
5. Distinctly yellow species; legs largely yellow TAENIORHYNCHUS, p. 251.
- Not yellow species 6.
6. Wing-scales all very broad (compare also *Aedeomyia*)
 MANSONIOIDES, p. 253.
- " mostly narrow 7.
7. Head mostly covered with flat scales (as in *Stegomyia*, etc.)
 LUDLOWIA, p. 244.
- " " " " narrow curved scales 8.
8. Head with a row of small flat scales round the eye-margins
 CULICIOMYIA, p. 254.
- Head without flat scales on the occiput 9.
9. Last two joints of hind tarsi white LUDLOWIA (MEGACULEX), p. 244.
- " " " not white 10.
10. Large to medium-sized species; femora and tibiae with pale spots 11.
- Femora and tibiae not spotted 13.
11. Thorax with distinct narrow white lines; a pale ring before tips
 of femora *Theo. spathipalpis*, p. 251.
- Thorax without white lines 12.
12. Thorax with the anterior two-thirds, or at least the middle third,
 with pale scales *C. quasigelidus*, p. 258.
- Thorax not so marked; spots on legs more numerous *C. tigripes*, p. 261.
13. Thorax with the anterior two-thirds bearing pale scales 14.
- " almost uniformly scaled 16.
14. Violet-blackish species *Taen. metallicus*, p. 252.
- Not violet-blackish species 15.
15. Abdominal segments with pale median basal spots *C. annulioris*, p. 259.
- " without such spots *C. consimilis*, p. 259.
16. A well-defined margin of white scales to eyes; small grey species,
 with small whitish basal spots on abdominal segments
 Prot. fuscum, p. 244.
- No well-defined rim of white scales to eyes (except sometimes in
 C. grahami) 17.
17. Large species, joints of tarsi basally banded *Theo. annulata*, p. 251.
- Medium-sized or small species, tarsi not banded, or rarely with
 basal and apical bands CULEX, p. 256.

Genus *PROTOMELANOCONION*, Theo.

Mon. Cul. V, p. 462 (1910).

1. *P. fuscum*, Theo., Mon. Cul. V, p. 463 (1910).

Although the generic characters will at once distinguish the male from all the related genera, the female is a very obscure insect, and might easily be mistaken for a small *Culex*, a *Culiciomyia*, or an *Aedes*. It perhaps bears the greatest resemblance to a *Culiciomyia*, since it has the same rim of white scales round the eye-margins; but an examination with the microscope shows that the white scales are narrow-curved and not flat. *P. fuscum* ♀ can be distinguished from *Culex grahami* and its allies by the much longer bristles on the thorax.

Genus *LUDLOWIA*, Theo.

Mon. Cul. IV, p. 193 (1907).

Megaculex, Theo., Mon. Cul. IV, p. 282 (1907).

Radioculex, Theo., Rec. Ind. Mus. II, p. 295 (1908).

Hispidimyia, Theo., Mon. Cul. V, p. 245 (1910).

The essential characters of the genus are:—(1) the apparently 2-jointed ♂ palpi, of which the apical joint is swollen; (2) the short fork-cells, especially the first; (3) the rather peculiar shape of the marginal cell; (4) the nearly bare posterior half of the wings; (5) the structure of the ungues, which is essentially the same as in *Culex*, but the larger claw on the anterior tarsi of the male always has two teeth; (6) the long antennae of the ♂, usually longer than the proboscis.

Ludlowia was founded on *Mimomyia* (?) *chamberlaini*, Ludlow, and *Radioculex* on *R. clavipalpus*, Theo. An examination of the types, however, shows that these are in reality one and the same species. *Hispidimyia hispida*, Theo., is very little different from *L. chamberlaini*, and *Megaculex albitarsis*, Theo., has all the essential characters of the genus.*

Table of species of *Ludlowia*.

1. Head with mostly narrow-curved and upright-forked scales in middle; last two joints of hind tarsi white (subgenus <i>Megaculex</i>)	2.
Head mostly covered with flat scales, except for a very small area behind; last two joints of hind tarsi not white (subgenus <i>Ludlowia</i>)	3.
2. Large species, 7-8 mm. in length	<i>plumosa</i> .
Small species, 3 mm. in length	<i>pincerna</i> .
3. Legs narrowly banded, last hind tarsal joint whitish	(<i>chamberlaini</i>)†
„ uniformly dark	<i>hispida</i> .

* Since the above was in type I have had an opportunity of examining a male of *Boycia mimomyiaformis*, Newst. (vide p. 266), from Derri, N. Nigeria (*J. J. Simpson*). It evidently belongs to the subgenus *Megaculex* of *Ludlowia*.

† This species does not occur in Africa.

1. *L. plumosa*, Theo., (*Culex*) Mon. Cul. I, p. 373 (1901).*Megaculex albitarsis*, Theo., Mon. Cul. II, p. 25 (1901).

The hind tarsi of the type of *L. plumosa* are missing, and as Theobald puts a query against his statement that the hind ungues are simple, I assume that they were absent when the insect was described. The only difference I can see between the types of *L. plumosa* and *M. albitarsis* is that in the former the upright forked scales of the head are dark, whereas in the latter they are yellow. There is variation in this respect, however, in the small series (four specimens) of *M. albitarsis*. Theobald incorrectly describes and figures the fore and mid ungues of the ♂ *M. albitarsis* as unidentate; the two teeth on the larger claw are quite evident in the type.

S. Nigeria; Congo Free State; Uganda; Mashonaland.

2. *L. pincerna*, Graham, (*Megaculex*) Ann. Mag. Nat. Hist. (8) V, 1910, p. 267.

Graham makes the same mistake as Theobald in describing the ♂ ungues. The basal tooth on the larger claw is much more difficult to see than the median one, and is probably overlooked in very many cases. As, however, its presence or absence is not usually a generic character, the oversight (which is very excusable) is not of serious import.

S. Nigeria.

3. *L. hispida*, (*Hispidimyia*) Theo., Mon. Cul. V, p. 245 (1910).

Specimens have been received at the Museum from Kampala Swamp and Kibanga, Uganda (*Capt. A. D. Fraser*).

Sudan; Uganda.

Genus BANKSINELLA, Theo.

Mon. Cul. IV, p. 468 (1907).

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|---|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------|
| 1. Costa spotted with black and yellow; hind femora yellow with black | | | | | | | | | |
| apical ring | ... | ... | ... | ... | ... | ... | ... | ... | <i>punctocostalis</i> . |
| „ uniformly dark; hind femora all dark above | ... | ... | ... | ... | ... | ... | ... | ... | 2. |
| 2. Proboscis unbanded | ... | ... | ... | ... | ... | ... | ... | ... | <i>luteolateralis</i> . |
| „ banded | ... | ... | ... | ... | ... | ... | ... | ... | <i>taeniarostris</i> . |

1. *B. punctocostalis*, Theo., Mon. Cul. V, p. 407 (1910).

Ashanti.

2. *B. luteolateralis*, Theo., Mon. Cul. II, p. 71 (1901).*Taeniorhynchus lineatopennis*, Ludlow, Canad. Ent. XXXVII, p. 133 (1905).*Banksinella chrysothorax*, Theo., (♂) Mon. Cul. V, p. 404 (1910).

Generally distributed over Africa; Philippine Is.; Perak, Malay States.

3. *B. taeniarostris*, Theo., Mon. Cul. II, p. 405 (1910).

The hind ungues of this species and of *B. punctocostalis* are simple, as in *B. luteolateralis*, of which this is perhaps a well-marked variety.

Ashanti.

Genus *MUCIDUS*, Theo.

Mon. Cul. I, p. 268 (1901).

1. *M. scatophagoides*, Theo., Mon. Cul. I, p. 277 (1901).*M. sudanensis*, Theo., Third Rep. Welle. Lab. p. 252 (1908).

Tibiae with pale bands at the base, middle and apex, all of about equal breadth. All tarsi with pale basal bands, most marked on the hind pair. Wing-fringe with eight pale spots.

The proboscis of *M. sudanensis* is said by Theobald to have a white band at the tip; this is an error, and the statement was evidently intended to apply to the *palpi*, the last joint of which is white. The species is closely related to the Australian *M. alternans*, Westw., which differs in having the tibiae dark at the apex, with two narrow white bands.

Sudan; Gold Coast; India.

2. *M. mucidus*, Karsch, Ent. Nachr. 1887, p. 25.*M. africanus*, Theo., Mon. Cul. I, p. 274 (1901).*M. grahami*, Theo., Mon. Cul. V, p. 127 (1910).

Fore and mid tibiae narrowly white at base, broadly white at apex. Hind tibiae narrowly white at base and apex and with a very narrow indistinct white band in the middle. Fore and mid tarsi all yellowish. Wing-fringe usually with seven pale spots.

The type of *M. grahami* is a dark specimen, in which the pale fringe spots are indistinct, only four being clearly visible, and traces of two others. Apart from this it does not differ from *M. mucidus*. The type of *M. africanus* has seven pale fringe-spots, not five as stated by Theobald.

M. alternans does not occur in Africa; the Natal specimen included by Walker in his series of *Culex commovens* (= *M. alternans*) is apparently a variety of *M. mucidus*.

Sierra Leone; Ashanti; S. Nigeria; N. Nigeria; Nyasaland Protectorate; Delagoa Bay.

Genus *OCHLEROTATUS*, Arrib.

Rev. Mus. La Plata, II, p. 143 (1891).

Culicada, Felt, N.Y. State Mus. Bull. No. 79, p. 391 b (1904).*Culicelsa*, Felt, *l.c.**Mimeteculex*, Theo., Third Rep. Welle. Lab. p. 258 (1908).*Grabhamia*, Theo., part.

Coquillett (Science, vol. 23, p. 314, 1906) sinks both *Culicada* and *Culicelsa* under *Ochlerotatus*, and though Theobald (Mon. Cul. IV, p. 14) regards this as a retrograde step, it seems to be inevitable. The present writer is in entire agreement with Coquillett as to the taxonomic value of toothed or simple claws in the female, as all other characters seem to support divisions based on this. A more detailed study may reveal satisfactory characters by which to separate *Culicelsa* and *Ochlerotatus* (*Culicada*), but at present such have not been discovered. Dyar, using the male genitalia as a basis of classification, doubts whether the two genera can be kept separate. The chief structural difference appears to be that in *Culicelsa* the hind ungues are simple, while in *Culicada* they are toothed; but *O. caliginosus* and *O. ochraceus* have the hind ungues simple in the male, but toothed in the female, so that this character cannot be of very great importance.

The genus *Ochlerotatus* is certainly well founded, and is accepted here in its original sense, with the slight modification necessary for the inclusion of *Culicelsa*. *O. albifasciatus*, Mcq., the type of the genus, is unrepresented in the British Museum Collection, two specimens so named by Walker certainly being wrongly identified. *O. (Leucomyia) scapularis*, Rond., is of precisely the same type as the species tabulated below, and is certainly not congeneric with the other species of *Leucomyia*, which are here included in *Culex*.

Theobald in publishing *Grabhamia* did not cite a type in any way, and Dyar (Proc. Ent. Soc. Washington, 1905, p. 48) specified *Culex dorsalis*, Mg., as the type; Felt, however, had previously (*loc. cit.*) chosen *C. jamaicensis*, Theo., which appears to be a true *Culex*. The genus *Grabhamia*, therefore, is not synonymous with *Ochlerotatus* and *Culicada*, but with *Culex*.

Ochlerotatus is mainly a Palaearctic genus, comparatively few species occurring within the tropics, where, on the other hand, *Culex* is more largely developed. The *Culicelsa* group includes (besides *C. taeniorhynchus*, Wied., the type, and the African species given below), *Culex vigilax*, Skuse, *Taeniorhynchus niger*, Giles (which is very close indeed to *C. taeniorhynchus*, Wied.) and others. *C. alboannulatus*, Mcq., is a true *Ochlerotatus*. *C. accraensis*, Theo. (*neotaeniorhynchus*, Theo.) is a *Culex*. In addition to the differences in unguis and male palpi, *Ochlerotatus* seems to differ from *Culex* in the structure of the male antennae, the plumes arising from the dorsal and ventral surfaces of the antenna only, instead of in whorls as in *C. pipiens*. Whether the two genera can always be distinguished in this way I am unable to say, as time has not allowed the examination of the antennae of very many species.

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|---|-----|-----|--------------------------|
| 1. Hind unguis toothed in both sexes (<i>Ochlerotatus</i> , s. str.) | ... | ... | 2. |
| " " simple in ♂ | ... | ... | 6. |
| 2. Tarsi unbanded... | ... | ... | 3. |
| Tarsal joints banded at both base and apex | ... | ... | 5. |
| 3. Abdomen unbanded, but in ♀ with very small median basal pale spots | ... | ... | 1. <i>cummingsi</i> . |
| Abdominal segments basally banded | ... | ... | 4. |
| 4. Thorax more or less ornamented with pale lines; wings without light scales | ... | ... | 2. <i>dentatus</i> . |
| Thorax uniformly scaled; wings with light and dark scales (N. Africa and Europe only) | ... | ... | 3. <i>nemorosus</i> . |
| 5. Banding of tarsi rather broad; abdominal segments with pairs of dark patches | ... | ... | 4. <i>dorsalis</i> . |
| Banding of tarsi narrow; abdomen almost all pale | ... | ... | 5. <i>longisquamosus</i> |
| 6. Hind unguis simple in both sexes (<i>Culicelsa</i>) | ... | ... | 7. |
| " " toothed in female | ... | ... | 12. |
| 7. Legs banded | ... | ... | 8. |
| " unbanded | ... | ... | 11. |
| 8. Tarsal joints with apical and basal banding | ... | ... | 6. <i>pulcritarsis</i> . |
| " " basal banding only | ... | ... | 9. |
| 9. Wings mottled with black and white scales; dark species | ... | ... | 10. |
| " not mottled; more brownish species; costal fringe whitish beyond middle | ... | ... | 7. <i>hirsutus</i> . |
| 10. Abdominal segments with apical lateral yellowish spots | ... | ... | 8. <i>durbanensis</i> . |
| " " without such spots | ... | ... | 9. <i>nigeriensis</i> , |

11. Abdominal segments with complete basal bands ... 10. *quasiunivittatus*.
 „ „ basal lateral white spots; thorax whitish at
 sides 11. *lateralis*.
 12. Smaller blackish species; hind ungues in ♂ equal... 12. *caliginosus*.
 Larger yellowish species; hind ungues in ♂ unequal (*Mimeteculex*,
 Theo.)... .. 13. *ochraceus*.
 Species *incertae sedis*; a rather broad whitish band at apex of hind
 tibiae; scutellum with golden-yellow scales 14. *leucarthritis*.

1. *O. cumminsi*, Theo. (*Culex*), Mon. Cul. III, p. 214 (1903).

Culicada mediopunctata, Theo., Mon. Cul. V, p. 304 (1910).

„ *fuscopalpalis*, Theo., Mon. Cul. V, p. 307 (1910).

The type of *C. mediopunctata* is only a variety of *O. cumminsi* with unusually large abdominal spots, traces of which can almost always be seen. The male genitalia of *C. fuscopalpalis* do not differ from those of *O. cumminsi*.

Nyassaland Protectorate; Uganda; Ashanti.

2. *O. dentatus*, Theo. (*Culex*), First Rep. Wellc. Lab., p. 75 (1905).

Evidently closely allied to *O. cumminsi*, but differs in the banded abdomen.

The male is at present unknown.

Abyssinia; Transvaal.

3. *O. nemorosus*, Mg., Syst. Besch. I, p. 4 (1818).

(?) *Grabhamia maculosa*, Theo., Ann Mus. Nat. Hung. III, p. 105 (1905)

Culicada nemorosa, Theo., Mon. Cul. IV, p. 370 (1907).

Several specimens from Algeria (*Rev. E. A. Eaton*) in the British Museum seem to belong to this species. Some are very much paler than others, one having the thorax and abdomen almost entirely buff-coloured, yet I feel sure it is only a variety. This specimen agrees very well with Theobald's description of *G. maculosa*, which makes it seem possible that the latter is only an extreme form of *O. nemorosus*. The corresponding pale variety of *Stegomyia fasciata* (described by Mr. G. A. K. Marshall in the last number of this Bulletin) is common in Algeria, as is an ochreous form of *C. pipiens*.

Algeria.

4. *O. dorsalis*, Mg., Syst. Besch. IV, p. 242 (1818).

Grabhamia dorsalis, Theo., Mon. Cul. III, p. 251 (1903).

Grabhamia subtilis, Ed. & Et. Serg., Bul. Mus. Paris XI, p. 240 (1905).

„ *willcocksii*, Theo., Mon. Cul. IV, p. 294 (1907).

The forms described as *G. subtilis* and *G. willcocksii* only differ in having the pale markings of the abdomen rather more extended than in typical *C. dorsalis*, and are evidently merely pale varieties of Meigen's species.

The unguinal formula in all the specimens I have seen (including British specimens determined by Mr. Theobald as *G. dorsalis* and as *G. pulcripalpis*, and African specimens of *G. subtilis* and *G. willcocksii*) is: ♂ 2.1—1.1—1.1, ♀ 1.1—1.1—1.1, and it is most probable that errors of observation were made in compiling the table on p. 285 of vol. IV of the Monograph of the Culicidae.

I am not quite certain whether the species at present under consideration is really *C. dorsalis* or *C. pulcripalpis*, Rond., or whether these two names are synonymous. Whichever may be the case, it is certainly the same as our British species, which has always been known as *C. dorsalis*. It is curious, however, that

Austen (Entomologist, 1895, p. 228) overlooked the fact that the last joint of the hind tarsi is entirely white or whitish, while Theobald gives this as a character of *C. pulcripalpis* (introducing *C. pulcripalpis* as British on some specimens which showed the character markedly) but *not* of *C. dorsalis*. As, however, every specimen in the British Museum, British or otherwise, whether determined as *C. pulcripalpis* or as *C. dorsalis*, has the last joint of the hind tarsi whitish, I feel fairly sure that the fact has simply been overlooked. There is in Britain, so far as the National Collection is concerned, only one species of the *C. dorsalis* group, and it seems *à priori* more probable that this would be Meigen's species than Rondani's.

Mansonia arabica, Giles (J. Trop. Med. 1906, p. 130) is related to *O. dorsalis*, but can readily be distinguished by the much broader wing-scales, and there are other differences which show it to be distinct. *Culex arabicus*, Becker (Denkschr. k. Akad. Wiss. Math. Nat. kl. LXIX, 2, p. 140, 1910) is probably a homonym, as both appear to belong to the group *Grabhamia*.

Europe; N. Africa.

5. *O. longisquamosus*, Theo. (*Grabhamia*), Ann. Mus. Nat. Hung. III, p. 102 (1905).

The ♂ and the hind ungues of the ♀ of this species have not been described, but it seems to belong to the *O. dorsalis* group, judging from the description.

Tunis.

6. *O. pulcritarsis*, Rond., Bull. Soc. Ent. Ital. IV, p. 31 (1872).

Culex leucacanthus, Lw., Besch. Eur. Dipt. III, p. 1 (1873).

Culex mariae, Serg., Thèse de Paris, p. 64 (1903).

Grabhamia pulcritarsis, Theo., Mon. Cul. III, p. 244 (1903).

The specimens of *C. mariae* in the British Museum agree perfectly with the descriptions of *C. pulcritarsis* (by Ficalbi) and *C. leucacanthus*. The unguis formula in these specimens is ♂ 2·1-2·1-0·0, ♀ 1·1-1·1-0·0, and not as given by Theobald in Mon. Cul. IV., p. 285; the above is the formula given by Ficalbi for *O. pulcritarsis*. The species is quite distinct from *C. dorsalis*.

Europe; Algeria.

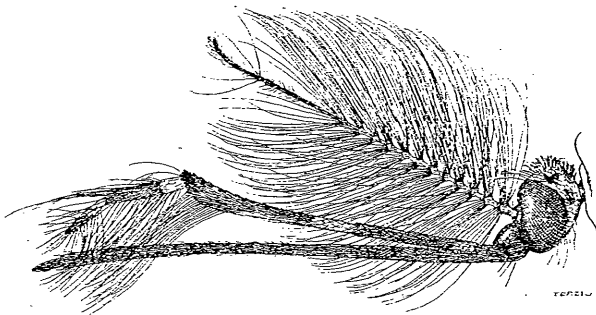


Fig. 1.—*Ochlerotatus hirsutus*, Theo., ♂; side view of head, to show form and position of palpi.

7. *O. hirsutus*, Theo. (*Culex*), Mon. Cul. I, p. 392 (1901). (Fig. 1.)

Culex transvaalensis, Theo., Mon. Cul. III, p. 165 (1903).

The proboscis has a broad though ill-defined band. This is quite a typical member of the *Culicella* group, taking *C. taeniorhynchus*, Wied. (*nec* Arrib.), as the type. S. Rhodesia; Transvaal.

8. **O. durbanensis**, Theo., Mon. Cul. III, p. 246 (1903).

Grabhamia durbanensis, Theo., *l.c.*

„ *ocellata*, Theo., Mon. Cul. V, p. 284 (1910).

The type of *G. durbanensis* is a small specimen, but evidently the same as *G. ocellata*.

Natal; Delagoa Bay.

9. **O. nigeriensis**, Theo. (*Grabhamia*), Mon. Cul. V, p. 281 (1910).

Rather closely resembles *O. vigilax*, Skuse, from Australia and *O. nocturnus*, Theo., from Fiji, but has much more numerous light scales on the wings.

The ♂ of *C. vigilax* has only a protuberance representing the tooth on the larger claw of the mid tarsi; the ♂ of *C. nigeriensis* is not yet known.

S. Nigeria; N. Nigeria; Uganda; Nyasaland.

10. **O. quasiunivittatus**, Theo. (*Culex*), Mon. Cul. II, p. 32 (1901).

Culiciomyia dalzieli, Theo., Mon. Cul. V, p. 234 (1910).

An obscure species, and apparently rare, as only three specimens have been received at the British Museum which can be referred with certainty to it: a male and female from Salisbury, Mashonaland, and a female from Katagum, N. Nigeria. It is not a *Culiciomyia*, and though differing considerably in appearance from the three following species, must be included here on structural characters. It could hardly be mistaken for *C. univittatus*, with which Mr. Theobald has compared it.

N. Nigeria; S. Rhodesia; Natal.

11. **O. lateralis**, Mg., Syst. Besch. I, p. 5 (1818).

Culicada lateralis, Theo., Mon. Cul. V, p. 310 (1910).

This European species has been recorded also from Algeria. It is very distinct and unlike any other European or African species with the exception of *O. ornatus*, Mg.

12. **O. caliginosus**, Graham (*Culex*), Ann. Mag. Nat. Hist. (8) v, p. 268 (1910).

Resembles *O. quasiunivittatus*, but the hind ungues of the ♀ are toothed and the head-scaling is different.

S. Nigeria.

13. **O. ochraceus**, Theo. (*Culex*), Mon. Cul. II, p. 103 (1901).

Culex pallidostriatus, Theo., Mon. Cul. IV, p. 410 (1907).

„ *parascelos*, Theo., Rec. Ind. Mus. IV, p. 18 (1910).

Mimeteculex kingii, Theo., Third Rep. Wellc. Lab. p. 258 (1908).

This species can be very easily recognised by the general yellowish coloration, legs striped with black and yellow, and the unequal hind ungues in the ♂. Similar leg-markings are however to be found in *Culex theileri* (= *pettigrewii*); whilst in *Pecomymia* and *Reedomyia lowisii* the ♂♂ have unequal hind ungues. I can see no difference between African and Indian specimens; the species, however, appears to be more common in Africa than in India. The unequal hind ungues of the male do not seem to the writer to form a sufficient reason for excluding the species from this genus.

N. Nigeria; Sudan; S. Rhodesia; India; Ceylon.

14. *O. leucarthritis*, Speiser (*Culex*), Kilimandjaro-Meru Exp., 1905-6, Dipt. Orth., p. 43 (1909).

Dr. Sjöstedt very kindly lent me the type of this species, and I can add the following notes to Dr. Speiser's description :

Head, bearing golden-yellow narrow-curved scales in the middle.

Thorax black, with brown scales, a short line of golden scales on the lateral margin in front, and a similar short line on each side of the middle line in front of the scutellum. Scutellum covered with narrow-curved bright golden-yellow scales ; bristles golden.

Abdomen blackish, the segments with small lateral pale basal spots.

The hind ungues are missing, but it seems to be an *Ochlerotatus* ; it is quite distinct from anything I have seen. The golden-scaled scutellum and the distinct pale band on the apex of the hind tibiae distinguish it at once.

German East Africa.

Genus THEOBALDIA, Neveu-Lemaire.

C. R. Soc. Biol., 1902, p. 1331.

Culiseta, Felt, New York State Mus. Bull. 79, p. 391c (1904).

This seems to be a well-marked genus. The claws and antennae are as in *Culex*, but the male palpi have the last two joints swollen, the terminal porrect and longer than the penultimate, being thus somewhat intermediate in structure between *Culex* and *Ochlerotatus*. The genus includes, besides the species mentioned in Theobald's monograph, *Culiseta absobrina*, Felt, and *Culicada morsitans*, Theo. The spotting of the wings, as might be expected, is not a constant generic character. Two species have been recorded from Africa.

Thorax with narrow white lines *spathipalpis*.

„ without white lines *annulata*.

1. *T. spathipalpis*, Rond., Bull. Soc. Ent. Ital. IV, p. 31 (1872).

Very variable in size, but easily recognised by the white lines on the thorax and the banded and spotted legs, which have a whitish ring just before the tip of the femora. The spots on the legs recall *Culex tigripes*, but the two can hardly be confused.

Cape Colony ; Natal ; Transvaal ; N. Africa ; Madeira ; Europe.

2. *T. annulata*, Schrank, Beit. z. Naturg. 97, 70 (1776).

Algeria.

Genus TAENIORHYNCHUS, Arrib.

Rev. Mus. La Plata, II, p. 147 (1891).

Mansonia, Blanchard, C.R. Soc. Biol. 53, p. 1046 (1901).

This genus is accepted in its original signification, the principal character separating it from other allied genera being the peculiar formation of the ungues (σ 2.0-2.0-0.0 or 1.0-1.0-0.0, Q 0.0-0.0-0.0). The wing-scales vary greatly in width from the very broad ones in the type *T. titillans*, Wlk. (= *taeniorhynchus*, Arrib., nec Wied.) to the narrow ones of *T. aurites* and its allies. The author fully agrees with Messrs. Dyar and Knab (Ent. News, July, 1910) that the genus *Mansonia* was a composite one, the Old World species belonging to a distinct genus, while *T. titillans*, *T. fasciolatus*, etc., are congeneric with the species erroneously added by Theobald to Goeldi's genus *Chrysoconops* ; it also

seems probable that Dyar's *Coquillettidia* is not properly separable from *Taeniorhynchus*. The type species of the genus *Chrysoconops*, *C. fulvus*, Wied., has no connection with the African and Oriental species associated with it since the genus was founded; it does indeed resemble them in colour, but in structure it is nearer to *Ochlerotatus* than to *Taeniorhynchus*. In the present writer's opinion *Culex titillans*, Wlk., must be taken as the type of Arribalzaga's genus, because it is quite evidently the species which he describes, although he wrongly determined it as *C. taeniorhynchus*, Wied. On this view, which is the reverse of that held by Dyar and Knab, *Mansonia* becomes a synonym of *Taeniorhynchus* since *C. titillans* was also the type of *Mansonia*.

If *C. taeniorhynchus*, Wied., be taken as the type, Arribalzaga's careful and complete description of *Taeniorhynchus* becomes inaccurate in many important particulars; this course, if adopted, would necessitate sinking *Culicelsa*, Felt, as a synonym of *Taeniorhynchus*, and produce the anomaly of a genus none of whose members possessed the generic characters.

- | | | | | | |
|--|-----|-----|-----|-----|------------------------|
| 1. Violet-black species, thorax with pale scales in front | ... | ... | ... | ... | <i>metallicus</i> . |
| Abdomen and legs yellow or partly yellow | ... | ... | ... | ... | 2. |
| 2. Tibiae all black, abdomen all yellow | ... | ... | ... | ... | <i>nigrithorax</i> . |
| „ yellow, black-tipped, hind pair with a black ring in middle | ... | ... | ... | ... | 3. |
| 3. Wing scales both dark and light | ... | ... | ... | ... | 4. |
| „ „ all golden yellow | ... | ... | ... | ... | 3. <i>aurites</i> . |
| 4. Thorax with the anterior two-thirds rather densely clothed with pale golden scales; joints of hind tarsi black at tips only | ... | ... | ... | ... | <i>annettii</i> . |
| Thorax uniformly clothed with sparse golden scales; joints of hind tarsi with broad black apical bands | ... | ... | ... | ... | 5. |
| 5. Thoracic integument black, abdomen all yellow | ... | ... | ... | ... | <i>cristatus</i> . |
| „ „ brown, abdominal segments with apical dark bands | ... | ... | ... | ... | <i>fuscopennatus</i> . |

1. **T. metallicus**, Theo. (*Culex*), Mon. Cul. II, p. 63 (1901).
 ? *Culex nigrochaetae*, Theo., ♂, Mon. Cul. II, p. 60 (1901).
Banksinella metallicus, Theo., Mon. Cul. V, p. 408 (1910).
Taeniorhynchus violaceus, Theo., Third Rep. Wellc. Lab., p. 262 (1908).
Chrysoconops nigra, Theo., Mon. Cul. V, p. 434 (1910).

A very distinct species, easily recognised by the sub-metallic violet colour of the abdomen, femora and tibiae, and the shining whitish area on the front of the thorax.

Sudan; S. Nigeria; Angola; Uganda.

2. **T. nigrithorax**, Theo. (*Chrysoconops*), Mon. Cul. V, p. 439 (1910).

Angola.

3. **T. aurites**, Theo., Mon. Cul. II, p. 209 (1901).

Chrysoconops aurites, Theo., Mon. Cul. IV, p. 493 (1907).

Somewhat variable, some specimens showing dark apical patches on some of the abdominal segments, others having the abdomen entirely yellow. The anterior legs are sometimes without any dark scales, sometimes with the tips of the joints black and the whole of the last two tarsal joints brownish. *T. aurites*

has been wrongly recorded from the Malay States; the specimens are *T. ochraceus*, which differs from *T. aurites* in having no median black ring on the hind tibiae.

Sudan; Uganda; S. Nigeria.

4. **T. annettii**, Theo., Mon. Cul. II, p. 205 (1901).

Chrysoconops annettii, Theo., Mon. Cul. IV., p. 491 (1907).

Chrysoconops pseudoconopas, Theo., Mon. Cul. V., p. 443 (1910).

The specimens of *C. pseudoconopas* have the thorax very much rubbed, but I can see no difference between them and the types of *C. annettii*. All the specimens I have seen of *C. annettii* have the distinguishing characters given by Theobald for *C. pseudoconopas*. The dark scales on the wings occur chiefly in two transverse bands, one before the tip of the wing and including the bases of the fork-cells, the other nearer the base. These bands are more conspicuous in some specimens than in others.

Uganda; S. Nigeria.

5. **T. cristatus**, Theo., First Rep. Wellc. Lab., p. 78 (1904).

Chrysoconops cristatus, Theo., Mon. Cul. IV., p. 491 (1907).

Sudan; N. Nigeria; S. Nigeria; Congo Free State (Katanga).

6. **T. fuscopennatus**, Theo., Mon. Cul. III, p. 265 (1903).

Chrysoconops fuscopenatus, Theo., Mon. Cul. IV., p. 492 (1907).

Culex drymoecius, Speiser, Kilimandjaro-Meru Exp., Dipt. Orth. p. 42 (1909).

Dr. Sjöstedt very kindly lent me a specimen of *C. drymoecius*, and it proved to be quite a typical *T. fuscopennatus*, though it certainly did not show the black abdominal spots mentioned by Dr. Speiser in his description. As, however, one or two males in the British Museum collection show these spots rather indistinctly, I think *C. drymoecius* can only be a variety of *T. fuscopennatus*.

Uganda.

Genus MANSONIOIDES, Theo.

Mon. Cul. IV., p. 498 (1907).

Mansonia, Blanchard, C. R. Soc. Biol., LIII, p. 1046 (1901) (part).

As suggested by Messrs. Dyar and Knab, and noted above, the Old-World species of "*Mansonia*" cannot be kept in *Taeniorhynchus*. They resemble that genus in the peculiar structure of the claws, but the male palpi are so different that they are obviously distinct. The penultimate joint is thin and curved upwards, as in *Culex*, but the terminal joint is very short— $\frac{1}{8}$ to $\frac{1}{4}$ as long as the penultimate, and bent downwards at an angle with it. The terminal joint, in all the males I have seen (*M. uniformis*, *M. annulipes* and *M. annulifera*) is entirely covered with white scales. The resemblance in all structural details, and in many minor characters as well, between *M. annulifera* and *M. uniformis* is so great that I do not think it is possible, in this case at least, to regard the presence of flat or narrow-curved scales on the scutellum as a generic character. Probably *Etorleptomomyia* is a synonym, but as the male of *E. mediolineata* is unknown, I have adopted the later name *Mansonioides* for this genus.

1. Tarsi basally banded	...	...	...	...	...	2.
First three tarsal joints apically banded	...	...	...	...	...	<i>mediolineata</i> .
2. Abdomen with narrow apical pale bands, scutellum flat-scaled (?)	...	...	...	...	...	<i>nigra</i> .
Abdomen with apical lateral pale spots...	...	...	...	...	...	<i>uniformis</i> .

1. *M. (?) mediolineata*, Theo., First Rep. Wellc. Lab., p. 71 (1904).

Etorleptiomyia mediolineata, Theo., *l.c.*

Sudan ; Transvaal.

2. *M. (?) nigra*, Theo., Second Rep. Wellc. Lab., p. 80 (1906).

Mansonia (?) nigra, Theo., *l.c.*

It is not easy to see why Theobald did not include this species in *Etorleptiomyia*, as the heart-shaped scales are even more pronounced than in *M. mediolineata*. The unique type is now very badly damaged, but is clearly distinct from the other two species here associated with it.

Sudan.

3. *M. uniformis*, Theo. (*Panoplites*), Mon. Cul. II, p. 180 (1901) (fig. 2).

The following are included here :—

Mansonia africana, Theo., Mon. Cul. II, p. 187 (1901).

„ *major*, Theo., Mon. Cul. III, p. 270 (1903).

„ *nigerrima*, Theo., Mon. Cul. V, p. 450 (1910).

In the form *africana* the two greyish stripes which are present on the thorax of *M. uniformis* (typical form) are more or less broken up into spots. The names *major* and *nigerrima* have been applied to forms in which the reddish-brown

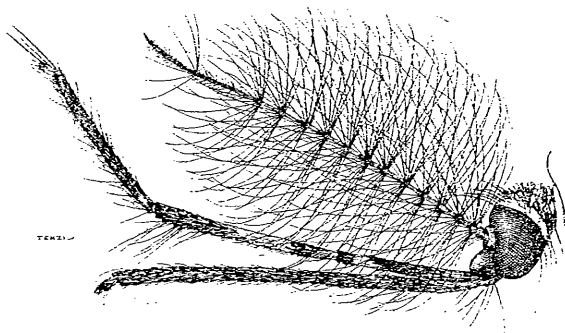


FIG. 2.—*Mansonioides uniformis*, Theo., ♂ ; side view of head. Note structure of palpi.

colour of the thorax is replaced by blackish, and the pale bands of the legs are narrower than usual. These forms, however, grade into one another, and it seems best to regard them as only varieties of *M. uniformis*.

Common throughout the Ethiopian, Oriental, and Australian regions.

Genus CULICIOMYIA, Theo.

Mon. Cul. IV, p. 227 (1907).

Neomelanoconion, Theo., Mon. Cul. IV, p. 514 (1907) (male only).

Pectinopalpus, Theo., Ann. Mag. Nat. Hist. (8) V, p. 375 (1910).

1. *C. nebulosa*, Theo., Rept. Liverp. S. Trop. Med., Mem. IV, App., p. x. (1901).

(?) *Culex invenustus*, Theo., *op cit.*, p. ix. (1901).

Culex cinereus, Theo., Mon. Cul. II, p. 58 (1901).

„ *nigrochaetae*, ♀, Theo., Mon. Cul. II, p. 60 (1901).

„ *pseudocinereus*, Theo., Mon. Cul. II, p. 62 (1901).

„ *freetownensis*, Theo., Mon. Cul. II, p. 69 (1901).

Neomelanoconion rima, ♂, Theo., Mon. Cul. IV, p. 514 (1907).

Pectinopalpus fuscus, Theo., Ann. Mag. Nat. Hist. (8) V, p. 375 (1910).

Culiciomyia uniformis, Theo., Mon. Cul. V, p. 230 (1910).

Dr. W. M. Graham first called the writer's attention to the probability of *Pectinopalpus fuscus* and *Culiciomyia freetownensis* being identical, and has suggested this in the "Bulletin of Entomological Research" (July, 1911, p. 132). At his suggestion I made preparations of the genitalia of a number of males, choosing specimens as different in size and in the amount of white on the abdomen as I could find. In none of these preparations could I see any specific differences; the smaller specimens were much less strongly chitinised, but this is only what might be expected in starved individuals. I also examined some hundreds of pinned adults, and though these varied greatly in size and in the extent of the whitish, lateral, abdominal spots, every gradation could be found between the various forms. In one case about 150 very small specimens were bred from the water in a pie-dish by Dr. T. F. G. Mayer, in Southern Nigeria, their size evidently being due to semi-starvation in the larval period. I have therefore come to the conclusion that there is only one variable African species of *Culiciomyia* (*C. dalzieli*, Theo., is a synonym of *Ochlerotatus quasiunivittatus*, Theo.), the forms or varieties of which are:—

α. *nebulosa*. Medium-sized specimens with obscure abdominal spots.

β. *cinerea*. Large specimens with distinct pale apical lateral spots on the abdominal segments.

γ. *pseudocinerea* (= *uniformis*, ? = *invenusta*). Large specimens with no pale abdominal spots.

δ. *freetownensis*. Small specimens with abdominal spots.

ε. *fusca*. Small specimens without abdominal spots.

As it would frequently be impossible to say whether a specimen were large or small, or even whether abdominal spots were present or not, since these are so variable in size, it does not seem advisable to retain these names in general use. There is some variation in the length of the fork-cells: two specimens from Prince's Island, Gulf of Guinea (*Dr. W. G. Ansorge*) have the first slightly shorter than the second. This is one of the many species which not infrequently have a bright green colour on the thorax or legs; this variation may possibly be due to something in the food of the larvæ.

In the Monograph of the Culicidæ (V, p. 239), referring to *C. freetownensis*, Theobald says "Perfect specimens show the venter of the abdomen to be white, except the apical segment, which is deep black." This remark only applies to some specimens wrongly determined as *C. freetownensis*, which are really *Eumelanomyia inconspicua*; the venter of *C. nebulosa* is all grey. *E. inconspicua* ♀ is very much like *C. nebulosa* to the naked eye, but has a black, shiny thorax, and a flat-scaled head. The thoracic integument of *C. nebulosa* and also the scales of the thorax, have a characteristic dull grey-brown appearance. The distinctions between *C. nebulosa* ♀ and *Protomelanoconion fuscum* ♀ have already been pointed out.

The type of *C. nigrochaetae* is not now in the British Museum, but it seems, from the description of the ♀, to have been only *C. nebulosa*. The number of

mid-scutellar bristles, as usual, is variable in this species, and as a matter of fact there are only 6, not 8, in the type of *C. cinerea*. I cannot help thinking, however, that the ♂ described as *C. nigrochaetae* was in reality *Taeniorhynchus metallicus*. *Culex invenustus* is probably the same species, but as I have not seen the type I have used the name *nebulosa*, which was published a page later in the same paper as *C. invenustus*. *C. invenustus* is said to have the thorax covered with flat scales (a character which is not found in any *Culex* I have seen), and to have the fore and mid femora swollen. If the former statement is an error, and the latter simply due to the femora having become flattened (a frequent occurrence), there cannot be much doubt that the specimen described as *C. invenustus* was a *C. nebulosa* var. *pseudocinerea*.

C. nebulosa appears to be one of the commonest of the CULICIDAE in West Africa, and extends into the Congo Free State, Uganda and Mashonaland.

Genus CULEX, Linn.

Syst. Nat. Ed. X (1758).

Culex, as now restricted, is one of the easiest genera to recognise in the male, but the females are sometimes not easily distinguished from those of *Taeniorhynchus*, etc. The genus includes only those species whose males have palpi and unguis similar in structure to those of *C. pipiens*. The mere upward curvature of the palpi may not be considered of importance, but as far as the writer has seen it seems to be perfectly constant, and when once understood forms the easiest character by which to distinguish a species of true *Culex* from one belonging to an allied genus. The structure and form of the ♂ palpi will be understood by a glance at the figure of *C. quasigelidus* ♂ (p. 258). The genus *Culex*, in this sense, includes *Lutzia*, Theo., *Aporoculex*, Theo., *Leucomyia*, Theo. (except *L. scapularis*), *Melanoconion*, Theo., *Heptaphlebomyia*, Theo., *Pseudoheptaphlebomyia*, Ventr., and some species of *Taeniorhynchus*, Theo. (*T. tenax* and *T. ager*), of *Grabhamia* (*G. jamaicensis*, etc), of *Culicada* (*C. quasimodesta* and *C. bicolor*) and of *Culicelsa* (*C. accraensis* and *C. annulirostris*) besides some small genera, such as *Lasioconops* and *Oculeomyia*, which were only founded on misconceptions: as regards the last named, contiguous eyes are found in nearly all the CULICALES, and I believe in most of the METANOTOTRICHA with the exception of *Eretmapodites*.

- | | |
|---|--------------------------|
| 1. Proboscis and tarsi with pale bands, those on tarsi including both sides of joints (fig. 4, a) | 2. |
| Proboscis and tarsi unbanded | 7. |
| 2. Thorax with pale scales on the anterior two-thirds, or at least with a transverse pale band behind the middle (<i>Leucomyia</i> , Theo.) (fig. 5, a) | 3. |
| Thorax with almost uniform scales, at most with a pair of pale spots, abdominal segments with complete basal white bands ... | 5. |
| 3. Femora and tibiae with rows of sharply defined whitish spots (fig. 4, a) | 1. <i>quasigelidus</i> . |
| Femora and tibiae not spotted | 4. |
| 4. Abdomen almost unicolorous dark brown | 2. <i>consimilis</i> . |
| Abdominal segments with both median basal and lateral apical triangular pale spots | 3. <i>annulioris</i> . |

5. Middle tibiae with a whitish lateral stripe (fig. 4, *b*); abdominal bands broadest in middle; band of proboscis broad and ill-defined
4. *duttoni*.
Middle tibiae unstriped; abdominal bands of equal breadth throughout; band of proboscis narrower and more clearly defined 6.
6. Femora not marbled 5. *thalassius*.
" marbled (*i.e.*, with dark and light scales interspersed) 6. *somaliensis*.
7. Large species (usually 7 mm. or more in length); legs spotted 7. *tigripes*.
Medium-sized or small species; legs not spotted 8.
8. Legs striped somewhat as in *Ochlerotatus ochraceus* (on the fore legs the pale stripe is more or less broken up into spots, recalling *Culex tigripes*) (fig. 4, *c*) 8. *theileri*.
Legs not so marked 9.
9. Tibiæ striped with whitish (fig. 4, *d*) much as in *Culex duttoni*; seventh vein more distinct than usual, and generally bearing a few scales (*Heptaphlebomyia*, Theo.) 9. *univittatus*.
Legs uniformly brownish (except for pale knee-spots) 10.
10. Abdominal segments with pale markings basally 11.
" " " " apically 19.
11. Abdominal segments with basal banding in both sexes 12.
" " with basal lateral pale spots, in the ♂ often united in the middle line to form an irregular-shaped band 14.
12. Larger species, abdominal bands yellowish ... 10. *pipiens* group.
Smaller species, abdominal bands white 13.
13. Thoracic scaling uniformly reddish-brown 11. *decens*.
" " partly bronzy-brown and partly brassy, the latter often predominating 12. *simpsoni*
14. Thorax all pale-scaled, integument with lateral pale areas in front (fig. 5, *b*); abdominal spots large in both sexes 13. *pruina*.
Thorax not all pale-scaled, integument uniformly dark 15.
15. Thorax with two distinct pale areas near the middle (fig. 5, *c*) 14. *ornatothoracis*.
" with uniform scaling or nearly so 16.
16. Venter entirely whitish 15. *guiarti*.
" with dark bands on the apices of the segments 17.
17. Bases of fork-cells in ♀ equidistant from wing-base ... 16. *grahami*.
Base of first fork-cell nearer wing-base than that of second ... 18.
18. Larger species (usually 5-6 mm.); thorax with reddish brown scales 17. *zombaensis*.
Smaller species (usually 3-4 mm.); thorax with dark brown scales 18. *invidiosus*.
19. Abdomen with complete apical bands on at least some of the segments 20.
Abdomen with apical lateral spots 22.

20. Terminal joint of ♀ palpi short and thick	19. <i>salisburyensis</i> .
" " " long and thin ... ..	... .. 21.
21. Abdominal segments 2-7 with apical pale bands	20. <i>piliferus</i> .
" " 2-4 only with complete apical pale	
bands	21. <i>insignis</i> .
22. Thoracic integument blackish, scales blackish	22. <i>rima</i> .
" " reddish ... ..	... .. 22.
23. Scales and bristles of thorax reddish brown	23. <i>sergenti</i> .
" " " black... ..	24. <i>rubinotus</i> .

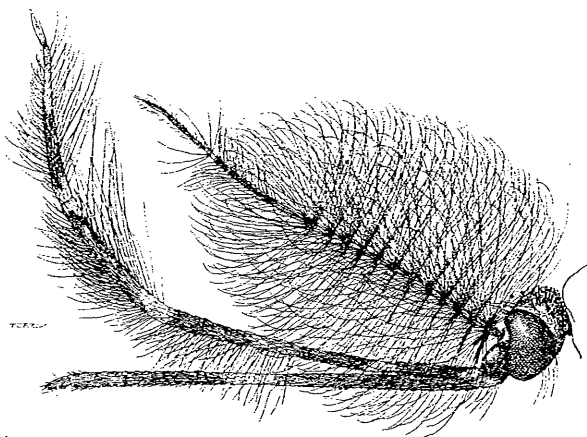


Fig. 3.—*Culex quasigelidus*, Theo. ♂; side view of head.
Note the long, hairy, upwardly curved palpi.

1. *C. quasigelidus*, Theo., Mon. Cul. III, p. 181 (1903) (figs. 3, 4a & 5a).
Lasioconops poecilipes, Theo., Rept. Liverp. S. Trop. Med., Mem. IV, App. p. ix (1901); Mon. Cul. III, p. 236 (1903).
Culex taeniorhynchoides, Giles, J. Trop. Med. 1904, p. 369.
Pseudoheptaphlebomyia madagascariensis, Ventrillon, Bul. Mus. Paris, XI, p. 427 (1905).
Taeniorhynchus tenax var. *maculipes*, Theo., First Rep. Welle. Lab., p. 79 (1905).
Aporoculex punctipes, Theo., Mon. Cul. IV, p. 316 (1907).
Leucomyia quasigelida, Theo., Mon. Cul. IV, p. 372 (1907).

The only species with which this can be confused is *C. tigripes*, which is larger, and has an unbanded proboscis and more numerous spots on the legs; the thoracic scaling is also quite different. *C. quasigelidus* has a very distinct appearance, as might be supposed from the fact that three genera have been erected for its special benefit. One of these, *Lasioconops*, was founded on a specimen which had a number of scales of some Lepidopteron adhering loosely to its abdomen. Some specimens of *Pseudoheptaphlebomyia* sent to the British Museum by Dr. Ventrillon are undoubtedly this species. In this and the two following allied forms the pale front two-thirds of the thorax is often more marked in the ♂ than in the ♀.

Gambia ; N. Nigeria ; S. Nigeria ; Sudan ; Uganda ; Nyasaland Protectorate ; Congo Free State ; Angola ; Madagascar.

2. **C. consimilis**, Newstead, Ann. Trop. Med. I, p. 23 (1907).

Culex tigrripes var. *consimilis*, Newstead, l. c.

Culex pseudoannulioris, Theo., Mon. Cul. V, p. 333 (1910).

Taeniorhynchus tenax, Theo., Mon. Cul. III, p. 258 (part).

This is very closely allied to *C. quasigelidus*, and may perhaps be only a variety of that species ; the difference in the leg marking, however, is so very striking that I prefer to consider them distinct. The four specimens of *C. pseudoannulioris* in the British Museum collection are all rubbed almost bare (they must have been described in that state), but I believe they can be safely included under *C. consimilis*. This species is no doubt the African representative of the Oriental *C. ager*, but it is difficult to accept Mr. Theobald's opinion that the two forms are conspecific ; the true *C. ager* (= *Taeniorhynchus tenax*) is not African. Of the Oriental species there are two varieties :—

a. *C. ager*, Giles, Entomologist, XXXIV, p. 196 (July 1901).

Taeniorhynchus ager, Giles, l. c.

Taeniorhynchus tenax, Theo., Mon. Cul. II, p. 198 (Nov. 1901).

Oculeomyia sarawaki, Theo., Mon. Cul. IV, p. 515 (1907).

β. *C. ager* var. *sinensis*, Theo., Mon. Cul. III, p. 180 (1903).

Leucomyia gelida var. *sinensis*, Theo., l. c.

Leucomyia sinensis, Theo., Mon. Cul. V, p. 313 (1910).

Grahamia ambigua, Theo., Mon. Cul. III, p. 248 (1903).

Grahamia taeniarostris, Theo., Mon. Cul. IV, p. 299 (1907).

The var. *sinensis* is distinguished from the type form by the presence of basal as well as apical yellow bands on the abdominal segments.

In Mr. Newstead's series of *C. consimilis* are specimens of the preceding species, but the type has no spots on the legs.

Sierra Leone ; Ashanti ; S. Nigeria ; Congo Free State ; Sudan ; Uganda ; Natal.

3. **C. annulioris**, Theo., Liverp. S. Trop. Med., Mem. V, App. (1901).

This species is really very distinct, but has been confused with *C. duttoni*, one of the types (♂) of *C. hirsutipalpis* (= *duttoni*) actually being a specimen of *C. annulioris*. The markings of the thorax and abdomen, and the absence of the stripe on the tibiæ, will suffice to distinguish the present species from *C. duttoni*.

Gambia ; S. Nigeria ; Angola ; S. Rhodesia ; Transvaal.

4. **C. duttoni**, Theo., Rept. Liverp. S. Trop. Med. Mem. IV, App. p. v. (1901).

C. dissimilis, Theo., Mon. Cul. I, p. 376 (1901).

C. hirsutipalpis, Theo., Mon. Cul. I, p. 378 (1901).

C. anarmostus, Theo., Rept. Liverp. S. Trop. Med., Mem. X, App. p. vi, (1902) ; Mon. Cul. III, p. 170 (1903).

(?) *C. condylodesmus*, Grünb., Zool. Anz. 29, p. 385 (1905).

C. albovirgatus, Graham, Ann. Mag. Nat. Hist. (8) V, p. 264 (1910).

The pale stripe on the tibiæ of this species is sometimes rather obscure, but in conjunction with the broad band on the proboscis, the two pale spots on the

thorax (not always visible), and the rounded abdominal bands, it makes the species an easy one to identify. *C. univittatus* has the same spotted thorax, striped tibiae and rounded abdominal bands, but differs in the unbanded proboscis and legs. The tibial stripe, too, in the last-named species is most distinct on the hind legs, while in *C. duttoni* it is particularly conspicuous on the middle legs. In the ♀ type of *C. dissimilis* I cannot make out the markings of the tibiae, and the fork-cells are different; in fact this specimen looks much more like *C. thalassius* than *C. duttoni*, but since the males associated with it are undoubtedly all *C. duttoni* I have included *C. dissimilis* here as a synonym. I feel all the more confident in doing this, since Theobald (Entomologist, 1908, p. 107) has already pointed out that *C. hirsutipalpis* is only a large form of *C. dissimilis*. *C. hirsutipalpis* differs from the typical form in having some pale scales at the apices as well as at the bases of the abdominal segments, but there is no doubt

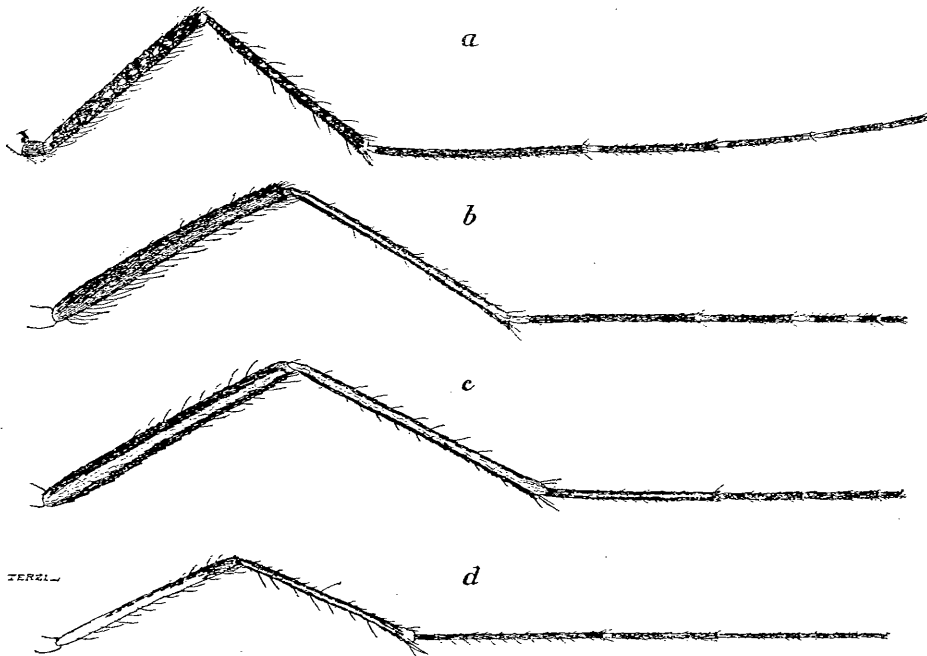


Fig. 4.—Legs of *Culex*: (a) Hind leg of *C. quasigelidus*, Theo.; (b) mid leg of *C. duttoni*, Theo.; (c) mid leg of *C. theileri*, Theo.; (d) hind leg of *C. univittatus*, Theo.

that this is only a variation, and it is hardly worth while retaining a separate name for it. *C. anarmostus* was described from a small specimen; this species, like many other mosquitos, varies very greatly in size. One specimen shows a remarkable abnormality in the neuration: the second vein is unbranched, and the upper branch of the fourth vein is only represented by a stump, so that the fork-cells are absent. *C. condylodesmus* is probably a synonym, but the description does not quite agree, as the band of the proboscis of the female is described as being broader and more distinct than in *C. dissimilis*.

Common throughout West Africa; Nyasaland; Transvaal.

5. *C. thalassius*, Theo., Rept. Liverp. S. Trop. Med., Mem. X, App. p. vii (1902); Mon. Cul. III, p. 168 (1903).

Culex bifoliata, Theo., J. Econ. Biol. I, p. 31 (1905).

Culicelsa accraensis, Theo., Mon. Cul. V, p. 317 (1910).

„ *neotaeniorhynchus*, Theo., Mon. Cul. V, p. 320 (1910).

There is very little doubt that *C. bifoliata* is the same as *C. thalassius*, which is certainly conspecific with *C. accraensis*. The proboscis in both the specimens of *C. bifoliata*, contrary to Theobald's statement, is distinctly banded. I have examined the ♂ genitalia in these two specimens, and also in a specimen from Accra, and can only detect one "foliate plate" in any of them. There appears to be no difference in the thoracic marking between *C. accraensis* and *C. neotaeniorhynchus*—at any rate not sufficient to warrant the retention of the latter name as a distinct variety. This name is rather misleading, as *C. thalassius* does not belong to the *Culicelsa* group, the type of which is *C. taeniorhynchus*, Wied.

Gambia; S. Nigeria; Transvaal; Delagoa Bay.

6. *C. somaliensis*, Neveu-Lemaire, Arch. Parasit. 10, p. 254 (1906).

C. salus, Theo., Third Rep. Wellc. Lab. p. 256 (1909).

C. salsus, Theo., Mon. Cul. V, p. 338 (1910).

Very much like *C. thalassius*, but the first fork-cell is shorter and the femora are marbled. It bears an extremely close resemblance to the Indian *C. microannulatus*, and is quite possibly only a form of that species. As, however, I do not feel confident that they are the same—there is some difference in the shape and colour of the thoracic scales—I have not adopted the name *microannulatus* for the African species. The description of *C. somaliensis* agrees very well with specimens of *C. salus*, a large number of which have been received by the Entomological Research Committee from Somaliland.

7. *C. tigripes*, Grandpré, Les Moustiques (1900).

(?) *C. concolor*, R.-D., Mém. Soc. d'Hist. Nat. Paris IV, p. 405 (1825).

C. maculicrura, Theo., Mon. Cul. II, p. 34 (1901).

C. tigripes var. *fusca*, Theo., Mon. Cul. V, p. 394 (1910).

This species is very distinct from all other African *Culex* on account of its large size and spotted legs. It is, however, closely related to the Oriental *C. concolor*, the only constant difference I can detect being in the relative length of the fork-cells: in *C. tigripes* ♀ the base of the first fork-cell is nearer the base of the wing than that of the second, while in *C. concolor* the bases of both are almost equidistant from the base of the wing, that of the second fork-cell being if anything nearer the wing-base than that of the first. *C. tigripes* is also on the whole a darker insect, with less yellow on the abdomen, though there is a great deal of variation in this respect in both forms, some specimens of *C. concolor* being as dark as any *C. tigripes*, and having hardly any yellow scales on the abdomen. The last joint of the ♂ palpi in *C. tigripes* is generally dark, while in *C. concolor* it is nearly always light. Both forms have the same leg-markings, these being subject to some variation. Since there is this constant difference between the two forms (in neuration) I think *C. tigripes* must be regarded as a distinct species. To my mind it is an absolutely typical *Culex*.

It is curious to notice, that when a species is common to the Ethiopian and Oriental regions, or when a pair of closely allied species occurs in the two regions respectively, the African form is often much darker in colour than the Eastern. The phenomenon does not seem to be confined to the CULICIDÆ, as I have noticed it in the Tipulid *Conosia irrorata*, Wied.

The specimens mentioned by Theobald as having been taken in Australia belong to the *concolor* form. I have made several preparations of the male genitalia of each form, and can detect no difference whatever; the genitalia are of the ordinary *pipiens* and *fatigans* type. Theobald's *C. tigripes* var. *fuscus* (Mon. Cul. V, p. 394) the male genitalia of which I have also examined, includes the darkest forms. It is certainly not, as I at first thought possible, a distinct species. *C. tigripes* is widely distributed over Africa.

8. *C. theileri*, Theo., Mon. Cul. III, p. 187 (1903).

C. pettigrewi, Theo., Rec. Ind. Mus. IV, p. 15 (1910).

A species very easily recognised by means of the striped femora. The co-type of *C. pettigrewi* in the British Museum exactly resembles *C. theileri*.

Transvaal; Madeira; India.

9. *C. univittatus*, Theo., Mon. Cul. II, p. 29 (1901).

Heptaphlebomyia simplex, Theo., Mon. Cul. III, p. 337 (1903).

Heptaphlebomyia montforti, Ventrillon, Arch. Parasit. IX, p. 448 (1905).

A rather obscure species, until the striped tibiae are noticed. Some specimens recall *C. duttoni*, but they can always be distinguished by the unbanded proboscis and legs. The British Museum series of *H. simplex* consisted of 3 ♀ and 1 ♂ *C. univittatus* (including type ♀ of *H. simplex*) and one ♂ *C. decens* (labelled as type of *H. simplex*, and figured in Mon. Cul. IV, p. 533). The co-types of *H. montforti* from Madagascar, which are in the British Museum collection, are certainly also *C. univittatus*. I do not believe the species is separable generically from *Culex*. The whitish spot on the apex of the tibiae is not more conspicuous in this species than in other members of the genus.

N. Nigeria; Angola; S. Rhodesia; Madagascar.

10. *C. pipiens*, Linn., Syst. Nat. Ed. X, p. 602 (1758).

Included here as varieties are:

- i. *C. fatigans*, Wied., Auss. Zweif. Ins. p. 10 (1828). The stem of the first fork-cell is a little longer than in *C. pipiens*.

E. Africa; common almost everywhere in other parts of the tropics.

C. fatigans is said by Grünberg (Zool. Anz. xxix, 1905, p. 390) to be, with *Stegomyia fasciata*, F., the commonest Culicine in Kamerun and Togo. It seems as though some mistake must have been made, as *C. fatigans* is unrepresented in any of the large collections of mosquitos which have been received in England from West Africa.*

- ii. *C. pallidocephala*, Theo., First Rept. Wellc. Lab. p. 73 (1904). The scales of the head are paler and the thorax is dark brown instead of reddish brown. The costal margin is darker.

Sudan; British East Africa.

* Since the above was written I have seen three specimens from Sokoto, N. Nigeria (Dr. J. M. Dalziel).

- iii. *C. stoehri*, Theo., Mon. Cul. IV, p. 419 (1907). The abdominal bands are more rounded, otherwise the specimen is like *C. pallidocephala*.
Nyasaland.
- iv. *C. varioannulatus*, Theo., Mon. Cul. III, p. 198 (= *C. azoriensis*, Theo., Mon. Cul. III, p. 210, 1903). This is an almost typical *C. pipiens*; the females are rather shrivelled, hence the bands on the apical segments of the abdomen are not visible.
Cape Colony; Azores.
- v. *C. pipiens*, L.
N. Africa; Europe; N. America.
11. **C. decens**, Theo., Rept. Liverp. S. Trop. Med. Mem. IV, App. p. vii, (1901).
C. masculus, Theo., Mon. Cul. II, p. 125 (1901).
C. minutus, Theo., J. Econ. Biol. I, p. 30 (1905).
C. nigrocostalis, Theo., Mon. Cul. V, p. 367 (1910).
C. lividocostalis, Graham, Ann. Mag. Nat. Hist. (8) V, p. 269 (1910).
Heptaphlebomyia simplex ♂, Theo., Mon. Cul. IV, p. 533 (1907).
Theobald states that in *C. masculus* the smaller claw on the fore and mid tarsi of the ♂ is not toothed; if this is the case (it is difficult to make out from the specimens), it is a very unusual variation. *C. masculus* seems otherwise identical with *C. decens*, which is a small and rather obscure species. Out of 18 specimens in the National Collection only 2 are females.
Sierra Leone; S. Nigeria; N. Nigeria; Sudan; Uganda; Transvaal.
12. **C. simpsoni**, Theo., J. Econ. Biol. I, p. 28 (1905).
Very much like *C. decens*, differing in the thoracic scaling.
Transvaal.
13. **C. pruina**, Theo., Rept. Liverp. S. Trop. Med. Mem. IV, App. p. viii, (1901).
C. pruinus, Theo., Mon. Cul. II, p. 332 (1901).
C. pallidothoracis, Theo., Mon. Cul. V, p. 370 (1910).
Easily distinguished from all other African species by the pale lateral areas on the thoracic integument.
Ashanti; S. Nigeria.
14. **C. ornatothoracis**, Theo., Mon. Cul. V, p. 376 (1910).
Very near *C. grahamsi*. Both have the female palpi longer than usual; in this species they are quite one-fourth the length of the proboscis.
S. Nigeria; Gold Coast.
15. **C. guiarti**, Blanchard, Les Moustiques, p. 629 (1905).
C. viridis, Theo. (nec R.-D., 1827), Mon. Cul. III, p. 212 (1903).
C. neavei, Theo., Second Rept. Wellc. Lab. p. 76 (1906).
The green colour is certainly not a specific character; it not uncommonly occurs in many species, e.g., *C. pipiens*, *C. grahamsi*, *C. pruina*, *Culicomyia nebulosa*, and the Tipulid *Dicranomyia chorea*.
Sudan; Uganda; N. Nigeria; Gold Coast.

16. *C. grahami*, Theo., Mon. Cul. V, p. 628 (1910).

C. pullatus, Graham (*nec* Coquillett, 1904), Ann. Mag. Nat. Hist. (8) V, p. 265 (1910).

This and the two following species are extremely closely allied and perhaps should be classed together. Larger series and a closer study are, however, required. There is sometimes in *C. grahami* a more or less distinct rim of white scales to the eyes, recalling that of *Protomelanoconion fuscum*.

Gold Coast ; S. Nigeria ; Uganda.

17. *C. zombaensis*, Theo., Mon. Cul. II, p. 143 (1901).

C. quasiquarti, Theo., Mon. Cul. V, p. 374 (1910).

C. quasiquarti may be distinct, but I can see no character to separate it from *C. zombaensis*.

Uganda ; Nyasaland.

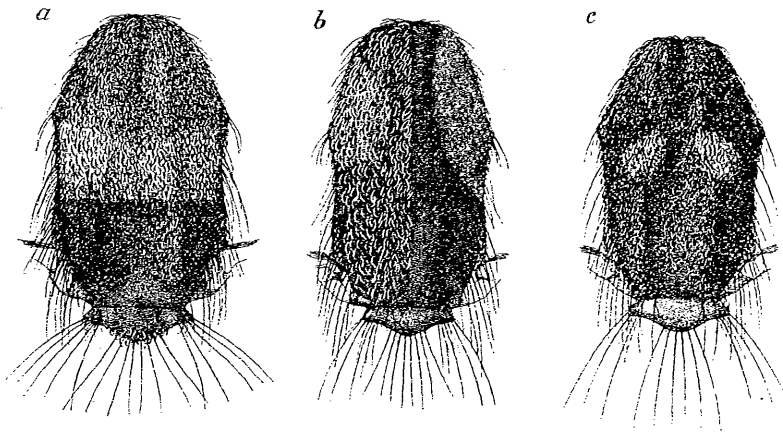


FIG. 5.—Dorsal view of thorax of, (a) *Culex quasigelidus*, Theo., ♀ ; (b) *Culex pruina*, Theo., ♀, the right half denuded to show the pale anterior patch ; (c) *Culex ornatothoracis*, Theo., ♀.

18. *C. invidiosus*, Theo., Mon., Cul. II, p. 329 (1901).

C. euclastus, Theo., Rept. Liverp. S. Trop. Med., Mem. X, App. viii. (1903).

C. chloroventer, Theo., Mon. Cul. V, p. 373 (1910).'

(?) *C. aquilus*, Graham, Ann. Mag. Nat. Hist. (8) V, 1910, p. 266.

If the males described as *C. aquilus* do not belong to this species, there is no male in the collection.

Gambia ; Gold Coast ; Nigeria ; Congo Free State ; Uganda.

19. *C. salisburyensis*, Theo., Mon. Cul. II, p. 113 (1901).

C. bostocki, Theo., J. Econ. Biol. I, p. 29 (1905).

The type of *C. bostocki* has been lost, but the description leaves practically no doubt that it was only *C. salisburyensis*.

S. Rhodesia ; Transvaal ; Natal.

20. *C. piliferus*, Theo., Mon. Cul. IV, p. 274 (1907).

Maillotia pilifera, Theo. l.c.

This species closely resembles a small *Culex*, so is included here, as *Maillotia* only differs from *Culex* in the size of the scales on the head and thorax. ♂ unknown.

Algeria.

21. *C. insignis*, Carter, Bull. Ent. Res. II, p. 37 (1911).

Culiciomyia insignis, Carter, l.c.

Nyasaland ; Uganda ; Congo Free State (Colquihatville) ; S. Nigeria ; Sierra Leone.

22. *C. rima*, Theo., ♀, Mon. Cul. II, p. 327 (1901).

(Nec *Neomelanoconion rima*, Theo., ♂, Mon. Cul. IV, p. 514, 1907).

Melanoconion rimus, Theo., Mon. Cul. III, p. 240 (1903).

Culex rima was founded on female examples, the specimens which Theobald took to be the males are only *Culiciomyia nebulosa* ; the ♂ of *C. rima* has not got the peculiar scales on the palpi or the flat scales round the eyes. Since the genus *Neomelanoconion* was founded on the male specimens in question it is a synonym of *Culiciomyia*.

Ashanti ; S. Nigeria ; Congo Free State ; Uganda.

23. *C. sergenti*, Theo., Mon. Cul. III, p. 218 (1903).

Algeria.

24. *C. rubinotus*, Theo., Second Rep. Wellc. Lab., p. 76 (1906).

A single specimen, with very few scales left on the thorax or abdomen.

Sudan.

African Species not included in the preceding Tables.

C. aegypti, Linn., Hasselquists' Reise nach Palestina, p. 470 (1762). The description is as follows :—" *Culex aegypti* articulationibus candidis. Magnitudo Culicis vulgaris Linn. Syst. N. 1. Color ex fusco caeus. Crura cana cum annulis candidis, parvis, circa articulationes et in articulis. Puncta candida ad marginem dorsi in corpore sub alis utrinque, plura, longitudinaliter sita. Annulus candidus ad basin thoracis, inter illum et corpus. Linea candida perpendicularis juxta oculos, utrinque una parva. Locus, Aegyptus, Culice communi rarior."

C. longefurcatus, Becker, Berl. Mitt. Zool. II, 3, p. 68 (1903). In his description Becker says "One sees no trace of scaling on the whole body." The name had therefore better be dropped altogether.

C. maculiventris, Mcq., Dipt. Exot. Sup. I, p. 7 (1846). This evidently belongs to the *dorsalis* group, but the description is not full enough for purposes of tabulation.

C. rufinus, Bigot (Theo., Mon. Cul. II, p. 169) ; *C. pusillus*, Mcq. (Theo., Mon. Cul. II, pp. 122, 166) ; *C. pallipes*, Mcq., nec Mg. (= *C. melanorhinus*, Giles ; Theo., Mon. Cul. II, p. 171). The descriptions of these species are inadequate.

Culicada quasimodesta, Theo., Ann. Mus. Nat. Hung. III, p. 88 (1905), and *Culex bicolor*, Mg., Syst. Besch. I, p. 9 (1818), both seem to belong to *Culex* (s. str.) and apparently to the *C. pipiens* group. I have not seen specimens.

Culex didieri, *C. pygmaeus* and *C. zeltneri*, Neveu-Lemaire, Arch. Parasit. 1906. I have not seen specimens.

C. mundulus, Grünb., Zool. Anz. 29 p. 388 (1905). Said to be closely related to *Culiciomyia nebulosa*, but larger and paler. The description agrees fairly well with the latter species, except that the venter is described as having the segments with pale apical bands.

C. par, Newst. Ann. Trop. Med. I, p. 25 (1907). From the description this appears to be closely allied to *C. consimilis*, and is perhaps a rubbed specimen of that species.

C. laurenti, Newst., l.c. p. 24. The abdomen is described as uniformly pale brown. The size is not stated, nor the structure of the unguis.

Taeniorhynchus africanus, Neveu-Lemaire, Arch. Parasit. 10, p. 271 (1906). This cannot be a true *Taeniorhynchus*, as the female has toothed claws.

Boycia mimomyiaformis, Newst., l.c. p. 34. Should probably be included in the genus *Ludlowia*; seems to be distinct from *L. pincerna*, which it most closely resembles, since the last three joints of the hind tarsi are described as bronzy-ochreous, the legs otherwise being unbanded.

Neomelanoconion palpale, Newst., l.c. p. 31. This species clearly does not belong to the genus *Neomelanoconion*, which is a synonym of *Culiciomyia*. The palpi of the male are figured as two-jointed; if this is really the case, the species cannot be a *Melanoconion*. The figures of the male palpus and wing and the description of the antennae suggest a *Ludlowia*.

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Note on some Culicidae described by Dr. K. Grünberg.—In the Zoologischer Anzeiger for 1905 (pp. 377-390), Dr. K. Grünberg described six new *Culicidae* from Kamerun and Togo, and the following notes on them may be useful.

1. *Myzomyia bisignata*.—This is in all probability a synonym of *M. rhodesiensis*, Theo. The third costal spot seems fairly distinct in Grünberg's figure, while in the type of *M. rhodesiensis* it is quite small.

2. *M. unicolor*.—Without a doubt the same as *M. umbrosa*, Theo. In publishing my note on this species in the July number of this Bulletin, I overlooked the fact that *M. nili*, Theo. (First Rep. Wellc. Lab., p. 66, 1904) is another synonym; the types correspond in every particular.

3. *Myzorhynchus obscurus*.—Evidently the same species which Theobald has subsequently described as *M. strachani*. As Grünberg suggests, it is very likely only a variety of *M. barbirostris*.

4. *Stegomyia longipalpis*.—Redescribed by Graham as *S. pollinator*. Transferred by Theobald to *Kingia*.

5. *Culex condylodesmus*.—Probably only *C. duttoni*. See above (p. 260).

6. *C. mundulus*.—Perhaps a *Culicomyia*. See above (p. 266).

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a specimen answering to this description, but the numerous specimens of *Aëdomyia* received from various parts of Africa show a good deal of variation in the amount of white on the proboscis and palpi, and I therefore incline to believe that Neveu-Lemaire only described an unusually dark specimen of the species which is widely distributed in Africa. This species I have previously identified with the Oriental *A. catasticta*; there are, however, slight but apparently constant differences between the two, and I therefore propose to use Neveu-Lemaire's name for what I believe is likely to prove the only African species of the genus.

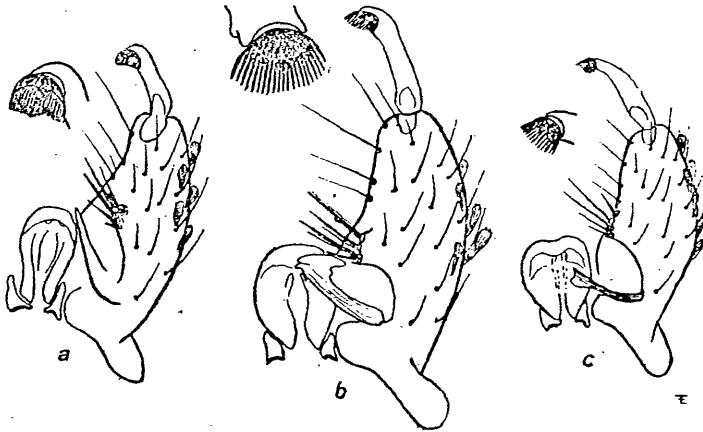


Fig. 10. Male genitalia of *Aëdomyia* seen from below, with tip of clasper further enlarged:—(a) *A. squamipennis*, Arr., from British Guiana; (b) *A. catasticta*, Knab, from Sarawak; (c) *A. africana*, N.-L., from Nigeria.

A. africana differs as follows from *A. catasticta*:—It is on the average distinctly smaller; the wings have a well-defined clear yellow patch at the base just below the costa, in which no darker scales are included; the yellow patch on the mesonotum is more sharply defined and rather larger, and its sides are not indented by patches of dark scales; the claspers of the male genitalia are somewhat narrowed instead of slightly expanded towards the tip, and their terminal spine is divided into about 15 instead of about 20 teeth (fig. 10 c).

Figures of the male genitalia of *A. catasticta* and *A. squamipennis* are given for comparison. It is possible that *A. catasticta* is the same as the Australian *A. venustipes*, but this is not likely, since Taylor speaks of white scales being present on most of the joints of the female antennae, whereas in the three species known to me only the first two antennal joints bear scales.

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