

Length about 7 mm.

Theobald has recorded a single female taken at Onderstepoort on the 19th August, 1911; it has not been found here since. We caught one female at Ntabanana, Zululand, on the bark of a tree in thick bush between 3 and 5 p.m. on the 5th February, 1923. It has also been recorded from Ashanti, Nyasaland Protectorate, Uganda, and Kenya Colony.

13. *AËDES* (*AËDIMORPHUS*) *QUASIUNIVITTATUS* (Theo.).

Culex quasiunivittatus Theo. (1901).

Culicimyia dalzieli Theo. (1910).

Ochlerotatus quasiunivittatus (Theo.) Edw. (1911).

Theobald, *Mon. Culic.*, II, p. 32 (1901).

Giles, *Handb. Gnats*, p. 429 (1902).

Edwards, *Bull. Ent. Res.*, Vol. II, iii, p. 250 (1911); Vol.

III, i, p. 23 (1912); Vol. V, iv, p. 276 (1915). *Ann.*

Durban Mus., I, ii, p. 163 (1915).

This species is closely allied to *A. (A.) dentatus* Theo., the main specific characters being found in the male genitalia. Edwards gives a figure of one of the male claspers in the *Bull. Ent. Res.*, V, p. 277, f. 1 (1915). Edwards records five specimens collected in the bush at Durban in June, 1914, and we have taken it at Onderstepoort. It has also been recorded from Salisbury, S. Rhodesia; Kenya Colony; Uganda; and N. Nigeria.

14. *AËDES* (*AËDIMORPHUS*) *DENTATUS* (Theobald).

Culex dentatus Theobald (1905).

Culex pallidopunctata Theo. (1911).

Ochlerotatus dentatus (Theo.) Edw. (1911).

Theobald, *First Rep. Well. Labs., Khartoum*, p. 75 (1905);

Mon. Culic., IV, p. 436 (1907). *First Rep. Dir. Vet.*

Res., Un. S.Afr., p. 267 (1911); 2nd ditto, p. 334

(1912).

Edwards, *Bull. Ent. Res.*, Vol. II, iii, p. 248 (1911); Vol.

III, i, p. 23 (1912); Vol. V, iv, p. 277 (1915).

Description of Adults:

Female.—*Head* deep brown with pale golden curved scales and pale and dark upright forked scales; on each side there is a small patch of dark and a patch of pale flat scales. Antennae dark brown; torus testaceous with a few pale narrow curved scales on the inner margins, following joint also testaceous at the base. Palpi and proboscis blackish-brown.

Mesonotum deep brown, clothed with bronzy narrow-curved scales and some yellowish ones arranged more or less in lines. Scutellum with pale golden narrow-curved scales. Pleurae with patches of creamy scales.

Abdomen deep brown, first segment with a patch of dark scales in the middle; remainder of segments with creamy scaled basal patches on bands and lateral spots; venter mostly covered with creamy scales.

Legs dark brown, femora pale at the base and beneath; femora and tibiae with a small pale apical spot.

Wings with brown scales on the veins; m. cu. about its own length distant from rm.

Length 5 to 5.5 mm.

Male.—*Palpi* dark brown, with an indistinct pale band near the middle of the long joint. Last two joints and apex of long joint with numerous hairs, especially on the under surfaces; penultimate joint slightly longer than apical joint. Scales on the median part of the head paler and broader than in the female. *Antennae* whitish with narrow brown bands at the insertions of the long hairs, except the apical joints, which are dark. *Abdomen* with complete basal white bands. Edwards gives a figure of one of the male claspers in the Bull. Ent. Res., V, p. 277 (1915).

Distribution.—Onderstepoort, Transvaal; Durban, Natal; Kenya Colony, Sudan; Abyssinia.

Seasonal Prevalence.—Common at Onderstepoort from September to June.

Habits.—The females are mainly nocturnal in habits, but we have taken them on horses during the day on one or two occasions.

15. *AÆDES* (*AÆDIMORPHUS*) *BEVISTI* (Edwards).

Ochlerotatus bevisi Edwards (1915).

Edwards, Bull. Ent. Res., V, iv, p. 275 (1915). Ann. Durban Mus., I, ii, p. 162 (1915).

Description of Adult (original):

Female.—*Head* clothed mainly with pale ochreous scales, but the usual spot of dark brown ones is present on each side. Scales narrow and curved in the middle and round the eyes, broad and flat at the sides, the latter reaching not far short of the middle line. *Palpi* blackish-brown with creamy tips. *Proboscis* dark brown at the base and apex, ochreous in the middle two-thirds beneath and at the sides. First two joints of antennae with small flat ochreous scales, the basal joint (torus) ochreous.

Thorax dark brown, clothed with narrow brown and ochreous brown scales without any definite pattern. Scutellar scales narrow. Flat ochreous scales on the pleurae.

Abdomen dark brown, each segment with whitish basal lateral spots and median bands not connected with the spots. Venter whitish ochreous, the apical margins of the apical segments black.

Legs.—*Femora* without any intersprinkling of light and dark scales, pale knee-spots very distinct. *Tibiae* blackish; on the front and middle legs largely pale on their outer and posterior faces; hind tibiae with a well-marked pale spot at the apex on the outside, which is about equal in length to the breadth of the tibia. *Tarsi* blackish; on all the legs there is a narrow ochreous ring embracing the tip of the first and base of the second joint, and a still narrower ring embracing the tip of the second and base of the third. All the claws toothed.

Wings clothed with dark brown scales, those of the lateral series linear. Bases of fork-cells level.

Length about 5 mm.

Described from four females collected at Durban in May and September, 1914.

III. The *vevans* series. As in the last, but hind tarsi with basal white bands. Six species are included in this series, three of which have been recorded from South Africa.

16. *AÆDES* (*AÆDIMORPHUS*) *HIRSUTUS* Theobald.

Culex hirsutum Theobald (1901).

Culex transvaalensis Theobald (1903).

Ochlerotatus hirsutus (Theo.) Edw. (1911).

Theobald, Mon. Culic., I, p. 392 (1901); Vol. III, p. 165 (1903); Vol. V, p. 336 (1910). First Rep. Dir. Vet. Res., Un. S.Afr., p. 261 (1911).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 249 (1911); Vol. III, i, p. 20 (1912); Vol. V, iv, p. 275 (1915).

Bedford, 5th and 6th Rep. Dir. Vet. Res., Un. S.Afr., p. 740 (1918). (Description and figure of larva.)

Description of Adults :

Female.—*Head* dark, clothed with pale narrow-curved scales in the middle; in front there are a few yellowish or brown narrow-curved scales, and behind a few dark upright forked scales mixed with the pale curved scales; on each side there are two patches of dark flat scales separated by a patch of pale ones. *Antennae* brown, the torus and following joint testaceous, the former with some pale narrow, flat scales on the inner margin. *Palpi* black with numerous pale scales at the apex. Proboscis ochreous, black at the base and apex.

Mesonotum dark, clothed with chestnut-brown narrow-curved scales and some pale creamy ones forming four small spots, also some at the sides and some round the bare space in front of the scutellum. Scutellum with pale narrow-curved scales. Pleurae with patches of pale flat scales.

Abdomen deep brown, first segment with a small patch of dark scales on each side of the middle and a few pale scales between the patches; the second to sixth segments with yellowish white basal bands and lateral spots; on the first segment there is usually also a pale median line, and the fifth and sixth segments also have some pale scales at the apices; seventh segment dark with basal lateral pale spot; venter clothed mostly with pale scales, but also a few black ones.

Legs.—Coxae pale with a few pale flat scales; femora, tibiae, and metatarsi dark brown to black speckled with white, the femora pale at the base and beneath with a pale spot at the apex; tibiae with a white basal band; first four joints of the fore and mid legs and all the joints of the hind legs with white basal bands, the bands being broadest on the hind legs and narrowest on the front legs.

Wings with scales on the veins dark brown; costal fringe whitish beyond the middle; m. cu. slightly more than its own length distant from rm.

Length about 4.5 to 5 mm.

Male.—*Palpi* dark brown with four pale bands, a narrow one near the base of the long joint, a broader one about the middle, and one at the bases of the last two joints; penultimate joint longer and slightly broader than the last joint; last two joints and apex of long joint with long hairs on their under surfaces. *Abdomen* with the basal bands white.

Distribution.—Onderstepoort, Transvaal; Bloemfontein (coll. J. C. Faure) and at the Vaal River Barrage (coll. A. Ingram) in the Orange Free State; Weenen, Natal (coll. H. P. Thomasset); Salisbury, S. Rhodesia; Angola; Kenya Colony; Uganda; and the Gold Coast.

Seasonal Prevalence.—Usually common at Onderstepoort after heavy rains during the months of November to May. It may also be present during the winter months should the weather be mild and rain fall.

Habits.—The females are mainly nocturnal, but have occasionally been taken on horses during the day. Females kept in captivity bite readily during the day. The larvae are as a rule only found in muddy pools or in holes in the ground after heavy rains, and very rarely in pools containing vegetation. Ova laid by females in captivity took three weeks to hatch when kept in the laboratory, and three to four days when placed out of doors in the sun. The ova can retain their vitality when kept dry, and the winter is probably usually passed in this stage.

17. *AÈDES* (*AÈDIMORPHUS*) *DURBANENSIS* (Theobald).

Grabhamia durbanensis Theo. (1903).

Grabhamia ocellata Theo. (1910).

Ochlerotatus durbanensis (Theo). Edw. (1911).

Theobald, *Mon. Cul.*, Vol. III, p. 246 (1903); Vol. V, p. 284 (1910).

Edwards, *Bull. Ent. Res.*, II, iii, p. 250 (1911) and *Ann. Durban Mus.*, I, ii, p. 162 (1915).

Description of Adult (original):

Female.—*Head* deep brown with grey narrow-curved scales in the middle, flat black and white ones at the sides, and with numerous black upright forked scales. Palpi rather long, densely scaled with brown scales at the base and white at the apex. Antennae brown, torus testaceous with some pale scales; two following joints testaceous with dark scales. Proboscis deep ochreous, black at the base and apex.

Mesonotum black with rich brown and pale grey narrow-curved scales, the former mostly in the middle and to some extent forming irregular ornamentation at the sides; pale grey scales in front of the scutellum. Scutellum with pale narrow-curved scales. Pleurae brown with grey scales.

Abdomen dark brown with basal white and yellow apical lateral spots; last segment unbanded; venter deep brown with scattered grey scales.

Legs brown; femora and tibiae mottled with creamy scales, the former with a pale spot at apex; coxae deep brown; tarsi with narrow pale basal bands, except the last fore and mid tarsi. Ungues of fore and mid legs thick, uniserrated and equal, of hind legs equal and simple.

Wings mottled with pale and dark scales; m. cu. rather more than its own length distant from rm.

Length 5 mm.

Distribution.—Durban, Natal; Delagoa Bay; Uganda; and Abyssinia.

Seasonal Prevalence.—The type female was caught at Durban in January, and several specimens were taken at Delagoa Bay in November.

18. *AÈDES (AÈDIMORPHUS) NIGERIENSIS* (Theobald).

Grabhamia nigeriensis Theo. (1910).

Culicelsa fryeri Theo. (1912).

Ochlerotatus nigeriensis (Theo.) Edw. (1911).

Theobald, *Mon. Culic.*, V, p. 281 (1910). *Trans. Linn. Soc.*, Lond., XV, i, p. 84 (1912).

Edwards, *Bull. Ent. Res.*, Vol. II, iii, p. 250 (1911); Vol. III, i, p. 20 (1912). *Ann. S.Afr. Mus.*, XIX, i, p. 159 (1924).

Description of Adult (original):

Female.—*Head* black with a line of small golden narrow-curved scales in the middle and large pale narrow-curved scales on each side; on each lateral margin two small patches of pale flat scales and two small patches of black flat scales; behind some brown and black upright forked scales. Palpi short, black scaled, with a few scattered creamy ones and white-scaled at apex. Proboscis dull, yellow-scaled in middle, black towards the base and apex. Antennae dark brown; torus black with testaceous patch and some small white flat scales; following joint testaceous with some similar scales.

Mesonotum black, covered with rich brown narrow-curved scales, and with two broad indistinct parallel lines of pale golden scales in front, a creamy spot on each side in front, and one on each side nearer the middle; similar scales present near the bases of the wings and on each side of the bare space in front of the scutellum. Scutellum with pale creamy narrow-curved scales. Pleuræ with patches of white flat scales.

Abdomen black, clothed with dusky black scales and with narrow white basal bands; venter black with numerous scattered white scales.

Legs black, femora and tibiae speckled with creamy scales, and with a creamy spot at their apices; fore tarsi with a creamy basal band on first three joints and a trace of a band on the fourth; mid tarsi with a band on the first four joints, and a trace on the fifth; band on hind tarsi broader. Fore and mid ungues equal and uniserate; hind equal and simple.

Wings with brown scales on the veins and some scattered creamy ones, especially on the third long vein; base of wings creamy; m. cu. more than its own length distant from rm.

Length 4.5 mm.

Described from females collected in N. Nigeria. It has also been recorded from S. Nigeria, Gold Coast, Nyasaland, Uganda, and recently Edwards has recorded it from Sandup, South-West Africa.

IV. The *ochraceus* series. Scutellar and postspiracular scales all narrow. Femora and tibiae lined in front; tarsi dark. Basal lobe of male side-piece absent.

This series includes one Ethiopian species with its Oriental representative *A. pallidostriatus* (Theo.).

19. *AÈDES* (*AÈDIMORPHUS*) *OCHRACEUS* (Theobald).

Culex ochraceus Theobald (1901).

Mimetecculex kingii Theobald (1908).

Ochlerotatus ochraceus (Theo.) Edw. (1911).

Theobald, Mon. Culic., Vol. II, p. 103 (1901); Vol. V, p. 409 (1910). Third Rep. Well. Res. Labs. Khartoum, p. 258 (1908).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 250 (1911); Vol. III, i, p. 23 (1912). Ann. S.Afr. Mus., XIX, i, p. 159 (1924).

Description of Adult (original):

Female.—*Head* brown, clothed with golden narrow-curved and dark upright forked scales, and on each side a patch of black, then pale and then deep ochreous flat scales; a narrow row of small creamy curved scales round eye-margins. Palpi bright ochreous, covered with deep brown and a few scattered grey and white scales and numerous black bristles. Antennae with the torus and next five joints ferruginous, remainder dark brown. Proboscis ochreous, black at the apex.

Mesonotum deep brown with narrow bright-golden curved scales, thickest at the sides and forming two parallel lateral golden lines. Scutellum with golden scales and golden-brown bristles on the border. Pleurae with two patches of small fine golden scales above, broader and larger creamy ones below.

Abdomen densely clothed with bright pale ochreous scales, each segment with lateral black scaled patches; venter with dense ochreous scales.

Legs.—Coxae ochreous with numerous pale scales; femora brown, pale ochreous at the base and beneath; tibiae ochreous, spotted with brown scales above; first tarsal joint ochreous, deep brown scales above, dark at the apex; second joint ochreous with black apex; last three joints black, rather ochreous beneath, those of hind legs somewhat paler than those of fore and mid legs. Ungues equal and uniseriate.

Wings yellowish, veins clothed with dark brown and ochreous scales; costa partly ochreous; dark scales especially prominent on the first, third, and fifth long veins, and at the end of the fork of the fourth and on the sixth veins.

Length 4 to 5 mm.

Distribution.—Described from a female collected at Salisbury, S. Rhodesia, in March. Edwards has recorded it from Ondongua, Nomtele, and Otjiwarongo, South-West Africa. It has also been recorded from Kenya Colony, N. Nigeria, and the Sudan.

Sub-genus *BANKSINELLA* Theobald.

Banksinella Theobald, Mon. Culic. IV, p. 468 (1907).

This sub-genus includes seven species, all of which are found in Africa, and one has also been recorded from the Philippine Islands and the Malay States. The species can be readily distinguished by the yellow or creamy longitudinal band on each side of the mesonotum.

TABLE OF SPECIES.

- (1) *Mesonotum* with bright yellow lateral bands. [2]
Mesonotum with creamy lateral bands; first long vein dark scaled from the apex beyond the base of the third long vein. *lineatopennis circumluteola* Theo.
- (2) Costa entirely dark; first long vein and lower branch of fifth yellow scaled almost to their tips; hind tibiae with small apical yellowish spot; middle tibiae rather conspicuously yellow on the hinder side, especially towards apex. *luteolateralis* Theo.
 Costa entirely dark; first long vein dark scaled beyond the base of the third long vein; hind tibiae without a distinct apical spot, though they may be pale beneath throughout their whole length. *lineatopennis* Ludlow.

20. *AËDES* (*BANKSINELLA*) *LINEATOPENNIS* Ludlow.

Taeniorhynchus lineatopennis Ludlow (1905).

Banksinella chrysothorax Theobald (1910).

Ludlow, *Canad. Ento.*, XXXVII, p. 133 (1905).

Theobald, *Mon. Culic.*, Vol. IV, p. 489 (1907); Vol. V, p. 404 (1910).

Edwards, *Bull. Ent. Res.*, V, iv, p. 274 (1915).

Description of Adult:

Female.—Head blackish-brown with golden narrow-curved scales and a few pale and brown upright forked scales in the middle, pale ochreous and dusky flat scales at the sides, and a tuft of golden bristles projecting between the eyes. Tori without scales. Palpi and proboscis blackish-brown.

Mesonotum black with bright brown narrow-curved scales in the middle, a short line of golden ones on each side of the middle in front of the scutellum, and a broad line of bright golden scales on each side. Scutellum with a few pale golden curved scales. Pleurae with a few pale yellow scales.

Legs dark brown, femora and sometimes the tibiae pale beneath.

Abdomen black, first segment with a patch of pale yellow scales in the middle; the remainder of the segments covered with dark brown scales and with pale yellow basal bands, a patch of similar coloured scales on the lateral margins, and sometimes a few scattered scales of the same colour mixed with the dark ones. Cerci long.

Wings clothed with brown and pale yellow scales; first long vein pale scaled at the base; lower branch of fifth with the basal two-thirds or more pale scaled, sometimes entirely pale scaled. The male genitalia have been figured by Carter (*Ann. Liver. Sch. Trop. Med.*, VII, iv, p. 583, 1913).

Distribution.—Weenen (coll. H. P. Thomasset), Durban, Natal; Seacow Lake, Empangeni, and Felixton (coll. A. Ingram), also in the Ntabanana and Mhlatuse Settlements, Zululand; Onderstepoort and Potchefstroom, Transvaal; the Vaal River Barrage, O.F.S. (coll. A. Ingram); S. Rhodesia; Angola; Uganda; Sudan; Philippine Islands; India; Malay States; and Assam.

Seasonal Prevalence.—Adults have been taken at Onderstepoort during the months of November to May.

Habits.—This species is mainly nocturnal at Onderstepoort, but females have on one or two occasions been caught here on horses during the day. In Zululand we found this species in thick bush near the Enseleni and Mhlatuse Rivers. It was frequently very common here during the day-time, but was never prevalent at night. Larvae have been collected at Onderstepoort and Potchefstroom in marshy pools.

AÈDES (BANKSINELLA) LINEATOPENNIS CIRCUMLUTEOLA Theo.

Banksinella luteolateralis var. *circumluteola* Theobald (1908).

Theobald, Ent., XLI, p. 107 (1908). Mon. Culic., v, p. 404 (1910).

This variety was described from specimens collected in the Transvaal by the late Mr. Simpson. It differs from the type in that the lateral areas of the mesonotum are clothed with creamy scales which unite in front, and also by the less pale scaled areas on the wings.

I found this variety extremely common in the day-time on the veld near Christiana, Transvaal, in March, 1913. The females were vicious blood-suckers and swarmed on my horse and on my back in company with *Aedes caballus* and a species of *Simulium*. As many as 60 specimens of these two species of mosquitoes were counted on my back at one time. Males were also caught flying about at the same time. Larvae were found breeding in holes made by the hoofs of animals at the sides of pans (small sheets of water), but I did not find larvae breeding in the pans.

Two other varieties have been described by Theobald, namely, *pallida* and *albothorax*. They were both described from specimens collected by Drs. Dutton and Todd at Inkutu, W. Africa, and closely resemble *circumluteola*.

21. AÈDES (BANKSINELLA) LUTEOLATERALIS Theobald (1901).

Theobald, Mon. Culic., II, p. 71 (1901).

Edwards, Bull. Ent. Res., V, iv, p. 274 (1915).

This species can be distinguished from *lineatopennis* by the characters given in the table. It has, as has recently been pointed out by Edwards, been confused with *lineatopennis*. A female from Durban was selected to represent the type, and a specimen of *lineatopennis* from Salisbury being chosen to represent the male. It has been found at Durban during the months of February, March, April, and June.

AÈDES (BANKSINELLA) LUTEOLATERALIS FLAVINERVIS Edwards.

Edwards (Ann. Durban Mus., I, ii, p. 61, 1915) records thirteen females caught in the beach bush at Durban on the 10th and 16th June, 1914, and a male taken at Umbilo, Natal, on the 13th September, 1914. I cannot trace the original description.

Sub-genus FINLAYA Theobald.

Theobald, Mon. Culic., III, p. 281 (1903).

This sub-genus is widely distributed, but only four species have been found in the Ethiopian region. The larvae, so far as is known, breed in holes in trees and plants containing water.

22. *AÆDES* (*FINLAYA*) *BARNARDI* Edwards (1924).

Edwards, Ann. S. Afr. Mus., XIX, i, p. 161 (1924).

Description of Adult (original):

Female.—*Head* clothed mostly with rather broad, pointed, close-lying pale ochreous scales. Proboscis blue-black, slender, slightly longer than the front femora. Palpi blue-black, one-fifth as long as the proboscis, second segment one-third longer than the first. Tori ochreous. Eyes practically touching. Thorax with blackish integument, except for the scutellum, which is ochreous.

Mesonotum clothed mostly with black scales, with five straight and rather sharply marked longitudinal lines of pale ochreous; median line forked a short distance in front of the scutellum; lateral lines occupying the margins, and composed of broader scales than the others, expanding into a rather large patch in front of each wing-base. Scutellum nearly bare; a few mixed light and dark scales on the mid lobe. Prothoracic lobes with flat whitish scales; pro-epimera with flat white scales below, narrow ones above; sternopleura and mesepimera rather densely clothed with flat white scales.

Abdomen blue-black; tergites with rather small basal lateral white spots; sternites with broad white basal bands, narrowed in the middle. Eighth sternite rather small for the sub-genus, densely clothed with dark scales; cerci scarcely distinguishable.

Legs blue-black; front and mid femora white beneath on the basal third; hind femora white all round on the basal half; mid and hind femora with a narrow white ring close to the tip, some dark scales actually at the tip; tibiae uniformly dark; front tarsi with a few white scales beneath at the bases of the first two segments; mid and hind tarsi with a narrow white ring at the base of the first segment, and a broader one, occupying rather more than half the segment, at the base of the second.

Wing-scales uniformly blackish, outstanding ones ligulate; venation normal.

Wing-length 4·5 mm.

Described from five females collected at Oudebosch, in the Caledon Division, C.P., in January, 1919.

This species can be distinguished from *A. (F.) wellmani* Theo., a species occurring in Angola and the Gold Coast by the thoracic ornamentation.

Sub-genus *OCHLEROTATUS* Arribalzaga.

Arribalzaga, Rev. Mus. de la Plata, I, p. 374; II, p. 143 (1891).

This sub-genus contains a number of species occurring in the Palaearctic, Nearctic, and Neotropical regions, also in Australia. Only two species have been found in the Ethiopian region, one of which occurs in S. Africa.

23. *AÆDES* (*OCHLEROTATUS*) *CABALLUS* (Theobald).

Grabhamia caballa Theobald (1912).

Ochlerotatus chelli Edwards (1915).

Theobald, Entom., XLV, p. 93 (1912). Second Rep. Dir. Vet. Res., Un. S. Afr., p. 321 (1912).

Edwards, Bull. Ent. Res., Vol. III, i, p. 20 (1912); Vol. V, p. 275 (1915).

Description of Adults :

Female.—*Head* dark, clothed with pale golden narrow-curved and upright forked scales, and a small patch of dark and pale flat ones on each side. *Antennae* dark brown; torus with small flat pale ochreous scales, following joint pale at base. *Palpi* and *proboscis* black-scaled.

Mesonotum dark brown, clothed with pale golden narrow-curved scales and bristles. *Scutellum* with ochreous narrow-curved scales. *Pleurae* with patches of pale creamy scales.

Abdomen deep brown; first tergite with two median patches of ochreous scales; remainder of tergites with ochreous basal bands and median longitudinal strips of the same colour, the stripes often broadening out considerably; venter ochreous-scaled.

Legs.—Femora mottled with dark brown and pale ochreous scales above, pale beneath, and with a pale spot at their apices; tibiae mottled with dark brown and pale ochreous scales; tarsi dark brown, first joint with a broad but ill-defined pale basal band, second to fourth joints with narrow basal pale bands, those on the fourth joints being frequently inconspicuous or absent. *Ungues* equal and uniseriate.

Wings with dark brown and a few pale scales on the veins; first forked cell with its base nearer the apex of the wing than that of the second.

Length about 5 mm.

Male.—*Palpi* black with some scattered pale scales, longer than *proboscis* by nearly the length of the last joint. *Abdomen* with pale median longitudinal stripe on the last two segments only. Pale basal bands on first two joints of hind tarsi narrower than in the female; third joint entirely dark.

Described from specimens collected at Onderstepoort. We have also taken it at Christiana and Potchefstroom, in the Transvaal, and at Vryburg, C.P. Dr. Ingram has taken specimens at the Vaal River Barrage, O.F.S., and at Bond's Drift, Natal; and H. P. Thomasset has collected specimens at Weenen, Natal. Specimens have also been collected at Bloemfontein, O.F.S. (J. C. Faure), and Edwards has recorded it from Nomtele, Namutoni, Andoni, and Otjiewarongo, in South-West Africa, and from Kenya Colony. The females are both nocturnal and diurnal in habits. They are vicious biters, and have been taken at Onderstepoort during the months of October to May.

Genus TAENIORHYNCHUS Arribalzaga.

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

Sub-genus TAENIORHYNCHUS Arribalzaga.

Panoplites Theobald, Mon. Culic., II, p. 173 (1901).

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

Pseudotaeniorhynchus Theobald, Mon. Culic., i, p. 19 (1911).

TABLE OF SPECIES (after Edwards).

- | | | |
|---|---------------------------------|-----|
| (1) Violet-black species; anterior half of thorax clothed with creamy scales. | <i>T. (T.) metallicus</i> Theo. | [2] |
| Species yellowish; tibiae yellow, often with black bands. | | |
| (2) Hind tibiae entirely yellow. | <i>T. (T.) chubbi</i> Edw. | [3] |
| Hind tibiae with a black band in the middle. | | |

- (3) Golden-yellow species; costa entirely yellow, dark scales on wings few or absent. *T. (T.) aureus* Edw.

Darker species; thoracic integument light brown in the middle of the mesonotum and scutellum, darker brown at the sides and in front; costa with at least a few dark scales; dark scales on wings numerous.

T. (T.) fuscopennatus Theo.

1. TAENIORHYNCHUS (TAENIORHYNCHUS) METALLICUS Theobald.

Culex metallicus Theobald (1901).

? *Culex nigrochaetae* Theobald (1901) (male).

Taeniorhynchus violaceus Theobald (1910).

Banksinella metallicus Theobald (1910).

Chrysoconops nigra Theobald (1910).

Theobald, Mon. Culic., Vol. II, pp. 60, 63 (1901); Vol. V, pp. 408, 421, 434 (1910). Third Rep. Well. Labs., Khartoum, p. 262 (1908).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 252 (1911); Vol. V, iv, p. 279 (1915). Ann. Durban Mus., I, ii, p. 163 (1915).

Description of Adult:

Female.—Head dark brown with a few grey narrow-curved scales, numerous black upright forked scales, and a patch of pale flat ones on each side. Proboscis and palpi violet-black. Antennae blackish-brown, first joint beyond torus ferruginous.

Mesonotum black, anterior half clothed with creamy narrow-curved scales, posterior half with bronze curved scales, except in front of the scutellum in the middle. Scutellum with some pale narrow-curved scales. Pleurae with patches of white scales.

Abdomen clothed with metallic violet-black scales; first segment ochreous with some dusky scales.

Legs violet black; femora testaceous at the base and on the venter.

Length 4.5 to 5 mm.

Male.—Palpi violet-black, slightly longer than proboscis, with an indistinct pale band near base of long joint; last two joints and apex of long joint with long black hairs.

Distribution.—Durban, Natal; Angola; Kenya Colony; Nyasaland; Uganda; S. Nigeria; Sudan; Philippine Islands.

2. TAENIORHYNCHUS (TAENIORHYNCHUS) CHUBBI Edwards (1915).

Edwards, Bull. Ent. Res., V, iv, p. 280 (1915). Ann. Durban Mus., I, ii, p. 163 (1915).

Description of Adult (original):

Species almost uniformly yellow; there are, however, black scales on the tips of the palpi, the proboscis, and tarsal joints, and scattered black scales on the femora; on the wings the scales of the fourth, fifth, and sixth longitudinal veins are mostly black, so that to the naked eye the wing appears dark on the lower basal part and yellow elsewhere; on the remaining veins (except the costa) there are a few dark scales. The scales on the hind tibiae are appressed. The male

genitalia closely resemble those of *T. aurites* (Theobald) except in the claspers, which are relatively larger and have a large membranous lobe, and also are more hairy towards the tip.

Described from six males and two females caught under mango trees and in grass near water at Umbilo, Durban, in September and October, 1914. Dr. Ingram has taken specimens at Empangeni and Felixton in Zululand.

3. *TAENIORHYNCHUS* (*TAENIORHYNCHUS*) *AUREUS* Edwards (1915).

Edwards, Bull. Ent. Res., V, iv, p. 281 (1915). Ann. Durban Mus., I, ii, p. 163 (1915).

Described from six females and seven males collected at Umbilo, Durban, on the 24th and 25th September, 1914. They were taken by Mr. L. Bevis in bush and in grass near water between 6.30 and 7 a.m. It is closely allied to *T. (T.) aurites* (Theo.), from which it only appears to differ in the claspers of the male hypopygium, which are extremely similar to those of *T. (T.) chubbi*, differing only in the absence of the tuft of hairs just before the apex.

4. *TAENIORHYNCHUS* (*TAENIORHYNCHUS*) *FUSCOPENNATUS* Theobald (1903).

Culex flavus Ventrillon (1904) *nec* Motschulsky (1859).

Culex grandidieri Blanchard (1905).

Chrysoconops fuscopennatus Theobald (1907).

Culex drymoecius Speiser (1909).

Chrysoconops bakeri (1911).

Theobald, Mon. Culic., Vol. III, p. 265 (1903); Vol. IV, p. 492 (1907); Vol. V, p. 446 (1910); *Novae Culic.*, p. 19 (1911). Second Rep. Dir. Vet. Res., Un. S. Afr., p. 339 (1912).

Ventrillon, Bull. Mus. Paris, X, p. 550 (1904).

Blanchard, Les Moust., p. 627 (1905).

Speiser, Kilimandjaro-Meru Exp., Diph. Orth., p. 42 (1909).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 253 (1911); Vol. III, i, p. 26 (1912). Ann. Durban Mus., I, ii, p. 163 (1915).

Description of Adult:

Female.—*Head* yellowish-brown, clothed with pale narrow-curved and dark upright forked scales. Antennae with the basal segments yellow; apical segments dark. Palpi with yellow scales and a few dark ones at the tip. Proboscis yellow, dark at the apex.

Mesonotum yellow, with golden narrow-curved scales. Scutellum and pleurae yellow.

Abdomen yellow, with yellow and dusky scales.

Legs yellow; femora and tibiae with some scattered dark scales and dark at the apices; hind femora also with a dark band in the middle; first three tarsal joints with dark apical bands; last two joints usually all dark.

Wings with yellow veins, clothed with long thin dusky and yellow scales, the dark scales predominating; the scales on costa and subcosta are shorter and broader than the rest.

Length 5–5.5 mm.

Distribution.—Onderstepoort, Transvaal; Pietermaritzburg (coll. C. Akerman) and Durban, Natal; Hluhluwe River Bridge, Empanjeni, Umfolosi Mill (coll. A. Ingram), Mhlatuse Settlement, and Manyana in Zululand (coll. G. A. H. B.). It has also been recorded from Kenya Colony, Tanganyika Territory, Uganda, and Zanzibar.

Seasonal Prevalence.—December to February at Onderstepoort. October at Manyana, northern Zululand, and April at Mhlatuse and Durban.

Habits.—The adults are nocturnal. Three females were collected in the act of biting animals in thick bush near the Mhlatuse River between the hours of 7 and 9 p.m. in April, 1923.

Sub-genus MANSONIOIDES Theobald.

Theobald, Mon. Culic., IV, p. 498 (1907).

? *Etorleptomyia* Theobald (1904).

? *Etorleptomyia* Theobald (1910).

? *Etorilepidomyia* Alcock (1911).

Diceromyia Theobald (1911).

Two species have been found in South Africa; they are both widely distributed.

1. TAENIORHYNCHUS (MANSONIOIDES) UNIFORMIS (Theobald).

Panoplites uniformis Theo. (1901).

Panoplites africanus var. *reversus* Theo. (1901).

Panoplites australiensis Giles (1902).

Mansonia uniformis Theo. (1903).

Theobald, Mon. Culic., Vol. II, pp. 180, 189 (1901); Vol.

III, p. 273 (1903); Vol. V, p. 448 (1910).

Giles, Mosq. or Gnats, 2nd Ed., p. 355 (1902).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 254 (1911); Vol.

IV, i, p. 51 (1913). Ann. Durban Mus., I, ii, p. 164 (1915).

Description of Adult:

Female.—Head brown with pale narrow-curved and dark upright forked scales; projecting forwards between the eyes a tuft of yellow bristles. Antennae dark brown with narrow yellowish bands at the insertions of the whorls; tori yellow, following joint yellow at the base, with one or two dark flat scales. Palpi yellow with dark flat scales and a few white ones at the apex. Proboscis yellow with some scattered black scales at the base and a broad band of black scales at the apex.

Mesonotum reddish-brown, clothed with golden-brown and pale greenish narrow-curved scales, the latter forming a pale unbroken longitudinal line on each side and a median line in front of the scutellum; bristles testaceous. Scutellum with pale narrow curved scales. Pleurae brown with patches of white flat scales.

Abdomen with a patch of ochreous scales in the middle of the first segment; remainder of segments purplish-brown, with ochreous scales on the apical and lateral margins, also a median basal patch on the second and third segments, and with white apical lateral spots on some of the segments; venter with ochreous scales.

Legs.—Femora ochreous beneath, mottled with brown and ochreous scales above and on the outer margins; on the outer margins there is a row of five more or less distinct pale blotches, the one near the apex forming a band; tibiae brown with an ochreous stripe on the inner margins and a row of pale spots on the outer margins; tarsi dark brown; first joint with a pale band at the base and another in the middle; second and third joints of fore and mid legs with basal pale bands; hind tarsi black with pale basal bands on all the joints.

Wings mottled with very broad dusky and pale scales.

Length 4.5 to 5 mm.

Distribution.—It does not appear to be common in South Africa. Females have occasionally been taken at Onderstepoort in mosquito-traps, and Edwards has recorded it from Durban, Natal, Lake Ngami, Bechuanaland, and Delagoa Bay, Portuguese East Africa. Dr. Ingram collected specimens in Zululand at Empangeni, Umfolosi Mill, and between Empangeni and Gingindhlovu. Edwards gives the following localities for this species in other parts of Africa:—Angola, Kenya Colony, Uganda, Nyasaland, Sudan, N. and S. Nigeria, Sierra Leone Gold Coast. It is also known to occur in India, Ceylon, Malay States, and Australia.

Seasonal Prevalence.—Females have been taken at Onderstepoort during the months of November to April.

Carrier of Disease.—This species has been proved to be a carrier of *Filaria bancrofti*.

2. TAENIORHYNCHUS (MANSONIOIDES) AFRICANUS (Theobald).

Panoplites africanus Theobald (1901).

Mansonia major Theobald (1903).

Mansonia nigerrima Theobald (1910).

Theobald, Mon. Culic., Vol. II, p. 187 (1901); Vol. III, p. 270 (1903); Vol. V, p. 450 (1910).

Edwards, Bull. Ent. Res.; Vol. IV, i, p. 52 (1913). Ann. Durban Mus., I, ii, p. 164 (1915).

This species is closely allied to *T. (M.) uniformis* Theo. The chief characters are to be found in the male hypopygium, of which Edwards gives excellent figures in Bull. Ent. Res., iv, pp. 51, 52, fig. 1 and 2. It can also be distinguished from that species by the thoracic integument being usually darker; the longitudinal pale lines are interrupted twice; the female palpi have a much more distinct white apex, and the legs are darker with white instead of ochreous spots on the tibiae. Both species are, however, somewhat variable.

Distribution.—Like the foregoing species, it is widely distributed in Africa, and Edwards (Bull. Ent. Res., XIV, iv, p. 365, 1924) has also recorded it from Queensland, Australia. In S. Africa it has been taken at Onderstepoort, Transvaal; Durban, Natal; Felixton (coll. A. Ingram), near Empangeni, and at Manyana, Zululand (coll. G. A. H. B.); Lake Ngami, Bechuanaland. Edwards has also recorded it from Kenya Colony, Uganda, Nyasaland, Sudan, N. Rhodesia, Belgian Congo, N. and S. Nigeria, Sierra Leone.

Seasonal Prevalence.—Females have been taken at Onderstepoort during the months of December to March. Edwards has recorded

three specimens taken at Durban in September and October, 1914. The specimens collected in Zululand were taken in October and February.

Habits.—Females have occasionally been taken at Onderstepoort in the mosquito-traps, and also on a horse at night. At Manyana, in northern Zululand, the writer collected several females at night in a cattle kraal, and near Empangeni a female was taken attempting to bite me whilst sitting under a tree at 1.30 p.m.

Breeding Places.—The larvae have been found by Ingram in West Africa in pools and swamps in which the plant *Pistia stratiotes* was growing. They do not rise to the surface of the water to breathe, but obtain air from the roots of the water-plant, to which they attach themselves by means of a specially modified breathing tube.

The larva has been described by Ingram (Bull. Ent. Res., III, p. 76 (1912), Edwards (Bull. Ent. Res., III, p. 378, 1912), and by Ingram and Macfie (Bull. Ent. Res., VIII, p. 137, 1917).

3. TAENIORHYNCHUS (MANSONIODES) MEDIOLINEATA (Theobald).

Etorleptomyia mediolineata Theobald (1904).

Anisocheleomyia quadrimaculata Newst. (1907).

Theobald, First Rep. Well. Labs., Khartoum, p. 71 (1904).

Entom., p. 107 (1908). Mon. Culic., V, p. 454 (1910).

First Rep. Dir. Vet. Res., Union S. Afr., p. 272 (1911).

Newstead, Ann. Trop. Med., I, p. 32 (1907).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 254 (1911); Vol. III, i, p. 24 (1912).

Macfie and Ingram, Bull. Ent. Res., XIII, iv, p. 423, f. 12, 13 (1923). Larva and pupa.

This species can be distinguished from the two foregoing species by the mesonotum being clothed with golden narrow-curved scales, except for a few bronzy ones behind; also by the first three tarsal joints being apically banded instead of basally banded.

Described by Theobald from a single female taken by Dr. Balfour in the Sudan and by Newstead from a female collected in the Belgian Congo. Theobald has since recorded a female collected by the late Mr. Simpson in the Transvaal. Edwards has recorded it from Nyasaland, and Macfie and Ingram from the Gold Coast.

Genus THEOBALDIA Neveu-Lemaire.

Neveu-Lemaire, C.R. Soc. Biol., p. 1331 (1902).

Sub-genus ALLOTHEOBALDIA Brolemann.

Brolemann, Ann. Soc. Ent., France, LXXXVIII, p. 91 (1919).

This sub-genus includes a single large species which is widely distributed. The characters are:—Male palpi shorter than the proboscis. Thorax with sharply defined white longitudinal lines. Spiracular bristles present. Femora and tibiae striped and spotted. Wings with four or five small dark spots; costa largely pale-scaled.

1. THEOBALDIA (ALLOTHEOBALDIA) LONGIAREOLATA (Macquart).

Culex longiareolata Macquart (1838).

Culex spathipalpis Rondani (1872).

Culex serratipes Becker (1908).

Culex annulatus var. *maroccanus* d' Anfreville (1916).

Macquart, Dipt. Exot., I, p. 34 (1838).

Rondani, Bull. Soc. Ent. Ital., IV, p. 31 (1872).

Theobald, Mon. Culic., Vol. I, p. 339 (1901); Vol. III, p. 154 (1903); Vol. V, p. 273 (1910). First Rep. Dir.

Vet. Res., Union of S. Afr., p. 260 (1911).

Becker, Mitt. Zool. Mus., Berlin, IV, p. 78 (1908).

D'Anfreville, Bull. Soc. Path. Exot., IX, p. 140 (1916).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 251 (1911);

Vol. VII, iii, p. 228 (1917); Vol. xii, p. 287 (1921).

Kirkpatrick, The Mosquitoes of Egypt, pp. 72-76 (1925).

♂, ♀, larva, and pupa.

Description of Adult:

Female.—*Head* black, clothed with dark upright forked scales, two median curved lines of white scales uniting in front, a small patch of white flat scales on the sides, and a narrow row of similar scales round the eye-margins; dark bristles over the eyes in front, brown ones at the sides. Antennae brown, tori and two following joints with some white scales. Palpi about one-third the length of proboscis, clothed with blackish-brown scales and some scattered white ones; also a small patch of white scales in the middle and at the apex. Proboscis brown.

Mesonotum brown, clothed with bright brown thin curved scales, and slightly broader white scales arranged in lines as follows:—A narrow median line extending back three-quarters of the way to the scutellum, where it forks, enclosing a small bare space; a lateral line on each side and an admedian line extending forwards from the scutellum beyond the middle, where it turns sharply outwards and meets the lateral line. Scutellum with white scales. Pleurae with numerous white scales.

Legs with the coxae brown with a line of white scales on the outside; femora pale beneath and with dark brown and white scales above; near the apex there is an ill-defined yellowish band and a white spot at the apex; tibiae blackish-brown with white stripes at the sides, these being often broken in places. Tarsi with the first joint also with a white line on the lateral margins and with a pale basal band; second and third of the fore legs, and second, third, and fourth joints of the mid and hind legs, also with pale basal bands, the bands being broadest on the second joints.

Abdomen with the first segment yellowish-brown with a few white scales in the middle; second to seventh segments clothed with brown scales and a few scattered yellow ones, also with a longitudinal patch of yellow scales in the middle and with white basal bands; eighth segment mainly clothed with white scales.

Wings clothed with brown scales, except on the costa, which is mainly white. There are four or five indistinct spots, formed by the accumulation of a few darker scales, present at the bases of the fork cells and second and third long veins.

Length about 7 mm.

Male.—Antennae with some white scales on the torus and next joint. Palpi slightly shorter than the proboscis, blackish-brown; long joint with a narrow white band near the base and another near the middle, also a few scattered pale scales; last two joints with white basal bands and a few scattered pale scales, also a few hairs; apical joint dilated. The wings are not so thickly scaled as in the female and the spots are not so conspicuous.

This species can be easily recognized by its large size, white scaled lines on the mesonotum, the small dark spots at the base of the fork cells and second and third long veins, and by the striped, banded, and spotted legs.

Distribution.—Cape Province: Capetown (coll. Dr. Robertson), Rosebank (*vide* Theobald), Richmond (G.A.H.B.), Kimberley (*vide* Edwards). Transvaal: Onderstepoort and Roberts Heights, Pretoria, Johannesburg, Potchefstroom (coll. Major Venniker), Klerksdorp (coll. A. Ingram), Christiana (G.A.H.B.). Orange Free State: Bloemfontein (coll. J. C. Faure). Cape Province: Mafeking (coll. A. Ingram). Natal. It also occurs in North and East Africa and in parts of Europe and Asia.

Seasonal Prevalence.—Both larvae and adults have been collected throughout the year, but it is not as a rule common in a locality for more than two to three months at a time.

Habits.—The adults are nocturnal in habits and have been found in houses and in mosquito-traps containing horses at Onderstepoort. The females collected in the mosquito-traps were never engorged.

Breeding Places.—Larvae have been found breeding in pools, water-barrels, dipping-tanks, and in a tarpaulin holding rain-water, usually in the neighbourhood of habitations.

Genus LUTZIA Theobald.

Theobald, Mon. Culic., III, p. 155 (1903).

This genus includes several species, the larvae of which are pre-*laceous* upon those of other species. The adults closely resemble those of *Culex*, but can be diagnosed by the presence of at least six lower mesepimeral bristles, whereas in *Culex* there are 0-4, but generally one. The larvae differ from those of *Culex* in possessing highly modified mouth-parts and antennae, and also by the peculiar structure of the siphon and anal segment.

Only one species has been found in Africa.

LUTZIA TIGRIPES (Grandpré and Charmoy).

Culex tigripes Grandpré and Charmoy (1900).

Culex maculicrura Theobald (1901).

Culex tigripes var. *fusca* Theobald (1910).

Grandpré and Charmoy, "Les Moustiques," Planter's Gazette Press, Port Louis, p. 6 (1900).

Theobald, Mon. Culic., Vol. II, p. 34 (1901); Vol. III, p. 227 (1903); Vol. V, p. 392 (1910). First Rep. Dir. Vet. Res., Union of S. Afr., p. 266 (1911); 2nd ditto, p. 329 (1912).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 261 (1911).
 Wesche, Bull. Ent. Res., I, i, p. 36, 1910. (Description of larva and pupa.)

Description of Adult:

Female.—*Head* dark, clothed with pale yellow narrow-curved scales, ochreous and a few dark upright forked scales, and a line of white scales on the eye-margins; projecting forwards in front is a tuft of bright ochreous bristles, and dark bristles are present at the sides. Antennae dark brown, torus and basal half of next segment testaceous with a patch of flat scales on the inner margins. Palpi short, blackish-brown with a few pale scales internally. Proboscis dark brown.

Mesonotum dark, covered with reddish-brown narrow-curved scales and some pale ochreous ones arranged as follows:—A small median spot in front, two distinct spots in the middle with a pale line extending backwards from each to the scutellum; there are also more or less distinct patches of pale scales on the lateral margins. Scutellum with pale narrow-curved scales. Pleurae brown with patches of pale flat scales and pale bristles.

Abdomen dark brown to black; first segment with two patches of pale yellow and dark scales in the middle; remainder of segments with creamy apical bands, the bands being broadest on the last two segments, and with white basal spots on the lateral margins.

Legs dark brown; coxae ochreous with a line of pale flat scales on the outer margins; femora and tibiae with a row of pale spots on one side, the spots being more distinct on the fore and mid legs, also with narrow pale apical bands; the femora are pale beneath; tarsi unbanded.

Wings with brown scales on the veins; first fork cell longer and narrower than the second.

Length about 6.5 to 7 mm.

Male.—Palpi longer than proboscis, dark brown, with a narrow pale yellow band before the middle of the long joint; last two joints upturned, with numerous hairs and narrow pale yellow basal bands; terminal joint also pale at tip. Abdomen with the apical bands narrower than in the female; sometimes absent on the basal segments.

This species can be easily distinguished by its large size and spotted legs. The yellow apical abdominal markings vary a great deal in both sexes; in some specimens yellow scales may be almost entirely absent.

Distribution.—Cape Province: Capetown, Elsenburg, Stellenbosch, Fernwood. Natal: Durban. Transvaal: Onderstepoort. It has also been recorded from Mozambique, Salisbury (S. Rhodesia), N. Rhodesia, Nyasaland, Tanganyika Territory, Kenya Colony, Uganda, Zanzibar, Gambia, Sierra Leone, N. and S. Nigeria, Gold Coast.

Seasonal Prevalence.—Both the adults and larvae have been found throughout the year at Onderstepoort.

Habits.—The females have not been observed to bite either man or animals. Only unengorged females have been collected in mosquito-traps containing horses at Onderstepoort. The adults are nocturnal in habits.

Breeding Places.—Larvae have been found in barrels, water-troughs, dipping-tanks, pools, ponds, and streams in company with the larvae of *Anopheles*, *Aedes*, and *Culex*, upon which they are predaceous.

Genus CULEX Linné.

Linné, Syst. Nat. Ed. (1758).

For a list of synonyms, the reader is referred to Edwards' paper (Bull. Ent. Res., Vol. III, Pt. 1, p. 27, 1912). They have not been included because all the South African species have always been retained in this genus, except *C. pulchrithorax* Edw. and synonyms of *C. quasigelidus* Theo., *C. consimilis* Newst., and *C. thalassius* Theo., and these were mainly placed in genera that are not synonyms of *Culex*.

TABLE OF SPECIES.

A.—ADULTS (compiled after Edwards).

- | | |
|--|------|
| (1) Mesonotum with three narrow yellow longitudinal lines (the median one divided into two in front of the scutellum) and a white line on each side. | |
| <i>C. pulchrithorax</i> Edw., p. 979. | |
| Mesonotum without such lines. | [2] |
| (2) Proboscis and tarsi with pale bands, those on the tarsi including both ends of the joints. | [3] |
| Proboscis and tarsi unbanded (<i>C. univittatus</i> sometimes shows traces of a median pale band on the proboscis). | [8] |
| (3) Mesonotum with pale scales on the anterior two-thirds, or at least with a transverse pale band behind the middle. | [4] |
| Mesonotum almost uniformly coloured, at most with a pair of pale spots; abdominal segments with complete basal white bands. | [7] |
| (4) Wing-scales all, or nearly all, dark; abdomen usually unicolorous. | [6] |
| Wings with numerous white scales; abdomen with conspicuous markings. | [5] |
| (5) Abdominal segments with complete yellowish apical bands; wing-scales equally light and dark, or almost so. | |
| <i>C. bitaeniorhynchus</i> Giles, p. 968. | |
| Abdominal segments with both median basal and lateral apical triangular spots; dark scales on wings preponderate. | |
| <i>C. annulioris</i> Theo., p. 968. | |
| (6) Femora and tibiae with rows of sharply defined white spots. | |
| <i>C. quasigelidus</i> Theo., p. 966. | |
| Femora and tibiae marbled but not spotted. | |
| <i>C. consimilis</i> Newst., p. 967. | |
| (7) Middle tibiae with a whitish lateral stripe; abdominal bands broadest in the middle; band of proboscis broad and ill-defined. | |
| <i>C. duttoni</i> Theo., p. 970. | |
| Middle tibiae unstriped; abdominal bands of equal breadth throughout; band of proboscis narrower and more clearly defined; femora not marbled. | |
| <i>C. thalassius</i> Theo., p. 969. | |
| (8) Tibiae with a yellowish or white stripe. | [9] |
| Legs uniformly brown or yellowish (except for pale spots at the apex of tibiae). | [10] |

- (9) Femora and tibiae with a yellowish or white stripe on their outer margins (on the fore legs the stripes are often more or less broken into spots). ...*C. theileri* Theo., p. 971. Smaller species; tibiae with a white stripe; "seventh vein" more distinct than usual, and often bearing a few scales. *C. univittatus* Theo., p. 971.
- (10) Abdominal segments with pale basal bands. [11]
Abdominal segments with pale scales, usually forming bands on the apical margins; small species. [16]
- (11) Larger species (about 5 mm.); abdominal bands yellowish; two apical joints of male palpi with a line of white scales on the under side. [12]
Smaller species (about 3-4 mm.); abdominal bands white. [15]
- (12) Mesonotum clothed with reddish-brown or ochreous-tinged scales. [13]
Mesonotum clothed with dark brown scales and some yellowish ones. [14]
- (13) Stem of first forked cell usually about one-seventh the length of the cell; ♂ hypopygia with second division of mesosome narrow and hook-like. *C. pipiens* L., p. 973. Stem of first fork cell usually about quarter the length of the cell; second division of mesosome very broad and plate-like. *C. fatigans* Wied., p. 974.
- (14) Mesonotum with yellowish scales on the margins of the posterior third or half and in front of the scutellum, and sometimes two yellowish spots near the middle; forked scales on head mainly brown. *C. pallidocephalus* Theo., p. 975.
Mesonotum with yellowish scales forming indistinct lines; yellow scales also present on and near scutellum; forked scales on head mainly yellow. *C. trifilatus* Edw., p. 975.
- (15) Thoracic scaling uniformly reddish-brown; male palpi dark. *C. decens* Theo., p. 976.
Thoracic scaling partly bronzy-brown and partly brassy, the latter often predominating; two apical joints of male palpi with a line of white scales on venter. *C. simpsoni* Theo., p. 975.
- (16) Proboscis scarcely longer than front tibiae; male palpi longer than proboscis. [17]
Proboscis nearly one-third longer than front tibiae; male palpi about quarter the length of proboscis. *C. pérenqueyi* Edw., p. 978.
- (17) Terminal joint of palpi short and thick. *C. salisburyensis* Theo., p. 977.
Terminal joint of palpi long and thin. *C. rima* Theo., p. 978
- B.—LARVAE (compiled after Edwards).
- (1) Siphon swollen towards the middle, with a more or less distinct dark ring near the apex; no distinct hair-tuft, this being represented by long solitary hairs. *C. duttoni* Theo.
Siphon not swollen towards the middle; hair-tufts usually distinct, even if small. [2]
- (2) Siphon short, not more than three times as long as its basal width, with 6-7 pairs of hair-tufts, 4 or 5 ventral and 2 lateral; pecten comprising 2-5 teeth. *C. nebulosus* Theo.

- Siphon long, at least four times as long as its basal width. [3]
- (3) Combs consisting of about 38–70 teeth, arranged in a triangular patch. [4]
- Comb consisting of about 4–8 teeth, arranged in a row. [8]
- (4) Anal papillae very short; comb comprising 60–70 teeth; pecten with 12–15 teeth, with numerous denticles extending from near the base to the apex. *C. thalassius* Theo.
- Anal papillae not very short. [5]
- (5) Siphon about four to six times as long as its basal width. [7]
- Siphon 8–9 times as long as its basal width. [6]
- (6) Siphon 8 × 1, pecten with 12–15 teeth; larvae in life usually green. *C. decens* Theo.
- Siphon about 8–9 × 1, pecten with about 14 teeth; larvae in life pale with median dark longitudinal band. *C. salisburyensis* Theo.
- (7) Siphon scarcely 4 × 1; pecten teeth averaging nine. *C. fatigans* Wied.
- Siphon about 5–7 × 1. [8]
- (8) Siphon about 7 × 1; pecten consisting of 12–15 teeth with longish basal denticles. *C. pipiens* L.
- Siphon about 7 × 1; pecten consisting of about nine simple teeth. *C. theileri* Theo.
- (9) Siphon with a more or less dark ring at one-third, hair-tufts very long; head very dark. *C. quasigelidus* Theo.
- Siphon unicolorous, hair-tufts short and inconspicuous; head not very dark. [10]
- (10) Siphon less than half the length of abdomen; antennal tuft at or just before middle. [12]
- Siphon about half the length of abdomen. [11]
- (11) Pecten with only three teeth; antennal tuft just beyond middle. *C. bitaeniorhynchus* Giles.
- Pecten with six teeth, last two more detached. *C. univittatus* Theo.
- (12) Pecten with five teeth, very short and close together. *C. annulioris* Theo.
- Pecten with six teeth, arranged in an irregular row, with a simple hair at either end of the row. *C. consimilis* Newst.

1. CULEX QUASIGELIDUS Theobald (1903).

Lasioconops poecilipes Theo. (1903).

Culex taeniorhynchoides Giles (1904).

Pseudoheptaphlebomyia madagascariensis Vent. (1905).

Culex par Newst. (1907).

Taeniorhynchus tenax var. *maculipes* Theo. (1907).

Aporoculex punctipes Theo. (1907).

Leucomyia quasigelida Theo. (1907).

Theobald, Mon. Culic., III, pp. 181, 236 (1903); Vol. IV, pp. 316, 488 (1907). Rep. Liverp. Sch. Trop. Med. Mem. IV, App. p. 1 (1901). First Rep. Wellc. Labs., Khartoum, p. 79 (1905). First Rep. Dir. Vet. Res., Union S. Afr., p. 271 (1911). Second ditto, p. 340 (1912).

Giles, Journ. Trop. Med., p. 369 (1904).

Ventrillon, *Bul. Mus. Paris*, XI, p. 427 (1905).

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

Edwards, *Bull. Ent. Res.*, Vol. II, Pt. iii, p. 258 (1911);
Vol. III, Pt. i, p. 29 (1912).

Kirkpatrick, *The Mosquitoes of Egypt*, pp. 107–111 (1925).
♂, ♀, larva, and pupa

Description of Adult:

Female.—*Head* covered with pale narrow-curved and black upright forked scales, a few ochreous forked scales sometimes present in front and white flat scales on the sides. Palpi black with a few white scales at apex. Proboscis black with a narrow pale median band. *Mesonotum* dark brown with dark reddish-brown narrow-curved scales and some yellow or pale grey ones on the anterior two-thirds; dark chaetae numerous. Scutellum with some pale narrow-curved scales. Pleurae with patches of pale flat scales. *Abdomen* dark brown, with or without pale basal bands; the sixth segment sometimes with prominent white lateral basal spots, and the seventh sometimes with white scales on the lateral margins and a few pale median apical ones. *Legs* brown; femora and tibiae with rows of sharply defined white spots; first four joints of tarsi pale-banded at both ends of the segments, the apical bands being inconspicuous. Wing-scales dark. *Length* 4 mm.

Male.—Resembles the female. The palpi with a broad yellow band at apex and four equidistant yellow bands below.

Theobald records numerous specimens collected in mosquito-traps at Onderstepoort during the months of March to May, 1910, and 1911. Since then it has been by no means common here, only three females having been taken. Dr. Ingram has collected specimens at Brits, Prince's Hill, and Letaba in the Transvaal, and at Hlululuwe and Gingindhlovu in Zululand. It has also been recorded from Angola, Madagascar, Congo Free State, Nyasaland Protectorate, Uganda, N. Nigeria, S. Nigeria, Gambia, Gold Coast, Egypt, and the Sudan.

Ingram and Macfie (26) found larvae in West Africa breeding along with larvae of other species in a small pool covered with the water-weed *Pistia stratiotes*.

2. *CULEX CONSIMILIS* Newstead (1907).

Culex pseudoannulioris Theobald (1910).

Taeniorhynchus tenax Theo. (1903) (part).

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

Theobald, *Mon. Culic.*, v, p. 333 (1910).

Edwards, *Bull. Ent. Res.*, Vol. II, Pt. 3, p. 259 (1911); Vol.
III, Pt. 1, p. 29 (1912).

Female.—*Head* with yellow narrow-curved scales, dark brown upright forked scales, and white flat scales on the sides. Palpi black. Proboscis black with a pale median band. *Mesonotum* with dark brown narrow-curved scales and yellow or greyish ones on the anterior two-thirds. Scutellum with yellow narrow-curved scales. Pleurae with patches of pale flat scales. *Abdomen* dark with lateral pale spots; venter with pale basal bands. *Legs* dark brown; femora and tibiae marbled; tarsi with pale bands, including both ends of the joints. *Length* 5 mm.

Distribution.—Natal, Kenya Colony, Congo Free State, Uganda, Gold Coast, Sierra Leone, S. Nigeria, Ashanti, Sudan.

The larvae have been described by Macfie and Ingram (Bull. Ent. Res., VII, Pt. 1, p. 12, 1916) from specimens collected in masses of filmy algae in clear water in the Gold Coast. Apparently there is little difference between the larvae of this species and those of *C. annulioris*.

3. *CULEX BITAENIORHYNCHUS* Giles (1901).

Taeniorhynchus ager Giles (1901).

Culex infula Theo. (1901).

Taeniorhynchus tenax Theo. (1901) (part).

Grabhamia ambigua Theo. (1903).

Grabhamia taeniarostris Theo. (1907).

Oculeomyia sarawaki Theo. (1907).

Culex ager var. *aethiopicus* Edwards (1912).

Giles, J. Bomb. Nat. Hist. Soc., XIII, p. 607 (1901).
Entom., XXXIV, p. 196 (1901).

Theobald, Mon. Culic., Vol. I, p. 370 (1901); Vol. II, p. 198 (1901); Vol. III, p. 248 (1903); Vol. IV, pp. 299 and 515 (1907).

Edwards, Bull. Ent. Res., Vol. III, i, p. 30 (1912); Vol. IV, p. 231 (1914).

This species resembles *C. annulioris* Theo., but can be easily distinguished by the characters given in the table; also the wing-scales are mainly larger and the pale band on the proboscis does not appear to be as broad in the female. The larva has been figured by Edwards (Bull. Ent. Res., III, iv, p. 380, f. 6, 1912).

Distribution.—This species is widely distributed in the Ethiopian region, and occurs throughout the Oriental region. We obtained one female and three males at Onderstepoort on the 9th January, 1917. Dr. Ingram has collected specimens at Brits and Letaba in the Transvaal, also on the Hluhluwe River in Zululand.

Breeding Places.—Macfie and Ingram (28) state that they found the larvae in the Gold Coast embedded in filmy algae. They are often found in polluted water.

4. *CULEX ANNULIORIS* Theobald (1901).

Culex neirti Ventrillon (1906).

Theobald, Liverp. Sch. Trop. Med., V, App. (1901). Mon.

Culic., Vol. 1, p. 371 (1901); Vol. III, p. 163 (1903);

Vol. V, p. 336 (1910). First Rep. Dir. Vet. Res., Union

S. Afr., p. 261 (1911); 2nd ditto, p. 328 (1912).

Ventrillon, Bull. Mus. Paris, XII, p. 103 (1906).

Edwards, Bull. Ent. Res., II, Pt. 3, p. 259 (1911); Vol III,

Pt. 1, p. 30 (1912); *ibid.*, p. 384 (1912). Larva.

Macfie and Ingram, Bull. Ent. Res., XIII, iv, p. 434 (1923).

Larva and pupa.

Description of Adult:

Female.—Head with pale narrow-curved scales, dark, and a few light forked scales, and white flat ones at the side. Palpi black with

some white scales at the apex. Proboscis dark with a broad median pale band. *Mesonotum* with dark brown narrow-curved scales and numerous light ones on the anterior two-thirds. Chaetae dark and pale; scutellum with pale narrow-curved scales; pleurae with patches of pale flat scales. *Abdomen* dark brown, each segment except first with a pale triangular basal spot, and pale lateral apical spots. *Legs* dark brown; femora and tibiae mottled; tarsi with pale bands, including both ends of the joints. *Wing-scales* mainly dark with a few scattered pale ones. *Length* 5-6 mm.

Male.—Resembles the female, except that the band on the proboscis is not quite so broad. The palpi have two pale bands on the first segment, a narrow one near the base and a broader one in front of it; second and third segments with small white basal bands—the latter with a broad apical one.

Distribution.—Johannesburg, Brits, Elim, Vaalwater (coll. A. Ingram), Onderstepoort, Transvaal; the Vaal River Barrage, O.F.S. (coll. A. Ingram); Kingwilliamstown, Stellenbosch, Cape Province; Weenen (coll. H. P. Thomasset); Jacobs, Tugela, Natal (coll. A. Ingram), Felixton, Empangeni, Begamusi Drift, and Hluhluwe River (coll. A. Ingram), also in the Mhlatuse Settlement (G.A.H.B.), Zululand; Salisbury, S. Rhodesia; Angola; Mauritius; Madagascar; Gambia; S. Nigeria; Gold Coast (Macfie and Ingram).

Seasonal Prevalence.—Adults have been collected at Onderstepoort during the months of January to May. It is not a common mosquito here.

The larva has been figured by Edwards (Bull. Ent. Res., III, Pt. 4, p. 382, f. 7 (1912).

Macfie and Ingram (28) state that they usually found the larvae firmly embedded in algae in the Gold Coast.

5. *CULEX THALASSIUS* Theobald (1902).

Culicelsa accraensis Theo. (1910).

Culicelsa neotaeniorhynchus Theo. (1910).

Theobald, Rep. Liverp. Sch. Trop. Med., Mem. 10, App. p. VIII (1902). Mon. Culic., Vol. III, p. 168 (1903);

Vol. v, pp. 317, 320 (1910).

Edwards, Bull. Ent. Res., Vol. II, Pt. 3, p. 261 (1911); Vol.

VII, Pt. 3, p. 225 (1917). Ann. Durban Mus., Vol. I,

Pt. 2, p. 164 (1915).

Description of Adult:

Female.—*Head* with pale yellow narrow-curved and black upright forked scales and some flat white ones at the sides. Palpi black. Proboscis black with a narrow median pale band. *Mesonotum* with brown narrow-curved scales. Scutellum with yellowish-brown curved scales. *Abdomen* black with either basal white bands or basal lateral white spots; venter clothed mainly with pale flat scales. *Legs* black; femora and tibiae with pale apical spots; tarsi with narrow pale basal bands, indistinct on the last two segments. *Wing-scales* brown. *Length* 4.5 mm.

Male.—Palpi brown, first segment with a narrow pale band near base and a wider one in front of it; second segment with a narrow basal band; third segment with a narrow basal band and a wider pale band at the apex.

Distribution.—Durban, Natal; Portuguese East Africa; Gambia; S. Nigeria; Gold Coast.

Seasonal Prevalence.—May at Durban.

6. *CULEX DUTTONI* Theobald (1901).

C. dissimilis Theo. (1901).

C. hirsutipalpis Theo. (1901).

C. anarmostus Theo. (1902).

C. bifoliata Theo. (1905) (part).

? *C. condylodesmus* Grünb. (1905).

C. albovirgatus Graham (1910).

Theobald, Rep. Liverp. Sch. Trop. Med., Mem. IV, App. p. V (1901); Mem. X, App. 1, p. VI (1902). Mon. Culic., Vol. I, pp. 376, 378 (1901); Vol. II, p. 318 (1901); Vol. III, pp. 162, 170 (1903); Vol. IV, pp. 395, 425 (1907). Jour. Econ. Biol., I, p. 31 (1905) (part). 1st Rep. Dir. Vet. Res., Union S. Afr., p. 261 (1911); 2nd ditto, p. 328 (1912).

Grünberg, Zool. Anz., 29, p. 385 (1905).

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

Edwards, Bull. Ent. Res., Vol. II, Pt. iii, p. 259 (1911); Vol. III, Pt. i, p. 31 (1912).

Wesche, Bull. Ent. Res., 1, Pt. 1, p. 34 (1910) (Description of larva and pupa).

Female.—Head with pale yellow narrow-curved scales, brown upright forked scales, and flat ones at the sides. Palpi covered with black scales and a few white ones on the inner margins. Proboscis black with a broad ill-defined median pale band. *Mesonotum* with golden and dark brown curved scales and golden and dark chaetae. *Abdomen* dark brown, each segment except first with a pale basal band, the bands being broadest in the middle; venter mostly covered with pale scales. *Legs* dark brown; tibiae with a narrow pale apical spot and mid tibiae with a white lateral stripe; tarsi with narrow pale basal and apical bands. *Wing-scales* dark brown. *Length* 5 mm.

Male.—Palpi with two pale bands on the first segment, a narrow one near the base and a broader one in front of it; second segment with a narrow white basal band and a line of white scales on the under side; third segment with a narrow basal band and a few pale scales at the apex.

Distribution.—We have taken it at Onderstepoort, and Dr. Ingram has collected specimens in the following localities:—Elim, Vetfontein, and Prince's Hill in the northern Transvaal; Jacobs, Tugela, Natal; Gingindhlovu, Mkuse River, and Hluhluwe River, Zululand. It has also been recorded from Salisbury, S. Rhodesia, Nyassaland, and throughout West Africa.

Time of Appearance.—Adults and larvae have been collected at Onderstepoort during the months of January to April.

Observations.—Larvae have been found in barrels and pools at Onderstepoort. Dr. Graham found them in barrels, tubs, and pools in West Africa during the months of June to August. They can be easily distinguished by a broadish dark or black ring on the siphon near the apex.

7. *CULEX THEILERI* Theobald (1903).

C. onderstepoortensis Theo. (1911).

C. tipuliformis Bedf., nec Theobald (1918). Larva.

Theobald, Mon. Culic., Vol. II, p. 325 (1901); Vol. III, p. 187 (1903); 1st Rep. Dir. Vet. Res., Union of S. Afr., pp. 262–265 (1911); 2nd ditto, pp. 329–334 (1912).

Edwards, Bull. Ent. Res., Vol. II, Pt. 3, p. 262 (1911); Vol. III, Pt. 1, p. 31 (1912); Ann. Durban. Mus., Vol. 1, Pt. 1, p. 164 (1915).

Bedford, 5th and 6th Rep. Dir. Vet. Res., Union of S. Afr., p. 741 (1918). Larva.

This species has been confused with *C. tipuliformis* Theo. which occurs in Asia and North Africa. They can be distinguished from each other by the male genitalia.

Description of Adult:

Female.—*Head* with pale creamy narrow-curved scales, yellow and brown upright forked scales, white flat ones at the side and pale ones round the margins of the eyes. Palpi dark brown with a few pale scales. Proboscis brown, darker at base and apex. *Mesonotum* with golden-brown narrow-curved scales and some pale ones behind; black and brown chaetae present on the sides. Scutellum with pale narrow-curved scales. Pleurae with patches of white flat scales. *Abdomen* dark brown with basal pale bands, the bands being broadest in the middle, and with a few white scales on the lateral margin; venter mainly covered with pale flat scales. *Legs* dark-brown; femora and tibiae with a narrow white stripe which is more or less broken up into spots on the fore legs; tibiae with a pale spot at apex; tarsi unbanded. *Wing-scales* dark brown. *Length* 5 mm.

Male.—First segment of palpi with a narrow pale band near base; second with a pale spot at base and a line of white scales on the under side; third segment with a pale spot at base.

Distribution.—Capetown (coll. Colonel Robertson), Uitenhage (*vide* Edwards), Mafeking (coll. A. Ingram), Cape Province; Vaal River Barrage (coll. A. Ingram), Bloemfontein, O.F.S. (J. C. Faure); Weenen (coll. H. P. Thomasset), Durban, Natal. In the Transvaal it has been taken at Pretoria, Onderstepoort, Roberts Heights, and Dr. Ingram has collected specimens at Johannesburg, Brits, Sterkfontein, Basinghall, Vaalwater, and Letaba.

Seasonal Prevalence.—Adults have been collected at Onderstepoort throughout the year.

Observations.—The larvae have been taken here in pools, dipping-tanks, and streams in which the water was either stationary or flowing slowly.

8. *CULEX UNIVITTATUS* Theobald (1901).

Heptaphlebomyia simplex Theobald (1903).

Heptaphlebomyia montforti Ventrillon (1905).

Culex ataeniatus Theobald (1911).

Culex goughii Theobald (1911) (female only).

Theobald, Mon. Culic., Vol. II, p. 29 (1911); Vol. III, pp. 199, 337 (1903); Vol. IV, pp. 531, 536 (1907). First Rep. Dir. Vet. Res., Union of S. Afr., pp. 261, 268 (1911).

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

Edwards, Bull. Ent. Res., Vol. II, iii, p. 262 (1911); Vol. III, i, p. 32 (1912); Vol. V, i, p. 67, fig. 5 (male hypopygium) (1914). Ann. Durban. Mus., I, i, p. 166 (1915).

Description of Adult:

Female.—*Head* clothed with cream-coloured curved scales, brown forked scales, white flat scales at the sides, and a line of white curved scales round the eye-margins. Proboscis brown, sometimes pale in the middle. Tori with a few white flat scales on the inner sides. Palpi black with a few white scales. *Mesonotum* clothed with golden curved scales, and some paler ones in front of the scutellum. Scutellum with pale curved scales. Pleurae with patches of white flat scales. *Abdomen* dark brown, first segment with a patch of dark scales in the middle; second to sixth segment with narrow white basal bands. *Legs*.—Femora pale, dark brown above with a white spot at the apex; tibiae with a narrow white stripe and a white band at the apex; tarsi dark brown, unbanded. *Wings* clothed with brown scales; seventh vein more distinct than usual, and generally bearing a few scales. *Length* 3.5–4 mm.

Male.—Palpi dark brown, first joint with a narrow white band before the middle; last two joints with a row of white scales on the under side.

This is a small species resembling *C. simpsoni* Theo., from which it can be easily distinguished by the white stripes on the tibiae and by the seventh vein being more distinct and bearing as a rule a few scales. The proboscis sometimes shows traces of a pale band in the middle, and in one specimen we examined, which was caught at Onderstepoort, the band was quite distinct. We have no hesitation, therefore, in sinking *C. ataeniatus* Theobald as a synonym of this species, especially as the type was taken here and as Edwards came to the conclusion it was only a variety of this species.

Distribution.—Johannesburg, Brits, Elim, Vetfontein, Prince's Hill, Basinghall, Vaalwater, Sterkfontein (coll. A. Ingram), Onderstepoort, Transvaal; Weenen (coll. H. P. Thomasset), Durban, Natal; Candover (coll. A. Ingram), Mhlatuse Settlement, Zululand; Vaal River Barrage (coll. A. Ingram), Bloemfontein, O.F.S. (coll. J. C. Faure); Mafeking, C.P. (coll. A. Ingram); Angola; Salisbury, S. Rhodesia; N.E. Rhodesia; Nyasaland; Kenya Colony; Mauritius; N. and S. Nigeria; Gambia; Gold Coast; Sudan.

Seasonal Prevalence.—Adults have been taken at Onderstepoort during the months of January to May, and Edwards records specimens taken at Durban in February, May, June, and October. We found this species common at the Mhlatuse from the 4th to 14th April, 1923. The specimens were caught on animals in thick bush at night and also early in the morning between 6 and 6.30 o'clock.

Breeding Places.—Larvae have been collected at Onderstepoort in streams in which the water was either stationary or flowing slowly. Edwards records a male from Durban bred from a larva collected in a pool.

9. *CULEX PIPIENS* Linné (1758).

Synonymy.—This species has been described under a great many names. It seems hardly necessary to give a list of all these names.

References :

Linné, Syst. Nat. Ed., X, p. 602 (1758).

Theobald, Mon. Culic., II, p. 132 (1901).

Edwards, Bull. Ent. Res., IV, i, p. 52, fig. 3 (male hypopygium) (1913). Ann. Durban Mus., I, ii, p. 165 (1915).

Kirkpatrick, The Mosquitoes of Egypt, pp. 133–136 (1925.) ♂, ♀, larva. and pupa.

Description of Adult :

Female.—Head clothed with golden narrow-curved scales, brown upright forked scales behind and a patch of white flat scales at the sides. Tori without scales. Proboscis dark brown. Palpi blackish-brown with some pale scales. *Mesonotum* clothed with narrow-curved golden-brown scales and slightly paler ones in front of the scutellum. In front there is a pair of bare admedian lines, and an indistinct pair outside these extending to the scutellum.

Legs mainly blackish-brown; coxae yellow with a few pale scales; femora yellow, dark above, with a narrow white band at the apex; tibiae dark with a yellow band at the apex; tarsi entirely dark.

Abdomen blackish-brown, usually with basal yellow bands which widen out laterally and extend down the side margins; first segment bare except for a patch of dark scales in the middle. Venter yellow with a few dark scales in the middle of the segments.

Wings clothed with brown scales. The stem of the first forked cell is usually about one-seventh the length of the cell.

Male.—Palpi dark brown, first segment with a narrow pale band one-third from the base; last two joints with a line of white scales on the under surface. Abdominal bands slightly broader than in the female.

Edwards has pointed out that the abdominal bands of the females from African localities are very variable, which is not the case with European specimens. In normal specimens the bands are well marked, but in some African specimens these are reduced to inconspicuous pale lateral spots, and every gradation may be found between these two extremes. It is closely related to *Culex fatigans* Wied.

Distribution.—This is the commonest mosquito in Europe, and it is also common in North Asia and North America. In South Africa it has been recorded from Durban and Stellenbosch, C.P., by Edwards and Dr. Robertson has sent us a large series from Capetown. Dr. Ingram has collected specimens at Johannesburg, Roberts Heights, Vaalwater, Elim, and Tzaneen in the Transvaal; the Vaal River Barrage in the O.F.S., and at Eshowe and on the Hluhluwe River in Zululand. Specimens have also been taken at Weenen, Natal (coll. H. P. Thomasset). It is also common in Kenya Colony and North Africa (*vide* Edwards).

Seasonal Prevalence.—September and October in Durban.

Habits.—This species is essentially a house-mosquito, and the larvae breed mainly in tubs, water-barrels, etc. In England the adults hibernate throughout the winter in cellars, out-houses, etc.

10. *CULEX fatigans* Wiedemann (1828).

Synonyms.—*Culex aestuans* Wied (1828); *Culex pallipes*.

Meigen (1838); *Culex anxifer* (coquerel) Bigot (1859); *Heteronycha dolosa* Arribalzaga (1896); *C. quasipipiens* Theo. (1901); *C. fouchowensis* Theo. (1901); ? *C. reesii* Theo. (1901); ? *C. sericeus* Theo. (1901); *C. osakensis* Theo. (male only) (1907); *C. christophersi* Theo. (1907); *C. quinquefasciatus* D. and K. (1909); *C. goughii* Theo. (male only) (1911).

References:

Wiedemann, Auss. Zweifl. Ins., p. 10 (1823).

Theobald, Mon. Culic., Vol. II, pp. 136, 145, 147, 151 (1901); Vol. IV, pp. 439, 453 (1907). First Rep. Dir. Vet. Res., Union of S. Afr., p. 268 (1911).

Edwards, Bull. Ent. Res., IV, i, p. 55, f. 4 (male hypopygium) (1913). Ann. Durban Mus., I, ii, p. 165 (1915).

This species is closely related to *Culex pipiens* Linné and is very difficult to distinguish unless the male hypopygium is examined. The scales on the mesonotum are ochreous, whereas in *C. pipiens* they are usually darker, and the stem of the first fork cell is usually more than quarter the length of the cell, whereas in *C. pipiens* the stem is usually about one-seventh the length of the cell, but these characters are variable and cannot always be relied upon.

Distribution.—This species is common and widely distributed throughout the tropics and sub-tropics. Edwards gives the following African localities for this species:—Capetown and Vryburg, Cape Province; Durban, Greenwood Park, and Pietermaritzburg, Natal; Onderstepoort, Transvaal; Nyasaland; Kenya Colony; Uganda; Zanzibar; Somaliland; Sudan; Belgian Congo. It also occurs in West Africa. We have received specimens from Roberts Heights, Pretoria, Potchefstroom, Transvaal, Capetown, and Durban, and took a female, presumably this species, in the Mhlatuse Settlement on the 5th April, 1923. Dr. Ingram collected specimens at the following localities in Zululand:—Gingindhlovu, Empangeni, Umfolosi River, Candover. Also at Johannesburg and Tugela, Natal. It has also been taken at Weenen, Natal (coll. H. P. Thomasset).

Seasonal Prevalence.—The adults are found throughout the year.

Habits.—Like the preceding species, this species is essentially a house mosquito, and is rarely found far from habitations. The adults are more vicious biters than those of *C. pipiens*, and like them are nocturnal in habits. They have only been taken in the mosquito-traps at Onderstepoort on a few occasions, and I have also taken them here in pigeon-cotes during the day. The larvae are found in similar situations as those of *C. pipiens*.

Economic Importance.—This species is a carrier of *Filaria bancrofti*, and is also a transmitting agent of bird malaria to birds. It was with this species that Sir Ronald Ross first worked out the complete life-cycle of a malarial parasite.

11. *CULEX PALLIDOCEPHALUS* Theobald (1904).

Culex stoehri Theobald (1907).

Theobald, First Rep. Wellc. Labs., Khartoum, p. 73 (female only), 1904. Mon. Culic., Vol. IV, pp. 419, 434 (1907); Vol. V, p. 374 (male only), 1910.

Edwards, Bull. Ent. Res., IV, i, p. 56, fig. 5 (male hypopygium), 1913. Ann. Durban Museum, I, ii, p. 165 (1915).

This species is closely related to the two preceding, but can be easily distinguished by the thorax, which, instead of being almost uniformly reddish-brown, is dark brown and clothed with dark brown scales, and with a variable number of yellowish ones on the margins of the posterior third or half of the mesonotum and in front of the scutellum; also with two more or less defined spots near the middle of the mesonotum, connected with the pale patch in front of the scutellum. The proboscis is black with some paler scales on the ventral surface in the middle.

Distribution.—Greenwood Park, near Durban, Natal; Kenya Colony; Uganda, Nyasaland; Sudan.

Seasonal Prevalence.—Three females collected at Greenwood Park on the 27.9.1914 (*vide* Edwards).

The habits of this species are probably the same as *C. pipiens* and *C. fatigans*.

12. *CULEX TRIFILATUS* Edwards (1914).

Edwards, Bull. Ent. Res., V, i, p. 65, f. 1 (male genitalia), 1914. Ann. S. Afr. Mus., XIX, i, p. 160 (1924).

This species is closely allied to *C. pallidocephalus* Theo. Edwards gives the following differences:—Yellow upright forked scales on the head more numerous (in *C. pallidocephalus* they are mostly brown); male palpi slightly shorter, longer than proboscis by last joint only, and with no white scales on the under surface of the terminal joint towards the apex; proboscis entirely black; apical bands on ventral segments of abdomen more distinct and blacker; femora with the ventral aspects darker. It can also be distinguished by the male hypopygium.

Distribution.—Recorded from Kenya Colony and Capetown, C.P.

13. *CULEX SIMPSONI* Theobald (1905).

Theobald, Jour. Econ. Biol., I, p. 23 (1905). Mon. Culic., IV, p. 441 (1907).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 263 (1911); Vol. III, i, p. 33 (1912); Vol. IV, i, p. 58 (1913); Vol. V, i, p. 67, f. 3 (male hypopygium), 1914. Ann. Durban Mus., I, ii, p. 166 (1915).

This is a small species resembling *C. decens* Theo., from which it can be distinguished by the male genitalia; the scales on the mesonotum being partly bronze-brown and partly brassy, the latter often predominating, and by the presence of a line of white scales on under side of the last two joints of the male palpi.

Distribution.—Onderstepoort, Transvaal; Durban, Natal; Salisbury, S. Rhodesia; Kenya Colony.

Dr. Ingram has collected specimens at Brits and Prince's Hill in the Transvaal, at Tugela in Natal, and Gingindhlovu, Felixton, Umfolosi River, Mkuse River, Candover, Incamana River, and on the Hluhluwe River in Zululand. Mr. H. P. Thomasset has also taken specimens at Weenen in Natal.

Seasonal Prevalence.—Adults have been collected at Onderstepoort throughout the year, except during the months of July and August. Edwards records two specimens taken at Durban in June.

Habits.—Adults have been collected at Onderstepoort in mosquito-traps containing horses, and also occasionally in houses. Larvae have been found here breeding in a tub containing rain-water, also in rock pools.

14. *CULEX DECENS* Theobald (1901).

Culex masculus Theobald (1901).

Culex minutus Theobald (1905).

Culex bifoliata Theobald (1905) (Part).

Culex nigrocostalis Theobald (1910).

Culex lividocostalis Graham (1910).

Heptaphlebomyia simplex Theobald (1907).

Theobald, Rept. Liverp. Sch. Trop. Med., Mem. LV, App. p. vii (1901). Mon. Culic., Vol. II, pp. 125, 334 (1901); Vol. IV, pp. 445, 533 (1907); Vol. V, p. 367 (1910). Jour. Econ. Biol., I, p. 30 (1905). First Rep. Dir. Vet. Res., Union of S. Afr., p. 267 (1911). 2nd ditto, p. 335 (1912).

Graham, Ann. Mag. Nat. Hist. (8), V, p. 269 (1910).

Edwards, Bull. Ent. Res., II, iii, p. 263 (1911).

Description of Adults:

Female.—*Head* clothed with yellowish-white narrow-curved scales, paler ones round the eye-margins; dark upright forked scales and a patch of white flat scales on each side. Palpi black. Proboscis brownish-black. *Mesonotum* clothed with reddish-brown narrow-curved scales. Scutellum with a few pale narrow-curved scales. Pleuræ with patches of white flat scales. *Legs* dark brown; coxæ and ventral aspect of femora pale; apices of femora and tibiae with small white spots. *Abdomen* blackish-brown with basal white bands; first segment with two median patches of black scales. *Wings* clothed with brown scales. *Length* about 3–4 mm.

Male.—Palpi blackish-brown with a narrow pale band near the base, but last two joints without a line of white scales on the under surfaces.

Edwards states that he cannot detect any difference between the male hypopygium of this species and of *C. invidiosus* Theo., a West African variety. He gives an excellent figure of the hypopygium of *invidiosus* in the Bull. Ent. Res., V, i, p. 70, f. 9 (1914).

Distribution.—Brits, Prince's Hill (coll. A. Ingram), Onderstepoort, and Witbank, Transvaal; Uganda; Sierra Leone; N. and S. Nigeria; Gold Coast; Sudan.

Seasonal Prevalence.—Adults have been taken at Onderstepoort throughout the year, except during the month of July. It is, however, more prevalent during the summer months.

Breeding Places.—Larvae have been found at Onderstepoort breeding in tubs, and we have received adults from Dr. C. K. Brain collected in a coal mine at Witbank 300 feet below the surface of the ground.

15. *CULEX SALISBURIENSIS* Theobald (1901).

Culex bostocki Theobald (1905).

Theobald, Mon. Culic., Vol. II, p. 112 (1901); Vol. III, p. 221 (1903); Vol. IV, p. 444 (1907). Jour. Econ. Biol., I, p. 29 (1905). First Rep. Dir. Vet. Res., Union of S. Afr., p. 270 (1911).

Edwards, Bull. Ent. Res., II, iii, p. 264 (1911).

Bedford, 5th and 6th Repts. Dir. Vet. Res., Union of S. Afr., p. 742, f. 5 (description and figure of larva), 1918.

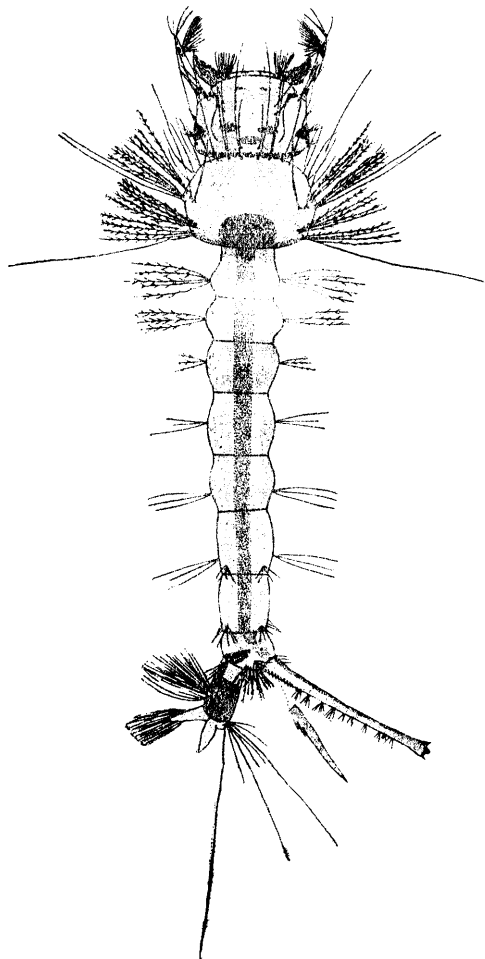


Fig. 6.—LARVA OF *Culex salisburyensis* THEOBALD.

Description of Adults:

Female.—*Head* clothed with pale yellow narrow-curved scales, paler ones round the eye-margins; dark upright forked scales and a patch of white flat scales on each side. Palpi black, apical segment short and broad. Proboscis black, scarcely longer than the front femora. *Mesonotum* clothed with narrow-curved golden and golden-brown scales. Scutellum with pale narrow-curved scales. Pleurae with patches of white flat scales. *Legs* dark brown, coxae and ventral aspect of femora yellow, the latter with a pale spot at their apices. *Abdomen* blackish-brown; first segment brown with two small patches of pale scales in the middle and numerous yellowish bristles; second to seventh segments with narrow pale apical bands. *Wings* clothed with brown scales. *Length* about 3 to 4 mm.

Male.—Palpi longer than proboscis, dark brown with a narrow pale band near the base; last two joints hairy with indistinct basal pale bands.

Distribution.—Brits (coll. A. Ingram), Onderstepoort, and Pretoria, Transvaal; Oudebosch, C.P.; Weenen, Natal (coll. H. P. Thomasset); Gingindhlovu and Eshowe, Zululand (coll. A. Ingram); Salisbury, S. Rhodesia.

Seasonal Prevalence.—Adults have been collected at Onderstepoort in mosquito-traps containing horses throughout the year.

Breeding Places.—Larvae have been collected at Onderstepoort in pools and in streams in which the water was either stationary or flowing slowly.

16. *CULEX PÉRENGUEYI* Edwards.

Culex (Neoculex) pérengueyi Edwards.

Edwards, Ann. S. Afr. Mus., XIX, i, p. 162 (1924).

This species was described from a single male collected in Capetown. It resembles *C. salisburyensis* Theo., but can be distinguished by the following characters:—Proboscis nearly one-third longer than the front femora; palpi about one-fourth shorter than the proboscis, almost devoid of hairs, penultimate segment rather longer than the terminal, mesonotum clothed with rather large light ochreous curved scales. Other differences are also to be found in the hypopygium.

17. *CULEX RIMA* Theobald (1901).

Melanoconion rimus Theobald (1903).

Theobald, Mon. Culic., Vol. II, p. 327 (1901); Vol. III, p. 240 (1903).

Edwards, Bull. Ent. Res., Vol. II, p. 265 (1912); Vol. XIII, i, p. 86 (1922).

This species resembles *C. salisburyensis* Theo., but can be distinguished by the following characters:—The palpi of the female are long and thin—about three times as long as the clypeus, the last segment being longer than the basal segments together. The narrow-curved scales on the head are slightly paler. The scales on the mesonotum are of a uniform brown colour, except on the anterior-margin, where they are pale. The pleurae are pale with a dark broad band adjoining the margin of the mesonotum, and another similar shorter

band running below and parallel with the upper one. Abdomen with pale apical lateral spots on the fifth to seventh segments, and with pale apical bands on the second to fifth segments; the latter may be indistinct or absent. Wings with the scales on the subcosta and first four long veins much broader.

Distribution.—Recorded from Ashanti, S. Nigeria, Lagos, Congo Free State, and Uganda. The writer collected a female in a tent in the Mhlatuse Settlement, Zululand, on the 21st February, 1923, one on the 22nd, and a male on the 23rd.

Breeding Grounds.—Dalziel records finding the larvae of *C. insignis* Carter, which at the most is only a variety of *C. rima*, in the holes of land-crabs in Lagos.

18. CULEX PULCHRITHORAX Edwards (1914).

Pseudohowardina lineata Theo. (1912), nec *C. lineatus* v. Humboldt (1820).

Howardina (?) *lineata* (Theo.) Edw. (1912).

Theobald, Entomologist XLV, p. 92 (1912). Second Rep. Dir. Vet. Res., Union S. Afr., p. 319 (1912).

Edwards, Bull. Ent. Res., III, 1, p. 13 (1912), v, 1, p. 73 (1914).

Description of Adults :

Female.—*Head* dark, with a line of white scales in the middle and round the margins, also a few scattered white ones behind; dark upright forked scales numerous, also a few dark chaetae present. Palpi short with black and white scales. Proboscis dark with a narrow line of white scales above.

Mesonotum dark brown with dark narrow-curved scales, and with three narrow yellow longitudinal lines, the median line divided into two in front of the scutellum, and a white line on each side; dark brown chaetae numerous. Scutellum with narrow yellow scales. Pleurae with patches of white scales arranged in lines.

Abdomen clothed with dark flat scales; sixth and seventh segments with lateral apical spots; white scales on venter more numerous.

Legs dark, femora and tibiae with a narrow white line, the former also with a white apical spot. *Wing-scales* dark brown. *Length* 3.5–4.5 mm.

Male.—Resembles the female, except that the palpi are brown, not quite as long as proboscis, and said to be two-jointed; the white scales on dorsum of abdomen are also more numerous.

This species can be easily distinguished by the presence of the yellow and white lines on the mesonotum. Described from three females and one male collected in mosquito-traps at Onderstepoort in August, 1910 and 1911. I have since taken a female here in a bathroom on the 13th October, 1914. Edwards has recorded a single female collected by Dr. G. A. K. Marshall at Ulundi, Natal (5,000–6,000 feet) in September, 1896.

19. CULEX INCONSPICUOSUS Theobald.

Aedes inconspicuus Theobald (1908).

Micraëdes (?) *inconspicuus* (Theo.) Edwards (1912).

- Theobald, Entom., XLI, p. 109 (1908). Mon. Culic., V, p. 483 (1910).
 Edwards, Bull. Ent. Res., Vol. III, i, p. 34 (1912); Vol. XIII, i, p. 88 (1922).
 Macfie and Ingram, Bull. Ent. Res., XIII, iv, p. 441, f. 25 (1923). Pupa.

Description of Adults :

Female.—Head dark brown, clothed with ochreous and brown flat scales, ochreous upright forked scales behind and brown ones in front. Palpi short, barely one-sixth the length of proboscis. Proboscis dark brown. *Mesonotum* dark brown, clothed with pale brown narrow-curved scales. Scutellum with some pale narrow-curved scales. *Legs* dark brown, unbanded; ungues equal and simple.

Abdomen dark brown with dull violet reflections; venter pale at the bases of the segments.

Wings with long thin brown lateral vein-scales. *Length* 3 mm.

Male.—Palpi short, about the same length as in the female. Abdominal segments deeply constricted at the base, and the scales on the apical edges show dull ochreous reflections. Ungues simple; those of the fore and mid legs unequal.

Distribution.—It was described from a female and male collected by the late Mr. Simpson in the Transvaal. Dr. Ingram has collected specimens at Brits and Tzaneen in the Transvaal; Tugela, Natal; and at Gingindhlovu, Eshowe, Empangeni, Umfolosi River, Candover, and on the Incamana River in Zululand.

Edwards has recorded it from the Congo, Uganda, and S. Nigeria, and Macfie and Ingram from the Gold Coast.

Breeding Places.—Dalziel records finding the larvae in the hole of a land-crab in Lagos.

Sub-genus CULICIOMYIA Theobald.

Culiciomyia Theobald, Mon. Culic., IV, p. 227 (1907).

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

This sub-genus may be distinguished by the head in both sexes having a narrow row of small flat scales round the eye-margins, and the male palpi with a row of long scales, widened about the middle and sharply pointed at the apex, projecting inwards from the the apical half or more of the long joint. Other distinguishing characters are to be found in the male hypopygium. Three species have been found in Africa, one of which occurs in South Africa.

20. CULEX (CULICIOMYIA) NEBULOSUS Theobald (1901).

? *Culex invenustus* Theobald (1901).

Culex pseudocinereus Theobald (1901).

? *Culex nigrochaetae* Theobald (1901) (female).

Pectinopalpus fuscus Theobald (1910).

Theobald, Rep. Liverp. Sch. Trop. Med., Mem. IV, App., p. x (1901). Mon. Culic., Vol. II, pp. 60 (female), 62, 330, 331 (1901); Vol. V, p. 416 (1910). Ann. Mag. Nat. Hist. (8), V, p. 375 (1910).

Edwards, Bull. Ent. Res., Vol. II, iii, p. 254 (1911); Vol. III, i, p. 34 (1912); Vol. XIII, i, p. 89 (1922). Ann. Durban Mus., I, ii, p. 164 (1915).

Description of Adults:

Female.—Head dark brown, clothed with ochreous narrow-curved scales, dark upright forked scales, a patch of white flat scales at the sides, and a line of similar scales round the eye-margins. Proboscis and palpi blackish-brown. Antennae brown.

Mesonotum black, clothed with very narrow dark brown scales. Scutellum with very narrow-curved pale scales. Pleurae brown with patches of white flat scales. Legs blackish-brown; coxae pale with patches of white flat scales, femora pale on ventral surface.

Abdomen blackish-brown, without bands and with or without pale apical lateral spots. Wings with brown scales, those towards apex of wing clavate. Length about 5 mm.

Male.—Palpi about the same length as proboscis, clothed with blackish-brown scales, and some long scales projecting inwards on the apical half of the long joint; last two joints not very hairy.

Distribution.—Edwards has recorded specimens collected in the bush at Durban. The writer found this species common in a house at Ntabanana, Zululand, in 1922–23, and Dr. Ingram has taken it at Eshowe. Edwards has also recorded it from Salisbury, S. Rhodesia, Tanganyika Territory, Uganda, Belgian Congo, Sierra Leone, S. Nigeria, Gold Coast, Sudan.

Seasonal Prevalence.—Found throughout the summer at Ntabanana. Specimens collected at Durban in May and June.

Breeding Places.—Larvae were found breeding in large numbers in a latrine at Ntabanana.

LIST OF SPECIES OF MOSQUITOES FOUND IN SOUTH AFRICA.

Family CULICIDAE.

Tribe ANOPHELINI.

Genus ANOPHELES Meigen.

Sub-genus ANOPHELES Meigen.

1. ANOPHELES (ANOPHELES) MAURITIANUS Grandpré and Charmoy.

Sub-genus MYZOMYIA Blanchard.

2. ANOPHELES (MYZOMYIA) SQUAMOSUS Theobald.
3. ANOPHELES (MYZOMYIA) ARGENTEOLOBATUS (Gough).
4. ANOPHELES (MYZOMYIA) PHAROENSIS Theobald.
5. ANOPHELES (MYZOMYIA) JACOBI (Hill and Haydon).
6. ANOPHELES (MYZOMYIA) NATALENSIS (Hill and Haydon).
7. ANOPHELES (MYZOMYIA) PRETORIENSIS (Theobald).
8. ANOPHELES (MYZOMYIA) MACULIPALPIS Giles.
9. ANOPHELES (MYZOMYIA) RUFIPES (Gough).
10. ANOPHELES (MYZOMYIA) THEILERI Edwards.
11. ANOPHELES (MYZOMYIA) ARDENSIS (Theobald).
12. ANOPHELES (MYZOMYIA) GAMBIAE Giles.
13. ANOPHELES (MYZOMYIA) CINEREUS Theobald.
14. ANOPHELES (MYZOMYIA) NILI Theobald.
15. ANOPHELES (MYZOMYIA) RHODESIENSIS Theobald.
16. ANOPHELES (MYZOMYIA) FUNESTUS Giles.
17. ANOPHELES (MYZOMYIA) PITCHFORDI (Giles).
18. ANOPHELES (MYZOMYIA) MARSHALLI (Theobald).
19. ANOPHELES (MYZOMYIA) TRANSVAALENSIS (Carter).

Tribe CULICINI.

Genus URANOTAENIA Arribalzaga.

1. URANOTAENIA BILINEATA FRASERI Edwards.
2. URANOTAENIA ALBA Theobald.
3. URANOTAENIA CANDIDIPES Edwards.
4. URANOTAENIA FUSCA Theobald.
5. URANOTAENIA MASHONAENSIS Theobald.

Genus MEGARHINUS Rob-Des.

Sub-genus TOXORHYNCHITES Theobald.

1. MEGARHINUS (TOXORHYNCHITES) BREVIPALPIS Theobald.

Genus ERETMOPODITES Theobald.

1. ERETMOPODITES QUINQUEVITTATUS Theobald.
2. ERETMOPODITES CHRYSOGASTER Graham.

Genus MUCIDUS Theobald.

1. MUCIDUS MUCIDUS Karsch.
2. MUCIDUS SCATOPHAGOIDES Theobald.

Genus ARMIGERES Theobald.

1. ARMIGERES ARGENTEOVENTRALIS Theobald.

Genus AÆDES Meigen.

Sub-genus STEGOMYIA Theobald.

1. AÆDES (STEGOMYIA) VITTATUS (Bigot).
2. AÆDES (STEGOMYIA) ARGENTEUS (Poirét).
3. AÆDES (STEGOMYIA) SIMPSONI (Theobald).
4. AÆDES (STEGOMYIA) METALLICUS Edwards.
5. AÆDES (STEGOMYIA) PSEUDONIGERIA (Theobald).
6. AÆDES (STEGOMYIA) POWERI Theobald.

Sub-genus AÆDIMORPHUS Theobald.

7. AÆDES (AÆDIMORPHUS) CAPENSIS (Edwards).
8. AÆDES (AÆDIMORPHUS) PUNCTOTHORACIS (Theobald).
9. AÆDES (AÆDIMORPHUS) TARSALIS (Newstead).
10. AÆDES (AÆDIMORPHUS) ABNORMALIS (Theobald).
11. AÆDES (AÆDIMORPHUS) ALBOCEPHALUS (Theobald).
12. AÆDES (AÆDIMORPHUS) CUMMINI (Theobald).
13. AÆDES (AÆDIMORPHUS) QUASIUNIVITTATUS (Theobald).
14. AÆDES (AÆDIMORPHUS) DENTATUS (Theobald).
15. AÆDES (AÆDIMORPHUS) BEVISI Edwards.
16. AÆDES (AÆDIMORPHUS) HIRSUTUS (Theobald).
17. AÆDES (AÆDIMORPHUS) DURBANENSIS (Theobald).
18. AÆDES (AÆDIMORPHUS) NIGERIENSIS (Theobald).
19. AÆDES (AÆDIMORPHUS) OCHRACEUS (Theobald).

Sub-genus BANKSINELLA Theobald.

20. AÆDES (BANKSINELLA) LUTEOLATERALIS Theobald.
- AÆDES (BANKSINELLA) LUTEOLATERALIS FLAVINERVIS Edwards
21. AÆDES (BANKSINELLA) LINEATOPENNIS Ludlow.
- AÆDES (BANKSINELLA) LINEATOPENNIS CIRCUMLUTEOLA Theobald.

Sub-genus FINLAYA Theobald.

22. AÆDES (FINLAYA) BARNARDI Edwards.

Sub-genus OCHLEROTATUS Arrib.

23. AÆDES (OCHLEROTATUS) CABALLUS (Theobald).

Genus TAENIORHYNCHUS Arrib.

Sub-genus TAENIORHYNCHUS.

1. TAENIORHYNCHUS (TAENIORHYNCHUS) METALLICUS (Theobald).
2. TAENIORHYNCHUS (TAENIORHYNCHUS) CHUBBI Edwards.
3. TAENIORHYNCHUS (TAENIORHYNCHUS) AUREUS Edwards.
4. TAENIORHYNCHUS (TAENIORHYNCHUS) FUSCOPENNATUS Theobald.

Sub-genus *MANSONIOIDES* Theobald.

5. *TAENIORHYNCHUS* (*MANSONIOIDES*) *UNIFORMIS* Theobald.
6. *TAENIORHYNCHUS* (*MANSONIOIDES*) *AFRICANUS* Theobald.
7. *TAENIORHYNCHUS* (*MANSONIOIDES*) *MEDIOLINEATUS* Theobald.

Genus *THEOBALDIA* Neveu-Lemaire.Sub-genus *ALLOTHEOBALDIA* Brolemann.

1. *THEOBALDIA* (*ALLOTHEOBALDIA*) *LONGIAREOLATA* Macquart.

Genus *LUTZIA* Theobald.

1. *LUTZIA* *TIGRIPES* (Grandpré and Charmoy).

Genus *CULEX* Linné.

1. *CULEX* *QUASIGELIDUS* Theobald.
2. *CULEX* *CONSIMILIS* Newstead.
3. *CULEX* *BITAENIORHYNCHUS* Giles.
4. *CULEX* *ANNULIORIS* Theobald.
5. *CULEX* *THALASSIUS* Theobald.
6. *CULEX* *DUTTONI* Theobald.
7. *CULEX* *THEILERI* Theobald.
8. *CULEX* *UNIVITATUS* Theobald.
9. *CULEX* *PIPIENS* Linné.
10. *CULEX* *FATIGANS* Wied.
11. *CULEX* *PALLIDOCEPHALUS* Theobald.
12. *CULEX* *TRIFILATUS* Edwards.
13. *CULEX* *SIMPSONI* Theobald.
14. *CULEX* *DECENS* Theobald.
15. *CULEX* *SALISBURIENSIS* Theobald.
16. *CULEX* *PÉRENGUEYI* Edwards.
17. *CULEX* *RIMA* Theobald.
18. *CULEX* *PULCHRITHORAX* Edwards.
19. *CULEX* *INCONSPICUOSUS* Theobald.

Sub-genus *CULICIOMYIA*.

20. *CULEX* (*CULICIOMYIA*) *NEBULOSUS* Theobald.

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ADDENDA.

SINCE this paper went to press the following species have been described or recorded from the Union by Ingram and De Meillon ("A mosquito survey of certain parts of South Africa, with special reference to the carriers of malaria and their control. Part I." Publ. S. Afr. Instit. for Med. Res., IV, 22, pp. 1-81, f. 1-53, 1927):—

1. ANOPHELES (MYZOMYIA) LONGIPALPIS Theobald.

Myzomyia longipalpis Theo., Mon. Culic., III, pp. 37-38, (1903).

A larva was collected at Prince's Hill, Northern Transvaal, in April, 1926, and adults were collected at Incamana River, Candover Rail, and the Pongola River in Zululand. It has been recorded from Kenya Colony, Nyasaland and Zanzibar. It is allied to *transvaalensis* and *funestus*, and has narrow white bands on the tarsi, and the last two joints of the female palpi are widely separated as in *transvaalensis*.

2. URANOTAENIA MONTANA Ingram and de Meillon, pp. 80-81.

Described from males and females collected in the forest at Eshowe, and one female taken in a railway carriage between Matubatuba and Gingindhlovu, Zululand, April, 1927. It is closely allied to *bilineata* Theo., from which it can be distinguished by the presence of apical cream-coloured bands on the tergites. From *candidipes* Edws. it can be distinguished by the presence of a white line on mesonotum in front of the wings.

3. HARPAGOMYIA TRICHOROSTRIS Theobald.

H. trichorostris Theo., Mon. Culic., V, pp. 548-549 (1910).

Larvae were found in April, 1927, breeding in the axil of a *Bilgergia mutans* and at the bases of leaves of an arum lily on the bank of a small stream in the forest at Empangeni, Zululand. Both the larva and pupa are described (pp. 76-78, f. 44-48). This species was originally described from specimens collected in Ashanti. It is a small mosquito, having the proboscis swollen at apex, large flat scales on head, and a median line of flat, bluish silvery scales on the mesonotum.

4. ERETMOPODITES SILVESTRIS Ingram and De Meillon, pp. 63-66, f. 14-17.

Described from a mutilated female reared from a larva found in a species of *Dracaena* in the forest at Eshowe, Zululand, in April, 1927. The larva and pupa are also described.

5. AÆDES (STEGOMYIA) SUBARGENTEUS Edwards.

A. (S.) subargenteus Edwards, Bull. Ent. Res., XV, iii, pp. 262-263 (1925).

Adults were taken in the forest at Eshowe, Zululand. It was described from adults and larvae collected in Nyasaland.

6. AÆDES (AÆDIMORPHUS) APICOANNULATUS (Edwards).

Aëdimorphus alboannulatus Theobald, Entom., xxxviii, p. 154 (1905); Mon. Culic., IV, pp. 199-201 (1907), *nec Culex (Ochlerotatus) alboannulatus* Macq. (1850).

Ochlerotatus apicoannulatus Edws., Bull. Ent. Res., III, i, p. 18 (1912); Vol. XV, iii, p. 267 (1925).

Larvae found in a rot hole in a tree at Hluhluwe River Bridge, Zululand. This species was described from a female and male collected in Sierra Leone.

7. AÆDES (AÆDIMORPHUS) FILICIS Ingram and De Meillon, pp. 58-61, f. 1-6.

Described from five females and a male reared from larvae or pupae found in a small pool overshadowed by ferns in the forest at Eshowe, Zululand, April, 1927. The larva and pupa are also described. This species is allied to *punctothoracis*, but can be distinguished by the head being covered with narrower scales in the middle, the scales of the white spots on mesonotum are also narrower, and it is a larger mosquito.

8. AÆDES (AÆDIMORPHUS) ARGENTEOPUNCTATUS (Theobald).

Stegomyia argenteopunctata Theo., Mon. Culic., I, pp. 316-318 (1901).

Ochlerotatus argenteopunctatus (Theo.) Edws., Bull. Ent. Res. III, i, p. 20 (1912).

Adults were collected in the forest at Eshowe, Zululand. It has also been recorded from S. Rhodesia, Uganda, Sudan and N. Nigeria. It is closely allied to *punctothoracis* and *flicis* (see page 943).

9. *CULEX AURANTAPEX* Edwards.

C. aurantapex Edws., Bull. Ent. Res., V, i, p. 74 (1914).

Adults were bred from pupae found in a large swamp at Empangeni and in a swamp near Felixton, Zululand. This species was described from a female collected in Kenya Colony. It is closely allied to *Cannulioris* and *C. bitaeniorhynchus*. From both these species it can be distinguished by the thorax being black clad with black scales and bristles and a few golden scales scattered over the surface, and tergites and stenites 5-8 being almost entirely orange-sealed.

10. *CULEX LAURENTI* Newstead, Ann. Trop. Med., I, p. 24 (1907).

Theobald, Mon. Culic., V, pp. 388-389 (1910).

Edwards, Bull. Ent. Res., V, i, p. 70, f. 10 (1914).

This species was found breeding in pools, a pond, swamp and amongst algae in a stream at Empangeni, Umfolozi River, Felixton and Gingindhlovu in Zululand, and Jacobs, Natal. It was originally described from specimens collected in the Belgian Congo.

11. *CULEX DRACONIS* Ingram and De Meillon.

Described from adults, larvae and pupae (pp. 67-70, f. 23-27) collected at Pietermaritzburg, Natal, May, 1927. The larvae were found breeding at the edges of a stream running amongst rocks. The authors inform me that it is a synonym of *Culex vansomereni* Edws. (Bull. Ent. Res., XVII, p. 29, f. 11 a-c, 1926), described from males and females collected in Kenya Colony. It belongs to the *pipiens* group and can be distinguished by the structure of its hypopygium.

12. *CULEX RICHTERI* Ingram and De Meillon.

Described from adults, larvae and pupae (pp. 72-74, f. 35-40), collected on the Begamuzi River, March, 1927. The larvae were found in rock pools. The authors inform me that it is a synonym of *Culex simpsoni* (p. 975).

13. *CULEX SERGENTI* Theobald, Mon. Culic., III, pp. 218-220, f. 115 (1903).

Recorded from Brits, Transvaal. This species was described from a female collected in Algeria. It can be distinguished by the tergites having pale apical spots and no pale basal bands, and the scales on mesonotum are reddish-brown.

The larvae and pupae of the following species are also described:

Uranotaenia mashaensis Theo.

They were found in a small shaded pool in the forest at Eshowe, Zululand, April, 1927 (pp. 70-71, f. 30-34).

Uranotaenia bilineata fraseri Edws.

Larvae and pupae found in grass-grown pool at Umfolozi, Zululand, March, 1927 (pp. 78-79, f. 49-52).

Aedes (Banksinella) lineatopennis Lud.

Larvae and pupae found in pools near Seacow Lake, Durban, February, 1927 (pp. 61-62, f. 7-12).

Culex inconspicuus Theo.

Larvae found in clear water in swampy ground or in pools in bed of streams in Zululand during March and April (pp. 74-75, f. 41-43).

INDEX.

Valid genera, sub-genera, and species in heavy type; synonyms in italics.

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