



I.—New genera and species of Tabanidæ in the British Museum (Natural History)

Ernest E. Austen

To cite this article: Ernest E. Austen (1912) I.—New genera and species of Tabanidæ in the British Museum (Natural History) , Annals and Magazine of Natural History, 9:49, 1-33, DOI: [10.1080/00222931208693101](https://doi.org/10.1080/00222931208693101)

To link to this article: <http://dx.doi.org/10.1080/00222931208693101>



Published online: 09 Sep 2009.



Submit your article to this journal [↗](#)



Article views: 3



View related articles [↗](#)



Citing articles: 1 View citing articles [↗](#)

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

“..... per litora spargite muscum,
Naiades, et circum vitreos considite fontes:
Pollice virgineo teneros hic carpite flores:
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas;
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Dea pelagi, et pingui conchylia succo.”

N. Parthenii Giannettasi, Ecl. 1.

No. 49. JANUARY 1912.

I.—*New Genera and Species of Tabanidæ in the British Museum (Natural History)*. By ERNEST E. AUSTEN.

(Published by permission of the Trustees of the British Museum.)

THE following paper contains descriptions of two new genera, thirteen new species, and one new variety. In addition, a very remarkable species is redescribed, and another species is renamed. The subjoined list may be useful as affording an indication of the habitats of the various species.

ETHIOPIAN REGION.

<i>Adersia</i> (gen. n.) <i>æstroïdes</i> , Karsch (redescription).	Zanzibar; German East Africa.
<i>Ægophagomyia pungens</i> , gen. et sp. n.	Zanzibar.
<i>Tabanus kingi</i> , Austen, var. <i>nigri-</i> <i>feminibus</i> , var. n.	Abyssinia; East Africa Protec- torate.
„ <i>selousi</i> , sp. n.	Anglo-Egyptian Sudan (Bahr-el- Ghazal).
„ <i>xanthomelas</i> , nom. nov. for <i>T. leucaspis</i> , v. d. Wulp (<i>nec</i> Wied.).	Gold Coast; Portuguese Congo; Congo Free State; Anglo-Egyptian Sudan (Mongalla Province); Uganda and Nyasaland Protec- torates.
„ <i>producticornis</i> , sp. n.	Portuguese East Africa.
„ <i>minuscularius</i> , sp. n.	„ „ „
<i>Ann. & Mag. N. Hist.</i> Ser. 8. Vol. ix.	1

MALAGASY REGION.

<i>Rhinomyza mordosa</i> , sp. n.	Madagascar.
" <i>simplicicornis</i> , sp. n.	"
<i>Ægophagamyia remota</i> , sp. n.	Rodriguez I., Indian Ocean.
" <i>terriceps</i> , sp. n.	Astove I., Indian Ocean.
<i>Bouvierella pulchella</i> , sp. n.	Madagascar.
<i>Chrysops aprugna</i> , sp. n.	"
" <i>insulensis</i> , sp. n.	"
" <i>lloydi</i> , sp. n.	"

AUSTRALIAN REGION.

<i>Pangonia bancrofti</i> , sp. n.	South Queensland.
------------------------------------	-------------------

PANGONIINÆ.

Genus PANGONIA, Macq.

Subgenus EREPHOPSIS, Rond.

Pangonia bancrofti, sp. n.

♀.—Length (10 specimens) 8.25 to 9.4 mm.; width of head 3.5 to 3.75 mm.; width of front at vertex 0.5 to 0.6 mm.; usual length of proboscis 2.6 to 3 mm.; length of wing 8.6 to 9.4 mm.

Small, compactly built species, with short, rounded abdomen, and with proboscis depending vertically beneath the head.—Thorax slate-coloured, dorsum greyish pollinose, narrowly striped with grey, and ground-colour posteriorly (including scutellum) with a distinct metallic sheen (purplish blue, in centre sometimes with a greenish tinge); dorsum of abdomen (second to fifth segments inclusive) shining dark metallic blue, sometimes with a purplish tinge, especially at sides, and towards centre often with a greenish tinge, which may even almost entirely replace the blue, hind borders of first five segments metallic cinnamon-rufous or metallic cinnamon, often with a purplish tinge; wings faintly tinged with isabella colour, without spots or other markings; femora cinnamon-coloured.*

Head: inner margins of eyes bordering front almost parallel, diverging but slightly below; face, jowls, and portion of front immediately above antennæ cinnamon-coloured, yellowish pollinose, occiput and upper two-thirds of front slate-grey, light grey pollinose; front, face, and upper portion of posterior orbits clothed with brownish or blackish hair, jowls and basioccipital region with bright ochraceous hair, eyes with raw-sienna-coloured hair, which

* For names and illustrations of colours, see Ridgway, 'A Nomenclature of Colors for Naturalists' (Boston: Little, Brown, & Company, 1886).

becomes brownish above; proximal joint of *palpi* mummy-brown, yellowish pollinose, and clothed with brownish or yellowish hair, terminal joint ochraceous-buff or tawny-ochraceous, broad; first and second joints of *antennæ* ochraceous-buff, clothed with black hair of moderate length, third joint ochraceous-rufous, brownish at tip. *Thorax*: dorsum clothed with black hairs, short for most part, but longer posteriorly and on scutellum, pleuræ and pectus with longer ochraceous hair, mesopleuræ mainly with blackish hair; grey pollinose stripes on dorsum three in number, extending from front to hind margin, median stripe extremely narrow, admedian stripes somewhat broader especially in front, transverse suture and sides of dorsum also grey pollinose. *Abdomen* very convex above, more or less rounded ovate in outline when viewed from the side, clothed above and below with short, appressed, bright ochraceous hair, which becomes longer and denser on the lateral margins and posterior angles of the dorsal scutes; dorsum of first segment, except hind border, slate-grey with a purplish tinge; dorsum of sixth and seventh segments grey, with dull cinnamon-coloured lateral margins and hind borders, grey area on sixth segment sometimes with a greenish or purplish metallic sheen; venter dark purple or purplish grey, except hind borders of segments, which are coloured as on dorsum. *Wings*: costa and fourth longitudinal vein dark brown, other veins raw-umber-coloured or mummy-brown, base of anterior branch of third longitudinal vein without an appendix; first posterior cell showing much individual variation as regards closure, often narrowly open, the degree of closure or opening frequently differing in the two wings of the same specimen; stigma raw-sienna-coloured (occasionally mummy-brown), elongate, and as a rule not very sharply defined, though distinct. *Squamæ* isabella-coloured, fringed with ochraceous hair on outer side and on part of hind margin. *Halteres* light mummy-brown, stalks isabella-coloured. *Legs*: front coxæ greyish cinnamon-coloured, middle and hind coxæ drab-grey in front, isabella-coloured posteriorly; coxæ and femora clothed with ochreous hair mixed with dark brown or black hair, the latter especially long and conspicuous on the under side of the middle femora; tibiæ and tarsi raw-umber-coloured, tips of tarsal joints dark brown.

South Queensland, Australia: type and nine other specimens from the Upper Burnett District (*Dr. T. L. Bancroft*).

In shape and size this pretty little species, which the

author has much pleasure in naming in honour of its discoverer, somewhat resembles the West Australian *Pangonia gibbula*, Walk., from which, however, it is readily distinguishable owing to its proboscis being vertical instead of projecting downwards and forwards at an obtuse angle with the longitudinal axis of the body, and to the metallic appearance and peculiar coloration of the abdomen.

ADERSIA, gen. nov.

Allied to the South American genus Sepsis, Walk.— Female usually decidedly larger than ♂, often much larger, thorax bulkier and abdomen broader. *Posterior orbits broad in ♀ instead of non-existent, as in Sepsis ♀. Eyes bare, separate in both sexes, in ♀ relatively rather small; front narrow in ♂, broad in ♀ and protuberant when viewed in profile; ocelli present. Proboscis and palpi extremely short and small, former depending vertically beneath head, latter nearly horizontal; proximal joint of palpi (at least in typical species) not swollen, as in Sepsis; terminal joint of palpi more elongate and less swollen in ♂ than in ♀, cup-shaped in both sexes when viewed from outer side, having, at least in typical species, a pit-like depression at distal extremity; antennæ short, especially first and second joints, third joint lanceolate in profile, consisting of eight annuli; jowls narrow, not, as in Sepsis, descending a long way below lower margins of eyes. Inner margin of each eye in ♀ uniformly curved, not, as in the ♀ of Sepsis nivalis, Walk. (the type of the genus Sepsis), produced into an angle just above the lowest fourth of the front. Wing with a distinct stigma, all posterior cells open; base of anterior branch of third longitudinal vein not (as in Sepsis) bent at a right angle, and not (as in Sepsis) emitting a backwardly directed appendix. Front claws long in both sexes; middle and hind claws longer and stouter in ♀ than in ♂.*

Typical species *Silvius æstroïdes*, Karsch.

Although resembling *Sepsis* in general appearance and coloration, as also in the smallness of the proboscis, *Adersia* is sufficiently distinguished from its South American ally by the differences mentioned above, as well as by the remarkably broad front of the ♀, which is not narrowed by a constriction due to the inner margin of each eye being produced into an angle a little above the antennæ. From *Pronopés*, Lw., as represented by *Pronopés nigricans*, Lw., from Cape Colony,—the only species of the genus yet described and of which no specimens have so far reached

the British Museum (Natural History),—*Adersia* would appear to be distinguishable *inter alia* by the eyes being devoid of hair and the body comparatively bare, by the second abdominal segment not being abnormally large, and by the wings not being of relatively unusual length. The small, almost minute size of the proboscis will alone suffice to distinguish *Adersia* from any other genus of African Tabanidæ at present known.

The author has much pleasure in naming this new genus in honour of Dr. W. M. Aders, who, during his sojourn in Zanzibar, has paid special attention to its blood-sucking flies, and has materially increased our knowledge of the Dipterous fauna of the island.

Adersia æstroïdes, Karsch.

Silvius æstroïdes, Karsch, Berl. Ent. Z., Bd. xxxi. p. 371, Taf. iv. fig. 1 (1887).

[Since this species was originally described from an imperfect female, while both original description and figure leave much to be desired, no apology is needed for publishing the following redescription, which is based on both sexes, a number of specimens of each of which, in excellent condition, were fortunately obtained by Dr. Aders. The present writer desires to express his acknowledgments to Dr. K. Grünberg, of the Königliches Zoologisches Museum, Berlin, where the type of the species is preserved. With obliging courtesy Dr. Grünberg, at the request of the writer, carefully compared one of Dr. Aders's specimens with the type, and as a result formed the opinion that the two specimens are conspecific,—a conclusion with which the writer, after studying the notes kindly furnished to him by Dr. Grünberg, entirely concurs. It should be added that the type of the species, which is from the mainland (Usambara, German East Africa), is considerably larger than even the largest of the females obtained by Dr. Aders, which themselves exhibit considerable variations in size. According to Dr. Grünberg, the type measures 15·5 mm. in length, while, as will be seen below, the maximum length of the females from Zanzibar is 13·5 mm.]

♂ ♀.—Length, ♂ (6 specimens) 9·8 to 10 mm., ♀ (13 specimens) 10 to 13·5 mm.; width of head, ♂ 2·75 to 3·2 mm., ♀ 2·8 to 3·75 mm.; width of front of ♂ at vertex 0·75 mm., width of front of ♂ in centre 0·25 mm., width of front of ♀ 1·25 to 1·6 mm. at vertex, greater below; length of visible portion of proboscis in both sexes about 0·75 mm.; length of wing, ♂ 6·6 to 7·4 mm., ♀ 8·75 to 11 mm.

Mule dusky grey above (dorsum of thorax dark olive-grey, dorsum of abdomen slate-grey), ♀ lighter grey above (dorsum of thorax light olive-grey, with whitish-grey longitudinal stripes, dorsum of abdomen drab-grey or smoke-grey), extreme lateral margins of abdominal segments in both sexes cream-buff or pinkish buff. Head light yellowish grey in ♂, cream-coloured in ♀, upper portion of front in ♂ mouse-grey. Third joint of antennæ clove-brown or black, first and second joints paler (mouse-grey or isabella-coloured in ♂, buff in ♀). Wings milky; fork of third longitudinal vein, cross-veins at each end of discal cell, and sixth longitudinal vein before middle faintly suffused with drab,—these markings sometimes indistinct; stigma light mummy-brown, in ♂ often paler than in ♀. Legs cream-buff or cream-coloured, femora in ♂ more or less grey.

Head: vertex and darker portion of front in ♂ clothed with pale yellowish hair, face and jowls in ♂ clothed with whitish hair; front in ♂ with a blackish, elongate spot in centre below ocellar tubercle, extending from eye to eye; in ♀ face, jowls, and upper three-fourths of front clothed with minute whitish hairs; *palpi* cream-buff, often more or less grey in ♂, clothed with whitish hair; *proboscis* ochraceous-buff, length of visible portion not exceeding 1 mm., usually only about 0.6 or 0.75 mm.; first and second joints of *antennæ* very short, clothed with short whitish hair, third joint ochraceous-buff at extreme base. *Thorax:* pleuræ and pectus grey in ♂; in ♀ pleuræ cream-coloured, disc of pectus light grey; in both sexes pleuræ and pectus clothed with whitish hair; dorsum clothed with minute, appressed, yellowish hairs; in ♀ these hairs are so small that, on a superficial inspection, the dorsum appears bare; whitish-grey longitudinal stripes on dorsum of ♀ fairly broad, consisting of a pair of admedian stripes which posteriorly are only narrowly separated or even apparently fuse together, and a more or less distinct stripe above base of each wing; in some specimens near front margin there is also an indication of a narrow median stripe; scutellum dark grey in ♂, in ♀ greyish buff or drab. *Abdomen* clothed in both sexes with short whitish hair, which is longer on sides, especially in ♂; dorsum with a dark, median, longitudinal stripe, more conspicuous in ♂, extending from second segment almost to distal extremity, more or less interrupted by hind margins of segments, and formed by minute black hairs among the whitish ones; whitish hair on dorsum of ♀ extremely small and closely appressed; in ♀ dorsal plate of last segment, either entirely

or for most part, and hind margins of some at least of preceding segments cream-buff; venter light grey or more or less cream-buff, without a dark longitudinal stripe. *Wings*: costa as far as stigma, auxiliary and first longitudinal vein to same point, third longitudinal vein between anterior transverse vein and fork, and portion of fifth longitudinal vein from base to fork buff, veins elsewhere for most part dark brown. *Squamæ* waxen white. *Halteres*: stalks cream-buff, knobs ivory-white. *Legs* clothed with whitish hair; under side of front femora shining, more or less dark brown in ♂, buff-yellow in ♀; claws black, buff or cream-buff at base.

Zanzibar and German East Africa (Usambara): type of ♂, type of redescription of ♀, and eight other specimens (4 ♂♂, 4 ♀♀), from Pigaduli, Zanzibar, 14. vi. 1911, "on sandy bank"; 3 ♀♀, same locality, 23. v. 1911, "on sandy bank"; 3 ♀♀, same locality, 10. xi. 1910, "numerous on sand"; 1 ♀, same locality, 12. xi. 1910; 1 ♂, 1 ♀, Bububu, 7. xii. 1910: all collected and presented by *Dr. W. M. Aders*.

Writing to the author on June 26, 1911, Dr. Aders remarked that the species described above had been "found almost exclusively in one place, generally on a hot, sandy bank where cattle are buried." Dr. Aders added that the cadavers of the cattle seemed to possess a great attraction for these flies. No information as to the blood-sucking powers of *Adersia æstroïdes* has yet been received, although it may be mentioned for what the observation may be worth that natives in Zanzibar assert that the species bites*. The peculiar coloration of the body and wings, which in the case of the body is most marked in the female sex, recalls that of other Diptera inhabiting sandy or desert regions, and is doubtless protective when the insects are resting on sand.

GENUS RHINOMYZA, Wied.

Rhinomyza mordosa, sp. n.

♀.—Length (10 specimens) 7 to 8.6 mm.; width of head 2.2 to 2.6 mm.; width of front at vertex 0.25 mm.; length of proboscis 1.5 to 1.8 mm.; length of wing 7.25 to 8.25 mm.

Small, narrow-bodied species, allied to Rh. maculata, Surcouf

* From information supplied to the writer in conversation, 12. vi. 1911, by Dr. A. Copland, who brought home a portion of the material collected by Dr. Aders.

(S.-E. Madagascar), *but distinguished by presence of a well-marked, continuous, pale median stripe on dorsum of abdomen, as also by certain differences in wing-markings.*—Dorsum of thorax russet-coloured; dorsum of abdomen, in fully coloured specimens, mummy-brown, with a pale (raw-sienna-coloured) median longitudinal stripe; antennæ raw-sienna-coloured, unicolorous, upper branch of third joint very short, merely a forwardly directed tooth; wings nearly hyaline, with, in distal half, two conspicuous sepia-coloured blotches resting on costal border.

Head buff or orange-buff pollinose (occiput smoke-grey), basioccipital region sparsely clothed with yellowish hair; front slightly broader below; ocellar spot greyish clove-brown; *frontal callus* tawny or tawny-ochraceous, narrow, only slightly expanded below, its upper extremity linear; *eyes* in specimens preserved in spirit dark bronze-green, without bands; *palpi* buff, proximal joint clothed with yellowish hairs, terminal joint clothed on outer side with minute black hairs; first and second joints of *antennæ* clothed above and on outer side with minute black hairs. *Thorax*: dorsum, including scutellum, clothed with minute, appressed, pale buff-yellow hairs, prealar callus on each side clothed with dark brown hairs; pleuræ and pectus cream-buff, covered with pearl-grey pollen, and sparsely clothed with whitish hair. *Abdomen*: median dorsal stripe varying in width in different specimens (sometimes very narrow on third and following segments), extending from base of abdomen to hind margin of sixth segment; imperfectly coloured specimens sometimes more or less pale (dull ochreous) on first two or three segments, on each side of median stripe; dorsum clothed for most part with minute, appressed, black hairs, but on median stripe and on lateral margins with similar pale yellow hairs, which also more or less predominate generally on fourth and fifth segments, besides clothing hind border of third segment; venter buff or ochraceous-buff, clothed with appressed yellowish hairs. *Wings*: the two main sepia-coloured blotches are situate as follows: firstly, a blotch includes the conspicuous, mummy-brown *stigma*, and then, narrowing considerably, either terminates on the third longitudinal vein (or in the first submarginal cell before reaching that vein), or extends across the wing to the bottom of the distal extremity of the discal cell, enclosing the posterior transverse vein, filling the extreme bases of the second and third posterior cells, and sometimes even extending into the angle in the upper margin of the fourth posterior cell; secondly, a blotch which occupies the distal

extremities of the marginal and submarginal cells, extends across the anterior branch of the third longitudinal vein into the upper part of the second submarginal cell, and has its proximal margin nearly straight and at right angles to the costa; the length of the space separating the stigmatic from the apical blotch, measured on the costa, varies in different individuals from about 1 mm. to about 1.4 mm.; the fork of the third longitudinal vein is suffused with sepia, and the small sepia-coloured spot so formed is sometimes connected either with the apical blotch, or, in the first posterior cell, with a forwardly directed prolongation from the stigmatic blotch, or with both; in addition to the foregoing the proximal half of the first basal cell is occupied by a faint, light sepia-coloured streak, sometimes indistinct; in specimens in which the stigmatic blotch does not extend beyond the third longitudinal vein, the veins at the distal extremity of the discal cell are still often suffused with sepia; veins mummy-brown, auxiliary vein paler, anterior transverse vein and extreme base of third longitudinal vein usually darker than remainder of veins. *Squamæ* sepia-coloured. *Halteres*: knobs seal-brown above, ochraceous-buff below; stalks buff, brownish at distal extremity. *Legs* buff or ochraceous-buff, distal extremities of both front femora and front tibiæ brown or brownish; front tarsi dark brown, proximal two-thirds of first joint paler, tips of middle and hind tarsi dark brown.

Madagascar: type and thirteen other specimens from Andranolava, Majunga Province, North-West Madagascar, 24. xi. 1907 (*J. J. Lloyd*); a fifteenth specimen, from same locality and collector, 8. xi. 1907.

With reference to this species the collector writes:—"A very active fly; bites like a mosquito. All the specimens sent were taken at dusk."

Rhinomyza simplicicornis, sp. n.

♀.—Length (8 specimens) 6.75 to 8.2 mm.; width of head 2.4 to 3 mm.; width of front at vertex 0.5 to just over 0.5 mm.; length of proboscis 1.2 to 1.25 mm.; length of wing 6.25 to 7.4 mm.

Small, thick-set species, with third joint of antennæ totally devoid of an upper branch, and wings without coloured bands, spots, or blotches, though with very conspicuous dark brown stigma.—Thorax greyish cream-buff, dorsum with three fairly broad, burnt-umber-coloured or dark brown, longitudinal stripes, converging posteriorly, and with a dark brown spot on

scutellum; *dorsum of abdomen* (in fully coloured specimens not altered by post-mortem changes) transversely and consecutively banded with cream-colour, dark brown, light grey, and mummy-brown.

Head cream-buff pollinose (occiput light grey), basi-occipital region clothed with yellowish-white hair; front much broader than in foregoing species, widening slightly below; ocellar spot greyish clove-brown; *frontal callus* cinnamon, cinnamon-rufous, or light mummy-brown, of normal shape, except that there is a pollinose indentation on each side, forming a constriction, just above lower extremity; *palpi* cream-buff, proximal joint clothed with pale yellowish hairs, terminal joint varying in width in different specimens but not particularly attenuated, clothed on outer side with minute black hairs; *antennæ* short, first and second joints clothed with minute black hairs, expanded portion of third joint ochraceous-buff, unusually broad from above downwards, with nothing in the shape of an upper branch, but with the upper margin rising in the centre into a prominent angle, four distal annuli clove-brown or black, unusually short, of uniform width, terminal annulus ending bluntly. *Thorax*: dark dorsal stripes commencing just behind level of humeral calli, median stripe usually reaching scutellum but paired stripes not extending beyond postalar calli; dorsum clothed with short, appressed, pale yellowish hair, and with blackish hair on dark brown scutellar spot, which occupies whole of upper surface of scutellum except margin; *pleuræ* and *pectus* clothed with yellowish-white hair; *mesopleuræ* dark brown below, *sternopleuræ* also largely dark brown on each side of middle line, but in both cases ground-colour partially concealed by the light grey pollen clothing *pleuræ*, *pectus*, and sides of dorsum. *Abdomen*: dorsum in fully coloured and unaltered specimens marked as follows,—first segment and anterior third or half of second cream-coloured; remainder of second segment and third segment entirely dark brown; fourth segment light grey, more or less dark brown, ochraceous-buff, or cinnamon on front border; remaining segments mummy-brown, hind margins of fifth and sixth segments greyish; the front margin of the dark brown band is often somewhat irregular, but in the middle line frequently sends out a triangular projection, which does not quite reach the posterior edge of the first segment; in imperfectly coloured specimens, or such as show post-mortem changes, the dark brown band is less sharply defined, and frequently exhibits irregular patches of paler (mummy-brown) colour near the front

margin of the third segment; dorsum clothed with minute, appressed hairs, pale yellowish or yellowish white on the fourth segment and on the cream-coloured band at the base, dark brown on the dark brown band, and lighter brown on fifth and following segments; venter in non-discoloured specimens cream-coloured at base, then mainly cream-buff, whitish cream-buff, or whitish, followed by ochraceous-buff at distal extremity, which is clothed with brownish hair, venter elsewhere clothed with minute, appressed, yellowish-white hair. *Wings* with a faint sepiceous tinge, which in certain specimens is somewhat more pronounced at extreme tip, next costa; veins for most part dark brown, those forming distal boundary of first and second basal cells darker than elsewhere, and more or less suffused with sepia; *stigma* sharply defined, varying in length in different specimens from 1.2 to 1.4 mm. *Squamæ* sepia-coloured, border dark brown. *Halteres*: knobs clove-brown, stalks cream-buff, dark brown at distal extremity. *Legs* cream-buff or buff, tips of front and hind femora and tibiæ dark brown, tips of middle femora and tibiæ brown, front tarsi clove-brown, middle and hind tarsi dark brown, proximal two-thirds of first joint of middle tarsi paler.

Madagascar: type and nine other specimens from Andranolava, Majunga Province, North-West Madagascar, October 15 to November, 1907 (*J. J. Lloyd*).

The collector's field-note runs:—"Seen from October 13 to November. Appears only in cool places, usually in evening. Bite very painful."

So far as the structure of the third joint of its antennæ is concerned, the species described above is an aberrant form, which agrees with *Rhinomyza edentula*, Wied., and *Rh. pusilla* (*Erodiorhynchus pusillus*), Schin.—the habitat of each of which is the Cape of Good Hope,—in the absence of an upper branch to the joint in question. As regards the remainder of its cephalic characters, except that the proboscis is somewhat shorter than usual, the new species is a true *Rhinomyza*, and to place it in this genus—the only existing one to which it could possibly be assigned—is preferable to founding a new genus for its reception. The comparative shortness of its proboscis prevents *Rh. simplicicornis* from being regarded as belonging to the same group as *Rh. edentula*, Wied., and *Rh. pusilla*, Schin., though it agrees with these species in its wings being devoid of coloured bands or blotches. In the large size and conspicuous appearance of the stigma, as well as in having its wings otherwise unmarked, *Rh. simplicicornis* agrees with *Rh. (Dichelacera)*

longirostris, Big., which is also found in Madagascar, but in which the third antennal joint is of the typical form.

ÆGOPHAGAMYIA *, gen. nov.

Resembling and allied to Silvius, Mg., but distinguished by the absence of a frontal callus in the ♀, by the proboscis being slender and elongate, and by the first and fourth posterior cells in the wing being closed before reaching the margin. Distinguished from Scione, Walk., by the eyes not being hairy nor the face conical. Distinguished from Bouvierella †, Surcouf, in which the first and fourth posterior cells in the wing are also closed, by the absence of a frontal callus in the ♀, by the proboscis being slender and elongate, and terminated by narrow, elongate labella (instead of being short and having large labella), by the smaller antennæ—especially the less elongate third joint, and by the first posterior cell in the wing being closed a relatively long way from instead of close to the hind margin, the stalk of the first posterior cell being two or three times as long as, instead of approximately equal in length to, only slightly longer or even shorter than that of the fourth posterior cell.—Body Tabanus-like in shape. Eyes meeting together above in ♂; front in ♀ of moderate breadth, its sides parallel; facets in front portion of eyes of ♂ not conspicuously larger than those behind; ocelli present. Proboscis and palpi slender, former elongate and prominent, projecting downwards and forwards, or (in ♂) sometimes horizontal, not thickened at base; labella long and narrow. Palpi small, in ♂ linear and horizontal or slightly curved upwards, terminal joint in ♀ elongate, somewhat swollen at base then bent downwards and acicular. Antennæ short, especially first and second joints, third joint lanceolate in profile, without any projection on its upper margin; terminal portion of third joint indistinctly annulate, composed of four annuli. Wings hyaline; first posterior cell with a long stalk, i. e. closed 0.6 to 0.75 mm. before reaching hind margin; fourth posterior cell closed either just before margin, or at any rate nearer to margin than point at which first posterior cell is closed; anterior intercalary vein, though sometimes complete, often terminating abruptly before reaching margin.

* *αιγοφάγος*, goat-eating (in allusion to the fact that all the specimens of the typical species taken by Dr. Aders in Zanzibar were found on goats); *μύια*, a fly.

† See below, p. 16. With the exception of *B. (Scione) alluaudi*, Giglio-Tos, the habitat of which is the Seychelles Is., the eight species of *Bouvierella* at present known are confined to Madagascar.

Typical species *Ægophagamyia pungens*, sp. n. It is worthy of note that the three representatives of the genus *Ægophagamyia* at present known, all of which are described below, are island forms, the typical species having been obtained in Zanzibar and the other two species in Rodriguez I. and Astove I. respectively.

Ægophagamyia pungens, sp. n.

♂ ♀.—Length, ♂ (7 specimens) 10·2 to 11·75 mm., ♀ (4 specimens) 9·6 to 11·2 mm.; width of head, ♂ 3 to 3·75 mm., ♀ 2·8 to 3·5 mm.; width of front of ♀ at vertex 0·5 to 0·6 mm.; length of proboscis, ♂ 2 mm. (in normal position) to 3·5 mm. (protruded), ♀ 1·75 to 2·5 mm.; length of wing, ♂ 7·75 to 9 mm., ♀ 8 to 9·25 mm.

Frontal triangle in ♂, viewed from above, bright cream-coloured or glistening white, pollinose; *front and face* in ♀ dull greyish cream-coloured; *first and second joints of antennæ* in both sexes buff or ochraceous-buff, *third joint* clove-brown; *dorsum of thorax* dark olivaceous-grey in ♂, lighter grey in ♀, in both sexes with faint darker streaks but without distinct markings; *abdomen* in ♂ ochraceous or tawny-ochraceous, with on dorsum a very conspicuous, blackish slate-coloured, median longitudinal stripe; *abdomen* in ♀ slate-grey on dorsum, the sides of the first four and lateral margins of remaining segments dull ochraceous-buff.

Head: face and jowls in both sexes clothed with whitish hair, short on face, longer on jowls; upper three-fourths of front in ♀ clothed with minute whitish hairs, mingled towards vertex with some blackish hairs; occiput in both sexes smoke-grey; *palpi* buff; *proboscis* greyish clove-brown, *labella* clove-brown; *third joint of antennæ* buff at extreme base. *Thorax*: *pleuræ* and *pectus* grey, lighter in ♀ than in ♂, clothed in both sexes with whitish hair; *dorsum* clothed with short, erect, yellowish hair in ♂, and with similar, whitish or yellowish-white hair in ♀. *Abdomen*: median stripe on dorsum of ♂ extending from base to distal extremity, narrower than elsewhere on third and fourth, or third, fourth, and fifth segments, dorsum of sixth segment in some ♂♂ for most part or entirely blackish slate-coloured; *venter* ochraceous in ♂, ochraceous-buff in ♀, without markings; *abdomen* clothed in ♂ with short, appressed, pale ochre-yellow hairs, in ♀ with similar pale yellowish hairs, on dorsum in both sexes mingled with black hairs towards distal extremity; ochraceous-buff area on dorsal side of first four segments in ♀ varying in width,

sometimes so broad as to reduce slate-grey area on these segments to a median stripe, in other specimens very narrow and confined to lateral margins. *Wings*: veins for most part brown, auxiliary vein buff, base of first longitudinal vein ochraceous-buff; stigma wanting. *Squamæ* cream-coloured, small. *Halteres*: stalks light isabella-coloured, knobs cream-buff. *Legs*: femora and tibiæ ochraceous, femora more or less streaked with dark grey, hind tibiæ brownish on upper side, sometimes entirely dark brown except at extreme base, tips of front and middle tibiæ sometimes brown or brownish; tarsi dark brown, first joint of front and middle pairs often paler (ochraceous or ochraceous-rufous) at base.

Zauzibar: type of ♂, two other ♂♂, and two ♀♀ from Bububu, 7. xii. 1910; type of ♀, four ♂♂, and one other ♀ from Pigaduli, 14. vi. 1911, "on goats": all collected and presented by Dr. W. M. Aders.

The collector's field-note is as follows:—"Very restricted in its occurrence: all the specimens of this species were caught within a radius of two miles, and always on goats."

Ægophagamyia remota, sp. n.

♂.—Length (1 specimen) 10·8 mm.; width of head 3·6 mm.; length of proboscis 2 mm.; length of wing 9·6 mm.

Agreeing with foregoing species in coloration and markings, except that the dark median stripe on dorsum of abdomen is broken up into spots; frontal triangle more prominent, and face (viewed in profile) inclined more obliquely backwards than in preceding species; terminal joint of palpi 0·8 mm. in length, longer than in foregoing species; front and middle femora, except at extreme tips, entirely greyish clove-brown.

Head: face and jowls clothed with whitish hair; *palpi* ochraceous, terminal joint dark brown at tip; *proboscis* dark brown; first and second joints of *antennæ* tawny-ochraceous, clothed above and on outer side with short black hairs, first joint more bulky and with a more prominent upper angle than in foregoing species (third joint wanting in type). *Thorax* and *abdomen* clothed with yellowish hair; median dorsal stripe on abdomen (at least in case of type) much narrower on second segment than in *Ægophagamyia pungens*; commencing at base of first segment, on which it occupies a median area equal to half the width of the segment, the stripe abruptly narrows on the second segment to about half its previous width and terminates suddenly at one-third of

the length of the segment from the hind margin ; on the third segment the stripe is represented by a scutiform median spot, extending from the base to a little beyond the middle ; on the fourth segment there is a smaller though rather wider median spot, somewhat triangular in outline, resting on the base of the segment and with its apex extending to a little beyond the middle ; the fifth and sixth segments each bear a broad transverse blotch, resting on the base of the segment, but not extending to either the lateral or posterior margins. *Wings* : first posterior cell closed 0·6 mm. from margin ; anterior intercalary vein (in typical specimen) terminating abruptly just beyond halfway between end of discal cell and hind margin of wing ; stigma exceedingly faint, not noticeable. *Squamæ* cream-buff. *Halteres* as in foregoing species. *Legs* : hind femora ochraceous, distal extremity dark brown, under side greyish dark brown ; tibiæ and tarsi as in foregoing species.

Rodriguez I., Indian Ocean : presented by the Royal Society.

Ægophagamyia terticeps, sp. n.

♀.—Length (2 specimens) 10·6 to 11 mm. ; width of head 3·5 to 3·75 mm. ; width of front at vertex 0·75 mm. ; length of proboscis 2·25 to 2·6 mm. ; length of wing 8·75 to 9 mm.

Resembling *Ægophagamyia pungens* ♀, *but distinguished by face being more protuberant, by ochraceous-buff area on dorsum of abdomen being confined to posterior angles of second and third and extreme lateral margins of following segments, and by the femora, except extreme base and tips, being entirely dark (greyish clove-brown).*

Head : face and lower third of front isabella-coloured, occiput and upper two-thirds of front dark grey ; median portion of face conspicuously protuberant, when head is viewed in profile ; face, jowls, and basioccipital region clothed with whitish hair, upper part of front clothed with dark brown hair ; *palpi* buff, terminal joint greyish on outer side ; *proboscis* greyish clove-brown, labella clove-brown ; first and second joints of *antennæ* ochraceous-buff, clothed for most part with short black hairs, third joint clove-brown, ochraceous-buff at extreme base. *Thorax* and *abdomen* : general coloration and hairy covering of thorax and of dark portion of dorsum of abdomen as in *Ægophagamyia pungens* ♀ ; ochraceous-buff areas on dorsal surface of second and third abdominal segments varying in size, sometimes much reduced, especially on third segment ; ventral surface of

fifth (or fourth) and following segments (at least in type and para-type) with a dark transverse band, occupying anterior two-thirds of each segment. *Wings*: first posterior cell, in type and para-type, closed 0.75 mm. from margin; anterior intercalary vein varying in length, terminating abruptly before reaching margin; veins mainly mummy-brown or dark brown, auxiliary vein, base of first longitudinal, and main portion of fifth longitudinal vein paler (cinnamon); stigma transparent, not noticeable. *Squamæ* cream-buff. *Halteres* as in *Ægophagomyia pungens*. *Legs*: tibiæ and tarsi clove-brown, middle tibiæ, except distal extremity, sometimes paler (cinnamon), proximal portion of front tibiæ also cinnamon-coloured in case of type.

Astove I., Indian Ocean (north of Madagascar); type and one other specimen (*P. R. Dupont*).

Genus BOUVIERELLA, Surcouf.

(Bulletin de Muséum National d'Histoire Naturelle, Année 1909,
p. 176 (Paris, 1909).)

Bowierella pulchella, sp. n.

♀.—Length (1 specimen) 12.6 mm.; width of head 4 mm.; width of front at vertex 0.6 mm.; length of proboscis 1.75 mm.; length of wing 10.4 mm.

Head, pleuræ, and pectus grey, dorsum of thorax slate-coloured, with a pair of faint, grey, admedian, longitudinal stripes; first two abdominal segments cream-buff, each marked on dorsum with a black blotch, that on second segment median, elongate-rectangular, that on first segment occupying greater part of dorsum except posterior angles, and tapering to hind margin; remaining abdominal segments black, hind margins of third to fifth segments inclusive pearl-grey, clothed with silvery-white hair; wings light isabella-coloured; legs, except coxæ, entirely black.

Head: subcallus, face, jowls, and basioccipital region pearl-grey, clothed with white hair, upper part of front blackish slate-coloured and clothed with blackish hair; *frontal callus* clove-brown, cuneate, with the upwardly directed apex prolonged into a narrow raised line; front narrowing slightly below; *palpi* slender, slate-grey on outer side; *proboscis* clove-brown; *antennæ* entirely clove-brown or black, except articular surface of third joint on outer side, which is narrowly cinnamon, first and second joints clothed with short black hair, expanded portion of third joint without an angular prominence on upper margin. *Thorax*: humeral

calli and lateral borders of dorsum grey, admedian stripes on dorsum commencing on front margin but becoming indistinct beyond transverse suture; *scutellum* slate-black, darker than remainder of dorsum; pleuræ and pectus clothed with white hair, dorsum somewhat sparsely clothed with minute, appressed, yellowish-white hairs, mixed with longer and more erect black hairs; a patch of longer silvery-white hair above base of wing on each side, and a smaller patch of similar hair on anterior extremity of each postalar callus; *scutellum*, portion of dorsum immediately in front of præ-scutellar groove, and remainder of postalar calli clothed entirely with black hair; prealar calli clothed with black mixed with silvery-white hair. *Abdomen*; median black blotch on dorsum of second segment extending from base almost to hind margin; ventral surface of third and following segments agreeing with dorsum in coloration and banding; black portion of abdomen clothed with black hair, which on dorsum of second segment also extends a little way outwards from sides of median blotch; cream-buff area clothed with yellowish-white hair, hind border of dorsum of second segment with whitish hair, which also extends on to the hinder portion of the median black blotch; posterior angles of dorsal scutes of third to fifth segments inclusive cream-buff, clothed with silvery-white or yellowish-white hairs, which more or less fringe the lateral margins of these scutes; posterior portion of dorsum of sixth segment somewhat greyish, with a few yellowish hairs on hind margin in middle line. *Wings*; extreme base and costal cells ochre-yellow; stigma orange-ochraceous, narrow; costa dark brown, auxiliary vein and main portion of fifth longitudinal vein orange-ochraceous, remaining veins mummy-brown. *Squamæ* light sepia-coloured, border mummy-brown. *Halteres* dark sepia-coloured, stalks buff at base. *Legs*: coxæ grey, clothed, like proximal half of under side of hind femora, with white hair; legs elsewhere clothed with black hair.

Madagascar: type from Andranolava, Majunga Province, North-West Madagascar, 25. x. 1907 (*J. J. Lloyd*).

The collector's field-note on this species is as follows:—"Observed first on Oct. 25th, 1907; taken at midday in vicinity of office. Another specimen was seen on the following day, but not captured; these were the only two individuals observed up to Oct. 30th, 1907. The natives know this fly and state that it oviposits in loose earth; its bite is said to be very painful; these flies are reported to become more plentiful later in the season."

Owing to its striking markings, this handsome species
Ann. & Mag. N. Hist. Ser. 8. Vol. ix. 2

cannot be confused with any other of its congeners at present known.

Genus CHRYSOPS, Meigen.

Chrysops aprugna, sp. n.

♀.—Length (4 specimens) 7·25 to 8·75 mm.; width of head 2·4 to 2·8 mm.; width of front at vertex 0·75 to 0·8 mm.; length of antennæ 2·2 to 2·4 mm.; length of wing 7 to 7·6 mm.

Upper surface of thorax and abdomen blackish slate-coloured.—*Antennæ entirely black, rather short, first joint somewhat swollen at base; frontal callus shining black; dorsum of thorax with a pair of narrow, light grey, longitudinal stripes; dorsum of abdomen on each side of first and second segments with a dull greyish cinnamon-coloured patch, more or less indistinct; hind borders of second and following abdominal segments on dorsal side yellowish-grey pollinose, in each case expanded in middle line into a more or less distinct triangle, seventh segment wholly grey pollinose; wings hyaline, first and second costal cells raw-sienna-coloured, extreme base, a conspicuous transverse band across middle (sharply defined except at posterior extremity), and a narrow border next costa at distal extremity of wing dark brown; middle and hind tibiæ, and first joint of middle and hind tarsi except extreme tips tawny.*

Head ochre-yellow pollinose (in rubbed specimens front and upper portion of posterior orbits yellowish-grey pollinose), frontal callus, quadrate facial tubercles (connected below by a median prolongation extending to margin of buccal cavity), and a spot below each eye shining black; ocellar spot greyish clove-brown; occiput slate-grey, except posterior orbits and a downward offshoot from latter on each side of occipital triangular extension of ocellar spot; frontal callus narrowly separated from eye on each side, its lower margin curved, its upper margin produced in middle line into an angle, which nearly reaches ocellar spot; face, jowls, and basioccipital region, except on shining black calli and spots, clothed with pale yellow or yellowish hair; pollinose portions of front clothed with similarly coloured hair (in some specimens between frontal callus and ocellar spot with dark brown or blackish hair); palpi greyish clove-brown, clothed on outer side and below with yellowish, pale yellow, or whitish hairs, terminal joint bluntly lanceolate in outline when head is viewed in profile; first and second joints of antennæ somewhat greyish pollinose, clothed with short, black hair. Eye-markings (as seen in six ♀ specimens preserved in spirit):

occipital border* broad, in contact with upper and lower as well as with posterior margin of eye, deeply notched and in some specimens actually divided into two parts; frontal spots large, and all three usually in contact with margin of eye; shaft attached to arrow-head, and, though sometimes not extending so far, usually reaching upper margin of eye and there forming a connection between upper extremity of occipital border and upper frontal spot; point of arrow-head not reaching lower extremity of occipital border, but shoulders of arrow-head sometimes in contact both with lower end of upper half of latter and with middle frontal spot. *Thorax* clothed with whitish hair, shorter on dorsum than on pleuræ and pectus; paired light grey longitudinal stripes on dorsum commencing on front margin, and, when viewed from above, disappearing after extending over about anterior three-fourths of main portion of dorsum, when, however, the thorax is viewed obliquely from behind the posterior extremities of the stripes are seen to curve round on to the postalar calli; lateral borders of dorsum light grey; pleuræ and pectus slate-grey, former marked with an undulating stripe of pale yellowish or ochreous pollen, which, commencing on each side above hind coxa, runs forwards along upper border of sternopleura as far as prothorax, and is connected with its fellow of the opposite side by a transverse band in front of the anterior coxæ; there is also a patch of similarly coloured pollen on upper portion of each mesopleura. *Abdomen*: dorsum clothed for most part with minute, appressed, ochreous hairs (on basal angle sometimes with whitish hairs), which become longer towards distal extremity; venter slate-grey, clothed with minute, appressed, ochreous or pale yellowish hairs, more or less yellowish-grey pollinose, especially towards distal extremity and on sides of preceding segments. *Wings*: proximal and distal edges of transverse band both somewhat irregular, proximal edge commencing on auxiliary vein a little beyond level of proximal end of stigma, thence running obliquely to second longitudinal vein at origin of third longitudinal, from this point passing straight across distal extremity of first basal cell to angle at proximal end of discal cell, and thence to the posterior of the two angles at distal extremity of second basal cell; from this point the proximal edge of the band follows the veins forming the base and proximal boundary of the fifth posterior cell, passing over into the anal cell in the narrow, distal

* For explanation and illustrations of terms, see E. Daecke, "On the Eye-Coloration of the Genus *Chrysops*" ('Entomological News,' vol. xvii, 1906, pp. 39-42, pl. i.).

portion of the latter, in which it becomes very faint, and so reaching the posterior margin of the wing; the distal edge of the transverse band commences on the costa, usually a little way beyond the end of the first longitudinal vein, forms a conspicuous projecting angle in the first submarginal cell, below which angle it is noticeably emarginate, and from the fourth longitudinal vein follows a somewhat irregular or slightly sinuous course to the vein forming the proximal boundary of the third posterior cell, after which it becomes obliterated; with the exception of its proximal margin, therefore, the transverse band does not reach the posterior margin of the wing, but becomes obliterated in the fourth and fifth posterior cells; dark brown border next costa at tip of wing commencing a short distance beyond transverse band (sometimes narrowly connected with distal margin of latter), and terminating just below distal extremity of anterior branch of third longitudinal vein; first basal cell with an ill-defined brownish longitudinal streak at its proximal extremity, second basal cell also slightly infuscated at extreme base. *Squamæ* light sepia-coloured, border darker. *Halteres* clove-brown. *Legs*: coxæ grey, clothed with whitish hair, front pair yellowish pollinose at base in front and sometimes with an ochraceous ground-colour; femora clothed with whitish hair, front pair clove-brown, more or less tawny at base, middle and hind femora greyish clove-brown, more or less tawny above, sometimes wholly tawny except extreme tips; front tibiæ not incrassate, clove-brown, more or less raw-umber-coloured at base; front tarsi clove-brown, tips of middle and hind tarsi dark brown.

Madagascar: type and nine other specimens from Tsaranana, North-Central Madagascar, 19-28. iii. 1907 (*W. C. Holden*).

With reference to this species the collector writes as follows:—"Native name '*fhidambo*,' or wild boar fly. Numerous only in certain localities, which are wooded, well watered, and generally the haunts of wild boars, but not necessarily of cattle. Prefers the shade, and is more numerous in the forest and in the evening. Bite very sharp."

From *Chrysops madagascarensis*, Ricardo,—the only species of the present genus from Madagascar hitherto described,—*C. aprugna* is distinguishable *inter alia* by the wing-markings and coloration of the tibiæ. In *C. madagascarensis* the wing-markings resemble those of the species described below as *C. lloydi*, being blackish clove-brown in colour, and the transverse band being much broader than

in *C. aprugna*, and its distal margin convex towards the tip of the wing, instead of irregular and emarginate below an angular projection in the first submarginal cell; the tibiæ, too, in *C. madagascarensis* are entirely black. Apart from other characters, *C. aprugna* is distinguishable from *C. Lloydi* by the antennæ being entirely black, instead of having the first joint ochraceous, as also by the coloration of the wing-markings and shape of the transverse band. The distinctive characters of *C. aprugna* as regards the following species are pointed out at the end of the description of the latter.

Chrysops insulensis, sp. n.

♀.—Length (1 specimen) 6·5 mm.; width of head 2 mm.; width of front at vertex just under 1 mm.; length of wing 7 mm.

Antennæ, body, and legs entirely black; wings nearly hyaline, base, costal border, both basal cells except an area just before their distal extremities (much larger in second than in first basal cell), and a very conspicuous transverse band across middle (sharply defined except at posterior extremity) blackish clove-brown; legs slender.

Head black; frontal callus, a large, cordate, facial tubercle occupying practically whole of face, and an inconspicuous spot below each eye shining black; ocellar spot shining black (in denuded specimen), broadly connected with frontal callus by a clove-brown area, which encircles frontal callus and extends a little way below it, connecting bases of antennæ; frontal callus roughly elliptical oval in outline, almost reaching eye on each side, its transverse diameter the longer; sides of front and of face narrowly brownish rawsienna-coloured pollinose, jowls (except shining spot below each eye), a small spot on each side of vertex next upper angle of each eye, and a narrow transverse band immediately below antennæ clothed with similarly coloured pollen; basioccipital region brownish pollinose; palpi black, terminal joint lanceolate in outline when head is viewed in profile, clothed on outer side with brownish pollen and short, blackish hair; antennæ of moderate length, first joint swollen, first and second joints clothed with blackish hair. Thorax: pleuræ and sides of dorsum brownish pollinose. Wings: blackish clove-brown costal border including costal cells and extending from base to just beyond distal extremity of anterior branch of third longitudinal vein, emarginate (and therefore narrower than elsewhere) in marginal cell, next distal edge of transverse band; in addition to costal

border, blackish clove-brown area at base of wing includes extreme base, proximal three-fourths of first basal cell, proximal three-fifths of second basal (distal border of proximal dark area in basal cells thus runs obliquely forwards), and base of marginal cell; basal dark area joins proximal edge of transverse band in marginal cell, above point of origin of third longitudinal vein, whence proximal edge of band passes straight across tips of both basal cells, just touching proximal angle of discal cell, and so filling extreme distal extremities of basal cells with dark colour; proximal edge of transverse band touches proximal basal angle of fifth posterior cell, and dies away in narrow, distal extremity of anal cell; starting from costal border not quite midway between distal extremity of stigma and tip of second longitudinal vein, distal edge of transverse band forms a *conspicuous angle* (*apex of which rests on base of anterior branch of third longitudinal vein*), then runs backwards towards base of wing and crosses main stem of third longitudinal vein about 0.5 mm. before its bifurcation; from this point distal edge of band passes somewhat obliquely across wing to proximal boundary of third posterior cell, after which it becomes indistinct; the band fills proximal two-thirds of fourth and fifth posterior cells, and then dies away towards hind margin of wing; portion of fifth longitudinal vein forming part of boundary of second basal cell bordered anteriorly with blackish clove-brown. *Squamæ* sepia-coloured, border darker. *Halteres* clove-brown. *Legs* clothed with blackish hair, none of the tibiae incrassate.

Madagascar: Ambohitombo Forest (*Dr. C. I. Forsyth Major*).

In *Chrysops insulensis* the shape of the transverse band on the wing resembles that seen in *C. aprugna*; apart from all other characters, however, the present species may be distinguished from the foregoing by the fact that the apex of the angle on the distal margin of the band rests on the base of the anterior branch of the third longitudinal vein, instead of being separated from it by a considerable interval. Other distinctive characters of *C. insulensis* as compared with *C. aprugna* are afforded by the much darker coloration of the wing-markings, by the much greater extent of the dark area at the proximal end of the basal cells, and by the legs being entirely black. From *C. madagascarensis*, Ricardo, as well as from the new species described below, *C. insulensis* is distinguishable at once by the distal margin of the transverse band being conspicuously angulate instead of nearly uniformly curved. When compared with the following

species, a further means of distinction is furnished by the wholly black antennæ.

Although the type of the present species is denuded, the characteristic wing-markings are quite distinctive as regards the other species of *Chrysops* at present known from Madagascar, and the description printed above is therefore sufficient for practical purposes. The details of the body-markings, if any, cannot be determined until further specimens are obtained. It may be noted that the type of *C. insulensis* was erroneously assigned by Miss Ricardo (Ann. & Mag. Nat. Hist. ser. 7, vol. ix., May 1902, pp. 369, 370) to *C. madagascarensis*; it is the second specimen mentioned by the authoress, whose description of the "shading" at the base of the wing is in reality taken from the type of the present species and not from that of *C. madagascarensis*, in the wing of which the basal cells, with the exception of their distal extremities, are entirely clear.

Chrysops lloydi, sp. n.

♀.—Length (4 specimens) 6·4 to 8 mm.; width of head 2·2 to 2·4 mm.; width of front at vertex 0·6 mm.; length of antennæ 2·6 mm.; length of wing 6·6 to 7 mm.

First joint of antennæ ochraceous; body black, moderately shining, dorsum of thorax with two conspicuous yellowish-grey, pollinose, longitudinal stripes; wings hyaline, a narrow costal border clove-brown or black, and a broad and sharply defined transverse band across middle purplish clove-brown or purplish black, the purple tinge very noticeable when wings are viewed at a certain angle; distal margin of transverse band not angulate, but convex towards tip of wing; legs slender.

Head black; front, except frontal callus, clove-brown ocellar spot and hind border of vertex, two small dark brown spots connecting frontal callus with base of each antenna, and a median saffron-yellow pollinose area below frontal callus and between bases of antennæ, ochre-yellow pollinose; face, except shining black facial tubercles, and basioccipital region bright saffron-yellow pollinose; greater part of each jowl occupied by a large, shining black area, extending inwards from lower margin of eye; basioccipital region and front behind frontal callus clothed with pale yellow hair; upper part of o. ciput with an ochre-yellow pollinose, elongate fleck on each side of median downward extension of ocellar spot; frontal callus shining black, prominent, roughly oval in outline, narrowly separated from eye on each side, its transverse diameter the longer; facial tubercles roughly

quadrate in outline, separated above by a narrow median interspace of saffron-yellow pollen, but connected below by a shining black (sometimes partly shining mummy-brown) median prolongation, which reaches anterior margin of buccal cavity; *palpi* black, inner surface of terminal joint paler, outer surface of terminal joint clothed with blackish hair; first and second joints of *antennæ* clothed with short black hairs, first joint slightly swollen, second joint dark brown above and on outer side, more or less ochraceous on lower part of inner surface and below, third joint clove-brown. *Thorax*: dorsum (including upper surface of scutellum) covered with short, erect, whitish hair, pleuræ and pectus clothed with longer brown or pale yellowish hair; admedian, yellowish-grey, pollinose stripes on dorsum narrow and sharply defined, commencing on front margin and extending over anterior two-thirds or three-fourths. *Abdomen* unicolorous, entirely without markings, clothed above and below with short, appressed, whitish hair. *Wings*: extreme base clove-brown; first and second basal cells entirely hyaline except at extreme tips; clove-brown costal border including costal cells and a narrow edging to costa, extending from distal margin of transverse band to just beyond tip of anterior branch of third longitudinal vein; proximal extremity of marginal cell infuscated; proximal margin of transverse band commencing on second longitudinal vein just before origin of third longitudinal, crossing distal extremity of first basal cell, just touching proximal angle of discal cell, and thence passing somewhat obliquely across anterior portion of distal extremity of second basal cell to meet basal boundary of fifth posterior cell at about its centre; from this point proximal margin of transverse band follows basal and proximal boundaries of fifth posterior cell, passing over into narrow, distal extremity of anal cell, and reaching hind margin of wing at tip of latter; distal margin of transverse band commencing on costal border a little way beyond distal extremity of stigma, and curving round to meet hind margin of wing at tip of fourth posterior cell; anal cell usually closed just before reaching wing-margin. *Squamæ* light sepia, borders dark sepia. *Halteres* clove-brown. *Legs* clove-brown or dark brown, clothed for most part with similarly coloured hair; first joint of front tarsi, except tip, burnt-umber-coloured; first joint of middle and first and second joints of hind tarsi, except tips, and third joint of hind and second and third joints of middle tarsi at base buff-yellow; middle tibiæ sometimes raw-umber-coloured, distinctly paler than femora; none of the tibiæ in the slightest degree incrassate.

Madagascar : type and three other specimens from Andranolava, Majunga Province, 20-29. xi. 1907 (*J. J. Lloyd*).

In a note attached to the type the collector wrote :—
“The first specimen of this species that I have ever seen ; taken while biting me on the hand ; bite not very severe.”

Although agreeing with *Chrysops madagascarensis*, Ricardo, in the shape of the transverse band on the wing, *C. lloydi* may at once be distinguished from the species in question, as well as from its two new congeners described above, by the ochraceous coloration of the first antennal joint.

Table for the Determination of the Species of *Chrysops*
at present known to occur in Madagascar.

- | | |
|--|-----------------------------------|
| 1. Antennæ entirely black | 2. |
| Antennæ not entirely black ; first joint
ochraceous | <i>lloydi</i> , Austen. |
| 2. Distal margin of dark transverse band
on wing angulate or irregular | 3. |
| Distal margin of dark transverse band
on wing not angulate nor irregular, but
curved | <i>madagascarensis</i> , Ricardo. |
| 3. Basal cells in wing, with exception of
a small area near distal extremity
(larger in second than in first basal
cell), entirely filled with dark colour ;
projecting angle on distal margin of
dark transverse band on wing reach-
ing fork of third longitudinal vein ;
legs entirely black | <i>insulensis</i> , Austen. |
| Basal cells in wing almost entirely
hyaline ; projecting angle on distal
margin of dark transverse band on
wing not reaching fork of third longi-
tudinal vein ; legs not entirely black,
largely tawny | <i>aprugna</i> , Austen. |

TABANINÆ.

Genus *TABANUS*, Linn.

Tabanus kingi, Austen, var. *nigrifeminibus*, var. n.

♀.—Length (5 specimens) 14 to 16·5 mm. ; wing-expanse of largest specimen 29·4 mm.

Differing from the typical form of the species chiefly in the coloration of the frontal callus and of the middle and posterior femora.

Agreeing with typical form of *Tabanus kingi*, Austen, as described and figured (‘Bulletin of Entomological Research,’ vol. i. pt. 4, pp. 291-293, figs. 1 & 2 a, January 1911), except that:—frontal callus is mummy-brown or dark mummy-

brown instead of black or clove-brown; upper distal angle of first joint of antennæ is conspicuously tipped with black, being covered with minute black hairs, and expanded portion of third joint is sometimes dark brown or brownish, except perhaps at base; on dorsum of thorax, especially on scutellum, the black hair is often more in evidence, giving a darker effect and rendering the covering of minute, appressed, buff-yellow hairs less noticeable; ground-colour of dorsum of abdomen is usually darker, being dark brown or brownish instead of tawny-ochraceous or ochraceous; the series of oblique, pale marks on dorsum of abdomen, outside admedian stripes, usually takes the form of clearly defined light grey spots, which are often distinctly ovate in shape, in which case they may not reach hind margins of segments on which they are situated; and, lastly, that ground-colour of all femora, and not merely of those of front legs, is black.

Abyssinia and the East Africa Protectorate: type of variety, "caught in tent in daytime," and one other specimen, "caught on camel in daytime," from Hawash Valley, Abyssinia, 30. viii. 1908 (*Dr. R. E. Drake-Brockman*); two additional specimens from Laga Hardin, Abyssinia, "caught in tent," 3, 8. ix. 1908 (*Dr. R. E. Drake-Brockman*); a fifth specimen from the East Africa Protectorate, between Lake Rudolf and the boundary of Abyssinia, January-February, 1910 (*N. C. Cockburn*). By the courtesy of Baron J. M. R. Surcouf, the author has been enabled to examine an additional example of this variety, from Gondar, Abyssinia, 10. ii. 1907 (*H. Latham*), now in the collection of the Muséum National d'Histoire Naturelle, Paris.

The variety described above was formerly referred to by the author (*loc. cit.* p. 293) as a "species." The entire absence of plastic differences, however, as well as the, in some respects, intermediate character of the recently acquired specimen from the East Africa Protectorate (in which, though all the femora are black, the hairy covering of the dorsum of the thorax and the shape of the outer greyish abdominal markings are as in the typical *T. kingi*), seems, on further consideration, scarcely to justify this view.

Tabanus selousi, sp. n.

♀.—Length (1 specimen) 12 mm.; width of head 4·2 mm.; width of front at vertex 0·5 mm.; length of wing 9·75 mm.

Resembling and allied to T. laverani, Surcouf (? *T. unilineatus, Lw.*), but distinguished by the shape and considerably

greater breadth of the median stripe on the dorsum of the abdomen, by the stripe being interrupted (concealed by minute black hairs) on the anterior portion of the second segment, and by the pale border on each side of the dorsum of the abdomen being narrower.

Head whitish-grey pollinose, face, jowls, and basioccipital region clothed with whitish hair; front of moderate breadth, inner margins of eyes bordering it converging slightly below; *frontal callus* mummy-brown, oblong, longer than broad, and close above it in middle line an upwardly directed, dark brown, elliptical callus, marked with a median groove; *palpi* greyish ochraceous-buff, proximal joint clothed with whitish hair, terminal joint viewed from side rather broad at base, tapering to a fairly sharp point at distal extremity, clothed above and on outer side with minute, shining, whitish or yellowish-white hairs, interspersed with minute black hairs; first and second joints of *antennæ* ochraceous-buff (third joint missing in case of type). *Thorax* as in *T. laverani*, *Surconf* (dorsum seal-brown, thinly clothed with greyish pollen, and with sides and two broad admedian stripes, commencing on front margin and meeting at tip of scutellum, grey pollinose and clothed with pale yellowish or whitish hair; *pleuræ* and *pectus* grey, clothed with whitish hair). *Abdomen*: dorsum chestnut-brown, darker on fourth and following segments, with a whitish-grey pollinose median stripe, which extends from base of first to hind margin of fifth segment, and on third and two following segments is composed of a series of truncate triangles, each of which has its base resting on the hind margin of its segment, and its forwardly directed apex cut off by the hind margin of the preceding segment; the triangles on the third and fourth segments are rather broad, and their bases approximately equal in length, while the base of the triangle on the fifth segment is conspicuously shorter, so that on that segment the stripe appears to be suddenly narrowed; on second segment, where stripe is constricted in middle and, except at extreme base and on distal half, concealed by minute black hairs, stripe is much narrower than on distal halves of two following segments; on first segment base of stripe takes the shape of a median blotch, which, anteriorly as broad as scutellum, tapers to hind margin; except where covered on second segment with minute black hairs, the stripe is clothed with minute, appressed, pale yellowish hairs (on hind margin of first segment in middle line the pale yellowish hairs are somewhat longer); sixth segment with a very narrow, almost

linear, drab-grey median stripe, inconspicuous by comparison with the truncate median triangles on the third, fourth, and fifth segments; extreme hind margins of second and following segments drab-grey; lateral borders of dorsum buff, clothed with whitish-grey pollen and silvery-white hair, and narrowing from base to tip; dark area of dorsum clothed with minute black hairs; ventral surface of first six segments ochraceous-buff, clothed with minute, appressed, pale yellowish hairs, fifth and sixth segments with a dark greyish blotch on each side; ventral surface of seventh segment dark grey, clothed with the usual, erect, coarse black hairs, and with minute, appressed, pale yellowish hairs on each side. *Wings* with a faint sepiceous tinge, anal cell raw-umber-coloured; veins mummy-brown, rather coarse-looking; *stigma* long, mummy-brown, sharply defined and conspicuous. *Squamæ* sepia-coloured, fringed with minute, pale yellowish hairs. *Halteres*: knobs yellowish-white, stalks buff. *Legs*: femora and tibiæ cinnamon-coloured, light grey pollinose, and clothed with pale yellowish or whitish hair; distal halves of front tibiæ brown, hind femora mouse-grey above and at base; front tarsi clove-brown, second, third, and fourth joints considerably expanded; middle and hind tarsi dark brown, extreme base of second and following joints, and first joint except tip cinnamon-coloured.

Anglo-Egyptian Sudan: Bahr-el-Ghazal, about thirty miles west of Rumbek, "on or near the Khor Gorman, in the neighbourhood of Yei's village," 18.iii.1911 (*F. C. Selous*).

It may be mentioned that it would seem probable that *Tabanus laverani*, Surcouf, to which reference is made in the diagnosis of the species described above, is in reality *T. unilineatus*, Lw., but that the description of the latter (Ber. Akad. Wiss. Berlin, 1852, p. 658) is so incomplete as to render absolutely certain determination impossible. *T. laverani* was met with by Mr. Selous in some numbers at the same place and on the same date as the type of the species just described, and was also found plentifully at other localities in the vicinity. Although *T. laverani* was formerly regarded as a purely West African species, the Museum collection now includes specimens of it from the Bahr-el-Ghazal, Nyasaland Protectorate, and Portuguese East Africa, besides others from the localities in West Africa recorded by the present writer in his 'Illustrations of African Blood-sucking Flies' (1909).

Tabanus xanthomelas, nom. nov., for

Tabanus leucaspis, v. d. Wulp, 'Notes from the Leyden Museum,' vol. vii. p. 74, pl. 5. fig. 3 (1885) (*nec* Wiedemann, 1828)—nomen bis lectum.

Material received from various parts of Africa during the last two years shows that *Tabanus leucaspis*, v. d. Wulp (*nec* Wied.), which was formerly considered by the present writer to be identical with *T. pluto*, Walk.*, is after all distinct from that species. The name *leucaspis* having previously been employed by Wiedemann for a *Tabanus* from Brazil, the designation of van der Wulp's species must be changed.

Tabanus xanthomelas can be distinguished from *T. pluto*, Walk., by its abdominal markings. In the case of the former species, the yellowish area, clothed with chrome-yellow hairs, on each side of the dorsal surface of the abdomen terminates abruptly on the hind margin of the third segment, while in that of the latter the corresponding area is continued on to the fourth segment, usually as far as the hind margin, and sometimes even extends on to the fifth segment. In *T. pluto*, too, the black median longitudinal stripe separating the two yellow areas is much broader and has sharply defined edges, while in *T. xanthomelas* the intervening stripe is less than half the width of that in *T. pluto*, besides being more or less ill-defined and incomplete, the areas clothed with chrome-yellow or Naples-yellow hair having a marked tendency to fuse together. In fact, in well-preserved specimens of *T. xanthomelas*, the median stripe may be reduced to a triangular or elongate black spot on the hind margins of the second and third segments, or even to a single spot on the hind margin of the former segment.

Tabanus xanthomelas, the type of which was stated to be from the Gold Coast, is represented in the National Collection by specimens from Portuguese Congo, the Congo Free State, the Anglo-Egyptian Sudan (Mongalla Province), and the Uganda and Nyasaland Protectorates. *Tabanus pluto*, Walk., the Museum examples of which are from Sierra Leone and the Sierra Leone Protectorate, Liberia, and Northern and Southern Nigeria, would, so far as present knowledge goes, appear to be purely West African.

* Cf. Austen, 'Illustrations of African Blood-sucking Flies,' p. 92 (1909).

Tabanus producticornis, sp. n.

♀.—Length (1 specimen) 11·6 mm.; width of head 4 mm.; width of front at vertex just under 1 mm.; length of antennæ 2·4 mm. (length of third joint 1·6 mm.); length of wing 10·2 mm.

Rather small species, with abnormally long and slender third antennal joint.—Front broad, inner margins of eyes bounding it almost parallel, diverging very slightly below; frontal callus very large, prominent, shining clove-brown, quadrate in outline when viewed from in front, except that its upper margin is produced in middle line into an upwardly directed angle; dorsum of thorax greyish olive, unstriped; dorsum of abdomen blackish slate-coloured, cinnamon-rufous on each side at base, hind borders of all segments cream-buff or greyish cream-coloured pollinose; wings hyaline, costal cells and stigma mummy-brown, anterior branch of third longitudinal vein angulate at base and provided with a backwardly directed appendix.

Head: front only about two and one-third times as long as broad, buff pollinose above callus, subcallus cream-buff pollinose; face, jowls, and basioccipital region whitish grey, clothed with white hair; occiput smoke-grey; *frontal callus* in contact with eye on each side below; *palpi* cream-coloured, first joint clothed below with long white hair, terminal joint remarkably small, acuminate, clothed on outer side with appressed, silvery-white hairs, interspersed towards tip with minute black hairs; first joint of *antennæ* long, ochraceous-rufous (ochraceous-buff at base), upper distal angle not produced; second joint of antennæ short, also without a prominent upper distal angle; third joint remarkably long, narrow, and almost straight, expanded basal portion ochraceous-rufous, as viewed from the side the upper and lower margins of its proximal extremity almost parallel, the angle on the upper margin of the expanded basal portion not prominent, situate just before the middle of this section of the joint; terminal annuli of third joint clove-brown, styliiform, together about one and a half times as long as expanded portion of joint; last annulus especially elongate, about three-quarters as long as the three preceding annuli taken together. *Thorax*: dorsum clothed with fine, erect, blackish hair, mixed with ochre-yellow hairs; dorsal surface of scutellum grey, olivaceous at base; pleuræ and pectus light grey, clothed with white hair. *Abdomen*: dorsal surface of first three segments, except hind borders, cinnamon-rufous on each side; lateral borders of dorsal

scutes (invisible from above) buff, narrowing from base of abdomen to distal extremity, and clothed with white or yellowish-white hair; posterior angles of fourth, fifth, and sixth segments clothed with yellowish hair; ventral surface greyish cream-buff, clothed with appressed yellowish or whitish hair (seventh segment mouse-grey, clothed with black hair), hind borders of third to fifth segments inclusive cream-coloured pollinose. *Wings*: veins dark brown or mummy-brown; stigma elongate, somewhat darker than costal cells, the latter together with the stigma constituting an abbreviated coloured border, which forms a conspicuous contrast with the colourless remainder of the wing. *Squamæ* light drab. *Halteres*: knobs cream-buff, somewhat darker at base; stalks ochraceous-buff. *Legs*: coxæ grey, clothed with white hair; femora and tibiæ cinnamon, femora clothed with white hair and more or less grey at base, under surfaces and distal extremities of front tibiæ dark brown or brownish; front tarsi not expanded, clove-brown (first joint dark brown); last two joints and tips of first three joints of middle and hind tarsi dark brown, remainder of middle and hind tarsi cinnamon.

Portuguese East Africa: Umbelusi River, 20 miles south of Lorenzo Marques, December 1910 (*C. W. Howard*).

The awl-like shape and relatively great length of the third joint of the antennæ give this species an altogether unusual appearance, and will alone suffice to prevent confusion with any other African *Tabanus* at present known.

Tabanus minuscularius, sp. n.

♀.—Length (2 specimens) 8·6 to 10 mm.; width of head 3 to 3·6 mm.; width of front at vertex 0·75 mm.; length of wing 7·2 to 8·2 mm.

Small, dusky species, with conspicuously grey-striped thorax, and dorsum of abdomen marked with an ill-defined, yellowish-grey, median, longitudinal stripe, and, midway between this and lateral margin on each side, a sharply defined and sometimes broader stripe of lighter grey, more or less distinctly composed of a series of elongate spots.

Head: front yellowish-grey pollinose, parallel-sided, relatively rather broad (its length about two and one-half times its breadth), subcallus cream buff pollinose, ground-colour of subcallus ochraceous-buff; face, jowls, and basi-occipital region whitish grey, clothed with white hair; occiput grey, posterior orbits yellowish grey; *frontal callus*

shining clove-brown, transversely oblong, extending from eye to eye; on vertex is a shining black transverse mark, also extending from eye to eye, and perhaps partly due to rubbing; midway between mark on vertex and callus is a dull, clove-brown or black, transverse band, of approximately same size as callus, and extending from eye to eye; *eyes banded*; *palpi* cream-buff or cream-coloured, proximal joint somewhat greyish and clothed with white hair, terminal joint viewed from the side curved lanceolate, clothed on outer side with minute, appressed, shining yellowish-white hairs, mixed with minute black hairs; first and second joints of *antennæ* ochraceous-buff, short, clothed with short, black hairs, their upper distal angles not produced; expanded portion of the third joint of *antennæ* ochraceous-rufous, viewed from side sometimes rather broad, terminal annuli of third joint clove-brown (the three proximal annuli sometimes paler). *Thorax*: dorsum dark olive-brown, greyish in front, thinly clothed with minute, appressed, shining buff-yellow hairs mixed with some blackish hairs, light grey on each side from humeral callus to scutellum, with three narrow, light grey, longitudinal stripes, and on each side a shorter and broader grey stripe, which extends from posterior margin of triangular depression at end of transverse suture to postalar callus; the three light grey stripes in the centre all start from the front margin, but while the median stripe becomes indistinct beyond the transverse suture, the paired stripes (which posteriorly, at any rate, are somewhat broader than the median one) are entire; dorsal surface of scutellum grey on each side, more or less olive-brown in centre, its hairy covering similar to that of remainder of dorsum; swelling occupying triangular depression at each end of transverse suture isabella-coloured, clothed below with longer dark brown or black hair, and above with short yellowish hair; *pleuræ* and *pectus* light grey (meso- and sternopleuræ sometimes with traces of isabella-colour), clothed with whitish hair. *Abdomen*: dorsum dark olive-brown, clothed on each side and on median stripe with minute, appressed, yellowish hairs, extreme hind margins of all segments, except first, yellowish-grey pollinose; first segment grey on each side; midway between median line and lateral margin is, on each side, a longitudinal series of elongate grey spots, each spot with its base resting on the hind margin of the preceding segment, the two series thus forming a pair of grey stripes (considerably broader than the stripes on the thorax), which, commencing at the base of the second segment, terminate on the sixth segment

before reaching the hind margin, though, when the abdomen is viewed at a low angle from behind, a small grey spot, representing the end of the corresponding stripe, is sometimes indistinctly visible on the seventh segment, on each side of the middle line; the inner edge of the spots on the second, third, and fourth segments is somewhat oblique, and the spots on the fourth and fifth as well as those on the subsequent segments may not reach the hind margins; median stripe continuous, deeper in colour, less clearly defined, and sometimes narrower than the grey stripes just described, commencing at base of abdomen and dying away on sixth segment; venter light grey, clothed with minute, appressed, yellowish hairs, hind margins of segments cream-buff. *Wings* hyaline, costa dark brown, other veins mummy-brown; *stigma* elongate, mummy-brown or raw-umber-coloured. *Halteres*: knobs cream-coloured, stalks somewhat darker. *Legs*: coxæ grey, clothed with whitish hair; front femora slate-grey, clothed with appressed whitish hair, mixed with longer, erect, black hairs; middle and hind femora isabella-coloured or drab, with a dark grey or dark greyish-brown band on distal third; tibiæ buff, clothed (except tips of front tibiæ and posterior surface of tips of hind tibiæ) with minute, appressed, glistening yellowish-white hairs, distal fourth of front tibiæ clove-brown, tips of hind tibiæ brown; front tarsi clove-brown, three middle joints slightly expanded; middle and hind tarsi seal-brown or dark mummy-brown, first and second joints of hind tarsi, except tips, sometimes paler.

Portuguese East Africa: Umbelusi River, 20 miles south of Lorenzo Marques, December 1910 (*C. W. Howard*).

In size and general appearance the species described above, which belongs to Surcouf's "Thirteenth Group," is not unlike the typical form of *Tabanus suffis*, Jaenn., although distinguishable, *inter alia*, by the front being of uniform breadth, instead of noticeably wider above; by the much darker coloration of the frontal callus, &c.; by each of the paired grey abdominal stripes being practically continuous, instead of broken up into a series of oblique spots; by the wings having a distinct stigma; by the anterior branch of the third longitudinal vein not being angulate nor provided with an appendix at the base; and by the wings lacking the conspicuous infuscation of certain veins or portions of veins that is characteristic of *T. suffis*.