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«*The crane flies of Angola* (*families* Ptychopteridae *and* Tipulidae; Diptera)»

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The crane flies of Angola (families *Ptychopteridae* and *Tipulidae; Diptera*)

I — INTRODUCTION

The dipterous insects commonly known as crane flies because of their long and easily detached legs actually include five distinct families of flies that are placed in three different superfamilies. These families are the *Tanyderidae* (the primitive crane flies) and *Ptychopteridae* (the phantom crane flies), in the superfamily *Psychodoidea; Trichoceridae* (the winter crane flies) and *Sylvicoliidae (Anisopodidae, Rhyphidae)*, the so-called false crane flies, in the superfamily *Sylvicoloidea (Anisopodoidea)*, and the *Tipulidae* (the true crane flies) the sole representative of the superfamily *Tipuloidea*. All of these families are represented in the Ethiopian fauna with the exception of the *Trichoceridae*. The *Tanyderidae* still is known from Africa only by the very isolated genus and species in South Africa, *Peringueyomyina barnardi* ALEXANDER. The *Sylvicolidae* is a small group not presently recorded from Angola. The remaining families include the *Ptychopteridae*, with a single genus, *Ptychoptera* MEIGEN, known to occur in the Ethiopian region, with 13 species so far discovered, including three in Madagascar, a single species having been discovered in Angola and discussed hereinafter, and the vast family *Tipulidae*. This latter is the largest known family of *Diptera*, with more than 12,000 described species, of which approximately 1,000 are presently known from the African mainland and the satellite islands, including more than 200 species in Madagascar.

Two recent comprehensive papers by the writer (ALEXANDER, 1956, 1963) consider the *Tipulidae* of the Ethiopian region, excluding Madagascar, and provide keys for the separation of the species. These include approximately 500 species from Tropical Africa, north of the Cunene and Zambezi rivers (Ruwenzori Expedition Report, 1956) and the Crane flies of South Africa (1963), discussing the area south of these rivers, a total of some 300 species. Dates in parenthesis in this paper refer to the Selected Bibliography provided later in the report. The crane fly fauna of Madagascar has been discussed in a series of eight papers by the writer, published in the *Mémoires de l'Institut Scientifique de Madagascar*, the first part in 1951 (Serie A, Tome V), the eighth and latest in 1961 (Serie E, Tome XII), including a total of 200 species of these flies. Descriptions of the several hundred species of African crane flies described by the writer are contained in a long series of papers, many of which are cited in the comprehensive reports mentioned above. An interesting and readily available account of Angola and its peoples has been prepared by VOLKMAR WENTZEL (Angola, Unknown Africa, 1961).

The crane flies of Angola had remained virtually unknown until a collection including 33 species was sent to me for determination and description by Dr. A. DE BARROS MACHADO of the Biological Laboratory, Museu do Dundo, of the Companhia de Diamantes de Angola

(Diamang), Dundo. I am particularly indebted to Dr. MACHADO for his efforts in making known this evidently rich fauna and for the opportunity to publish the results of this study in the official journal, the *Publicações Culturais*. Types of the novelties and representatives of previously described species are to be preserved in the Musée Royal de l'Afrique Centrale, Tervuren; paratypes and duplicate specimens are in the writer's personal collection of World *Tipulidae*.

As far as is known to me only two species of crane flies had been recorded from Angola, these being *Nephrotoma fuscipennis* (KARSCH) and *Limonia (Dicranomyia) tipulipes* (KARSCH), both being based on material collected by ALEXANDER VON HOMEYER (1834-1903) at Pungo Andongo (Pungo Ndongo) in 1882. All other species result from the present collection made by Dr. MACHADO and colleagues, Mons. ED. LUNA DE CARVALHO and Mme. HENRI BERTRAND. The materials were taken in three principal localities in north-eastern Angola, close to the borders of Kasai and Katanga in the Republic of the Congo.

Alto Chicapa, along the Rivers Camutongola, Gungo and Tchimboma, at about 10° 53′ S. Lat., 19° 14′ E. Long., Alt. 1300 m.

Alto Cuílo, along the Rivers Cavuemba and Tchá-Muchito, at about 10° 00′ S. Lat., 19° 30′ E. Long., Alt. 1250 m.

Dundo and vicinity; gallery forests of the River Luachimo, Lunda, at about 7° 22′ S. Lat., 20° 50′ E. Long., Alt. 726 m.

The geographical distribution of the *Tipulidae* of Tropical Africa still remains poorly known and it is impossible to do more than provide broad generalizations at this time. The various species previously described have the following distributions.

1. Species described from the north and northwest — Cameroons, Nigeria and others. *Ptychoptera africana, Tipula (Acutipula) oryx* subsp., *Limonia compta, L. (Thrypticomyia) nigeriensis, L. (Geranomyia) ornatrix, Toxorhina (Ceratocheilus) cornigera.*

2. Species described from the east and northeast — Uganda, Kenya, Ruanda, Nyasaland and the Rhodesias. *Nephrotoma smithersiana, Limonia (Dicranomyia) guttula, Trentepohlia (Paramongoma) perpendicularis, T. (T.) exornata.*

3. Species with a wide distribution in Tropical Africa — Nigeria and the Cameroons to Uganda, Kenya and southwards. *Ctenacroscelis brunneus basiproductus, Limonia (Euglochina) connectans, Conosia irrorata, Lecteria (Lecteria) africana.*

In the Taxonomic Section figures are provided to show the wing venation of the genera and subgenera where these characters are used in classification. An asterisk (*) preceding the name indicates that the species had not been recorded from Angola previously.

II — TAXONOMIC SECTION

PTYCHOPTERIDAE

1. * *Ptychoptera africana* Alexander

(Fig. 1)

Ptychoptera africana ALEXANDER; Entomologist, 53: 101-102; 1920.

The type, a ♀, was from Ilesha, Southern Nigeria, collected in September 1911, by HUMFREY; type in the British Museum (Natural History).

ANGOLA: 2 ♀♀, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15615. Venation (Fig. 1).

TIPULIDAE

TIPULINAE

2. * *Ctenacroscelis brunneus basiproductus* Alexander

(Fig. 2)

Ctenacroscelis brunneus basiproductus ALEXANDER; Ann. Natal Mus., 15: 2, fig. 3 (♂ hypopygium); 1960.

ANGOLA: 1 ♂, Dundo, Luachimo River, gallery forest, August 1960 (MACHADO); ANG. 15460. Venation (Fig. 2).

3. * *Tipula (Acutipula) angolana* sp. n.

(Fig. 25)

Belongs to the *pomposa* group; size large (wing of male about 26 mm); mesonotal praescutum brown, margins darker, disk with three obscure yellow stripes, scutellum light yellow; mediotergite yellow with a brown area on either side of midline; pleura light yellow; femora brownish yellow, tips narrowly brownish black; wings brownish yellow, restrictedly patterned with light brown, including seams over anterior cord and *m-cu*; abdomen fulvous yellow, lateral tergal borders blackened, outer segments darkened; male hypopygium with apex of tergal lobe bifid, spiculose; outer dististyle a subcircular pale yellow plate, apex obtuse, inner margin produced into a small lobe; inner dististyle very irregular in conformation.

Male. — Length about 28 mm; wing 26 mm.

Female. — Length about 30 mm; wing 27 mm.

Frontal prolongation of head cinnamon brown, more yellowed beneath; nasus stout, dark brown; palpi dark brown, terminal segment lighter brown. Antennae with scape and pedicel obscure yellow, first flagellar segment brownish yellow, succeeding segments weakly bicolored, stems dark brown, the small basal enlargements brownish yellow; longest verticils a little shorter than the segments. Head brown, orbits vaguely more yellowed.

Pronotum light brown, lateral angles of scutellum darker brown. Mesonotal praescutum with ground brown, margins dark brown, disk with three conspicuous obscure yellow stripes, the broad median area vaguely divided by two capillary pale brown lines; scutal lobes with two obscure yellow or light brown areas that are narrowly bordered by darker brown, central area obscure yellow; scutellum light yellow, parascutella light brown, becoming blackened on either side behind; postnotum yellow, mediotergite with a brown area on either side of a broad central ground line; vestiture of notum yellow, long and conspicuous on scutellum and mediotergite. Pleura light yellow. Halteres dark brown, base of stem orange. Legs with coxae and trochanters light yellow; femora brownish yellow, bases clearer yellow, tips narrowly brownish black; tibiae light brown, tarsi darker, passing into black; claws of male toothed. Wings strongly suffused with brownish yellow, prearcular and costal fields more saturated; the small stigma and inconspicuous seams over anterior cord and *m-cu* light brown; veins brown. Veins unusually glabrous; trichia on distal section of R_{4+5}, scattered trichia on all three basal sections of M_{1+2} and base of M_1; a few trichia scattered over M; scattered trichia on both Anal veins, including prearcular section. Venation: Petiole of cell M_1 subequal to *m*; *m-cu* at near four-fifths M_{3+4}.

Abdominal tergites fulvous yellow, lateral borders narrowly blackened, outer segments darker; basal sternites light yellow; hypopygium extensively darkened. Male hypopygium

(Fig. 25) with posterior border of tergite, *t*, produced into a median lobe, outer half with a central furrow, producing two lobes that are provided with microscopic spicules. Ninth sternite with a small lobe on either side provided with a brush of yellow setae. Dististyles, *d*, distinctive; outer style a subcircular pale yellow plate, apex obtuse, inner margin produced into a small lobe; surface with pale yellow setae, some shorter; inner dististyle very irregular in conformation, about as figured; outer lobe erect, tipped with strong yellow setae.

Holotype, a broken ♂, Dundo, at night in house, April 21, 1954 (MACHADO); ANG. 15866. Allotopotype, a broken ♀, December 1948 (MACHADO); ANG. 15871.

Tipula (Acutipula) angolana is very different from all other Ethiopian species of the *pomposa* group, being most nearly related to *T. (A.) alphaspis* SPEISER and *T. (A.) nyasae* ALEXANDER. The structure of the dististyles of the male hypopygium, particularly the subcircular outer style, is quite distinctive of the species. Species of the group additional to the above as listed in the Ruwenzori Report, include *T. (A.) gaboonensis* ALEXANDER, *T. (A.) leonensis* ALEXANDER, *T. (A.) pomposa* BERGROTH, and *T. (A.) schizostyla* ALEXANDER. To these should be added the more recently described *T. (A.) bantu* ALEXANDER, 1956, of Kivu, and *T. (A.) urundiana* ALEXANDER, 1955, of Urundi.

4. * *Tipula (Acutipula) oryx pallipleura* subsp. n.

Male. — Length about 20 mm; wing 18-19 mm; antenna 11-11.5 mm.

Female. — Length about 24 mm; wing 20 mm.

Very similar to typical *oryx* ALEXANDER in the structure of the male antennae and hypopygium, differing conspicuously in the coloration of the thorax. Pronotum yellow. Mesonotal praescutum yellow with three faintly indicated more reddish fulvous stripes; scutal lobes yellowed, restrictedly patterned with brown, scutellum and mediotergite weakly infuscated. Pleura uniformly pale yellow. Abdomen more uniformly brownish yellow, the darkened subterminal ring almost as in *oryx*. Wings with costal cell much paler than the brown cell *Sc*, in *oryx* the cell darkened.

In typical *oryx* mesonotal praescutum and scutum liver brown, margined sublaterally with black, the extreme lateral margins pale, mediotergite fulvous, margined with dark brown. Pleura yellowed, patterned longitudinally with dark brown, this continued caudad over the dorsal pleurotergite.

Holotype, ♂, Dundo, September-October 1948 (MACHADO); ANG. 15871.

Allotopotype, ♀, with the holotype. Paratopotype, 1 ♂, September 9, 1953 (MACHADO); ANG. 15865.

The species, with the new subspecies, is well distinguished from all other members of *Acutipula* as presently known, by the unusual length of the antennae of the male, which exceed one-half the length of the wing. The most similar species are *Tipula (Acutipula) amissa* ALEXANDER, of Portuguese East Africa, and *T. (A.) auspicis* ALEXANDER, of the Cameroons, both with the male antennae much shorter.

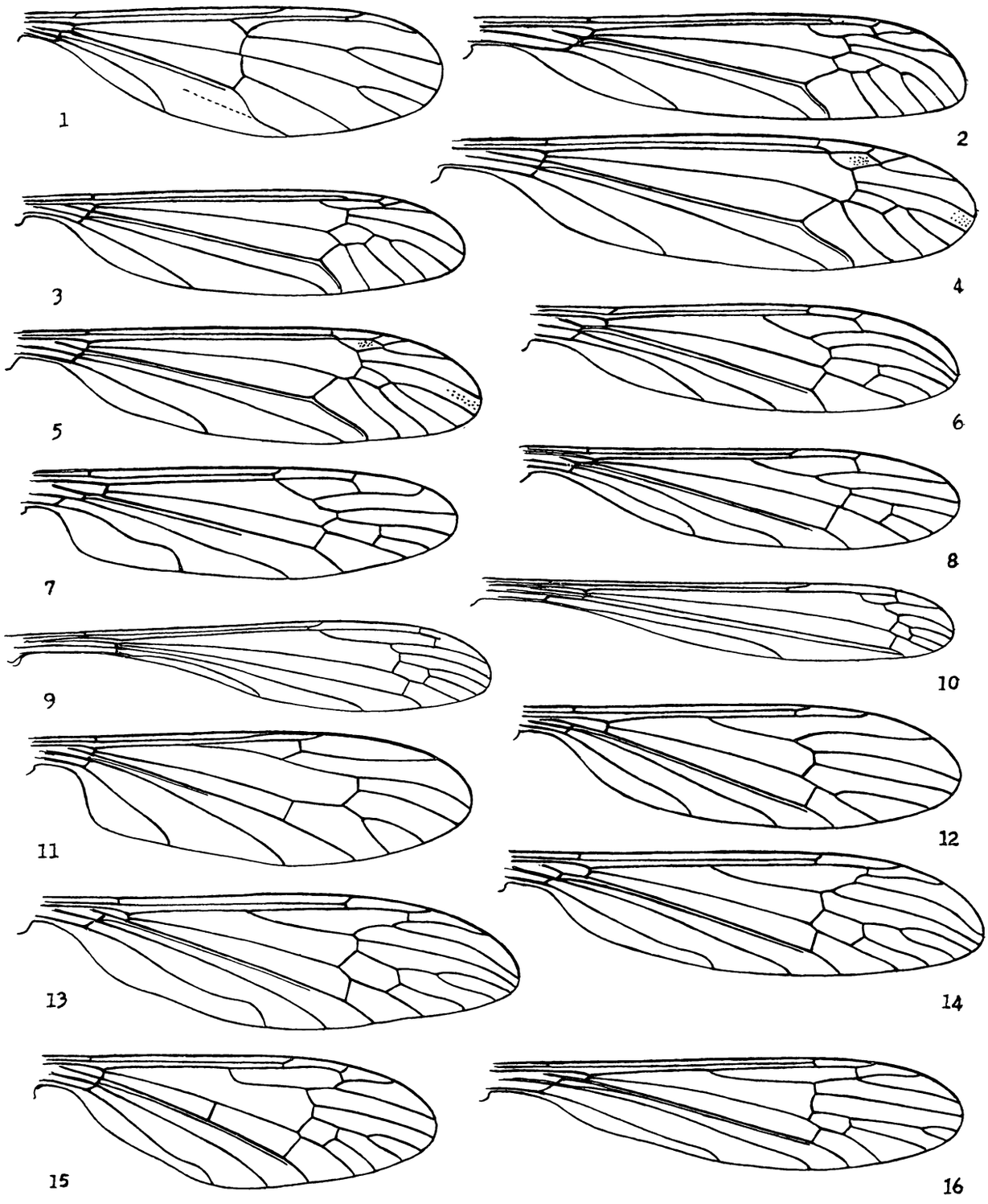
Typical *oryx* was described from Elat, Cameroons, taken in 1920 by JACOB A. REIS.

Tipula oryx ALEXANDER; Ann. Mag. Nat. Hist. (9) 8: 174-175; 1921.

Tipula (Acutipula) oryx ALEXANDER; Ruwenzori Exped. 1934-35, 1, no. 7: 167, 170; 1956.

The venation (Fig. 3) and the male hypopygium (Fig. 26) of typical *oryx* have not been illustrated and are shown here for completeness of the description.

Male hypopygium (Fig. 26) with the tergal lobe, *t*, glabrous except for delicate scattered setae, slightly expanded outwardly, apex emarginate forming slightly divergent blades. Region of ninth sternite on either side with an erect stout lobe provided outwardly with very long conspicuous setae, the longest subequal in length to the lobe itself; at base



Figs. 1-16. — 1. *Ptychoptera africana* ALEXANDER, venation; — 2. *Ctenacroscelis brunneus basiproductus* ALEXANDER, venation; — 3. *Tipula (Acutipula) oryx* ALEXANDER, venation; — 4. *Nephrotoma machadoi* sp. n., venation; — 5. *Nephrotoma sangoana* sp. n., venation; — 6. *Limonia compta* ALEXANDER, venation; — 7. *Limonia (Dicranomyia) neomidas* sp. n., venation; — 8. *Limonia (Geranomyia) obsolescens chicapae* subsp. n., venation. — 9. *Limonia (Thrypticomyia) nigeriensis* (ALEXANDER), venation; — 10. *Limonia (Euglochina) connectans* (ALEXANDER), venation; — 11. *Antocha (Orimargula) quadrispinosa* sp. n., venation; — 12. *Helius (Helius) luachimoensis* sp. n., venation; — 13. *Pseudolimnophila (Pseudolimnophila) dundoensis* sp. n., venation; — 14. *Pseudolimnophila (Pseudolimnophila) exsul prefurcata* subsp. n., venation; — 15. *Limnophila (Elaeophila) angolensis* sp. n., venation; — 16. *Limnophila baluba* sp. n., venation.

of lobe with a dense pencil of equally long yellow setae. Outer dististyle, *d*, broadest just before midlength, narrowed gradually to the obtuse apex. Inner dististyle moderately complex, as shown; beak a flattened blade, tip obtuse, surface above with dense microscopic pale spicules, on ventral half these replaced by dense yellow setae; lower beak a blackened plate, the lower apical angle acutely pointed; region of outer crest produced into a hatchet-shaped yellow blade, provided with relatively few strong setae.

5. * *Nephrotoma baluba* sp. n.

(Figs. 27, 28)

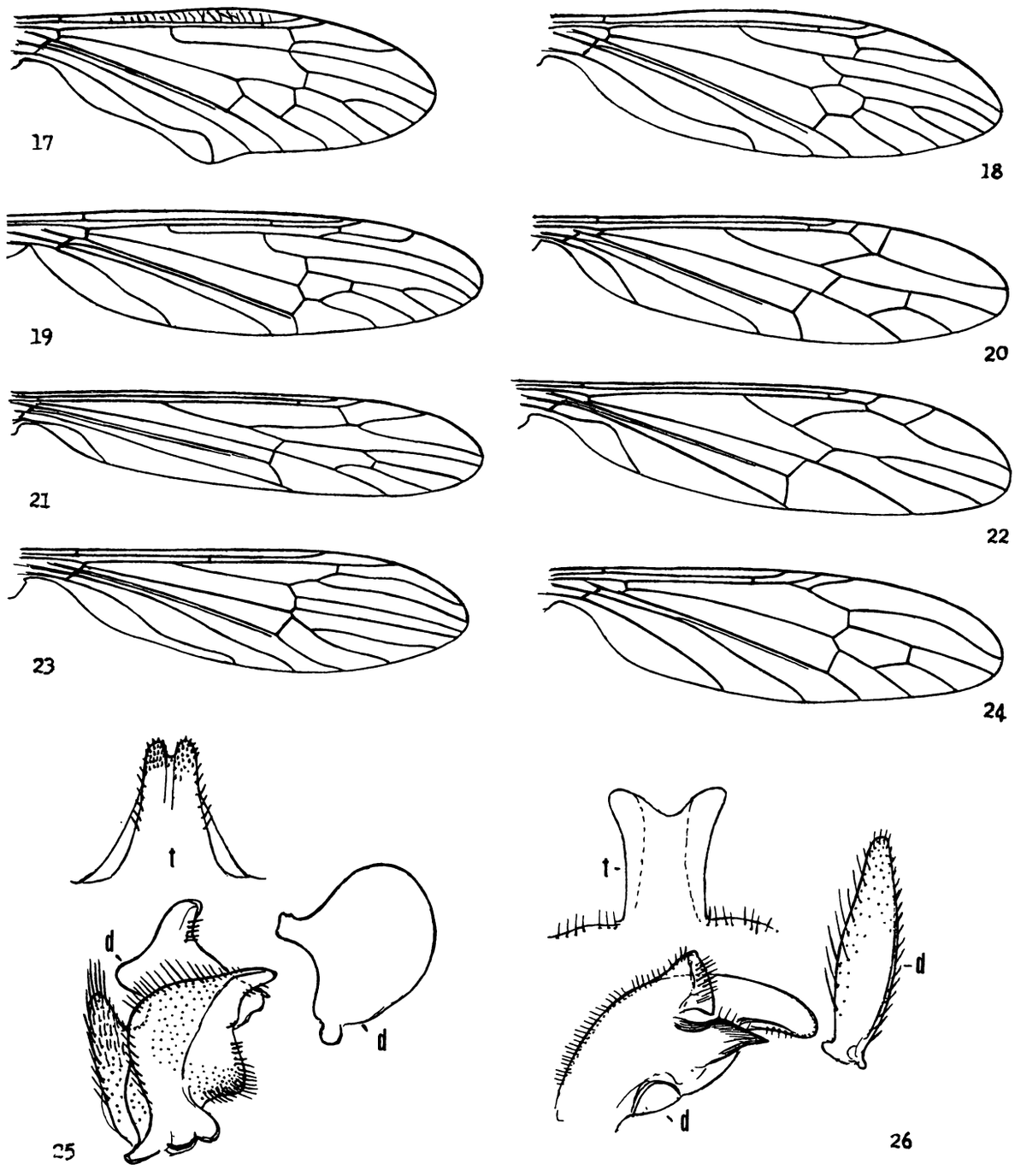
Mesonotal praescutum with a solidly blackened shield, all stripes being entirely confluent, outer lateral ends continued broadly to margin; head orange, occipital brand very inconspicuous; scutellum yellowed; pleura yellow, extensively patterned with reddened areas; halteres dark brown; femora black, bases yellowed; wings faintly infuscated, stigma and cell *Sc* brown; abdomen with basal segments banded black and orange, subterminal segments black forming a broad ring; male hypopygium with inner dististyle relatively long and narrow, the outer basal lobe a stout spine placed at outer apical angle; posterior border of eighth sternite with a conspicuous median tonguelike lobe.

Male. — Length about 14 mm; wing 12 mm; antenna about 3.7 mm.

Frontal prolongation of head light yellow, more reddened apically above; nasus reddened, with long stout black setae; palpi with proximal three segments light brown, terminal segment darker brown. Antennae of moderate length, as shown by the measurements; scape light yellow, pedicel slightly darker yellow, flagellum black; flagellar segments longer than their verticils, basal enlargements conspicuous. Head orange; occipital brand very inconspicuous, pale brown, ill-delimited; vertical tubercle high, weakly notched; a scarcely evident pale brown suffusion on orbits at narrowest part of anterior vertex; setae of head relatively short and sparse, black.

Pronotum light yellow medially, sides light brown. Mesonotal praescutum polished light yellow, the disk with a solidly blackened shield, the stripes being confluent, the lateral pair continued broadly laterad to margin; scutal lobes and suture very extensively blackened, the central yellow area very reduced; scutellum yellowed, parascutella brownish black; mediotergite light yellow, posterior third dark brown, pleurotergite whitened, more infuscated behind and beneath; praescutum and scutum glabrous, scutellum and mediotergite with very sparse pale setae. Pleura yellow, extensively patterned with more reddened areas on ventral anepisternum, sternopleurite and meron. Halteres dark brown, base of stem restrictedly dull orange. Legs with coxae brownish orange, fore coxae slightly darker brown; trochanters orange; femora black, bases yellowed, on fore legs including about the proximal fourth, a little more extensive on remaining legs; tibiae and tarsi brownish black; claws long, toothed. Wings with a brownish tinge, stigma, cell *Sc*, and a narrow seam in cell Cu_1 between the cubital branches pale brown; a suffusion over anterior cord and a very inconspicuous darkening at wing tip; veins brown. Stigma with relatively numerous trichia, none in outer wing cells. Venation: Sc_2 ending opposite origin of the gently arcuated *Rs*; cell M_1 narrowly to more broadly sessile; *m-cu* before fork of *M*; cell *2nd A* narrow.

Abdomen with basal segments conspicuously banded black and orange, the first segment, outer two-fifths of second and outer two-thirds of third segment blackened, fourth and fifth segments yellowish orange to orange, succeeding segments uniformly black; hypopygium light yellow, including also the posterior end of eighth segment. Male hypopygium (Figs. 27, 28) with tergite, *t*, transverse, posterior border on either side with the lobes emarginate so as to appear bilobed, each part with blackened spicules. Outer dististyle, *d*, long, widest at near midlength, about four times as long as broad, pale, including the yellow



Figs. 17-26 — 17. *Conosia irrorata* (WIEDEMANN), venation of male; — 18. *Clydonodozus scalaris* sp. n., venation; — 19. *Lecteria (Lecteria) machadoi* sp. n., venation; — 20. *Trentepohlia (Paramongoma) perpendicularis* ALEXANDER, venation; — 21. *Trentepohlia (Mongoma) fragillima bertrandae* subsp. n., venation; — 22. *Trentepohlia (Trentepohlia) exornata* BERGROTH, venation; — 23. *Erioptera (Erioptera) angolana* sp. n., venation. — 24. *Toxorhina (Ceratocheilus) nimbipleura* sp. n., venation; — 25. *Tipula (Acutipula) angolana* sp. n., male hypopygium; — 26. *Tipula (Acutipula) oryx* ALEXANDER, male hypopygium.

(Symbols: *t*, ninth tergite; *d*, inner and outer dististyles).

setae. Inner dististyle relatively long and narrow, beak stout, not blackened; lower beak broadly obtusely rounded; dorsal crest low, not reaching end of beak; spine of outer basal lobe placed high at upper outer angle of style, much higher than usual in the genus. Gona-

pophysis, *g*, very broad, tip obtuse, without a basal spine. Eighth sternite, *8 s*, broad, posterior border truncate, median region produced into a conspicuous tonguelike lobe provided with abundant pale retrorse setulae.

Holotype, ♂, Dundo, crepuscular, in garden , February 20, 1960 (MACHADO); ANG. 14842. Paratopotype, ♂.

By my key to the Tropical African species of the genus (Ruwenzori Report, 1934-35, 1, no. 7: 135-139), the present fly runs to *Nephrotoma fumidapicalis ampla* ALEXANDER, described from Mount Mlanje, Nyasaland, differing conspicuously in the coloration of the body and wings. Typical *fumidapicalis* ALEXANDER, of Nyasaland, Portuguese East Africa and Southern Rhodesia, is even more distinct, as in the vestiture of the postnotum and structure of the male hypopygium, including the quite different inner dististyle.

6. *Nephrotoma fuscipennis* (Karsch)

Pachyrhina fuscipennis KARSCH; Ent. Nachrichten, 12: 52-53; 1886.
Nephrotoma fuscipennis fuscipennis ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 136; 1956.

The types, 2 ♂♂, 1 ♀, were from Pungo Andongo, Angola, taken in 1882 by HOMEYER. There are two further races in East Africa discussed in the Ruwenzori Report.

7. * *Nephrotoma machadoi* sp. n.

(Figs. 4, 29, 30)

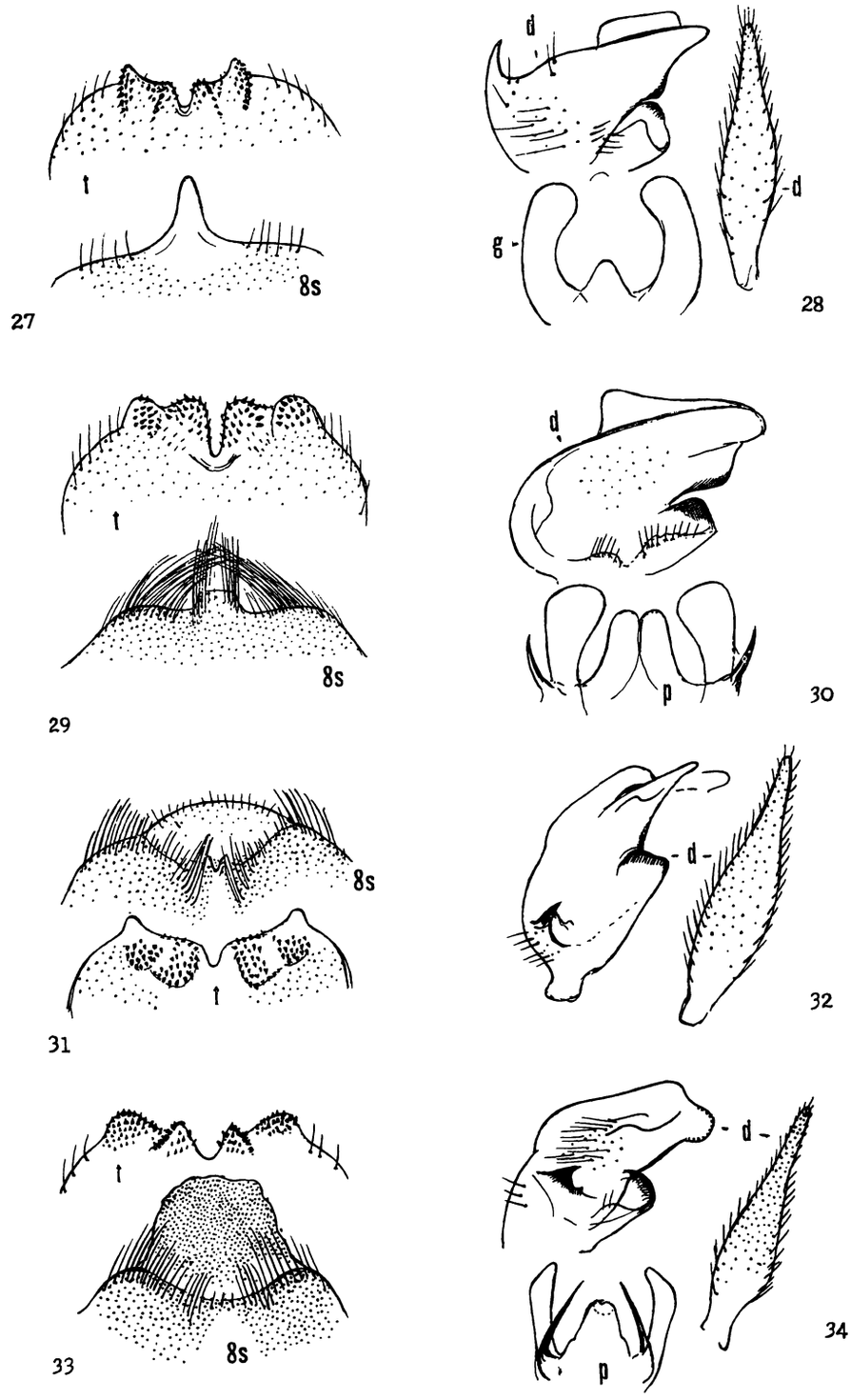
Size relatively large (wing of male 14 mm); mesonotal praescutum orange with three broad black stripes, the lateral pair with anterior ends outcurved; scutellum black, mediotergite yellow, posterior third blackened; pleura conspicuously variegated light yellow and black; antennae short, flagellum black; halteres infuscated; legs with all coxae black, femora black, bases narrowly yellowed, claws of male small, simple; wings strongly infuscated, slightly patterned with darker; abdomen black, bases of segments nacreous, genitalia of both sexes deep yellow; male hypopygium with tergal lobes broad, emarginate; eighth sternite with posterior border with three low lobes that are provided with long setae.

Male. — Length about 13 mm; wing 14 mm; antenna about 3.2 mm.

Female. — Length about 14 mm; wing 15.5 mm.

Frontal prolongation of head light yellow, dorsally with outer half weakly infuscated, less conspicuous in the allotype; nasus elongate, with long black setae; palpi light brown. Antennae of male short; scape obscure orange, pedicel light brown, flagellum black; flagellar segments with basal enlargements small, verticils of proximal six or seven segments long, on outer segments verticils much smaller. Head orange; occipital brand small, broad, pale brown; a very inconspicuous brown cloud on orbits at narrowest point between eyes; vertical tubercle high, with a very delicate impressed median line.

Pronotal scutum conspicuously orange yellow medially, sides more broadly brownish black, scutellum black. Mesonotal praescutum polished orange with three broad polished black stripes, interspaces narrow, lateral black stripes broadly reaching the margin, the extreme borders yellowed; scutum restrictedly yellow, each lobe with a single very large black area, suture black, including also the outer margin of scutal lobes, with an extension onto the posterior pretergites, isolating a small yellowed area on outer lateral part of praescutum; scutellum, including the parascutella, black; mediotergite light yellow, posterior third blackened,



Figs. 27-34 — 27, 28. *Nephrotoma baluba* sp. n., male hypopygium; — 29, 30. *Nephrotoma machadoi* sp. n., male hypopygium; — 31, 32. *Nephrotoma platysphela* sp. n., male hypopygium; — 33, 34. *Nephrotoma sangoana* sp. n., male hypopygium.

(Symbols: *t*, ninth tergite; *s*, eighth sternite; *d*, dististyles; *g*, gonapophysis; *p*, phallosome).

pleurotergite light yellow, posterior end blackened; setae of praescutal interspaces and scutum very small, of scutellum and mediotergite longer. Pleura light yellow, conspicuously patterned with black on propleura, ventral anepisternum, sternopleurite and meron; a narrow blackened

transverse line on posterior border of mesepisternum. Halteres infuscated, base of stem narrowly obscure yellow. Legs with all coxae black, with sparse inconspicuous yellow setae; trochanters abruptly yellow; femora black, bases narrowly yellowed, tibiae and tarsi dark brown; claws of male small, simple. Wings (Fig. 4) strongly infuscated, prearcular field, with cells *C* and *Sc*, darker brown, stigma still darker; whitened obliterative areas before stigma and across base of cell *1st* M_2; veins brown. Macrotrichia in stigma and in outer end of cell R_5. Venation: *Rs* gently arcuated; petiole of cell M_1 short, from one-sixth to one-third *m*; *m-cu* before fork of M_4.

Abdomen of male black, basal rings of segments more nacreous, becoming narrower on outer segments; eighth and ninth segments of male orange yellow, eighth sternite with two major darkenings on basal half; in the female, abdomen more uniformly blackened; genital segment deep yellow; cerci straight, tips acute. Male hypopygium (Figs. 29, 30) with tergite, *t*, transverse, beyond midlength gradually narrowed; posterior border with a broad lobe on either side of a narrow median notch, each half of the emarginate lobe provided with abundant blackened spicules; tergal setae relatively small, yellow, punctures very pale. Ninth sternite and basistyle not modified. Outer dististyle broken beyond base. Inner dististyle, *d*, with apex of beak deeply split, the upper flattened blade broadly obtuse, the under part narrowly blackened; lower beak blackened, apex truncate; dorsal crest relatively high, reaching the apex of the beak, becoming gradually elevated posteriorly, the end declivitous; no spine or comparable armature in region of the outer basal lobe. Phallosome, *p*, with sheath of aedeagus short and broad, the subtending gonapophyses short with very broad apices; aedeagus laterally produced into a slender spine; penis stout, dark reddish brown. Eighth sternite, *8s*, very broad, narrowed outwardly, apex generally truncate, produced into three low lobes, the lateral pair with long incurved setae, decussate at midline, the smaller more membranous median lobe with long setae that are directed caudad.

Holotype, ♂, Alto Cuílo, River Tchá-Muchito, small branch on left of the River Cavuemba, in gallery forest, June 1, 1954 (MACHADO); ANG. 10186. Allotopotype, ♀.

I am pleased to dedicate this attractive fly to Dr. A. DE BARROS MACHADO, who collected this outstanding series of Angolan *Tipulidae*. *Nephrotoma machadoi* is readily distinguished from generally similar members of the genus by the coloration of the body and wings, in conjunction with the simple claws of the male. Other regional species that have the coxae uniformly blackened include *N. perlepida* ALEXANDER and *N. triquetra* ALEXANDER, both with toothed claws; various other species having simple claws in the male, as *N. leto* ALEXANDER and *N. subinanis* ALEXANDER, are quite different in coloration.

8. **Nephrotoma platysphela* sp. n.

(Figs. 31, 32)

General features of coloration and structure virtually as in *Nephrotoma sangoana* sp. n., differing in the details of the male hypopygium, particularly the tergite, beak of the inner dististyle and the eighth sternite.

Male hypopygium (Figs. 31, 32) with tergite, *t*, transverse, posterior border very gently convex, with a U-shaped median emargination; lobes broad, the outer apical angles glabrous, the flattened lobes with abundant black spicules; disk of tergite with numerous setae on sides, broadly lacking on the median region. Outer dististyle, *d*, with distal third narrowed, setae relatively sparse, long, black. Inner dististyle with beak darkened, more slender than in *sangoana*; dorsal crest sclerotized anteriorly, paling to hyaline membrane behind; armature of the outer basal lobe about as in *sangoana*. Phallosome with gonapophyses longer and narrower than in *sangoana*, the subtending spine more slender, only about one-half as long. Eighth sternite, *8s*, with setae over the outer three-fourths, narrowly interrupted at

he midline; median emargination with a low broad more membranous lobe, its apex very ;ently convex, surface with abundant microscopic setulae and scattered elongate pale setae.

Holotype, ♂, Dundo, March 31, 1954 (MACHADO); ANG. 15868. Paratype, ♂, with he type.

9. * *Nephrotoma sangoana* sp. n.

(Figs. 5, 33, 34)

Size medium (wing of male to 11 mm); mesonotal praescutum with a central black hield formed by confluent black stripes leaving the humeral triangles light yellow, scutum nd scutellum polished black, pleura conspicuously variegated light yellow and black; all :oxae blackened; wings weakly darkened; abdomen brownish black, bases of proximal segments ıarrowly yellowed, hypopygium orange; male hypopygium with beak of inner dististyle very ›roadly obtuse, outer basal lobe a low flange, near posterior end produced into a single short pine; eighth sternite with apical margin concave, broadly filled with very extensive paler nembrane that is covered with abundant microscopic setulae.

Male. — Length about 12.5-13 mm; wing 10.5-11 mm; antenna about 4.5-4.6 mm.

Female. — Length about 14-15 mm; wing 11.8-12 mm.

Frontal prolongation of head short, yellow, pale brown dorsally except at base, nasus longate, brown; palpi brown, outer two segments darker brown. Antennae of male relatively ong, as shown by the measurements; scape orange, pedicel orange brown to pale brown, lagellum black; segments exceeding the verticils, moderately incised. Head orange; occipital ›rand elongate-triangular, pale and poorly differentiated.

Pronotum light yellow, sides and propleura broadly brownish black. Mesonotal praecutum almost covered by three confluent polished black stripes, humeral triangles light ellow; scutum and scutellum polished black, central region of scutum narrowly obscure ellow; mediotergite light yellow, posterior third to fourth black, pleurotergite black, katapleurorgite pale yellow; praescutum and central region of scutum with very short black setae, ın scutellum and mediotergite longer but sparse. Pleura conspicuously variegated with light ellow and black, the latter including most of anepisternum, the broad ventral sternopleurite, ıarrower ventral meron, and anterodorsal angle of pteropleurite; dorsopleural membrane ›roadly light yellow. Halteres black, base of stem and apex of knob restrictedly obscure range. Legs with all coxae brownish black, middle and posterior pairs slightly more pruinose; rochanters obscure orange, middle and hind pairs in cases brown; remainder of legs brownish lack, femoral bases narrowly yellowed; claws of male long, hairy, strongly toothed. Wings Fig. 5) weakly darkened, stigma and cell *Sc* more infuscated; veins brown. Macrotrichia ı outer end of cell R_5 with somewhat fewer in stigma. Venation: Cell M_1 with petiole unctiform to very short, approximately one-third to one-fourth *m*; *m-cu* before fork of M_4.

Abdomen brownish black, central area of second tergite and bases of tergites three nd four narrowly yellowed, succeeding segments blackened, hypopygium orange; in female, he yellow bases of the segments include also tergite five and sternites four and five. Ovipositor ith genital segment orange; cerci straight, tips subacute. Male hypopygium (Figs. 33, 34) ith tergite, *t*, transverse, posterior border with a U-shaped emargination, the broad lateral obes more shallowly indented to form two lobules, the outer one densely black spiculose on one side of the type these spicules much reduced in number, evidently an abnormal ondition), inner lobule with a row of comparable spicules. Outer dististyle, *d*, relatively long nd slender, outer third narrowed, maximum length about five times the greatest width hich is just before midlength. Inner dististyle distinctive; outer beak very broadly obtuse; orsal crest long, paling to hyaline membrane behind, anteriorly with oblique parallel striolae; ›wer beak blackened, apex subtruncate; region of outer basal lobe a low flange, near posterior nd bearing a single short blackened spine; disk of style with long yellow setae from pale

punctures. Phallosome, *p*, with gonapophyses appearing as small pale blades, only a little longer than the slender spines that subtend the aedeagus. Eighth sternite, *8s*, narrowed outwardly, apical margin concave, very broadly filled with paler membrane covered with abundant microscopic setulae; body of sternite sclerotized and darkened, with dark setae that narrowly include the median area.

Holotype, ♂, Dundo, December 2, 1947 (MACHADO); ANG. 15871.

Allotopotype, ♀, February 24, 1954 (MACHADO); ANG. 15864.

Paratopotype, ♀, with the allotype.

Nephrotoma sangoana is still another species that by means of keys to the genus runs to *N. fumidapicalis* ALEXANDER and allies, differing most distinctively in the structure of the male hypopygium, particularly the inner dististyle and eighth sternite.

10. * *Nephrotoma smithersiana* Alexander

Nephrotoma smithersiana ALEXANDER; Jour. Ent. Soc. South Africa, 22: 51-53, fig. 1 (venation), fig. 11 (♂ hypopygium); 1959.

The types were from Salisbury, Southern Rhodesia, taken in March through May 1956-1957, by COURTENAY N. SMITHERS. The single specimen recorded herewith from Angola is slightly smaller than the type (*Male.* — Length about 9.5 mm; wing 9 mm; antenna 7.5 mm) and differs slightly in thoracic coloration, the three praescutal stripes being polished chestnut brown with only their anterior ends intensely blackened, the scutal lobes similarly chestnut, with only the lateral portions black.

ANGOLA: 1 ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15691-1.

LIMONIINAE

LIMONIINI

11. * *Limonia compta* (Alexander)

(Fig. 6)

Limnobia compta ALEXANDER; Ann. Mag. Nat. Hist. (9) 6: 15-16; 1920.

Limonia (Limonia) compta ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 205, fig. 204 (wing of holotype); 1956.

The types were from Southern Nigeria, taken by Dr. T. F. G. MAYER.

ANGOLA: 1 ♀, Dundo, in house at night, January 11, 1960 (MACHADO); ANG. 11696.

The single broken female differs from the type in some minor respects but I consider it as belonging to this species. Wings (Fig. 6) with *Sc* a little longer, with both Sc_1 and Sc_2 nearly opposite fork of *Rs*; cell *1st* M_2 a little longer, subequal in length to distal section of vein M_3; *m-cu* shortly beyond fork of *M*. Abdomen with apex of first segment and broad bands on segments two to five yellow, including also the base of segment two, the pattern involving both the tergites and sternites; two subterminal segments uniformly black, the outer ones, with the ovipositor, orange.

12. * *Limonia (Dicranomyia) guttula* (Alexander)

)icranomyia guttula ALEXANDER; Canad. Ent. 47: 80, fig. (wing); 1915.
.imonia (Dicranomyia) guttula ALEXANDER; Ann. Natal Mus. 15: 12; 1960.

Described from Lourenço Marques, Portuguese East Africa. Known also from Mada-ascar. *Limonia (Dicranomyia) pauciguttata* (ALEXANDER), described from the Cameroons, nd *L. (D.) sus* ALEXANDER, known from New Guinea and Micronesia, are very close and nay prove to be identical. Other regional members of the *punctulata* group include *L. (D.) ıidas* ALEXANDER, of Mauritius, *L. (D.) neoguttula* ALEXANDER, of Southern Rhodesia, and *.. (D.) sanctae-helenae* ALEXANDER, of Saint Helena, all entirely different from the present fly.

ANGOLA: 1 ♂, Dundo, June 8, 1960 (native collector); ANG. 15050-6.

13. * *Limonia (Dicranomyia) neomidas* sp. n.

(Figs. 7, 35)

Size large (wing of female 8.5 mm); mesonotal praescutum with three very broad lark brown stripes; scutellum light yellow, the posterior border and mediotergite blackened; ıalteres yellow; legs black, femoral bases yellowed; wings whitened, with a restricted dark ›rown pattern, Sc_1 ending opposite origin of *Rs*, cell *2nd A* very broad; abdomen dark ›rown, basal segments paler brown; valves of ovipositor unusually short and stout, cerci lattened, their tips broadly truncate.

Female. — Length about 8 mm; wing 8.5 mm.

Rostrum stout, black; palpi brownish black. Antennae with scape brown, remainder ›lack; flagellar segments oval, the outer ones smaller and slightly more elongate. Head dark ›rown; anterior vertex about twice the diameter of scape.

Pronotal scutum broadly dark brown above and on sides, with an obscure orange spot ›n either side behind, scutellum more yellowed. Mesonotal praescutum with three very broad 'irtually confluent dark brown stripes, the median area vaguely split by a capillary paler 'itta; humeral region conspicuously buffy yellow, interspaces indicated behind, light brown; cutum with lobes pale brown, median region and posterior callosities narrowly yellow; cutellum conspicuously light yellow, blackened posteriorly, as is the mediotergite, pleuro-ergite brownish gray. Pleura brown, dorsal sternopleurite extensively more yellowed, ventral ternopleurite light gray, above with a pale brown line, metapleura brown. Halteres yellow, :nob more orange yellow. Legs with fore coxae pale brown, narrowly ringed with dark ›rown, posterior coxae darker brown; trochanters obscure yellow; remainder of legs black, emoral bases yellowed, including the proximal fifth or sixth of the segment. Wings (Fig. 7) vhitened, with a restricted but conspicuous dark brown pattern arranged as follows: Arculus .nd an extensive line in cell *Sc* above it; a common area at origin of *Rs* and fork of *Sc*; :ord, outer end of cell *1st* M_2 and over R_2 and adjoining veins; a circular spot in cell *1st A* .djoining vein *2nd A* before tip; very small marginal darkenings at ends of longitudinal 'eins, most conspicuous on R_3, virtually lacking on R_{4+5}; veins light yellow, brownish black n the patterned areas. Venation: Sc_1 ending opposite origin of *Rs*, Sc_2 near its tip; cell *'st* M_2 long, subequal in length to distal section of M_{1+2}; *m-cu* shortly beyond fork of *M*; :ell *2nd A* very broad, vein *2nd A* bent strongly into the margin.

Basal abdominal tergites light brown, outer segments and the sternites more uniformly larker brown. Ovipositor (Fig. 35) unusually short and stout; cerci flattened, tips broadly runcate, hypovalvae nearly as long; preceding tergite pale brown, with very long pale setae.

Holotype, ♀, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694-1.

Limonia (Dicranomyia) neomidas is most similar to *L. (D.) submidas* ALEXANDER, of Uganda, distinguished by the coloration of the thoracic pleura, abdomen and legs, and in the details of venation and pattern of the wings, including the short *Sc*. Attention is called to the peculiar structure of the ovipositor.

14. *Limonia (Dicranomyia) tipulipes* (Karsch)

Dicranomyia tipulipes KARSCH; Ent. Nachrichten, 12: 51-52; 1886.
Dicranomyia consimilis BERGROTH; Ent. Tidskr., 9: 127; 1888.
Dicranomyia confinis BERGROTH; Ent. Zeit., 8: 116; 1889.
Dicranomyia tangentialis SPEISER; Kilimandjaro-Meru Zool. Exped., 1905-1906, 10 Diptera, 4 Orthorapha Nematocera, pp. 47-48; 1909.
Dicranomyia columbina BRUNETTI; Fauna Brit. India, Diptera Nematocera, p. 567; 1912.

The type male was taken at Pungo Andongo, Angola in 1882 by Major ALEXANDER VON HOMEYER. The species now is known to be very widely distributed in southern and eastern Africa, Madagascar, the Seychelles and certain of the Mascarent islands, as well as in India and Ceylon. The species varies somewhat in the size and number of the darkened costal areas, in some cases with three major markings, in others with four.

15. * *Limonia (Rhipidia) sigilloides* Alexander

Limonia (Rhipidia) sigilloides ALEXANDER; Ann. Mus. Congo, Tervuren, Zool., 36: 279-280; 1955.
Limonia (Rhipidia) sigilloides ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 201, 219, fig. 72 (♂ hypopygium); 1956.

The type was from Muhavura, Ruanda, altitude 2100 meters, January 28, 1953, taken by BASILEWSKY.

Allotype, ♀, Length about 7 mm; wing 8 mm.

Characters generally as in the type male, differing in certain regards. Mesonotal praescutum with an irregular brown pattern that includes a large elongate-oval central area on posterior half of sclerite, with a smaller triangular mark at cephalic margin, the point directed backward; remainder of central praescutal area obscure yellow, bordered laterally by a narrow sinuous brown stripe that becomes obsolete behind; mediotergite narrowly darkened laterally and with a complete narrow brown central vitta. The peculiar praescutal pattern may prove to be of sufficient importance to warrant the separation of the present fly as a distinct subspecies or species but a male specimen would be needed before such a course were to be followed.

Allotype, ♀, Dundo, in house at night, October 20, 1960 (MACHADO); ANG. 15692.

16. * *Limonia (Geranomyia) obsolescens chicapae* subsp. n.

(Fig. 8)

Similar to typical *obsolescens* ALEXANDER (Uganda, Kenya) differing especially in the details of the male hypopygium. Vestiture of praescutum abundant, including longer setae on the interspaces, on the stripes with much smaller setulae, the whole praescutal disk thus

ppearing microscopically hairy. Wings (Fig. 8) with costal fringe a little shorter. Male ypopygium with the dorsal dististyle shorter and more nearly straight, blackened. Gonaophysis with mesal-apical lobe much narrower, darkened, the margins not crenulate.

Holotype, ♂, Alto Chicapa, River Camutongola, in mosquito trap, July 15, 1954 MACHADO); ANG. 3843. Allotopotype, ♀, pinned with type. Paratopotypes, 12 ♂♀, July 2-17, 1954 (MACHADO); ANG. 3843, 10188-1, 10223-1, 15862, several ♂♀, unmounted.

17. * *Limonia (Geranomyia) ornatrix* (Alexander)

Geranomyia ornatrix ALEXANDER; Rev. Zool. Afr., 14: 168-170, fig. 4 (wing); 1926.

The type, a ♀, was from Mo Tyan, the Cameroons, taken August 14, 1923, by ACOB A. REIS.

ANGOLA: 1 ♀, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); NG. 15694-1.

18. * *Limonia (Thrypticomyia) nigeriensis* (Alexander)

(Fig. 9)

Dicranomyia (Thrypticomyia) nigeriensis ALEXANDER; Ann. Mag. Nat. Hist. (9) 8: 161; 1921.
Limonia (Thrypticomyia) nigeriensis ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 201; 1956.
Limonia (Thrypticomyia) nigeriensis ALEXANDER; Ann. Natal Mus., 15: 19; 1960.

Described from Nigeria, more recently discovered in Portuguese East Africa.

ANGOLA: 1 ♂, Dundo, in garden, February 1960 (MACHADO); ANG. 14888. Venation Fig. 9).

19. * *Limonia (Euglochina) connectans* (Alexander)

(Fig. 10)

Dicranomyia connectans ALEXANDER; Ann. Mag. Nat. Hist. (9) 5: 54; 1920.
Limonia (Euglochina) connectans ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 208; 1956.
Limonia (Euglochina) connectans VERDCOURT; Ent. Mo. Mag. (4) 223: 153; 1958.

Widespread in Tropical Africa, known hitherto from the Cameroons, Congo, northeast Darfur; Uganda, Kenya, Portuguese East Africa and Southern Rhodesia.

ANGOLA: 1 ♂, Dundo, in garden, February 1960 (MACHADO); ANG. 14888.

The peculiar venation had not been figured (Fig. 10). The position of the cord and ater veins far distad, as shown, is a character of the subgenus while the apical fusion of eins Cu_1 and *1st A*, closing cell *Cu* at the margin, is a unique feature in the entire genus *imonia*. The species has been found in association with spider's webs (VERDCOURT reference), habit known for several other species in the subgenera *Euglochina* ALEXANDER and *Thryptimyia* SKUSE.

20. * *Antocha (Orimargula) quadrispinosa* sp. n.

(Figs. 11, 36, 37)

Size relatively large (wing 5 mm or more); mesonotal praescutum reddish brown, anteriorly with a narrow blackened central stripe, pleura variegated reddish brown and darker brown; antennae short, black; last tarsal segment with an epicondyle, claws with four major spines; wings whitish subhyaline, more yellowed at base; macrotrichia on outer radial and medial veins; abdomen dark brown, genital segments brownish yellow.

Male. — Length about 4.5-5 mm; wing 5-6 mm; antenna about 0.85-1.0 mm.

Female. — Length about 5.5-6 mm; wing 5.5-6 mm.

Rostrum reddish brown, palpi elongate, black, the combined rostrum and palpi subequal in length to remainder of head. Antennae short, black; flagellar segments short-oval, the outer ones oval, terminal segment about one-third longer than the penultimate; longest verticils subequal to the segments. Head gray.

Cervical region elongate, blackened. Pronotum yellowed on sides. Mesonotal praescutum reddish brown with a narrow blackened central stripe on anterior third; scutum brownish gray, sides of lobes more yellowed; scutellum brownish gray, posterior border broadly yellowed; mediotergite dark gray, pleurotergite reddish brown. Pleura reddish brown, anepisternum and ventral sternopleurite more darkened. Halteres with stem yellowed, knob weakly darker. Legs with coxae and trochanters brownish yellow; femora yellowish brown, tibiae and tarsi somewhat darker; last tarsal segment with a stout epicondyle; claws (Fig. 37) elongate, with four major spines and a smaller more basal spinule. Wings (Fig. 11) whitish subhyaline, without stigma; base and costal field more yellowed; veins light brown, more yellowed in the brightened areas, including the incrassated outer costal region. Macrotrichia on outer fourth of vein R_3 and all but the bases of distal sections of R_{4+5}, M_{1+2} and M_3. Venation: M_{3+4} shorter than basal section of M_{1+2}.

Abdomen dark brown, very slightly pruinose, hypopygium and genital shield of ovipositor brownish yellow. Ovipositor with cerci gently upcurved to the obtuse tips. Male hypopygium (Fig. 36) with posterior border of tergite, *t*, nearly truncate. Outer dististyle, *d*, with unusually conspicuous delicate setulae on outer surface. Proctiger, *p*, with very long delicate setae.

Holotype, ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694-1. Allotopotype, ♀, pinned with type. Paratopotypes, 9 ♂♀.

Antocha (Orimargula) quadrispinosa agrees with *A. (O.) nigristyla* ALEXANDER and *A. (O.) schmidi* ALEXANDER, in the leg characters, the presence of an epicondyle and four major spines on claws, differing in the reduction in number of macrotrichia of the wing veins and in details of structure of the antennae and male hypopygium. The Ethiopian species of *Orimargula* MIK are most readily separated by the structure of the legs, especially the terminal tarsal segment and toothing of the claws. The other species having an epicondyle (an enlarged hairy cushion at base) have the following numbers of major spines on claws — *A. (O.) brevicornis* ALEXANDER, 3; *A. (O.) indumeni* ALEXANDER, 3; *A. (O.) kraussi* ALEXANDER, 1; *A. (O.) multispina* ALEXANDER, 6 or 7; *A. (O.) transvaalia* (ALEXANDER), 3. Species that lack the epicondyle are *A. (O.) delibata* RIEDEL, 3; *A. (O.) longicornis* ALEXANDER, 1; *A. (O.) melina* ALEXANDER, 1; *A. (O.) pauliani* ALEXANDER, 1; *A. (O.) setosa* ALEXANDER, 1; *A. (O.) venosa* ALEXANDER, 2.

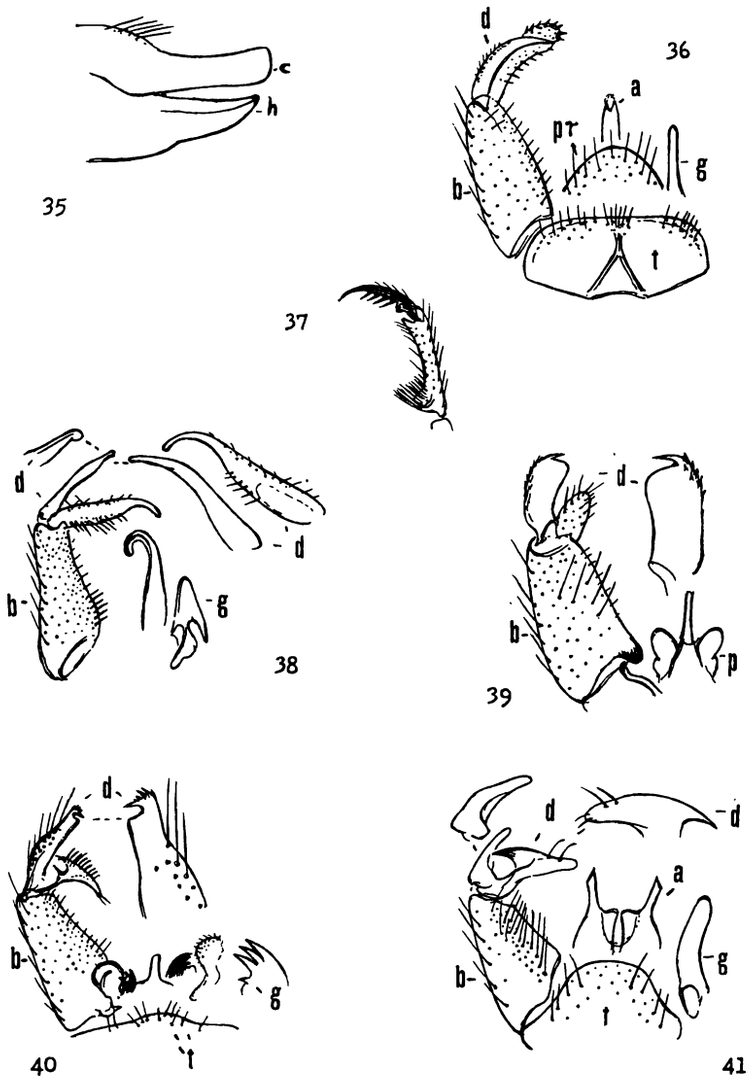
20a. * *Antocha (Orimargula) quadrispinosa minuscula* subsp. n.

Male. — Length about 3.2-3.5 mm; wing 3.8-4.1 mm; antenna about 0.7-0.75 mm.

Female. — Length about 4 mm; wing 4.7-5 mm.

Virtually identical with typical *quadrispinosa* sp. n., differing chiefly in the evidently smaller size, as shown by the measurements.

Holotype, ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); MNG. 15694-1. Allotopotype, ♀, pinned with type. Paratopotypes, 14 ♂♀.



Figs. 35-41 — 35. *Limonia (Dicranomyia) neomidas* sp. n., ovipositor, lateral aspect; — 36. *Antocha (Orimargula) quadrispinosa* sp. n., male hypopygium; — 37. *Antocha (Orimargula) quadrispinosa* sp. n., terminal tarsal segment male; — 38. *Helius (Helius) luachimoensis* sp. n., male hypopygium; — 39. *Limnophila (Elaeophila) angolensis* sp. n., male hypopygium; — 40. *Limnophila baluba* sp. n., male hypopygium; — 41. *Toxorhina (Ceratocheilus) nimbipleura* sp. n., male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *c*, cercus; *d*, dististyles; *g*, gonapophysis; *h*, hypovalvae; *p*, phallosome; *pr*, proctiger; *t*, tergite).

21. * *Helius (Helius) luachimoensis* sp. n.

(Figs. 12, 38)

General coloration of head and thoracic notum dark brown, ventral pleurites yellowish brown; halteres with stem light brown, knob brownish black; legs yellowish brown, tarsi pale to yellowish white; wings weakly tinged with brown, costal and stigmal regions very

slightly darker brown; Sc_1 longer than Sc_2, ending opposite midlength of basal section of R_{4+5}, *m-cu* at midlength of M_{3+4}.

Male. — Length, including rostrum, about 5 mm; wing 4.5 mm; rostrum alone about 0.8 mm.

Rostrum black, relatively long, about one-half longer than remainder of head. Antennae with scape and pedicel black; flagellum broken. Head dark brown.

Cervical region elongate, dark brown. Pronotum dark brown, sides of scutellum obscure yellow. Mesonotal praescutum and scutum almost uniformly dark brown, scutellum paler brown, postnotum yellowish brown; notum glabrous. Pleura brown dorsally, more yellowish brown on sternopleurite, meron and metapleura. Halteres with stem light brown, brightened at base, knob brownish black. Legs with coxae and trochanters yellowish brown; femora yellowish brown, tips darker; tibiae brownish yellow, tarsi more yellowish white. Wings (Fig. 12) weakly tinged with brown, costal and stigmal regions very slightly darker brown, the latter scarcely delimited posteriorly; veins brown. Costal fringe relatively long; macrotrichia on most longitudinal veins beyond cord, including both branches of *Rs*, distal section of Cu_1, and sparse and scattered on basal halves of M_{1+2} and M_3; no trichia on *Rs*. Venation: Sc_1 longer than Sc_2, ending about opposite midlength of basal section of R_{4+5}; *m-cu* at midlength of M_{3+4}.

Abdomen, including hypopygium, dark brown. Male hypopygium (Fig. 38) with basistyle, *b*, long, setae at base of mesal face strong and spinoid. Outer dististyle, *d*, smooth, apex small, entire. Inner dististyle longer, outer third narrowed. Gonapophysis, *g*, with outer end oval, margin produced basad into a spinoid point. Aedeagus strongly curved at apex.

Holotype, ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694-1.

Helius (Helius) luachimoensis is most nearly related to *H. (H.) imperfectus* (ALEXANDER), described from Sierra Leone, which still is insufficiently known. The present fly has the wings more darkened, with slight differences in venation and trichiation of the wings, including the long vein Sc_1 which is conspicuously longer than Sc_2.

HEXATOMINI

22. * *Pseudolimnophila (Pseudolimnophila) dundoensis* sp. n.

(Fig. 13)

Size large (wing of male 9.5 mm); head brownish gray, anterior vertex blackened; mesonotal praescutum with disk chiefly dark brown, paler medially behind, lateral borders light gray, pseudosutural foveae and tuberculate pits polished black; posterior sclerites of notum and the pleura chiefly dark brown; legs medium brown; wings pale brown, restrictedly patterned with darker brown along cord and outer end of cell *1st* M_2, centers of virtually all cells with longitudinal whitened streaks; *r-m* just beyond fork of *Rs*, *m-cu* more than one-half times its length beyond fork of *M*; abdominal tergites medium brown, sternites more reddish yellow, on outer segments restricted to a narrow central vitta, the sides broadly dark brown.

Male. — Length about 10 mm; wing 9.5 mm.

Rostrum and palpi black. Antennae with scape and pedicel black; flagellum broken. Head brownish gray, anterior vertex blackened, with three low lobes behind the antennal fossae; posterior vertex freckled with black spots, the strongly narrowed posterior part more pruinose.

Prothorax dark brown. Mesonotal praescutum with disk chiefly dark brown, the posterior half of central part a little paler, lateral borders broadly light gray; pseudosutural

foveae polished black, conspicuous, tuberculate pits similarly blackened, separated by a distance about equal to their own diameter; posterior sclerites of notum dark brown, posterior border of scutellum slightly paler brown, mediotergite more pruinose. Pleura dark brown, more pruinose on pteropleurite and pleurotergite, dorsopleural membrane light brown. Halteres broken. Legs with fore coxae blackened, middle and posterior pairs yellow; trochanters yellow; remainder of legs medium brown; claws small. Wings (Fig. 13) pale brown, stigma darker brown; relatively conspicuous paler brown clouds over cord and outer end of cell *1st* M_2; centers of most cells with longitudinal whitened streaks that restrict the ground to broad seams along the veins; veins brown, more yellowed at wing base. Venation: *r-m* just beyond fork of *Rs*; *m-cu* from about two-thirds to four-fifths its own length beyond fork of *M*.

Abdominal tergites medium brown, sternites more reddish yellow, on outer segments the color restricted to a narrow central vitta, the sides broadly dark brown; hypopygium brown.

Holotype, ♂, Dundo, Luachimo forest, August 1960 (MACHADO); ANG. 15460-2.

Pseudolimnophila (Pseudolimnophila) dundoensis is about intermediate in size between *P. (P.) frugi* (BERGROTH) and *P. (P.) senex* ALEXANDER. It differs from *P. (P.) exsul prefurcata* subsp. n., in the body coloration and venation. It is probable that one of the most important characters for separation of species in this difficult genus will be found in the antennal structure.

23. * *Pseudolimnophila (Pseudolimnophila) exsul prefurcata* subsp. n.

(Fig. 14)

Male. — Length about 10 mm; wing 10.5 mm; antenna about 2 mm.

Female. — Length about 10 mm; wing 10.5 mm; antenna about 2.2 mm.

Larger than typical *exsul*, differing in venation and details of coloration. Antennae much shorter, the proximal flagellar segments short-oval, the first not brightened basally. In *exsul* all flagellar segments are elongate-cylindrical, the outer ones slightly longer and more slender. Reddish praescutal stripes very extensive, greatly reducing the three dark brown interspaces, especially the lateral pair; pseudosutural foveae castaneous. Wings (Fig. 14) with veins more delicate than in *exsul*. Venation: *r-m* at or before fork of *Rs*, as shown.

The structure of the antennae indicates that the present fly may be found to represent a distinct species. Typical *exsul* was described from the Boma Plateau, Sudan, taken in 1939 by the late Dr. JOHN G. MYERS (Proc. Roy. Ent. Soc. London (B) 19: 86; 1950). In the Ruwenzori Report I had considered it as representing a race of *frugi* (BERGROTH) but it now seems advisable to restore it to specific status.

24. * *Limnophila (Elaeophila) angolensis* sp. n.

(Figs. 15, 39)

Size small (wing of male to 6.8 mm); general coloration dark gray, praescutum with two narrow darker brown intermediate stripes, pleura black; antennal flagellum and legs yellow; wings of male broadest opposite end of vein *2nd A*, very pale yellow with a heavy brown pattern, including larger and darker costal and marginal spots and abundant paler brown dots in all cells.

Male. — Length about 6-6.2 mm; wing 6.5-6.8 mm; antenna about 1.2-1.3 mm.

Rostrum and palpi black. Antennae relatively short, yellow, scape, pedicel and outer flagellar segments slightly darker, pale brown; proximal six flagellar segments oval, rounded beneath, with verticils on upper surface; outer segments elongate, with very long verticils. Head dark brown; anterior vertex broad.

Pronotum large, dark brown, gray pruinose, anterior pretergites brownish yellow. Mesonotal praescutum dark gray, with narrow dark brown intermediate stripes that widen behind, slightly broader than the central interspace; sublateral stripes narrow, paler brown, lateral praescutal borders with a darkened area; humeral region buffy yellow, enclosing the oval black pseudosutural foveae; posterior sclerites of notum dark gray, scutal lobes and central area of scutum and scutellum darker brown, the suture intensely blackened; postnotum and pleura more uniformly blackened. Halteres with stem obscure yellow, knob brownish black. Legs with all coxae and trochanters black, remainder of legs light yellow. Wings (Fig. 15) with ground very pale yellow with a heavy brown pattern that includes larger darker brown marks at origin of *Rs* and across the supernumerary crossvein in cell *M*, and along the cord, extending from R_{1+2} at costa to *Cu*, expanded in the radial field, enclosing a small circular ground area in base of cell R_4; smaller dark brown marginal spots, the largest at R_3 and R_4; all cells with small subcircular paler brown dots, in most cells these subequal in area to the ground, more sparse on anterior third of wing; veins yellow, brown in the patterned areas. Venation: Sc_1 ending shortly before fork of *Rs*, Sc_2 near its tip; R_{1+2}, R_2 and R_{2+3} all subequal; cell M_1 longer than its petiole; cell *1st* M_2 short-rectangular, *m-cu* at near one-third to one-fourth M_{3+4}.

Abdomen, including hypopygium, dark brown. Male hypopygium (Fig. 39) with the outer dististyle, *d*, broad, with a single major apical spine, with about seven or eight small appressed spinules; disk and lower face of style smooth; inner dististyle pale, with sparse relatively long yellow setae.

Holotype, ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694. Paratopotypes, 2 ♂♂, with the type.

The most similar African species is *Limnophila (Elaeophila) subannulata* ALEXANDER, of Southern Rhodesia, which differs in the coloration of the thorax and legs, as the pattern of the coxae and femora. The male sex of *subannulata* remains unknown.

25. * *Limnophila baluba* sp. n.

(Figs. 16, 40)

Belongs to the *filata* group; size medium (wing of female 7 mm); general coloration of thorax brownish gray, pronotal scutellum and humeral region of praescutum obscure orange; halteres dark brown; legs brownish black; wings strongly infuscated, stigma darker, with further restricted darkenings that include the distal ends of outer radial cells and a narrow seam over cord; cells *R* and *1st A* with narrow whitened longitudinal lines; R_2 close to fork of the long R_{2+3+4}, cell M_1 about one-third its petiole; male hypopygium with very long setae on outer dististyle, the outer apical angle a curved point that is crested with four or five small spinules; gonapophysis terminating in about three strong spines.

Male. — Length about 7.5 mm; wing 6.3 mm; antenna about 1.0 mm.

Female. — Length about 8.5 mm; wing 7 mm.

Rostrum and palpi black. Antennae brown, relatively short; proximal flagellar segments oval, outer ones gradually more elongate; proximal segments with short verticils and a dense white pubescence, verticils of outer segments long and conspicuous. Head dark brown.

Pronotum large, dark brown, scutellum obscure orange. Mesonotal praescutum dark brown, surface light gray pruinose, humeral region obscure orange, encircling the elongate

ack pseudosutural foveae; posterior sclerites of notum and the pleura dark brownish gray; orsopleural membrane light brown. Halteres dark brown. Legs with coxae and trochanters own; remainder of legs brownish black. Wings (Fig. 16) strongly infuscated, stigma oval, rker brown; further darkenings in distal ends of outer radial cells, a narrow pale brown am over cord, best indicated by a deepening in color of the veins, and still smaller brown ouds at outer end of cell *1st* M_2 and posterior cord; conspicuous longitudinal whitened reaks in cell *1st A* behind the vein and in cell *R* adjoining vein *M*, extended distally across ll *1st* M_2 into cell M_3; veins pale brown, darker in the clouded areas. Longitudinal veins eyond cord with abundant macrotrichia, lacking on R_{2+3+4}, sparse on second section of R_{1+2}, lacking on *Rs*, *M* and *2nd A*; a short series of trichia on outer fifth of *1st A*. Venation: R_1 ending just beyond fork of *Rs*, Sc_2 near its tip; R_2 close to fork of the long R_{2+3+4}, bout two-thirds as long as R_{1+2}; cell M_1 short, about one-third its petiole; *m-cu* variable position, from opposite one-third to before midlength of M_{3+4}; cell *2nd A* narrow, especially on outer half.

Abdomen, including hypopygium, dark brown. Ovipositor with both cerci and hypogium long and straight, the latter black. Male hypopygium (Fig. 40) with posterior border tergite, *t*, gently convex, the central part further elevated into a small very low cushion. uter dististyle, *d*, blackened, dilated on central half, provided with very long conspicuous tae; outer apical angle a narrowed curved point, with four or five small spinules on outer argin. Inner dististyle with apex slender, tipped with long setae. Basistyle, *b*, with the terbase an oval flattened blade, the outer surface with short setae. Phallosome with aedeagus ry small, pale; gonapophysis much smaller than the interbase, terminating in about three rong spines.

Holotype, ♂, Alto Chicapa, Gungo River, Cuango-Muqué branch, in gallery forest, ne 27, 1954 (MACHADO & ED. LUNA DE CARVALHO); ANG. 3841-2. Allotopotype, ♀.

The subgeneric status of species belonging to the *filata* group of the genus remains question. For a further discussion of the problem, a paper by the writer may be consulted uwenzori Report, 1956: 290-291). Among the rather numerous African species presently own, this species is most nearly allied to *Limnophila hetaira* ALEXANDER, *L. suffilata* LEXANDER, and some others, differing most evidently in the pattern and venation of the wings, d in the details of hypopygial structure, particularly the outer dististyle.

ERIOPTERINI

26. * *Conosia irrorata* (Wiedemann)

(Fig. 17)

mnobia irrorata WIEDEMANN; Aussereur. zweifl. Ins. 1: 574; 1828.
mnobia substituta WALKER; List Dipt. Brit. Mus. 1: 39; 1848.
mnophila crux DOLESCHALL; Natuurk. Tijdschr. Nederl. Indie 14: 388, pl. 4, fig. 3; 1857.
nosia irrorata ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 309; 1956.

Widely distributed throughout the Palaeotropics, including eastern Australia, northward o the Palaearctic region, in Africa including East Africa, northwest to Lake Tchad (Union Central African Republics) and Liberia, southward to Portuguese East Africa. Venation male (Fig. 17).

ANGOLA: Alto Chicapa, Tchimboma River, August 1954 (MACHADO); ANG. 3739-1.

River Camutongola, mosquito survey, July 12-17, 1954 (MACHADO); ANG. 3843, 188-1, 10223-1, 15862.

27. * *Clydonodozus scalaris* sp. n.

(Fig. 18)

General coloration of praescutum yellow with four brown stripes, posterior sclerites and pleura yellowed, patterned with darker, pteropleurite heavily blue-gray pruinose; antennae black; femora yellow, tips narrowly and abruptly black; wings yellowed, conspicuously but restrictedly patterned with dark and paler brown, vein R_{2+3+4} about twice R_{2+3}; abdomen orange, intermediate sternites with a narrow black band across base, continued caudad along sides of segment.

Female. — Length about 19 mm; wing 13 mm.

Rostrum short, reddish brown; palpi with first segment dark brown, sparsely pruinose, second segment polished black, hemispherical, the convex side outward. Antennae with scape and pedicel blackened above, more reddened beneath, flagellum black; basal flagellar segments oval with short verticils, outer segments becoming elongate, with long verticils that are fully one-half longer than the segments. Head with front and the tuberculate cephalic part of anterior vertex more chestnut, the latter behind golden yellow pollinose, variegated with blackened areas, posterior vertex broadly dark brown, sparsely yellow pollinose.

Cervical region and pronotum reddish brown, the scutum above darker brown. Mesonotal praescutum with ground yellow pollinose, with four brown stripes, the intermediate pair narrow, converging behind, broader than the central ground vitta; pseudosutural foveae reddened, inconspicuous against the ground; scutum and base of scutellum dark brown, sparsely pruinose, parascutella and outer end of scutellum more yellowish brown; postnotum yellowish brown, anterior part of mediotergite light gray pruinose. Pleura obscure fulvous yellow, propleura and dorsal anepisternum darker, pteropleurite heavily blue-gray pruinose, ventral sternopleurite weakly dusted with gray; dorsopleural membrane buffy yellow behind, with a blackened spot before wing root. Halteres with stem reddened, knob brown. Legs with fore coxae dark brown, remaining coxae and all trochanters fulvous; femora light yellow, tips narrowly and abruptly black, the amount subequal on all legs, on fore femora including about the outer tenth of segment; tibiae and tarsi brownish yellow, tips of segments narrowly blackened. Wings (Fig. 18) with the ground yellowed, conspicuously but restrictedly patterned with dark and paler brown; darker areas along cord, outer end of cell *1st* M_2, fork of M_{1+2} and in radial field, at near midlength of vein R, origin of Rs, Sc_2 and a larger area in the stigmal region; a circular brown marginal spot on vein R_3; extreme wing tip from cells R_3 into M_3 narrowly infuscated; a broad paler brown wash at near one-third the wing length, including cell R backward to the posterior wing border; arcular region and broad outer ends of cells R and M yellowed; the broad cell C brownish yellow, Sc clear light yellow; veins clear yellow, chiefly brown in the darkened areas. Venation: R_{2+3+4} yellow, about twice R_{2+3}, the latter subequal to R_2.

Abdomen elongate, tergites obscure orange, basal segment brown; sternites orange, distinctively patterned with black, including the narrow bases of segments two to seven, inclusive, the areas continued caudad as narrow lateral lines that are broadly interrupted on posterior fourth of each segment. Genital shield fulvous; cerci long and slender, gently upcurved.

Holotype, ♀, Dundo, Luachimo Forest, October 2, 1960 (MACHADO); ANG. 15615.

By my key to the African species of the genus *Clydonodozus* ENDERLEIN (Ruwenzori Expedition 1934-35, 1, no. 7: 310-311; 1956), the present fly runs to *C. interruptus* ALEXANDER, which appears to be closely related. The two flies are readily separated by the coloration, particularly the pattern of the abdominal sternites, as described. In *interruptus* the sternites have an interrupted blackened central longitudinal stripe instead of the transverse band of the present fly.

28. * *Lecteria (Lecteria) africana africana* Alexander

cteria africana ALEXANDER; Bull. Amer. Mus. Nat. Hist. 43: 14-15, pl. 4, fig. 2 (wing); 1920.

The types were from the former Belgian Congo, taken at Faradji and Bagboro by NG and CHAPIN. Now known from the Cameroons to Uganda.

ANGOLA: 1 ♂, Dundo, December 2, 1947 (MACHADO); ANG. 15871.

29. * *Lecteria (Lecteria) machadoi* sp. n.

(Fig. 19)

Size very large, especially the abdomen (Male, length 32 mm, abdomen 25 mm); sonotal praescutum brownish yellow with four medium brown stripes, pleura yellowish own; tibiae dark brown with two pale yellow rings, the subbasal one narrower; wings scure yellow with an abundant brown spotted and dotted pattern; abdomen obscure low, lateral borders of both tergites and sternites narrowly dark brown.

Male. — Length about 32 mm; wing 20 mm; abdomen alone about 25 mm; antenna out 3.3 mm.

Rostrum very short, light brown; palpi short, darker brown. Antennae with scape k brown, pedicel paler brown, basal two flagellar segments enlarged, dull orange, outer ments darker, more elongate, with very long verticils. Head light brown, orbits narrowly re yellowed; vertex with a continuous narrow darker brown central line.

Pronotal scutum medium brown, more yellowed laterally, with a conspicuous tubercle either side of midline; scutellum more yellowed, deeply impressed medially, especially front. Mesonotal praescutum brownish yellow, with four narrow medium brown stripes, intermediate pair united before the suture; central ground vitta subequal in width to dark stripes, with vague indications of a capillary very pale brown line; pseudosutural eae subtriangular in outline, dull brown, conspicuous; scutum brownish yellow, each e with two slightly separated medium brown areas, with a further darkened spot on es immediately behind the suture, midline of scutum faintly darkened; scutellum testaceous low, weakly darkened medially, provided with short yellow setae; mediotergite obscure low in front, more reddish brown behind, pleurotergite brownish yellow; vestiture of escutum and scutum long and conspicuous, erect. Pleura light brown or yellowish brown, sopleural membrane more buffy. Halteres infuscated, base of stem broadly orange. Legs h coxae and trochanters yellowish brown; femora obscure yellow, the narrow tips slightly ker; tibiae dark brown, with two pale yellow rings, the subbasal one about one-half as ensive as the subterminal ring; tarsi light brown; legs with abundant setae, longest on the ae and tarsi; basitarsi without modified spinoid setae. Wings (Fig. 19) obscure yellow, h an abundant brown pattern that includes a major area at and above the fork of *Rs*, h a smaller mark at origin of *Rs*; all cells with numerous pale brown dots, their margins it and ill-defined, the dots much less numerous than in *pluriguttata*, in the clearer yellow *Cu* larger and more separated; veins light brown, prearcular and outer radial veins more owed, anterior arculus whitened. Venation: R_{2+3} relatively long, about three times R_2, *pluriguttata* the two elements subequal; basal section of R_5 arcuated basally, subequal R_{2+3+4}.

Abdomen very long, as shown by the measurements; obscure yellow, tergites with arrow dark brown lateral line, more conspicuous posteriorly; eighth tergite dark brown, owed behind, ninth tergite dark brown; sternites yellow, lateral borders of posterior half segment narrowly dark brown, more extensive on seventh segment.

Holotype, ♂, Dundo, Luachimo River, gallery forest, January 25, 1956 (MACHADO); ANG. 15869.

This conspicuous crane fly is named for Dr. MACHADO who has added so materially to our knowledge of the insect fauna of Angola. The only described species that is at all similar to the present fly is *Lecteria pluriguttata* ALEXANDER, of Nigeria (Ann. Mag. Nat. Hist. (9) 6: 340-341; 1920), a smaller fly (Male, length about 28.5 mm; wing 18 mm; abdomen alone about 22 mm) that differs conspicuously in the pattern of the thorax and wings but especially the legs, as the unpatterned tibiae. A key to the African species of *Lecteria* is given in the Ruwenzori Report, pp. 307-309; 1956.

30. * *Trentepohlia (Paramongoma) perpendicularis* Alexander

(Fig. 20)

Trentepohlia (Paramongoma) perpendicularis ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 314-315; 1956.

The type, a male, was from Lake Nabugabo, Masaka, Uganda, taken November 13, 1934, by FRED W. EDWARDS. Venation (Fig. 20).

ANGOLA: 2 ♀♀, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694-1.

31. * *Trentepohlia (Mongoma) fragillima bertrandae* subsp. n.

(Fig. 21)

Male. — Length about 9-12 mm; wing 9-10.5 mm.

Female. — Length about 9-10 mm; wing 9-9.5 mm.

Characters generally as in typical *fragillima* (WESTWOOD), especially as regards the distribution of white and dark coloration of the legs. Coloration of notum light brown or fulvous, paling to reddish yellow on sternopleurite and meron. Abdominal tergites dark brown, sternites and hypopygium obscure yellow to orange yellow. Antennae with scape yellowed, remainder blackened. Darkened tibial ring subequal to or slightly more extensive than the whitened tip; whitened apex of femur extensive, subequal in extent to the pale tibial base, in cases a little more or less; modified setae of fore femora unusually long. Venation (Fig. 21).

Holotype, ♂, Dundo, Luachimo River, in gallery forest, July 2, 1957 (Mme. HENRI BERTRAND). Allotopotype, ♀, pinned with type. Paratopotypes, several of both sexes, with the types; ANG. 11609; further specimens from type locality, July 26, 1960 (MACHADO); ANG. 15283.

Named for Mme. HENRI BERTRAND, collector of part of the type series. The species, *fragillima* (WESTWOOD), is the type of the subgenus *Mongoma* WESTWOOD, vastly developed throughout the Palaeotropics.

32. * *Trentepohlia (Trentepohlia) exornata* Bergroth

(Fig. 22)

Trentepohlia exornata BERGROTH; Ent. Tidskr. 9: 135-137, fig. 3 (wing); 1888.

The type was from Delagoa, Caffraria, South Africa. Widely distributed in eastern and south-eastern Africa; Portuguese East Africa. Venation (Fig. 22).

ANGOLA: 1 ♀, Dundo, in garden, February 1960 (MACHADO); ANG. 14884.

33. * *Erioptera (Erioptera) angolana* sp. n.

(Fig. 23)

General coloration of thorax fulvous yellow, restrictedly patterned with brown; head dark ɔwn; knobs of halteres blackened; legs light yellow; wings clear pale yellow, with an incons-ːuous very pale brown pattern, arranged as three entirely separated crossbands, the cord pale.

Female. — Length about 7.5 mm; wing 7 mm.

Rostrum yellow; basal palpal segments yellow, outer two light brown. Antennae yellow; ɔximal two flagellar segments more or less fused, outer segments elongate-fusiform. Head lished dark brown.

Cervical region light brown. Mesonotal praescutum polished yellow, sides of posterior f darker, the color continued backward across the suture to include the scutum, more lowed over the suture; scutellum testaceous yellow, postnotum brownish yellow, praescutal ae pale, long and conspicuous. Pleura chiefly polished brown, more yellowed on propleura l ventral mesopleurites. Halteres with basal two-thirds of stem yellow, outer end and ɔb blackened. Legs with coxae and trochanters yellowed; femora and tibiae light yellow, si pale brown. Wings (Fig. 23) clear pale yellow, with an inconspicuous very pale brown ːtern, appearing as three entirely disconnected crossbands, the first narrowest, at region arculus; second band over *Rs*, reaching the margin behind, not involving cells *C* and *Sc*; ːer band slightly narrower, lying beyond cord, including the oval slightly darker brown ɡma; wing tip broadly pale; the alternating pale bands include the cord; veins yellow, er in the ground areas, trichia pale brown. Venation as in the *peringueyi* group; R_{2+3+4} ɔut one-third longer than R_{2+3}; vein *2nd A* long, strongly sinuous.

Abdomen uniformly fulvous yellow, the valves of ovipositor light horn yellow, long l slender.

Holotype, ♀, Alto Chicapa, Tchimboma River, August 1954, collected in mosquito ɔ set in a marshy area (MACHADO); ANG. 3739-1.

Erioptera (Erioptera) angolana is quite distinct from other regional species that are ıted to *E. (E.) peringueyi* BERGROTH, differing especially in the coloration of the body l wings. The darkened wing pattern is unusually pale. The most similar described species *E. (E.) carissima* ALEXANDER, described from Nyasaland.

34. * *Toxorhina (Ceratocheilus) cornigera* (Speiser)

ʻringomyia cornigera SPEISER; Berlin. Ent. Zeitschr. 52: 130-132; 1908.
ʻringomyia (Neostyringomyia) cornigera ALEXANDER; Canad. Ent. 44: 85-86; 1912.
ʻatocheilus winn-sampsoni WESCHÉ; Jour. Linn. Soc., Zool., 30: 358-359, pl. 49, figs. 1, 2, 3, 6, 8, 9 (structural details); 1910.
ɕorhina (Ceratocheilus) cornigera ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 365; 1956.

Described from the Cameroons and Southern Nigeria.

ANGOLA: Dundo, December 1947 (MACHADO); ANG. 15870. Luachimo River, ery forest, October 2, 1960 (MACHADO); ANG. 15694-1.

35. * *Toxorhina (Ceratocheilus) nimbipleura* sp. n.

(Figs. 24, 41)

Allied to *brachymera*; size relatively small (wing of male less than 5 mm); mesonotal ɛscutum light reddish brown, sides yellowed, disk with three poorly indicated brown

stripes, pleura and pleurotergite almost uniformly brownish black; apex of knob of halteres light brown; legs dark brown; wings weakly darkened, patterned with dark and paler brown, without darkenings at arculus or Sc_2; *Rs* short, approximately one-third the basal section of R_5; abdomen brownish black, intermediate segments with yellow bases; male hypopygium with posterior angle of inner dististyle produced into an acute spine.

Male. — Length, excluding rostrum, about 5.5 mm; wing 4.6-4.8 mm; rostrum about 4 mm.

Rostrum about three-fourths the remainder of body, dark brown. Antennae with proximal segments black, scape and pedicel pruinose, flagellum a little paler. Head dull black, vaguely pruinose, especially behind, occiput narrowly pale; vertex relatively broad, about twice the enlarged pedicel.

Cervical region and prothorax intensely black. Mesonotal praescutum light reddish brown, paling to yellow on sides, with three poorly indicated brown stripes, their anterior ends indistinct, lateral praescutal borders paling to whitish; scutum broadly dark brown medially, including the inner margins of lobes, the lateral parts light reddish brown; scutellum yellow, narrowly dark brown at base, mediotergite light gray. Pleura and pleurotergite almost uniformly brownish black, contrasting with the pale praescutum. Halteres with stem and base of knob yellow, apex of latter light brown. Legs with coxae brownish black; trochanters dark brown; remainder of legs dark brown, tarsi paling to light brown. Wings (Fig. 24) weakly darkened, slightly patterned with more darkened clouds and yellowed areas; prearcular and costal fields light yellow; darker brown areas at and near fork of *Rs*, cord and outer end of cell *1st* M_2, including the adjoining membrane; pale brown marginal clouds at ends of veins M_{1+2} to *2nd A*, more extensive in medial field; wing tip in cells R_4, R_5 and M_2 more yellowed; no darkenings at arculus or Sc_2; veins light yellow, darker in the marginal clouds, almost black in the darker brown areas. Macrotrichia of veins behind *C* almost lacking, with a few near outer end of vein R_5. Venation: Sc_1 ending opposite origin of *Rs*, Sc_2 retracted, Sc_1 nearly twice *Rs*, the latter very short, approximately one-third the basal section of R_5; anterior branch of *Rs* variable in length and sinuosity, subequal to or longer than basal section of R_5 (shorter in holotype, as figured).

Abdomen brownish black, bases of the more proximal intermediate segments yellowed, including segments two to four, hypopygium black. Male hypopygium (Fig. 41) with basistyle, *b*, provided with abundant dense setulae and numerous long setae on mesal face. Inner dististyle, *d*, with posterior angle of outer margin produced into an acute spine, outer margin before apex with two long setae. Arms of aedeagus, *a*, relatively short.

Holotype, ♂, Dundo, Luachimo River, gallery forest, October 2, 1960 (MACHADO); ANG. 15694-1. Paratopotype, ♂.

The closest relative of the present fly is *Toxorhina (Ceratocheilus) brachymera* ALEXANDER, described from the Ruwenzori Range, Uganda. It is readily told by the uniformly blackened thoracic pleura and other details of coloration of the body, legs and halteres, and in the structure of the male hypopygium, including the acute posterior spine of the inner dististyle.

III — SUMMARY

Only two species of *Tipulidae* were previously known from Angola. This paper, based on a collection submitted to the author by the Biological Laboratory of the Museu do Dundo, deals with 33 Angolan species, 15 of which are described as new. Two species of Northern Rhodesia, included in the same collection, are also mentioned, one of them being new to Science.

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V — ALPHABETICAL INDEX OF INCLUDED SPECIES

ADDENDA

RECORDS OF *TIPULIDAE* FROM NORTHERN RHODESIA

In the materials from Angola submitted for study by Dr. MACHADO there were cluded two species from Northern Rhodesia, taken by him in April 1961. I am including ese records in the present paper.

Limonia (Limonia) nyasaensis (Alexander)

mnobia nyasaensis ALEXANDER; Ann. Mag. Nat. Hist. (9) 6: 10-11; 1920.
monia (Limonia) nyasaensis ALEXANDER; Ruwenzori Expedition 1934-35, 1, no. 7: 204, fig. 197 (wing of allotype); 1956.

The types were from Mount Mlanje, Nyasaland, collected in January 1913 by A. NEAVE. Known also from Portuguese East Africa.

NORTHERN RHODESIA: 1 ♀, Chipongwe Cave No. 3, near Lusaka, under side of ɔnes at bottom of the cave, April 8, 1961 (MACHADO); RH.N. 15968-15.

Antocha (Orimargula) tanycera sp. n.

Size small (wing of male 4.5 mm); antennae of male elongate, about two-thirds the ng, segments long-cylindrical with abundant long erect white setulae; thoracic praescutum, ɪtum and pleura patterned with darker brown; claws of male with a single relatively short ine; wings weakly darkened, veins brown; R_{2+3} relatively short, about one-third R_2, veins th long conspicuous macrotrichia.

Male. — Length about 4.5 mm; wing 4.5 mm; antenna about 3 mm.

Described from an alcoholic specimen. Rostrum brownish yellow; palpi brown. ɪtennae of male elongate, as shown by the measurements, approximately two-thirds the dy or wing; scape and pedicel yellow, flagellum dark brown; flagellar segments long-ɪndrical, with abundant long erect white setulae, the longest about one-third the segment, ɪm slightly elevated basal punctures; in *longicornis* the flagellar segments are a trifle longer th proportionately shorter setulae. Head dark brown.

Pronotum yellow. Mesonotal praescutum brownish yellow, with a conspicuous dark ɔwn median stripe on anterior half, the posterior end and lateral stripes faintly indicated; ɪtum yellow, lobes extensively patterned with dark brown; scutellum and postnotum light low. Pleura obscure yellow, variegated with brown on anepisternum, center of pteropleurite

and ventral sternopleurite. Halteres with stem pale, the large knob weakly darkened. Legs with coxae brownish yellow, trochanters yellow, remainder of legs brown; claw with a single spine, this much smaller than in *longicornis*, about one-fourth as long as the terminal part of claw beyond it; in *longicornis* the spine more basal in position, exceeding one-third the length of the terminal part of claw. Wings weakly darkened, veins brown. Macrotrichia of veins markedly longer and more conspicuous than in *longicornis*, occurring on outer third of R_3, all of distal sections of R_{4+5}, M_{1+2}, M_{3+4}, M_3 and M_4, and on more than the outer half of basal section of R_{4+5}. Venation: R_{2+3} relatively short, about one-third R_2, in *longicornis* the two veins subequal in length.

Abdomen light brown, with abundant short erect setulae; basistyles of hypopygium more yellowed.

Holotype, alcoholic ♂, Livingstone, Victoria Falls, Zambezi River, at base of falls among rocks, April 4, 1961 (MACHADO); RH.N. 15969-5.

The only other described Ethiopian member of the subgenus *Orimargula* having greatly lengthened antennae in the male is *Antocha (Orimargula) longicornis* (ALEXANDER), of the Cameroons, distinguished by the virtually unpatterned thorax, slightly longer antennae, and differences in the tarsal claws and wing trichia as described. In the Oriental fauna there are several species of *Orimargula* having elongate antennae as in the present fly.