but the scutellar discals are wanting in one of the three specimens, the formula for *st* in one female is 2 : 1 instead of 1 : 1.

Length : 5-6 mm.

Dept. of Research and Specialist Services, Salisbury : [Vumba Mts., Umtali distr., S. Rhodesia, XI.1940 (1 ♂ leg. A. CUTHBERTSON, holotype)]; [VI.1935 and XI.1940 (3 ♀♀ leg. A. CUTHBERTSON)].

Genus **TRICYCLEA** WULP.

Tricyclea WULP, C. R. Soc. Ent. Belge, XXVIII, 1884, p. 293; CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 513; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 365; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 275 et 555; SÉGUY, Mem. Estud. Mus. Zool. Coimbra, (1), n° 67, 1933, p. 75; TOWNSEND, Man. Myiol., V, 1937, p. 87; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 481.

Type species : *T. ferruginea* WULP from E. Africa.

Zonochroa BRAUER & BERGENSTAMM, Musc. Schiz., II, 1891, p. 87; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 110; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 555; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 481.

Type species : *Z. exarsa* BRAUER & BERGENSTAMM from Guinea.

Keniella MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 114; TOWNSEND, Man. Myiol., V, 1937, p. 78; ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 187; et J. Ent. Soc. S. Africa, XVIII, 1955, p. 53.

Type species : *K. somereni* MALLOCH from Kenya.

In 1953, I published a revision of the genera *Tricyclea* and *Hemigymnochaeta* based mainly on material which I had received through the kindness of Dr. C. H. CURRAN, American Museum of Nat. History, New York. Following former authors, I tried to classify them according to so-called outer features, that means using the pattern of the thorax, abdomen and wings and the chaetotaxy. But I also started to confirm the status of every species by dissecting the male terminalia and figured them as far as it was possible. As the specimens were not very numerous and came only from few localities, I was able to compile a key in which the male genitalia could be avoided completely.

After this, I received material not only from the « Institut des Parcs nationaux du Congo Belge » and the « Musée du Congo Belge », but also from various other museums, for example from the British Museum including the Commonwealth Institute of Entomology, and the rich and interesting collection of the Zoological Museum of Berlin. This material reveals that the variability of the outer features is much greater than I thought previously, and that my first key is quite inadequate. It will be necessary in future to dissect the genitalia of every male or at least of a few of a series collected at the same locality and date. In spite of the much richer material

now before me, it is nevertheless not possible to give a revision of the genus which can be called satisfactory. Almost every new series of specimens received reveals a further variation of the pattern in a certain species, so that nearly all descriptions of the *Tricyclea* species should be regarded at present as preliminary only. The future work to be done must consist in collecting long series from various localities, in mounting these specimens as carefully as possible and dissecting the terminalia when the objects are still fresh. Then the variability within different populations can be studied, and it will probably be found that ecological and genetic factors play an important role in producing the colouring of the body.

One of the most interesting findings with respect to the intraspecific variability of the species of *Tricyclea* and other genera is the fact that in many species the width of the male frons is also not constant. It may vary to a slight, or sometimes to a very high degree showing all kinds of intermediate measurements, or there may be two strains of males, a broad-fronted (*f. latifrons*) and a narrow-fronted one (*f. angustifrons*). These two strains may occur within the same population (e. g. in *Tricyclea analis* from Vieux-Kilo, Belg. Congo), or they may be separated as subspecies, for instance *T. fasciata fasciata* and *T. fasciata ferruginea*. For more details see ZUMPT (1955). The discovery of the variability of the male frons led to the decision to unite *Keniella* MALLOCH with *Tricyclea* WULP.

The hypopygia of some of the species recognized in this paper are quite characteristic and highly specific, whereas others show only slight differences indicating that the species may belong to closely related groups. There is also a variability of this organ which makes it possible that the one or other species regarded as distinct at present may prove to be conspecific with a related one.

Regarding the structure of the hypopygium only, the following relationship can be detected :

Cerci broad, hypopygium highly specific.

Tricyclea patrizii ZUMPT	cerci rectangular, of unusual shape.
Tricyclea semicinerea BEZZI	cerci short and stout.
Tricyclea perpendicularis VILLENEUVE ...	cerci with a basal, median protrusion.
Tricyclea kivuensis n. sp.	cerci with a basal, median protrusion.
Tricyclea fasciata MACQUART	cerci hook-shaped, paralobi small.

Paralobi voluminous, hypopygium highly specific.

Tricyclea major CURRAN	paralobi broadly triangular.
Tricyclea nana ZUMPT	paralobi broadly enlarged basally.
Tricyclea latifrons CURRAN	paralobi longer than cerci, truncated terminally.

Cerci and paralobi slender, hypopygia similar to each other and less specific.

Tricyclea dubia ZUMPT	cerci long-triangular.
Tricyclea diffusa MALLOCH	
Tricyclea du CURRAN	paralobi hook-shaped.
Tricyclea bivittata CURRAN	
Tricyclea par ZUMPT	paralobi club-shaped.
Tricyclea claripennis SÉGUY	
Tricyclea bifrons MALLOCH	
Tricyclea semithoracica VILLENEUVE	
Tricyclea analis MALLOCH	paralobi stout, club-shaped or parallel-sided.
Tricyclea unipunctata CURRAN	paralobi more or less, parallel-sided.
Tricyclea martini (ZUMPT)	
Tricyclea vansomereni ZUMPT	
Tricyclea somereni (MALLOCH)	
Tricyclea similis CURRAN	paralobi short, rudimentary.

In spite of the fact that the outer features are continually proving to be extremely variable, I have tried once more to draw up a key, in which I use these features as far as I think they are of taxonomic value.

The main generic features of the genus may be summarized as follows :

Head with the eyes bare in male, touching or separated from each other by as much as half the eye-length. In narrow-fronted specimens, *iv* only is developed, in broad-fronted ones, *ev*, *f* and 1 *fo* gradually appear. In the female sex, the 2nd pair of *fo* is mostly present too. Antennae of normal structure, arista with long hairs on both sides, a carina of the antennal groove is not developed. Parafacialia bare or setulose.

Thorax non-metallic, with a yellow-brown and blackish pattern, the one colour being sometimes almost totally suppressed by the other. Propleura as well as the prosternum always haired, alar declivity bare or with a few setae, suprasquamal ridge bare, supraspiracular convexity only with a microscopical pilosity; *ac*=2-3+3, *dc*=2+3-4, *ia*=1+2-3, *ph*=1-3, *h*=3, *prs*=1, *n*=2, *sa*=3, *sc*=4-6+1, *st*=1 : 1, at least 1 *pst* and *pp* present. Wing with the stem-vein and r_1 not setulose, r_5 dorsally with setae at most up to *r-m*, R_5 normally open. Thoracic squama normally broad, rarely narrow, always bare dorsally. Legs without outstanding features, fore-tibia with 2 to several *ad* and one submedian *pv*; mid-tibia with 1 sub-median *av*, 0-2 *ad* and 1-3 *pv*; hind-tibia with 2 to several *ad*, 0-2 *av* and one to several *pd*.

Abdomen yellow-brown and blackish like the thorax, 2nd sternite large and covering margins of the tergites, following sternites free, 5th emarginate, with hairs and sometimes with bristles, tergites III and IV without median discal bristles. Hypopygium composed of 3 free segments, cerci

mostly free, sometimes close together, paralobi normally slender, rarely broad, phallosome with separated theca and phallus, spine present, harpes broad, not spine-like, vesicae consisting of denticulated membranes.

Very little is known about the biology of the *Tricyclea* species. VILLENEUVE mentioned that *T. perpendicularis* drops the eggs into and between the funnel-shaped openings of temporary nests of driver ants. Whether the other species have a similar mode of life, still remains to be proved.

The genus *Tricyclea* is evidently restricted to the Ethiopian region. When listing the genus *Zonochroa* BRAUER et BERGENSTAMM, a synonym of *Tricyclea*, TOWNSEND says that it is also recorded from the East Indies. S. WHITE, AUBERTIN and SMART, however, in the Fauna of British India, Diptera, vol. VI, 1940, do not mention the genus, and I myself have not received flies from the Oriental region, which belong or could be referred to this genus.

KEY TO THE SPECIES

(based on the male sex, but may be used partially for females).

1 (2) Only 3 postsutural *dc* present.
Thorax wholly yellow brown, *ac*=2-3+3, *ia*=1+2, *sc*=5+1, *ph*=1; thoracic squama narrow as in *Hemigymnochaeta*. Wings hyaline. Abdomen yellow brown, posterior margins of the segments narrowly dark banded and with a median triangular spot each on tergites III and IV. 3-4 mm. — Liberia ..... 7. *T. nana* ZUMPT.

2 (1) Mesonotum with 4 postsutural *dc*; thoracic squama broad 3

3 (12) Male frons broad and provided with *iv*, *ev*, *f* and mostly also one pair of proclinate *fo* 4

4 (7) Male frons at vertex measuring about $^3/_{10}$-$^3/_7$ of eye-length 5

5 (6) Wings totally hyaline or with two well demarcated marginal spots, the basal one broadly covering *St*, the terminal one the last half of R_1 and R_2.
Thorax predominantly yellow-brown, but mesonotum broadly blackish on the disc; *ac*=3+3, *dc*=2+4, *ia*=1+3, outer *ph* present, but sometimes weak. Abdomen with black bands. 5-6 mm. — Belg. Congo .....
17. *T. analis* MALLOCH f. *latifrons*.

6 (5) Wings only with faint dark clouds which do not cover *St*, forming a pattern similar to that of *T. diffusa*.
Unknown to me. Pattern of thorax similar to that of the foregoing species, but outer *ph* is wanting. 6-7 mm. — Kenya ..... 21. *T. somereni* (MALLOCH).

7 (4) Male frons at vertex measuring about ½ of eye-length 8

8 (9) Thorax, except the blackish postnotum, as well as abdomen, totally yellow-brown.

Wings hyaline, *ac*=3+3, *dc*=3+4, *ia*=1+3, outer *ph* present. 4,5-5 mm. — Bechuanaland ..... 13. *T. par* ZUMPT.

9 (8) Thorax with a black dorsal pattern, abdomen wholly yellow-brown or spotted ..... 10.

10 (11) Mesonotum with a more or less extended black median vitta which does not surpass the *dc*, abdominal tergites with small apical spots. Parafacialia with setae only on the outermost base.

Chaetotaxy of thorax as in *T. par*. 4-5 mm. — Bechuanaland ..... 19. *T. martini* (ZUMPT).

11 (10) Mesonotum broadly blackened, the vittae reaching *ia*; abdomen wholly yellow-brown. Parafacialia with setae on almost the whole length.

Otherwise similar to *T. martini*. 4-6 mm. — Port. E. Africa, Bechuanaland ..... 14. *T. claripennis* SÉGUY.

12 (3) Male frons much narrower or eyes even touching, at most *ev* weakly developed as a hair, *f* and *fo* always wanting 13

13 (14) Male frons at the narrowest point measuring about 1/5 of eye-length.

Thorax yellow-brown, with a dark mesonotal disc, *ac*=3+3, *dc*=2+4, *ia*=1+3, outer *ph* present. Wings hyaline. Abdomen yellow brown, tergites III and IV with a narrow marginal band, *V* with a pair of apical spots. 7 mm. — S. Rhodesia ..... 8. *T. latifrons* CURRAN. (comp. 17. *T. analis* f. *latifrons* which normally has spotted wings).

14 (13) Male frons at the narrowest point not broader than 1/7 of eye-length 15

15 (18) Palpi in male about as broad as the third antennal segment, in the female still more strongly dilated 16

16 (17) Eyes in male touching or very closely approximated.

Thorax yellow-brown with a broad discal spot of varying size, *ac*=3+3, *dc*=2+4, *ia*=1+3, outer *ph* present. Wings hyaline or with a long terminal costal spot. Legs predominantly yellow. Abdomen yellow brown, 3rd and 4th tergites with relatively broad black marginal bands. 6-8 mm. — West and Central Africa, Natal ... 5. *T. fasciata fasciata* MACQUART.

17 (16) Eyes in male widely separated, frons at the narrowest point measuring 1/8-1/11 of eye-length.

Thorax and abdomen with reduced black pattern, 3rd and 4th abdominal tergites with very narrow apical bands. 6-8 mm. — East Africa, S. Rhodesia, Bechuanaland, S. W. Africa ..... 5. *T. fasciata ferruginea* WULP.

18 (15) Palpi narrower, in the male not as broad as the 3rd antennal segment, in the female not distinctly broader than this 19

19 (30) Last abdominal tergite without paired apical spots or a demarcated apical band, unicoloured instead, or with a quite indistinct pattern 20

20 (21) Thorax totally glossy black, only pro- and poststigma yellow or brown.

Eyes touching in male, female frons at vertex about 3/7 of eye-length, occiput and upper frons black, remaining head yellow. Wings hyaline or more or less brownish tinged; $ac=2+3$, $dc=3+4$, $ia=1+3$, outer *ph* present. Abdomen dark brown or blackish, without demarcated pattern. 4-7 mm. — Belg. Congo ..... 4. *T. kivuensis* n. sp.

21 (20) Thorax at least partially yellow-brown, black parts not glossy, dull and densely whitish pollinose 22

22 (23) Mesonotum wholly orange, remaining body yellow, hind margins of abdominal segments brownish.

According to SÉGUY, the male eyes have enlarged facets and are touching. Antennae yellow-orange, femora and tibiae yellow, tarsi brownish. 4 mm. — French Congo ..... 23. *T. ochracea* SÉGUY.

23 (22) Mesonotum with a more or less extended dark pattern, rarely totally yellow, but then abdomen partly black. On account of the great variability of the pattern and the uniformity of the outer features the following species are, according to the present state of our knowledge, only identifiable with certainty by the hypopygia 24

24 (25) Cerci very stout, with a basal knob-like protrusion, paralobi slender, slightly club-shaped.

Black abdominal pattern less extended, leaving the 4th tergite partly yellowish. Eyes of male touching or very closely approximated, inner facets a little smaller than in the following species: female frons at vertex about 3/7 of eye-length. Black mesonotal pattern variable, outer *ph* wanting. Wings hyaline, unspotted. 6-7 mm. — Probably all over the Ethiopian region ..... 2. *T. semicinerea* BEZZI.

25 (24) Cerci slender, without a knob-like basal protrusion 26

26 (27) Cerci strongly tapering and pointed terminally, paralobi club-shaped.

Black abdominal pattern more extended than in the foregoing species, the last two segments totally black. Eyes of male touching, inner facets slightly larger than in *T. semicinerea*, female frons at vertex about 1/3 of eye-length. 7-8 mm. — S. W. Africa ..... 9. *T. dubia* ZUMPT.

27 (26) Cerci subparallel in the lower part 28

28 (29) Paralobi more or less club-shaped. Wings hyaline or spotted. See 17. *T. analis* MALLOCH.

29 (30) Paralobi hook-shaped. Wings with the costal area more or less extended brownish or with an apical spot only. See 11. *T. du* CURRAN.

30 (19) Last abdominal tergite with a pair of well demarcated apical spots, which are sometimes fused 31

31 (34) Wings wholly hyaline 32

32 (33) Abdominal bands interrupted, only developed laterally, in the median line ill-defined, small apical spots. Frons of male at the narrowest point measuring almost twice the width of the anterior ocellus.

Only one male known. Wing without costal spine, $ac=3+3$, $dc=2+4$, $ia=1+3$, $sc=4+1$, outer *ph* present. 5 mm. — Kenya ..... 1. *T. patrizii* ZUMPT.

33 (32) Abdominal bands complete and broader. See 17. *T. analis* MALLOCH f. *immaculata*.

34 (31) Wings with the costal area spotted or demarcated dark brown ... 35

35 (36) Wings with an apical costal spot, covering R_1 and R_3 and which broadly reaches *r-m* by a more or less distinct cloudy extension.

Thorax with the whole dorsum glossy black, only shoulders, post-alar areas, part of pleurae and tip of scutellum remaining yellow or brown. Abdomen with black bands of varying size. Outer *ph* wanting. Eyes in ♂ touching, frons at vertex in ♀ about $^3/_7$ of eye-length. 7-8 mm. — West and Central Africa ..... 10. *T. diffusa* MALLOCH.

36 (35) Wings with spotted or demarcated costal area but without a cloudy extension covering *r-m* 37

37 (38) Big species of 9-10 mm length, with the thorax totally orange, abdomen banded.

Chaetotaxy as usual, outer *ph present*. Wings with the costal area totally brown, a very narrow hyaline stripe behind the tip of *sc*, remaining parts brownish tinged. — Liberia ..... 6. *T. major* CURRAN.

38 (37) Smaller species under 8 mm length, mesonotum mostly with a single median vitta, sometimes with two longitudinal stripes or even unicoloured yellow. For identification of the following species, the hypopygium only can be used 39

39 (40) Cerci with a median basal protrusion.

Mesonotum with an undivided black vitta of varying size, abdomen banded. Wings with 2 costal spots. Outer *ph* always seems to be present. 5-7 mm. — Probably distributed all over tropical Africa down to S. Rhodesia ..... 3. *T. perpendicularis* VILLENEUVE.

40 (39) Cerci without a median basal protrusion 41

41 (42) Paralobi short and narrow, at most half as long as cerci. Dark pattern highly variable. 5-8 mm. Known from Liberia, Cameroons and the Belgian Congo ..... 22. *T. similis* CURRAN.

42 (41) Paralobi about as long as the cerci 43

43 (46) Paralobi hook-shaped. Costal area of wing more or less uniformly brown, or this pattern may be reduced to an apical spot, but normally there are not two well separated spots 44

44 (45) Cerci more slender. Thoracic pattern highly variable. 5-7 mm. — West and Central Africa ..... 11. *T. du* CURRAN.

45 (44) Cerci stouter. Thorax with two broad longitudinal vittae which do not reach the yellow scutellum. 7-8 mm. — Southern Africa ..... 12. *T. bivittata* CURRAN.

46 (43) Paralobi club-shaped or parallel-sided. Costal area of wings with one or two distinct spots 47

47 (52) Paralobi dilated terminally like a club, or if parallel-sided, they are relatively stout 48

48 (49) Cerci fused, but with a suture between them. Outer *ph* mostly lacking. Pattern variable. 4-7 mm. — Central Africa ..... 15. *T. bifrons* MALLOCH.

49 (48) Cerci free 50

50 (51) Cerci relatively stout. Variable in every respect. Wings normally with 2 spots, but sometimes hyaline. Eyes touching or the frons is complete with width at the narrowest point up to ¾ of eye-length. 6-8 mm. — Central Africa, Angola ..... 17. *T. analis* MALLOCH.

51 (50) Cerci more slender. Variable like the foregoing species from which it is perhaps not specifically separable. 4-7 mm. — West and Central Africa ..... 16. *T. semithoracica* VILLENEUVE.

52 (47) Paralobi not distinctly club-shaped, more or less parallel-sided and relatively slender 53

53 (54) Cerci strikingly long and slender. Wings with two costal spots. Thorax almost totally black, only the tip of the scutellum and parts of the pleurae reddish yellow, abdomen with broad black bands. 5-6 mm. — Uganda ..... 20. *T. vansomereni* ZUMPT.

54 (53) Cerci stouter. Wings with an apical spot only. Dark thoracic pattern variable but not as extended as in the foregoing species. 5-7 mm. — West and Central Africa ... 18. *T. unipunctata* CURRAN.

Species nos 24-28 are species *incertae sedis* and not included in the key. See notes on p. 133.

[1. — **Tricyclea patrizii** ZUMPT.]

(Fig. 60.)

Tricyclea patrizii ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 500, fig. 10.

Up to now, only the holotype of this species is known. It shows a hypopygium (fig. 60) of quite outstanding structure. The specimen was caught near Nairobi, Kenya.

[2. — **Tricyclea semicinerea** BEZZI.]

(Fig. 61.)

Tricyclea semicinerea BEZZI, Bull. Soc. Ent., XXXIX, 1908, p. 77; MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 118; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 499, fig. 9.

Tricyclea palliventris CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 516; et Bull. Amer. Mus. N. H., LVII, 1928, p. 365; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 561; ZUMPT, Trans. R. Ent. Soc. Lond., CIX, 1953, p. 499.

T. semicinerea, originally based on a single female from Eritrea, has been redescribed by me (1953) and the male terminalia figured (fig. 61). Material was received from many places South of the Sahara and the species is probably distributed all over the Ethiopian region, but it does not seem to be a common one. In my above-mentioned paper, I listed records from Liberia, both Rhodesias and Transvaal. In the meantime, I have also received this species from S. Nigeria and S. W. Africa.

3. — **Tricyclea perpendicularis** VILLENEUVE.

(Fig. 62.)

Tricyclea perpendicularis VILLENEUVE, Trans. Ent. Soc. Lond., (1921), 1922, p. 522; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 557; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 509, fig. 16.

Tricyclea distigma CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 520, figs. 5-7; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 557.

Tricyclea cockbilli ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 510, fig. 17 (syn. nov.).

In 1953, I described my *T. cockbilli* from S. Rhodesia and distinguished it from *T. perpendicularis* by certain differences in the shape of the hypopygium. Further material which I have received since then reveals that this organ is slightly variable with respect to the shape of the 5th sternite, the apical part of the cerci and density of hairs. Ostensible differences are

due to the way this complex organ is mounted on the slide and the degree of flattening between slide and coverslip.

The hypopygium (fig. 62) of *T. perpendicularis* is characterized by a fork-like protrusion between the cerci, a feature which it shares with *T. kivuensis* m., but the cerci of the latter have a distinct terminal tooth and are only sparsely haired. Judging from the few specimens of *kivuensis* known up to now, it should also be recognizable by outer features.

This, however, can no longer be said of *T. perpendicularis* since the great variability of wing and body pattern in other species has been detected. It is therefore always necessary to dissect the male genitalia, and most of the females have to remain unidentified or at least doubtful until specific characters can be detected in the female sex.

There is not much to be added to my redescription of this species. Specimens with totally hyaline wings or with only a terminal costal spot have not yet been found. The dorsal vitta of the thorax is variable in size, but never as extended as for instance in *T. similis* so that the lateral areas and at least the posterior part of the scutellum always remain yellow; outer *ph* well developed. Abdominal bands vary in width, but are always distinct as are the paired apical spots of the last tergite.

P. perpendicularis was previously known to me from Nigeria and S. Rhodesia. The following specimens have since been received.

Collection L. LIPPENS : Sud lac Édouard, riv. Rwindi, 1.000 m, 24.IV.1936 (1 ♂).

Collection Musée du Congo : [Boma, 1935 (1 ♂ leg. W. MOREELS)]; [Ruanda : Kigali, VI-VII.1933 (1 ♂ leg. A. BEQUAERT)].

Collection Zool. Museum Berlin : [Uam Gebiet, S. O. Kamerun. 29.IV.1914 (1 ♂ leg. TESSMANN)]; [Mangu-Jendi, Togo, VII-VIII.1909 (21 ♂♂, 6 ♀♀)].

Collection British Museum, London : [Kumasi, Gold Coast (9 ♂♂, 6 ♀♀)]; [Yarizori, Gold Coast, VII.1914 (3 ♂♂)]; [Azare, Nigeria (1 ♂♀)]; [Juba, Anglo-Egypt. Sudan (1♂♀)]; [Chole, Nyasaland (2 ♂♂)]; [Kafue, N. W. Rhodesia, VIII.1913 (1 ♂)].

Collection U. S. Nat. Museum, Washington : [Benguella, Angola (2 ♂♂)].

4. — **Tricyclea kivuensis** n. sp.

(Fig. 63)

Male. — Eyes broadly touching, with distinctly enlarged inner facets which gradually pass over to the small outer ones; ocellar triangle black, with a pair of long *iv*, but *oc* relativey short and thin; lower part of frons triangular, at the tip with a more or less extended blackish area, at the base yellow-orange like the face, about 6 pairs of *paf* present together with a few black setae on the parafrontalia and the upper part of parafacialia. Antennae yellow, 3rd segment about twice as long as the second. Facial ridge with black bristles on the lower $\frac{3}{5}$. Buccae yellow with a slight whitish pollinosity, hairs and peristomal bristles black, height about $\frac{1}{3}$ of eye-length. Palpi yellow, greatly dilated terminally, but not reaching width of the 3rd antennal segment.

Thorax glossy black with a very slight whitish pollinosity which does not form a distinct pattern. Pro- and poststigma yellow to brown, the shoulders and margins of the pleural plates sometimes yellow; *ac*=2+3, *dc*=2+4, *ia*=1+3, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *sc*=5-7+1, *st*=1:1, one strong *pst* and *pp* accompanied by several weaker hairs. Post-alar declivity with black setae. Wings hyaline or more or less brownish tinged, but without a demarcated costal area, costal spine wanting, r_5 dorsally with setae reaching *r-m*, R_5 normally open but closed in one of the female specimens before me; thoracic squama brownish tinged, broad, halter yellow. Legs yellow to reddish-brown, fore-tibia with 3-4 *ad* and one submedian *pv*; mid-tibia with 2 *pv* and one submedian *ad* and *av*; hind-tibia with several *ad*, two longer *pd* and one submedian *av*.

Abdomen dark brown to blackish, without a fixed pattern. Hypopygium (fig. 63) slightly similar to that of *T. perpendicularis*, showing a fork-like protrusion between the cerci.

Female. — Frons at vertex about $\frac{3}{7}$ of eye-length, upper half or more of it black, chaetotaxy not complete, the lower pair of *fo* being absent.

Length : 4-7 mm.

Mission G. F. DE WITTE :

Holotype : 1 ♂ labelled : Rutshuru, 1.285 m, 6-8.VI.1934 (in Coll. Inst. Parcs Nat. du Congo Belge, Brussels).

Paratypes : Rutshuru 1.285 m, 6-8.VI.1934; 6.VII.1935; 29-31.V.1935 (1 ♂, 3 ♀♀); Rutshuru, 1.285 m, 18-23.VI.1935 (2 ♀♀); Kibati, 1.900 m, 18-19.I.1934 (1 ♂).

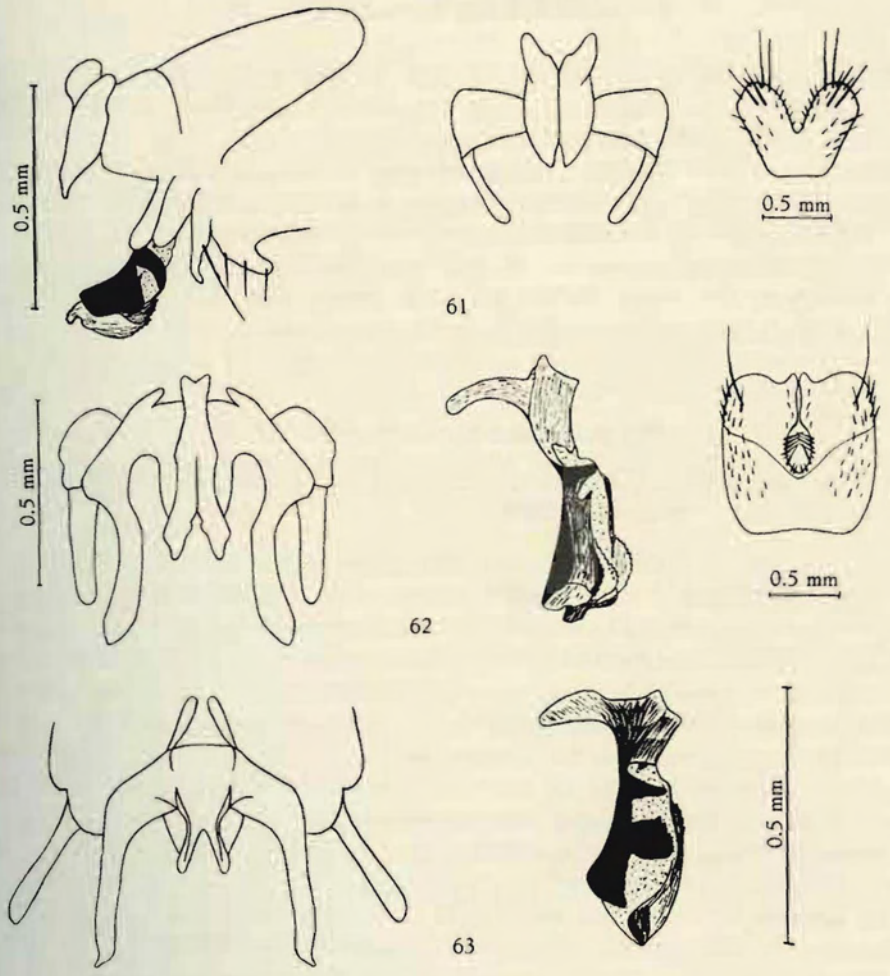

FIG. 61. — *Tricyclea semicinerea* BEZZI. Hypopygium in lateral view, cerci with paralobi and 5th. sternite in frontal view (after ZUMPT). Specimen from Waterberg district, Transvaal.

FIG. 62. — *Tricyclea perpendicularis* VILLENEUVE. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Nigeria.

FIG. 63. — *Tricyclea kivuensis* n. sp. Cerci and paralobi, phallosome. Paratype from Rutshuru, P.N.A.

5. — **Tricyclea fasciata** MACQUART.

Tricyclea fasciata fasciata MACQUART.

(Fig. 64.)

Tricyclea fasciata MACQUART, Mem. Soc. R. Sci. Lille, (1842) 1843, p. 290; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 558; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 501, fig. 11.

Zonochroa exarsa BRAUER & BERGENSTAMM, Denkschr. Akad. Wiss. Wien, LVIII, 1891, p. 178; et LX, 1893, p. 110; BEZZI, Bull. Soc. Ent. Ital., XXXIX, 1908, p. 77; SÉGUY, Encycl. Ent., B II, Dipt., X, 1946, p. 35.

Tricyclea evanida VILLENEUVE, Trans. Ent. Soc. Lond., (1921) 1922, p. 519; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 559.

Tricyclea kasatana CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 6.

[**Tricyclea fasciata ferruginea** WULP.]

Tricyclea ferruginea WULP, Bull. Soc. Ent. Belg., 1884, p. 294; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 503.

T. fasciata is widespread in the Ethiopian region and well characterized by its hypopygium (fig. 64) which is absolutely identical in both subspecies. A constant outer feature seems to be the shape of the palpi which, especially in the female sex, are strikingly broad. The dark pattern, however, is extremely variable as in most other *Tricyclea* species. The black mesonotal vitta may be almost totally reduced, or it may be greatly extended leaving parts of the pleurae and the margins of the scutellum yellow. Abdominal bands on tergites III and IV normally broad and covering a quarter to a half of the segmental length, but sometimes they are narrower, tending, in connection with a reduced thoracic vitta, to a pattern normally found in the ssp. *ferruginea*. The wings may be wholly hyaline (f. *immaculata*), or they may show a terminal costal spot of varying size (f. *maculata*). These variations of the pattern do not show a geographical restriction.

A segregation, however, seems to exist with respect to strains which are characterized by holoptic males (f. *angustifrons*) and dichoptic males (f. *latifrons*), the latter strain being in addition more lightly coloured. On the thorax of ssp. *ferruginea*, there is normally only a median stripe between the *ac* or at most the *dc*, and the transverse bands on the 3rd and 4th abdominal tergites only cover about one tenth of the length of the segments. Furthermore, only the f. *immaculata* has been found.

The nominate form inhabits West and Central Africa, but was recently found also in the temperate rain-forests of Natal. The subspecies *ferruginea* is recorded from savannah areas of S. Rhodesia, Bechuanaland and S. W. Africa. Since finishing my last revision of this genus (1953), I have received the following additional material :

T. fasciata fasciata MACQUART.

Mission G. F. DE WITTE : Ndeko (près Rwindi), 1.082 m, 27.XI.1934 (1 ♀, f. *immaculata*).

Collection L. LIPPENS : Sud lac Édouard (riv. Rwindi), 1.000 m, 24.IV.1936 (1 ♀, f. *immaculata*).

Collection Musée du Congo : [Élisabethville, XII.1920, I & III.1921, II.1929 (2 ♂♂, 8 ♀♀, f. *immaculata*, leg.M. BEQUAERT)]; [Stanleyville, III.1926 (1 ♂♀, f. *maculata*, leg. J. GHESQUIÈRE)]; [Bambesa, V.1938 (1 ♂, 2 ♀♀, f. *maculata*, leg. HENRARD)]; [Léopoldville, 1930 (1 ♂, f. *immaculata*, leg. TINANT)]; [Jadotville, 1948 (1 ♂, f. *immaculata*, leg. R. M. M. ADELAÏDE)]; [Banalia, VII.1938 (1 ♀, f. *immaculata*, leg. HENRARD)]; Rutshuru, V.1936 (1 ♀, f. *immaculata*, leg. L. LIPPENS)]; [Yakoma, II.1932 (1 ♀, f. *maculata*, leg. H. J. BRÉDO)]; [Gandajika, III.1947 (1 ♀, f. *maculata*, leg. HENRARD)]; [Kibali-Ituri : Pawa, IV.1948 (1 ♀, f. *maculata*, leg. LAMBRECHT)].

Collection S. A. Institute for Med. Research, Johannesburg : [Illovo Beach, Natal, 27.II.1954 (3 ♂♂, 2 ♀♀, f. *maculata* and f. *immaculata*, leg. H. PATERSON)]; [Kumasi, Gold Coast, 12.VI.1947 (1 ♂♀, f. *immaculata*)].

Collection Zool. Museum Berlin : [Misahoehe, Togo, 10.IV.1894 (1 ♂, f. *maculata*, leg. E. BAUMANN)]; [Mangu-Jendi, Togo, VII-VIII.1909 (1 ♀, f. *immaculata*)]; [Ngoko Station, Kamerun, 13.IV.1902 (1 ♀, f. *maculata*, leg. HOESEMANN)]; [Nkolentangan, Span. Guinea, 12.XII.1907 (2 ♂♂, f. *maculata*, leg. G. TESSMANN)].

Collection British Museum, London : [Aburi, Gold Coast (1 ♂♀, f. *immaculata*)]; [Oshogbo, S. Nigeria, XI.1910 (1 ♀, f. *immaculata*)].

T. fasciata ferruginea WULP.

Collection S. A. Institute for Med. Research, Johannesburg : [MARTIN's drift, Bechuanaland, II.1953 (3 ♂♂, 4 ♀♀, leg. PATERSON)].

[6. — **Tricyclea major** CURRAN.]

(Fig. 65.)

Tricyclea major CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 7; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 515, fig. 21.

This big species with a length of 9-10 mm is well characterized by unusually broad paralobi (fig. 65). Up to now, only one pair is known from Liberia, but like the other *Tricyclea* species, it is also to be expected in other parts of tropical Africa.

In my key I characterized this species on the basis of its large size and the pattern of the wing and thorax. As there is not sufficient material available at present to prove whether these features are specific, the genitalia should always be dissected.

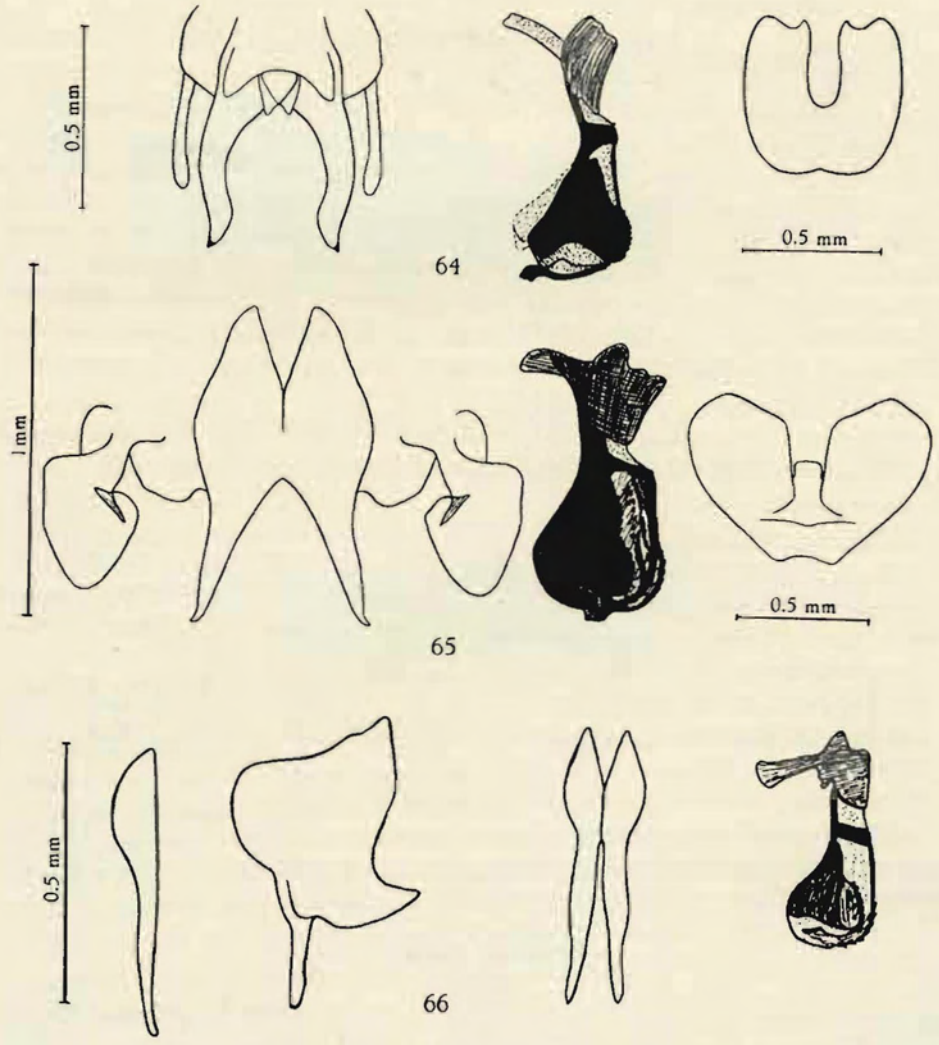

FIG. 64. — *Tricyclea fasciata* MACQUART. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Liberia.

FIG. 65. — *Tricyclea major* CURRAN. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Robertsport, Liberia.

FIG. 66. — *Tricyclea nana* ZUMPT. Cercus, paralobus and phallosome in lateral view, both cerci frontally (after ZUMPT). Paratype from Robertsport, Liberia.

[7. — **Tricyclea nana** ZUMPT.]

(Fig. 66.)

Tricyclea nana ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 497, fig. 8.

An extremely small species (3-4 mm) which is transitional between *Tricyclea* and *Hemigymnochaeta* with respect to the narrow thoracic squama. The mesonotum shows only 3 postsutural *dc* and 1 *ph* which make the species readily recognizable among all other *Tricyclea* species. Only the typical series, consisting of 3 ♂♂ and 3 ♀♀ from Robertsport, Liberia is known up to now. Hypopygium (fig. 66).

[8. — **Tricyclea latifrons** CURRAN.]

(Fig. 67.)

Tricyclea latifrons CURRAN. Ann. Mag. N. H., (9), XIX, 1927, p. 517; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 503.

Only the male sex is known and was described from the environs of Salisbury, S. Rhodesia. It is well recognizable from the broad frons and

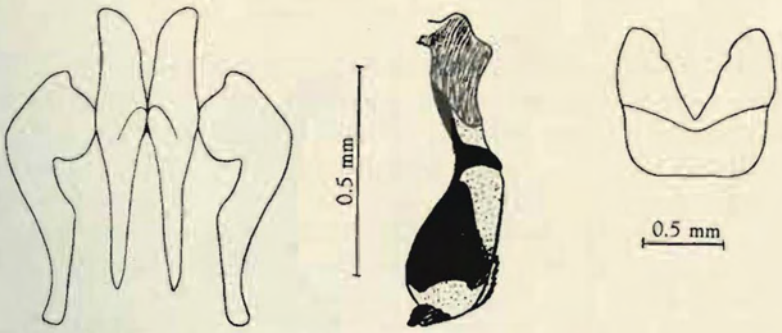

FIG. 67. — *Tricyclea latifrons* CURRAN.
Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT).
Specimen from Salisbury, S. Rhodesia.

the hypopygium (fig. 67). The following locality is the second to be recorded in the literature.

Collection Musée du Congo : [Lomami : Luputa, III.1935 (1 ♂ leg. BOUVIER)].

[9. — **Tricyclea dubia** ZUMPT.]

(Fig. 68.)

Tricyclea dubia ZUMPT, Rev. Ecuat. Ent. Parasit., I, 1953, p. 75, fig. 4.

Although similar to *T. semicinerea* in general appearance, *T. dubia* is well characterized by the shape of the hypopygium (fig. 68). Up to now, only the typical series from Outjo, S. W. Africa, is known.

10. — **Tricyclea diffusa** MALLOCH.

(Fig. 69.)

Tricyclea diffusa MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 560; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 512.

Tricyclea ornatipennis VILLENEUVE, Bull. Mus. roy. Hist. nat. Belg., XII, n° 4, 1936, p. 9.

? *Tricyclea dorippa* SÉGUY, Ann. Soc. ent. France, CIX, (1940) 1941, p. 126.

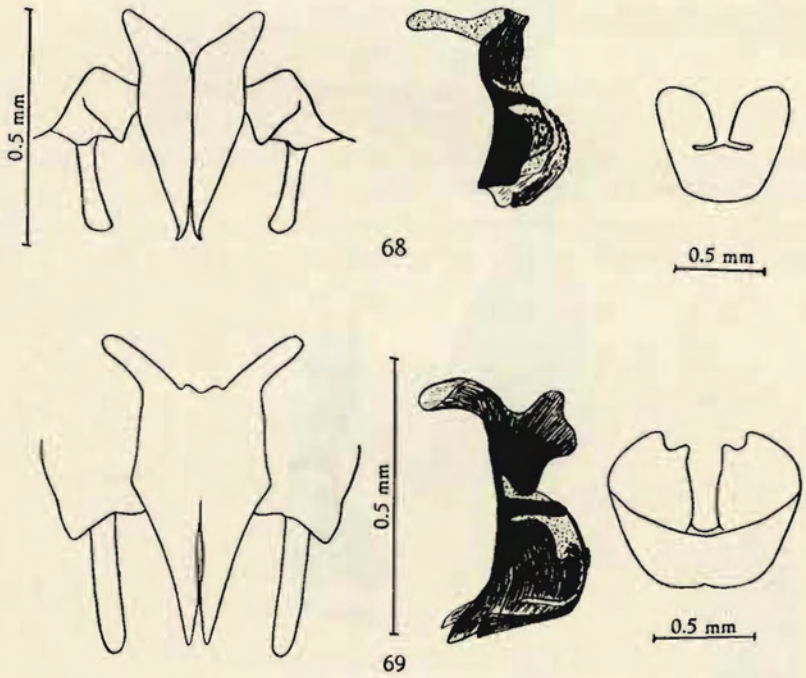

FIG. 68. — *Tricyclea dubia* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Paratype from Outjo, S.W. Africa.

FIG. 69. — *Tricyclea diffusa* MALLOCH. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Togo.

When revising the genera *Hemigymnochaeta* and *Tricyclea* (1953), I had only 4 female specimens of this species from Liberia before me. In the meantime, I have also received the male which shows a characteristically shaped hypopygium (fig. 69). With respect to the outer features, the pattern of thorax and wings seems to be quite constant in both sexes.

Length : 6-8 mm.

Mission G. F. DE WITTE : Kabasha, 1.500 m, 14.XII.1934 (2 ♀♀).

Collection Musée du Congo : [Kibali-Ituri : Geti, II-IV.1937 (1 ♂ leg. Ch. Scops)]; terr. Rutshuru, 13.VIII.1937 (1 ♂ leg. Miss. Prophylactique).

Collection Zool. Museum Berlin : [Bismarckburg, Togo, X.1891 (2 ♂♂, 1 ♀ leg. R. Buettner)].

Collection British Museum, London : [Njala, Sierra Leone (2 ♀♀)]; [Nwamba, Uganda, VII.1945 (1 ♀)].

Collection U. S. Nat. Museum, Washington : [Njala, Sierra Leone (1 ♂)].

11. — **Tricyclea du** Curran.

(Fig. 70.)

Tricyclea du Curran, Amer. Mus. Nov., n° 506, 1931, p. 8; Zumpt, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 513, fig. 19.

Tricyclea bivittata Malloch (nec Curran), Ann. Mag. N. H., (10), III, 1929, p. 557; Zumpt, id. ibid., p. 513.

Tricyclea confusa Curran, Amer. Mus. Nov., n° 506, 1931, p. 9.

T. du is also more variable than I thought before (1953). There are specimens which have only the apical part of the costal area blackened, and which cannot be separated by outer features from *T. unipunctata* and *T. semithoracica*. Furthermore, the paired black spots of the last abdominal tergite tend to become reduced and may totally disappear, so that *T. du* becomes similar to *T. semicinerea* Bezzi and some *T. analis*. The pattern of thorax and abdomen is variable too, so that the only reliable feature remaining is the shape of the hypopygium (fig. 70). As already pointed out it is similar to that of *T. bivittata* from Southern Africa. *T. du* has been recorded up to now only from West and Central Africa.

Length : 5-7 mm.

Collection American Museum, New York : [Du River, Liberia (holotype ♂ of *du* Curran)]; [Reppo's Town, Liberia (holotype ♀ of *confusa* Curran)]; [Robertsport, Liberia, 31.X.1943 (♂♀ leg. M. Snyder)].

Collection U. S. Nat. Museum, Washington : [Ibadan, Nigeria (1 ♂)]; [Liberia (2 ♂♂, 1 ♀)].

Collection Zool. Museum, Berlin : [Uam distr., S. O. Kamerun, 1.V.1914 (2 ♂♂, 3 ♀♀ leg. G. Tessmann)]; [Mangu-Jendi, Togo, VII-VIII.1909 (1 ♂♀)].

Collection British Museum, London : [Komasi, Gold Coast, IX.1947 (1 ♂, 2 ♀♀)]; [Shinyanga, Tanganyika, V.1952 (2 ♂♂, 1 ♀)].

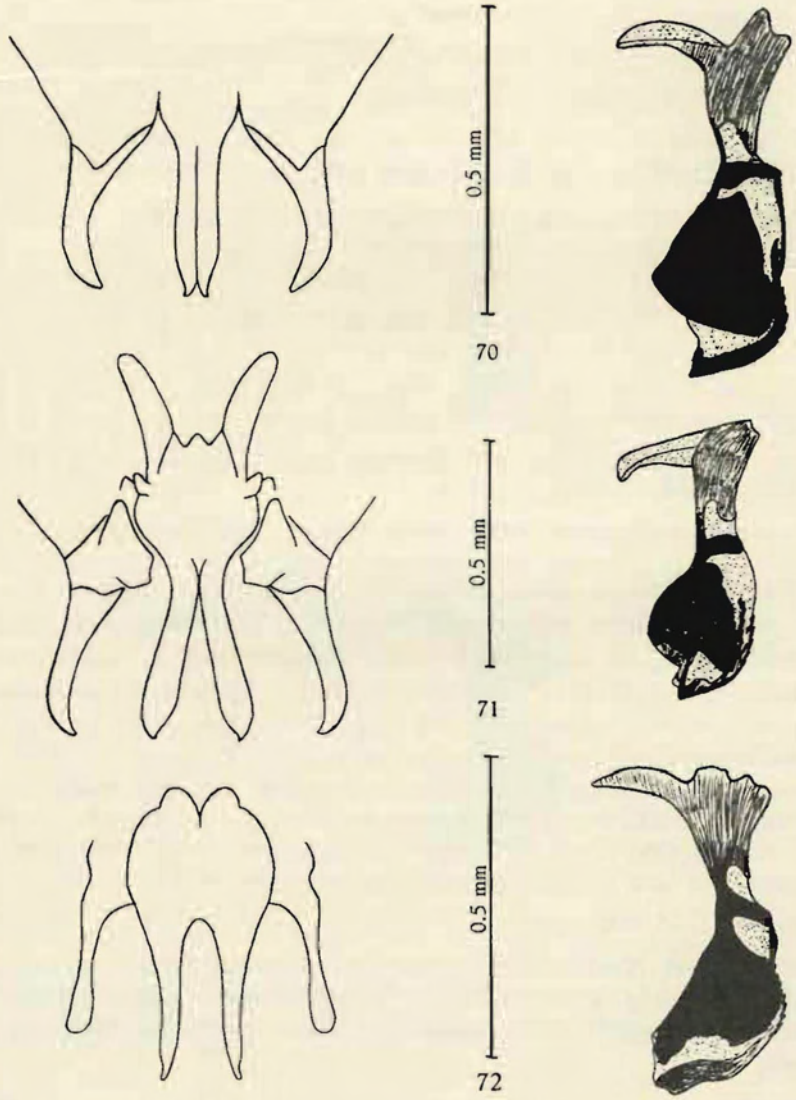

FIG. 70. — *Tricyclea du* CURRAN. Cerci with paralobi and phallosome (after ZUMPT). Specimen from Robertsport, Liberia.

FIG. 71. — *Tricyclea bivittata* CURRAN. Cerci with paralobi and phallosome (after ZUMPT). Paratype from S. Rhodesia.

FIG. 72. — *Tricyclea par* ZUMPT. Cerci with paralobi and phallosome. Specimen from Bechuanaland (paratype).

[12. — **Tricyclea bivittata** CURRAN.]

(Fig. 71.)

Tricyclea bivittata CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 523, figs. 8-9; et Bull. Amer. Mus. N. H., LVII, 1928, p. 365; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 514, fig. 20.

Apart from the type series (3 ♂♂, 2 ♀♀ from Prospect, S. Rhodesia, and 1 ♂ from East London, Cape Prov.), I have received only another male from Storms River, C. P., leg. 1.I.1954. Whether the pattern of the mesonotum is constant, remains to be proved. The hypopygium (fig. 71) is very similar to that of *T. du*, but cerci of the latter are more slender. Further material must prove whether perhaps the two species are more closely related to each other.

[13. — **Tricyclea par** ZUMPT.]

(Fig. 72.)

Tricyclea par ZUMPT, J. Ent. Soc. S. Africa, XVIII, 1955, p. 55, fig. 4.

This species was described recently from 2 ♂♂ and 1 ♀ from MARTIN's drift, Bechuanaland. It is easily recognizable (hypopygium fig. 72). No further material has been received in the meantime.

[14. — **Tricyclea claripennis** SÉGUY.]

(Fig. 73.)

Tricyclea claripennis SÉGUY, Mem. Mus. Zool. Univ. Coimbra, (1), n° 67, 1933, p. 74; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 500; et J. Ent. Soc. S. Afr., XVI, 1953, p. 189, fig. 6.

Described from 1 ♂ from Chemba, Port. E. Africa. I have received 6 ♂♂ and 1 ♀ from MARTIN's drift, Bechuanaland. Hypopygium shown in fig. 73.

15. — **Tricyclea bifrons** MALLOCH.

(Fig. 74.)

Tricyclea bifrons MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 117; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 507, fig. 15.

Tricyclea binotata MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 116; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 507.

T. bifrons is another highly variable species with respect to the pattern of thorax and abdomen. There are specimens with an almost totally yellow mesonotum and others in which it is wholly black, furthermore, a pattern as in typical *semithoracica* in which only the postsutural area is blackened, is not rare. The wings always have a pair of costal spots as far as can be concluded from the material present. Outer *ph* normally lacking. Abdomen with transverse bands of varying width, last tergite with two apical spots. Also the body length is strikingly variable, ranging from 4 to 7 mm.

The hypopygium (fig. 74) is similar to that of *T. semithoracica* but the cerci are united and evidently only separable by force. Up to now, specimens are known only from Kenya, Uganda and the Rutshuru district.

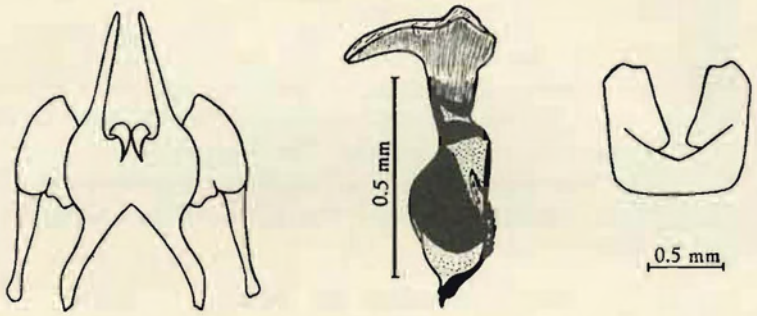

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FIG. 73. — *Tricyclea claripennis* SÉGUY. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Bechuanaland.

FIG. 74. — *Tricyclea bifrons* MALLOCH. Cerci with paralobi, phallosome and upper half of 5th. sternite (after ZUMPT). Specimen from Nairobi, Kenya.

The series from Robertsport, Liberia, mentioned in my paper (1953), have the cerci split and are to be placed to *T. semithoracica*.

Mission G. F. DE WITTE : Nyongera (près Rutshuru), 1.218 m, 22.VII.1935 (2 ♂♂); Rutshuru, 1.285 m, VI-VII.1935 (1 ♂, 3 ♀♀); Rutshuru, riv. Musugereza, 1.100 m, 4.VII.1935 (2 ♀♀).

[16. — **Tricyclea semithoracica** VILLENEUVE.]

(Fig. 75.)

Tricyclea semithoracica VILLENEUVE, Trans. Ent. Soc. Lond., 1921 (1922), p. 520; CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 516; et Bull. Amer. Mus. N. H., LVII, 1928, p. 365; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 511.

Tricyclea verticella VILLENEUVE, Trans. Ent. Soc. Lond., 1921 (1922), p. 521; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 508 (syn. nov.).

Dissection of the genitalia reveals that the striking pattern of the thorax (black vitta restricted to the postsutural area), used by VILLENEUVE for characterizing his *T. semithoracica*, is of no specific value. Specimens with a normal thoracic pattern showed a hypopygium of the same shape, and it can also be stated, that *T. verticella* was only based on such specimens with a more extended mesonotal vitta.

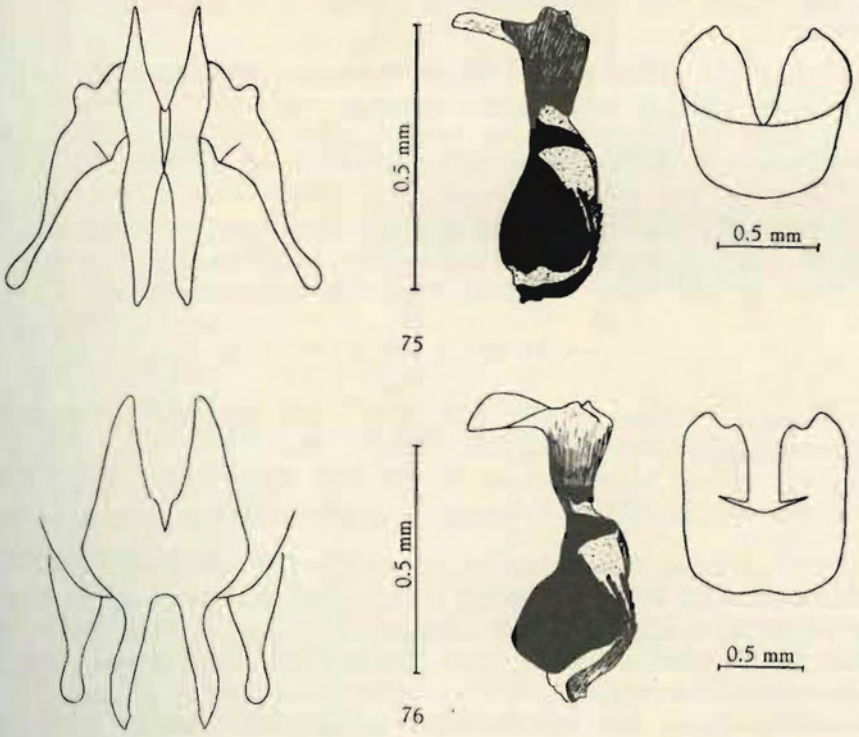

FIG. 75. — *Tricyclea semithoracica* VILLENEUVE. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Ibadan, Nigeria.

FIG. 76. — *Tricyclea analis* MALLOCH. Cerci with paralobi, phallosome and 5th. sternite. Paratype from Benguella, Angola.

The hypopygium (fig. 75) dissected from a specimen from Ibadan, Nigeria, is similar to that of the highly variable *T. analis* MALLOCH, but the cerci and especially the paralobi are more slender. In specimens from the Belgian Congo, I found that the paralobi show a tendency to become shorter so that it is sometimes difficult to separate them from specimens of *analis* with exceptionally slender paralobi.

The males of this material from the Congo area are all holoptic and have a rather extended black pattern on thorax and abdomen; wings with two costal spots or an apical one only. It will have to be decided in the future whether *T. analis* and *T. semithoracica* really represent good species, or whether we are dealing with a species that is not only variable in its outer features, but also in the shape of the hypopygium.

Collection Musée du Congo : [Sankuru : Lukumi, I.1928 (1 ♂ leg. GHESQUIÈRE)]; [Bambesa, 16.V.1938 (1 ♂, 2 ♀♀ leg. P. HENRARD)]; [Tshuapa : Flandria, V.1946 (1 ♂ leg. P. HULSTAERT)]; [Mayumbe : Sumbi, 5.V.1926 (4 ♂♂ leg. A. COLLART)]; [Urundi : Rumonge, 1934 (1 ♂ leg. A. LESTRADE)].

Collection British Museum, London : Several ♂♂ and ♀♀ from Ilorin, Oshogbo and Ibadan, Nigeria.

Collection Zool. Museum, Berlin : [Mangu-Jendi, Togo (1 ♂)].

Collection American Museum, New York : [Robertsport, Liberia, II-IV-XII.1943 (several ♂♂ and ♀♀ leg. SNYDER)].

17. — **Tricyclea analis** MALLOCH.

(Fig. 76.)

Tricyclea analis MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 559; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 499.

Tricyclea currani ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 511, fig. 18; et J. Ent. Soc. S. Africa, XVIII, 1955, p. 54.

In my paper on the variability among the *Calliphorinae*, especially of the male frons, I have pointed out that *T. currani* should be regarded as a synonym of *T. analis*, in spite of great differences in the outer features. Through the kindness of Dr. R. KELLOGG, U. S. National Museum, Washington, I have been able to study 2 paratypes of *T. analis* from Benguella, Angola, and state that the hypopygium (fig. 76) is evidently identical with that of *currani* and of further specimens from the Belgian Congo.

With respect to the outer features, *T. analis* from the type locality has closely approximated eyes in the male sex. Mesonotal disc covers the area between the anterior margin and the scutellum, and is bordered laterally by the *prs* and the postsutural *ia*, pleurae partly blackish. Wings totally hyaline. Abdomen with the last tergite yellow-brown, 4th tergite almost entirely black, 3rd tergite with the hind half black and a broad median black stripe, which continues to tergite I+II.

T. currani was based on a quite aberrant specimen from Faradje, Belgian Congo. The shape of the median mesonotal vitta does not

represent a constant feature, and the examination of specimens from other localities in the Belgian Congo reveals also, that the spotted or unicoloured hind abdominal tergite, at least in this species, can not be used as a specific character. The thoracic and abdominal patterns show nearly all kinds of variations in the same population. The abdomen may be banded and the last tergite shows two distinct apical spots, or the last tergite may have no spots and be brownish, or it may be almost totally black.

The wings are unspotted in the type series and in one male before me from the Rutshuru, whereas all other specimens show a pair of costal spots, the one broadly covering *St*, the other on the terminal half or less of R_1 and R_2.

The most interesting fact, however, is the variability of the width of the male frons. In the type specimens as well as in those from several localities in the Belgian Congo, the eyes are touching or the frons is very narrow, its width at the narrowest point not exceeding 1/7 of eye-length. But there are other specimens from the Congo area, and some of them even from the same localities (Vieux Kilo and Rutshuru), in which the frons varies between 3/10 and 3/7 of eye-length at its narrowest point (*analis* f. *latifrons*). In these specimens, *ev* and *f* are developed and the first pair of *paf* is more or less proclinate, so that it can be taken for *fo*.

Length : 6-8 mm.

Mission G. F. de Witte : Kanyabayongo (Kabasha), 1.780 m, 8.XII.1934 (1 ♂, f. *latifrons*); Rutshuru, 1.285 m, 6-8.VI.1934 (1 ♂, f. *latifrons*, 1 ♂, f. *angustifrons*, 2 ♀♀?).

Mission H. Damas : Lac Mokoto : c. Kishale, 23.IX.1935 (1 ♂, f. *angustifrons*, 5 ♀♀ ?).

Collection Musée du Congo : [Eala, 19.IX.1935, (2 ♂♂, f. *angustifrons*, leg. H. J. Brédo)]; [Stanleyville, 1922 (1 ♂, f. *angustifrons*, leg. J. Ghesquière)]; [Kilo, 1931 et 1935 (1 ♂, f. *angustifrons*, 3 ♀♀ ?, leg. G. du Soleil)]; [Vieux Kilo, IX.1935 (4 ♂♂, f. *angustifrons* and f. *latifrons*, 1 ♀, leg. R.P. Thalmann)]; Rutshuru, IV-V.1936 (1 ♂, f. *latifrons*, 5 ♀♀?, leg. L. Lippens); [Uele, Faradje, XI.1912 (1 ♂, leg. Exp. Lang-Chapin)].

18. — **Tricyclea unipunctata** Curran.

(Fig. 77.)

Tricyclea unipunctata Curran, Ann. Mag. N. H., (9), XIX, 1927, p. 518, fig. 3-4; Malloch, Ann. Mag. N. H., (10), III, 1929, p. 559; et (10), IV, 1929, p. 118; Zumpt, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 505, fig. 13.

? *Zonochroa pterostigma* Bezzi, Boll. Lab. Portici, VIII, 1914, p. 290; Malloch, Ann. Mag. N. H., (10), IV, 1929, p. 118.

Tricyclea liberia Curran, Amer. Mus. Nov., n° 506, 1931, p. 8.

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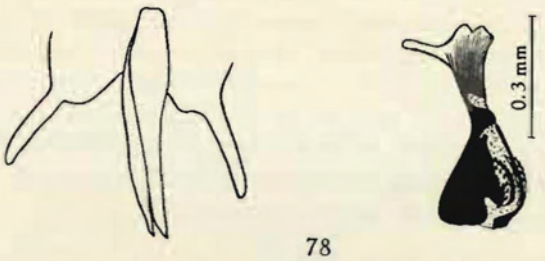

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FIG. 77. — *Tricyclea unipunctata* CURRAN. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Robertsport, Liberia.

FIG. 78. — *Tricyclea martini* (ZUMPT). Cerci with paralobi, turned slightly laterally, phallosome in lateral view (after ZUMPT). Paratype from Bechuanaland.

FIG. 79. — *Tricyclea vansomereni* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Paratype from W. Ruwenzori, Uganda.

The discovery of specimens of *T. du* and *T. semithoracica* with only one small apical spot on the wings makes it impossible to separate these specimens from *T. unipunctata* by outer features. The only reliable feature is again the hypopygium (fig. 77), which shows some similarity to that of *T. vansomereni*, but the cerci are less slender and only a little longer than the paralobi. The great variability of the dark pattern of the body has already been mentioned in my last revision of this genus (1953).

Length : 5-7 mm.

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 16.X.1934 (1 ♂).

Collection American Museum New York : [Zu, Liberia, XII.1943 (♂♀, leg. F. M. SNYDER)]; [Reppo Town, IX.1926 (1 ♀, leg. J. BEQUAERT, holotype of *T. liberia* CURRAN)]; [Faradje, Belg. Congo, XI.1912 (1 ♂, holotype of *T. unipunctata* CURRAN)].

Collection British Museum, London : [Fort Johnston, Nyasaland, I.1924 (1 ♂)]; [Kumasi, Gold Coast, IX.1947 (1 ♂)].

[19. — **Tricyclea martini** (ZUMPT).]

(Fig. 78.)

Keniella martini ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 188.

Known from 6 ♂♂ and coming from the same locality as *T. par.* No further specimens have been received (hypopygium fig. 78).

[20. — **Tricyclea vansomereni** ZUMPT.]

(Fig. 79.)

Tricyclea vansomereni ZUMPT, Rev. Ecuat. Ent. Parasit., I, 1953, p. 76, fig. 5.

This species has recently been described by me from 2 ♂♂ from the W. Ruwenzori, Uganda, 6.000-7.000 ft., VII.1946, leg. VAN SOMEREN. The thorax is almost totally black, only the tip of the scutellum and parts of the pleurae are reddish-yellow. Abdomen with broad black bands, legs partly blackish, wings with two separated costal spots. Chaetotaxy of thorax normal, the outer *ph* is present. Hypopygium (fig. 79) similar to that of the fore-going species, but the cerci are more slender and distinctly longer than the paralobi.

Length : 5-6 mm.

[21. — **Tricyclea somereni** (MALLOCH).]

(Fig. 80.)

Keniella somereni MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 114; ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 188.

This species, described from Rabai, Kenya, has remained unknown to me. Only one pair is recorded and preserved in the British Museum,

London. MALLOCH figured the terminalia (fig. 80), which indicate that we are probably dealing with a good species not described elsewhere.

22. — **Tricyclea similis** CURRAN.

(Fig. 81.)

Tricyclea similis CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 10; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 506, fig. 14.

This species, originally described from Liberia, is well characterized by its short paralobi (fig. 81). I redescribed it in 1953 and mentioned specially the extended dark colouring of the body, having broad abdominal bands and the mesonotum almost totally black. A series before me from the Cameroon Mts. shows that the species can be represented by still darker specimens; they have the thorax almost completely black, only the tip of the scutellum remaining bright yellow, and the abdomen is blackened too except the last segment which is yellow and provided with two apical spots. On the other hand, a male specimen from the Rutshuru district has the thorax orange-yellow with only two faintly indicated longitudinal stripes on the mesonotum, and the abdomen is banded as in specimens from Liberia. Wings in all specimens with two costal spots.

Length : 5-8 mm.

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 6-8.VI.1934 (1 ♂).

Collection Zool. Museum Berlin : [Buea, Kamerun, 1.000-2.100 m (7 ♂♂, leg. PREUSS)].

[23. — **Tricyclea ochracea** SÉGUY.]

Tricyclea ochracea SÈGUY, Encycl. Ent., B II, Dipt., IX, 1938, p. 22; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 498.

It is doubtful whether the female specimens mentioned by me (1953) from S. Rhodesia really belong to SÉGUY's species. Further material has not been received in the meantime.

Tricyclea spec. **incertae sedis.**

The following species are known to me only from the descriptions :

[24. — **Tricyclea bicolor** BEZZI.]

Tricyclea bicolor BEZZI, Ann. Soc. ent. Belg., LII, 1908, p. 383; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 519.

Described from 1 ♂ from the Congo.

[25. — **Tricyclea bipartita** SÉGUY.]

Tricyclea bipartita SÉGUY, Encycl. Ent., B II, Dipt., IX, 1938, p. 62; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 518.

A species with two-spotted wings and a mesonotum blackened only on the postsutural area. It may therefore be a synonym of *T. semithoracica* or *T. bifrons*. Described from 1 ♂ from Lealui, S. Rhodesia.

[26. — **Tricyclea decora** SÉGUY.]

Tricyclea decora SÉGUY, Mém. Mus. Zool. Univ. Coimbra, (1), n° 67, 1933, p. 73; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 519.

Described from 1 ♂ from Lambaréné, French Congo, and 1 ♀ from Gorongoza, Port. E. Africa. The specimens have two-spotted wings. The description is quite inadequate and, of course, it is more than doubtful whether the two specimens even belong to one species.

[27. — **Tricyclea nigroseta** CURRAN.]

Tricyclea nigroseta CURRAN, Ann. Mag. N. H., XIX, 1927, p. 522; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 506.

I have seen the single female (Madje, Belg. Congo) from which this species was described, and placed it, according to its pattern, in the key of my last revision (1953). But since the pattern has proved in the meantime to be quite variable and normally useless for classification, the status of this species remains doubtful.

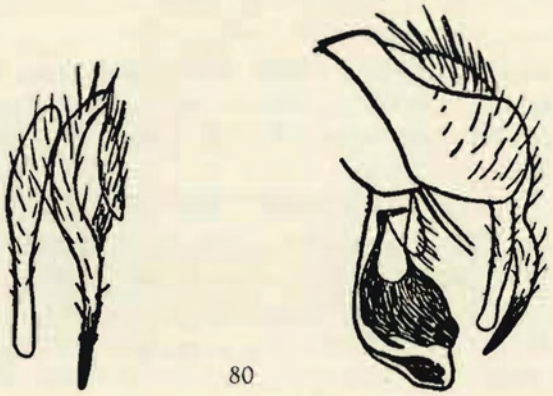
[28. — **Tricyclea spiniceps** MALLOCH.]

Tricyclea spiniceps MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 557, fig. 2; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 517.

I have not seen this species which is based on 1 ♂♀ from Buea, Cameroon Mts. This pair was preserved in the Zoological Museum of Hamburg, but was lost during the war. The author characterized it by a relatively broad male frons being « fully three times as wide at narrowest point as distance across posterior ocelli », a clouded costal area, and an extended mesonotal vitta. The 5th sternite has a big blunt tooth at the inner corner of the emargination, probably similar to that in *T. perpendiculars*.

I have not seen any specimens which could be referred to this species.

Two further « *Tricyclea* » species, described by KARSCH as *T. flavipennis* and *T. parva* (Berl. Ent. Ztschr., XXXI, 1887, p. 378) and founded on single females, are no longer in the Zool. Museum of Berlin and are probably lost. Moreover, it is very doubtful whether KARSCH even had *Calliphorinae* before him when erecting these species because he compares them with *Pyrellia*, a genus belonging to the *Muscidae*.



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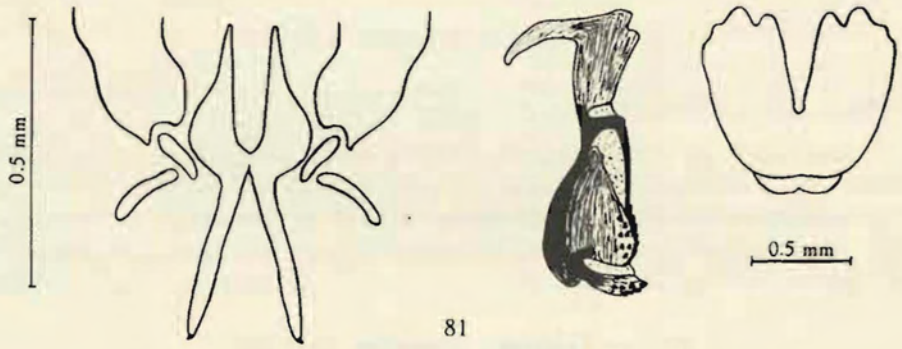

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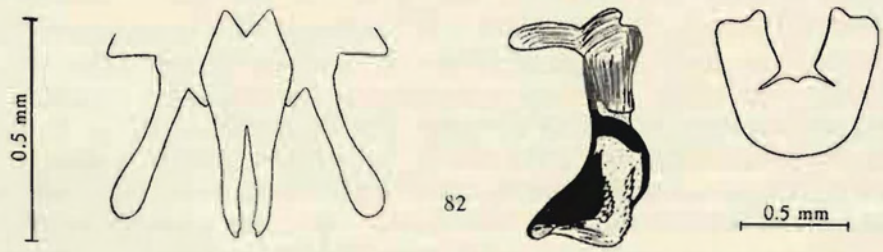

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FIG. 80. — *Tricyclea somereni* (MALLOCH). Paralobus and cercus in frontal view, hypopygium laterally (after MALLOCH). Holotype from Rabai, Kenya.

FIG. 81. — *Tricyclea similis* CURRAN. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Robertsport, Liberia.

FIG. 82. — *Hemigymnochaeta apicifera* CURRAN. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Robertsport, Liberia.

Genus **TRICYCLEALA** VILLENEUVE.

Tricycleala VILLENEUVE, Bull. Mus. roy. Hist. nat. Belg., XIII, n° 35, 1937, p. 1.

Type species : *T. maculipennis* VILLENEUVE from Eala, Belg. Congo.

VILLENEUVE based the genus on a single female, and I myself have only 3 ♀♀ of his species before me. But nevertheless, it is easily recognizable among all other genera of *Calliphorinae* by the arista with dorsal hairs only, by the veins r_1 and r_{4+5} which are dorsally beset with hairs throughout their entire length, in combination with a bare stem-vein and a haired propleuron and prosternum. In general appearance, *T. maculipennis* is similar to a *Tricyclea* species, but the thoracic squama is narrow and there are 4 postsutural *ac*, only the last pair being strongly developed.

1. — **Tricycleala maculipennis** VILLENEUVE.

Tricycleala maculipennis VILLENEUVE, Bull. Mus. roy. Hist. nat. Belge, XIII, n° 35, 1937, p. 2.

Female. — Eyes bare, frons at vertex about half as wide as one eye is long, slightly widened to the antennal groove, yellow-orange, only the ocellar-triangle blackish. Face and buccae yellow, occiput blackish in the upper part. Antennae with the two basal joints yellow, the third more or less darkened, amply 3 times as long as the second, arista brown, with long hairs dorsally, but ventrally only with very short setae. The chaetotaxy consists of strong *iv* and *ev*, reclinate *f* and one pair of *fo*, 7-8 pairs of *paf*, parafrontalia furthermore with black setae which are continued to the parafacialia in a single row reaching the middle of the eye. Facial ridge with strong black bristles on the lower two thirds, vibrissa long, peristomal bristles strong, buccal and occipital hairs black, height of buccae 3/8 of eye-length. Palpi yellow, broadly enlarged terminally.

Thorax orange, *ac*=2+4, but only the last pair strongly developed, *dc*=2+4, *ia*=1+2-3, *ph* =1 (outer absent), *h*=3, *prs*=1, *n*=2, *sa*=3, *sc*=5+0-1, *st*=1 : 1, one long and one short *pst* and *pp* each. Postalar declivity bare, propleuron and prosternum with setae. Wings with a cloudy spot at the end of r_{2+3}, costal spine small, but costa with relatively long bristles, r_1 dorsally densely beset with bristly hairs, ventrally only with a few, r_{2+3} bare, r_{4+5} dorsally in full length with relatively widely placed hairs, ventrally with hairs only in the basal half, *m* bent up broadly and sigmoidly, r_{4+5} slightly bent down terminally, R_5 narrowly open. Squamae hyaline and bare dorsally, the lower one narrow, longer than broad, lobe-shaped, halter yellow. Legs yellow, fore-tibia with 2 *ad* and a submedian

pv, mid-tibia with a submedian *ad* and *av* and 2 *pd*, hind-tibia with 2 *ad* and a submedian *av*, claws and pulvilli short.

Abdomen yellow-brown, hind margin of 2nd tergite narrowly blackened, 3rd and 4th tergite with about the hind half blackened, last tergite with two apical spots, sternites with long marginal hairs.

Length : 4-5 mm.

Mission G. F. DE WITTE : Kanyabayongo (Kabasha), 1.760 m, 7.XII.1934 (1 ♀); Rutshuru, 1.285 m, 2?-21.XII.1933 (2 ♀♀).

Genus **HEMIGYMNOCHAETA** CORTI.

Hemigymnochaeta CORTI, Ann. Mus. Stor. nat. Genova, XXXV, 1895, p. 142; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 275; et (10), IV, 1929, p. 118; SÉGUY, Encycl. Ent., B II, Dipt., X, 1946, p. 33; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 481.
Type species : *H. lutea* CORTI from Abyssinia.

Parochromyia HOUGH, Proc. Acad. Nat. Sci., L, 1898, p. 178; MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 118; TOWNSEND, Man. Myiol., V, 1937, p. 82.
Type species : *P. varia* HOUGH from Somaliland.

Auchmeromyiella TOWNSEND, Ins. Ins. Mens., VI, 1918, p. 154; MALLOCH, Ann. Mag N. H., (10), III, 1929, p. 561; TOWNSEND, Man. Myiol., V, 1937, p. 69.
Type species : *A. angola* TOWNSEND from Angola.

Tricyclodes CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 525; et Bull. Amer. Mus. N. H., LVII, 1928, p. 363; MALLOCH, Ann. Mag. N. H., (10), III, 1929, pp. 277 et 561; SÉGUY, Mem. Estud. Mus. Zool. Coimbra, (1), n° 67, 1933, p. 74; TOWNSEND, Man. Myiol., V, 1937, p. 82.
Type species : *T. pallens* CURRAN from S. Africa.

The genus *Hemigymnochaeta* is closely related to *Tricyclea* from which it is to be separated mainly by its bare propleuron. Eyes bare as in this genus, but always touching in the male sex, dichoptic males not yet being known. Parafacialia at most with a few setae at the base. Colouring of thorax and abdomen as in *Tricyclea*, but evidently less variable. Thoracic squama, as a rule, narrow and lobe-shaped, but sometimes broad and more or less truncate. Hypopygium more primitively built than in most *Tricyclea*-species.

All *Hemigymnochaeta* species are very similar to each other, even in the hypopygial structure, but show on the other hand an astonishingly wide range of intraspecific variability. I have already discussed this problem at some length recently (ZUMPT, 1953). These variations, which are found in almost every species, concern mainly the number of postsutural *dc* (if 3 or 4), and independently of this feature, the size of the upper facets of eyes in the male sex. For these « homologous strains » I have proposed the

following designations which will be independent of the rules of nomenclature :

1° f. *macrommatidiata* — IV *dc*=large upper facets and 4 *pst dc*,
2° f. *macrommatidiata* — III *dc*=large upper facets and 3 *pst dc*,
3° f. *micrommatidiata* — IV *dc*=smaller upper facets and 4 *pst dc*,
4° f. *micrommatidiata* — III *dc*=smaller upper facets and 3 *pst dc*.

Very little is known about the biology of the *Hemigymnochaeta* species. *H. unicolor* (BIGOT) and *H. varia* (HOUGH) were reared from mushrooms and fungus beds of termites. The genus is known only from the Ethiopian region.

In the following key outer features have been used to some extent. However, their value is very restricted and every identification should be confirmed by a careful comparison of the male genitalia. The identification of the females must remain doubtful in most cases and is often quite impossible.

KEY TO THE SPECIES.

1 (2) Fifth abdominal tergite with paired, black apical spots, or these are fused forming an apical, distinct narrow band.
Wings hyaline, more or less tinged, or with the costal area totally or partly demarcated, darkened. Mesonotum dorsally blackened or yellow-brown, 4 postsutural *dc*. Eyes in male with relatively small facets. Hypopygium with club-shaped paralobi and the phallosome terminally broad. 5-8 mm. — Ethiopian region ..... 1. *H. apicifera* CURRAN.

2 (1) Fifth abdominal tergite without paired apical spots or a narrow apical band, but wholly brown or black or the disc more or less darkened 3

3 (6) Mesonotum wholly orange or yellow-brown without dark pattern. 4

4 (5) The strongly sclerotized lower part of the phallosome more or less triangular, remarkably widened terminally, paralobi slender, cerci unitipped, distinctly swollen in the middle.
Wings hyaline and more or less tinged, or the costal area slightly demarcated brown. Eyes in male with bigger or smaller upper facets, postsutural *dc*=3 or 4. Up to now, a forma *micrommatidiata* — III *dc* has not been recorded. 5-9 mm. — Ethiopian region ..... 2. *H. bequaerti* CURRAN.

5 (4) Lower part of phallosome more or less parallel and terminally rounded, cerci bitipped.
Wings wholly hyaline, no specimens with darkened costal area known. Eyes in male with big or smaller upper facets, 4 or 3 postsutural *dc*. 5-9 mm. — Ethiopian region .....
3. *H. unicolor* (BIGOT).

6 (3) Mesonotum with a more or less pronounced dark pattern 7

7 (8) Mesonotum with 3 postsutural *dc*.

Described from one female which I have not seen. Costal area of wing brown, mesonotum with a median black vitta, abdomen banded, last tergite red with the apex brownish. 7-8 mm. — Belg. Congo ..... 4. *H. roubaudi* SÉGUY.

8 (7) Mesonotum with 4 postsutural *dc* 9

9 (10) Wings with the terminal part (behind r_1) of the costal area demarcated brown. Hypopygium slender, cerci with tooth-shaped tips; 5th sternite with a pair of short interior protrusions.

Eyes in male with large upper facets; mesonotum with the disc blackened, median area slightly lightened. 6-7 mm. — Probably widespread over the Ethiopian region ..... 5. *H. gracilis* (SÉGUY).

10 (9) Wings (as far as it is known) without costal spot. Hypopygium otherwise built 11

11 (14) Mesonotum with a dark, more or less extended single discal spot which is at most a little indistinctly lightened in the median area 12

12 (13) Cerci simply pointed, paralobi narrower.

Eyes in male with large and smaller upper facets. Wings hyaline, more or less tinged. 6-8 mm. — Liberia, Belgian Congo, S. Rhodesia ..... 6. *H. liberia* CURRAN.

13 (12) Cerci with semicircularly truncated tips, paralobi broader.

Upper facets large in male. 6-7 mm. — Belg. Congo, Ruanda-Urundi ..... 7. *H. incerta* ZUMPT.

14 (11) Mesonotum with a pair of widely separated and normally distinct black, longitudinal vittae. Phallosome slender, more or less parallel 15

15 (16) Thoracic squama narrow, equally rounded. Hypopygium with the paralobi not strikingly club-shaped, but the cerci basally broader.

Eyes of male with bigger and smaller upper facets. 6-8 mm. — East, Central and Southern Africa ..... 8. *H. varia* (HOUGH).

16 (15) Thoracic squama distinctly broader, less equally rounded, reminiscent of that of the *Tricyclea*-species. Hypopygium with strikingly club-shaped paralobi and very slender cerci.

Eyes in male with large upper facets. 9 mm. — S. Rhodesia ..... 9. *H. laticeps* ZUMPT.

Not included : *H. ornata* (SÉGUY), comp. p. 148.

[1. — **Hemigymnochaeta apicifera** CURRAN.]

(Fig. 82.)

Hemigymnochaeta apicifera CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 12; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 494, fig. 7.

Hemigymnochaeta mitis CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 13; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 495 (syn. nov.).

Tricyclea resurgens VILLENEUVE, Rev. Zool. Bot. Afr., XXI, 1932, p. 284; ZUMPT, Rev. Zool. Bot. Afr., XXI, 1932, p. 503 (syn. nov.).

H. apicifera, up to now, was known from Liberia only. It is recognizable by the paired black apical spots (sometimes fused) of the last abdominal tergite. With respect to the hypopygium, however, it is very similar to *H. unicolor*, but the phallosome is broader and its frontal margin more strongly curved (fig. 82). The colouring is variable, but only f. *micrommatidiata* — IV *dc* is known to occur.

Collection Musée du Congo : [Bambesa, 6.VII.1937 (1 ♂ leg. J. VRYDAGH)]; [V.1938 (2 ♀♀ leg. P. HENRARD)]; [Stanleyville, 10.III.1928 (1 ♀ leg. A. COLLART)]; [Lomami, VII.1930 (1 ♀, leg. QUARRÉ)]; Sankuru : Komi, VII.1930 (1 ♀, leg. M. J. GHESQUIÈRE, lectotype of *resurgens*).

Collection British Museum, London : [Aburi, Gold Coast, IV.1911 (1 ♀)]; [Bwamba, Uganda (2 ♂♂, 4 ♀♀)].

Collection Museum für Naturkunde, Stuttgart : [Pare Mts., Usangi, Tanganyika, VI.1952 (1 ♂, leg. LINDNER)].

2. — **Hemigymnochaeta bequaerti** CURRAN.

(Fig. 83.)

Hemigymnochaeta bequaerti CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 14; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 488, fig. 3.

This species is only separable from the following one by the shape of the hypopygium (fig. 83), of which I am giving a new drawing. In that published in my last revision (1953) the cerci are a little too stout. The hypopygium is similar to that of *H. gracilis*, but the tips of the cerci are not distinctly denticulated and the 5th sternite is different.

Mission G. F. DE WITTE : Rwindi, 1.000 m, 20-24.XI.1934 (1 ♂, f. *macrommatidiata*-IV *dc*); Rutshuru, 1.285 m, 2.VII.1935 (1 ♂, f. *macro.*-IV *dc*); [Uele : Monga, 450 m, 18.IV-8.V.1935 (2 ♂♂, f. *macro.*-IV *dc*; 1 ♂, f. *micro.*-IV *dc*)].

Mission H. DAMAS : Lac Mokoto : c. Kishale, 23.IX.1935 (1 ♂, f. *macro.*-IV *dc*).

Collection Musée du Congo : [Bambesa, 16.V.1938 (1 ♂, f. *macrommatidiata*-IV *dc*, leg. P. HENRARD); IV.1937 (1 ♂, f. *micro.*-IV *dc*,

leg. J. VRYDAGH)]; Rutshuru, 20.II.1936 (1 ♂, f. *macro.*-IV *dc*, leg L. LIPPENS); [Kibali-Ituri : Geti, 1934 (1 ♂, f. *macro.*-IV *dc*, leg. CH. SCOPS)]; [Léopoldville, 1932 (1 ♂, f. *macro.*-IV *dc*, leg. VAN HOOF)]; [Bas Congo : Mangembo, 1932 (1 ♂, f. *macro.*-IV *dc*, leg. ZWOLAKOWSKI)].

Collection Zool. Museum, Berlin : [Mangu-Jendi, Kamerun, VII-VIII.1909 (4 ♂♂, f. *macro.*-IV *dc*)]; [Bismarckburg, Togo, X.1891 (1 ♂, f. *macro.*-IV *dc*, leg. R. BUETTNER)].

Collection British Museum, London : [Nairobi, Kenya, VII.1937 (1 ♂, f. *micro.*-IV *dc*)]; [Ngong, Kenya (4 ♂♂, f. *micro.*-IV *dc*)]; [Ilorin, Nigeria (1 ♂ ,f. *micro.*-IV *dc*)]; [Njola, S. Leone (2 ♂♂, f. *micro.*-IV *dc*)].

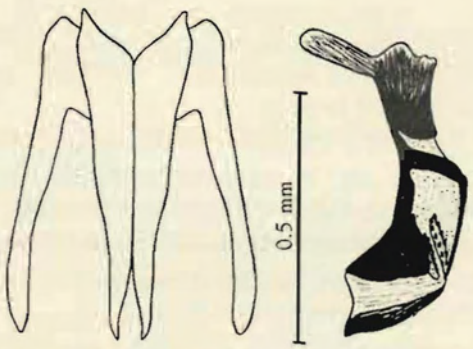


FIG. 83. — *Hemigymnochaeta bequaerti* CURRAN.
Cerci with paralobi, phallosome.
Specimen from Togo.

Collection S. A. Institute for Med. Research, Johannesburg : [New Agathe, Transvaal, 4.XII.1932 (4 ♂♂, 4 ♀♀, f. *micro.*-IV *dc*, leg. DE MEILLON)]; [Pinetown, Natal, 8.III.1954 (5 ♂♂, 1 ♀, f. *macro.*-IV *dc*, leg. H. PATERSON)].

3. — **Hemigymnochaeta unicolor** (BIGOT).

(Fig. 84.)

Ochromyia unicolor BIGOT, Bull. Soc. Zool. France, XII, 1887, p. 608; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 486, fig. 2.

Hemigymnochaeta lutea CORTI, Ann. Mus. Genova, XXXV, 1895, p. 142; SÉGUY, Encycl. Ent. BII, Dipt., X, 1946, p. 35.

Zonochroa flaveola BEZZI, Ann. Soc. Ent. Belg., LII, 1908, p. 383; VILLENEUVE, Bull. Mus. Hist. nat. Belg., XII, n° 12, 1936, p. 5.

Hemigymnochaeta clara CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 11; VILLENEUVE, Bull. Mus. Hist. nat. Belg., XII, n° 12, 1936, p. 5; CUTHBERTSON, Occ. Pap. Rhod. Mus., IV, 1935, p. 17, pl. 2, fig. 6; et Trans. Rhod. Sci. Ass., XXXVII, 1939, p. 145.

Hemigymnochaeta flavella VILLENEUVE, Bull. Mus. Hist. nat. Belg., XIII, n° 35, 1937, p. 3; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 486.
Hemigymnochaeta foveola SÉGUY, (errore), Encycl. Ent. B II, Dipt., X, 1946, p. 35.

This species probably occurs everywhere in the Ethiopian region and all four strains have been recorded (f. *macrommatidiata* III & IV *dc*, f. *microm-matidiata* III & IV *dc*). A separation from *H. bequaerti* is only possible by dissecting the male terminalia (fig. 84). There are numerous specimens

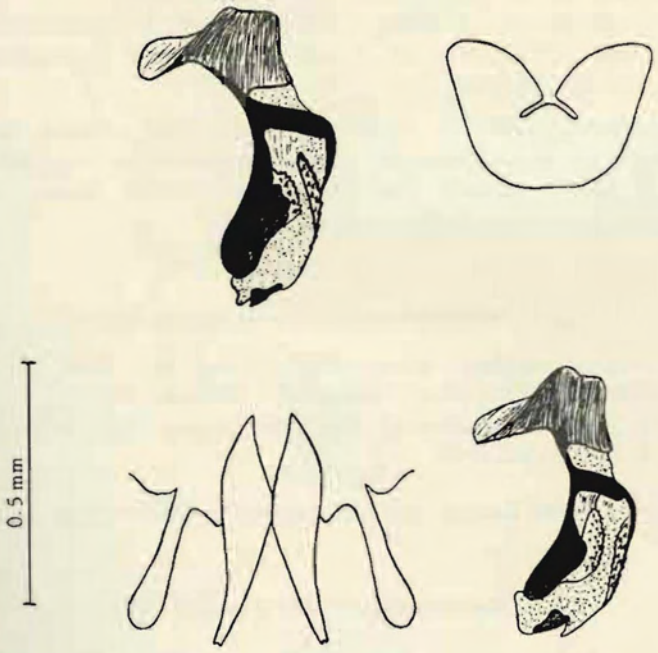


FIG. 84. — *Hemigymnochaeta unicolor* (BIGOT).
Cerci with paralobi and 5th. sternite in frontal view, two phallosomes laterally, to show the variability (after ZUMPT).

before me, but there was no time to dissect the hypopygium of every male. I have therefore only listed those specimens the identification of which could be confirmed by this procedure.

Mission G. F. DE WITTE : Rwindi, 1.000 m, 20-24.XI.1934 (2 ♂♂, f. *macro.*-IV *dc*); Nyasheke (volc. Nyamuragira), 1.820 m, 1-26.VI.1935 (1 ♂, f. *macro.*-III *dc*); Kalinga-Vitshumbi, 1.000 m, 12.XI.1934 (1 ♂, f. *macro.*-III *dc*); Tshamugussa (Bweza), 2.250 m, 9.VIII.1934 (1 ♂, f. *micro.*-III *dc*); Nyongera (près Rutshuru), 1.218 m, 22.VII.1935 (1 ♂, f. *macro.*-III *dc*);

Rutshuru, 1.285 m, 6-8.VI.1934 et 1935 (8 ♂♂, 1 ♀, f. *micro.*-III et IV *dc*); Burambi (volc. Muhavura), 2.325 m, 5.IX.1934 (1 ♂, f. *macro.*-III *dc*); [Uele : Monga, 450 m, 18.IV-8.V.1935 (5 ♂♀, f. *macro.*-III et IV *dc*)].

Mission H. Damas : Ngesho, 3.VIII.1935 (1 ♂, f. *micro.*-III *dc*); lac Mokoto, c. Kishale, 23.IX.1935 (11 ♂♂, f. *micro.*-III *dc*); Vitshumbi, 10-14.I.1936 (1 ♂, f. *micro.*-III *dc*); sud lac Édouard, riv. Rwindi, IV.1936 (12 ♂♂, f. *macro.*-III et IV *dc*)

Collection Musée du Congo : [Élisabethville, I-II.1921, L.1931 (7 ♂♂, f. *macro.*-III *dc*, leg. M. Bequaert)]; Rutshuru, VI.1936, IX.1937 (4 ♂♂, f. *macro.*-III *dc*, leg. L. Lippens); [Eala, III.1935 (1 ♂, f. *macro.*-III *dc*, leg. A. Corbisier)]; [Bambea, V.1938 (3 ♂♂, f. *macro.*-III *dc*, leg. P. Henrard)]; Eala, 14.VI.1935 (1 ♂, f. *macro*-IV *dc*, leg. J. Ghesquière; lectotype of *flavella* Villeneuve).

In my revision (1953), I recorded this common species from Liberia, Belgian Congo, S. W. Africa, S. Rhodesia, Transvaal and Natal. In the meantime, I have received specimens also from S. Leone, Gold Coast, Uganda, Nyasaland and Bechuanaland.

[4. — **Hemigymnochaeta roubaudi** Séguy.]

Hemigymnochaeta roubaudi Séguy, Encycl. Ent. B 2, Dipt., X, 1941, p. 34; Zumpt, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 493.

? *Tricyclea fuliginosa* Villeneuve, Bull. Mus. Hist. nat. Belg., XII, n° 41, 1936, p. 2; Zumpt, id. ibid.

This species from Brazzaville still remains unknown to me.

5. — **Hemigymnochaeta gracilis** (Séguy).

(Fig. 85.)

Tricyclea gracilis Séguy, Mem. Estud. Mus. Zool. Univ. Coimbra, I, n° 67, 1933, p. 73; et Encycl. Ent. B 2, Dipt., X, 1946, p. 35; Zumpt, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 493; et Ann. Mus. Congo Tervuren, Zool., XXXVI, 1955, p. 322, fig. 2.

This species was redescribed (hypopygium fig. 85) by me in 1955 and specimens were listed from Nigeria, Ruanda, Uganda, Nyasaland and Transvaal. There is a forma *micrommatidiata* and a forma *macrommatidiata*, but postsutural *dc* always 4 in number. Since my last paper, I have received the following additional material :

Mission G. F. de Witte : Rwindi, 1.000 m, 20-24.XI.1934 (1 ♀).

Collection S. A. Institute for Med. Research, Johannesburg : [Pt. St. Johns, Cape Prov., 18.II.1954 (8 ♂♂, 3 ♀♀, f. *macro.*-IV *dc*, leg. H. Paterson)].

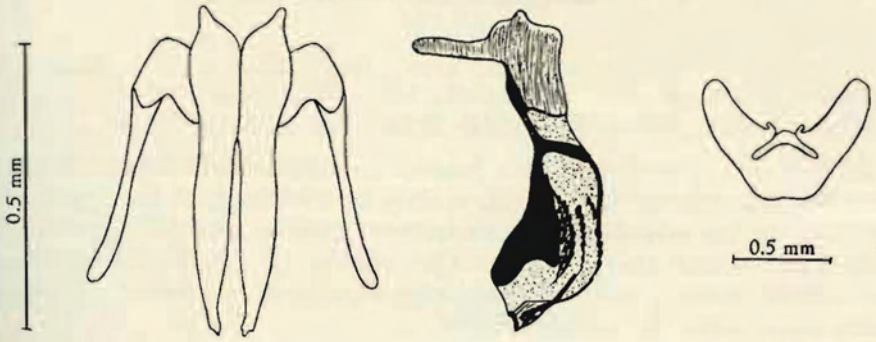


FIG. 85. — *Hemigymnochaeta gracilis* (SÉGUY).
Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT).
Specimen from White River, Transvaal.

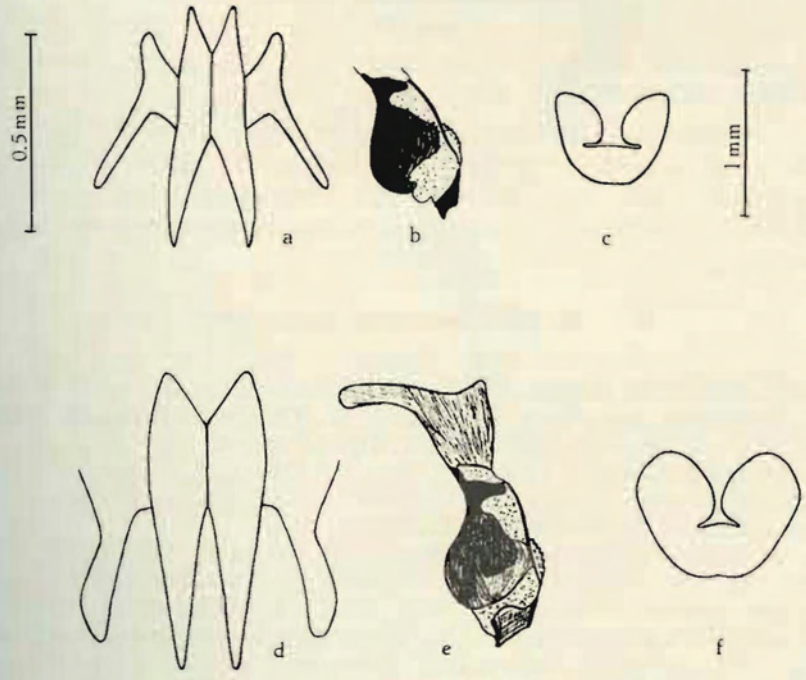


FIG. 86. — *Hemigymnochaeta liberia* CURRAN.
(a-c) : cerci with paralobi, phallosome and 5th. sternite, of a specimen from Robertsport, Liberia; (d-f) : a specimen from Salisbury, S. Rhodesia (after ZUMPT).

6. — **Hemigymnochaeta liberia** CURRAN.

(Fig. 86.)

Hemigymnochaeta liberia CURRAN, Amer. Mus. Nov., n° 506, 1931, p. 12; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 491, fig. 6.
Hemigymnochaeta liberia orientalis ZUMPT, id., ibid. (syn. nov.).

In 1953, I believed that it was possible to separate a Southern subspecies from the Western nominate form, mainly by the shape of the hypopygium (fig. 86). In the meantime, I have received further material from S. Rhodesia which reveals that in the same population the hypopygium may show a variability covering the whole range between these two forms. I therefore prefer to suppress the subspecies *orientalis*.

There is a f. *microммatidiata* and a f. *macrommatidiata* which may occur together at the same locality. The species was known before from Liberia and S. Rhodesia.

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 18.X.1934 (1 ♂, f. *micro.*-IV *dc*).

[7. — **Hemigymnochaeta incerta** ZUMPT.]

(Fig. 87.)

Hemigymnochaeta incerta ZUMPT, Ann. Mus. Congo Tervuren, Zool., XXXVI, 1955, p. 323, fig. 3.

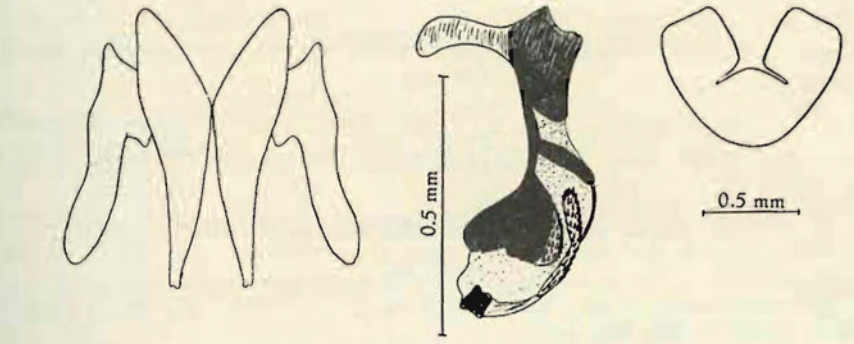
Only recently described from Elisabethville and Ruanda-Urundi. This species is not separable from the foregoing one by outer features but the hypopygium (fig. 87) is quite characteristic, showing semicircularly truncated tips of cerci, broad paralobi and a phallosome somewhat similar to that of *liberia*.

8. — **Hemigymnochaeta varia** (HOUGH).

(Fig. 88.)

Parachromyia varia HOUGH, Nat. Sci. Philadelphia, 1898, p. 178, figs. 1, 9-11; MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 118; ZUMPT, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 489, figs. 1 and 4.
Auchmeromyiella angola TOWNSEND, Ins. Ins. Mens., VI, 1918, p. 154; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 562; SÉGUY, Encycl. Ent. B 2, Dipt., X, 1946, p. 35; ZUMPT, id., ibid.
Tricyclea difficilis CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 526, fig. 11; MALLOCH, Ann. Mag. N. H., (10), III, 1929, pp. 277 et 561; ZUMPT, id., ibid.
Tricyclodes pallens CURRAN, Ann. Mag. N. H., (9), XIX, 1927, p. 525, fig. 10; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 365; ZUMPT, id., ibid.
Tricyclea tridentata VILLENEUVE, Bull. Mus. roy. Hist. nat. Belg., XII, n° 41, 1936, p. 3; ZUMPT, id., ibid.

A common species in East and Southern Africa, where the formae *microммatidiata*-IV *dc* and *macrommatidiata*-IV *dc* occur. The following specimens have been received from Central Africa.



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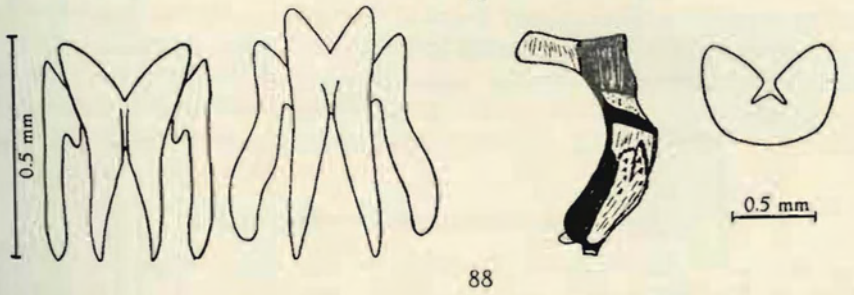

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Fig. 87. — *Hemigymnochaeta incerta* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Elisabethville, Belgian Congo.

Fig. 88. — *Hemigymnochaeta varia* (HOUGH). Two pairs of cerci with paralobi, to show variability; phallosome and 5th. sternite (after ZUMPT).

Fig. 89. — *Hemigymnochaeta laticeps* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Paratype from Salisbury, S. Rhodesia.

Mission G. F. DE WITTE : Kanyabayongo (Kabasha), 1.760 m, 7.XII.1934 (1 ♂, f. *micro.*-IV *dc*); Nyasheke (volc. Nyamuragira), 1.820 m, 14-26.VI.1935 (1 ♀).

Collection Musée du Congo : [Uele (1 ♂, f. *macro.*-IV *dc*, leg. RODHAIN)]; [Élisabetville (8 ♂♂, f. *macro.*-IV *dc*, leg. RICHARD, M. BEQUAERT, P. QUARRÉ)].

Collection British Museum, London : [Mambre Estate, Kenya, 26.V.1932 (1 ♂, 2 ♀♀)]; [Usangu distr., Tanganyika, 28.XI.1910 (1 ♂, 2 ♀♀)].

[9. — **Hemigymnochaeta laticeps** ZUMPT.]

(Fig. 89.)

Hemigymnochaeta laticeps VILLENEUVE *in litt.*, Trans. R. Ent. Soc. Lond., CIV, 1953, p. 490, fig. 5.

I have seen this species only from S. Rhodesia. It was separated from the closely related foregoing species by broader thoracic squamae and by the hypopygium showing extremely broad paralobi in conjunction with relatively slender cerci (figs. 88 et 89). Further material must prove whether we are really dealing with a good species or only with a subspecific form.

[10. — **Hemigymnochaeta ornata** (SÉGUY).]

Tricyclea ornata SÉGUY, Mem. Estud. Mus. zool. Univ. Coimbra, I, n° 67, 1933, p. 76; Encycl. Ent. B 2, Dipt., IX, 1938, p. 78; id., ibid., Dipt., X, 1946, p. 34.

This species has remained unknown to me, and its status is completely doubtful. SÉGUY described it originally as *Tricyclea*, but in his last paper, transferred it to *Hemigymnochaeta*. In this genus, it would be easily recognizable by two dark spots in the costal area of the wings, a feature which, up to now, has only been found in the genus *Tricyclea*. It is therefore highly questionable whether *H. ornata* really belongs to this genus, or represents one of the *Tricyclea* species with spotted wings.

[Genus **NEOCORDYLOBIA** VILLENEUVE.]

Neocordylobia VILLENEUVE, Bull. Soc. Path. exot., XXII, 1929, p. 437; PATTON, Ann. Trop. Med. Parasit., XX, 1936, p. 67; TOWNSEND, Man. Myiol., V, 1937, p. 79.

Type species : *N. roubaudi* VILLENEUVE from Senegal.

Neocordylobia is monotypic up to now. It is related to *Hemigymnochaeta*, but has a broad thoracic squama, the male is dichoptic and the hind tibia has no ventral bristles. Furthermore, the phallosome is quite typical, but reminiscent of those of the *Hemigymnochaeta* species.

The flies were caught in and around the burrows of antbears, but whether the larvae are dermal parasites like *Cordylobia*, as PATTON suggests, is still to be proved.

[1. — **Neocordylobia roubaudi** VILLENEUVE.]

(Fig. 90.)

Neocordylobia roubaudi VILLENEUVE, Bull. Soc. Path. exot., XXII, 1929, p. 437; PATTON, Ann. Trop. Med. Parasit., XXX, 1936, p. 63, fig. 6; FAIN, Ann. Soc. Belg. Med. Trop., XXXIII, 1953, p. 613.

This species is probably widespread in the Ethiopian region, but only a few records are available. It was described from Senegal and from Uganda. I have seen specimens from Kenya, Tanganyika, S. Rhodesia and Zululand.

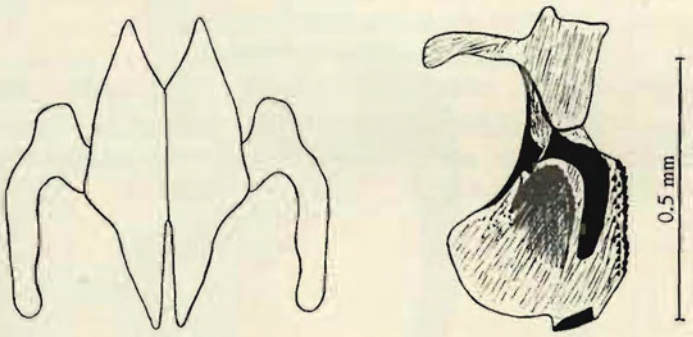

FIG. 90. — *Neocordylobia roubaudi* VILLENEUVE.
Cerci with paralobi and phallosome.
Specimen from Kenya.

Male. — Frons at the narrowest part of the lower end of the ocellar triangle about one sixth as wide as the eye is long, strongly widened towards the vertex and the antennal groove, the whole head yellow to orange, parafrontalia and parafacialia slightly whitish dusted, one parafrontalium near the tip of the ocellar triangle about half as wide as the frontal stripe. Eyes oval, with small facets. Chaetotaxy : *iv* and *oc* present, *paf* reach the hind margin of the 1st antennal segment, *ev*, *f* and *fo* wanting. Parafrontalia beset with black setulae, parafacialia in the upper half with yellow ones, bare in the lower half. Third antennal segment about 2 ½ times as long as the second, arista yellow like the remaining antennae, with long hairs below and above. Buccae half as high as the eye is long, anterior ⅔ with a row of long black bristles, the posterior half with long, soft, yellow hairs, vibrissa long and thick, facial ridge with black bristles almost halfway upwards. Buccae beset with yellow hairs, which are long in the posterior lower corner, short on the remaining part; the short hairs in the anterior part of the

buccae are sometimes more or less darkened basally. Palpi slightly dilated apically, with stiff black hairs, yellow-brown like the proboscis.

Thorax yellow-brown, notum with two broad black stripes which are sometimes fused and normally do not reach the scutellum; meso- and sternopleurites more or less blackish. Chaetotaxy : *ac*=2-3+4, *dc*=2+4, *ia*=1+2, *ph*=3-4, *h*=2-3 (outer present), *prs*=1, *n*=2, *sa*=4-5 (more or less irregularly arranged), *pa*=2, scutellum with up to 7 pairs of marginals and 1 pair of discals but some of the marginals weak. Prostigma yellow, one long *pst* and 1-2 *pp*, *st*=1 : 1. Propleura bare, prosternum densely beset with fine hairs. Wings hyaline, veins brown, costal spine wanting, r_{4+5} with setae on both sides which dorsally almost reach *r-m*, R_5 open. Both squamae yellowish, without discal hairs, the lower broad, truncated, halter yellow. Legs totally yellow-brown, fore-tibia with 3 short *ad* which are hardly longer than the other hairs, one submedian *pv*; mid-tibia with one submedian *av* and *ad* and 2 median *pd*; hind-tibia with a dense row of short *ad* and *pd*, but no ventral bristles present.

Abdomen with the segments I+II and anterior half of III brown, the other segments blackish, with white dust. Hypopygium see fig. 90.

Female. — Frons widest at vertex, slightly narrowing to the antennal groove and here a little more than half as wide as the eye is long. Chaetotaxy of head complete, with *iv*, *ev*, 1 *f* and 2 *fo*. Other features as in the male.

Length : 8-10 mm.

[Genus **PACHYCHOEROMYIA** VILLENEUVE.]

Pachychoeromyia VILLENEUVE, Bull. Soc. Ent. France, 1920, p. 225; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 274; SÉGUY, Encycl. Ent., B 2, Dipt., VIII, 1935, p. 131; PATTON, Ann. Trop. Med. Parasit., XXIX, 1935, p. 199; TOWNSEND, Man. Myiol., V, 1937, p. 81.
Type species : *C. praegrandis* AUSTEN from the Cape of Good Hope.

The only species of the genus, *P. praegrandis* (AUSTEN), is easily recognizable by features given in the key of genera. It was originally described as a *Cordylobia* species. ROUBAUD, who made an extensive study of all calliphorids bloodsucking in the larval stages, transferred it to the genus *Auchmeromyia*, mainly on account of its similar bionomics. VILLENEUVE erected a new genus for it, but PATTON transferred it back to *Auchmeromyia* stating, however, that the structure of the phallosome was quite peculiar. The dorsomedian shaft shows « a characteristic long prolongation bent ventrally at end » (fig. 91).

On account of this structure and also of the haired lower squama, I prefer for the time being to retain the genus *Pachychoeromyia*, as is usually done by contemporary dipterists.

1. — **Pachychoeromyia praegrandis** (AUSTEN).

(Fig. 91.)

Cordylobia praegrandis AUSTEN, Bull. Ent. Res., I, 1911, p. 79, fig. 1; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 120, figs.; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, p. 42, figs.; PATTON, Ann. Trop. Med. Parasitol., XXIX, 1935, p. 216, figs. 16-20.

PATTON has given a good description of this species, with excellent drawings of the male and female terminalia. It is well characterized by its large size (14-18 mm), its colouring and the broad, truncate thoracic squama which is provided dorsally, in almost full extent, with erect silky

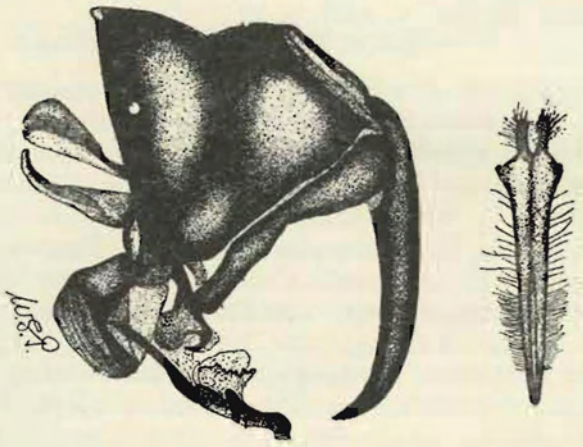

FIG. 91. — *Pachychoeromyia praegrandis* (AUSTEN).
Hypopygium in lateral view and cerci in frontal view (after PATTON).

hairs. The body is predominantly yellow brown, the mesonotum shows two widely separated, blackish, longitudinal stripes and the last two abdominal tergites are darkened; the foregoing ones mostly have black bands on the hind margins and there is a narrow median longitudinal line. Legs totally yellow brown. The outer *ph* is wanting as in *Auchmeromyia*, the number of *st* is variable, 1 : 1 or 0 : 1.

P. praegrandis is not uncommon in Southern Africa and is found as far south as the Cape. It is known furthermore from Senegal in the West to the Sudan in the East, but, as far as I am aware, it has not been recorded from the Congo area, nor is it present in the material of the « Institut des Parcs Nationaux du Congo Belge » and the « Musée du Congo Belge ».