INSTITUT DES PARCS NATIONAUX DU CONGO BELGE | INSTITUUT DER NATIONALE PARKEN VAN BELGISCH CONGO

Exploration du Parc National Albert

MISSION G. F. DE WITTE (1933-1935)

FASCICULE 87

Exploratie van het Nationaal Albert Park

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AFLEVERING 87

CALLIPHORIDAE

(DIPTERA CYCLORRHAPHA)

Part I : CALLIPHORINI and CHRYSOMYIINI

BY

FRITZ ZUMPT, Ph. D., F. R. E. S. (Johannesburg)

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PREFACE

The fly-family *Calliphoridae* is of great medical importance. Nevertheless, our knowledge of this family in the Ethiopian region has not yet been summarised. This may be explained by the fact that only very few genera have been revised on a modern basis or are sufficiently well known. Most genera are in an unsatisfactory state; descriptions of species are either scattered over many journals and difficult to detect, or else they are so inadequate that they could be applied to several species separable only by the male terminalia.

This study of the Ethiopian species of the *Calliphoridae* was commenced about six years ago. I have been fortunate in receiving the support of many museums, institutes and private collectors who have sent me types and paratypes as well as large collections of identified and unidentified flies, thus enabling me to determine the status of many doubtful specimens. Extensive collections have been received from the American Museum of Natural History, New York, the « Musée royal du Congo Belge » and the « Institut des Parcs Nationaux du Congo Belge ». I am greatly indebted to these institutes, especially to the last-named, which has undertaken to publish not only the results of its own collections, but to include all my other results as well.

This revision of the *Calliphoridae* of the Ethiopian region will not by any means be complete as many more new species are sure to be discovered in the future. Also, the higher classification is open to dispute. I hope, however, that it will at least form a basis for further studies.

Mainly for technical reasons, I propose to present the revision in four parts containing the *Calliphorini* and *Chrysomyini*, the *Rhiniini*, the *Miltogramminae* and the *Sarcophaginae* respectively. This suggestion has been kindly accepted by the editor.

The limits of the Ethiopian region accepted here are those proposed by HOLDHAUS (1929) and SÉGUY (1950). Accordingly, Madagascar and the adjacent islands are not included but are thought to form a co-ordinate Madagascan region.

In addition to those institutions mentioned above, I have received material from the following museums and institutes : British Museum (Natural History) and Commonwealth Institute of Entomology, London; Department of Agriculture, Pretoria; Department of Research and Specialist Services, Salisbury; Deutsches Entomologisches Institut, Berlin-Friedrichshagen; Museo Dr. ALVARO DE CASTRO, Lourenço Marques; Naturhistorisches Museum, Wien; Rhodes University, Grahamstown; South African Museum, Cape Town; Staatliches Museum für Naturkunde, Stuttgart; Transvaal Museum, Pretoria; United States National Museum, Washington; Zoologisches Museum, Berlin. I wish to thank the officials of these institutions for their help. Amongst the many private collectors and owners of private collections, special thanks are due to Dr. S. V. PERIS, Madrid, for his assistance and for supplying a great deal of my *Rhiniini* material.

I also wish to express my thanks to Miss W. TILL of this institute, for her help in compiling this work and preparing it for publication.

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SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH,
JOHANNESBURG.

CLASSIFICATION.

The *Calliphoridae* belong to a well-defined group of higher *Diptera* which is listed by OLDROYD (1949) as the « *Section Calypterae* » of the suborder *Brachycera*. Within the *Calypterae* which, from a taxonomic point of view, are chiefly characterized by a distinct dorsal cleft or seam on the second antennal segment, OLDROYD distinguishes the following families: *Muscidae*, *Calliphoridae*, *Tachinidae*, *Nycteribiidae*, *Hippoboscidae* and *Braulidae*. OLDROYD's paper deals with the British fauna only. With respect to the Ethiopian fauna, the families *Mormotomyiidae* and *Streblidae* are to be added. HENNIG (1952), in his recent work on « Die Larvenformen der Dipteren », also distinguishes the *Cordyluridae* and *Oestridae*, whereas he transfers the *Braulidae* to the *Acalypterae*. The *Braulidae* are highly specialised ectoparasites of bees. Whether the transfer of this family to the *Acalypterae* is justified or not, will not be discussed here. The *Cordyluridae*, however, should be regarded, according to VAN EMDEN (1941), as a mere subfamily of the *Muscidae*. The *Oestridae* are a polyphyletic group of which the *Gasterophilidae* are regarded by OLDROYD and other authors as a distinct family of the *Acalypterae*, whereas the rest are placed partly into the *Calliphoridae* and partly into the *Tachinidae*.

The *Hippoboscidae*, *Streblidae* and *Nycteribiidae* are easily recognisable, bloodsucking ectoparasites of birds and mammals and were formerly placed into the separate section of *Pupipara*. The *Mormotomyiidae* only contains one species of striking appearance, *Mormotomyia hirsuta* AUSTEN, which was found in a cave in Kenya. The remaining three families, *Muscidae*, *Calliphoridae* and *Tachinidae*, contain a vast number of species of the typical shape of a higher fly. They are closely related to each other and their classification into families and more especially into subfamilies has given rise to many disputes in the past and present. I am following SÉGUY (1941), OLDROYD (1949), HENNIG (1952) and other authors in regarding the *Sarcophaginae* as a subfamily of the *Calliphoridae*, which is separated from the *Muscidae* by the distinct row of hypopleural bristles and from the *Tachinidae* by the wanting or only very weakly developed postscutellum. By most authors, and formerly also by myself (1952), the *Miltogramminae* were regarded as a tribe of the *Sarcophaginae*. I now believe that the differences, mainly with respect to the male postabdomen, are so important that the *Miltogramminae* should be valued as a co-ordinate group of the *Calliphorinae* and *Sarcophaginae*. True *Rhinophorinae* as restricted by SÉGUY (1941) are not known to me from the Ethiopian region. Those genera listed by TOWNSEND (1938) in his family « *Melanophoridae* » belong to other groups.

The classification of the *Calliphoridae* of the Ethiopian region is proposed as follows:

1 (6) Outer posthumeral bristle situated laterad of the presutural bristle, but sometimes it is reduced. Stem-vein bare or with a row of bristly hairs — **Calliphorinae** 2

2 (3) Stem-vein bare ..... *Calliphorini* (p. 20).

3 (2) Stem-vein dorsally with a row of bristly hairs 4

4 (5) Subalar knob with rather long, erect hairs; thoracic squama subtruncate at apex, concave on outer margin and haired on part of upper surface. Upper occiput without a bare and glossy band ..... *Chrysomyiini* (p. 178).

5 (4) Subalar knob bare or at most with a very short, decumbent pilosity; thoracic squama rather narrow at apex, straight or nearly so on outer margin. Upper occiput mostly with a bare and glossy, submarginal band extending almost entirely across its width ..... *Rhiniini* (see part II).

6 (1) Outer posthumeral bristle situated mesiad of, or almost in line with the presutural bristle; if outer *ph* wanting, arista, as a rule, bare or only pubescent; stem-vein always bare 7

7 (8) Postabdomen of male consists of 3 free segments, the 6th not fused with the united 7th and 8th segments. Arista bare or with a short pilosity, rarely with long hairs — **Miltogramminae** ..... *Miltogrammini* (see part III).

8 (7) Postabdomen of male consists of 2 free segments (1st and 2nd genital segments), the 6th being separated from the 7th+8th by a suture, or being partly or wholly reduced — **Sarcophaginae** (see part IV) 9

9 (10) First genital segment large, being fused with a well-developed 6th tergite, which is separated from the 7th+8th tergites by a suture or a row of strong bristles. Arista bare in the Ethiopian species ..... *Agriini.*

10 (9) First genital segment without an indicated 6th tergite, no suture or row of bounding bristles; it is totally fused with the following segments or totally reduced. Arista, as a rule, with long hairs, rarely short pilose or bare ..... *Sarcophagini.*

Morphological features of taxonomic importance.

The body of a Calliphorid fly is composed, as in other insects, of head, thorax and abdomen, with the relative appendages. There are no Calliphorids known in which the wings are reduced or in which the structure of the legs has undergone striking changes due to parasitism or other

environmental conditions. However, in the Holarctic subfamily of *Cephenomyiinae*, the mouthparts are rudimentary.

The head always shows one pair of compound eyes and three ocelli. The arrangment of bristles (chaetotaxy) is of great taxonomic importance and normally different in the two sexes. A complete chaetotaxy is shown in fig. 1, and is normally to be found in the female sex. In the male sex it is more or less reduced owing to the larger compound eyes which cover parts of the frons. In some groups, especially in several genera of *Miltogramminae*, the number of bristles is increased.

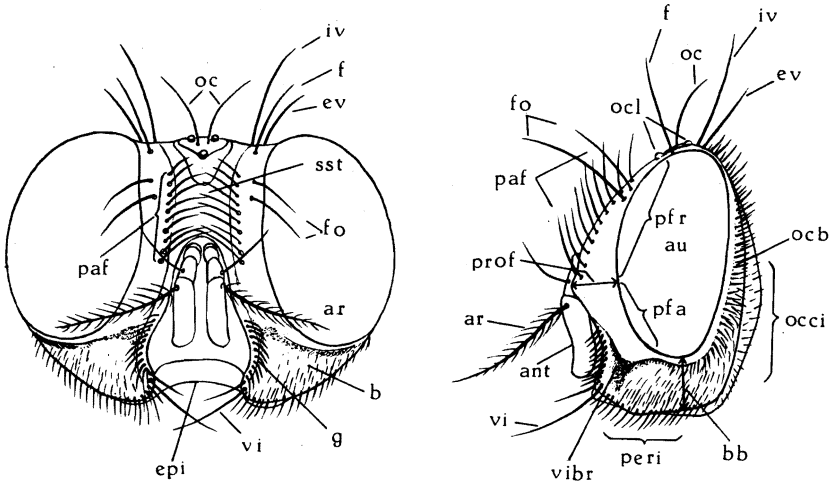


FIG. 1. — Frontal and lateral view of head.

Explanation of lettering.

ant = antenna; ar = arista; au = compound eye; b = bucca; bb = height of bucca; epi = epistome; ev = outer vertical bristles; f = frontal bristle; fo = fronto-orbital bristles; g = facial ridge; iv = inner vertical bristles; oc = ocellar bristles; ocb = postocular bristles; occi = occiput; ocl = ocelli; paf = parafrontal and parafacial bristles; peri = peristome; pfa = parafacialium; pfr = parafrontalium; prof = profrons; sst = frontal stripe; vi = vibrissae; vibr = vibrissarium.

The thoracic features important to the taxonomist may be taken from fig. 2. The dorsal plate consists almost entirely of the mesonotum, which appears to be divisible into three parts by transverse sutures. The last part is called the scutellum. The anterior suture is of importance in connection with the arrangement of the bristles. The formula ac=2+3 for example means that 2 acrostichal bristles on each side are situated in front of the suture, 3 behind it. Of the intra-alars, no more than one is found in front of the suture. Several authors have sometimes added one or two of the more anteriorly placed bristles to the intra-alars, but in this paper these are regarded as posthumerals, at least as far as the *Calliphoridae* are

concerned. The bristles on the scutellum are, as far as they are clearly distinguishable from the normal hairs, situated on or very close to the margin and on the disc. In the figure, five marginal bristles and one discal are indicated on each side and are expressed by the formula sc=5+1. The sternopleural bristles may consist of two anterior and one posterior (st=2 : 1), or the lower frontal may be wanting (st=1 : 1), or they may

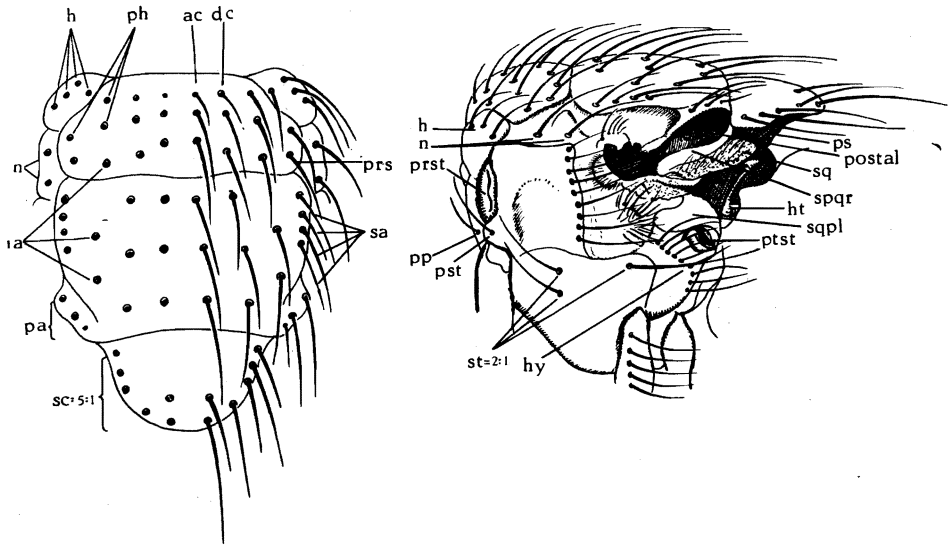


FIG. 2. — Dorsal and lateral view of thorax.

Explanation of lettering.

ac = acrostichal bristles; dc = dorsocentral bristles; h = humeral bristles; ht = halter; hy = hypopleuron with hypopleural bristles; ia = intra-alar bristles; n = notopleural bristles; pa = postalar bristles; ph = posthumeral bristles; postal = postalar declivity; pp = propleural bristle; prs = presutural bristle; prst = prostigma; ps = postscutellum; pst = prostigmatic bristle; ptst = poststigma; sa = supra-alar bristles; sc = scutellar bristles; spqr = suprasquamal ridge; sq = thoracic squama; sqpl = supraspiracular convexity; st = sternopleuron with sternopleural bristles.

be almost in a straight line as in the *Sarcophaginae* (st=1 : 1 : 1); very rarely are more than three distinct sternopleurals recognisable.

The lateral walls of the thorax are composed of several chitinized plates, of which four large ones are known as meso-, ptero-, hypo- and sternopleuron. Two other plates, the propleuron and the supraspiracular convexity, are important in so far as they are bare or beset with long thin hairs.

The wings show important features with respect to their venation and the presence or absence of small bristles on certain veins. The cells are marked by capitals and the veins by small letters (cf. fig. 3).

The bristles of the legs normally have a fixed position. The abbreviations used in the text are as follows :

ad = anterodorsal bristles;
av = anteroventral bristles;
pd = posterodorsal bristles;
pv = posteroventral bristles.

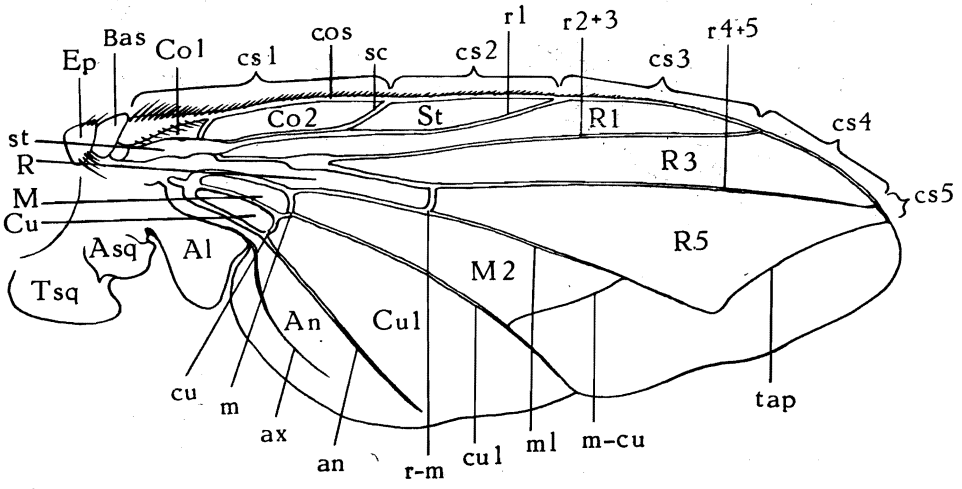
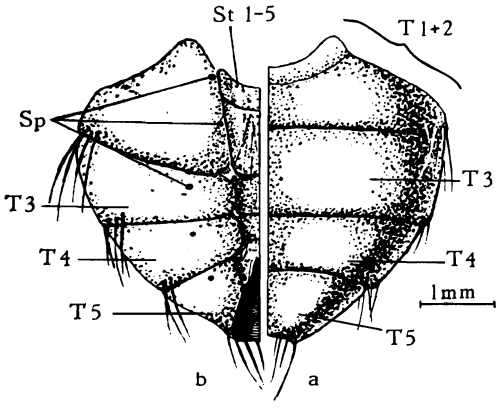


FIG. 3. — Wing of a Calliphorid fly.

Explanation of lettering.

Ep = epaulet; Bas = basicosta; Co 1 = costal cell; St = subcostal cell; R = 1st. basal cell; R 1 = marginal cell; R 3 = submarginal cell; R 5 = 1st. posterior cell; M = 2nd. basal cell; M 2 = 2nd. posterior cell; Cu = 3rd. basal cell; Cu 1 = 3rd. posterior cell; An = axillary cell; Al = alula; Asq = alar squama; Tsq = thoracic squama; cos = costa; cs 1-5 = segments of costa; st = stem-vein; sc = subcosta; r 1 = 1st. longitudinal vein; r 2+3 = 2nd. longitudinal vein; r 4+5 = 3rd. longitudinal vein; m 1 = 4th. longitudinal vein; cu 1 = 5th. longitudinal vein; an = 6th. longitudinal vein; ax = axillary vein; r-m = discal cross-vein; m = upper basal cross-vein; cu = lower basal cross-vein; tap = upper marginal cross-vein; m-cu = lower marginal cross-vein.

The abdomen of the male (figs. 4-8) consists of the preabdomen, which is clearly visible from above, and the postabdomen, which is strongly modified for copulatory purposes and in the inactive stage is rolled up and hidden ventrally between the fifth tergite and sternite. The preabdomen apparently consists of four segments, but the first consists of the fused first and second tergites, whereas the corresponding sternites are mostly still separated. The fifth sternite is more or less emarginate and provided with bristles or hairs. The postabdomen consists of 2-4 separable segments, the number of which is important in the higher classification of the



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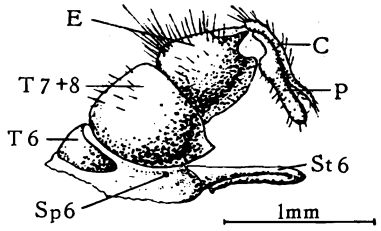

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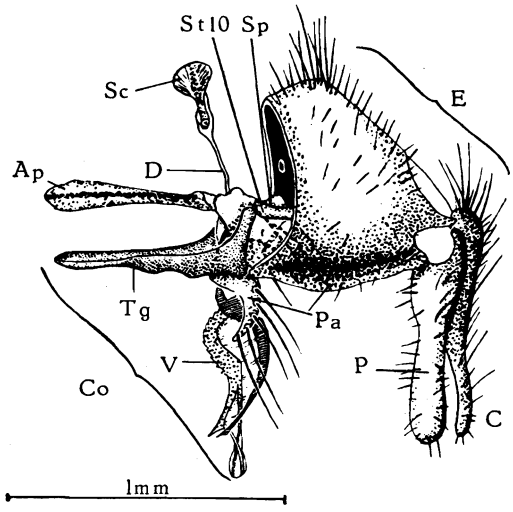

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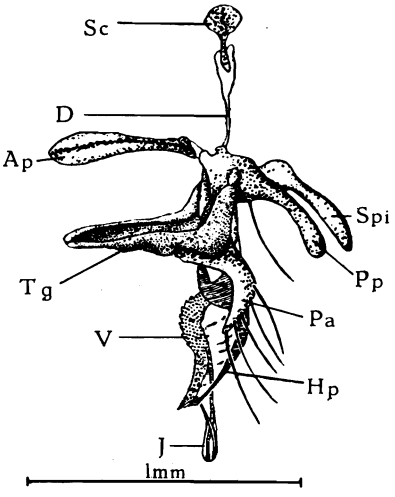

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FIGS. 4-7. — Male abdomen of a *Calliphora*.
(After ZUMPT & HEINZ.)

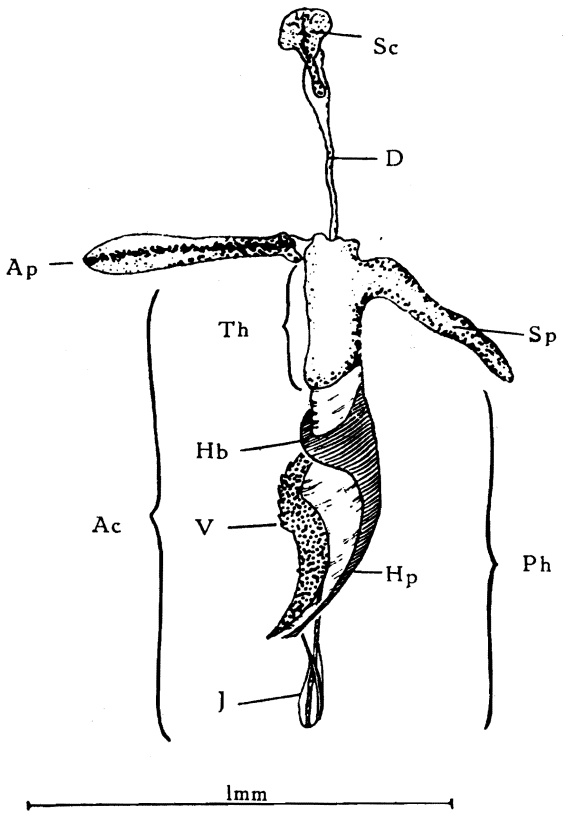

FIG. 8. — Male abdomen of a *Calliphora*.
(After ZUMPT & HEINZ.)

FIG. 4. — Preabdomen in dorsal (a) and ventral (b) view.
FIG. 5. — Postabdomen, inner copulatory organ not visible.
FIG. 6. — Last genital segment with inner copulatory organ (hypopygium).
FIG. 7. — Isolated inner copulatory organ.
FIG. 8. — Phallosome isolated.

Explanation of lettering.

Ac = aedeagus; Ap = apodeme; C = cercus; Co = inner copulatory organ; D = ductus ejaculatorius; E = epandrium; Hb = harpes basis; Hp = harpes; J = juxta; P = paralobus; Pa = anterior paramere; Ph = phallus; Pp = posterior paramere; Sc = sperm pump; Sp = spiracle; Spi = spinus; St = sternite; T = tergite; Tg = tergosternum; Th = theca; V = vesica.

Calliphoridae. If only two are present, as for example in the *Sarcophaginae*, then they are designated as the first and second genital segments. The male genitalia, also called hypopygium, are of the greatest and most decisive taxonomic importance. They have been discussed by ZUMPT and HEINZ (1950), from whose paper the drawings have been taken. The lettering denotes the structures which are mentioned in the systematic part.

The paper by ZUMPT and HEINZ has been opposed (by letter) by Prof. G. CRAMPTON (U.S.A.) and Dr. G. H. HARDY (Australia), who have come to different conclusions with respect to the homology of the tergites and sternites of the postabdomen and of certain parts of the hypopygium. These authors may be quite right. I have not yet found the time or the opportunity to check their views or to revise my theory. The purpose of our paper was a practical one, namely, to give a nomenclature of those parts of the hypopygium which are important for taxonomy.

The question arose, whether it was advisable at all to try to use homologous terms for designating the parts of the hypopygium and also other parts of the body. There will always be a danger that generally accepted terms will have to be changed from time to time because new ideas and discoveries have been made. As an applied entomologist, I have now come to the conclusion that a set of terms is required, not charged with any phylogenetic speculations. Analogous and not homologous parts should have the same designation.

The female abdomen is also composed of a pre- and postabdomen, the latter forming an ovipositor. Recently, several authors have proved that the number and shape of tergal and sternal plates may be of taxonomic importance, like the male postabdomen. But little has been done up to now (cf. THOMAS, 1951; KANO & SATO, 1951) in flies from other zoogeographical regions and almost nothing in Ethiopian flies. It would be useful in separating the females of those species which are at present only separable in the male sex. In order to build up a systematics based on the female ovipositor, it would be necessary to rear most of the species to ensure that the wrong sexes are not placed together. This is an immense task which is still waiting for its elaborator.

VARIABILITY.

There is a significant intraspecific variability within many species of *Calliphoridae* which is far greater than was formerly believed or imagined by many contemporary authors. I have already dealt with the value of several features used by former authors and believed to be highly constant in the genera *Hemigymnochaeta* and *Tricyclea* (ZUMPT, 1953). These features are the wing-pattern (whether spotted or totally hyaline), the chaetotaxy of the thorax, the size of the facets of the eyes, and the general colouring of the body. The variability often concerns features which have formerly been used for separating genera and even higher groups. In many species there seem to exist in the same population different strains characterized by certain morphological features, the deciding genes for which may be inherited according to MENDEL's pattern with dominant and non-dominant characters. These strains are very often repeated in related species, a phenomenon which has been known for a long time to occur in other groups, for example, beetles and butterflies. In these groups, however, these strains are normally designated by different Latin names as prescribed by the rules of nomenclature for species and geographical or ecological subspecies. This habit results in a vast number of worthless names, as almost every catalogue of *Coleoptera* or *Lepidoptera* shows. HEIKERTINGER (1937) therefore proposed to designate those « homologous » forms occurring in the same genus or even in related genera, by the same term, which would indicate the kind of aberration but would not be affected by the rules of nomenclature and would not bear the name of the original author. Very often, even this kind of classification will be unnecessary as it will be quite sufficient merely to mention the range of variability in the description.

A great deal of the variability stated to occur in the *Calliphoridae* is certainly pathological, for example, the doubling of bristles, the asymmetrical chaetotaxy of body and legs, or unusual colouring and pattern. Furthermore, I have the impression that the colouring may not infrequently be dependent on different environmental factors at a certain period of life, as is known for example from butterflies and moths. Perhaps the different « variations » of *Chrysomyia chloropyga* WIEDEMANN may have come about in this way.

The morphology of the male genitalia is, I believe, the most important criterion for separating the species of the *Calliphoridae.* I have drawn this conclusion, not because the theory of « lock and key » may always provide an explanation for non-interbreeding between two species, but because the male genitalia are so complicated and dependent upon so many different genes that drastic morphological differences must also indicate physiological differences. Two species therefore, which differ in the structure of the male genitalia, are much less closely related than might be

suggested by a similarity in other external features. On the other hand, if two species have identical genitalia but show differences in their chaetotaxy or colouring, even if they are not intergrading, there is strong support for the belief that they are only strains, or at the most subspecies, if they are geographically or ecologically isolated.

Strictly speaking, our limiting of species and subspecies remains on a theoretical basis as long as we have not proved experimentally that two groups of specimens are really genetically isolated, or shown whether or not a gene-flow takes place under natural conditions. This knowledge can only be achieved in very few cases. In the overpowering majority we have to draw our conclusions from those taxonomic units which have been studied experimentally.

A variability, of course, also exists in the male genitalia, and it is necessary to dissect a great number of specimens in order to get a true picture of the deciding features separating two species. In no case is it sufficient to dissect one male from each of two groups of specimens which have been separated by other external features, and then to associate the structure of the genitalia with one particular set of other features, and vice versa. It may hapen that both sets of external features (strains) exist within the same species, and that the two species are really separable only by genital features. Unfortunately for many amateurs and applied entomologists, most of the Calliphorids can now only be identified with certainty if the male genitalia are dissected. That means, moreover, that very often the female sex has to remain unnamed.

In 1934 the well-known dipterologist, J. R. MALLOCH, wrote the following sentences :

« It entails considerable work to dissect the hypopygia and, while I am not averse to doing this work when necessary, it must be obvious that not every person who may be compelled to identify species will have the time to go as thoroughly into the anatomy of his species as is essential when he is compelled to depend upon hypopygial characters as criteria for this purpose. I thus use hypopygial characters, or at least the hidden hypopygial characters, only as a last resort in distinguishing doubtful species and place dependence upon external characters of proven worth throughout the family for separations. »

This opinion can no longer be supported, in the same way that it is not dependable today to diagnose infectious diseases without using laboratory methods.

The dipterologist must accept the fact that the male genitalia have to be dissected from most flies and that it is advisable to undertake this procedure when they are being mounted for the first time. At least the hypopygia

should be bent off the body, so that they can be easily cut and mounted on a slide if the macroscopic examination should prove to be insufficient.

The keys given below are based mainly on external features, the genitalia being avoided as far as possible. However, on account of the variability, every male specimen identified according to these keys should be confirmed by comparing the genitalia with the figure of this organ.

TECHNIQUE.

The technique for mounting the hypopygia varies with the different kinds of *Calliphoridae*. Those of the *Sarcophaginae* are big and voluminous and can be studied with a dissecting microscope. They normally show all the necessary details if simply bent off and only occasionally is it necessary to cut them off and mount them dry on a separate pasting label. In the *Calliphorinae* and *Miltogramminae* however, the genitalia are relatively small and I prefer to mount them on a slide in BERLESE's fluid. This medium is water-soluble and the dissected genitalia can be mounted without being dehydrated. A disadvantage is that this medium never hardens completely so that the slides must be kept in a horizontal position.

Another reason for preferring to have the genitalia of the *Calliphorinae* and *Miltogramminae* mounted on slides is to save time. Genitalia mounted on a slide can be figured by means of a drawing apparatus in a relatively short time. If they are still on the specimen, or kept in toto in glycerine, it takes much longer and requires greater ability to make an accurate drawing.

All figures in the systematic part of this paper are, if not otherwise stated, drawn from these slides. The genitalia are to some extent flattened by the coverslip, a fact which should be borne in mind when the drawings are being interpreted or compared with dry and freshly dissected genitalia.

LIST OF VALID SPECIES OF *CALLIPHORINI* AND *CHRYSOMYIINI* KNOWN TO ME FROM THE ETHIOPIAN REGION.

Scientific name	Recorded from	
	Belgian Congo	P.N.A.
CALLIPHORINI		
1. *Phumosia nudiuscula* (BIGOT)	—	—
2. *Phumosia nigroviolacea* (VILLENEUVE)	—	—
3. *Phumosia pseudolucilia* (VILLENEUVE)	+	+
4. *Phumosia fulvicornis* (BIGOT)	+	—
5. *Phumosia mallochi* n. n.	+	+
6. *Phumosia callipyga* VILLENEUVE	—	—
7. *Phumosia mossopi* ZUMPT	—	—
8. *Phumosia longiseta* (MALLOCH)	—	—
9. *Phumosia congensis* n. sp.	+	+
10. *Phumosia metallica* (CURRAN)	—	—
11. *Phumosia pollinosa* n. sp.	+	+
12. *Phumosia proserpina* VILLENEUVE	—	—
13. *Phumosia imitans* (VILLENEUVE)	+	+
14. *Phumosia meropia* (SÉGUY)	—	—
15. *Phumosia biplaga* (VILLENEUVE)	—	—
16. *Phumosia overlaeti* n. sp.	+	—
17. *Phumosia incerta* (CURRAN)	+	+
18. *Phumosia fulva* (SÉGUY)	—	—
19. *Phumosia rufescens* (VILLENEUVE)	+	—
20. *Phumosia vittata* (CURRAN)	+	—
21. *Phumosia schoutedeni* ZUMPT	+	+
22. *Phumosia bicolor* (BEZZI)	+	+
23. *Phumosia snyderi* ZUMPT	—	—
24. *Phumosia muscoidea* (CURRAN)	+	+
25. *Phumosia lutescens* (VILLENEUVE)	+	+
26. *Phumosia cuthbertsoni* ZUMPT	+	+
27. *Phumosia stabulans* (BEZZI)	+	+
28. *Phumosia wittei* n. sp.	—	+

Scientific name	Recorded from	
	Belgian Congo	P.N.A.
29. *Phumosia spinicosta* (MALLOCH)	+	+
30. *Phumosia dubiosa* (VILLENEUVE)	+	—
31. *Hemipyrellia pulchra* (WIEDEMANN)	—	—
32. *Hemipyrellia fernandica* (MACQUART	+	+
33. *Lucilia infernalis* (VILLENEUVE)	+	—
34. *Lucilia sericata* (MEIGEN)	—	—
35. *Lucilia cuprina* (WIEDEMANN)	+	+
36. *Pericallimyia majuscula* VILLENEUVE	+	+
37. *Pericallimyia flavicauda* (MALLOCH)	—	—
38. *Pericallimyia insignis* (CURRAN)	—	—
39. *Pericallimyia westermanni* (WIEDEMANN)	—	—
40. *Pericallimyia wittei* n. sp.	—	+
41. *Pericallimyia perlata* (WALKER)	+	—
42. *Pericallimyia versicolor* VILLENEUVE	—	—
43. *Pericallimyia marginalis* VILLENEUVE	+	—
44. *Pericallimyia basilewskyi* ZUMPT	+	+
45. *Pericallimyia curvinerva* VILLENEUVE	—	—
46. *Pericallimyia io* n. sp.	—	+
47. *Pericallimyia immaculata* n. sp.	+	+
48. *Pericallimyia bequaerti* CURRAN	—	+
49. *Pericallimyia similis* n. sp.	+	+
50. *Zernyiella dubia* n. gen. n. sp.	—	—
51. *Calliphora croceipalpis* JAENN.	+	+
52. *Ochromelinda thoracica* VILLENEUVE	+	+
53. *Ochromelinda abyssinica* n. sp.	—	—
54. *Ochromelinda (?) novella* (VILLENEUVE)	—	—
55. *Adichosina thoracica* VILLENEUVE	—	—
56. *Adichonisa marginalis* CURRAN (nec. VILLENEUVE)	—	—
57. *Adichosina munroi* (CURRAN)	—	—
58. *Adichosina munroi* ssp. *ugandensis* nov..	+	+
59. *Adichosina rosei* n. sp.	—	—
60. *Tricyclea patrizii* ZUMPT	—	—
61. *Tricyclea semicinerea* BEZZI	—	—
62. *Tricyclea perpendicularis* VILLENEUVE	+	+
63. *Tricyclea kivuensis* n. sp.	—	+
64. *Tricyclea fasciata* MACQUART	+	+

Scientific name	Recorded from	
	Belgian Congo	P.N.A.
65. *Tricyclea fasciata* ssp. *ferruginea* WULP	—	—
66. *Tricyclea major* CURRAN	—	—
67. *Tricyclea nana* ZUMPT	—	—
68. *Tricyclea latifrons* CURRAN	+	—
69. *Tricyclea dubia* ZUMPT	—	—
70. *Tricyclea diffusa* MALLOCH	+	+
71. *Tricyclea du* CURRAN	—	—
72. *Tricyclea bivittata* CURRAN	—	—
73. *Tricyclea par* ZUMPT	—	—
74. *Tricyclea claripennis* SÉGUY	—	—
75. *Tricyclea bifrons* MALLOCH	—	+
76. *Tricyclea semithoracica* VILLENEUVE	+	—
77. *Tricyclea analis* MALLOCH	+	+
78. *Tricyclea unipunctata* CURRAN	+	+
79. *Tricyclea martini* (ZUMPT)	—	—
80. *Tricyclea vansomereni* ZUMPT	—	—
81. *Tricyclea somereni* (MALLOCH)	—	—
82. *Tricyclea similis* CURRAN	—	+
83. *Tricyclea ochracea* SÉGUY	—	—
84. *Tricyclea bicolor* BEZZI	+	—
85. *Tricyclea bipartita* SÉGUY	—	—
86. *Tricyclea decora* SÉGUY	—	—
87. *Tricyclea nigroseta* CURRAN	+	—
88. *Tricyclea spiniceps* MALLOCH	—	—
89. *Tricycleala maculipennis* VILLENEUVE	+	+
90. *Hemigymnochaeta apicifera* CURRAN	+	—
91. *Hemigymnochaeta bequaerti* CURRAN	+	+
92. *Hemigymnochaeta unicolor* (BIGOT)	+	+
93. *Hemigymnochaeta roubaudi* SÉGUY	—	—
94. *Hemigymnochaeta gracilis* (SÉGUY)	+	+
95. *Hemigymnochaeta liberia* CURRAN	—	+
96. *Hemigymnochaeta incerta* ZUMPT	+	—
97. *Hemigymnochaeta varia* (HOUGH)	+	+
98. *Hemigymnochaeta laticeps* ZUMPT	—	—
99. *Hemigymnochaeta ornata* (SÉGUY)	—	—

Scientific name	Recorded from	
	Belgian Congo	P.N.A.
100. *Neocordylobia roubaudi* VILLENEUVE	—	—
101. *Pachychoeromyia praegrandis* (AUSTEN)...	—	—
102. *Auchmeromyia luteola* (FABRICIUS)	+	—
103. *Auchmeromyia boueti* (ROUBAUD)	—	—
104. *Auchmeromyia choerophaga* (ROUBAUD)	—	—
105. *Auchmeromyis bequaerti* ROUBAUD	+	—
106. *Cordylobia anthropophaga* (BLANCHARD)	+	—
107. *Cordylobia ruandae* FAIN	+	—
108. *Stasisia rodhaini* (GEDOELST)	+	—
109. *Bengalia aliena* MALLOCH	+	—
110. *Bengalia africana* MALLOCH	—	—
111. *Bengalia spinifemorata* VILLENEUVE	+	—
112. *Bengalia gaillardi* SURCOUF and GUYON	+	—
113. *Bengalia floccosa* (WULP)	+	—
114. *Bengalia cuthbertsoni* n. sp.	—	—
115. *Bengalia depressa* WALKER	+	+
116. *Bengalia minor* MALLOCH	—	—
117. *Bengalia lepineyi* SÉGUY	—	—
118 *Bengalia peuhi* VILLENEUVE	—	—
119. *Onesihoplisa umbrosa* VILLENEUVE	+	—
120. *Peristasisea luteola* VILLENEUVE	—	—
CHRYSOMYIINI		
121. *Chrysomyia bezziana* VILLENEUVE	+	—
122. *Chrysomyia polymita* VILLENEUVE	+	+
123. *Chrysomyia vanemdeni* ZUMPT	—	—
124. *Chrysomyia laxifrons* VILLENEUVE	+	+
125. *Chrysomyia inclinata* WALKER	+	+
126. *Chrysomyia marginalis* (WIEDEMANN)	+	+
127. *Chrysomyia chloropyga* (WIEDEMANN)	+	+
128. *Chrysomyia albiceps* (WIEDEMANN)	+	+

Subfamily **CALLIPHORINAE.**

The subfamily *Calliphorinae* is, at least in the Ethiopian region, a fairly well defined group, and in practice there will probably be no doubt whether a given species belongs to this subfamily or to the *Miltogramminae* or *Sarcophaginae*. However, to find taxonomic features which are characteristic and present in all species of the subfamily is a more difficult task. This becomes clear when studying the papers by HALL (1948), MESNIL (1944), SÉGUY (1928, 1935), TOWNSEND (1935) and many other authors who have dealt with the higher classification of the *Calypterae*.

To separate the *Calliphorinae* from the *Sarcophaginae* and *Miltogramminae* I have used in the key on page 6 the relative arrangement of the posthumeral and presutural bristles, a feature which I believe to be constant in this subfamily. It is of course, of no phylogenetic value, but only fulfils a practical purpose.

It is very difficult, if not impossible, to decide which of the features used by the taxonomists are really of phylogenetic significance and which not. I believe that a male postabdomen composed of four (*Mimodexiini* in the Palaearctic Region) or three segments indicates that this group is more primitive than those in which only two genital segments have remained. The same is true for a less or greater specialization in the structure of the phallosome. These ideas have been discussed in some detail by ZUMPT & HEINZ (1950).

I think, therefore, that we can accept that the *Sarcophaginae* represent a more highly developed group than the *Calliphorinae* and the *Miltogramminae*. But which of the latter two subfamilies is the more primitive is difficult to decide. The *Miltogramminae*, however, are certainly more closely related to the *Sarcophaginae* than are the *Calliphorinae*. Within the Ethiopian *Calliphorinae*, I recognise three tribes which are easily separable from one another. Whether they represent really co-ordinate and monophyletic groups remains open for discussion. I believe that many of our taxonomic features have been subject to a convergent evolution and that they very often obscure the former way of evolution.

CALLIPHORINI.

KEY TO THE GENERA OF THE ETHIOPIAN REGION.

1 (2) Proboscis short and stout, somewhat boat-shaped, the lower surface formed of a heavily sclerotized, evenly rounded plate which is slightly bulbous at base as in *Stomoxys*, and tapered slightly from base to apex, the lateral edges turned over on dorsum, and each with some strong bristly hairs which are at least as long as the largest of those on the palpi ..... 17. *Bengalia* ROBINEAU-DESVOIDY (p. 163).

2 (1) Proboscis of normal shape, hairs on sides of dorsal surface weak and much shorter than the longest of those on the palpi .....

3 (8) Suprasquamal ridge with two groups of quite long and strong bristly hairs, one on the anterior and the other on the posterior part, with a distinct break between the groups, colour of body always metallic blue, green or bronze 4

4 (5) Supraspiracular convexity with fine erect hairs which are much longer than the usual pilosity ... 2. *Hemipyrellia* TOWNSEND (p. 63).

5 (4) Supraspiracular convexity with microscopic pilosity only .....
3. *Lucilia* ROBINEAU-DESVOIDY (p. 68).

6 (3) Suprasquamal ridge without setulose hairs at posterior extremity, sometimes with very fine and weak hairs on entire extent which are not divided into two groups, and sometimes with a group at anterior extremity; no special kind of body-colouring 7

7 (8) Supraspiracular convexity with quite long erect hairs on entire area ..... 1. *Phumosia* ROBINEAU-DESVOIDY (p. 23).

8 (7) Supraspiracular convexity bare, or at most with a short microscopic pilosity 9

9 (10) Predominantly metallic blue or green species, with the tip of the abdomen narrowly red ..... 4. *Pericallimyia* VILLENEUVE (p. 76).

10 (9) Tip of abdomen not demarcated red coloured, otherwise body showing all kinds of colouring 11

11 (16) Propleura haired in centre 12

12 (13) Thoracic squama with dark hairs on the upper surface. Body of dark bluish colouring .....
6. *Calliphora* ROBINEAU-DESVOIDY (p. 94).

13 (12) Thoracic squama bare on upper surface. Body predominantly yellow brown, with a more or less extended black pattern 14

14 (15) Arista with long hairs on the upper side only, bare, below, r_1 bristled ..... 10. *Tricycleala* VILLENEUVE (p. 137).

15 (14) Arista with hairs on both sides; r_1 bare .....
9. *Tricyclea* WULP (p. 108).

16 (11) Propleura bare in centre 17

17 (18) Thoracic squama with fine long hairs on the upper side .....
13. *Pachychoeromyia* VILLENEUVE (p. 150).

18 (17) Thoracic squama bare on the upper side 19

19 (20) Outer posthumeral bristles wanting; thoracic squama broad; hypopygium with the cerci fused. Big, predominantly yellow-brown flies, the larvae of which are bloodsucking ..... 14. *Auchmeromyia* BRAUER et BERGENSTAMM (p. 152).

20 (19) Outer posthumeral bristles present (except in *Ochromelinda abyssinica m.*, which has median discals on tergites III & IV). Thoracic squama broad or narrow, cerci at least partly free 21

21 (22) Parafacialia densely haired in full extent. Arista with long or short hairs ..... 15. *Cordylobia* GRUENBERG (p. 157).

22 (25) Parafacialia densely haired in the upper half, bare below. Arista with long hairs 23

23 (24) Thorax dull brownish, abdomen almost totally glossy black ..... 16. *Stasisia* SURCOUF (p. 160).

24 (23) Thorax metallic dark blue, abdomen yellow-orange ..... 5. *Zernyiella* n. gen. (p. 93).

25 (22) Parafacialia bare or only scattered hairs in the extreme upper part. Arista with long or short hairs 26

26 (33) Arista with long hairs 27

27 (30) Stout species, body yellow-brown or brown and blackish. Abdominal tergites III and IV without median discal bristles 28

28 (29) Eyes in male widely separated, at the narrowest point measuring about 1/6 of eye-length; hind-tibia without ventral bristles; thoracic squama broad, truncated ... 12. *Neocordylobia* VILLENEUVE (p. 148).

29 (28) Eyes in male touching; hind-tibia with ventral bristles; thoracic squama narrower, not broadly truncated ..... 11. *Hemigymnochaeta* CORTI (p. 138).

30 (27) More slender species with the body totally or partly metallic blue or green, or if brown and black, at least tergite IV with median discal bristles 31

31 (32) Body yellow brown and blackish. Mesonotum with the presutural *ac* wanting, or only the median pair present; 3 postsutural *ia* ..... 7. *Ochromelinda* VILLENEUVE (p. 97).

32 (31) Body metallic blue or green, at least partly. Mesonotum with 2 presutural *ac* and 2 postsutural *ia* ..... 8. *Adichosina* VILLENEUVE (p. 101).

33 (26) Arista pilose on both sides, the longest hairs hardly longer than the thickened base. Body in shape and colouring similar to *Adichosina*, but median discals wanting ..... (*Onesiħoplisa* VILLENEUVE comp. p. 177).

Genus **PHUMOSIA** ROBINEAU-DESVOIDY.

Phumosia ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 427. — MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, pp. 490 et 497, et (10), III, 1929, p. 274. — SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 137. — TOWNSEND, Man. Myiol., V, 1937, p. 83. — S. WHITE, AUBERTIN & SMART, Fa. Brit. India, Dipt., VI, 1940, p. 65. — ZUMPT, Rev. Ecuat. Ent. Parasit., I, 1953, p. 69, et Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 574.

Type species : *P. abdominalis* ROBINEAU-DESVOIDY from Timor.

Plinthomyia RONDANI, Ann. Mus. Civ. Gen., VII, 1875, p. 427. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. emimelania* RONDANI from Borneo.

Ochromyia BRAUER & BERGENSTAMM nec MACQUART (1835), Denkschr. Akad. Wiss. Wien, LX, 1893, p. 178. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : ?

Somalia HOUGH, Proc. Acad. nat. Sci. Phil., L, 1898, p. 181. — TOWNSEND, Man. Myiol., V, 1937, p. 85. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *S. enigmatica* HOUGH from Somaliland.

Paratricyclea VILLENEUVE, Bull. Soc. Ent. France, 1913, p. 243, et Ann. Soc. ent. France, LXXXV, 1916, p. 151. — MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 490, et (10), III, 1929, p. 274. — SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 137. — TOWNSEND, Man. Myiol., V, 1937, p. 85. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. stabulans* BEZZI from Eritrea.

Caiusa SURCOUF, Arch. Mus. Hist. nat. Paris, (5), VI, 1919, p. 52. — SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 138. — TOWNSEND, Man. Myiol., V, 1937, p. 72. — S. WHITE, AUBERTIN & SMART, Fa. Brit. India, Dipt., VI, 1940, p. 69. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *C. indica* SURCOUF from India.

Chopardia SURCOUF, Arch. Mus. Hist. nat. Paris, (5), VI, 1919, p. 79. — TOWNSEND, Man. Myiol., V, 1937, p. 144. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *C. aenescens* SURCOUF from Madagascar.

Decaryella SÉGUY, Encycl. Ent. Dipt., II, 1925, p. 188, et VIII, 1935, p. 142. — TOWNSEND, Man. Myiol., V, 1937, p. 115. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *D. cinerea* SÉGUY from Madagascar.

Obscuria MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 95; id., ibid., (9), XVII, 1926, p. 490, et (10), III, 1929, p. 273. — CURRAN, Amer. Mus. Nov., 506, 1931, p. 3. — SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 135 — TOWNSEND, Man. Myiol., VI, 1938, p. 231. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *O. spinicosta* MALLOCH from Kenya.

Paraphumosia SÉGUY, Bull. Soc. ent. France, 1926, p. 62, et Encycl. Ent. Dipt. VIII, 1935, p. 140. — TOWNSEND, Man. Myiol., V, 1937, p. 118. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. waterloti* SÉGUY from Madagascar.

Paratricyclea subg. *Phumosella* MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 492. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. longiseta* MALLOCH from Kenya.

Phumosia subg. *Stenophumosia* VILLENEUVE, Rev. Zool. Afr., XIV, 1926, p. 68. — TOWNSEND, Man. Myiol., V, 1936, p. 173 (syn. nov.).

Type species : *L. fulvicornis* BIGOT from Ethiopia.

Pseudocaiusa VILLENEUVE, Rev. Zool. Bot. Afric., XV, 1927, p. 392. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. dubiosa* VILLENEUVE [1] from Formosa.

Phumolucilia MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 334. — TOWNSEND, Man. Myiol., V, 1937, p. 164. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *P. costata* MALLOCH from Cameroons.

Denatella SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 135. — TOWNSEND, Man. Myiol., V, 1937, p. 115. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *D. alluaudi* SÉGUY from Kenya.

Chopardimyia SÉGUY, Ann. Soc. ent. France, CIX, 1941, p. 124. — ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576.

Type species : *C. fulva* SÉGUY from Ivory Coast.

The genus *Phumosia* was fully discussed in my paper on *P. schoutedeni* (ZUMPT, 1954), and the reasons for synonymizing all the genera listed above were explained. Defined in this broad sense, *Phumosia* is easily separable from all other Calliphorid genera. The generic features may be summarized as follows :

Head in male with the eyes more or less closely approximated, bare or (rarely) pubescent, upper facets more or less enlarged, the width of frons at the narrowest point not exceeding 1/6 of eye-length [2]; *ev*, *f* and *fo* not

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[1] According to S. WHITE, AUBERTIN & SMART (Fa. Brit. India, Dipt. VI, 1940, p. 72), *P. dubiosa* VILLENEUVE is a synonym of *P. testacea* S. WHITE.

[2] After the manuscript of *Phumosia* was completed, a single male of a new species was discovered at Port St. Johns, Cape Coast. This male, described as *P. patersoni* (J. ent. Soc. S. Afr., **18**, 1955, p. 51, fig. 1), represents a quite outstanding species, as the frons at the tip of the ocellar triangle measures 1/3 of the eye-length. No account has been taken of this species in the generic diagnosis given above, or in the list of species from the Ethiopian region. In general appearance it is similar to *P. imitans* VILLENEUVE and would run down to this species in the key.

developed, but present in the female sex. Parafacialia bare or setulose. Antennal groove with carina absent or more or less developed in the upper part; two fine hairs in centre of the lower part of the face are sometimes present, but normally not, and represent a feature in the state of reduction.

Thorax with *ac*=0-2+0-4, *dc*=2-3+3-4, *ia*=0-1+2-3, *ph*=1-3, *h*=1-3, *prs*=1, *n*=2, *sa*=2-3, *pa*=2, *sc*=2-6+0-2, *st*=1-2 : 1, at least 1 *pst* and 1 *pp* present, alar-declivity bare or setulose, but propleuron, prosternum and supraspiracular convexity always haired. Suprasquamal ridge without tufts of hairs, bare or at most with a fine pilosity. Wing with subcostal sclerite and stem-vein bare, r_1 sometimes setulose, R_5 normally open, rarely closed, thoracic squama narrow and bare. Legs without outstanding features, fore-tibia with 1 *pv* and several *ad*; mid-tibia with 1 *ad*, *av*, 0-1 *pd* and 0-2 *pv*; hind-tibia with 2-4 *ad*, 0-4 *pd* and 0-2 *av*.

Abdomen of *Rhiniini*-type, sternites large with borders over-lapping the corresponding tergites, fifth sternite emarginated, but without special thorns or bristles; 3 genital segments, cerci mostly free, seldom fused, paralobi normally cerci-like, sometimes more or less reduced in length; phallosome (fig. 9) of simple construction, theca and phallus separated, spine mostly wanting, occasionally poorly developed, harpes denticulated, vesicae weakly sclerotized, with a more or less denticulated membrane.

The genus *Phumosia* is distributed over the tropical zones of the Old World, the greatest number of species probably occurring in the West and Central African rain forests. With respect to the bionomics of the Ethiopian species, only a few notes are recorded on *P. stabulans* (Bezzi).

KEY TO THE SPECIES.

1 (2) Costal area of wing, including *Co*, *St* and *R*, black, strongly demarcated; remaining part smoky.

Body wholly metallic violet, legs blackish. Eyes in ♂ close together, frons at the narrowest point about as wide as the anterior ocellus, in ♀ about 3/7 of eye-length. Thorax with *ac*=0-2+1, *dc*=2+4, *ia*=1+2-3, outer *ph* present, *sc*=4+1, *st*=1 : 1; alar-declivity haired, parafacialia bare. 8-10 mm. — Cameroons, Belg. Congo ..... 5. *P. mallochi* n. n.

2 (1) Costal area of wing not strongly demarcated, but hyaline or smoky like the remainder of the wing, or only slightly and ill-defined darker brown 3

3 (8) Parafacialia densely beset with blackish setae, or at least with a few scattered ones in the lower half 4

4 (5) Mesonotum with *dc*=2-3+4; parafacialia densely beset with black setae.

Body metallic dark green or greenish olive, thorax relatively densely dusted, legs blackish. Frons at the narrowest point measuring 1/6-1/7 of eye-length in ♂, 2/3 of eye-length in ♀. Thorax with *ac*=1-2+2, *ia*=1+3, outer *ph* present, *sc*=3+1-2, *st*=2 : 1, alar declivity haired. 6-9 mm. — Southern Africa ..... 1. *P. nudiuscula* (BIGOT).

5 (4) Mesonotum with *dc*=2+3 6

6 (7) Parafacialia densely beset with black setae; outer *ph* and presutural *ac* present.

Body metallic black and bluish, otherwise as in *nudiuscula* ..... 2. *P. nigroviolacea* (VILLENEUVE).

7 (6) Parafacialia only with an irregular row of a few scattered setae in the lower half, outer *ph* and presutural *ac* wanting.

Body dark, metallic greenish-olive, legs blackish to brown. Frons at the narrowest point in ♂ 1/6-1/11, in ♀ about half of eye-length. Thorax with *ac*=0+1, *ia*=0+2-3, *sc*=3+1, *st*=1 : 1; alar declivity bare. 2,5-4,5 mm. — Belg. Congo, Ruanda ..... 17. *P. incerta* (CURRAN).

8 (3) Parafacialia bare or only with a few setae on the extreme upper part 9

9 (24) Thorax and abdomen wholly metallic and shiny, green, blue or blackish, with or without a distinct pollinosity, thoracic spiracles dark and outer *ph* present 10

10 (17) Mesonotum with *dc*=2+3 11

11 (12) Eyes distinctly pubescent.

Body black, thorax slightly purplish, abdomen metallic greenish black, legs blackish. Eyes in ♂ close together. Thorax with *ac*=2+3, *sc*=6+1, *st*=2 : 1. 6 mm. — Kenya ..... 8. *longiseta* (MALLOCH).

12 (11) Eyes bare 13

13 (14) Presutural *ia* wanting, alar declivity bare.

Body metallic green or blue, faintly dusted, legs brownish. Eyes in ♂ close together, in the ♀ separated by a distance equal to about 1/3 of eye length. Outer *ph* present, *sc*=3-4+1, *st*=2 : 1. 5-7 mm. — Belg. Congo, Ruanda ..... 9. *P. congensis* n. sp.

14 (13) Presutural *ia* present, alar declivity with a few setae 15

15 (16) Thorax and abdomen greenish blue, very slightly dusted, similar to *congensis*.

Thorax with *ac*=2+3, outer *ph* present, *sc*=4+1, *st*=2 : 1. 6 mm. — S. Rhodesia ..... 10. *P. metallica* (CURRAN).

16 (15) Thorax and abdomen blackish, metallic dark green, or olive, more densely dusted.

Thorax with *ac*=1-2+2-3, outer *ph* present, *sc*=3+1, *st*=2 : 1. 5-7 mm. — Belg. Congo ..... 11. *P. pollinosa* n. sp.

17 (10) Mesonotum with *dc*=2+4 18

18 (19) Thorax and abdomen weakly metallic and shiny, fairly densely dusted, with the general appearance of a *Calliphora*.

Eyes in ♂ close together, in ♀ separated by about half of eye length, *ac*=2+2, *ia*=1+3, outer *ph* present, *sc*=4+1, *st*=2 : 1; alar declivity with a few setae. 7-9 mm. — S. Rhodesia. ..... 7. *P. mossopi* ZUMPT.

19 (18) Thorax and abdomen metallic blue or green, only weakly dusted, with the general appearance of a *Lucilia* 20

20 (21) Last abdominal tergite with a weak bronze shine, hind margins of the preceding two tergites not blackened.

Otherwise as in the following two species .....
6. *P. callipyga* VILLENEUVE.

21 (20) Last abdominal tergite not bronze, but coloured like the preceding ones which have the hind margins more or less distinctly darkened 22

22 (23) Vein r_1 dorsally bare. Antennae, palpi and tarsi blackish; cerci and paralobi slender.

Body metallic blue or black green, legs dark brown. Eyes close together in ♂, frons about 4/9 of eye length in ♀; *ac*=1+1, *ia*=1+3, outer *ph* present, *sc*=4+1, *st*=2 : 1, alar-declivity haired. 7-9 mm. — Belg. Congo, Anglo-Egypt. Sudan, Kenya ..... 3. *P. pseudolucilia* (VILLENEUVE).

23 (22) Vein r_1 dorsally bristled in the terminal half. Antennae, palpi and tarsi light-brown or yellow, cerci and paralobi stouter.

Otherwise as in *pseudolucilia*. 5-9 mm. — Liberia, Nigeria, Anglo-Egypt. Sudan, Urundi ..... 4. *P. fulvicornis* (BIGOT).

24 (9) Body otherwise coloured, if metallic, then partly brownish or at least the thoracic spiracles light brown 25

25 (34) Body partly with metallic colours, otherwise brownish. Outer *ph* always (?) present 26

26 (29) Mesonotum with *dc*=2+4 27

27 (28) Sternopleurals 2 : 1; body-length not exceeding 10 mm, upper facets in male only slightly enlarged.

Body with dull brownish and metallic green and blue colours which normally show a different pattern in the two sexes, thorax predominantly brown, legs yellow-brown. Eyes in ♂ almost touching, in ♀ separated by about ½ of the eye

length. Mesonotum with *ac*=1-2+2-4, *ia*=1+2-3, outer *ph* present, *sc*=3+1; alar declivity haired. 5-10 mm — Probably distributed over the whole rainforest area of West- and Central Africa ..... 13. *P. imitans* (VILLENEUVE).

28 (27) Sternopleurals 1 : 1; body-length 12-13 mm; upper facets in male strikingly enlarged.

Body in both sexes almost totally metallic blue, legs reddish. Mesonotum with *ac*=1+2, *ia*=1+3, outer *ph* present, *sc*=3-5+1; alar declivity haired. — Tanganyika, Nyasaland ..... 12. *P. proserpina* VILLENEUVE.

29 (26) Mesonotum with *dc*=2+3 30

30 (31) Thorax predominantly metallic black, slightly greyish dusted, shoulders and scutellum red; abdomen red with a broad median line and the lateral margins black.

Chaetotaxy of the thorax probably as in *overlaeti* m., but *sc*=6+1. 6 mm. — Kenya ..... 14. *P. meropia* SÉGUY.

31 (30) Thorax metallic blue or green, only slightly pollinose; abdomen also totally metallic like the thorax, or partly yellowish 32

32 (33) Yellowish pattern of abdomen variable, but always present, the latter never totally metallic green or blue. Hypopygium with the cerci stouter than in the following species.

Frons in ♂ narrow, in ♀ about 3/7 of the eye-length, at the vertex. Thorax with *ac*=2+3, *ia*=1+3, outer *ph* present, *sc*=4+1, *st*=2 : 1; alar declivity haired. 5-7 mm ..... 15. *P. biplaga* (VILLENEUVE).

33 (32) Abdomen like the thorax totally metallic bluish-green, only the thoracic spiracles reddish. Hypopygium with the cerci more slender than in *biplaga*.

Frons in ♂ narrow, in ♀ about ½ of eye-length, at the vertex. Thorax with *ac*=1-2+2, *ia*=1+3, outer *ph* present, *sc*=4+1, *st*=2 : 1; alar declivity haired. 7-9 mm ..... 16. *P. overlaeti* n. sp.

34 (25) Body without metallic colouring 35

35 (36) Parafacialia with an irregular row of a few scattered setae on the lower half [comp. 7 (6) — *P. incerta* (CURRAN). Badly preserved specimens which have lost the glossy metallic shine].

36 (35) Parafacialia bare of setae, at most a few scattered ones on the extreme upper part 37

37 (40) Body wholly yellow to reddish, without a dark pattern. (The abdominal pattern of 45 (46) — *P. schoutedeni* ZUMPT is sometimes strongly reduced. Length of this species does not exceed 5,5 mm) 38

38 (39) Mesonotum with 4 postsutural *dc*. 9 mm. — Ivory Coast ..... 18. *P. fulva* (SÉGUY).

39 (38) Mesonotum with 3 postsutural *dc*. 8-9 mm. — Belgian Congo ..... 19. *P. rufescens* (VILLENEUVE).

40 (37) Thorax or abdomen with a dark pattern 41

41 (44) Outer *ph* present 42

42 (43) Mesonotum with three longitudinal dark stripes on a rusty ground, abdomen almost unicoloured yellow-brown, but thickly pollinose. Three postsutural *dc*.

Eyes in ♂ close together, ♀ not yet found. Thorax with *ac*=1+1, *ia*=1+3, *sc*=4+1, *st*=2 : 1; alar declivity haired. 7 mm. — Belg. Congo ..... 20. *P. vittata* (CURRAN).

43 (42) Mesonotum at most with ill-defined dark vittae on brownish ground, abdomen with the mid-line and hind margins of the tergites blackened. Four postsutural *dc*. [Comp. 27 (28) — *P. imitans* (VILLENEUVE)].

44 (41) Outer ph wanting 45

45 (46) A glossy, yellow-orange species in which only the abdomen shows a variable blackish pattern; body almost without pollinosity.

Eyes in ♂ close together, in ♀ separated by a distance almost equal to eye-length. Thorax with *ac*=0-1+2-3, *dc*=2+3, *ia*=0-1+2-3, *sc*=3+0-1, *st*=1 : 1; alar declivity bare. 4,5-5,5 mm. — Belg. Congo, Ruanda-Urundi, Uganda, Kenya ..... 21. *P. schoutedeni* ZUMPT.

46 (45) Species with the ground colour brown or blackish, pollinosity always dense 47

47 (50) Alar declivity with black setae near the base of the wing 48

48 (49) Thorax dark brown in ground colour and with a dense grey pollinosity, abdomen light brown, with a median line and the hind margins of the tergites more or less broadly dark brown. Hypopygium with the cerci stouter.

Frons in ♂ measuring at the narrowest point up to 1/10 of the eye-length, in ♀ at the vertex about 1/2 of eye-length. Thorax with *ac*=0-1+1, *dc*=2-3, *ia*=1+2-3, *sc*=3-4+1, *st*=1-2 :1. 5-9 mm. — Centr. and West Africa ..... 22. *P. bicolor* (BEZZI).

49 (48) Thorax and abdomen black with a greyish-olive pollinosity. Hypopygium with the cerci slender. Specimens of 50 (51) *P. snyderi* with a few decumbent setae on the alar declivity.

50 (47) Alar declivity bare; always 3 postsutural *dc* 51

51 (52) Abdomen in ♂ about as long as broad.

Thorax and abdomen black with a greyish-olive pollinosity. Otherwise very similar to *P. imitans* (VILLENEUVE). 4-7 mm. — Liberia, Gold Coast ..... 23. *P. snyderi* ZUMPT.

52 (51) Abdomen in ♂ distinctly longer than broad 53

53 (54) Mesonotum with a broad median, dark olive coloured stripe which is distinctly dilated towards the scutellum and which continues onto it forming there a triangular discal spot.

Frons at the narrowest point 1/7-1/12 of eye-length in ♂, about 2/3 of eye-length in ♀. Thorax with *ac*=0+0-1, *ia*=0+2, *sc*=3+0-1, *st*=2 : 1. Wings with *r-m* strikingly clouded. 5-9 mm. — Uganda, Ruanda, Belg. Congo ..... 24. *P. muscoidea* (CURRAN).

54 (53) Mesonotum with 2 narrow median stripes which are more or less distinct : *Stabulans*-group. Only separable with certainty by the hypopygial structures 55

55 (58) Presutural *ia* mostly, prescutellar *ac* always present. Eyes in ♂ close together, frons at the narrowest point not greater than 1/10 of eye-length 56

56 (57) Hypopygium with oblique truncate cerci and slender paralobi. A more brownish species with the legs totally yellow-brown. 4-7 mm. — The distribution area is known to extend from the Gold Coast over Central Africa and the Anglo-Egypt. Sudan southwards to Transvaal ..... 25. *P. lutescens* (VILLENEUVE).

57 (56) Hypopygium with broadly truncate cerci and hook-shaped paralobi. A more greyish species with darkened femora. 5-6 mm. — S. Rhodesia. Specimens from the Belg. Congo vary in size from 3,5-6 mm and show further differences ..... 26. *P. cuthbertsoni* ZUMPT.

58 (59) Presutural *ia* always wanting, prescutellar *ac* wanting or present. Eyes in ♂ more widely separated, width of frons up to 1/6 of eye-length 59-62

59 (—) Frons of ♂ at the narrowest point about 1/7 of eye-length; *ac* wanting, *sc*=2+0. 6 mm. — Nyasaland, Belg. Congo ..... 30. *P. dubiosa* (VILLENEUVE).

60 (—) Frons of ♂ at the narrowest point 1/6-1/8 of eye-length; *ac*=0-1+1-2, *sc*=2-3+0-1. 5-8 mm. — South, East and Central Africa ..... 27. *P. stabulans* (BEZZI).

61 (—) Frons of ♂ at the narrowest point 1/8-1/10 of eye-length; *ac*=0+0-1, *sc*=2+0. 5-8 mm. — Kenya, Belg. Congo ..... 29. *P. spinicosta* (MALLOCH).

62 (—) Frons of ♂ at the narrowest point 1/11-1/15 of eye-length; *ac*=0+1, *sc*=2-3+1. Belg. Congo ..... 28. *P. wittei* n. sp.

Phumosia gambiensis (VILLENEUVE, Ann. Soc. Ent. France, LXXXV, 1916, p. 154), which has remained unknown to me, is omitted. It belongs to the stabulans-group and may be a synonym of one of the species described above.

[1. — **Phumosia nudiuscula** (BIGOT)] (1).

(Figs. 9, 10.)

Pollenia nudiuscula BIGOT, Bull. Soc. Zool. France, XII, 1887, p. 596; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 493.

Paratricyclea nudiuscula ssp. *moerens* VILLENEUVE, Bull. Mus. roy. Hist. nat. Belg., XII, n° 4, 1936, p. 8.

This species does not occur in the Belgian Congo and seems to be restricted to Southern Africa. It has been recorded, or specimens are before me, from the Eastern Cape, from many places in the Orange Free State and Transvaal, from Natal incl. Zululand, and from S. Rhodesia where this species perhaps reaches the northern limit of its area of distribution. In this area it is quite a common species, especially in the moister parts, e.g. in the riverine vegetation or near dams, swamps etc.

The body is slender, metallic dark green or greenish olive and shows a relatively dense whitish dusting. On the mesonotum, four more or less ill-defined, longitudinal, non-dusted stripes are recognisable. The eyes of the male are separated, at the narrowest part, by a distance equal to 1/6-1/7 of the eye-length, in the female by 2/3rd of the eye-length at the vertex. Frontal stripe reddish to black, parafrontalia and -facialia silvery dusted and relatively densely beset with black setae throughout the entire length. Face blackish, 3rd antennal segment about twice as long as the second, buccae black, silvery dusted and blackish haired. In the male only *iv*, *oc* and 8-12 pairs of *paf* developed, female also with *ev*, *f* and 2 *fo*.

Thorax with *ac*=1-2+2, *dc*=2-3+4, *ia*=1+3, external *ph* present, scutellum normally with 3 pairs of marginal and 1-2 pairs of shorter discal bristles. Pro- and poststigma black-brown, *st*=2 : 1. Alar declivity with a few black setae. Wings more or less brownish tinged. Legs in fully matured specimens black, but often those with partly reddish legs are caught. Hypopygium shown in fig. 10. Length : 6-9 mm.

[2. — **Phumosia nigroviolacea** (VILLENEUVE).]

Paratricyclea nigroviolacea VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 152.

VILLENEUVE based this species on a single male from Cape Town. It should be kept in the South African Museum, Cape Town, but it is not there any more. It may be lost or may not have been returned by the author.

(1) The species between [ ] were not captured in the Park. Also the localities indicated between [ ] are outside the Park.

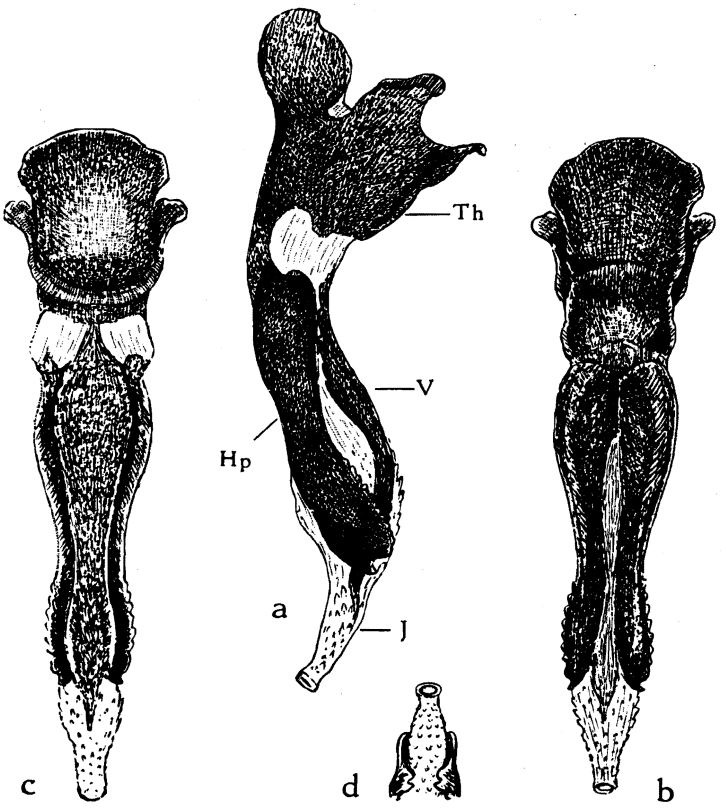


FIG. 9. — Phallosome of *Phumosia nudiuscula* (BIGOT).
a) lateral view; b) dorsal view; c) ventral view; d) opening of the ductus ejaculatorius.
Lettering as in figs. 4-8.

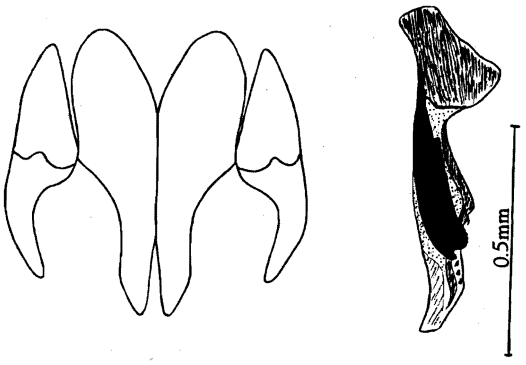


FIG. 10. — *Phumosia nudiuscula* (BIGOT).
Cerci and paralobi in frontal view, phallosome laterally.
Specimen from Johannesburg, Transvaal.

From Port St. Johns, Eastern Cape, I have received one female specimen which seems to fit VILLENEUVE's short description. It represents a species which agrees in every respect with *P. nudiuscula* (BIGOT) except that there are 3 postsutural *dc* developed instead of four.

When a male is found, it will be possible to check whether *P. nigro-violacea* as defined above really represents a good species or whether we are dealing with a mere variation.

3. — **Phumosia pseudolucilia** (VILLENEUVE).

(Figs. 11, 12.)

Paratricyclea pseudolucilia VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 156; MALLOCH, Ann. Mag. N. H. (9), XVII, 1926, p. 494.

This species was originally described from the Belgian Congo (Nieuwdorp, 2 ♂♂, 2 ♀♀). I have several specimens from Central Africa before

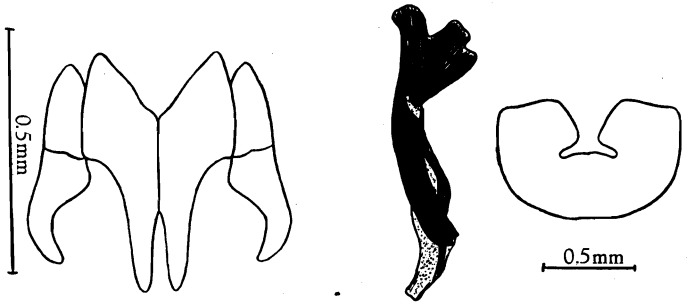


FIG. 11. — *Phumosia pseudolucilia* (VILLENEUVE).
Cerci and paralobi, phallosome and 5th. sternite.
Specimen from Mayumbu, P.N.A.

me which I refer, following Miss D. AUBERTIN's identifications, to this species. They are in general appearance very similar to *P. molaris* ZUMPT (=*fulvicornis* BIGOT) of which a detailed description has recently been given, but r_1 is dorsally bare. Other features which may serve to separate them are the colouring of the antennae, palpi and tarsi, which are yellow or yellow-brown in *fulvicornis*, but dark brown or blackish in *pseudolucilia*. These features, of course, only apply to fully matured specimens. Quite characteristic is the shape of the hypopygium, the cerci and paralobi of which are distinctly more slender in *pseudolucilia* than in *fulvicornis* (figs. 11 and 13). In the description of *P. molaris*, I mentioned that the

wings are « deeply brownish tinged ». In *P. pseudolucilia*, the wings are normally more hyaline but there seems to be some degree of overlapping variability within both species. The colour of the body in several specimens of *pseudolucilia* before me is dark green, not blue. This change of colouring is not surprising and is also known from other groups, e.g. *Lucilia*.

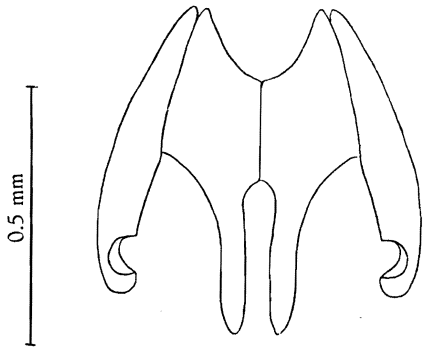


FIG. 12. — *Phumosia pseudolucilia* (VILLENEUVE).
Cerci and paralobi in frontal view.
Specimen from Uam district, Cameroons.

Mission G. F. DE WITTE : Mayumbu (volc. Nyamuragira), 2.100 m, 14-26.VI.1935 (3 ♂♂); Nyasheke (volc. Nyamuragira), 1.820 m, 14-26.VI.1935 (1 ♀); Mubiliba (volc. Nyamuragira), 2.000 m, 14-26.VI.1935 (1 ♂); Gitebe (volc. Nyamuragira), 2.324 m, 14-26.VI.1935 (1 ♀); Kabasha, 1.500 m, 12.XII.1934 (1 ♂); May-ya-Moto, 950 m, 6-9.XI.1934 (1 ♀); Kivu, Rutshuru, 1.285 m, 13-20.XII.1938 (2 ♀♀); Kibati, 1.900 m, 10-12.I.1934 (1 ♂♀); [Uele : Monga, 450 m, 18.IV-8.V.1935 (1 ♂, 3 ♀♀)].

Mission H. DAMAS : Lac Mokoto : c. Kishale, 1.470 m, 23.IX.1935 (1 ♂, 3 ♀♀).

Collection L. LIPPENS : SL Edouard : Katakunda, 1.600 m, 5.III.1936 (1 ♀).

Collection Musée du Congo : [Kivu : Tshibinda, XII.1927 (1 ♂♀, leg. CH. SEYDEL)]; [Katanga : La Panda, 2.X.1920 (1 ♀, leg. M. BEQUAERT)]; Rutshuru, 15.V.1936 (1 ♂, 2 ♀♀, leg. L. LIPPENS); [Kamogibe (Sud Masisi), 4.III.1936 (1 ♀, leg. L. LIPPENS)].

Collection Zool. Museum Berlin : [Ruwenzori Westseite, 2.500 m, II.1908 (1 ♀)]; [Ins. Kwidjwi, Kivu-See, IX.1907 (3 ♀♀)].

Collection British Museum : [Nagichot, Anglo-Egypt. Sudan, III.1946 (4 ♂♂, leg. LEWIS)]; [Teita Hills, Kenya (3 ♂♂)].

Collection American Museum New York : [Stanleyville, Belg. Congo (1 ♂)].

Remarks. — From the Zool. Museum in Berlin, I have received 3 ♂♂ from the Uelle Mts., Benito distr., Span. Guinea, and 3 ♂♂, 3 ♀♀ from the Uam distr. in S. E. Cameroons, which differ in the shape of the paralobi (fig. 12). No external features which would separate them from the above

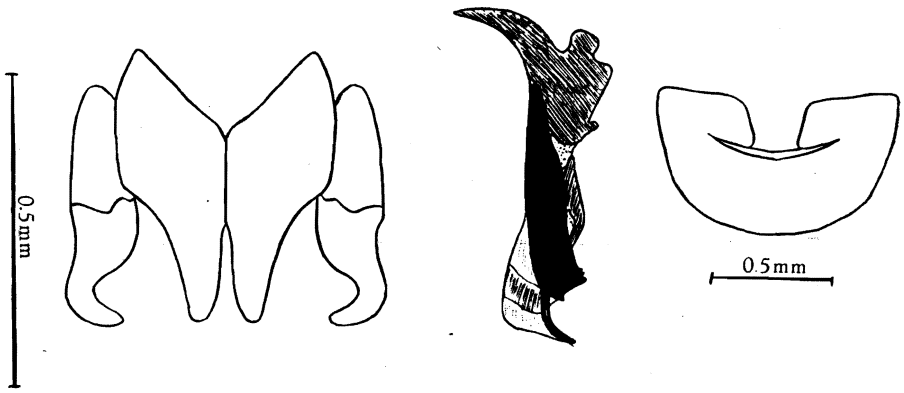


FIG. 13. — *Phumosia fulvicornis* (BIGOT).
Cerci and paralobi, phallosome and 5th. sternite.
Specimen from Robertsport, Liberia (after ZUMPT).

listed specimens of *pseudolucilia* could be detected. More and better preserved material is necessary in order to decide whether we are dealing with another good species or with a mere variation of *pseudolucilia.*

[4. — **Phumosia fulvicornis** (BIGOT).]

(Fig. 13.)

Lucilia fulvicornis BIGOT, Ann. Soc. ent. France, 1891, p. 379; VILLENEUVE, Rev. Zool. Afr., XIV, 1926, p. 68.

Phumosia molaris ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 184, fig. 3 (syn. nov.).

Similar to the foregoing species, but r_1 is dorsally beset with black setae in the terminal half. The type locality of *P. molaris* is Robertsport, Liberia. In the meantime, I have received the following additional specimens :

Collection Musée du Congo : [Urundi : Rumonge, 1934 (1 ♂, leg. A. LESTRADE)]; [Lomani : Katanga, 20.XII.1923 (1 ♂, leg. M. BEQUAERT)]; Mayumba, 1917 (1 ♂, leg. R. MAYNÉ).

Collection British Museum : [Ikotos, Anglo-Egyptian Sudan, XII.1933 (1 ♂)].

U. S. National Museum Washington : [Ibadan, Nigeria (1 ♂♀)].

5. — **Phumosia mallochi** nom. nov.

(Fig. 14.)

Phumolucilia costata MALLOCH, Ann. Mag. N. H., (10), IV, 1929, p. 334; (nec MALLOCH, 1926) ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 186 (syn. nov.).

? *Paratricyclea pseudolucilia* var. *nebularis* VILLENEUVE, Bull. Mus. roy. Hist. nat. Belg., XIII, n° 27, 1937, p. 4 (syn. nov.).

This striking species which bears a superficial similarity to *Lucilia infernalis* (VILLENEUVE) has been based on a single male from Buea, Cameroon Mts. (1.000-1.200 m). It was kept in the Zoological Museum of Hamburg, Germany, and was lost during the last world-war. I then received from the American Museum of Nat. History, New York, a female specimen from the same locality, on which I based the neotype (ZUMPT, 1953). Later, more specimens were forwarded to me, namely 1 ♂, 2 ♀♀ from Buea (Berlin Museum) and 1 ♂, 4 ♀♀ from the high mountains in the Belgian Congo.

This material enables me to complete the description given by me in 1953. The chaetotaxy of the mesonotum is variable, in as much as the presutural *ac* may be totally wanting or there may be 1-2, sometimes asymmetrically developed. This feature was mainly used by MALLOCH to found his genus *Phumolucilia*. Also the « two hairs on lower central portion of the face », specially mentioned by this author, are decumbent and mostly wanting. The discal bristle on the scutellum is sometimes not developed, and there may be 2 or 3 postsutural *ia* present. The chaetotaxy of the legs seems to be most variable, as in many other *Phumosia* species too. In my description of the neotype, I stated that the second tibia bears one *ad* and one *av*, but these bristles may increase to 1 *ad*, 1 *av*, 1 *pd* and 2 *pv*; on the hind tibia, several distinct *ad* and *pd* as well as 1 *av* may be recognisable. For hypopygium see fig. 14. The length of the body varies between 8 and 10 mm.

Mission G. F. DE WITTE : Vers mont Kamatembe, 2.300 m, 7-23.I.1935 (1 ♂, 3 ♀♀).

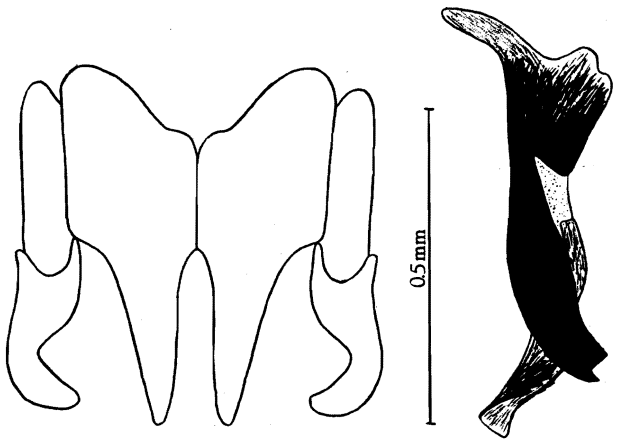
Collection Musée du Congo : [N. Lac Kivu : Rwankwi, IV.1948 (1 ♂, leg. J. V. LEROY)].

Collection Museum Berlin : [Buea, Gr. Kamerunberg, 900-1.200 m, 19.X.1910 (1 ♂, 2 ♀♀, leg. HINTZ)].

[6. — **Phumosia callipyga** VILLENEUVE.]

Phumosia callipyga VILLENEUVE, Bull. Soc. ent. France, LXXXIII, 1914, p. 307.

? *Phumosia bipartita* MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 500 (syn. nov.).



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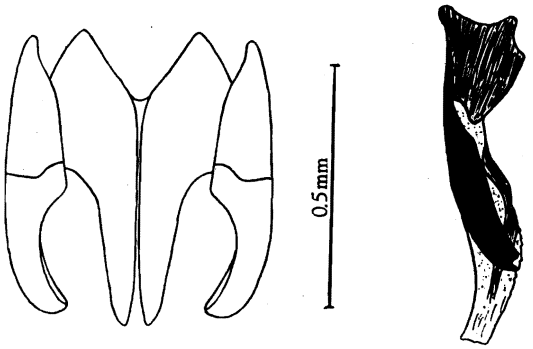

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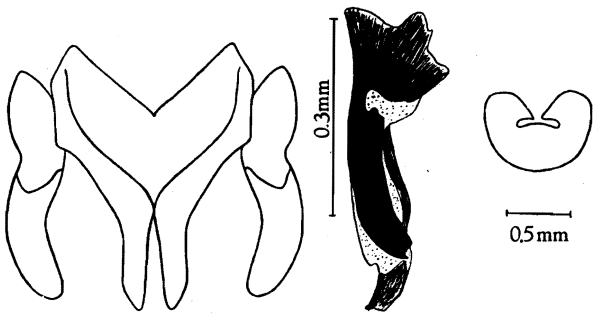

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FIG. 14. — *Phumosia mallochi* nom. nov. Cerci and paralobi, phallosome. Specimen from Buea, Cameroons.

FIG. 15. — *Phumosia mossopi* ZUMPT. Cerci and paralobi, phallosome (after ZUMPT). Specimen from the Vumba Mounts, S. Rhodesia.

FIG. 16. — *Phumosia congensis* n. sp. Cerci and paralobi, phallosome and 5th. sternite. Specimen from Rutshuru, P.N.A.

This species is based on a single male from « Urwald Moera » (Tanganyika Terr. ?). Dr. BEIER, Vienna, was kind enough to send me this specimen. As it is in a very poor condition, partly damaged by *Anthrenus*, it is impossible to dissect the genitalia.

In general appearance it bears a striking resemblance to *P. pseudolucilia* VILLENEUVE but, nevertheless, I do not believe it to be conspecific with this species. The colouring of the body is generally the same in both species but the abdomen in *pseudolucilia* has the hind margins of the 3rd and 4th tergites narrowly black banded, whereas these tergites in *callipyga* are uniformly dark blue. Furthermore, the 5th tergite in *callipyga* shows a weak bronze shine, but is glossy green-blue in *pseudolucilia*. The alar declivity in *callipyga* is more extensively haired than in most specimens of *pseudolucilia*, which probably caused VILLENEUVE to place the latter into the genus *Paratricyclea*, but this feature is variable.

I cannot detect any further features which may be of taxonomic value.

Length : 8 mm.

[7. — **Phumosia mossopi** ZUMPT.]

(Fig. 15.)

Phumosia mossopi ZUMPT, Rev. Ecuat. Ent. Parasit., I, 1953, p. 70, fig. 1.

P. mossopi shows a striking similarity to a *Calliphora* species. It has been fully described by me recently and nothing is to be added to this paper. It is only known from the Vumba Mts. in S. Rhodesia, and no further material has been received in the meantime. Hypopygium shown in fig. 15.

[8. — **Phumosia longiseta** (MALLOCH).]

Paratricyclea (*Phumosella*) *longiseta* MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 495.

I have not seen this species which was based on one male from the S.-E. edge of Kenya Forest, 1.500-1.800 m, 7.II.1911. (leg. T. J. ANDERSON).

According to the description, an outstanding feature of *P. longiseta* is the distinct pubescence of the eyes, which caused the author to erect the new subgenus *Phumosella* for it. Further characteristics are the two fine hairs in the centre of the lower part of the face, which are found in several other *Phumosia* species too, but which I believe represent a more or less degenerating feature very often not or only asymmetrically developed in specimens of the same population. The face as well as the parafacialia, buccae, antennae and palpi, are said to be brown. The thorax, seen from behind, has the « sides and two broad submedian vittae whitish-dusted, the intervening three black vittae shining, less distinctly posteriorly ». The abdomen is also faintly whitish-dusted and shows a dark dorso-central vitta basally. Legs black, tibiae brownish, wings smoky.

With respect to the chaetotaxy, the author mentions that the parafacialia are bare, *dc* and *ac* « very long » and both arranged 2+3, *sc*=2 : 1. Abdomen with erect hairs and bristles which are « longer than usual ». It is not mentioned whether the outer *ph* is present and the alar declivity haired, but I assume that they are.

9. — **Phumosia congensis** n. sp.

(Fig. 16.)

Similar to *P. metallica* CURRAN, but apart from the differently shaped hypopygium, the chaetotaxy of the mesonotum shows differences which may prove to be constant when more material has been examined.

Male. — Frons very narrow in the middle, at the tip of the ocellar triangle about as wide as one ocellus, strongly widened towards the antennal groove, frontal stripe only developed in the lower half, brown; parafrontalia densely grey pollinose, with about 10 pairs of *paf*, otherwise bare, *iv* and *oc* present, parafacialia in the upper part as densely pollinose as the parafrontalia, in the lower part brown, no setae present; antennae and epistome light brown, third segment more or less darkened, about 2 ½ times as long as the second, vibrissa long and thick, a few short hairs above, peristome with a row of black bristles; buccae almost ¼ as high as the eye is long, for the greater part black and beset with black hairs but the upper and anterior margin largely brown. Eyes oval, with small facets. Palpi yellow brown, slightly widened towards the apex, with black setae; proboscis more or less dark-brown.

Thorax metallic green to blue as in the genus *Lucilia*, only slightly dusted, without any distinct pattern.

Chaetotaxy : *ac*=1+1-2, *dc*=2+3, *ia*=0+2-3, *ph*=2 (outer present), *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, scutellum with 3-4 pairs of long marginal and 1 pair of discal bristles. Prostigma as well as the hind stigma dark brown, two long *pst* and *pp* present, *st*=2 : 1. Propleurae and prosternum haired. Alar declivity bare. Wing hyaline with brown tinge, veins yellow brown, costal spine long, r_{4+5} on both sides with a few setae a little more than half-way to *r-m*, R_5 open. Squamae yellow-brown, the lower one of median breadth, the inner margin not attached to the scutellum, halter yellow-brown. Legs more or less dark brown; fore-tibia with several *ad* and one strong submedian *pv*; mid-tibia with one submedian *av* and *ad*, 2-3 median *pd* and 1 *pv*; hind-tibia with 2 *ad* and 2 *av* in the holotype, but up to 4 each in the other specimens, furthermore 1 *av*; tarsi and pulvilli of normal length.

Abdomen slightly longer than broad, metallic green or bluish like the thorax but not dusted; tergites with marginal bristles, but no discal ones. Hypopygium relatively stout, with club-shaped paralobi (fig. 16).

Female. — Frons at vertex a little more than ⅓ as wide as the eye is long (15 : 40), gradually dilated towards the antennal groove, frontal stripe subparallel, dark-brown, buccae about ⅓ as high as the eye is long, colouring and dusting as in the male. Chaetotaxy of head complete : *iv*, *ev*, *oc*, 1 *f*, 2 *fo*. Chaetotaxy and colouring of thorax and abdomen as in the male.

Length : 5-7 mm.

Mission G. F. DE WITTE :

Holotype : 1 ♂ labelled : P.N.A., Rutshuru, 1.285 m, 18-23.VI.1934 (in coll. Inst. Parcs Nat. du Congo Belge, Brussels).

Paratypes : Rutshuru, several localities, 1.100-1.285 m, VI-VII.1934 et 1935 (75 ♂♂, 121 ♀♀); Rwindi, 1.000 m, 20-24.XI.1934 (1 ♂); Kabasha (escarpement), 1.500 m, 14.XII.1934 (1 ♂).

Mission H. DAMAS : Riv. Ondo, affl. Rutshuru, 1.800-1.850 m, 30.VII.1935 (1 ♂).

Collection L. LIPPENS : Sud lac Édouard : riv. Rwindi, 1.000 m, 4.II.1936 (1 ♀).

Collection Musée du Congo : Rutshuru, IV-VI.1936 (39 ♂♂, 44 ♀♀ leg. L. LIPPENS); [Ruanda : gîte de Nkuli, 17.III.1936 (1 ♂♀ leg. L. LIPPENS)].

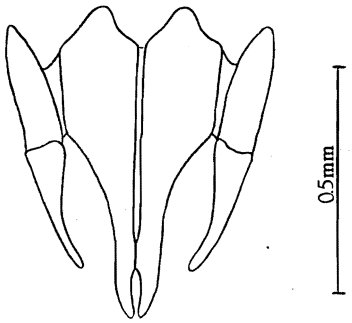


FIG. 17. — *Phumosia metallica* (CURRAN).
Cerci and paralobi.
Specimen from Balla-Balla, S. Rhodesia.

[10. — **Phumosia metallica** (CURRAN).]

(Fig. 17.)

Paratricyclea metallica CURRAN, Amer. Mus. Nov. 506, 1931, p. 6.

CURRAN based his description on a single male from Balla-Balla, S. Rhodesia, II.1931, which had been sent to him by the late Mr. CUTHBERTSON. I received a second headless male from CUTHBERTSON's collection in Salisbury, taken in the same locality and on the same date. From this specimen the

drawing of the hypopygium (fig. 17) has been made. A third male with the same labelling was sent to me by the American Museum of Nat. History, New York. So all three probably represent a typical series.

P. metallica is closely related to *congensis* m., but apart from the strikingly different shape of the hypopygium, the mesonotum shows *ac*=2+3, *ia*=1+3 and the alar declivity is beset with a few hairs. More material is required to prove whether these characters are constant. Length : 6 mm. The female has not yet been described.

11. — **Phumosia pollinosa** n. sp.

(Fig. 18.)

A metallic, olive or blackish-green, species with a fairly dense whitish dust forming two distinct longitudinal vittae on the anterior part of the mesonotum. Humeral calli dusted too. The hypopygium is similar to that of *congensis*, but the cerci and paralobi are distinctly longer and more slender (fig. 18). Whether the features of the mesonotal chaetotaxy separating this species from *congensis* and *metallica* are constant remains to be proved when more material from different localities becomes available.

Male. — Eyes almost touching behind the ocellar triangle; frons at the narrowest point not broader than the anterior ocellus. Frontal stripe red-brown, triangular, only developed in the lower part of the frons. Parafacialia with red-brown ground-colour, bare, but densely yellowish-white pollinose, with about ten pairs of *paf*, one pair of *iv* and one pair of long proclinate *oc*. Antennae reddish-yellow, the third segment twice as long as the second. Buccae about 3/8 of eye-length, whitish dusted like the prafrontalia. Vibrissa long, peristomal bristles and buccal hairs black. Palpi yellow, slightly curved and widened terminally.

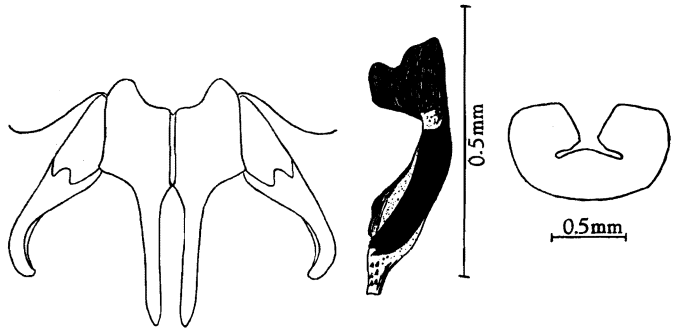
Thorax normally with 2+3 *ac*, but in the holotype with 4 right and 3 left *post ac*, *dc*=2+3, *ia*=1+2, *ph*=2 (outer present), *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3+1, pro- and poststigma dark brown, one stronger and one weaker *pst* and *pp*, *st*=2:1. Prosternum and propleura haired, alar declivity only with a few hairs. Wings hyaline, yellowish tinged, veins brown, costal spine distinct, r_{4+5} dorsally only with a few setae at the root, R_5 open, squama tinged like the wings, halters yellow brown. Legs yellow-brown, femora sometimes more or less darkened; chaetotaxy as in *congensis*. Abdomen as long as broad, hind margins of the tergites not darkened.

Female. — Frons at vertex 5/11-5/12 of eye-length, frontal stripe black, parallel, chaetotaxy of head fully developed.

Length : 5-7 mm.

Holotype : 1 ♂ labelled : P.N.A., vers Rweru (volc. Mikeno), 2.400 m, 26-27.VII.1934 (in coll. Inst. Parcs Nat. du Congo Belge, Brussels).

Paratypes : Rweru (volc. Mikeno), 2.400 m, 26-27.VIII.1934 (3 ♂♂).



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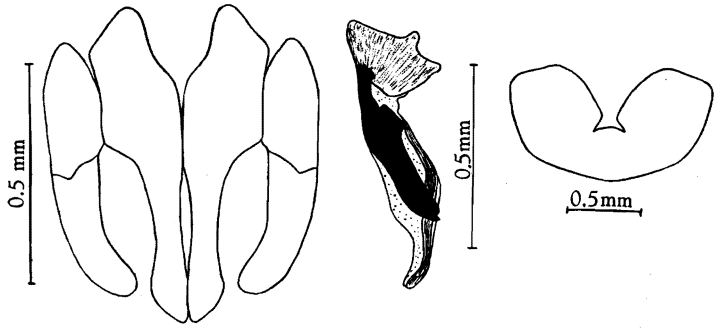

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FIG. 18. — *Phumosia pollinosa* n. sp. Cerci and paralobi, phallosome and 5th. sternite. Specimen from Rweru, P.N.A.

FIG. 19. — *Phumosia proserpina* VILLENEUVE. Cerci and paralobi, phallosome and 5th. sternite. Specimen from Chole, Nyasaland.

FIG. 20. — *Phumosia imitans* (VILLENEUVE). Cerci and paralobi, phallosome and 5th. sternite. Specimen from Rutshuru, P.N.A.

The following specimens are not regarded as types. Several of them have a mesonotal chaetotaxy like *congensis*, from which they are mainly separable by the dark colouring of the body and, in the male sex, by the differently shaped hypopygium.

Kivu : Rutshuru, 1.285 m, 4.VII.1935 (1 ♂, 2 ♀♀).

Kanyabayongo (Kabasha), 1.760 m, 7.XII.1934 (1 ♂); Ruanda : volc. Sabinyo-vallée Rwebeya, 3.000 m, 22.IX.1934 (7 ♀♀).

Collection Musée du Congo : Rutshuru : Kilinga, VI.1936 (2 ♂♂ leg. L. LIPPENS).

[12. — **Phumosia proserpina** VILLENEUVE.]

(Fig. 19.)

Phumosia proserpina VILLENEUVE, Bull. Soc. ent. France, 83, 1914, p. 305.

This striking species has been described by VILLENEUVE from 1 ♂ from Moshi, Kilimanjaro Mts., Tanganyika and 7 ♀♀ from Nyasaland. I have seen 1 ♂ from Chole, Nyasaland (Brit. Museum) and 1 ♂♀ from Langenberg, Lake Nyasa, Tanganyika (Zool. Museum of Berlin).

P. proserpina is the largest Ethiopian species in the genus, the specimens before me measuring 12-13 mm in body-length. The colouring of the body is almost totally metallic blue, with light whitish pollinosity, but the prostigma is yellow-brown and parts of the pleurae are brownish shining through the more or less metallic surface. Furthermore, the face, including antennae, is totally reddish to orange, legs, at least in the specimens before me, wholly reddish-brown. As already noticed by the author, the first three segments of the hind tarsi are in both sexes ventrally beset with a dense brush of short yellow hairs. The chaetotaxy of the thorax consists of *ac*=1+2, *dc*=2+4, *ia*=1+3, *ph*=2 (outer present), *h*=2-4, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3-5+1, 1-2 *pst* and *pp*, *st*=1:1. Prosternum, propleuron and alar declivity are haired. The eyes of the male have strikingly enlarged upper facets and touch each other in the middle; in the female, the facets are of normal size and the frons at vertex measures about 3/7 of eye-length. The hypopygium is of characteristic shape (fig. 19).

13. — **Phumosia imitans** (VILLENEUVE).

(Fig. 20.)

Paratricyclea imitans VILLENEUVE, Bull. Soc. ent. France, LXXXV, 1916, p. 153; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 494.

Paratricyclea caerulea VILLENEUVE, Bull. Soc. ent. France, LXXXV, 1916, p. 155 (syn. nov.).

Paratricyclea imitans var. *coeruliventris* MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 495 (syn. nov.).

? *Phumosia brunnescens* MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 500 (syn. nov.).

With respect to the colouring, this species is the most variable one I have come across in the *Calliphorinae*. The males are normally predominantly dark brown, densely greyish and olive pollinose, and the thorax shows ill-defined, metallic bluish vittae of variable size; abdomen with a more or less extended, longitudinal, metallic-blue or greenish stripe in the middle, and ill-defined lateral metallic spots; thoracic spiracles and legs always yellow brown. Females, as a rule, with the abdomen totally metallic blue, only the hind margins of the tergites are narrowly reddish; thorax coloured as in the male, the metallic vittae, however, are often more extended. The metallic vittae may totally disappear in both sexes, or they may become so extensive that the whole fly appears metallic. This happens more often in the female sex, but totally metallic males are not unusual.

It is therefore not surprising that this species has been described several times, too much importance having been attached to the colouring of the body. In the very abundant material before me, all transitions between the various patterns are present. The shape of the hypopygium remains constant, so that there should be no doubt about the conspecificity of all these forms. A striking fact is, however, that the hypopygium of *P. bicolor* (BEZZI) is almost identical with that of *imitans*. The paralobi of the first species are normally a little more slender than in the latter. The question is, however, whether this feature is always consistent. *P. bicolor* is a species in which the outer *ph* is wanting and there are only 3 postsutural *dc* present, furthermore, metallic colours never occur. It is, therefore, always possible to separate these two species by external features. On the other hand, the outer *ph* and the number of *dc* are inconstant features in the genus *Tricyclea*. Further investigations are necessary to get a clear view of the status of these two species.

To separate *caerulea* from *imitans* MALLOCH used the absence or presence of a few setae situated ventrally at the junction of the humeral cross-vein and the subcosta. This feature is variable within the same population.

The characteristics of *P. imitans* are as follows :

Male. — Eyes almost touching, upper facets slightly bigger than the lower ones. Frons at the narrowest point not broader than the anterior ocellus; frontal stripe triangular, black-brown or more or less reddish. Parafrontalia and -facialia greyish or brownish pollinose, the latter with a few black setae in the upper part. Antennae with the basal segment yellow, the third black-brown for the greater part, about 2 ½ times as long as the second. Antennal groove with a broad and flat carina. Face reddish brown, buccae blackened, measuring about ⅓ of eye-length; buccal and peristomal hairs black, *iv* and *oc* present, about ten pairs of *paf*. Palpi yellow, only slightly widened terminally.

Thorax coloured as described above. Chaetotaxy : *ac*=1-2+2-4, *dc*=2+4, *ia*=1+2-3, *ph*=2 (outer present), *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3+1, normally one weaker and one stronger *pp* and *pst*, *st*=2 : 1.

Prosternum, propleuron and alar declivity haired. Pro- and poststigma yellow-brown. Wings hyaline, only basally with a slight yellowish tinge, veins yellow brown, costal spine long, r_5 dorsally with a few setae not reaching *r-m*, R_5 widely open, squama light yellow brown, halter yellow. Legs yellow-brown, fore-tibia with several *ad* and one long submedian *pv*; mid-tibia with a submedian *ad*, *av*, *pd* and 2 *pv*; hind-tibia with 3-4 longer *ad* and *pd* as well as with 2 submedian *av*; claws and pulvilli of normal size.

Abdomen broader than long. Fifth sternite with a deep incision, hypopygium (fig. 20) with hook-shaped paralobi and blunt cerci.

Female. — Eyes widely separated, facets equal, frons at the vertex measuring half of the eye-length, gradually widened to the antennal groove; buccae almost half the eye-length. Chaetotaxy of head complete, with *iv*, *ev*, *oc*, *f* and 2 *fo*.

Length : averaging from 8-10 mm, but there are also specimens which only reach 5 mm in length.

Mission G. F. DE WITTE : Rutshuru, several localities, 1.100-1.285 m, XII.1933, I et VI.1934, VI et VII.1935 (55 ♂♂, 76 ♀♀); Rwindi, 1.000 m, 20-24.XI.1934 (2 ♀♀); Kabasha (escarpement), 1.500 m, 14.XII.1934 (2 ♂♂, 4 ♀♀).

Collection L. LIPPENS : Sud lac Édouard : riv. Rwindi, 1.000 m, 4.II.1936 & 14-25.II.1936 (3 ♂♂, 4 ♀♀); Sud lac Édouard : Katakunda, 1.600 m, 5.III.1936 (1 ♂).

Collection Musée du Congo : Rutshuru, IV.1934, IV-VI.1936 (150 ♂♂, 145 ♀♀ leg. L. LIPPENS; [Lomani-Luputa, IV.1934 (1 ♂♀, leg. BOUVIER)]; [Kilo, IX.1930 (1 ♀ leg. R. P. THALMANN)]; [Lokandu, III.1939 (1♂ leg. MARÉE)]; [Kapanga, XI.1933 (1 ♂ leg. G. F. OVERLAET)]; [entre Irumi et Mombasa, X.1931 (3 ♂♂ leg. L. LEBRUN)]; [Bambesa, I.1937 (1 ♀ leg. J. VRYDAGH); [Ituri : Blukwa, XI.1928 (1 ♂ leg. A. COLLART)]; [Kibali-Ituri : Niarembe, V.1935 (1 ♂♀ leg. CH. SCOPS)]; [Ruanda : lac Nyakibuju, III.1936 (2 ♂♂, 2 ♀♀ leg. L. LIPPENS)].

Collection Zool. Museum Berlin : [Manow, Tanganyika (2 ♂♂)]; [Misahoehe, Togo, IV.1894 (1 ♀ leg. E. BAUMANN)].

Collection British Museum : [Bwamba, Uganda (2 ♂♂, 1 ♀)]; [Kumasi, Gold Coast (1 ♀)].

Collection American Museum New York : [Kampala, Uganda, IX.1918 (1 ♀)].

VILLENEUVE, in his original description, mentions this species from Nyasaland, Kenya, Belgian Congo and Nigeria. According to CUTHBERTSON (Tr. Rhod. Sci. Ass. 36, 1938, p. 123) it also occurs in the Vumba Mts., S. Rhodesia, but this record is perhaps referable to *P. mossopi* m.

[14. — **Phumosia meropia** (SÉGUY).]

Paratricyclea meropia SÉGUY, Mém. Mus. H. N. Paris (N.S.), VIII, 1938, p. 379.

This species, based on a single male from Mt. Elgon, Kenya, has remained unknown to me. It is most probably closely related to *P. biplaga*, but the colouring is quite different, being metallic black, with the shoulders, scutellum and parts of the abdomen reddish. The antennal groove is provided with a weak carina. The frons, at the narrowest point, is twice as wide as the anterior ocellus; face, antennae and palpi reddish. Thorax with *ac*=1-2+2, *dc*=2+3, *sc*=6+1, *st*=2:1.

Length : 6 mm.

[15. — **Phumosia biplaga** (VILLENEUVE).]

(Fig. 21.)

Paratricyclea biplaga VILLENEUVE, Bull. Soc. ent. France, LXXXIII, 1914, p. 385.

This species was based by the author on a single female from Nyasaland, the description being very short and poor. Nevertheless, the colour features allow one to recognise it in a few specimens which I received from Gwelo,

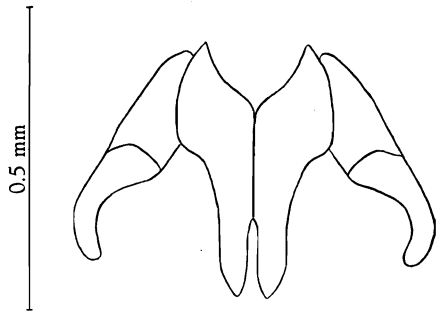


FIG. 21. — *Phumosia biplaga* (VILLENEUVE).
Cerci and paralobi in frontal view.
Specimen from Barbeton, Transvaal.

S. Rhodesia (1 ♂, 2 ♀♀ leg. CUTHBERTSON, 29.XI.1932), from Barberton, Transvaal (1 ♂ leg. MUNRO, 16.V.1914) and from Naboomspruit, Transvaal (1 ♀ leg. ZUMPT, II.1949). *P. biplaga* is related to *P. imitans* but is smaller in the average and the thorax in both sexes has a glossy, metallic blue or green, ground colour, with a slight whitish dusting. The abdomen is red-orange with a variable metallic pattern forming a median vitta and transverse bands on the anterior part of the tergites; sometimes the abdomen is almost totally metallic.

Male. — Eyes with almost equally sized facets, frons at the narrowest point up to twice as wide as the anterior ocellus; frontal stripe reddish, parafrontalia and -facialia silvery dusted, the former with a few black setae, the latter bare. Antennal groove without carina. Otherwise as in *imitans*.

Thorax with *ac*=2+3, *dc*=2+3, *ia*=1+3, *ph*=2 (outer present), *h*=3, *prs*=1, *sa*=3, *pa*=2, *sc*=4+1, *pp*=1-3, *pst*=1-2, *st*=2:1, prosternum and propleuron haired, alar declivity with a few black setae. Pro- and poststigma yellow-brown. Wings hyaline, as in *imitans*. Legs yellow, foretibia with several *ad* and one long submedian *pv*; mid-tibia with a submedian *ad*, *av*, *pd* and 2 *pv*; hind-tibia with 2-3 *ad* and *pd*, *av* wanting.

Abdomen broader than long, with the fifth sternite deeply emarginated, hypopygium (fig. 21) very similar to that of *P. imitans* but the cerci are a little stouter.

Female. — Frons at vertex 3/7 of eye-length, gradually widened to the antennal groove. Chaetotaxy of head complete.

Length : 5-7 mm.

16. — **Phumosia overlaeti** n. sp.

(Fig. 22.)

Similar to almost totally metallic specimens of *P. biplaga* VILLENEUVE, but the abdomen never shows brown spots on either the dorsal or ventral surfaces. The hypopygium (fig. 22) has the cerci more slender than in *biplaga*, also the 5th sternite is slightly differently shaped.

Male. — Frons at the narrowest point in the holotype 1 ½ times as wide as the anterior ocellus, in the paratype twice as wide, frontal stripe reddish or black respectively, triangular in the lower part, narrowed to a line further up. Parafrontalia and parafacialia in the upper half black with silvery dusting, the latter in the lower half reddish like the vibrissarium. Buccae black, whitish dusted, hairs black, buccal height about one third of the eye-length. The chaetotaxy consists of *iv*, *oc* and about 12 pairs of *paf* which gradually diminish in size towards the vertex. Antennae with the two basal segments predominantly reddish, the third for the greater part black, 2 ½ times as long as the second. Palpi orange, slightly widened and curved towards the tip.

Thorax metallic bluish-green, but prostigma reddish whereas the poststigma is blackish as in *biplaga* VILLENEUVE. A white pollinosity is present which cannot be overlooked, but a distinct pattern is not formed. Chaetotaxy : *ac*=1+2 in the holotype, 2+2 in the paratype, *dc*=2+3, *ia*=1+3, *ph*=2 (outer present), *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=4+1, *st*=2:1, one stronger and one weaker *pst* and *pp*. Prosternum, propleuron and alar declivity haired. Wings with a light yellow tinge, veins yellow brown, costal spine well developed, r_{4+5} dorsally with black setae half-way to *r-m*,

R_5 open, squamae predominantly light brown. Legs totally reddish-orange, fore-tibia with 5 longer *ad* and one submedian *pv*; mid-tibia with submedian *ad*, *pd*, and *av* as well as 2 *pv*; hind-tibia with several *ad* and 2 *pd*.

Abdomen as long as broad, like the thorax, totally metallic and whitish dusted.

Female. — The single female before me is in a bad condition. Frons at the vertex about half as wide as the eye is long, widened towards the antennal groove, whereas the reddish frontal stripe is slightly narrowed downwards. Chaetotaxy of head complete.

Length : 7-9 mm.

Collection Musée du Congo :

Holotype : 1 ♂ from Lulua : [Kapanga, VIII.1932, leg. F. G. OVERLAET].

Paratypes : [Élisabethville, 24.VII.1920 (1 ♂, leg. M. BEQUAERT)]; Rutshuru, 25.V.1936 (1 ♀ leg. L. LIPPENS).

The male from Élisabethville has been retained for the collection of the S. African Institute for Med. Research, Johannesburg.

17. — **Phumosia incerta** (CURRAN).

(Fig. 23.)

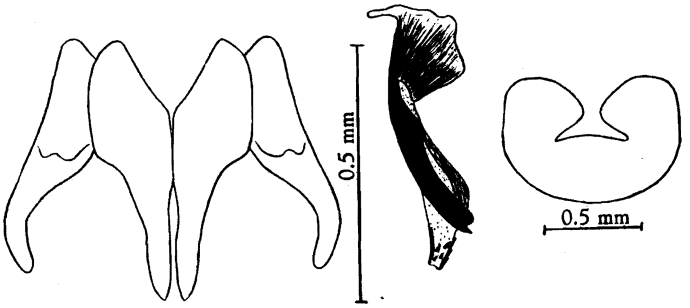
Obscuria incerta CURRAN, Amer. Mus. Nov., 506, 1931, p. 4.
? *Denatella alluaudi* SÉGUY, Encycl. Ent. Dipt., VIII.1935, p. 135 (syn. nov.).

CURRAN described this species from Burunga in the Parc National Albert where it seems to be quite a common fly. Outside the park, I have only seen it from several places in Ruanda.

P. incerta is an easily recognisable fly. Within the genus *Phumosia* sensu ZUMPT (1953), it is characterized by the metallic, dark greenish-olive colouring of the body, the wanting outer *ph* and the parafacialia which show an irregular row of a few scattered setae in the lower part. In badly preserved specimens the parafacial setae are sometimes indistinct. In this case, the species runs down to *P. congensis m.*, from which, and all related forms, however, it is immediately separable by the absence of the presutural *ac* and the outer *ph*.

The description given by the authors is fully adequate and no corrections are necessary. I only want to add that the length of the body ranges from 2,5 to 4,5 mm, and the narrowest width of the male frons from $\frac{1}{6}$-$\frac{1}{11}$ of eye-length. Furthermore, a drawing of the hypopygium (fig. 23) is given. The male terminalia are quite typical for the genus *Phumosia* and prove that *P. incerta* does not represent a different genus as thought by CURRAN.

The female sex was not known to the author. It is coloured like the male. The eyes are widely separated, the frons at the vertex being a little



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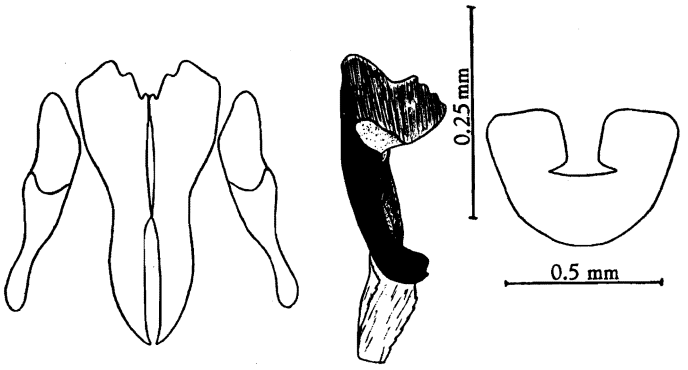

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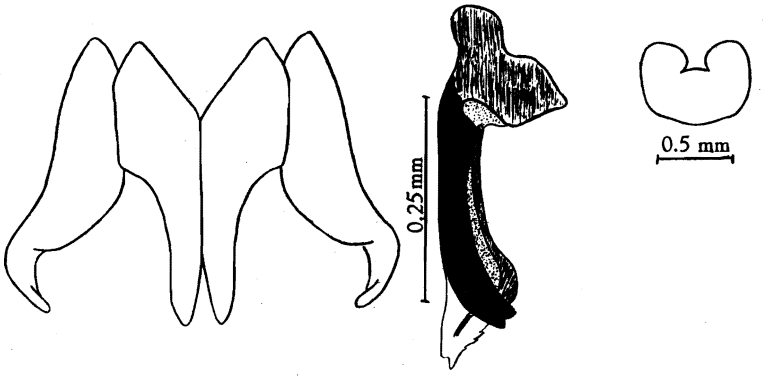

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FIG. 22. — *Phumosia overlaeti* n. sp. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Kapanga, Belgian Congo (holotype).

FIG. 23. — *Phumosia incerta* (CURRAN). Cerci with paralobi, phallosome and 5th. sternite. Specimen from P.N.A.

FIG. 24. — *Phumosia schoutedeni* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Rutshuru, P.N.A.

more than half as wide as the eye is long; it is gradually widened towards the antennal groove. Frontal stripe almost parallel, parafrontalia broad, greyish dusted like the parafacialiia. Chaetotaxy of head complete, with *iv*, *ev*, *f* and 2 *fo*, the lower *fo* normally very long and thick.

Mission G. F. DE WITTE : Kamatembe, 2.100 m, 15-20.IV.1934 (21 ♂♂, 24 ♀♀); Mushumangabo (volc. Nyamuragira), 2.075 m, 14-26.VI.1935 (2 ♂♂, 1♀); Shamuheru (volc. Nyamuragira), 1.820 m, 14-26.VI.1935 (10 ♂♂, 37 ♀♀); Mubiliba (volc. Nyamuragira), 2.000 m, 14-26.VI.1935 (1 ♂♀); Gitebe (volc. Nyamuragira), 2.324 m, 14-26.VI.1935 (7 ♂♂, 6 ♀♀); Rweru (volc. Mikeno), 2.400 m, 26.VII.1934 (2 ♂♂, 6 ♀♀); Kibati, 1.900 m, 19.I.1934 (1 ♂♀); Nyarusambo, 2.000 m, 2.VII.1934 (8 ♂♂, 4 ♀♀); Tshumba (Mushari), 2.100 m, 28.IV-1.V.1934 (6 ♂♂, 10 ♀♀); Burunga (Mokoto), 2.000 m, 9-20.III.1934 (32 ♂♂, 31 ♀♀); Tshamugussa (Bweza), 2.250 m, 9.VIII.1934 (4 ♂♂, 21 ♀♀); Rutshuru (Kivu), 1.285 m, 6-23.VI.1934 4 ♂♂, 5 ♀♀); Kalondo (Kivu), 1.750 m, 22-27.III.1934 (11 ♂♂, 14 ♀♀); Ngesho (Kivu), 2.000 m, 3-6.IV.1934 (3 ♂♂, 5 ♀♀); Kanyabayongo (Kabasha), 1.760 m, 7.XII.1934 (3 ♂♂, 6 ♀♀); Nyabirehe (Ruanda), 2.400 m, 22.II.1935 (2 ♂♂, 11 ♀♀); Ruhengeri (Ruanda), 1.800-1.825 m, 6.II.1935 (2 ♂♂, 1 ♀); mont Tamira (Ruanda), 2.600 m, 11.II.1935 (7 ♀♀).

Mission H. DAMAS : Ngesko (Kivu), 2.000 m, 3.VIII.1935 (12 ♂♂, 21 ♀♀); Kalondo (Kivu), 1.750 m, 6-9.VIII.1935 (16 ♂♂, 34 ♀♀); N'Dalaga (Kivu), 1.725 m, 8.VIII.1935 (4 ♀♀); Lukulu (Kivu), 1.725 m, 15.VIII.1935 (1 ♂, 2 ♀♀).

Collection L. LIPPENS : Sud lac Édouard : Vitshumbi, 925 m, 15.IV.1939 (1 ♂).

Collection Musée du Congo : [Rutovu (Ruanda), 2.350 m, 20-23.I.1953 (1 ♀ leg. BASILEWSKY)]; Ruhengeri (Ruanda), 1.900 m, 27.I.1953 (1 ♀ leg. BASILEWSKY); Muhavura (Ruanda), 2.100 m, 28.I.1953 (1 ♀ leg. BASILEWSKY); [Biumba (Ruanda), 2.300 m, 6.II.1953 (1 ♂ ♀ leg. BASILEWSKY)]; [Kayove (Ruanda), 2.000 m, 14.II.1953 (1 ♂ leg. BASILEWSKY)].

[18. — **Phumosia fulva** (SÉGUY).]

Chopardimyia fulva SÉGUY, Ann. Soc. ent. France, CIX, 1941 (1940), p. 125, fig. 4.

SÉGUY based the new genus *Chopardimyia* on this species, of which only a single male is known. He characterized the genus as having a relatively broad suprasquamal ridge and a broad carina in the antennal groove. These features are found in different degrees of development in the species united under *Phumosia* (ZUMPT, 1953) and cannot, therefore, be regarded as good generic features.

According to the description, the body is wholly orange with a slight yellowish dusting, wings hyaline with the base yellowish tinged. Thorax

with *ac*=1+1, *dc*=2+4, two postsutural *ia* present, *prs* and probably the outer *ph* developed, scutellum with 4 pairs of marginal bristles, *st*=2:1, alar declivity with a few hairs. The eyes of the male are separated by a space about twice as broad as the anterior ocellus.

Length : 9 mm. — Described from the Ivory Coast, XII.1938.

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

[19. — **Phumosia rufescens** (VILLENEUVE).]

Paratricyclea rufescens VILLENEUVE, Rev. Zool. Bot. Afr., XIV, 1926, p. 65.

This species, unknown to me, should be similar to *P. fulva*, but it has only three postsutural *dc* developed. The thorax is said to be greyish-red, the remaining body dull red, wings greyish tinged.

Length : 8-9 mm.

The author based the description on several males and females from Mayumbe, Belgian Congo.

[20. — **Phumosia vittata** (CURRAN).]

Somalia vittata CURRAN, Amer. Mus. Nov., 248, 1927, p. 7.

Up to now only one male is known, which Dr. CURRAN kindly forwarded to me. It was collected near Faradje, Belgian Congo. *P. vittata* is well characterized by three dark brown, longitudinal, posteriorly abbreviated stripes on a rusty coloured and pollinose thorax, the almost unicoloured, yellow-brown, thickly pollinose abdomen and yellow legs. The eyes have the upper facets greatly enlarged but not demarcated from the lower ones, frons at the narrowest point measuring about 1/16 of eye-length; *iv*, *oc* and 8 *paf* present. Parafrontalia and -facialia brownish with grey dusting, the latter bare of setae. Third antennal segment about twice as long as the second, antennal groove with a broad and flat carina which shows a median deepened line. Thorax with the following chaetotaxy : *ac*=1+1, *dc*=2+3, *ia*=1+3, *ph*=2 (outer present), *h*=2, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=4+1, *st*=2:1. Pro- and poststigma yellow, propleuron and prosternum haired, alar declivity with a few setae. Abdomen about as long as broad. In the original description, the tergites are said to have « brownish apices », but in the type specimen before me, they are not differently coloured from the anterior parts, only a faint median line being a little darker brown. Fifth sternite with a deep incision. The hypopygium could not be dissected.

Length : 7 mm.

21. — **Phumosia schoutedeni** ZUMPT.

(Fig. 24.)

Phumosia schoutedeni ZUMPT, Ann. Mus. Congo Tervuren, Zool., 1, 1954, p. 576, fig. 1.

P. schoutedeni was fully described by me when discussing the status of

the genus *Phumosia*. It is an easily recognizable species with respect to external features as well as to the hypopygium (fig. 24).

Mission G. F. DE WITTE : Rutshuru, several localities, 1.100-1.285 m, I-V-VI-X-XI.1934, XII.1933, VII.1935 (119 ♂♂, 160 ♀♀); Rwindi, 1.000 m, 20-24.XI.1934 (16 ♂♂, 41 ♀♀); May-ya-Moto, 950 m, 10.XI.1934 (♀).

Collection L. LIPPENS : Sud lac Édouard : riv. Rwindi, 1.000 m, 4.II.1936 (1 ♂, 3 ♀♀).

Collection Musée du Congo : Rutshuru, II-IV-VI-IX-X.1936, VII.1937 (30 ♂♂, 91 ♀♀ leg. LIPPENS); gîte de Nukuli (Ruanda), 2.500 m, 17.III.1936 (3 ♂♂, 3 ♀♀ leg. LIPPENS); [Kinazi (Ruanda), 1.600 m, 5-8.I.1953 (1 ♂ leg. BASILEWSKY)]; [Bururi (Urundi), 1.800-2.000 m, 5-12.III.1953 (6 ♂♂, 12 ♀♀ leg. BASILEWSKY)]; [Makoronkwe (Urundi), 1.450 m, 12.III.1953 (1 ♂ leg. BASILEWSKY)].

Collection British Museum : [Bwamba, Uganda (2 ♂♂)]; [Kaimosi, Kenya (1 ♀)]; [Ukamba, Kenya (1 ♀)].

22. — **Phumosia bicolor** (BEZZI).

(Fig. 25.)

Tricyclea bicolor BEZZI, Ann. Soc. ent. Belg., LII, 1908, p. 383; VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 157; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 494.

I have not seen the type of this species, a male from the Congo, but refer to it a fairly common West and Central African form which VILLENEUVE and MALLOCH have identified as *P. bicolor*. It is a variable species ranging from 5-9 mm in length, with a dense grey and yellow-brown pollinosity and with a more or less distinct black pattern on the abdomen. In general appearance it is similar to brown, non metallic coloured specimens of *P. imitans* VILLENEUVE, but the outer *ph* is always wanting, and only 3 postsutural *dc* are developed. The hypopygium (fig. 25) is also very similar to that of *imitans*, a fact already discussed when dealing with this species (cf. p. 44). BEZZI's description being very inadequate, I am giving a redescription of this species.

Male. — Eyes with the upper facets only slightly bigger than the lower ones. The frons varies in width; at the narrowest point it may be as broad as the anterior ocellus or even reach $\frac{1}{10}$ of the eye length, so that the frontal stripe is present to its full extent. Frontal stripe red-brown, strongly dilated towards the antennal groove; parafrontalia and -facialia silvery dusted, the latter bare of setae, the former with sparse ones and 8-10 pairs of *paf*; *oc* and *iv* long; antennae yellow-brown, the third segment more or less darkened, about 2 ½ times as long as the second; antennal groove and buccae densely silvery dusted like the parafacialia; a broad, flatly arched antennal carina is more or less developed; vibrissarium red-brown with weaker dusting, several black setae on the facial ridge above the long

vibrissa; buccae about ⅓ of eye-length; peristomal bristles and buccal hairs black. Palpi yellow, slender, slightly dilated terminally.

Thorax with dark brown ground colour, the dorsum densely grey pollinose, with two median, narrow dark lines in front of the suture and ill-defined lateral vittae extending more or less beyond the suture; shoulders, tip of scutellum and the pleura partly brownish pollinose, but the pattern formed by the pollinosity is highly variable. Chaetotaxy : *ac*=0-1+1, *dc*=2+3, *ia*=1+2-3, *ph*=1, *h*=2-3, *prs*=1, *n*=2, *sa*=3, *pa*=2, scutellum with 3-4 longer marginal and one pair of discal bristles, *st*=1-2 : 1, one or two *pp* and *pst*. Pro- and poststigma yellow-brown, propleura and prosternum haired, alar declivity at least with a few black setae. Wings brownish tinged, veins yellow-brown, costal spine long, r_{4+5} dorsally with a few black setae which do not reach *r-m*, R_5 widely open, squama and halter yellow. Legs wholly light brown, fore-tibia with several *ad* and one long submedian *pv;* mid-tibia with 2 *pv* and one *pd*, *ad* and *av*; hind-tibia with several *ad* and *pd* as well as 2 *av*; claws and pulvilli about as long as the last tarsal segment.

Abdomen stout, about as long as broad, light brown, with the hind margins of the tergites and narrow median stripe dark brown, but this pattern may be more or less reduced, so that the abdomen is wholly yellow or brown. Lateral discal bristles are wanting, even on the last segment.

Female. — Eyes separated from each other by half the eye-length, buccae also half as high as the eye. Frons strongly dilated towards the antennal groove, frontal stripe subparallel, chaetotaxy of head complete, with 1 *f* and 2 proclinate *fo*.

Length : 5-9 mm.

Mission G. F. DE WITTE : Rutshuru, several localities, 1.100-1.285 m, XII.1933, V-VI.1934, VII.1935 (10 ♂♂, 13 ♀♀); Kanyabayongo (Kabasha), 1.760 m, 8.XII.1934 (2 ♀♀); Kamatembe, 2.100 m, 15-20.IV.1934 (2 ♀♀); entre Kalinga-Vitshumbi, 1.082-925 m, 12.XI.1934 (2 ♂♂, 2 ♀♀).

Collection Musée du Congo : Rutshuru, V.1936, VII.1937 (11 ♂♂, 16 ♀♀ leg. L. LIPPENS); [Kisantu, 1932 (3 ♂♂, 1 ♀ leg. R. P. VANDERYST)]; [Arebi : Bundo-Moto, VII.1925 (1 ♂, leg. H. SCHOUTEDEN)]; [Eala, XII.1935 (1 ♂ leg. J. GHESQUIÈRE)]; [Bambesa, XII.1933 (1 ♂ leg. H. J. BRÉDO)]; [Kwango : Dongo, 5.I.1940 (1 ♀ leg. VLEESCHOUWERS)]; [Haut-Lopori, V-VI.1927 (1 ♀ leg. GHESQUIÈRE)]; [Ituri : Faradje, II.1930 (1 ♀ leg. A. COLLART)]; [Albertville, XII.1918 (2 ♀♀ leg. MAYNÉ)].

Collection British Museum : [Jombeni Hills, Kenya, V.1947 (1 ♀)]; [Unyoro distr., Uganda (1 ♀)]; [Bwamba, Uganda (2 ♂♂)]; [Ibadan, N. Nigeria (2 ♂♂, 2 ♀♀)]; [Njala, S. Leone, IX.1929 (21 ♂♂, 18 ♀♀)].

Collection American Museum, New York : [Stanleyville, Belg. Congo, III.1915 (1♂)]; [Muepha River, Liberia (2 ♂♂)]; [Robertsport, Liberia (5 ♂♂, 7 ♀♀)].

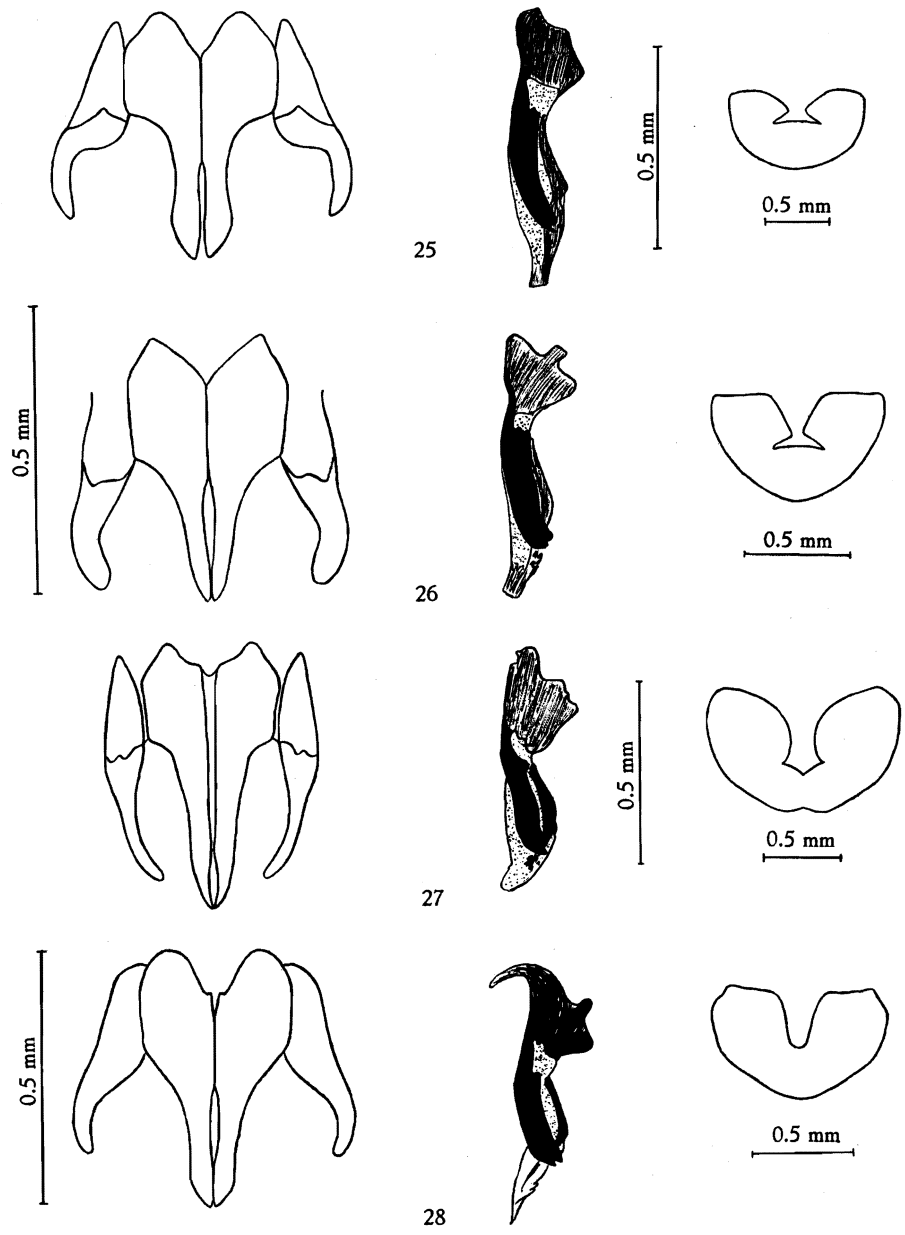


FIG. 25. — *Phumosia bicolor* (BEZZI). Cerci with paralobi, phallosome and 5th. sternite. Specimen from Rutshuru, P.N.A.

FIG. 26. — *Phumosia snyderi*, ZUMPT. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Robertsport, Liberia.

FIG. 27. — *Phumosia muscoidea* (CURRAN). Cerci with paralobi, phallosome and 5th. sternite. Specimen from P.N.A.

FIG. 28. — *Phumosia lutescens* (VILLENEUVE). Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Barberton, Transvaal.

[23. — **Phumosia snyderi** ZUMPT.]

(Fig. 26.)

Phumosia snyderi ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 185, fig. 4.

P. snyderi was described from Robertsport, Liberia. Later I also received a male specimen from Accra, Gold Coast. It is closely related to *P. bicolor* with which it agrees in the general shape of the body. However, it is generally more darkly coloured. The thorax and abdomen are black with a greyish-olive pollinosity. The darker pattern consists of more or less distinct longitudinal stripes on the thorax, and narrow posterior bands as well as a median stripe on the abdominal segments. The legs have blackish femora, the remaining joints being dark to light brown. Chaetotaxy as in *bicolor*, outer *ph* wanting as in this species. The *av* are wanting on the mid-tibia in the typical series, but it is doubtful whether this feature is constant in both species. The hypopygium (fig. 26) proves the close relationship to *bicolor*, but the cerci are distinctly slender and with the terminal points longer than in this species.

24. — **Phumosia muscoidea** (CURRAN).

(Fig. 27.)

Paratricyclea muscoidea CURRAN, Amer. Mus. Nov., 506, 1936, p. 5.

CURRAN described *P. muscoidea* from a single male caught at Kabale, Uganda. Through the kindness of the author, I have been able to check this specimen and to state its identity with a large series of both sexes which I have received from the Parc National Albert and from Ruanda. It is easily recognizable by its pattern and well characterized by the male terminalia (fig. 27).

The original description is quite adequate and only a few additions are needed. The width of the male frons varies to a certain degree as in most *Phumosia* species. At the narrowest point, it measures from $\frac{1}{7}$ to $\frac{1}{12}$ of the eye-length. The facets of the eyes are of almost equal size in both sexes. The chaetotaxy of the thorax is a follows : *ac*=0+0-1, *dc*=2+3, *ia*=0+2, *ph*=1, *h*=2-3, *prs*=1, *n*=2, *sa*=2-3, *pa*=2, *sc*=3+0-1, *st*=2 : 1, normally one thick and one thin *pp* and *pst* present, prosternum and propleuron haired, alar declivity bare. Legs black and densely pollinose, tibiae reddish-brown, or the whole legs are more or less uniformly brown; fore-tibia with several *ad* and a very long submedian *av;* mid-tibia with a strong submedian *ad* and *v* and 2 *pd*; hind-tibia with 2-3 long *ad* and *pd* and 1 or 2 submedian *av*. Abdomen slender, 1 $\frac{1}{2}$ times as long as broad.

In the female, the frons at vertex measures almost $\frac{2}{3}$ of the eye-length, frontal stripe parallel, parafrontalia and -facialia very broad, chaetotaxy of head complete, but the posterior *fo* short, the lower one very long and thick.

Length : 5-9 mm.

Mission G. F. DE WITTE : Mont Sesero, près Bitashimwa, 2.000 m, 1-2.VIII.1934 (4 ♂♂, 2 ♀♀); Nyarusambo, 2.000m, 2.VII.1934 (3 ♂♂, 3 ♀♀); May-ya-Moto, 950 m, 9.XI.1934 (2 ♂♂); vers Rweru (volc. Mikeno), 2.400 m, 3-26.VII.1934 (17 ♂♂, 2 ♀♀); Rutshuru (riv. Rodahira), 1.200 m, 1.VII.1935 (3 ♂♂, 2 ♀♀); Ngesko, 2.000 m, 3-6.IV.1934 (1 ♂); Ruanda : mont Tamira (près du lac N'Gando), 2.600 m, 11.II.1935 (22 ♂♂, 5 ♀♀); Nyabirehe and lac N'Gando (pied volc. Karisimbi), 2.400 m, 22.II.1925 and 8-9.III.1935 (91 ♂♂, 66 ♀♀).

Collection Musée du Congo : [lac Gando (N. Kivu), XII.1925 (1 ♂ leg. H. SCHOUTEDEN)].

25. — **Phumosia lutescens** (VILLENEUVE).

(Fig. 28.)

Paratricyclea lutescens VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 155.

Phumosia nana ZUMPT, Rev. Ecuat. Ent. Parasit., 1, 1953, p. 74, fig. 3 (syn. nov.).

The holotype of *P. nana* was based on material from the Northern Transvaal and fully described by me recently. I also had specimens from other parts of Africa before me (S. Rhodesia, Kenya, Uganda, Belg. Congo, Sudan and Gold Coast) which revealed that *P. nana* is a fairly variable species, like the other members of the « *stabulans*-group ». The intra-alar bristles vary from 1+3 to 0+2, the lower sternopleural bristle is sometimes present, sometimes weak or hair-like only. The male sex is readily separable by the shape of the hypopygium (fig. 28). The identity of the females must remain uncertain and they are therefore not taken into consideration in the following list.

Mission G. F. DE WITTE : Kivu : Rutshuru, several localities, 1.218-1.285 m, V-VII.1935 (7 ♂♂).

Collection L. LIPPENS : Sud lac Édouard : riv. Rwindi, II.1936 (2 ♂♂ leg. L. LIPPENS).

Collection Musée du Congo : Terr. Rutshuru, VII.1937 (2 ♂♂, MISS. PROPHYLACTIQUE); Rutshuru, Kilinga, II & IV.1936 (2 ♂♂ leg. L. LIPPENS); [Bambesa, 2.III.1939 (1 ♂ leg. J. VRYDAGH)]; [Ruanda : Biumba, 2.300 m, 6.II.1953 (1 ♂ leg. BASILEWSKY)]; [Ruanda : lac Nyakihugu, 17.III.1936 (1 ♂ leg. L. LIPPENS)]; [Urundi : Rumonge, 1934 (1 ♂ leg. A. LESTRADE)].

26. — **Phumosia cuthbertsoni** ZUMPT.

(Fig. 29.)

Phumosia cuthbertsoni ZUMPT, Rev. Ecuat. Ent. Parasit., 1, 1953, p. 72, fig. 2.

I based this species on 2 ♂♂ and 2 ♀♀ from Salisbury, S. Rhodesia, caught by the late Mr. A. CUTHBERTSON. These specimens are well characterized by the shape of the hypopygium. External features may also be used, with some caution, to separate them from the closely related *P. nana*.

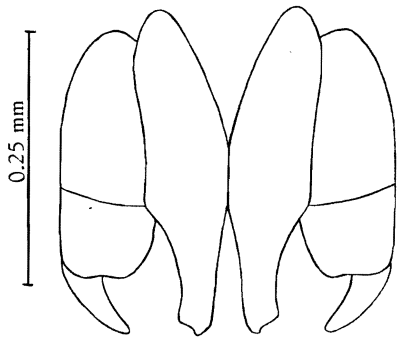


FIG. 29. — *Phumosia cuthbertsoni* ZUMPT.
Cerci and paralobi from a specimen collected in P.N.A.

The material before me from the Belgian Congo complicates the status of the species tremendously. With respect to the shape of the hypopygium (fig. 29) there is only a slight aberration to be found, the tips of the cerci being in the average less broadly truncated than in the type specimens. This feature, however, is variable, and cerci quite similar to that of the type may be seen. In the external features the difference is striking. The Congo specimens are a little slender, the general colouring appears to be darker, the pollinosity is black-olive, tibiae and tarsi are often as dark-brown as the femora. With respect to the chaetotaxy, a considerable variation is to be stated. On the mesonotum, the normal chaetotaxy includes *ac*=0+1, *ia*=0+2, *sc*=2+1, *st*=1 : 1, but the prescutellar *ac* may be wanting, *ia* may have the formula 1+2, the lower *st* may be present, and the scutellar bristles vary from 2+0 to 3+1. The width of the frons at the narrowest point lies between $\frac{1}{12}$ and $\frac{1}{10}$ of the eye-length, whereas in the type specimens, the eyes are almost touching. The body-length varies between 3,5 and 6 mm.

If the hypopygium were not so strikingly simlar to the typical *cuthbertsoni*, I would not hesitate to regard the Congo specimens as belonging to a new species. Perhaps we are dealing with a distinct subspecies which

should be named, but I do not want to take this step because I have only seen 2 pairs of *cuthbertsoni* from S. Rhodesia. Before splitting a species into subspecies, it is necessary to have a good knowledge of the variability within the different populations. This is not yet the case in *cuthbertsoni*. Even the Congo material is insufficient and, moreover, so badly preserved, that no exact statements regarding the external features in the different specimens can be made and no conclusions can be drawn.

I have therefore labelled the specimens listed below as *cuthbertsoni* with a ?, and intend to leave the clarifying of the taxonomic status to a future date when more, and well mounted, material becomes available.

Mission G. F. DE WITTE : Rutshuru, 1.250-1.285 m, 6-23.VI.1934 et 5-15.VII.1935 (7 ♂♂); Kanyabayongo (Kabasha), 1.760 m, 7.XII.1934 (14 ♂♂); Burunga (Mokoto), 2.000 m, 15.III.1934 (2 ♂♂); Kamatembe, 2.100 m, 17.IV.1934 (1 ♂); lac Magera, 2.000 m, 1.III.1934 (1 ♂); Ngesho, 2.000 m, 3-6.IV.1934 (2 ♂♂); Kinyamahura (Djomba), 1.800 m, 23.VIII.1934 (1 ♂); Kalondo (lac Ndalaga), 1.750 m, 22-27.III.1934 (1 ♂); Tshumba (Mushari), 2.100 m, 28.IV-1.V.1934 (2 ♂♂); [Uele : Monga (riv. Bili), 450 m, 18.IV-8.V.1935 (1 ♂)].

Mission H. DAMAS : Kalondo, 1.750 m, 6-9.VIII.1935 (9 ♂♂); N'Dalaga, 1.725 m, 8.VIII.1935 (2 ♂♂); [Likutu (Kivu), 15.VIII.1935 (1 ♂)].

Collection Musée du Congo : Rutshuru, 12.V.1936 (1 ♂ leg. L. LIPPENS).

27. — **Phumosia stabulans** (BEZZI).

(Fig. 30.)

Pollenia stabulans BEZZI, Bull. Soc. ent. Ital., XXXIX, 1908, p. 80; VILLENEUVE, Bull. Soc. ent. France, 1913, p. 242; VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 158; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 492.

? *Somalia enigmatica* HOUGH, Proc. Acad. Nat. Sci., L, 1898, p. 181.

? *Paratricyclea consors* VILLENEUVE, Ann. Soc. Ent. France, LXXXV, 1916, p. 152; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 492.

P. stabulans was described from a single female from Ghinda in Eritrea. I have not seen this specimen which has to remain doubtful in any case because the females of the so-called *stabulans*-group are not clearly separable with our present knowledge. I am referring to *stabulans* a species which has been identified by VILLENEUVE as this species. It is quite common in S. Africa and seems to be distributed over the Eastern and Central part of Africa. I have seen specimens from Natal (det. VILLENEUVE) and Transvaal, S. Rhodesia, Uganda and now also from the Eastern part of the Belgian Congo.

P. stabulans is well characterized in the male sex by the structure of the hypopygium, the cerci being fused (fig. 30). This is an unique feature in the genus *Phumosia*. External features characterizing the species are

a relatively broad frons in the male sex varying from 1/6-1/8 of eye-length, usually a presutural and a prescutellar *ac*, the wanting presutural *ia*, and the scutellar bristles consisting of 3 pairs of marginals and 1 pair of discals. The abdomen in the male is relatively slender, being 1 1/2 times as long as broad.

But unfortunately, these external characters are not reliable because of the overlapping variability of this and the related species. The chaetotaxy varies as given in the redescription below. The male frons, on account of its relatively great width, would be a feature separating *P. stabulans* from most related species, but it is known from other *Phumosia* species that the variability may be considerable also in this part of the body. *P. muscoidea*, of which I have received numerous specimens, may be taken as an example. The males of this species have the frons varying in width from 1/7 to 1/12 of eye-length.

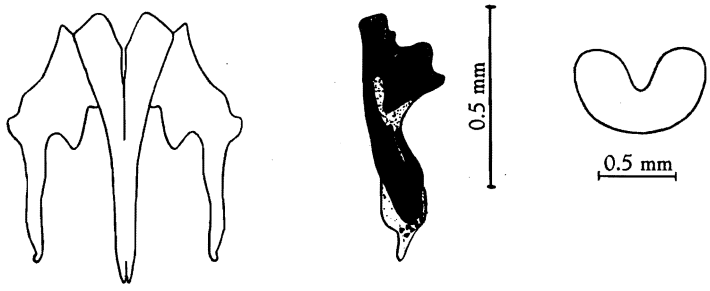


FIG. 30. — *Phumosia stabulans* (BEZZI).
Cerci with paralobi, phallosome and 5th. sternite.
Specimen from Bwamba, Uganda.

The taxonomic features of *P. stabulans* are as follows :

Male. — Eye with the upper facets slightly enlarged, frons at the narrowest point 1/6-1/8 as wide as the eye is long, widened towards the vertex as well as the antennal groove, frontal stripe black or more or less reddish, near the tip of the ocellar triangle about twice as broad as one parafrontalium, gradually dilated downwards; parafrontalia and -facialia silvery pollinose, bare except for the *paf; iv* and *oc* strong. The first two antennal segments light-brown, the third dark-brown to black, twice as long as the second. Buccae almost half as high as the eye, whitish pollinose on blackish ground, hairs black. Palpi yellow-brown, almost parallel, slightly curved.

Thorax with the ground colour predominantly black, with a dense grey and olive pollinosity forming 3 more or less distinct, dark, longitudinal bands on the mesonotum. Chaetotaxy : *ac*=0-1+1-2, *dc*=2+3, *ia*=0+2, *ph*=1, (outer absent) *h*=2-3, *prs*=1, *n*=2, *sa*=2-3, *pa*=2, *sc* normally 3+1 (some-

times 3+0 or 2+0), 1-2 *pst* and *pp*, *st*=2:1. Pro- and poststigma black-brown, propleuron and prosternum haired, alar-declivity bare. Wings hyaline or brownish tinged, the costal area sometimes more or less darker brown, veins yellow brown, costal spine long, r_{4+5} on the upper side with a few setae half-way to *r-m* which is slightly clouded, R_5 open; upper squama yellow-brown, lower dark-brown, halter yellowish. Legs with blackish femora and yellow-brown tibiae and tarsi; fore-tibia with several short *ad* and one longer submedian *pv*; mid-tibia with a submedian *ad*, 0-1 *av* and 1-2 *pd*; hind-tibia with 2 *ad* and 2 *pd*, 1 submedian *av*; tarsi and pulvilli relatively long, as long as the last tarsal segment.

Abdomen slender, about 1 ½ times as long as broad, with the same ground colour and pollinosity as the thorax, a narrow median vitta more or less distinct, the last three segments with marginal bristles, laterally sometimes with a few discals.

Female. — Frons at vertex about ⅔ as wide as the eye is long, strongly widened towards the antennal groove, frontal-stripe sub-parallel, black-brown or more or less reddish, buccae about ⅓ as high as the eye is long. Chaetotaxy of head consisting of *iv*, *ev*, *oc*, *f* and 1-2 *fo* of variable size.

Length : 5-8 mm.

Biology. — According to CUTHBERTSON (Tr. Rhod. Sci. Ass., 35, 1937, p. 28), the species is larviparous and the female drops 20-50 small larvae of 0,6-0,7 mm length. The adults are found on flowering plants, dung and faeces.

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 18-23.VI.1934 (2 ♂♂); Kanyabayongo (Kabasha), 1.760 m, 8.XII.1934 (2 ♂♂); escarpement de Kabasha, 1.500 m, 12.XII.1934 (1 ♂); Rutshuru (riv. Kanzarue), 1.200 m, 18.VII.1935 (1 ♂); Rutshuru, 1.285 m, VI et X.1934 (7 ♂♂); Nyongera (près Rutshuru), 1.218 m, 22.VII.1935 (2 ♂♂); Luofu, 1.700 m, 10.XII.1934 (1 ♂).

Mission H. DAMAS : Ishara, 15.X.1935 (1 ♂).

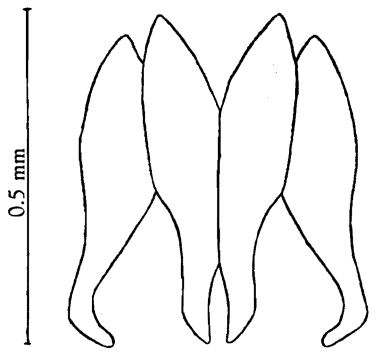
Collection Musée du Congo : Rutshuru, IV et V.1936 (8 ♂♂ leg. L. LIPPENS): [Kisantu, 1931 (1 ♂ leg. R. P. VANDERYST)].

The are further 16 ♀♀ from the Rutshuru district before me which most probably belong to this species.

28. — **Phumosia wittei** n. sp.

(Fig. 31.)

There are 3 specimens from the Rutshuru district before me which are separable from *P. stabulans* by a differently shaped hypopygium having free cerci and long paralobi bent inwards or backwards in the distal part (fig. 31). The external features fall within the range of variability of *P. stabulans*, except the narrowest width of the frons which varies from $\frac{1}{15}$ (holotype) to $\frac{1}{11}$ (paratype) of eye-length. Thorax with *ac*=0-1 (very weak in one paratype), *dc*=2+3, *ia*=0+2, *ph*=1, (outer absent),



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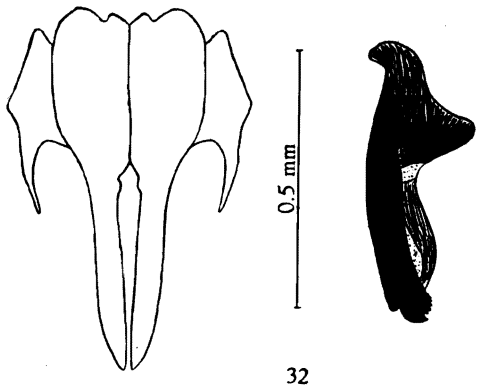

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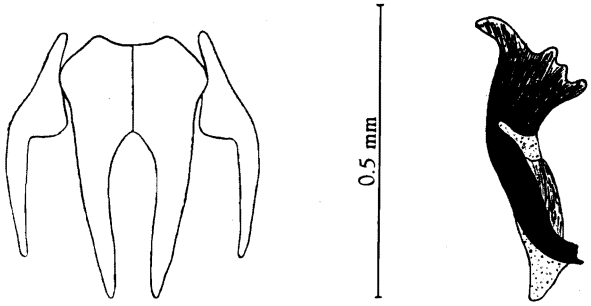

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FIG. 31. — *Phumosia wittei* n. sp. Cerci and paralobi in frontal view. Paratype from Rutshuru, P.N.A.

FIG. 32. — *Phumosia spinicosta* (MALLOCH). Cerci with paralobi and phallosome. Specimen from P.N.A.

FIG. 33. — *Phumosia dubiosa* (VILLENEUVE). Cerci with paralobi and phallosome. Specimen from Sumbi, Belgian Congo.

h=2, *prs*=1, *n*=2, *sa*=2, *pa*=2, *sc*=2+1 in the holotype and one paratype, 3+1 in the other paratype, *st*=2 : 1. Wings brown tinged, *r-m* not clouded in the specimens before me.

Length : 5-6 mm.

Mission G. F. DE WITTE :

Holotype : 1 ♂ labelled Kivu : Rutshuru, 1.285 m, 1-6.VI.1935 (in coll. Inst. Parcs Nat. du Congo Belge, Brussels).

Paratypes : Rwindi, 1.000 m, 20-24.XI.1934 (1 ♂); Rutshuru, 1.285 m, 18-23.VI.1934 (1 ♂ in coll. S. Afr. Inst. Med. Res., Johannesburg).

29. — **Phumosia spinicosta** (MALLOCH).

(Fig. 32.)

Obscuria spinicosta MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 96; CURRAN, Amer. Mus. Nov., 506, 1931, p. 3.

Like *P. stabulans*, this species was described from a single female (Njoro, Kenya). I have not seen this type, but it is characterized by the author by the wanting *ac* on the mesonotum and by the presence of only 2 pairs of marginal bristles on the scutellum. In other respects this species should be quite similar to *P. stabulans*.

Among the material received from the North-Eastern part of the Belgian Congo, I found several specimens which comply with MALLOCH's description, and which are characterized by a peculiar hypopygium having the paralobi strongly reduced (fig. 32). I refer them to MALLOCH's *spinicosta*.

Male. — Frons at the narrowest point 1/8-1/10 of eye-length, otherwise head characters as in *stabulans*. Thorax coloured as in this species, chaetotaxy as follows : *ac*=0+0-1, *dc*=2+3, *ia*=0+2, *ph*=1 (outer absent), *h*=2, *prs*=1, *n*=2, *sa*=2, *pa*=2, *sc*=2+0, one *pp* and *pst*, *st*=2:1. Remaining features as in *stabulans*.

Mission G. F. DE WITTE : Kanyabayongo (Kabasha), 1.760 m, 6.XII.1934 (1 ♂); May-ya-Moto, 950 m, 6-9.XI.1934 (1 ♂); Sake, 19-22.II.1934 (1 ♂).

Mission H. DAMAS : [Nyamirundi, rive Sud, 12.X.1935 (1 ♂)].

Collection L. LIPPENS : Sud lac Édouard : riv. Rwindi, 1.000 m, 24.IV.1936 (5 ♂♂).

Collection Musée du Congo : Kivu : Sake, 14.II.1936 (1 ♂ leg. L. LIPPENS); Rutshuru, 8.V.1936 (1 ♂ leg. L. LIPPENS).

[30. — **Phumosia dubiosa** (VILLENEUVE).]

(Fig. 33.)

Paratricyclea dubiosa VILLENEUVE, Ann. Soc. ent. France, LXXXV, 1916, p. 154.

VILLENEUVE described this species from a single female from Charo, Nyasaland, and characterized it mainly by the wanting *ac*, the presence of only two pairs of marginal bristles on the scutellum and by some other features which apply to a male specimen which I have received from the Belgian Congo. The features of this specimen are as follows :

Male. — Eyes with small facets, frons relatively broad, at the narrowest point measuring 1/7 of the eye-length, frontal stripe dark-brown, parafrontalia and -facialia silvery pollinose, the former very narrow near the ocellar-triangle, parafacialia bare. Vibrissarium to a great extent reddish brown, buccae grey pollinose, almost one third as high as the eye is long, with black hairs. Antennae dark brown, the third segment about twice as long as the second, carina between the antennae not developed. The chaetotaxy

includes a pair of long *iv* and proclinate *oc* as well as 6 pairs of *paf.* Palpi dark brown, curved and slightly widened towards the tip.

Thorax black, with grey and olive pollinosity; *ac* totally wanting, *dc*=2+3, *ia*=0+2, *ph*=1 (outer wanting), *h*=2, *prs*=1, *n*=2, *sc*=2+0, *st*=2 : 1, one *pst* and *pp.* Prosternum and propleuron haired, alar declivity bare. Pro- and poststigma blackish. Wings slightly brownish tinged, veins brown, *r-m* dark clouded and relatively thick, costa with strikingly long marginal spinules in the basal half and also with a big costal spine, r_{4+5} dorsally with setae half-way to *r-m*, R_5 open, squamae brownish tinged like the wings. Legs dark brown, fore-tibia with two thin *ad* and one long submedian *pv*; mid-tibia with a submedian *ad* and *av* as well as 2 *pv;* hind-tibia with 2 *ad* and 2 *av*, claws and pulvilli long.

Abdomen one fourth longer than broad, densely olive pollinose, without a distinct pattern, only a darker median line is faintly indicated; long marginal bristles present, but no discal ones. Hypopygium (fig. 33) with slender cerci and paralobi.

Length : 6 mm.

Collection Musée du Congo : Mayumbe : Sumbi, 6.V.1926 (1 ♂ leg. A. COLLART).

Genus **HEMIPYRELLIA** TOWNSEND.

Hemipyrellia TOWNSEND, Ins. Ins. Mens., VI, 1918, p. 154. — MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 504, et (10), III, 1929, p. 273. — AUBERTIN, Proc. Zool. Soc. London, 1931, p. 499. — TOWNSEND, Man. Myiol., V, 1937, p. 149. — S. WHITE, AUBERTIN & SMART, Fa. Brit. India, Diptera, VI, 1940, p. 41.

Type species : *H. curriei* TOWNSEND from Liberia.

AUBERTIN (1931), in her revision of the genus, listed 8 species which are restricted to the Old World. They are, in general appearance, very similar to species of the genus *Lucilia* and have sometimes been classified as a subgenus of it. But the presence of a haired supraspiracular convexity is to be regarded as a feature important enough to justify the generic separation of *Hemipyrellia* from *Lucilia. Phumosia* and *Hemipyrellia* are the only calliphorid genera in the Ethiopian region with a long-haired supraspiracular convexity. In other respects, however, *Hemipyrellia* is more closely related to *Lucilia*, with which it shares all remaining generic features.

H. pulchra is said to be viviparous (S. WHITE, AUBERTIN & SMART, 1940) and to breed in human excrements or decomposing carcasses. The same behaviour is true for *H. fernandica*, the most common *Hemipyrellia* species in Africa South of the Sahara, and one which is also known to be a facultative cause of wound myiasis in domesticated animals (ZUMPT, 1951).

KEY TO THE SPECIES.

1 (2) Antennae with the third segment bright orange.

Body metallic bluish-green, strongly pollinose anteriorly and on the hypopleura, the hind margins of the abdominal segments sometimes appearing slightly banded; legs blackish or dark brown, fore femora dark metallic green. Eyes in ♂ almost contiguous, frons at the narrowest point measuring 1/16-1/19 of the eye-length, eyes in ♀ separated from each other by fully half the eye-length. Thorax with *ac*=2+2, *dc*=3+3, *ia*=1+2-3, *sc*=4+1, *st*=1-2 : 1. 7-9 mm. — Nigeria, Anglo-Egyptian Sudan, Port. E. Africa, India .....
1. *H. pulchra* (WIEDEMANN).

2 (1) Antennae with the third segment blackish brown 3

3 (4) Eyes in ♂ close together, width of frons at the narrowest point not greater than twice the diameter of the anterior ocellus, ♀ frons at vertex half as broad as the eye is long. The black bristles above the vibrissa almost reach the middle of the facial ridge.

Colouring as in the foregoing species, but legs more brownish and fore-femora not glossy metallic. Chaetotaxy of thorax also as in *pulchra*. 7-9 mm. — Up to now, only known from the Madagascan region and the Seychelle Is., but perhaps still to be discovered in the Ethiopian region too .....
2. *H. brunnipes* (MACQUART).

4 (3) Eyes in ♂ widely separated, frons at the narrowest point 1/7-1/8 as broad as the eye is long, in ♀ at vertex almost half as broad. The black bristles above the vibrissa only cover one fourth to one third of the lower facial ridge.

Colouring and chaetotaxy as in *pulchra*. 5-10 mm. — A very common fly which is probably distributed all over the Ethiopian region, but has not yet been found elsewhere .....
3. *H. fernandica* (MACQUART).

[1. — **Hemipyrellia pulchra** (WIEDEMANN).]

(Fig. 34.)

Musca pulchra WIEDEMANN, Auss. Zweifl. Ins., II, 1830, p. 406; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 505; AUBERTIN, Proc. Zool. Soc. London, 1931, p. 503, fig. 3; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 44, fig. 18.

Lucilia ruficornis MACQUART, Mém. Soc. Nat. Sci. Agric. Arts Lille, 1847, p. 100, et Dipt. Exot. Suppl., II, 1847, p. 84.

Musca phellia WALKER, List. Dipt. Brit. Mus., IV, 1849, p. 884.

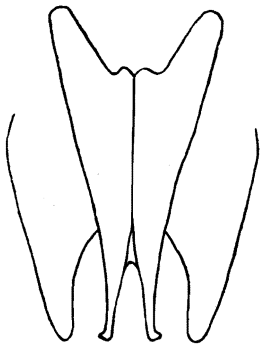
Somomyia pagodina BIGOT, Ann. Soc. ent. France, (5), VII, 1877, p. 40.

H. pulchra has only recently been recorded from the Ethiopian region. Even in the « Fauna of British India » (1940), only places in India are listed. The species is well characterized by its hypopygium (fig. 34) and easily separable from the other Ethiopian species, *H. fernandica*, by the bright orange 3rd antennal segment and the narrow frons in the male.

Collection S. A. Institute for Med. Research, Johannesburg : Maiduguri, Nigeria, IX.1942 (2 ♂♂).

Collection British Museum London : Wad Medani, Anglo-Egyptian Sudan, 21.II.1945 (1 ♂♀ leg. LEWIS).

Collection Zool. Museum Berlin : Chifumbasi, Port. E. Africa, IV.1905 (1 ♀ leg. W. TIESLER).



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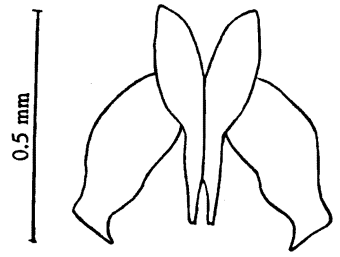

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FIG. 34 — *Hemipyrellia pulchra* (WIEDEMANN). Cerci and paralobi in frontal view. Specimen from Wadi medani, Sudan.

FIG. 35. — *Hemipyrellia brunnipes* (MACQUART). Cerci and paralobi in frontal view. Specimen from Madagascar.

[2. — **Hemipyrellia brunnipes** (MACQUART).]

(Fig. 35.)

Lucilia brunnipes MACQUART, Mém. Soc. Sci. Agric. Arts Lille, 1843, p. 295, et Dipt. Exot., II, 1843, p. 138.

Lucilia argentipes MACQUART, Dipt. Exot. Suppl., IV, 1851, p. 246.

Lucilia madagascariensis MACQUART, Mém. Soc. Sci. Agric. Arts Lille, 1851, p. 219, et Dipt. Exot. Suppl., IV, 1851, p. 246; VILLENEUVE, Rev. Zool. Afric., IV, 1916, p. 205.

Lucilia borbonensis MACQUART, Mém. Soc. Sci. Agric. Arts Lille, 1851, p. 220, et Dipt. Exot. Suppl., IV, 1851, p. 247.

Hemipyrellia cyanea AUBERTIN (nec FABRICIUS), Proc. Zool. Soc. Lond., 1931, p. 501, fig. 2; VAN EMDEN, Ruwenzori, Exp. 1934-1935, II. n° 6, 1951, p. 701.

Hemipyrellia pseudofabriciana ENDERLEIN, Sitzber. Ges. naturf. Fr. Berlin, 1935, p. 246.

The separation of the females of this species and of *fernandica* is difficult, but the males are easily recognizable by the width of the frons and the structure of the hypopygium (fig. 35).

In the collections of the S. African Institute for Medical Research and the Zool. Museum of Berlin, there are several specimens from different localities on Madagascar and from the Seychelle Is.

3. — **Hemipyrellia fernandica** (MACQUART).

(Fig. 36.)

Lucilia fernandica MACQUART, Mém. Soc. Sci. Agric. Arts Lille, 1855, p. 132, et Dipt. Exot. Suppl., V, 1855, p. 112; AUBERTIN, Proc. Zool. Soc. London, 1931, p. 500, fig. 1; PATTON & CUSHING, Ann. Trop. Med. Parasit., XXVIII, 1934, p. 118.

Lucilia taeniops BIGOT, Ann. Soc. ent. France, (3), VII, 1859, p. 542.

Lucilia assiniensis BIGOT, Ann. Soc. ent. France, 1891, p. 380.

Hemipyrellia curriei TOWNSEND, Ins. Ins. Mens., VI, 1918, p. 154.

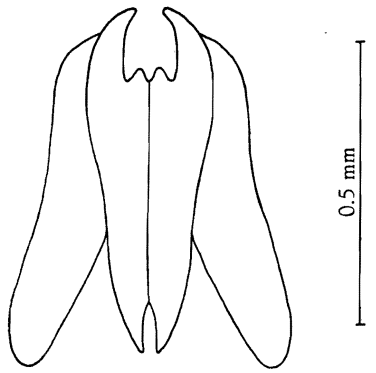


FIG. 36. — *Hemipyrellia fernandica* (MACQUART).
Cerci and paralobi in frontal view.
Specimen from Yaoundé, Cameroons.

H. fernandica is a very common fly in the Ethiopian region and, if the generic characters are carefully checked, it cannot be placed in any other genus. But on account of its superficial similarity to *Lucilia sericata* and *L. cuprina*, it is often, especially by non-dipterists, taken for one of these species. The shape of the hypopygium (fig. 36) is quite characteristic.

Mission G. F. DE WITTE : [Uele : Buta, 450 m, 11.IV.1935 (1 ♀)].

Mission H. Damas : Bugazia, lac Édouard, rive Ouest, 915 m, 13-16.V.1935 (2 ♀ ♀); riv. Ondo, affl. Rutshuru, 1.000-1.200 m, 30.VII.1935 (1 ♀).

Collection L. LIPPENS : Sud lac Édouard, cp. Rwindi, 1.000 m, 25.IV.1936 (1 ♀).

Collection Musée du Congo : Kivu : Kisenyi., 925 m, IV.1923 (2 ♀♀ leg. VAN SACEGHEM); [Rwankwi, IV.1948 (2 ♀♀ leg. J. V. LEROY)]; [Wan, XII.1921 (1 ♀ leg. VAN SACEGHEM)]; [Ituri : Kilo, 1930 (1 ♀ leg. G. DU SOLEIL)]; [Bunia, II.1934 (3 ♀♀ leg. J. V. LEROY)]; [Sankuru : Kondue (3 ♀♀ leg. E. LUJA)]; [Komi, 8.II.1930 (7 ♂♂, 2 ♀♀ leg. J. GHESQUIÈRE)]; [Uele : Moto, 1920 (1 ♀ leg. L. BURGEON)]; [Dinglia, 1935 (1 ♂ leg. J. V. LEROY)]; [Bambesa, 30.X.1937 (4 ♂♂, 18 ♀♀ leg. J. V. LEROY)]; [Katanga : Luilu, XII.1925 (1 ♂ leg. CH. SEYDEL)]; [lac Albert : Kasenyi, 15.V.1935 (2 ♂♂, 10 ♀♀ leg. H. J. BRÉDO)]; [Urundi : Rumonge, 1934 (1 ♀ leg. A. LESTRADE)]; [Kanyinya, 1.500 m, 1947 (leg. DAMES DE MARIE)]; [Bas-Congo : Mangembo, 1932 (1 ♀ leg. ZWOLAKOWSKI)]; [Kwango : Dongo, 5.I.1940 (1 ♂♀ leg. VLEESCHOUWERS)]; [Kikwit, XII.1920 (leg. P. VANDERIJST)]; [Wamba, 1936 (1 ♂ leg. DEGOTTE)]; [Léopoldville, X.1941 (1 ♂, 3 ♀♀ leg. J. LEPERSONNE)]; [Albertville, 18.III.1936 (2 ♀♀ leg G. HOESLI)]; [Jadotville, 1948 (5 ♀♀ leg. R. M. M. ADELAIDE)]; [Coquilhatville, 1945 (1 ♀ leg. *P.* HULSTAERT)]; Rutshuru, 20.III.1936 (1 ♂, 2 ♀♀ leg. L. LIPPENS); [Barumbu, VIII.1923 (8 ♀♀ leg. J. GHESQUIÈRE)]; [Kasai (1 ♀ leg. L. ACHTEN)]; [Port-Francqui, X.1937 (4 ♀♀ leg. MME GILLARDIN)]; [Nyangwe, IV-V.1918 (1 ♂♀ leg. R .MAYNÉ)]; [Élisabethville, 31.I.1930 (5 ♂♂, 11 ♀♀ leg. M. BEQUAERT)]; [Uvira, habitation, VIII-XII.1949 (8 ♂♂, 18 ♀♀, leg. G. MARLIER)]; [Eala, X.1929 (1 ♂, 6 ♀♀ leg. H. J. BRÉDO)]; [Kisantu, 1927 (1 ♂♀ leg. R. P. VANDERYST)]; [Gabon : Libreville, 1-12.I.1931 (1 ♀ leg. A. TINANT)]; [île de San THOMÉ, (1 ♀ leg. DE SAEGER)].

Collection S. A. Institute for Med. Research, Johannesburg : Much material is recorded in the card-register or present in the collection from all four provinces of the Union of S. Africa, from S. W. Africa, Bechuanaland, S. Rhodesia and Port. E. Africa.

Collection Zool. Museum Berlin : [Nkolentangan, Span. Guinea, 14.XI.1907 (1 ♀ leg. G. TESSMANN)]; [Uam-Gebiet, S. O. Kamerun, 21.V.1914 1 ♂, 2 ♀♀ leg. G. TESSMANN)]; [Chifumbasi, Port. O. Afrika, IV.1905 (5 ♂♂ leg. W. TIESLER)]; [Alcu-Benito Gebiet, Span. Guinea, 1-15.IX.1906 (1 ♀ leg. G. TESSMANN)]; [Langenberg, Nyassa See, 19-30.III.1898 (1 ♂, 3 ♀♀ leg. FUELLEBORN)]; [Dodoma, D. O. Afrika, (2 ♀♀ leg. BRANDES)]; [Gelo-Fluss, O. Sudan (2 ♀♀ leg. O. NEUMANN)]; [Bibundi, Kamerun, 18-30.X.1904 (1 ♀ leg. G. TESSMANN)]; [Bismarckburg, Togo, 8-13.III.1893 (1 ♂, 2 ♀♀ leg. L. CONRADT)]; [Misahoehe, Togo, 10.IV.1894 (1 ♂ leg. E. BAUMANN)].

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

Genus **LUCILIA** ROBINEAU-DESVOIDY.

Lucilia ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 452; MALLOCH, Ann. Mag. N. H., (9), XVII, 1936, p. 503 et (10), III, 1929, p. 273; SÉGUY. Encycl. Ent. A IX, 1928, p. 145 et A XXI, 1941, p. 26; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 395; TOWNSEND, Man. Myiol., V, 1937, p. 151; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 46; WATERHOUSE and PARAMONOV, Austr. J. Sci. Res., III B, 1950, p. 311; HALL, Blowflies N. America, 1948, p. 223.
Type species : *M. caesar* LINNÉ from Sweden.

Phaenicia ROBINEAU-DESVOIDY, Hist. Nat. Dipt. Paris, II, 1863, p. 750; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 504; TOWNSEND, Man. Myiol., V, 1937, p. 162; HALL, Blowflies N. America, 1948, p. 231.
Type species : *M. sericata* MEIGEN from Germany.

Phumonesia VILLENEUVE, Bull. Soc. Ent. France, 1914, p. 307; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 273; TOWNSEND, Man. Myiol., V, 1937, p. 164.
Type species : *P. infernalis* VILLENEUVE from Tanganyika.

Bufolucilia TOWNSEND, Proc. U. S. Nat. Mus., LVI, 1919, p. 542 et Man. Myiol., V, 1937, p. 140; HALL, Blowflies N. America, 1948, p. 215.
Type species : *L. bufonivora* MONIEZ from France.

Caesariceps ROHDENDORF, Rev. Zool. russe, VI, 1926, p. 93; TOWNSEND, Man. Myiol., V, 1937, p. 141.
Type species : *L. flavipennis* KRAMER nec. MACQUART from France.

Dasylucilia ROHDENDORF, Rev. Zool. russe, VI, 1926, p. 93; TOWNSEND, Man. Myiol., V, 1937, p. 141.
Type species : *L. pilosiventris* KRAMER from Germany.

Roubaudiella SÉGUY, Bull. Soc. Path. exot., XVIII, 1925, p. 735; TOWNSEND, Man. Myiol., V, 1937, p. 170.
Type species : *R. caerulea* SÉGUY from French Congo.

Luciliella MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 507; TOWNSEND, Man. Myiol., V, 1937, p. 152.
Type species : *L. fumicosta* MALLOCH from Phillipine Is.

Viridinsula SHANNON, Proc. Ent. Soc. Wash., XXVIII, 1926, p. 131; TOWNSEND, Man. Myiol., V, 1937, p. 175.
Type species : *L. pionia* WALKER from Galapagos Is.

Chaetophaenicia ENDERLEIN, Tierwelt Mitteleurop., VI, 3, 1936, p. 211 (syn. nov.).
Type species : *L. silvarum* MEIGEN from Germany.

AUBERTIN (1933), in an excellent revision of this genus on a worldwide basis, has given drawings of the terminalia of each species. An additional paper which should be mentioned, is one by WATERHOUSE and PARAMONOV (1950) which deals with the detailed taxonomy of *L. sericata* (MEIGEN) and *L. cuprina* (WIEDEMANN), the most important species from an economic point of view. The genus *Lucilia*, as defined by AUBERTIN, is easily separable in both sexes from the remaining Calliphorid genera.

The generic features may be summarized as follows :

Head in male with the eyes always bare, upper facets rarely markedly enlarged, the width of frons at the narrowest point not exceeding ⅓ of eye-length; *ev*, *f* and *fo* not developed, although present in the female sex. Parafacialia normaly bare, only in one species (*L. fumicosta* MALLOCH) with a row of minute bristles. Median carina in the antennal groove not or only weakly developed in the upper part.

Thorax with *ac*=2-3+2-3, *dc*=3+3, *ia*=1+2-3, *ph*=3, *h*=3-4, *n*=2, *sa*=3, *pa*=2, *sc*=4-5+1-2, *st*=2 : 1, at least 1 *pst* and 1 *pp* present, alar declivity, propleuron and prosternum setulose, but supraspiracular convexity always without upright hairs. Suprasquamal ridge with an anterior and a posterior tuft of hairs. Wing with the stem-vein bare, subcostal sclerite with a few setae or with decumbent pubescence only, r_1 not setulose, R_5 open, thoracic squama broad, truncate, bare dorsally. Legs without outstanding features, fore-tibia with 1 *pv* and several *ad*; mid-tibia with a variable set of bristles, lying between 0-3 *ad*, 1-2 *av*, 1-3 *pd* and 1-2 *pv;* hind-tibia with several *ad*, 2-3 *pd* and 2-3 *av*.

Abdomen constructed as in *Calliphora*, sternites relatively small, the first two sternites clearly visible, the following ones slightly overlapped by the tergites; fifth sternite emarginated, without special thorns or bristles; 3 genital segments, cerci mostly free, rarely fused, and paralobi cerci-like; phallosome with the same structure as in the true *Calliphora* species, theca and phallus separated, spine always present, harpes rod-like and terminally bent, vesicae well sclerotized, denticulated.

The genus *Lucilia* is distributed all over the world but only poorly represented in the Ethiopian region by 3 species, namely *L. infernalis* (VILLENEUVE), *L. cuprina* (WIEDEMANN) and *L. sericata* (MEIGEN), of which only the first two are probably endemic in our region. *L. sericata* has evidently been introduced by man from the Palaearctic region, whereas *L. cuprina* may have been spread from Africa to other tropical and subtropical parts of the world by the sheep-farming industry.

Nothing is known about the bionomics of *L. infernalis*, but extensive literature is available on biological and ecological facts regarding the two other Ethiopian species. In South Africa, a great deal of work on the bionomics of *L. sericata* and *L. cuprina* has been done by SMIT (1931) and by HEPBURN (1943). Both authors as well as HALL (1948) give further references to these and other « blow-flies ». They are also known to cause myiasis in man and animals, *L. cuprina* being the most important « sheep blow fly » in S. Africa and Australia (ZUMPT, 1951).

KEY TO THE SPECIES.

1 (2) Costal area of wing deeply infuscate; subcostal sclerite with one or more wiry upright bristles.

Body metallic dark blue to purple, legs brownish black. Eyes in ♂ nearly touching, in ♀ separated by a distance almost equal to ⅓ of eye-length. Thorax with *ac*=3+2-3, *dc*=3+3, *ia*=1+2. 8-10 mm. — Probably distributed over the whole rain forest area of Africa, southwards to the mountanous regions of S. Rhodesia ..... 1. *L. infernalis* (VILLENEUVE).

2 (1) Costal area not infuscated, but wings totally hyaline; subcostal sclerite with fine decumbent pubescence only 3

3 (4) Fore femur in both sexes black or dark bluish metallic. Head with 6-8 occipital bristles on each side, humeral callus with 6-8 setae. Male with the hairs on the abdominal sternites about the same length as those on the hind femur and tibia.

Body metallic green or bluish-green. Frons at the narrowest point measuring ⅕-⅙ of eye-length in ♂, more than half of eye-length in ♀. Thorax with *ac*=2+3, *dc*=3+3, *ia*=1+2. 5-10 mm. — Almost worldwide ..... 2. *L. sericata* (MEIGEN).

4 (3) Fore femur in both sexes bright metallic green. Head with only one occipital bristle on each side, humeral callus with 2-4 setae. Male with the hairs on the abdominal sternites strikingly longer than on the hind femur and tibia.

Body metallic green to blue-green or coppery, in some parts of the area of distribution predominantly dull olive-bronze. Frons at the narrowest point measuring about ¼ of eye-length in ♂, about ⅘ of eye-length in ♀. Thoracic chaetotaxy as in the foregoing species. 5-10 mm. — A cosmopolite of the tropical and subtropical regions ..... 3. *L. cuprina* (WIEDEMANN).

[1. — **Lucilia infernalis** (VILLENEUVE).]

(Fig. 37.)

Phumonesia infernalis VILLENEUVE, Bull. Soc. ent. France, LXXXIII, 1914, p. 307; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 404, fig. 9-10.

Roubaudiella caerulea SÉGUY, Bull. Soc. Path. exot., XVIII, 1925, p. 735; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 405 (*syn. nov.*).

?Phumonesia bimaculata VILLENEUVE, Bull. Ann. Soc. ent. Belge, LXVI, 1926, p. 269 (*syn. nov*).

Lucilia nigricosta MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 507.

Phumonesia villeneuvei CURRAN, Amer. Mus. Nov., 248, 1927, p. 4.

In general appearance, this species is very similar to *Phumosia mallochi* ZPT. n. n. from which, of course, it is easily separable by the

generic features. AUBERTIN, in her revision of the genus, listed *caerulea* SÉGUY as a « var. » of *infernalis* VILLENEUVE, but was inclined to think that she was dealing with only a « single variable species ». The variety is separated by AUBERTIN in the male sex, the only sex she was able to compare, by dark brown antennae, a more or less infuscated alar squama and by having only two pairs of postsutural *ac*, whereas the nominate form has orange antennae, a white upper squama and 3 postsutural *ac*. The structure of the hypopygium (fig. 37) is identical in both forms.

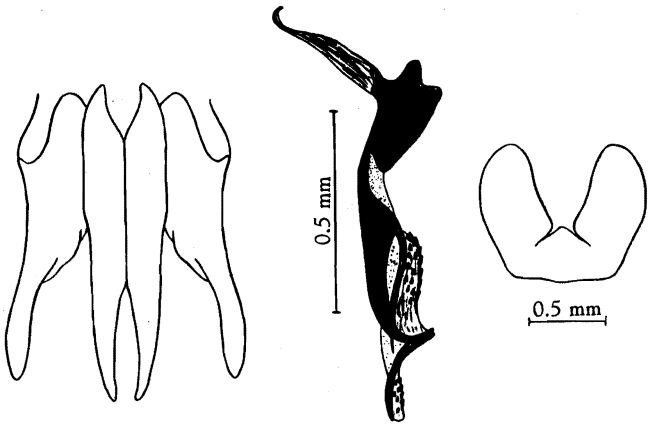


FIG. 37. — *Lucilia infernalis* (VILLENEUVE).
Frontal view of cerci, paralobi and 5th. sternite, lateral view of phallosome.
Specimen from Ituri, Belgian Congo.

In spite of the wide area of distribution, this species seems to be rare and I myself have only seen relatively few specimens. However, I received the same impression as AUBERTIN with respect to the variability and propose to place *caerulea* definitely into the synonymy of *infernalis*.

Collection Musée du Congo : [Ituri : Beni, X.1928 (1 ♀ leg. M^me^ VAN RIEL)]; [mont Wago, 24.XI.1928 (1 ♂ leg. A. COLLART)]; [Ruanda : Kayove, 2.000 m, 14.II.1953 (1 ♀ leg. BASILEWSKY)].

Collection Naturhist. Museum Wien : [N. W. Tanganyika, 1910 (1 ♂ ♀, leg. GRAUER, types of *infernalis*)].

Collection Zool. Museum Berlin : [Bismarckburg, Togo, 9-11.V.1893 (1 ♂ ♀, leg. L. CONRADT)]; [Buea, Kamerunberg, 900-1.200 m, 12.X.1910 (1 ♀ leg. HINTZ)]; [Alca Benito, Span. Guinea, 1-15.IX.1906 (1 ♀)].

Collection American Museum, New York : [Stanleyville, Belg. Congo, III.1915 (1 ♀, type of *villeneuvei*)]; [Robertsport, Liberia, 15.IX.1942 (1 ♀)].

Collection Nat. Museum, Bulawayo : [Chirinda Forest, S. Rhodesia, X.1926 (1 ♂ ♀)]; [Vumba Mts., S. Rhodesia III.1935 (1 ♂)].

[2. — **Lucilia sericata** (MEIGEN).]

(Figs. 38, 39.)

Musca sericata MEIGEN, Syst. Beschr., V.1826, p. 53; SÉGUY, Encycl. Ent., A IX, 1928, p. 9, figs. 199, 205, 206, 209, 210, et A XXI, 1941, p. 31; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 411, fig. 17; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 54, fig. 26; HALL, Blowflies N. America, 1948, p. 259, figs.; WATERHOUSE and PARAMONOV, Austr. J. Sci. Res., B III, 1950, p. 310 ff, figs.

Musca nobilis MEIGEN, Syst. Beschr., V, 1826, p. 56.

Musca tegularia WIEDEMANN, Auss. Zweifl. Ins., II, 1830, p. 655.

Chrysomyia capensis ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 451.

Lucilia modesta ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 454.

Lucilia pubescens ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 454.

Lucilia calida ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 464; MACQUART, Dipt. exot., II, 1835, p. 258.

Musca pruinosa MEIGEN, Syst. Beschr., VII, 1830, p. 294.

Lucilia chloris HALIDAY, Ent. Mag., I, 1833, p. 165.

Lucilia flavipennis MACQUART (nec KRAMER), Mém. Soc. Roy. Agric. Arts Lille, 1842, p. 296 et Dipt. exot., II, 3, 1843, p. 139.

Lucilia basalis MACQUART, Mém. Soc. Roy. Agric. Arts Lille, 1842, p. 305, et Dipt. exot., II, 3, 1843, p. 148.

Musca lagyra WALKER, List. Dipt. Brit. Mus., IV, 1849, p. 885.

Lucilia latifrons SCHINER, Fa. Austr., I, 1862, p. 590.

Lucilia sayi JAENNICKE, Abh. senckenb. naturf. Ges., VI, 1867, p. 375.

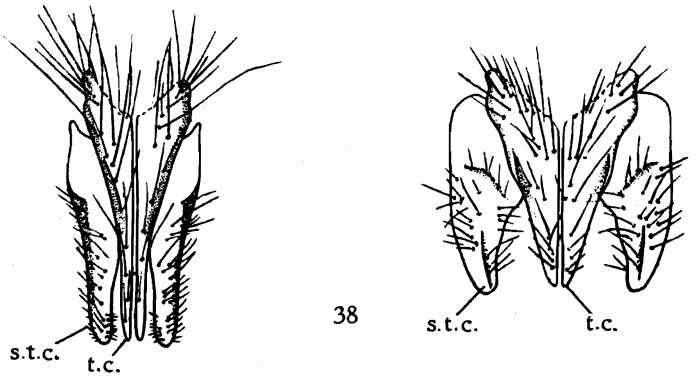
Lucilia barberi TOWNSEND, Smiths. Misc. Coll., LI, 1908, p. 121.

Lucilia giraulti TOWNSEND, Smiths. Misc. Coll., LI, 1908, p. 121.

For Synonymy see also WATERHOUSE and PARAMONOV (1950).

L. sericata and *L. cuprina* are listed by several authors (see HALL, 1948) in a separate genus, *Phaenicia* ROBINEAU-DESVOIDY. But, according to WATERHOUSE and PARAMONOV (1950), neither of the characters given to separate *Phaenicia* from *Lucilia* can be regarded «as providing adequate justification for any more than subgeneric status». The question is, however, whether it is advisable at all to retain or to create subgeneric names which are subject to the laws of nomenclature. We have enough scientific names to deal with, so that I share the opinion of many other contemporary authors that, if it is really necessary to subdivide a genus, independant group-names would fulfil the same purpose.

L. sericata and *L. cuprina*, especially in the female sex, have often been confused with each other in former papers. WATERHOUSE and PARAMONOV, in an excellent paper, have studied the taxonomy of both species intensively and found several characters which allow the females to be separated with absolute certainty. The males cannot be confused at all, if the width of the frons and the length of the ventral hairs of the abdomen are carefully studied. The hypopygia are quite distinct (see figs 38 and 39).



38

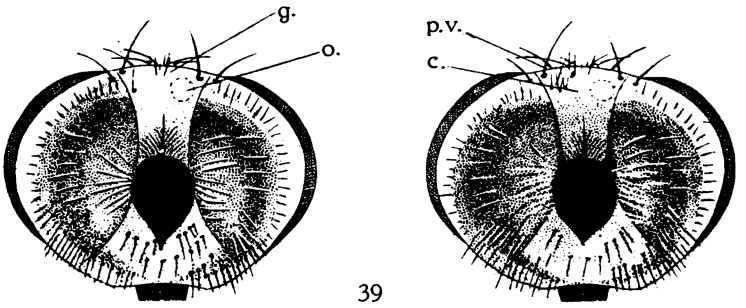


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FIG. 38. — Cerci and paralobi in frontal view of *Lucilia cuprina* (WIEDEMANN) — left — and *L. sericata* (MEIGEN) — right. (After WATERHOUSE & PARAMONOV.) s.t.c. = paralobus; t.c. = cercus.

FIG. 39. — Posterior view of head of *Lucilia cuprina* (WIEDEMANN) — left — and *L. sericata* (MEIGEN) — right. (After WATERHOUSE & PARAMONOV.) c. = cerebrale; g. = post-vertical bristles; o. = area of occipital bristles; p.v. = inner vertical bristle.

L. sericata is indigenous in the Holartic region and has been transported from there by man to almost all other parts of the world, but most probably only recently. It is by no means common in Central and S. America, and its behaviour and irregular distribution in the Oriental and Australasian regions undoubtedly reveal that it is an introduced species there. The same is true for the Ethiopian region. In South Africa, for instance, *L. sericata* is most common in or near larger towns and other « strongly civilized » places, whereas it is rare or even wanting in rural districts, its place being taken there by *L. cuprina.*

There were no specimens of *L. sericata* among the material I received from the Belgian Congo, neither have I seen any in other collections from the tropical parts of Africa.

A modern account of the life-history, with detailed descriptions and figures of the immature stages, is given by HALL (1948) and by WATERHOUSE and PARAMONOV (1950).

3. — **Lucilia cuprina** (WIEDEMANN).

(Figs. 38, 39.)

Musca cuprina WIEDEMANN, Auss. Zweifl. Ins. II, 1830, p. 654; SHANNON, Proc. Ent. Soc. Wash., XXVIII, 1926, p. 131; MALLOCH, Proc. Linn. Soc. N. S. Wales, LII, 1927, p. 321; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 413, figs 18-19; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 55, figs. 27-28; WATERHOUSE and PARAMONOV, Austr. J. Sci. Res., B III, 1950, p. 310 ff., figs.

Lucilia dorsalis ROBINEAU-DESVOIDY, Ess. Myod., 1830, p. 453; WATERHOUSE & PARAMONOV, Austr. J. Sci. Res., B III, 1950, p. 310 ff.

Lucilia amica ROBINEAU-DESVOIDY, Ess. Myod., 1830, p. 453.

Lucilia elegans ROBINEAU-DESVOIDY, Ess. Myod., 1830, p. 458.

Lucilia argyrocephala MACQUART, Mém. Soc. Roy. Agric. Arts Lille, 1846, p. 326, et Dipt, Exot. Suppl., I, 1846, p. 198; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 506.

Musca fucina WALKER, List. Dipt. Brit. Mus., IV, 1849, p. 883.

Musca serenissima WALKER, Ins. Saunders, IV, 1852, p. 340.

Musca temperata WALKER, Ins. Saunders, IV, 1852, p. 340.

Lucilia leucodes FRAUENFELDT, Verh. zool, -bot. Ges. Wien XVII, 1867, p. 453.

Somomyia pallifrons BIGOT, Ann. Soc. ent. France, VII, 1877, p. 257.

Strongyloneura nigricornis S.-WHITE, Spolia Zeylan., XIII, 1924, p. 115.

Lucilia pallescens SHANNON, Ins. Ins. Mens., XII, 1924, p. 78; HALL, Blowflies, N. America, 1948, p. 247, figs.; WATERHOUSE and PARAMONOV, Austr. J. Sci. Res., B III, 1950, p. 312.

Lucilia sericata SMIT, Sci. Bull. Dept. Agric. S. A., n° 62, 1928, p. 1; et Rep. Dir. Vet. Serv., Onderstepoort, 1931, p. 299, figs.

For synonymy see also WATERHOUSE and PARAMONOV (1950).

L. cuprina is certainly an indigenous species in the Ethiopian region and from here, probably only very recently in some cases, has invaded other subtropical and tropical parts of the world.

WATERHOUSE and PARAMONOV (1950) distinguish two forms of *cuprina*, namely ssp. *cuprina* in the Far East, the Oriental region from Malaya eastwards to Hawaii and the Americas, and ssp. *dorsalis* in Africa, India and Australia. The separating features which they give are, however, very slight and intergrading and lie mostly « in general coloration ». The nominate form is said to be « easily recognized by its dull olive-bronze body coloration » whereas ssp. *dorsalis* is « metallic coppery green, green, or bluish green ».

I have seen a great number of specimens from all parts of its distribution area and have come to the conclusion that this feature does not hold throughout, and that there are all kinds of intermediate forms. *L. cuprina dorsalis* should, therefore, no longer be listed as a distinct subspecies.

For morphological characters see *L. sericata* (MEIGEN). An account of the life history including descriptions and figures of the immature stages is given by HALL (1950) under *Phaenicia pallescens* (SHANNON) and by WATERHOUSE and PARAMONOV (1950.

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 26-28.XII.1933 (1 ♀); [Uele : Monga, 450 m, 18.IV-8.V.1935 (1 ♀)].

Mission H. DAMAS : Lac Édouard, Vitshumbi, 14.I.1936 (1 ♀); [N. lac Kivu : N'Coma, 11.II.1936 (1 ♂)].

Collection Musée du Congo : [Kivu : Kobaia, 17.XII.1922 (1 ♂♀ leg. VAN SACEGHEM)]; [Tshibinda, XI.1927 (1 ♀ leg. CH. SEYDEL)]; [Ituri : Bunia, 1938 (7 ♀♀ leg. P. LEFÈVRE)]; [Nioka, 20.I.1934 (1 ♀ leg. J. V. LEROY)]; [Lomami : Kamina, 1930 (1 ♂ leg. R. MASSART)]; [Sankuru : Komi, 31.III.1930 (2 ♂♂, 1 ♀ leg. J. GHESQUIÈRE)]; [Uele : Dinglia, 1935 (1 ♂♀ leg. J. V. LEROY)]; [Katanga : Nyonga, V.1925 (1 ♂, 2 ♀♀ leg. G. F. DE WITTE)]; [Kasai : Bumba, 18.III.1940 (1 ♀ leg. J. J. DEHEYM)]; [Lulua : Kasai, 1928 (1 ♀ leg. WALKER)]; [Mahagi-Miarembe, V.1935 (1 ♂, 4 ♀♀ leg. CH. SCOPS)]; [Élisabethville (1 ♂♀ leg. Miss. Agric.)]; [Barumbu, VII.1925 (1 ♂♀ leg. J. GHESQUIÈRE)]; [Eala, IX.1935 (1 ♂ leg. J. GHESQUIÈRE)]; [Léopoldville, 1933 (3 ♀♀ leg. A. TINANT)]; [Stanleyville, 25.IV.1928 (3 ♀♀ leg. A. COLLART)]; [Yuhovi, 23.VII.1935 (1 ♀ leg. H. J. BRÉDO)]; [Kasenyi (lac Albert), VI.1935 (1 ♀ leg. H. J. BRÉDO)]; [Kanlama, 1931 (1 ♀ leg. R. MASSART)]; [Lusambo, 1938 (1 ♀ leg. V. LAGAE)]; [Bambesa, 16.V.1938 (2 ♀♀ leg. P. HENRARD)]; [Kabinda, X.1934 (1 ♀ leg. M^me^ GILLARDIN)]; [Leverville, 1928 (1 ♀ leg. M^me^ J. TINANT)]; Ruanda : Muhavura, 28.I.1953 (1 ♀ leg. BASILEWSKY); Ruhengeri, 20.I.1934 (2 ♀♀ leg. COLBACK); [Kibungu, X-XII.1937 (2 ♂♂, 1 ♀ leg. R. VERHUIST)]; [Tanganyika : Kigoma, IX.1918 (1 ♂, 2 ♀♀ leg. R. MAYNÉ)].

Collection S. A. Institute for Med. Research, Johannesburg : A great deal of material is recorded in the card-register or is present in the collection from all four provinces of the Union of S. Africa, from S. W. Africa, Basutoland and S. Rhodesia.

Collection Zool. Museum Berlin : [Jaunde Stat., Kamerun, 800 m, (3 ♂♂ leg. ZENKER)]; [Gore, Neu-Kamerun, 4.XII.1912 (20 ♀♀ leg. HOUY)]; [Langenberg, Nyassa-See, XII.1897-I.1898 (2 ♀♀ leg. FUELLEBORN)]; [Kisseka, D. O. Africa, 14.VII.1911 (2 ♀♀ leg. H. MEYER)]; [Meruberg, Kilimanjaro (1 ♀ leg. ABEL)]; [Bismarckburg, Togo, 15-17.IV.1893 (1 ♀ leg. L. CONRADT)]; [Tananarive, Madagascar (3 ♂♂, 3 ♀♀ leg. FRIEDERICHS)].

Collection American Museum, New York : [Kasata and Robertsport, Liberia (several ♂♂ and ♀♀)]; [Narck, Kenya, II.1948 (1 ♂♀)].

Genus **PERICALLIMYIA** VILLENEUVE.

Pericallimyia VILLENEUVE, Bull. Soc. ent. France, 1915, p. 266; CURRAN, S. Afr. Div. Ent. Mem., V, 1926, p. 47; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 274; SÉGUY, Encycl. Ent. Dipt., VIII, 1935, p. 148; TOWNSEND, Man. Myiol., V, 1937, p. 161.
Type species : *P. marginalis* VILLENEUVE from N. W. Tanganyika.

Africomusca TOWNSEND, J. N. York ent. Soc., XL, 1932, p. 441; Man. Myiol. V, 1937, p. 133 (syn. nov.).
Type species : *P. westermanni* WIEDEMANN from the Cape.

There is some doubt whether this genus really represents a monophyletic group. The hypopygium of *P. insignis* is strongly reminiscent of *Calliphora* in which genus CURRAN originally placed this species. The hypopygia of the other species are similar to those of the *Adichosina* species or show some peculiar characters. The feature common to all species of this genus is the metallic blue or greenish body with a red-tipped abdomen.

Head in male with the eyes touching or closely approximated, width of frons at the narrowest point not exceeding 1/7 of eye-length, upper facets more or less enlarged, bare; *ev*, *f* and *fo* not developed but present in the female sex. Parafacialia almost bare or distinctly setulose in the upper half like the parafrontalia. Antennal groove without carina.

Thorax with *ac*=2+2-3, *dc*=2-3+3, *ia*=0-1+1-3, *ph*=3, *h*=3-4, *prs*=1, *n*=2, *sa*=3-4, *pa*=2, *sc*=3-6+1, *st*=1-2 : 1, at least one *pst* and *pp* which are normally accompanied by several hairs, alar declivity and prosternum always haired, propleuron bare or haired, supraspiracular convexity bare. Suprasquamal ridge without tufts of hairs. Wing with the subcostal sclerite bare or provided with a few longer setae, r_1 never setulose, R_5 open, thoracic squama broad, terminally rounded or more or less truncate, white to black-brown, with or without discal hairs. Legs blackish, without outstanding features, fore-tibia with 1 *pv* and a row of short *ad*, mid-tibia with 1 *ad*, 1 *av*, 1 *pd* and 2 *pv*; hind-tibia with a row of short *pd* and *ad*, among which 2-3 longer bristles project, furthermore 1-2 *av* in the lower half.

Abdomen of *Calliphora*-type, 1st and 2nd sternites separated, the 2nd relatively large, fifth sternite emarginated, without special thorns or bristles; tergites III and IV with or without median discal bristles, 5th tergite with discals and marginals and with the hind margin always demarcated reddish; 3 genital segments, cerci always free and paralobi slender, phallosome with separated theca and phallus, spine present, harpes hook-like, with or without denticles at the tip, vesicae denticulated and normally fairly heavily sclerotized.

The genus *Pericallimyia* is restricted to the Ethiopian region, with the greatest number of species in the rain-forest area of Central Africa. But only relatively few specimens have so far come to our knowledge. They are probably not so rare but difficult to collect because they live in the thick bush. The South African *Pericallimyia* species, *P. westermanni* and *P. perlata*, are found in the so-called « temperate rain forest » and may be baited with human faeces.

Because of the rareness of specimens in the collection, almost nothing can be said about the intraspecific variability of the different species. It can be already stated that the propleura may be bare or haired within the same species, a feature which is of generic importance for all other Ethiopian genera of *Calliphorinae*. Whether or not the arrangement of the abdominal discal bristles is constant, must be proved in future when more material becomes available. The same is true for the pattern of the thoracic bristles. In the meantime, the chaetotaxy of the abdomen is used in the key, after basing the species on the structure of the hypopygium. This organ is of decisive importance, as in other calliphorids too, and should always be checked.

KEY TO THE SPECIES.

1 (8) Thoracic squama dark brown with upstanding hairs on the disc; costal area never demarcated dark-brown 2

2 (7) Abdominal tergites III and IV without median discal bristles 3

3 (6) Eyes of male touching or almost so, frons at the narrowest point smaller than the anterior ocellus 4

4 (5) Upper facets of male only slightly enlarged.
Body metallic dark-blue, with whitish pollinosity; legs blackish. Thorax with *ac*=2+3, *dc*=2+3, *ia*=1+1-3, *sc*=5+1, *st*=2 : 1, propleura haired or bare. 7-12 mm. — Cameroons, Belg. Congo, Uganda, Tanganyika Terr. ....
1. *P. majuscula* VILLENEUVE.

5 (4) Upper facets of male strikingly enlarged.
Otherwise like the foregoing species, but apparently always 3 post *ia* present. 10-14 mm. — S. Rhodesia .....
2. *P. flavicauda* (MALLOCH).

6 (3) Eyes of male more widely separated, frons at the narrowest point distinctly broader than the anterior ocellus, measuring $\frac{1}{12}$-$\frac{1}{13}$ of eye-length.
Otherwise like *P. majuscula*. — Only known from the Cameroon Mts. ..... 3. *P. insignis* (CURRAN).

7 (2) Abdominal tergites IV (♀) or III and IV (♂) with a pair of median discal bristles.

General appearance of *P. majuscula*. Male frons at the narrowest point measuring $1/11$-$1/15$ of eye-length. — Cape Province, Transvaal, S. Rhodesia ..... 4. *P. westermanni* (WIEDEMANN).

8 (1) Thoracic squama whitish to dark-brown, but without upstanding hairs on the disc; costal area of wing sometimes demarcated brown 9

9 (12) Costal area of wing demarcated black-brown 10

10 (11) Male frons measuring about $1/7$ of eye-length.

Body metallic dark blue, with whitish pollinosity, legs blackish. Thorax with $ac=2+3$, $dc=2+3$, $ia=1+2$, $sc=4+1$, $st=1:1$, propleura bare. 5,5 mm. — Belg. Congo ..... 5. *P. wittei* n. sp.

11 (10) Male frons at the narrowest point not wider than 2-3 times the width of the anterior ocellus.

The three following species are only separable from each other by the structure of the hypopygium. Compared with the foregoing species, the propleura may be haired or bare and the pattern of *st* varies from 1 : 1 to 2 : 1. — S. Africa, Belg. Congo ..... 6. *P. perlata* (WALKER).

Tanganyika Terr. ..... 7. *P. versicolor* (VILLENEUVE).

Tanganyika Terr., Belg. Congo ..... 8. *P. marginalis* VILLENEUVE.

12 (9) Costal area of wing not demarcated black-brown 13

13 (16) Abdominal tergites III and IV with a pair of median discal bristles 14

14 (15) Wing-vein *r-m* clouded; third antennal segment 3 times as long as the second. Male frons $1/9$-$1/11$ as wide as the eye is long.

Body metallic dark blue and whitish pollinose as in the other *Pericallimyia* species, legs black. Thorax with $ac=2+2$, $dc=2+3$, $ia=1+3$, $sc=4+1$, $st=2:1$. 6-7 mm. — Belg. Congo, Ruanda-Urundi, Tanganyika Terr. ..... 9. *P. basilewskyi* ZUMPT.

15 (14) Wing-vein *r-m* not clouded, third antennal segment twice as long as the second. Male frons not broader than twice the width of the anterior ocellus.

Only one badly preserved male is known from the Tanganyika Terr. 6 mm ..... 10. *P. curvinerva* VILLENEUVE.

16 (13) Abdominal tergite III without a pair of median discal bristles. 17

17 (18) Abdominal tergite IV with a pair of median discal bristles; presutural *ia* wanting.
A new species from the Belgian Congo. 5 mm .....
11. *P. io* n. sp.

18 (17) Abdominal tergites III and IV without median discal bristles; presutural *ia* present 19

19 (20) Wing-vein *r-m* not clouded.
Known from the Belgian Congo and Uganda. 4,5-8 mm ...
12. *P. immaculata* n. sp.

20 (19) Wing-vein *r-m* clouded 21

21 (22) Wing-vein *r-m* with a circular, large black spot; costal spine wanting.
Belgian Congo, Ruanda-Urundi, Uganda. 5-7 mm .....
13. *P. bequaerti* CURRAN.

22 (21) Wing-vein *r-m* narrowly blackened; costal spine well developed.
Similar to the two foregoing species, the identities of which must always be confirmed by comparing the male genitalia. 5-6 mm. — Belg. Congo, Ruanda-Urundi, Tanganyika Terr. ...
14. *P. similis* n. sp.

1. — **Pericallimyia majuscula** VILLENEUVE.

(Fig. 40.)

Pericallimyia majuscula VILLENEUVE, Bull. Soc. ent. France, 1915, p. 267; CURRAN, Div. Ent. Mem., 5, 1926, p. 47.

Similar to *P. insignis* (CURRAN) from which it is separable only in the male sex.

Male. — Frons in the middle line-shaped, at the narrowest point smaller than the anterior ocellus, eyes therefore almost touching, frontal stripe, parafrontalia and parafacialia black or dark reddish, silvery dusted, vibrissarium little lighter reddish, buccae and occiput black. Of the head chaetotaxy, a pair of long *iv* and *oc* and about 10 *paf* are developed, parafrontalia and upper half of parafacialia densely beset with black setae, vibrissa long, peristomal bristles and buccal hairs black, on the occiput yellowish hairs are detectable beside the black ones; facial ridge on the lower ⅔ to ¾ with a row of strong black bristles and hairs. Antennae blackish, only the terminal margin of the second segment reddish, the third 3 times as long as the second, arista on both sides with long hairs. Palpi black, slightly enlarged terminally.

Thorax dark blue, sometimes with a coppery lustre, pollinosity whitish forming a pattern as in *Calliphora* species. Pro- and poststigma blackish. Chaetotaxy : *ac*=2+3, *dc*=2+3, *ia*=1+1-2, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=5+1 (discals sometimes increased), *st*=2 : 1, *pst* and *pp* each represented by a single strong bristle accompanied by several weaker

hairs. Propleura haired or bare, with all transitions, prosternum and alar declivity haired. Wings with dark brownish base, remaining part more or less tinged, veins black-brown, basicosta black, costal spine wanting, r_{4+5} with only a long seta at the base, *m* bent up in a right angle, R_5 open, both squamae black-brown, the lower one almost totally beset with upstanding dark hairs, halter yellow brown. Legs blackish; fore-tibia with a row of short *ad* and one long submedian *pv*; mid-tibia with 2 *pv* and one submedian *av*, *ad* and *pd* (last may be reduced); hind-tibia with two longer *pd* and *ad* and a row of shorter ones each, furthermore 1-2 *av* in the lower half.

Abdomen almost as long as broad, metallic dark blue, pollinosity white, forming a lustrous pattern; tergites II and III with lateral marginal bristles and IV and V with complete marginal rows of them, dorsally no discal bristles present, about the last two-thirds of the 5th tergite bright yellow; fifth sternite emarginated, hypopygium (fig. 40) quite different from that of *P. insignis* (CURRAN).

Female. — Frons at vertex a little more than one third as wide as the eye is long, gradually widened towards the antennal groove. Chaetotaxy of head complete, with *iv*, *ev*, *f* and 2 *fo*.

Length : 7-12 mm.

Mission G. F. DE WITTE : Vers mont Kamatembe, 2.300 m, 7-23.I.1935 (1 ♂ ♀).

Collection Musée du Congo : [Eala, VI.1932 (2 ♀♀ leg. A. CORBISIER)].

Collection Naturhist. Museum Wien : [N. W. Tanganyika, 1910 (lectotype ♂, 1 ♂ ♀ paratypes, 3 ♀♀ leg. GRAUER)]; [Matengo Hochl., wsw. Songea, 30.II.1936 (3 ♂♂, 3 ♀♀ leg. ZIMMER)];

Collection Zool. Museum Berlin : [Langenburg, Nyassa-See, 25-28.X.1899 (1 ♀ leg. FUELLEBORN)]; [Buea, Kamerun, 2.100-2.500 m, (1 ♂ leg. PREUSS)].

Collection S. A. Institute for Med. Research, Johannesburg : [Behungi, Uganda, 4.IV.1927 (1 ♂)].

EXPLANATION OF FIGURES 40 TO 44.

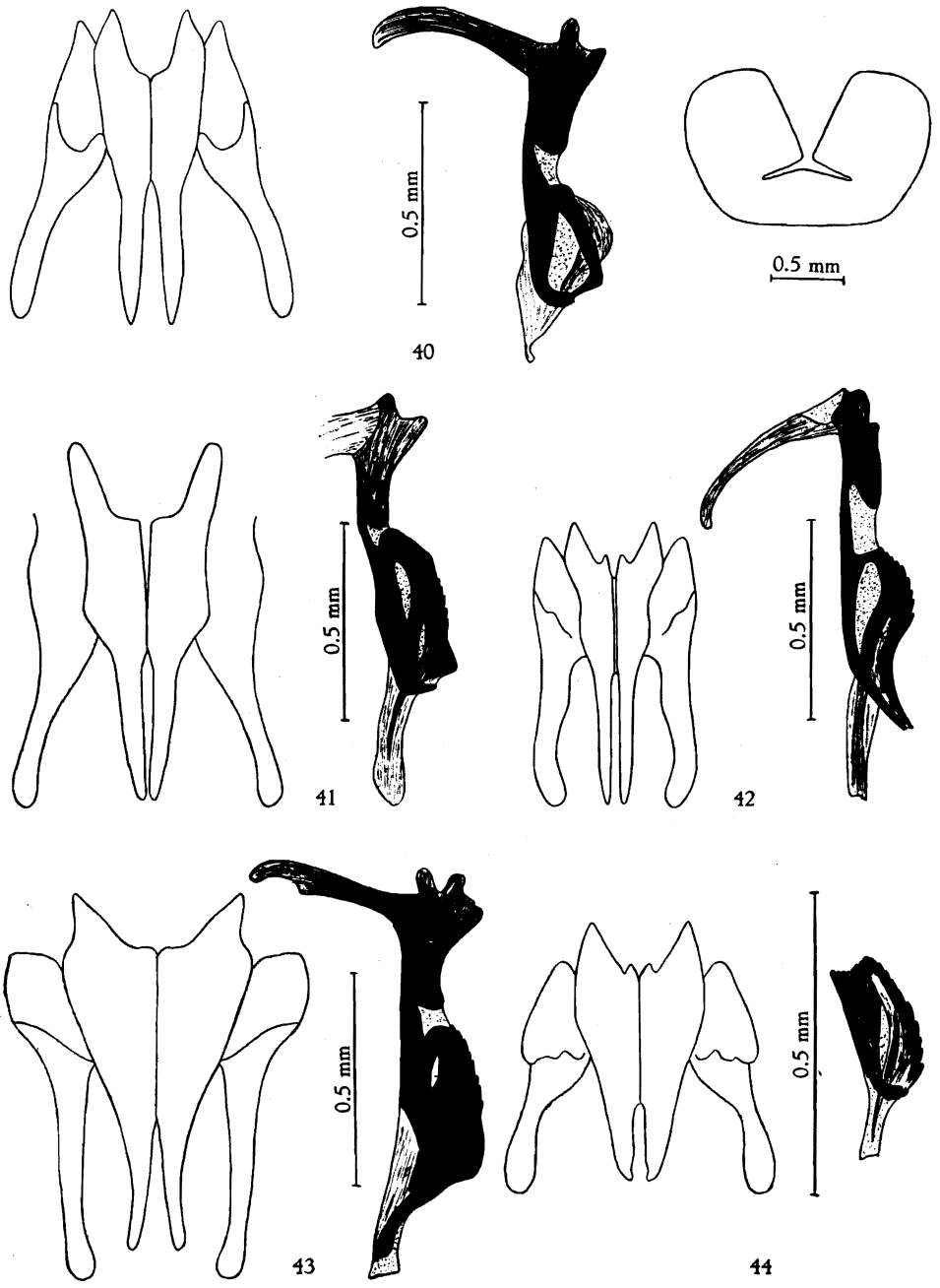
FIG. 40. — *Pericallimyia majuscula* VILLENEUVE. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Buea, Cameroons.

FIG. 41. — *Pericallimyia flavicauda* (MALLOCH). Cerci with paralobi in frontal view, phallosome laterally. Specimen from Vumba Mounts, S. Rhodesia.

FIG. 42. — *Pericallimyia insignis* (CURRAN). Cerci with paralobi in frontal view, phallosome laterally. Specimen from Cameroons Mounts.

FIG. 43. — *Pericallimyia westermanni* (WIEDEMANN). Cerci with paralobi, phallosome. Specimen from Vumba Mounts, S. Rhodesia.

FIG. 44. — *Pericallimyia wittei* n. sp. Cerci with paralobi, phallosome. Specimen from P.N.A. (holotype).



FIGS. 40 TO 44.

[2. — **Pericallimyia flavicauda** (MALLOCH).]

(Fig. 41.)

Calliphora flavicauda MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 97; CUTHBERTSON, Tr. Rhod. Sci. Ass., XXXVI, 1938, p. 122, figs 15-27.

This species was confused by TOWNSEND and CUTHBERTSON (see CUTHBERTSON 1938) with *P. westermanni* (WIEDEMANN), which is a S. African species extending northwards probably only as far as the Vumba Mts. in S. Rhodesia, where it meets and lives together with *P. flavicauda* (MALLOCH), a species until now known only from this district. It is easily separable from *P. westermanni* in both sexes by the wanting median discal bristles on tergites III and IV, and from *P. majuscula* VILLENEUVE and *P. insignis* (CURRAN) in the male sex by the touching eyes with strikingly enlarged upper facets. MALLOCH based the species on the female sex only, which is not separable from *P. majuscula* and *P. insignis*. Neither species, however, occurs in the Vumba Mts., so that there is no doubt about the status of *P. flavicauda*. The male is described here for the first time.

Male. — Eyes broadly touching, with strikingly enlarged facets in the upper two-thirds, frontal stripe only developed in the lower half, blackish or reddish brown, parafrontalia and -facialia coloured like the frontal stripe and white pollinose, vibrissarium red-brown, buccae blackish. Parafrontal bristles developed only in the lower half, *iv* and *oc* present, black setae on the parafrontalia and the upper half of parafacialia, vibrissa long, peristomal bristles and buccal hairs black, on the occiput yellowish hairs are detectable beside predominating black ones; facial ridge on the lower ⅔ to ¾ with a row of strong black bristles and hairs. Antennae blackish, terminal margin of the second segment reddish, the third at least 3 times as long as the second, arista with long hairs on both sides. Palpi dark brown, slightly enlarged terminally.

Thorax dark blue, with a whitish pollinosity as in *P. majuscula*. Pro- and poststigma blackish. Chaetotaxy : *ac*=2+3, *dc*=2-3+3, *ia*=1+3, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3-4, *pa*=2, *sc*=5-6+1, *st*=2:1, one strong bristle each of *pst* and *pp*, accompanied by several hairs. Propleura haired or bare, prosternum and alar declivity haired. Wings with dark brownish base, remaining part hyaline or slightly tinged, veins black-brown, basicosta black, costal spine rudimentary, r_{4+5} dorsally with a few setae at base, *m* bent up at a right angle, R_5 open, both squamae black brown, halter brown with yellow knob. Legs blackish, fore-tibia with a row of short *ad* and one long submedian *pv*; mid-tibia with 2 *pv* and one submedian *pd*, *ad* and *av*; hind-tibia with two longer *pd* and *ad* lying in a row of shorter ones, furthermore 1-2 *av* in the lower half.

Abdomen almost as long as broad, metallic dark blue, with a whitish pollinosity as in *P. majuscula* and like this species without median discals

on the 3rd and 4th tergites. Hypopygium (fig. 41) similar to that of *P. westermanni.*

Female. — No constant features known for separating it from *P. majuscula* and *P. insignis.*

Length : 10-14 mm.

Biology. — According to CUTHBERTSON, this species is larviparous and deposits one single larva at a time, apparently of the first stage. He dissected the female reproductive organs and found a large uterus of about 5 mm length which was abundantly supplied with tracheae. Several larvae removed from the uterus of gravid flies developed to the end of the third stage on human faeces. The duration was 8-9 days. However, the author could not detect whether the larvae were saprophagous or predatory on other maggots. The uterine larva and the mature one are figured in CUTHBERTSON's paper (1938).

Dept. of Research and Specialist Services, Salisbury : [Vumba Mts., Umtali distr., S. Rhodesia, XII.1934, III.1935 (4 ♂♂, 10 ♀♀, leg. A. CUTHBERTSON)].

[3. — **Pericallimyia insignis** (CURRAN).]

(Fig. 42.)

Calliphora insignis CURRAN, American Mus. Nov., n° 985, 1938, p. 1.

This species is known only from the Cameroon Mts., at an altitude between 2.100 and 2.500 m. The type series, of which 2 ♂♂ and 2 ♀♀ are before me, was collected by myself at the « Mannsquelle », 2.300 m, 13.XI.1935. A further pair was sent to me by the Zool. Museum of Berlin. The locality-label bears the information, Buea, 2.100-2.500 m. This town is, however, situated at an altitude of about 1.000 m, whereas the given altitude of 2.100-2.500 m is already beyond the high forest. Most probably, this pair was collected near the same locality where I collected the type series.

P. insignis is similar to *P. majuscula* VILLENEUVE in every respect, except that the male frons is wider, measuring at the narowest point $\frac{1}{12}$-$\frac{1}{13}$ of eye-length, and that the hypopygium (fig. 42) is quite different, showing a great similarity to that of the Palaearctic *Calliphora* species. I could not find any separating features for the females of the two species.

[4. — **Pericallimyia westermanni** (WIEDEMANN).]

(Fig. 43.)

Tachina westermanni WIEDEMANN, Zool. Mag., III, 1819, p. 23.

P. westermanni (WIEDEMANN) is closely related to *P. majuscula* VILLENEUVE, from which it differs in the shape of the hypopygium (fig. 43) and by the presence of median discal bristles on the abdomen. The male frons

varies at the narrowest point between 1/11 and 1/15 of the eye-length; the female frons at vertex is a little more than one third as wide as the eye is long. The abdominal chaetotaxy is different in both sexes. In the male, there is one pair of strong median discal bristles on the 3rd and on the 4th tergite, whereas the female shows them on the 4th tergite only. Fifth tergite in both sexes with several discal and marginal bristles, furthermore the 3rd tergite with 2-4 median and several lateral marginal bristles, and the 4th with a row of marginals. Otherwise, the species seems to coincide with *P. majuscula.*

Collection S. A. Institute for Med. Research, Johannesburg : Up to now, only records from Southern Africa are known where the species is restricted to the temperate rain forest and thick riverine bush. [Cape Province : Plettenberg Bay, V.1951 (1 ♀ leg. MUSPRATT)]; [Knysna, V.1951 and IV.1954 (3 ♀♀ leg. MUSPRATT)]; [Storm's River, 31.XII.1953 (1 ♂ leg. ZUMPT)]; [East London, 23.III.1924 (1 ♂♀, leg. MUNRO)]; [Pondoland, IV.1951 (1 ♀ leg. MUSPRATT)]; [Transvaal : Potchefstroom, 7.II.1953 (1 ♂♀ leg. PATERSON)]; [Magoeba's Kloof, IV.1953 (1 ♂ leg. PATERSON)]; [S. Rhodesia : Vumba Mts., III.1935 (1 ♂ leg. A. CUTHBERTSON)].

5. — **Pericallimyia wittei** n. sp.

(Fig. 44.)

There is only one male before me which is not even in a good condition. But in spite of this I think a description is justified, because this species is well characterized by the shape of the hypopygium, and is also easily separable from all other *Pericallimyia* species with a blackened costal area by its wide frons.

Male. — Eyes with only slightly enlarged upper facets; frons at the narrowest point about 1/7 as wide as the eye is long, frontal stripe complete, at the tip of the ocellar triangle distinctly broader than one parafrontalium. Parafrontalia and -facialia whitish pollinose, ground-colour blackish for the greatest part, becoming reddish towards the vibrissarium. Antennal groove and antennae black, the 3rd segment more than 3 times as long as the second, arista with long hairs on both sides. Buccae and occiput black, with black hairs. Chaetotaxy of head consists of a pair of long *iv* and *oc* as well as about 12 *paf.* Parafrontalia with black setae which extend half way down the parafrontalia. Facial ridge on the lower two-thirds with bristles, vibrissa long and strong. Palpi black brown, moderately enlarged towards the tip.

Thorax metallic dark blue with a whitish pollinosity. Pro- and poststigma black-brown. Chaetotaxy : *ac*=2+3, *dc*=2+3, *ia*=1+2, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=4+1, *st*=1:1, but two long bristly hairs are visible under the foremost, one strong *pst* and *pp*, accompanied by several long hairs. Propleura bare in this specimen, prosternum and

alar declivity haired. Wings with the costal area deep brown including the cells *Co*, *St* and R_1, veins dark brown, basicosta black, costal spine short and weak, r_{4+5} with a seta at the base, *m* with a rounded angle, R_5 open, squamae whitish, the lower without upright dorsal hairs, halter yellow brown and with a light yellow knob. Legs blackish, only the hind pair present. Abdomen coloured and dusted like the thorax, a pair of median discals on the 3rd and 4th segments, furthermore the 3rd with a pair of median marginal and several lateral bristles, the 4th with a row of marginal bristles and the 5th segment with several discal and marginal bristles. Hypopygium (fig. 44) with short cerci and club-shaped paralobi.

Length : 5,5 mm.

Mission G. F. DE WITTE : Vers Rweru (volc. Mikeno), 2.400 m, 26-27.VII.1934 (1 ♂ holotype).

[6. — **Pericallimyia perlata** (WALKER).]

(Fig. 45.)

Musca perlata WALKER, Trans. Ent. Soc. London, N. S., V, 1860, p. 314.

This species is probably very rare. It was described from Natal, but only single specimens have been found since then in several localities of the temperate rain forest from the Cape Coast at Tzitzikama up to Zululand. It is very interesting to state that 3 male specimens from the Congo area prove that *P. perlata* is distributed much further North where it is linked with two other species, *P. versicolor* VILLENEUVE and *P. marginalis* VILLENEUVE. These two species are, according to the badly preserved material before me, only separable from *P. perlata* by the shape of the hypopygium.

There are 1 ♂ and 4 ♀♀ from South Africa before me. The male has the frons at the narrowest point about $\frac{1}{14}$ of eye-length (2-3 times the width of the anterior ocellus). The frontal stripe is therefore only developed in the lower half. Head otherwise as in *P. wittei*, but the occiput shows predominantly whitish hairs. Thorax with respect to colouring and chaetotaxy as in *P. wittei*, propleura haired or bare, *st*=1 : 1, sometimes 2 : 1, wings with the costal area more broadly and deeply darkened, including most of the cell R_3. Legs black, fore-tibia with a row of *ad* of which four are longer than the remaining ones, furthermore one long submedian *pv*; mid-tibia with 2 *pv* and one submedian *ad*, *av* and *pd*; hind-tibia with 2 *ad* and 2 *pd* as well as 2 *av* in the lower half. Abdomen as in *P. wittei*, but hypopygium (fig. 45) with slender cerci and paralobi.

The females have the frons at the vertex about $\frac{1}{3}$ of eye-length. Chaetotaxy of head complete. Colouring of thorax and abdomen metallic blue to bluish-green, 3rd and 4th abdominal segments each with a pair of median discals as in the male sex.

In the 3 males from the Congo area, the frons at the narrowest point varies from $\frac{1}{12}$-$\frac{1}{14}$ of eye-length. In the average, they are longer (9-11 mm)

than the South African specimens (7-8 mm) and the hyaline part of the wing is a little more intensely tinged.

Collection Musée du Congo : [Bambesa, XII.1933 (1 ♂ leg. H. J. BRÉDO)]; [Mundjungani, IX.1927 (1 ♂ leg. A. COLLART)]; [Bangala : Dioho. XI.1927 (1 ♂ leg. COLLART)].

Collection S. A. Institute for Med. Research, Johannesburg : [Transvaal : Waterval Onder, 28.II.1952 (1 ♂ leg. PATERSON)]; [Natal : Hluhluwe, Zululand. 18.I.195? (1 ♀ leg. ZUMPT)]; [N'Kwaleni, Zululand, 2.III.1935 (1 ♀ leg. ROBINSON)]; [Cape Province : Pondoland, Transkei. IV.1951 (1 ♂ leg. MUSPRATT)]; [Tzitzikama Forest, XII.1951 (1 ♀ leg. MUSPRATT)].

[7. — **Pericallimyia versicolor** VILLENEUVE.]

(Fig. 46.)

Pericallimyia versicolor VILLENEUVE, Bull. Soc. ent. France, 1915, p. 269; CURRAN, Div. Ent. Mem., 5.1926, p. 47.

From the Zoological Museum in Vienna, I received a series of 5 typical male specimens from the « Urwald Moera » in Tanganyika, from which the drawing of the hypopygium has been made. Most probably VILLENEUVE did not designate a holotype, so I have selected the dissected specimen as lectotype. VILLENEUVE mentions in the description further specimens from Uganda and from S. Nigeria. It is very doubtful whether these, at least from the last locality, really belong to the same species.

All specimens before me are in a bad condition and more or less shrunken, evidently having been killed in alcohol. The hypopygium (fig. 46) is similar to that of *P. perlata* but the paralobi are more slender. I am not able to detect further separating features.

Length : 7-9 mm.

Collection Naturhist. Museum Wien : [Tanganyika : Urwald Moera, 1910 (5 ♂♂ leg. GRAUER)].

[8. — **Pericallimyia marginalis** VILLENEUVE.]

(Fig. 47.)

Pericallimyia marginalis VILLENEUVE, Bull. Soc. ent. France, 1915, p. 268.

VILLENEUVE based this species on 3 ♂♂ from « N. W. Tanganyika » and « Urwald hinter dem Bandberg d. N.-W. Tanganika-See, 1.800-2.000 m ». From the Zoological Museum of Vienna, I received a ♂ from each locality, the first being selected as lectotype. A third male from Stanleyville was sent to me by Dr. CURRAN, New York. The genitalia of all three males have been dissected and proved to be identical (fig. 47). They are very similar to those of *P. perlata* and *P. versicolor* but, nevertheless, well characterized. However, the number of specimens of all three species is very small and

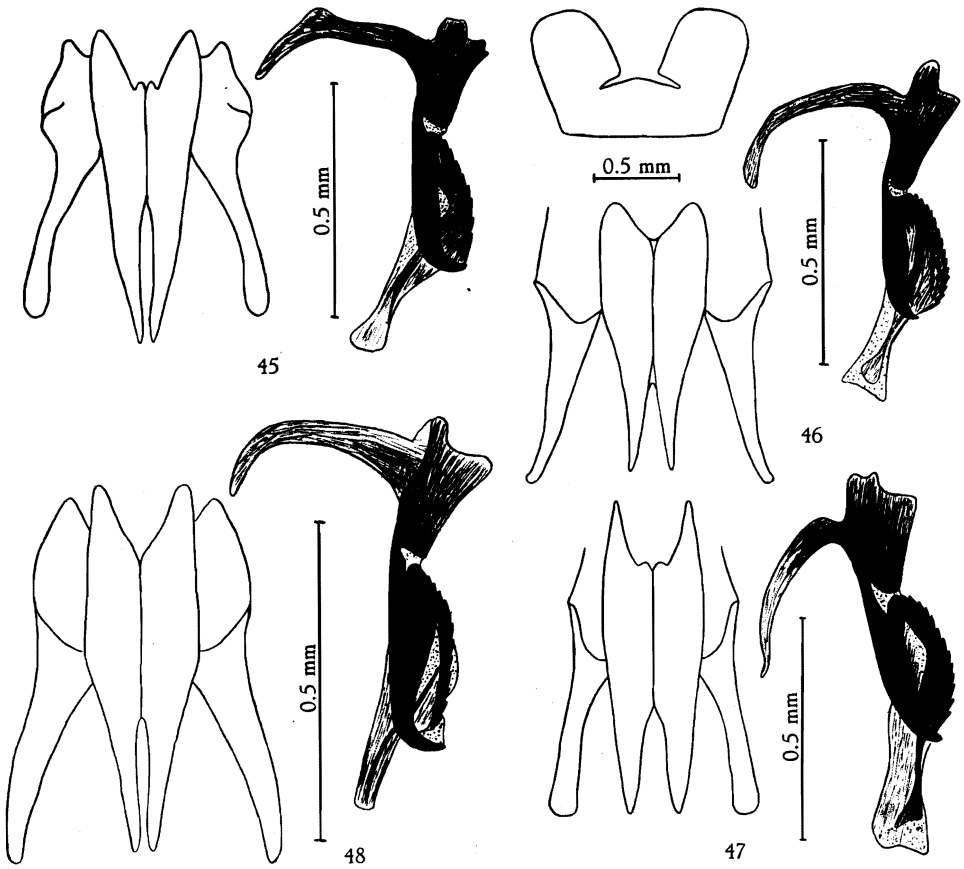


FIG. 45. — *Pericallimyia perlata* (WALKER). Cerci with paralobi, phallosome. Specimen from Waterval Onder, Transvaal.

FIG. 46. — *Pericallimyia versicolor* VILLENEUVE. Cerci with paralobi, 5th. sternite in frontal view, phallosome laterally. Specimen from Tanganyika.

FIG. 47. — *Pericallimyia marginalis* VILLENEUVE. Cerci with paralobi, phallosome. Specimen from N.W. Tanganyika.

FIG. 48. — *Pericallimyia basilewskyi* ZUMPT. Cerci with paralobi, phallosome (after ZUMPT). Specimen from Ruanda (holotype).

perhaps in future transitional specimens may be found proving that we are only dealing with one variable species.

The two ♂♂ from the typical series are shrunken as are those of *P. versicolor*. The male from the Congo is in a good condition and has the frons at the narrowest point about $\frac{1}{15}$ of eye-length. The 3rd antennal

segment is 3 ½ times as long as the second, but in the lectotype, it only measures 3 times the second. The propleuron shows a few odd setae in all 3 specimens. Thoracic squama relatively dark brown in the Tanganyika specimens (body blue) but white in that from Stanleyville (body dark green).

Collection Naturhist. Museum Wien : [N. W. Tanganika and Urwald hint. d. Bandbg. d. N.-W. Tanganika-See, 1.800-2.000, 1910 (2 ♂♂ leg. GRAUER)].

Collection American Museum, New York : [Belgian Congo : Stanleyville, III.1915, taken from Bembex (1 ♂)].

9. — **Pericallimyia basilewskyi** ZUMPT.

(Fig. 48.)

Pericallimyia basilewskyi ZUMPT, Ann. Mus. Congo Tervuren, Zool., XXXVI, 1955, p. 320, fig. 1.

This species was recently described by me from a male specimen from Ruanda. In the meantime, I have received two more males which show no important differences in the shape of the hypopygium (fig. 48) or in other morphological features. A feature not mentioned in the original description is the more or less clouded *r-m*. The width of frons at the narrowest point is $\frac{1}{10}$ and $\frac{1}{11}$ of eye-length respectively in the two above-mentioned specimens so that the measurements are now to be given as $\frac{1}{9}$ to $\frac{1}{11}$ of eye-length. The body length is 6-7 mm.

Mission G. F. DE WITTE : Ngesho, 2.000 m, 3-6.IV.1934 (1 ♂).

Collection Musée du Congo : [Ruanda : Biumba, 2.300 m, 6.II.1953 (1 ♂ leg. BASILEWSKY)].

Collection S. A. Institute for Med. Research, Johannesburg : [Songea, Tanganyika Terr., 15.000-17.000 m (1 ♂)].

[10. — **Pericallimyia curvinerva** VILLENEUVE.]

(Fig. 49.)

Pericallimyia curvinerva VILLENEUVE, Bull. Soc. ent. France, 1915, p. 268; CURRAN, Div. Ent. Mem., 5, 1926, p. 47.

This species is known only from one badly preserved and partly shrunken specimen of which a complete description cannot be given. It is, however, well characterized by the shape of the hypopygium (fig. 49), and in this respect not to be confused with any other *Pericallimyia* species. The frons is narrow, in the middle not broader than twice the width of the anterior ocellus. Antennae black-brown, the third segment about twice as long as the second. Chaetotaxy of the thorax is not clearly detectable because of the shrunken state of the specimen, wings slightly tinged, but without

demarcated, darker costal area. Abdominal tergites III and IV each with a pair of median discal bristles.

Length : 6 mm.

Collection Naturhist. Museum Wien : [Western Tanganyika, 1910 (holotype ♂, leg. GRAUER)].

11. — **Pericallimyia io** n. sp.

(Fig. 50.)

This new species is easily recognizable by the hypopygium as well as by the outer features. The hypopygium (fig. 50) is characterized by broad paralobi beset with extremely long hairs. Externally, the species is separable from the other known species by a dark brown, but bare thoracic squama, by hyaline wings, and by a pair of median discal bristles on the 4th abdominal tergite, whereas they are wanting on the 3rd.

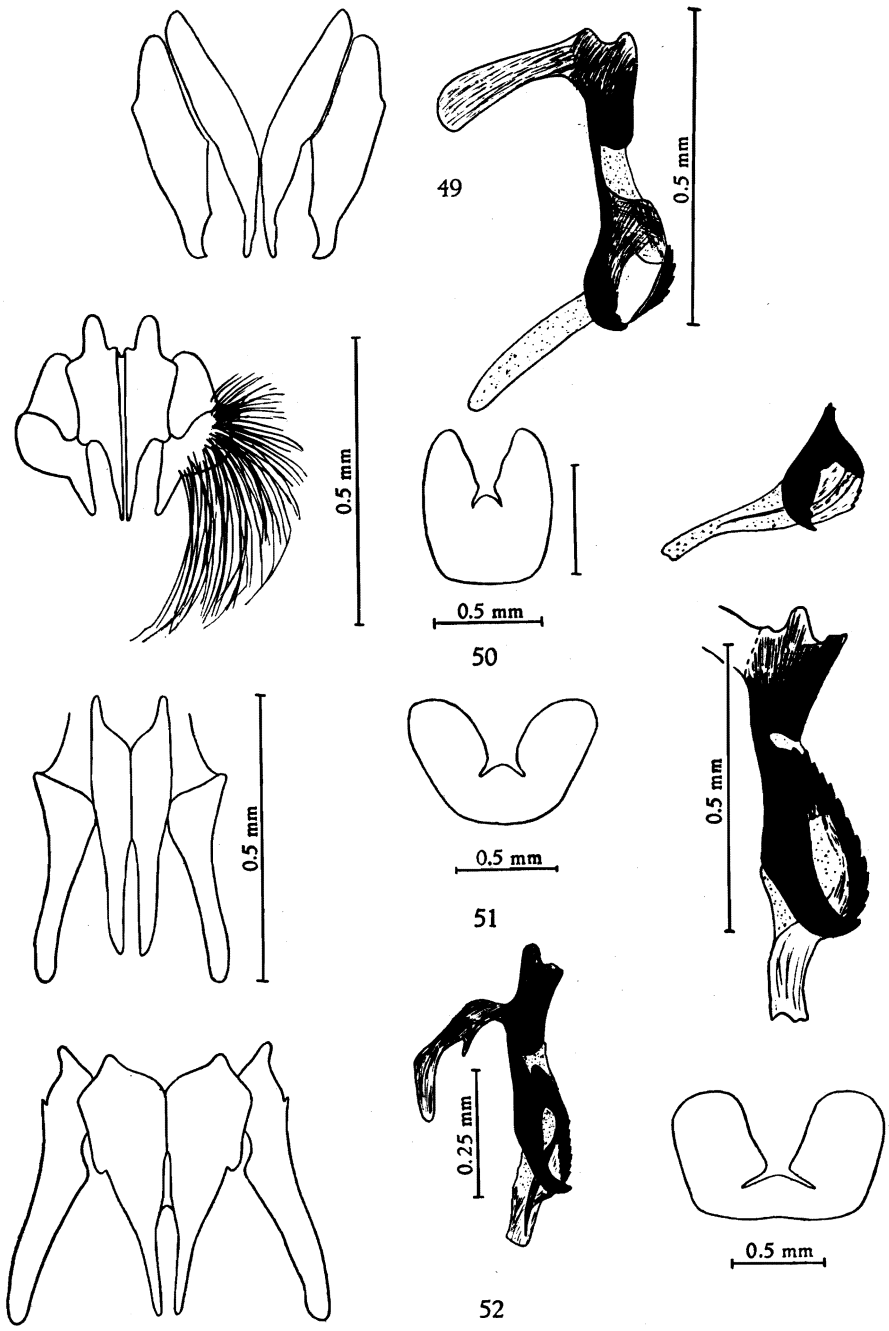
Male. — Frons narrow, breadth in the middle not more than twice the diameter of the anterior ocellus; frontal stripe line-shaped in the median part, triangular at the base, dark to reddish brown; parafrontalia and -facialia black, towards the vibrissarium more reddish, whitish pollinose, *iv*, *ev* and about 10 *paf* developed, parafrontalia and upper half of parafacialia with odd black setae, vibrissa long, above it a second fairly long seta and several shorter ones on the lower third of the facial ridge, peristomal bristles and buccal hairs black, bucca black and whitish pollinose, height one third of eye-length. Antennae black brown, third segment about 3 times as long as the second. Palpi black brown, slightly enlarged terminally.

Thorax metallic dark blue and whitish pollinose. Pro- and poststigma black brown. Chaetotaxy : *ac*=2+3, *dc*=2+3, *ia*=0+2, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3+1, *st*=1:1, but the foremost lower one is represented by a bristly hair, one stronger and one weaker bristle each of *pst* and *pp*. Propleura bare, prosternum and alar declivity with fine hairs. Wings without demarcated costal area, totally hyaline with a very slight brownish tinge, veins including basicosta black brown, costal spine small, r_{4+5} with a few setae at the base, *m* bent up in an obtuse angle, R_5 open, thoracic squama black brown, without dorsal hairs, upper squama lighter brown, halter yellow. Legs blackish, with the usual chaetotaxy as in *P. majuscula* VILLENEUVE.

Abdomen coloured like the thorax, with a pollinosity forming a pattern as in *Calliphora*, changing with the incidence of light. Tergites III and IV with marginal bristles, only the 4th with a pair of discals too.

Length : 5 mm.

Mission G. F. DE WITTE : Kibati, 1.900 m, 10-12.I.1934 (1 ♂ holotype); Shamuheru (volc. Nyamuragira), 1.843 m, 15.VI.1935 (1 ♂ paratype). The holotype has been returned, paratype in the collection of the S. African Institute for Med. Research, Johannesburg.



FIGS. 49-52.

12. — **Pericallimyia immaculata** n. sp.

(Fig. 51.)

Similar to *P. io* and separable from it by having the lower half of the facial ridge beset with bristles, by the presence of the presutural *ia*, and by the absence of the median pair of discal bristles on tergite IV. There are, therefore, only dorsal discals on the last tergite. Furthermore, *st*=1 : 1, the scutellum shows 4 marginal bristles, the costal spine is wanting or weakly developed, and *m* has the terminal part bent up at a right angle. Hypopygium (fig. 51) with the normal, moderately long hairs and quite different from that of *P. io* with respect to the shape, but similar to the two following species. In the female, the frons at the vertex measures about ⅜ of eye-length, head bristles complete.

Length : 4,5-8 mm.

Mission G. F. DE WITTE :

Holotype : 1 ♂ from Gitebe (volc. Nyamuragira), 2.324 m, 14-26.VI.1935.

Paratypes : Gitebe, 2.324 m, 14-26.VI.1935 (2 ♀♀); Mayumbu (volc. Nyamuragira), 2.100 m, 14-26.VI.1935 (1 ♀); Shamuheru (volc. Nyamuragira), 1.843 m, 15.VI.1935 (1 ♂); Nyasheke (volc. Nyamuragira), 1.820 m, 1-26.VI.1935 (1 ♀). One paratypical pair retained for the collection of the S. Afric. Institute for Med. Research, Johannesburg.

Collection Musée du Congo :

Paratype : 1 ♀ from [Rwankwi, nord Lac Kivu, IV.1948 (leg. J. V. LEROY)].

Collection British Museum : [W. Ruwenzori, Uganda, 8-9.000 ft, VI.1946 (1 ♂ leg. VAN SOMEREN)].

13. — **Pericallimyia bequaerti** CURRAN.

(Fig. 52.)

Pericallimyia bequaerti CURRAN, Amer. Mus. Nov., 506, 1931, p. 4.

This species was based on 1 ♂ from Bebungi in Uganda and 2 ♀♀ from Burunga in the Belgian Congo. The male (holotype) is characterized

EXPLANATION OF FIGURES 49 TO 52.

FIG. 49. — *Pericallimyia curvinerva* VILLENEUVE. Cerci with paralobi, phallosome. Specimen from W. Tanganyika (holotype).

FIG. 50. — *Pericallimyia io* n. sp. Cerci with paralobi and 5th. sternite in frontal view, tip of phallosome laterally. Specimen from Shamuheru, P.N.A. (paratype).

FIG. 51. — *Pericallimyia immaculata* n. sp.. Cerci with paralobi, 5th. sternite and phallosome. Specimen from Mayumbu, P.N.A. (paratype).

FIG. 52. — *Pericallimyia bequaerti* CURRAN. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Bebungi, Uganda (holotype).

by a large circular black spot on *r-m*, whereas the female has *r-m* only narrowly darkened, the vein forming a blackish line. Through the kindness of Dr. CURRAN, I have been able to study the holotype and one of the two females. Additional material from Central Africa shows that we are dealing with two species characterized by differently shaped hypopygia (figs. 52-53).

The features which separate both sexes of *P. bequaerti* from the other *Pericallimyia* species are the wing-pattern in combination with a dark-brown, but dorsally bare, thoracic squama, and the wanting median discals on the abdominal tergites III and IV. Frons in ♂ at the narrowest point 2-3 times as wide as the anterior ocellus ($\frac{1}{12}$-$\frac{1}{15}$ of eye-length), in ♀ at vertex $\frac{2}{5}$ of eye-length. Head black, sometimes frontal stripe and vibrissarium more or less reddish, 3rd antennal segment about 2 ½ times as long as the second. Buccae with black hairs, its height $\frac{1}{4}$-$\frac{1}{3}$ of eye-length. Thoracic chaetotaxy normal, *ac*=2+3, *dc*=2-3+3, *ia*=1+2, *ph*=3, *h* mostly 4, *sc*=4+1, *st*=1-2 : 1. Wings without costal spine, costal area hyaline, but base brownish and *r-m* covered by a circular, large black spot; *m* bent up almost at a right angle. Abdomen metallic dark blue and whitish pollinose like the thorax, IIIrd and IVth tergites with marginal bristles only.

Length : 5-7 mm.

Mission G. F. DE WITTE : Rutshuru (riv. Rodahira), 1.200 m, 1.VII.1935 (1 ♂); Mont Tamira (près lac N'Gando), 2.600 m, 11.III.1935 (2 ♀♀).

Collection American Museum New York : [Bebungi, Uganda, 4.IV.1937 (1 ♂ leg. BEQUAERT, holotype)].

14. — **Pericallimyia similis** n. sp.

(Fig. 53.)

This species is extremely similar to *P. bequaerti*, which explains the fact that CURRAN mixed them. The base of the wing, however, is not strikingly darkened, *r-m* is only narrowly blackish and the costal spine is well developed. The hypopygium (fig. 53) of the only male before me has the tips of the cerci weakly denticulated.

Length : 5-6 mm.

Mission G. F. DE WITTE : Holotype, 1 ♂ from Ruhengeri (sources Kirii), 1.800-1.825 m, 2.X.1934.

Collection Naturhist. Museum Wien : [Tanganyika Terr. : Lupembe Bg., wsw. v. Songea, 1.800-2.000 m, 1-10.II.1936 (3 ♀♀ leg. ZERNY)].

Collection British Museum : [Uganda : W. Ruwenzori, 8-9.000 ft, VII.1946 (1 ♀ leg. VAN SOMEREN)].

Collection American Museum, New York : [Burunga, Belg. Congo (1 ♀ leg. BEQUAERT, paratype of *P. bequaerti* CURRAN)].

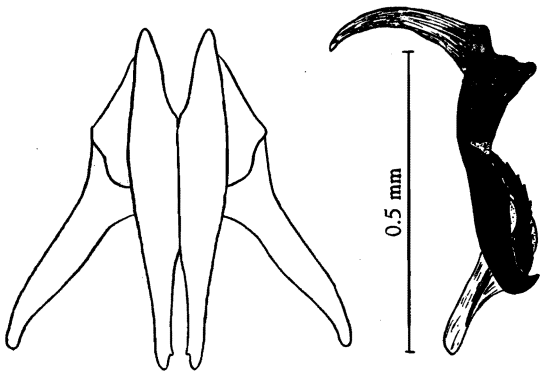


FIG. 53. — *Pericallimyia similis* n. sp.
Cerci with paralobi, phallosome.
Specimen from Ruhengeri, Ruanda (holotype).

Genus **ZERNYIELLA** nov.

Type species : *Z. dubia* n. sp. from the Tanganyika Terr.

This so far monotypic genus is represented by an easily recognizable species. Its generic features may be taken from the species description. The bare suprasquamal ridge and supraspiracular convexity, the haired prosternum and alar declivity in conjunction with the colouring of the body show that this genus is evidently most closely related to *Pericallimyia*.

Nothing is known about the biology.

[1. — **Zernyiella dubia** n. sp.]

(Fig. 54.)

In general appearance, this fly could be taken for an *Orthellia* with a yellow abdomen.

Male. — Eyes with almost equal facets, frons at the narrowest point measuring $\frac{1}{9}$-$\frac{1}{13}$ of eye-length, widened towards the vertex and the antennal groove. Parafrontalia and -facialia black or partly reddish, densely silvery dusted, frontal stripe black-brown to reddish, complete, at the tip of the ocellar triangle almost as wide as one parafrontalium. Vertex with a pair of long and strong *iv*, *ev* developed as a pair of long hairs, ocellar triangle with a pair of proclinate *oc* and several hairs, 12-14 pairs of strong *paf*, *f* and *fo* wanting, parafrontalia and the upper half of parafacialia with relatively long setae. Antennae black-brown, third segment a little more than twice as long as the second, arista with long hairs on both sides almost up to the tip, antennal groove without carina. Vibrissarium reddish brown, facial ridge with a row of long bristles on the lower third, buccae and occiput black, with white pollinosity, peristomal bristles and buccal hairs

black, height of bucca ¼ of eye-length. Palpi brown, slightly curved and a little widened terminally.

Thorax metallic dark blue, with slight whitish pollinosity as in *Pericallimyia*. Chaetotaxy : *ac*=2+3, *dc*=2-3+3, *ia*=0+2, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, scutellum with 3 long and thick marginals and several bristly hairs of unfixed number on the disc, one long *pp* and *pst*, which are accompanied by several hairs, *st*=1 : 1. Propleuron bare, prosternum and alar declivity with long hairs. Wings with a slight brownish tinge, but without demarcated costal area, veins brown, costal spine distinct, r_{4+5} dorsally at base with a few setae, R_5 open, *m* bent up in a rounded obtuse angle, thoracic squama light yellow, dorsally bare, halter yellow. Legs black brown; fore-tibia with a row of *ad* and one long submedian *av;* mid-tibia with 2 *pv* and a submedian *pd*, *av* and *ad*; hind-tibia with 2 *pd*, 2 longer and 2 shorter *ad* as well as with 2 *av* in the lower half.

Abdomen unicoloured yellow-orange, sternites with dense and long hairs, tergite I+II laterally with marginal bristles and bristly, densely placed discal hairs, the dorsal part with short hairs only, tergite III with a pair of median discals and marginals as well as with a few lateral marginals, 4th tergite with a pair of median discals (in one paratype with 2 pairs of median discals) and a continuous row of marginals, last tergite with bristles all over the surface. Hypopygium (fig. 54) with slender cerci and truncate paralobi.

Length : 8-9 mm.

Female. — Not known.

Collection Naturhist. Museum Wien : [Ugano, Matengo Hochl. wsw. Songea, Tanganyika Terr., 15-1.700 m, 11-20.III.1936 (3 ♂♂ leg. ZERNY)].

Genus **CALLIPHORA** ROBINEAU-DESVOIDY.

Calliphora ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 433; MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 96; SÉGUY, Encycl. Ent., A IX, 1928, p. 135; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 274; SÉGUY, Encycl. Ent. B. Dipt., VIII, 1935, p. 144; HARDY, Proc. Linn. Soc. N. S. Wales, LXII, 1932, p. 17; TOWNSEND, Man. Myiol., V, 1937, p. 141; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 32; HARDY, Proc. R. Soc. Queensland, LVII, 1947, p. 53; HALL, Blowflies, N. America, 1948, p. 292.
Type species : *M. vomitoria* LINNÉ from Sweden.

Mya RONDANI, N. Ann. Sci. Bologna, (3), II, 1851, p. 175, et Dipt. Ital., I, 1856, p. 90; TOWNSEND, Mann. Myiol., V, 1937, p. 141.
Type species : *M. vomitoria* LINNÉ from Sweden.

Somomyia RONDANI, Dipt. Ital., IV, 1861, p. 9; TOWNSEND, Man. Myiol., V, 1937, p. 141 (nov. nom. pro *Mya* RONDANI).
Type species : *M. vomitoria* LINNÉ from Sweden.

A fair number of species of the genus is distributed over the Holarctic region, but, as far as it is known, only one occurs in the Ethiopian region.

This species, *C. croceipalpis* JAENNICKE, is a typical *Calliphora* and very closely related to the type species. But there are, in the Northern hemisphere as well as in the Australasian region, further groups of species which are sometimes dealt with as distinct genera, sometimes as subgenera or mere groups (cf. TOWNSEND, 1937; HARDY, 1937 and 1947; H322, 1948).

The question of a new classification of the Holarctic *Calliphorinae* will be raised in a forthcoming paper (« *Calliphorinae* » in LINDNER, Fliegen der palaearktischen Region). Those of the Australasian region have recently been dealt with by HARDY.

1. — **Calliphora croceipalpis** JAENNICKE.

(Fig. 55.)

Calliphora croceipalpis JAENNICKE, Abh. Senckenberg, Ges., VI, 1867, p. 376 : Porter, S. Afr. J. Sci., XXVII, 1924, p. 376, fig. 6; MALLOCH, Ann. Mag. N. H., (9), XVII, 1926, p. 509; CUTHBERTSON, Tr. Rhod. Sci. Ass., XXXVI, 1938, p. 122.

Calliphora capensis BRAUER & BERGENSTAMM, Denkschr, Akad, Wien, LVIII, 1891, p. 442.

Calliphora parasacra SPEISER, Kilimanjaro-Meru Exp., II, 1910, Abt. 10, p. 155; PATTON, Phillipp. J. Sciences, XXVII, 1925, p. 187.

This widespread fly is easily recognizable by its generic features and not to be confused with any other of the known Calliphorids in the Ethiopian region. Some of the bigger *Pericallimyia* species are similar to *C. croceipalpis* in general appearance but they have a red-tipped abdomen.

Male. — Eyes with the upper facets only slightly enlarged, frons at the narrowest point measuring 1/9-1/10 of eye-length. Frontal stripe black to reddish brown, triangular, the tip reaching the ocellar triangle; parafrontalia black and silvery dusted, besides the *paf* densely beset with black setae, parafacialia black too or more or less reddish towards the vibrissarium, silvery pollinose and in the upper half with black setae like the parafrontalia. Ocellar triangle with hairs and one pair of long *oc*, *iv* well developed, *ev*, *f* and *fo* wanting. Antennal groove without carina, third antennal segment about 3 ½ times as long as the second, black, more or less reddish at the base, basal segments predominantly black, arista with long hairs on both sides, last third bare. Facial ridge with the basal two thirds bristled, vibrissarium reddish, vibrissa long, peristomal bristles, hairs on buccae and occiput black on black ground, height of bucca about one third of eye-length. Palpi bright orange, terminally enlarged.

Thorax blackish blue, with the pollinosity typical of *Calliphora*. Prostigma bright orange, poststigma black-brown. Chaetotaxy : *ac*=2-3+3, *dc*=3+3, *ia*=1+1-2, *ph*=3, *h*=4, *prs*=1, *n*=2, *sa*=3-4, *sc*=4-5+1, *st*=2 : 1, one strong *pp* and *pst* each, accompanied by several hairs. Propleura, prosternum and alar declivity haired. Wings hyaline, at the base more or less brownish tinged, veins dark brown, basicosta brown, epaulette black, costal spine wanting, r_{4+5} with a few setae at the base, *m* with a pronounced

right angle, R_5 open, both squamae black brown, the lower with upstanding long hairs on almost the whole disc, halter dark brown with a yellow tip. Legs black, fore-tibia with a row of *ad* and one long submedian *pv*, mid-tibia with 2-4 *ad*, 1-2 *pd*, 2 *pv* and 1 *av*; hind-tibia with a row of *ad* of which two are strikingly longer, 2-4 longer *pd* as well as 2 submedian *av*.

Abdomen metallic dark blue, with white pollinosity forming a pattern of large spots changing with the light incidence. Tergite III with lateral marginals, tergite IV with lateral and dorsal marginals, last tergite densely beset with discal and marginal bristles. Hypopygium (fig. 55) similar to that of the Holarctic *C. vicina* ROBINEAU-DESVOIDY (= *erythrocephala* auct.).

Female. — Frons at vertex almost half as wide as the eye is long, chaetotaxy of head complete, with *ev*, *f* and 2 *fo*.

Length : 7-12 mm.

Biology. — CUTHBERTSON (1938) says that the female is larviparous. This is wrong. We have reared *C. croceipalpis* several times on decomposing meat and can state that it is oviparous like the Holarctic *Calliphora* species. The stigmal plates of the 3rd instar have been figured by PORTER (1924) who recorded the species as an occasional cause of wound and enteric myiasis. In Johannesburg, this species occurs during the colder months and was found developing in carcasses from June until September (ZUMPT and PATTERSON, 1952).

Mission G. F. DE WITTE : Karisimbi, vers sud, riv. Bikwi, 3.100 m, 28.II.1935 (1 ♂ ♀); Tshamugussa (Bweza), 2.250 m, 10.VIII.1934 (1 ♀); volc. Sabinyo, vallée Rwebeya, 3.000 m, 26.IX.1934 (15 ♂♂, 9 ♀♀); Ninda, 2.150 m, 26.IX.1934 (8 ♂♂, 10 ♀♀); Kibga (volc. Visoke), 2.400 m, 11.II.1935 (1 ♂); mont Tamira (près lac N'Gando), 2.600 m, 11.III.1936 (1 ♀).

Collection Musée du Congo : P. N. A. : gite Nyiragongo, 2.300 m, 1933 (1 ♂ ♀ leg. DE WULF); Kivu : Mutura, 15.III.1923 (1 ♂ leg. VAN SACEGHEM).

Collection American Museum, New York : [Mt. Mlanje, Nyasaland (1 ♂)]; [Addis Abeba, Abyssinia, VII.1926 (1 ♀)].

Staatl. Museum f. Naturkunde, Stuttgart : [Kibo West, Tanganyika, 2.800 m, IV.1952 (2 ♀ ♀ leg. E. LINDNER)].

Collection S. A. Institute for Med. Research, Johannesburg : A great deal of material is recorded in the card-register or present in the collection from the Cape Province, Basutoland, Orange Free State, Transvaal, Natal and S. Rhodesia.

C. croceipalpis ranges from the Cape over the higher altitudes of East and Central Africa up to Abyssinia, but most probably it is not present in the Western parts of Africa.

Genus **OCHROMELINDA** VILLENEUVE.

Ochromelinda VILLENEUVE, Bull. Soc. ent. France, 1915, p. 295; TOWNSEND, Man. Myiol., V, 1937, p. 158.

Type species : *Ochromelinda thoracica* VILLENEUVE from Tanganyika.

This genus is closely related to *Adichosina* and could perhaps be united with it. In general appearance, however, it is characterized by a slender body of yellow and blackish colouring and is easily separable from the species of *Adichosina*, which have the entire body or at least the thorax metallic blue or green (*Adichonisa novella* VILLENEUVE from Nyasaland, Bull. Ann. Soc. ent. Belge, 74, 1934, p. 185, which I have not seen, may belong to *Ochromelinda*). Furthermore, the presutural *ac* are wanting or only the median pair may be present. The fact that the phallosome is unusually heavily sclerotized (cf. fig. 56) made me decide to keep *Ochromelinda* separate from *Adichosina*.

Only very few specimens of *Ochromelinda* as well as of *Adichosina* are known, and it will have to be decided in the future whether they really represent two distinct units or not.

Head in male with the eyes closely approximated, width of frons apparently not exceeding twice the diameter of the anterior ocellus; upper facets hardly enlarged, bare; *iv* always, *ev* sometimes weakly developed, *f* and *fo* only present in the female sex. Parafacialia in the upper part with a few odd setae which are difficult to see. Antennal groove without carina.

Thorax with *ac*=0-1+1, *dc*=2+3, *ia*=1+3, *ph*=1-3 (outer present or wanting), *h*=2-3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3-4+1, *pst* and *pp* developed, *st*=2:1. Propleuron and supraspiracular convexity bare, but prosternum as well as the alar declivity sometimes with a few odd hairs. Suprasquamal ridge without tufts of hairs. Wing with the subcostal sclerite bare, r_1 not setulose, R_5 open, thoracic squama broad, dorsally bare. Legs without outstanding features.

Abdomen slender, structure as in *Pericallimyia*. Tergites with lateral discal and marginal bristles of outstanding length, median discals present on tergites IV and V, sometimes on III too. Structure of hypopygium principally as in *Pericallimyia*, but vesicae heavily sclerotized and hardly separable from the other terminal parts of the phallosome.

Only two species are known which inhabit the Eastern and Central parts of the Ethiopian region down to the mountainous districts of S. Rhodesia.

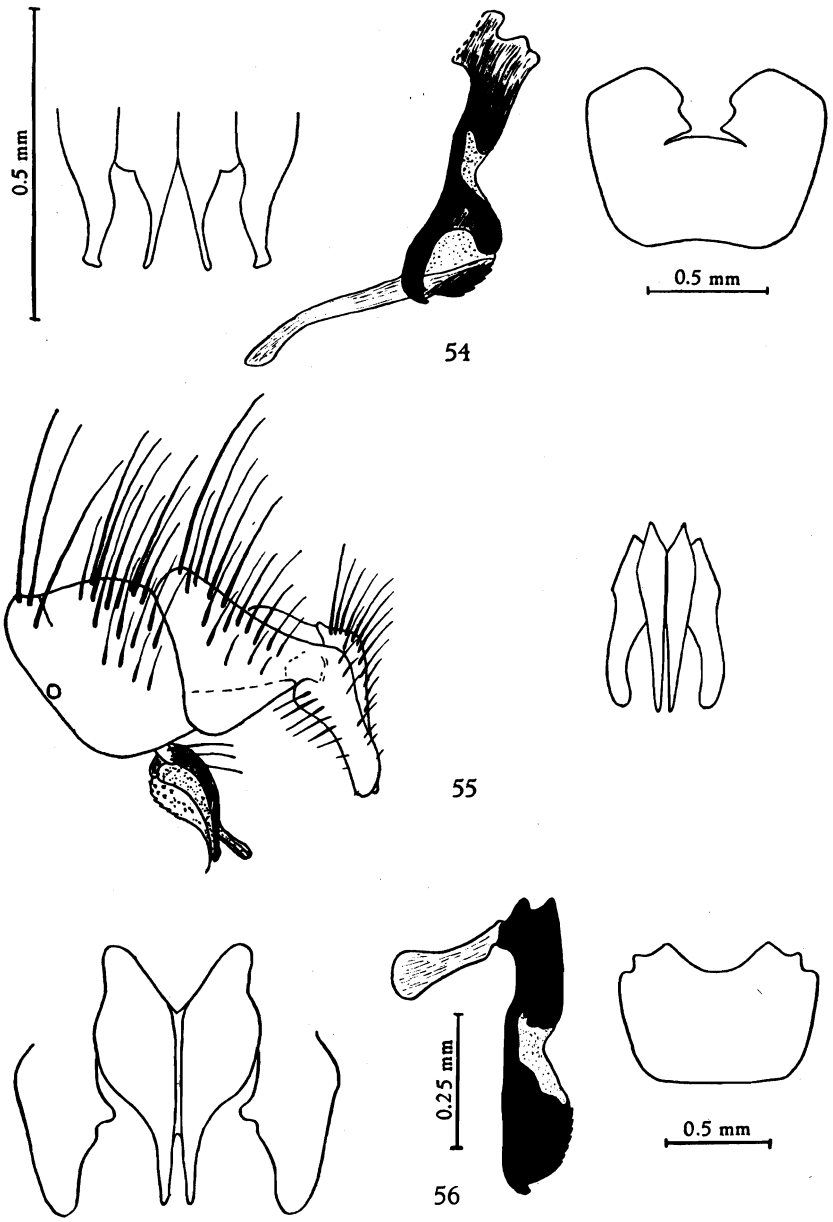


FIG. 54. — *Zernyiella dubia* n. gen., n. sp. Cerci with paralobi and 5th. sternite in frontal view, phallosome laterally. Specimen from Ugano, Tanganyika (paratype).

FIG. 55. — *Calliphora croceipalpis* JAENNICKE. Hypopygium laterally, cerci with paralobi in frontal view. Specimen from Johannesburg, Transvaal.

FIG. 56. — *Ochromelinda thoracica* VILLENEUVE. Cerci with paralobi, phallosome and 5th. sternite. Specimen from P.N.A.

KEY TO THE SPECIES.

1 (2) One pair of presutural *ac* and outer *ph* present. Thorax and abdomen yellow-brown, with a variable black pattern.

Frons in ♂ at the narrowest point not more than twice as wide as the anterior ocellus, in ♀ at vertex about ⅓ of eye-length. 8-9 mm. — Belg. Congo, Tanganyika, S. Rhodesia ..... 1. *O. thoracica* VILLENEUVE.

2 (1) Presutural *ac* as well as outer *ph* wanting. Thorax black, with white pollinosity forming an *Anthomyia*-like pattern.

Otherwise as in the foregoing species. 7 mm. — Abyssinia ..... 2. *O. abyssinica* n. sp.

1. — **Ochromelinda thoracica** VILLENEUVE.

(Fig. 56.)

Ochromelinda thoracica VILLENEUVE, Bull. Soc. ent. France, 1915, p. 296.
Ochromelinda vittigera VILLENEUVE, Bull. Soc. ent. France, 1915, p. 297 (syn. nov.).

An evidently rare fly, which is very variable with respect to the colouring but well characterized by the structure of the hypopygium (fig. 56).

Male. — Frons at the narrowest point not more than twice the diameter of the anterior ocellus ($\frac{1}{13}$-$\frac{1}{15}$ of eye-length), widened towards the vertex and the antennal groove. Parafrontalia black, dusted with white, touching at the tip of the ocellar triangle, frontal stripe dark to reddish brown; parafacialia more or less reddish towards the vibrissarium, whitish dusted like the parafrontalia; buccae and occiput also black with white pollinosity, the former measuring only ¼ the length of the eye. Vertex with *iv* strongly developed and in two ♂♂ with a hair-like *ev* too, which, however, is not developed in the 3rd male before me; a pair of proclinate *oc* behind which a second but weaker pair is developed, *f* and *fo* wanting, 6 stronger pairs of *paf* and several hair-like ones extending from the tip of the ocellar-triangle to the antennal base, parafrontalia and basal part of parafacialia with a few odd blackish setae which are only detectable at high magnification. Facial ridge with a second, slightly shorter vibrissa above the long one and a few thin and short hairs, which are restricted to the basal part of the ridge; peristome with black bristles, buccae with black hairs, occiput with black and yellowish hairs. Antennal groove without carina, antennae predominantly black-brown, third segment about twice as long as the second, arista with long hairs on both sides, last third bare. Palpi dark brown, very slender and hardly enlarged terminally.

Thorax totally black-brown, only pro- and poststigma yellow, or yellow brown with the mesonotum and pleurae darkened to a greater or lesser extent. Chaetotaxy : $ac = 1+1$ (the middle presutural being present),

dc=2+3, *ia*=1+3, *ph*=2-3, but outer one present, *h*=2-3 (one weak), *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3-4+1, one long *pst* and *pp*, accompanied by stouter hairs, *st*=2 : 1. Propleura and prosternum bare, alar declivity bare too or only with a few odd setae. Wings partly or totally brownish tinged, alar and thoracic squamae with the same tinge, bare on the disc, halter yellow. Veins brown, costal spine distinct, r_1 bare, r_{4+5} with a few setae at the base only, R_5 open, r_{4+5} bent downwards, *m* bent up terminally like a flat « s ». Legs yellow brown, except the tarsi which are totally black; fore-tibia with 3-5 *ad* and one long submedian *av;* mid-tibia with 2-3 *pd* and one submedian *ad* and *pv*; hind-tibia with 2 *ad*, 2 *pd* and 1 submedian *av*.

Abdomen with a variable pattern like the thorax. It may be almost totally black, leaving only the tergites I+II, the front margin of III and the sternites yellow brown, or the black area may be reduced, only a dorsal median vitta of variable size remaining. All tergites laterally with several discal and extremely long marginal bristles, dorsally the 3rd with a pair of semi-erect median marginals, the 4th at least with a pair of discal bristles and the 5th with several discal and marginal bristles.

Female. — The only female before me is relatively light-coloured. Frons almost parallel, at vertex about ⅓ as wide as the eye is long. Frontal stripe bright orange, parafrontalia and -facialia silvery dusted as in the male. Face including antennae yellow-brown. Second pair of *oc* minute, but *ev*, *f* and 2 *fo* fully developed, long and strong. Palpi yellow. Abdomen with a pair of weak median discals on tergite III. Otherwise as in the male.

Length : 8-9 mm.

Mission G. F. DE WITTE : Nyasheke (volc. Nyamuragira), 1.820 m, 1-26.VI.1935 (1 ♂); Burunga (Mokoto), 2.000 m, 15-16.III.1934 (1 ♂).

Mission H. DAMAS : Lukula, lac Mokoto, 15.VIII.1935 (1 ♂).

Collection Musée du Congo : [Ruanda : Rutovu, 2.350 m, L.1953 (1 ♂ leg. P. BASILEWSKY)].

Dept. of Research and Specialist Services, Salisbury : [Vumba Mts., Umtali distr., S. Rhodesia, XI.1940 (1 ♂ leg. A. CUTHFERTSON)].

O. thoracica was originally described from N. W. Tanganyika.

2. — **Ochromelinda abyssinica** n. sp.

(Fig. 57.)

This new species, of which only a single male is known, shows a very striking colouring. The thorax has an *Anthomyia*-like pattern consisting of a black, rectangular, median vitta extending from the anterior margin to the level of the second pair of postsutural *dc*; on each side there is one pair of lateral blackish vittae only narrowly separated at the suture. The

foremost vitta is bordered anteriorly by the *prs* and the single median *ph*. The hindmost vitta extends a little further behind the first *ia*. Remaining mesonotum white pollinose, scutellum black. Pleurae black with a white pollinosity, pro- and poststigma black-brown. Abdomen predominantly yellow brown, dorsally with a broad median vitta of black-brown colour covering the basal half of the combined tergites I+II, and narrowed from here until it reaches the 4th tergite, which is almost totally darkened dorsally like the last one. Legs yellow brown, except coxae, tips of femora and tarsi, which are black-brown.

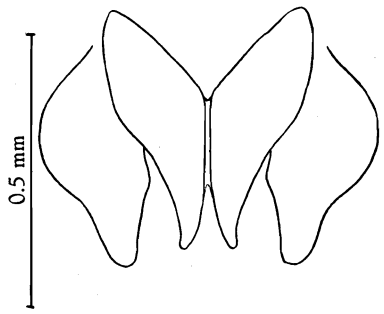


FIG. 57. — *Ochromelinda abyssinica* n. sp.
Frontal view of cerci with paralobi.
Specimen from Abyssinia (holotype).

With respect to the morphological features, there is a great similarity to *O. thoracica*. Structure and chaetotaxy of head as in this species. With respect to the thorax, the presutural *ac* are wanting, as well as the outer *ph*, foremost postsutural *ia* very weak, *sc*=4+1, but first marginal and the discal bristles short and thin. Wings with a longer costal spine. Hind-tibia with 2 submedian *av*. Remaining features of the thorax and those of the external abdomen as in *O. thoracica*, but median discals on tergite III present. Hypopygium (fig. 57) with broader cerci, phallosome as in the related species.

Length : 7 mm.

Collection British Museum : [Wachache Ravine nr. Addis Abeba, Abyssinia, ca. 8.000 ft, 9.IX.1926 (1 ♂ leg. H. SCOTT)].

Genus **ADICHOSINA** VILLENEUVE.

Adichosina VILLENEUVE, Bull. Ann. Soc. ent. Belge, LXXIV, 1934, p. 186.

Type species : *Adichosina thoracica* VILLENEUVE from the Cameroons.

The genus is based on *A. thoracica* which has remained unknown to me. The description is, moreover, very inadequate only enabling me to

establish the fact that the other species placed by me into this genus really belong to it. VILLENEUVE's diagnosis does not allow this species to be included with the other ones before me in a key.

In the same paper, VILLENEUVE described a second species of the genus, *A. novella*, based on a single female from « Mt. Mlanje », Nyasaland. I have not seen this species either, but according to the description, it may be a species of *Ochromelinda*.

From the Commonwealth Institute of Entomology, London, as well as from the Dept. of Research and Specialist Services, Salisbury, I received a number of specimens, identified by VILLENEUVE himself as *Adichosina* spec. or *A. marginata* VILLENEUVE. This last species has apparently never been described and is therefore a mere name in litt. CURRAN, when describing his *munroi*, mentions *marginalis* VILLENEUVE as a related species which has a dark-tipped abdomen like *munroi*.

VILLENEUVE described a *Pericallimyia marginalis*, but it shows a red-tipped abdomen like all other species of the genus. CURRAN's species, however, is certainly an *Adichosina* spec., which has never been described by VILLENEUVE. It is not known where Dr. CURRAN saw this species and what it really represents. It was not amongst the Ethiopian calliphorids which he kindly sent me for my studies.

This material, and that sent to me from other museums, contained 2 species which have proved to be distinct according to the different shapes of the hypopygia. However, the members of this genus seem to be rare or are at least not commonly found, so that the range of the intraspecific variability is still not known. I was therefore unable to classify a certain number of female specimens which do not agree in every outer feature with the males present. The presence or absence of the discal bristles on the abdominal tergites is one of these questionable features. It may be that they are of no taxonomic value at all, but the contrary may be true too, so that these females may include several still unknown species.

To be brief, the genus *Adichosina* is one of the most insufficiently known groups within the Ethiopian *Calliphorinae* owing to the rareness of material. Probably many more species are still to be discovered in future, and collections should be made especially in West and Central Africa, in order to find out which species VILLENEUVE had before him when erecting this genus.

The two species of *Adichosina* before me have in common a metallic green to blue and brownish-black body of slender shape. The eyes in the male sex are relatively close together, the frons at the narrowest point measuring $\frac{1}{9}$-$\frac{1}{12}$ of eye-length. In *A. thoracica*, however, the male is said to be completely holoptic. The inner vertical bristle may be represented as a long hair in the male, *f* and *fo* are wanting as usual but present in the female. The parafacialia may be bare or provided with setae in the upper part.

Thorax with *ac*=2+0-3, *dc*=2+3, *ia*=0-1+2, *ph*=2-3 (outer present), *h*=3-4, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3-4+0-2, *pst* and *pp* developed, *st* normally 1 : 1. Remaining features as in *Ochromelinda* to which *Adichosina* is closely related.

KEY TO THE SPECIES.

(*A. thoracica* VILLENEUVE, *A. novella* VILLENEUVE and *A. marginalis* CURRAN nec VILLENEUVE, are omitted).

1 (2) Parafacialia bare, without setae in the upper part; postsutural *ac* present, presutural *ia* wanting.

Frons in ♂ at the narrowest point measuring 1/9-1/12 of eye-length, in ♀ at vertex about 3/7 of eye-length. Abdomen of ♂ with width to length from 9 : 13 (nominate form) to 1 : 2 (ssp. *ugandensis* nov.), 3rd and 4th tergites in both sexes with a pair of median discal bristles. 5-7,5 mm. — Cape Province, Transvaal, S. Rhodesia, Uganda, Belg. Congo ..... 1. *A. munroi* (CURRAN).

2 (1) Parafacialia with an irregular row of setae in the upper part; postsutural *ac* absent, presutural *ia* present.

Frons in ♂ at the narrowest point about 1/11 of eye-length, in ♀ (?) at vertex about 2/5 of eye-length. Abdomen in ♂ with width to length =7 : 9, median discals of tergites III and IV only present in ♂. 5-6 mm. — S. Rhodesia ..... 2. *A. rosei* n. sp.

[1. — **Adichosina munroi** (CURRAN).]

(Fig. 58.)

Pericallimyia munroi CURRAN, Mem. Div. Ent., U. S. A. Dept. Agric., 1926, p. 47; Bull. Amer. Mus. N. H., LVII, 1928, p. 366.

A. munroi was the first species of the genus to be described. It was based on several males from the Eastern Cape Province, collected by Dr. K. MUNRO in 1923 and 1924. Specimens of this type series are before me, from which the following redescription has been made.

Specimens from Uganda, the Congo area and S. Rhodesia differ considerably in several outer features and could easily be taken as representatives of a further species, if the structure of the hypopygium did not coincide basically with that of the type specimens. Furthermore, a pair of specimens from the Eastern Transvaal which are intermediate in some of the outer features, show that a cline may exist from South to North. I decided, therefore, to regard the specimens from Central Africa as belonging to a new subspecies, whereas for the time being, I place those from Transvaal

to the nominate form. This solution, however, can only be a temporary one, until more material becomes available which may throw more light on the natural relationship of these forms.

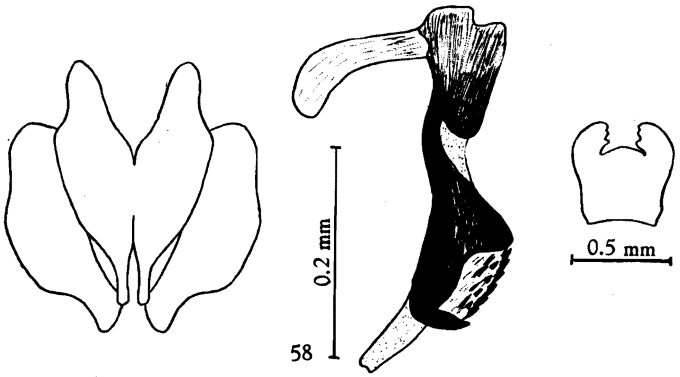
Male. — Eyes with the upper facets slightly enlarged, frons at the narrowest point measuring 1/9-1/10 of eye-length (2-3 times the width of the anterior ocellus), widened towards the vertex and the antennal groove. Parafrontalia and -facialia black to reddish-brown, silvery pollinose, without setae beside the bristles; frontal stripe black-brown, very narrow in front of the ocellar triangle. Vertex with a pair of long *iv*, a pair of long and a pair of short proclinate *oc*, about 10 pairs of *paf* present. Antennal groove black-brown with white pollinosity like the remaining part of the head, without carina, antennae dark brown, the third segment about twice as long as the second, arista with long hairs on both sides, the last third or fourth bare. Facial ridge in the basal part with a few black hairs above the vibrissa, peristomal bristles and occipital hairs black, bucca low, measuring 1/6-1/7 of eye-length. In addition to the peristomal hairs, there are only a few buccal hairs present. Palpi dark brown, very narrow, hardly enlarged terminally.

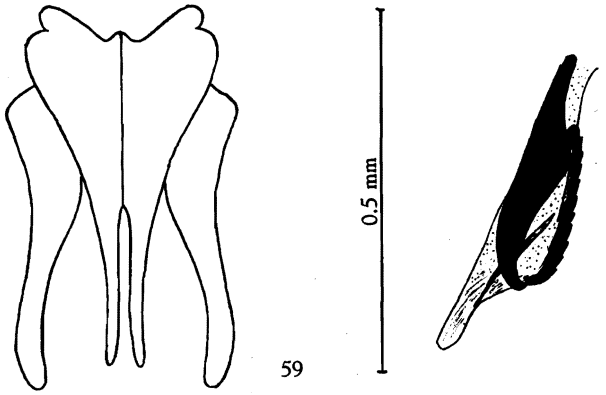
Thorax metallic greenish to dark blue, pleurae and fore-part of mesonotum densely white pollinose, remaining thorax only slightly dusted, pro- and poststigma black-brown. Chaetotaxy : *ac*=2+3, *dc*=2+3, *ia*=0+2, *ph*=3, *h*=3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3+0-2 (discals weak), a long *pst* and *pp* present, accompanied by stouter hairs, *st*=1 : 1. Propleura and prosternum bare, alar declivity with a few setae. Wings with the costal area down to *m* demarcated dark-brown, remaining part hyaline or slightly tinged, veins brown, costal spine distinct, r_{4+5} at base with a few setae, R_5 open, *m* bent up in a broad arch; thoracic squama broadly rounded, black-brown and bare dorsally. Legs black brown, fore-tibia with a row of relatively long *ad* and one submedian *av*; mid-tibia with 2 *pv* and one submedian *av*, *ad* and *pd*; hind-tibia with 2 *pd* and 3 *ad* as well as one submedian *av*.

Abdomen relatively broad, greatest width to length =9 : 13. Colouring as in the thorax, white pollinosity relatively thin, almost totally covering the last tergite, and laterally more than the basal half of the 4th and 3rd tergites, whereas it is indistinct in the median part, tergite I+II not pollinose. Fifth tergite with long marginal and discal bristles, the fourth and third with a row of marginal bristles and a pair of median discals, basal tergite laterally with a long marginal bristle accompanied by a tuft of bristly hairs, dorsal marginals and discals not developed. Hypopygium strown in fig. 58.

Length : 6-7,5 mm.

The typical series, coming from East London, C. P., consists of 7 males, of which I have received two from Dr. H. C. CURRAN (American Museum, New York) and one from Dr. H. K. MUNRO (Dept. Agriculture, Pretoria).





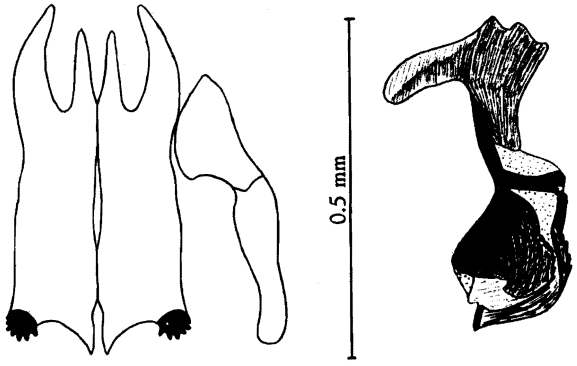


FIG. 58. — *Adichosina munroi* (CURRAN). Cerci with paralobi, phallosome and 5th. sternite. Specimen from East London, Cape Province.

FIG. 59. — *Adichosina rosei* n. sp. Cerci with paralobi, terminal part of phallosome. Specimen from Vumba Mounts, S. Rhodesia (holotype).

FIG. 60. — *Tricyclea patrizii* ZUMPT. Cerci with one paralobus in frontal view, phallosome laterally (after ZUMPT). Holotype from Nairobi, Kenya.

One pair from White River, Transvaal (leg. H. PATERSON, 6.III.1953), differs from the type series by its more slender body, the index of the abdomen being 7 : 10. Furthermore, the 3rd antennal segment is 2 ½ times as long as the second. Width of frons at the narrowest point is about $\frac{1}{12}$ of eye-length; frontal stripe, therefore, narrowed to a line before reaching the ocellar triangle. The female has a broad frons, which is very slightly widened towards the antennal groove and measures at vertex $\frac{3}{7}$ of eye-length. Frontal stripe black brown, slightly narrowed towards the antennae. Regarding the head bristles, *iv*, *ev* and *f* are well developed, of the *fo*, however, only the upper pair is present. Chaetotaxy of the thorax and abdomen the same in both sexes and identical with that of the type specimens.

Adichosina munroi ugandensis subspec. nov.

The 4 males before me from Kampala, Uganda (leg. H. HARGREAVES, 19.V.1926), which were sent to me by Dr. F. VAN EMDEN, Commonwealth Institute of Entomology, London, are regarded as typical. The thorax is dark-green coloured, pollinosity and chaetotaxy as in the nominate form. Abdomen very slender and twice as long as broad, ground colour metallic dark brown, pollinosity thick, covering about the anterior half of the last three tergites; arrangement of bristles as in the S. African specimens. Width of frons between $\frac{1}{9}$ and $\frac{1}{12}$ of eye-length, third antennal segment about 3 times as long as the second.

Length : 5-7,5 mm.

The following specimens agree generally with the type series of ssp. *ugandensis* :

Mission G. F. DE WITTE : Rutshuru, 1.285 m, 30.XII.1933-3.I.1934 (1 ♂).

Collection Musée du Congo : Rutshuru, 19.V.1936 (1 ♂ leg. L. LIPPENS); [Élisabethville, 12.III.1921 (1 ♀ M. BEQUAERT)].

Dept. of Research and Specialist Services, Salisbury : [Salisbury, 17.II.1939 (1 ♂ leg. A. CUTHBERTSON)].

[2 .— **Adichosina rosei** n. sp.]

(Fig. 59.)

Mr. D. J. W. ROSE, Salisbury, sent me some calliphorid flies ex CUTHBERTSON's collection, among which I found a male *Adichosina* identified as *P. munroi*. It is, however, different from *P. munroi* in several outer features and is well characterized by the structure of the hypopygium, proving that we are dealing with a new species.

Male. — Eyes with the upper facets only slightly enlarged, frons at the narrowest point about $\frac{1}{11}$ as wide as the eye is long, widened towards the

vertex and the antennal groove. Parafrontalia and -facialia black, with whitish pollinosity, frontal stripe black-brown, complete, at the tip of the ocellar triangle about as broad as one parafrontalium. Vertex with a pair of strong *iv*, *ev* hair-like, but almost as long as the *iv*, *oc* long and proclinate, 9 *paf* with several shorter hairs between them, parafacialia with a few setae in the upper third continuing the *paf* in an irregular row. Antennal groove whitish pollinose, without carina, antennae black brown, 3rd segment 3 times as long as the second, arista with hairs almost to the tip. Vibrissarium dark reddish brown, facial ridge with a row of about 8 bristles above the vibrissa, bucca black and, like the occiput, densely beset with black hairs, its height more than a third of eye-length. Palpi black-brown.

Thorax metallic dark blue, with a white pollinosity, which leaves three broad mesonotal stripes undusted. Pro- and poststigma black-brown. Chaetotaxy : *ac*=2+0, *dc*=2+3, *ia*=1+2, *ph*=2-3, *h*=4, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=4+1, but the discals weak, a long *pp* and *pst* present, *st*=1:1. Propleura and prosternum bare, alar declivity with a few setae. Wings without demarcated costal area, slightly brownish tinged, veins dark brown, costal spine distinct, r_{4+5} at base with a few setae, R_5 open, *m* with a rounded angle of almost 90°; thoracic squama broadly rounded, black brown, bare dorsally. Legs black-brown, fore-tibia with a row of relatively long *ad* and one submedian *av*; mid-tibia with 2 *pv*, a small submedian *pd* and a long one each of *av* and *ad*; hind-tibia with 2 long *pd* and *ad* and 2 relatively weak *av* in the lower half.

Abdomen longer than broad, with an index of about 9 : 7, metallic dark blue like the thorax, with a faint pollinosity which leaves the hind half of the 3rd and 4th tergites more or less and indistinctly free. Tergite I+II laterally with a strikingly long marginal bristle and a tuft of stouter bristles and hairs, dorsal discals and marginals not developed, tergite III with a pair of long median discals and marginals, laterally with hairs and several marginal bristles, 4th tergite with a pair of median discals as on III, but the hind margin with a continuous row of bristles, last tergite with discal and marginal bristles all over the dorsal surface. Hypopygium (fig. 59) with slender cerci and paralobi.

Female. — There are 3 female specimens from the type locality before me which most probably belong to this species, but they may not be labelled as paratypes. In contrast to the male, the median discals of the abdominal tergites III and IV are wanting. Frons at vertex measuring about ⅖ of eye-length, strongly widened towards the antennal groove, frontal stripe black, parallel, at the tip of the ocellar-triangle about twice as wide as one parafrontalium, *iv*, *ev*, *oc*, *f* and 2 *fo* as well as 5 *paf* present, the row of fine setae continuing the *paf* on the parafacialia are developed as in the male sex. Height of bucca about ¼ of eye-length, 3rd antennal segment 2 ½ - 3 times as long as the second. Chaetotaxy of thorax as in the male,

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.	
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_3.
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 3/7 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 ♂).

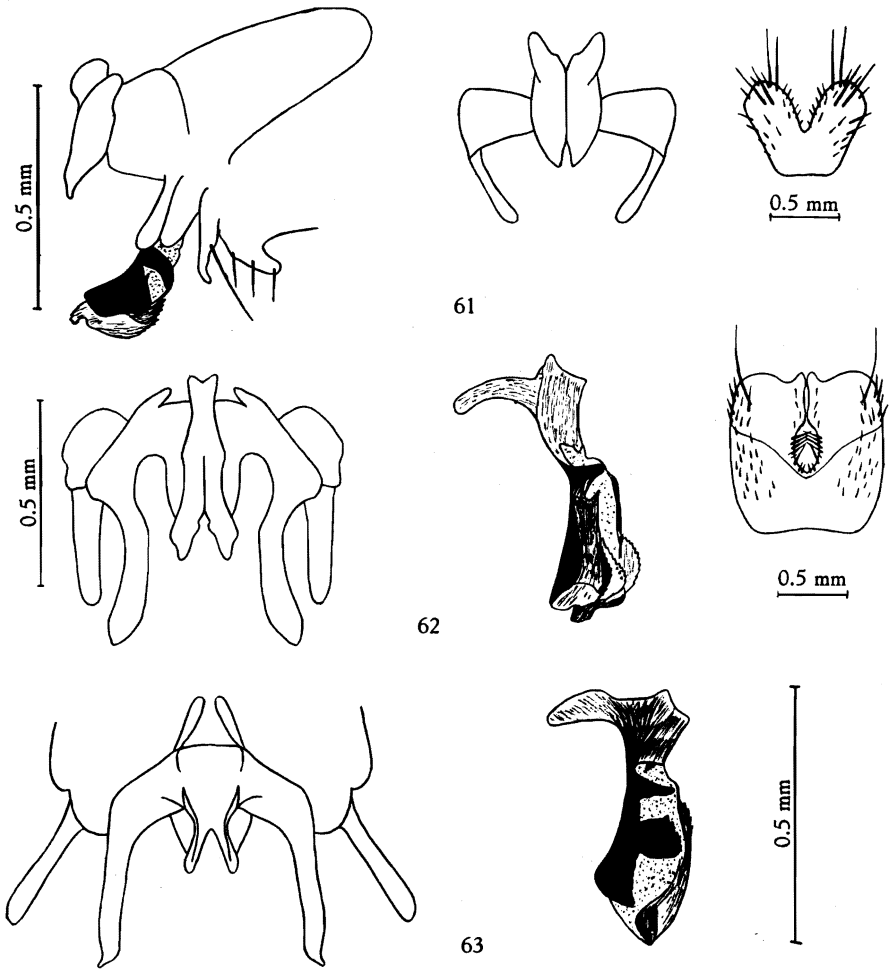


FIG. 61. — *Tricyclea semicinerea* BEZZI. Hypopygium in lateral view, cerci with paralobi and 5th. sternite in frontal view (after ZUMPT). Specimen from Waterberg district, Transvaal.

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.

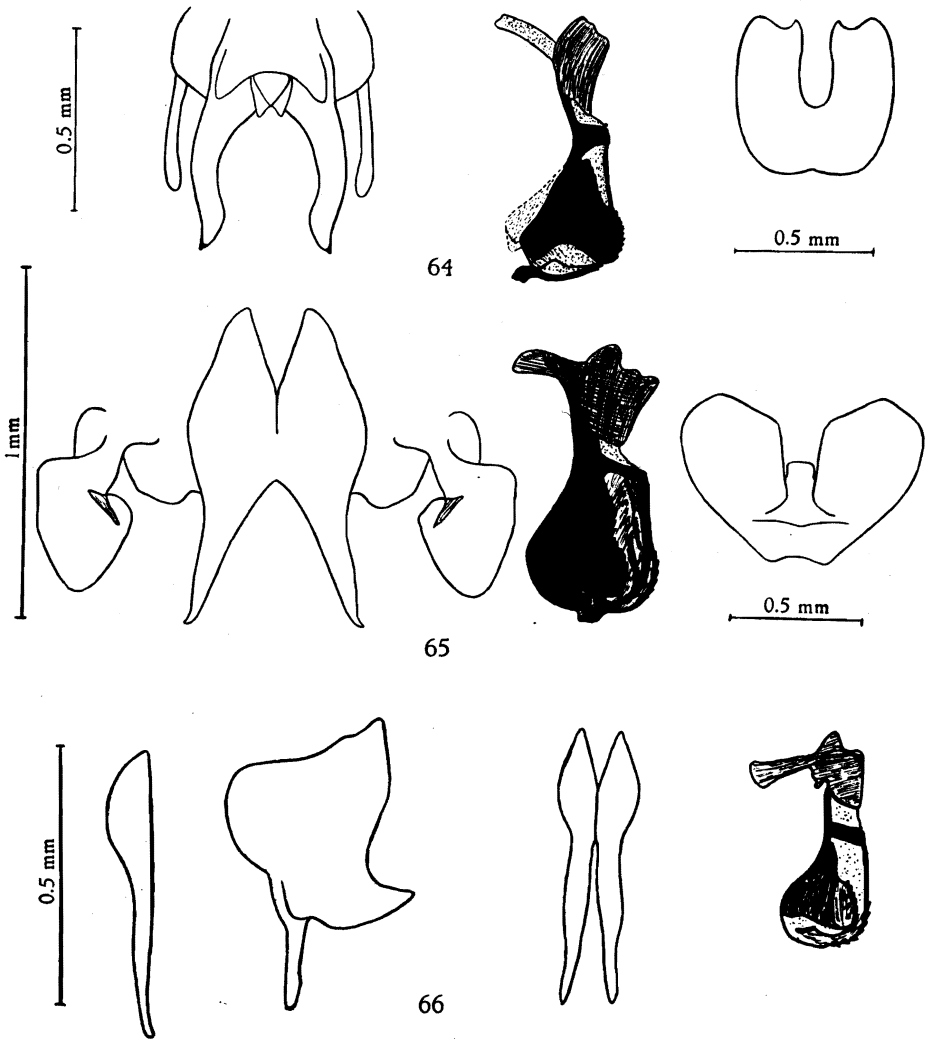


FIG. 64. — *Tricyclea fasciata* MACQUART. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Liberia.

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

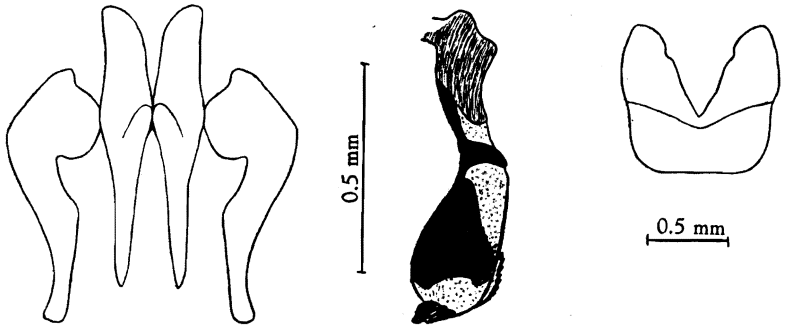


FIG. 67. — *Tricyclea latifrons* CURRAN.
Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT).
Specimen from Salisbury, S. Rhodesia.

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.

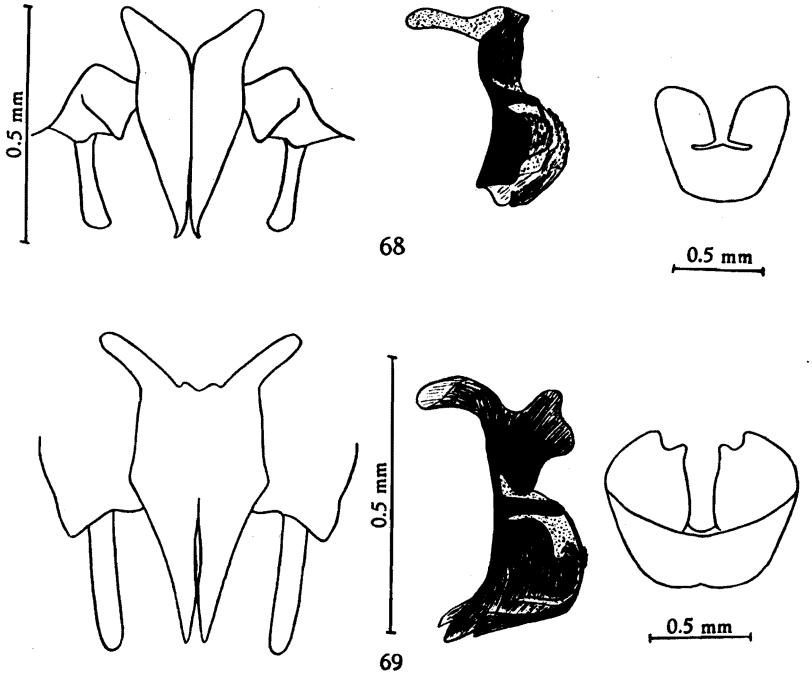


FIG. 68. — *Tricyclea dubia* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Paratype from Outjo, S.W. Africa.

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 ♀)].

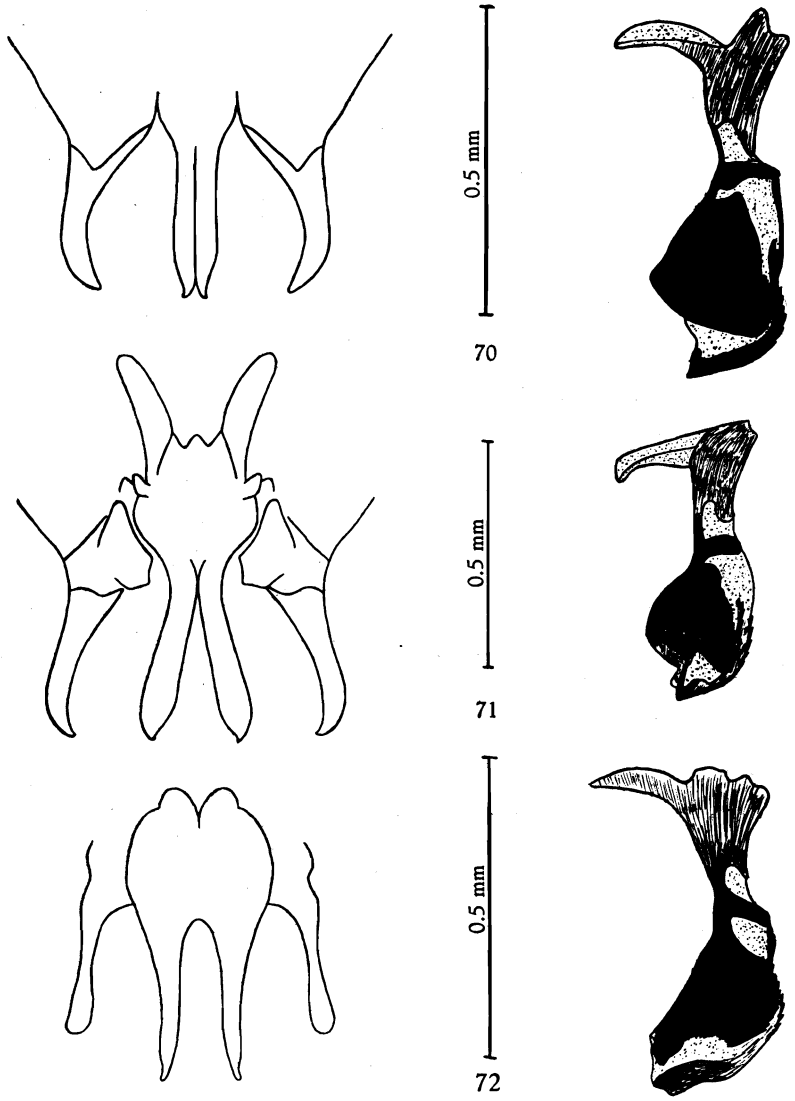


FIG. 70. — *Tricyclea du* CURRAN. Cerci with paralobi and phallosome (after ZUMPT). Specimen from Robertsport, Liberia.

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.

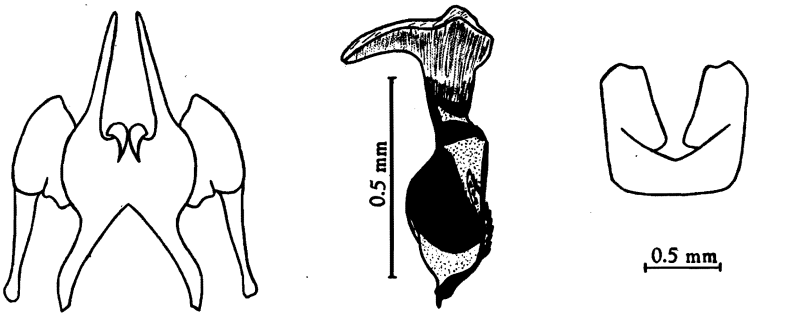
(Fig. 74.)

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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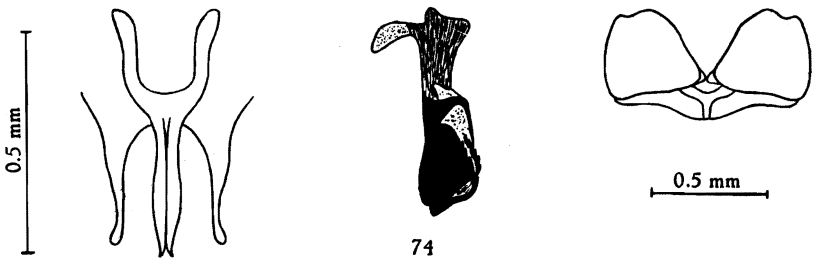

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FIG. 73. — *Tricyclea claripennis* SÉGUY. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Bechuanaland.

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.

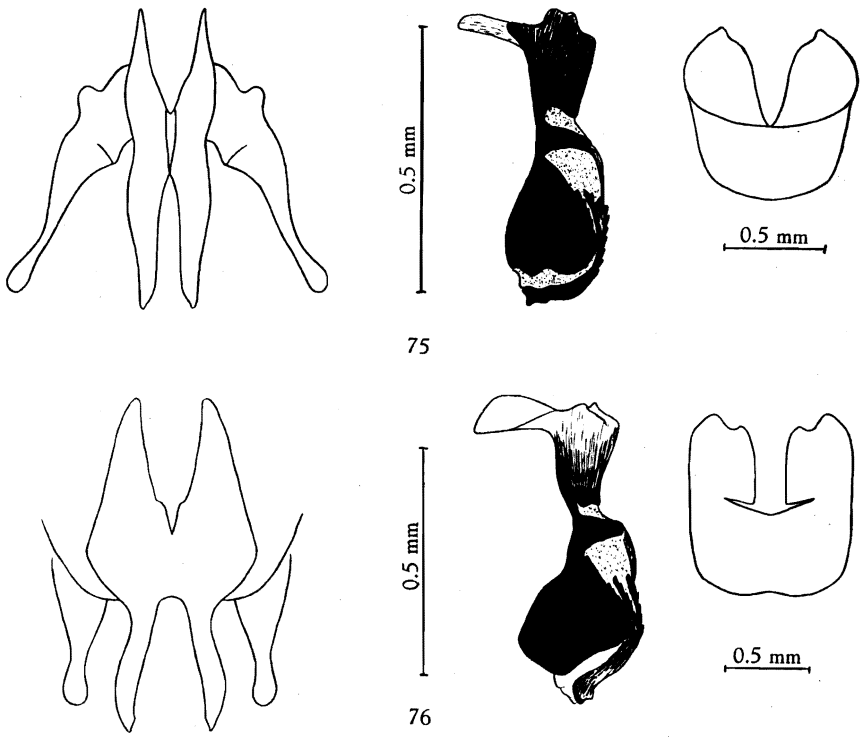


FIG. 75. — *Tricyclea semithoracica* VILLENEUVE. Cerci with paralobi, phallosome and 5th. sternite. Specimen from Ibadan, Nigeria.
FIG. 76. — *Tricyclea analis* MALLOCH. Cerci with paralobi, phallosome and 5th. sternite. Paratype from Benguella, Angola.

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_3.

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.

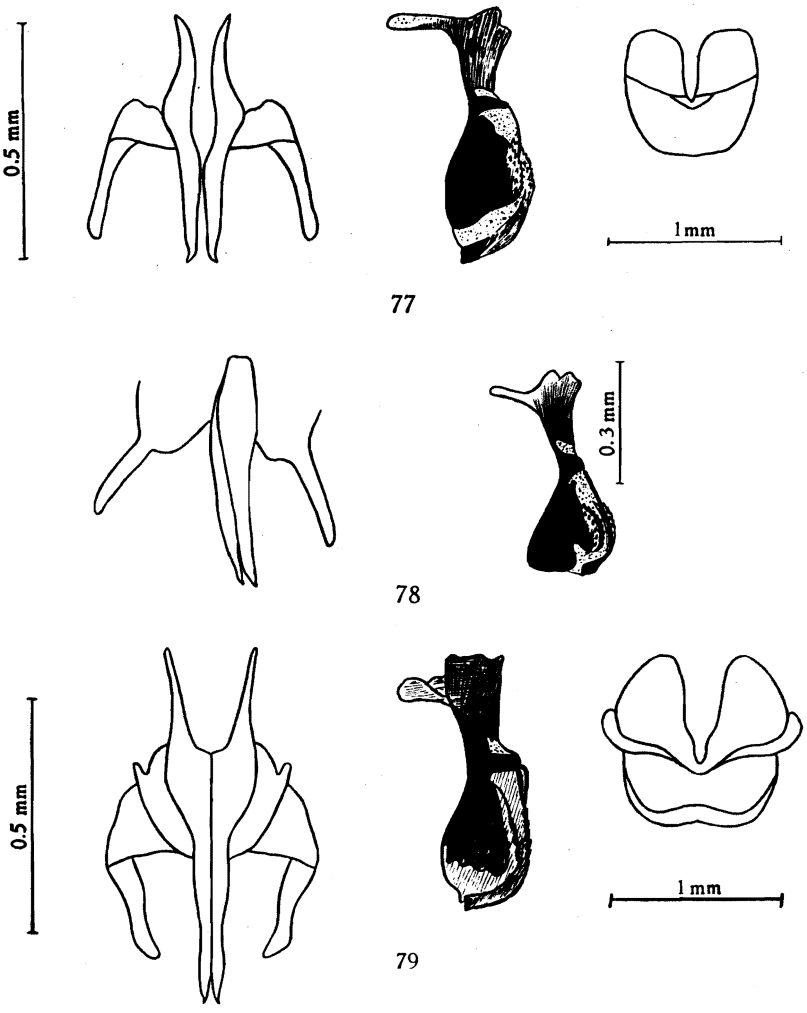


FIG. 77. — *Tricyclea unipunctata* CURRAN. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Robertsport, Liberia.

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*.

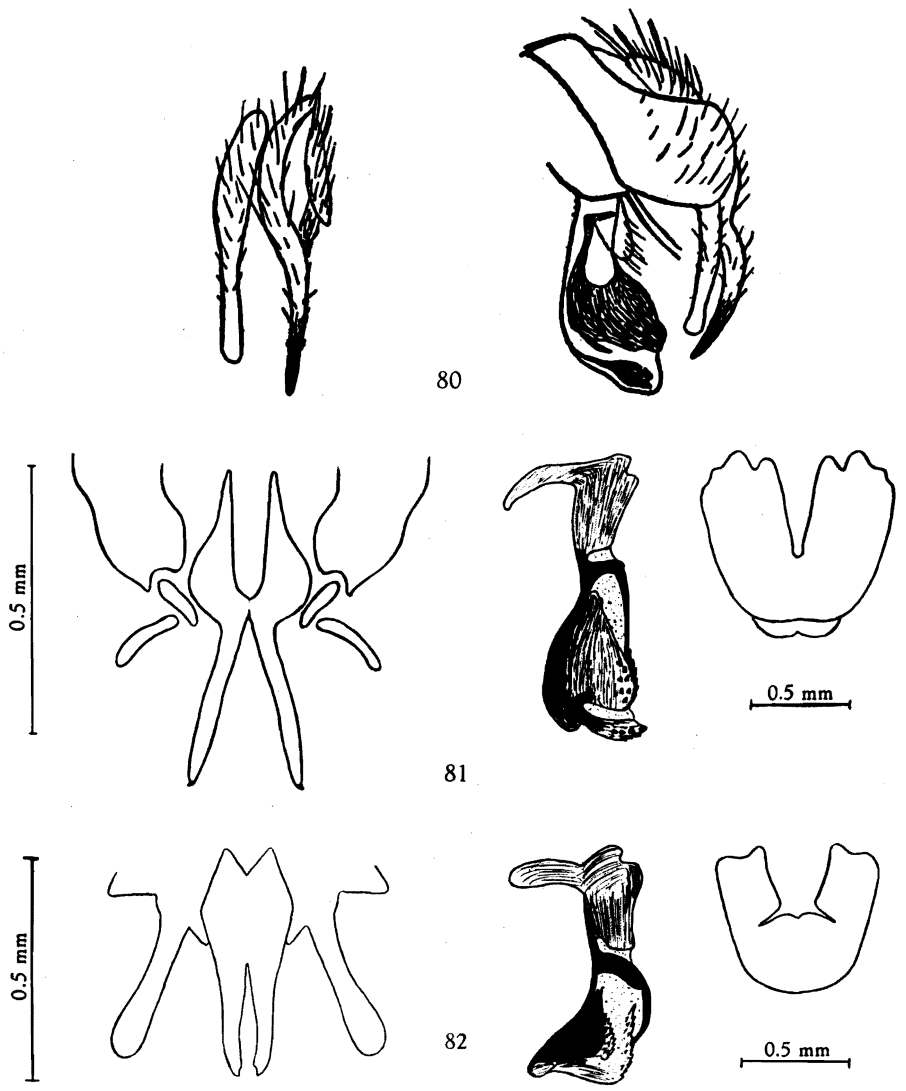


FIG. 80. — *Tricyclea somereni* (MALLOCH). Paralobus and cercus in frontal view, hypopygium laterally (after MALLOCH). Holotype from Rabai, Kenya.

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*)].

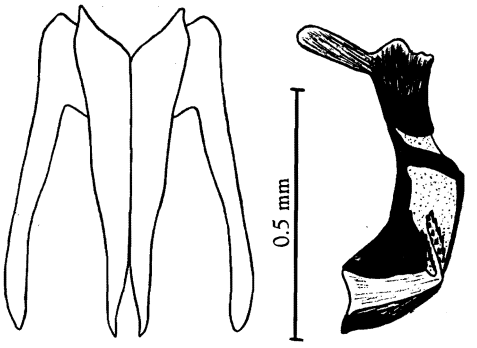


FIG. 83. — *Hemigymnochaeta bequaerti* CURRAN.
Cerci with paralobi, phallosome.
Specimen from Togo.

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. B II, 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. *micrommatidiata* III & IV *dc*). A separation from *H. bequaerti* is only possible by dissecting the male terminalia (fig. 84). There are numerous specimens

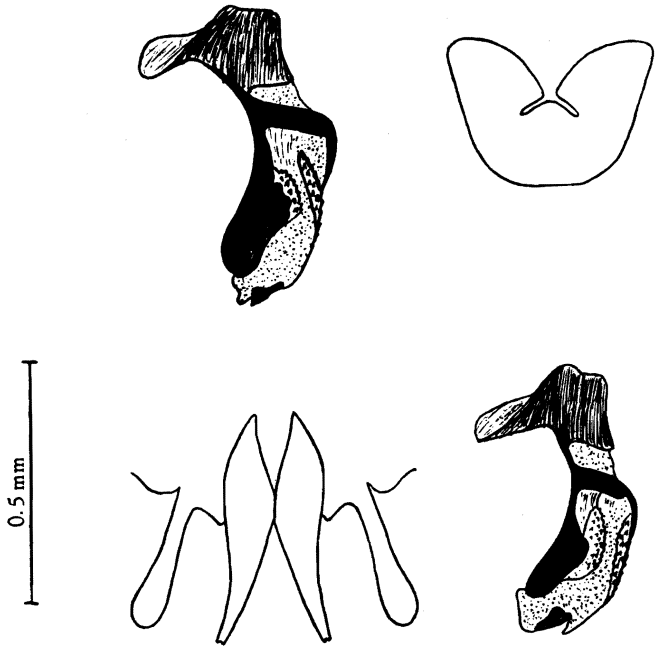


FIG. 84. — *Hemigymnochaeta unicolor* (BIGOT).
Cerci with paralobi and 5th. sternite in frontal view, two phallosomes laterally, to show the variability (after ZUMPT).

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)].

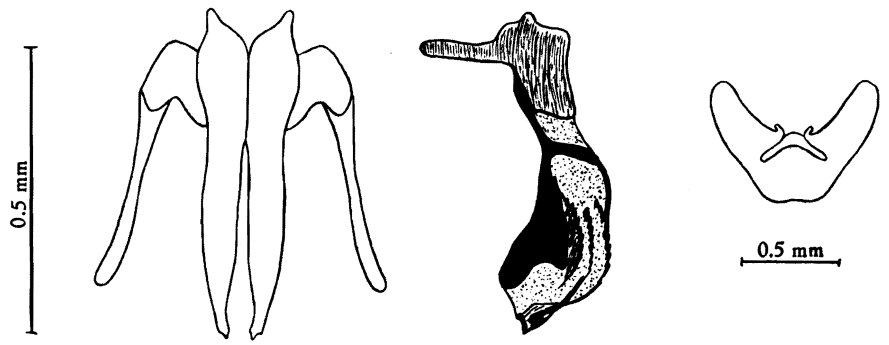


FIG. 85. — *Hemigymnochaeta gracilis* (SÉGUY).
Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT).
Specimen from White River, Transvaal.

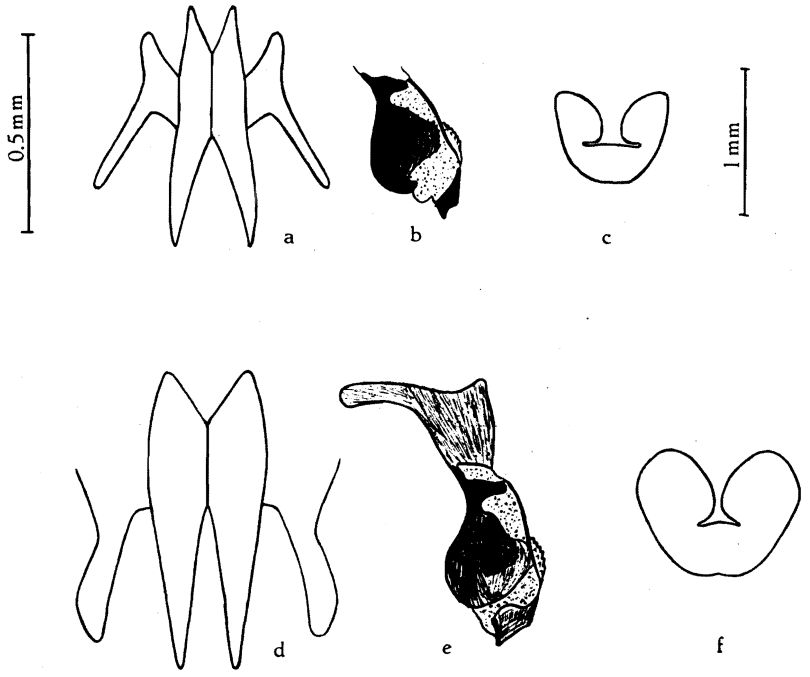


FIG. 86. — *Hemigymnochaeta liberia* CURRAN.
(a-c) : cerci with paralobi, phallosome and 5th. sternite, of a specimen from Robertsport, Liberia; (d-f) : a specimen from Salisbury, S. Rhodesia (after ZUMPT).

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. *micrommatidiata* 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 *micrommatidiata*-IV *dc* and *macrommatidiata*-IV *dc* occur. The following specimens have been received from Central Africa.

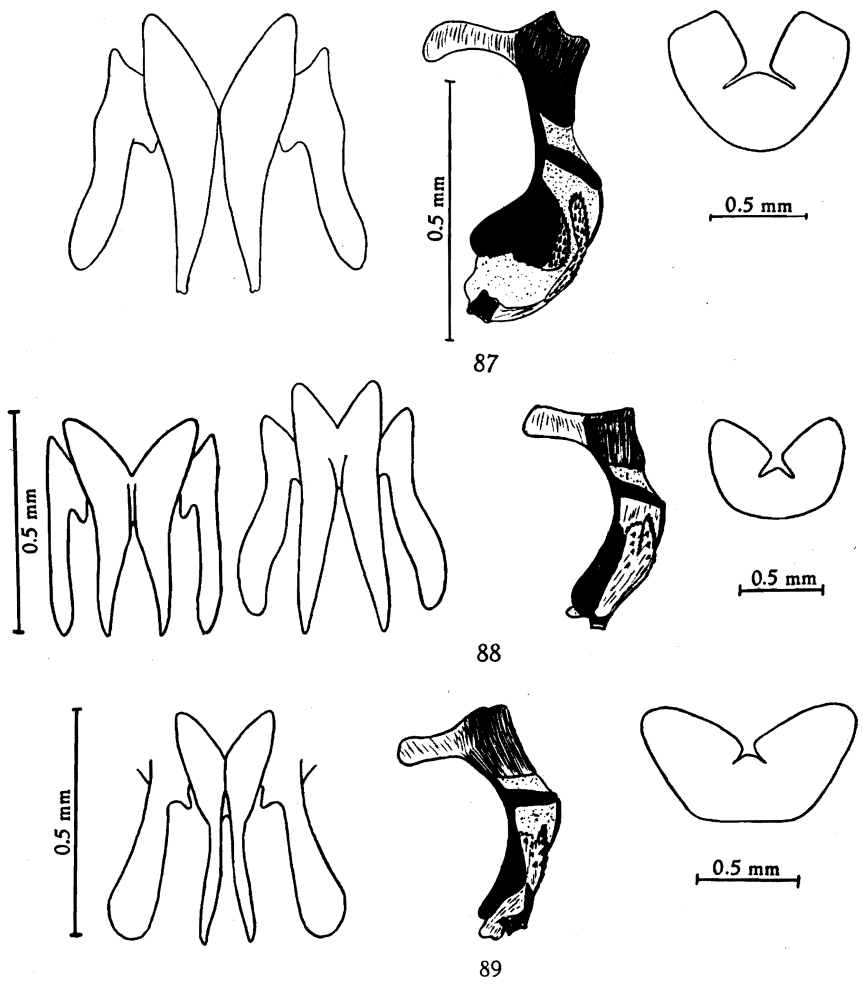


FIG. 87. — *Hemigymnochaeta incerta* ZUMPT. Cerci with paralobi, phallosome and 5th. sternite (after ZUMPT). Specimen from Elisabethville, Belgian Congo.

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.

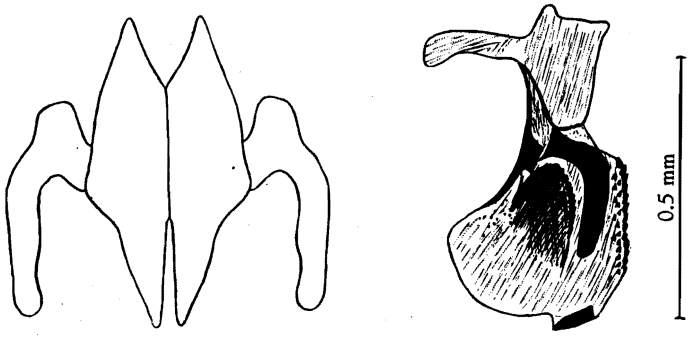


FIG. 90. — *Neocordylobia roubaudi* VILLENEUVE.
Cerci with paralobi and phallosome.
Specimen from Kenya.

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 ».

[Genus **AUCHMEROMYIA** BRAUER & BERGENSTAMM.]

Auchmeromyia BRAUER und BERGENSTAMM, Denkschr. Akad. Wiss. Wien, LVIII, 1891, p. 87; ROUBAUD, C. R. Acad. Sci., CLIII, 1911, p. 553; SURCOUF et GUYON, Bull. Mus. Nat. hist nat., 1912, p. 420; BEZZI, Ent Mitt., II, 1913, p. 71; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 110; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, p. 30; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 274; SÉGUY, Encycl. Ent., B 2, Dipt., VIII, 1935, p. 131; TOWNSEND, Man. Myiol., V, 1937, p. 68.
Type species : *M. luteola* FABRICIUS from Guinea.

Choeromyia ROUBAUD, C. R. Acad. Sci., CLIII, 1911, p. 553; SURCOUF et GUYON, Bull. Mus. Nat. hist. nat., 1912, p. 420; BEZZI, Ent. Mitt., II, 1913, p. 71; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 118; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, p. 39; MALLOCH, Ann. Mag. N. H., III, 1929, p. 274; SÉGUY, Encycl. Ent., B 2, Dipt., VIII, 1935, p. 131; TOWNSEND, Man. Myiol., V, 1937, p. 72.
Type species : *C. choerophaga* ROUBAUD from Timbuktu.

ROUBAUD and PATTON have carried out extensive studies on this genus with respect to the systematics as well as the bionomics. The larvae are bloodsuckers and live in close association with man, the burrow-inhabiting ant bear (*Orycteropus afer* PALLÁS) and the wart-hog (*Phacochoerus aethiopicus* PALLÁS).

Four species belonging to this genus are known. They are characterized by a medium-sized (7-12 mm), predominantly yellow-brown coloured body, bare propleuron, thoracic squama, suprasquamal ridge and supraspiracular convexity, the always wanting outer *ph* and totally fused cerci; the phallosomes are reminiscent of those of *Hemigymnochaeta*.

Further generic features distinguishing *Auchmeromyia* from *Hemigymnochaeta*, which perhaps may represent the more primitive ancestral unit, are to be stated as follows :

Head in both sexes with bare, widely separated eyes and well developed *iv*, *ev* and *f*. In the female, additional one or two *fo* are present, but sometimes weak or indistinct. Parafrontalia densely setulose, parafacialia only setulose in the upper half. Arista dorsally and ventrally with long hairs. Facial ridge on the lower part with bristles, vibrissa and peristomal hairs normal.

Thorax with *ac*=2-3+3-4, *dc*=2+2-4, *ia*=1+2, outer *ph* wanting, *h*=3, *prs*=1, *n*=2, *sa*=3-4, *sc*=4-6+1, *st*=1:1, *pst* and *pp* present. Legs and wings as in *Hemigymnochaeta*, but thoracic squama broad. Abdomen without median discal bristles. The chaetotaxy, especially on the thorax, is extremely variable, even in the same species.

Auchmeromyia species are known only from the Ethiopian region.

KEY TO THE SPECIES

(after PATTON, comp. figs 92 et 93.)

♂♂

1 (2) Abdominal tergite III about 1 ½ times longer than tergite IV ..... 1. *A. luteola* (FABRICIUS).
2 (1) Abdominal tergite III of normal length 3
3 (4) Mesonotal black stripes not well marked, abdomen mainly yellow with few markings ..... 2. *A. boueti* (ROUBAUD).
4 (3) Mesonotal black stripes well marked and broad; abdomen better marked, especially tergites IV and V 5
5 (6) Posterior border of tergite IV straight ..... 3. *A. choerophaga* (ROUBAUD).
6 (5) Posterior border of tergite IV with a slight but distinct incision ..... 4. *A. bequaerti* ROUBAUD.

♀♀

1 (2) Abdominal tergite III about twice the length of IV ..... 1. *A. luteola* (FABRICIUS).
2 (1) Abdominal tergite III of normal length 3
3 (4) Abdominal tergite IV markedly incised on posterior border ..... 4. *A. bequaerti* ROUBAUD.
4 (3) Abdominal tergite IV not deeply incised, sometimes slightly so, as in *choerophaga* 5
5 (6) Last 3 tergites black or nearly so ... 3. *A. choerophaga* (ROUBAUD).
6 (5) Last 3 tergites mainly yellow with black markings ..... 2. *A. boueti* (ROUBAUD).

[1. — **Auchmeromyia luteola** (FABRICIUS).]

(Figs. 92, 93.)

Musca luteola FABRICIUS, Syst. Antl., 1805, p. 286; NEWSTEAD, DUTTON & TODD, Ann. Trop. Med. Parasit., I, 1907, p. 49, figs. 12-14; RODHAIN & BEQUAERT, Rev. Zool. Afr., II, 1913, p. 145, fig. 1; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 122, figs.; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, p. 44, figs; PATTON, Ann. Trop. Med. Parasit., XXIX, 1935, p. 201, figs. 1-5; GARRETT-JONES, Bull. Ent. Res., XLI, 1915, p. 679.

Auchmeromyia tilhoi SURCOUF & GUYON, Bull. Mus. Nat. hist. nat., 1912, p. 423.

A. luteola is widespread in the Ethiopian region and a well known parasite in native huts. Man is the only host recorded up to now, but he most probably got the parasite from a burrowing animal which may still exist. The last paper on the distribution and biology of this fly was published by GARRETT-JONES. According to him, *A. luteola* is distributed over almost

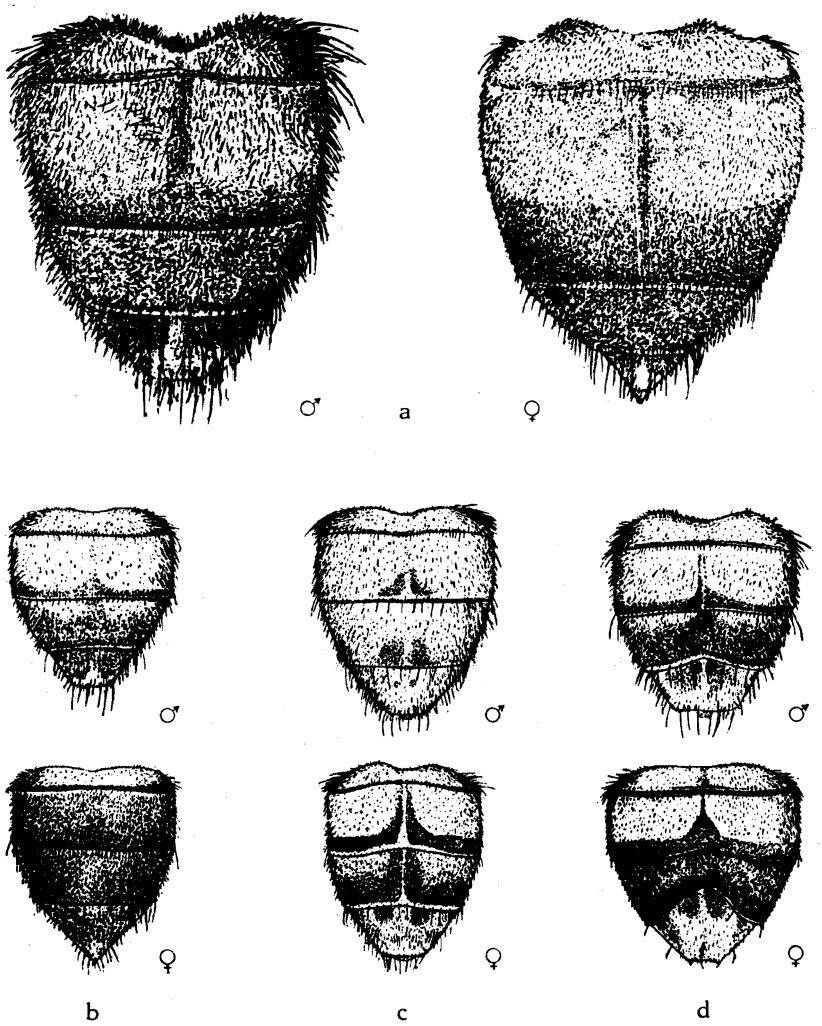


FIG. 92. — Abdomen of (a) *Auchmeromyia luteola* (FABRICIUS); (b) *A. choerophaga* (ROUBAUD); (c) *A. boueti* (ROUBAUD); (d) *A. bequaerti* ROUBAUD (after PATTON).

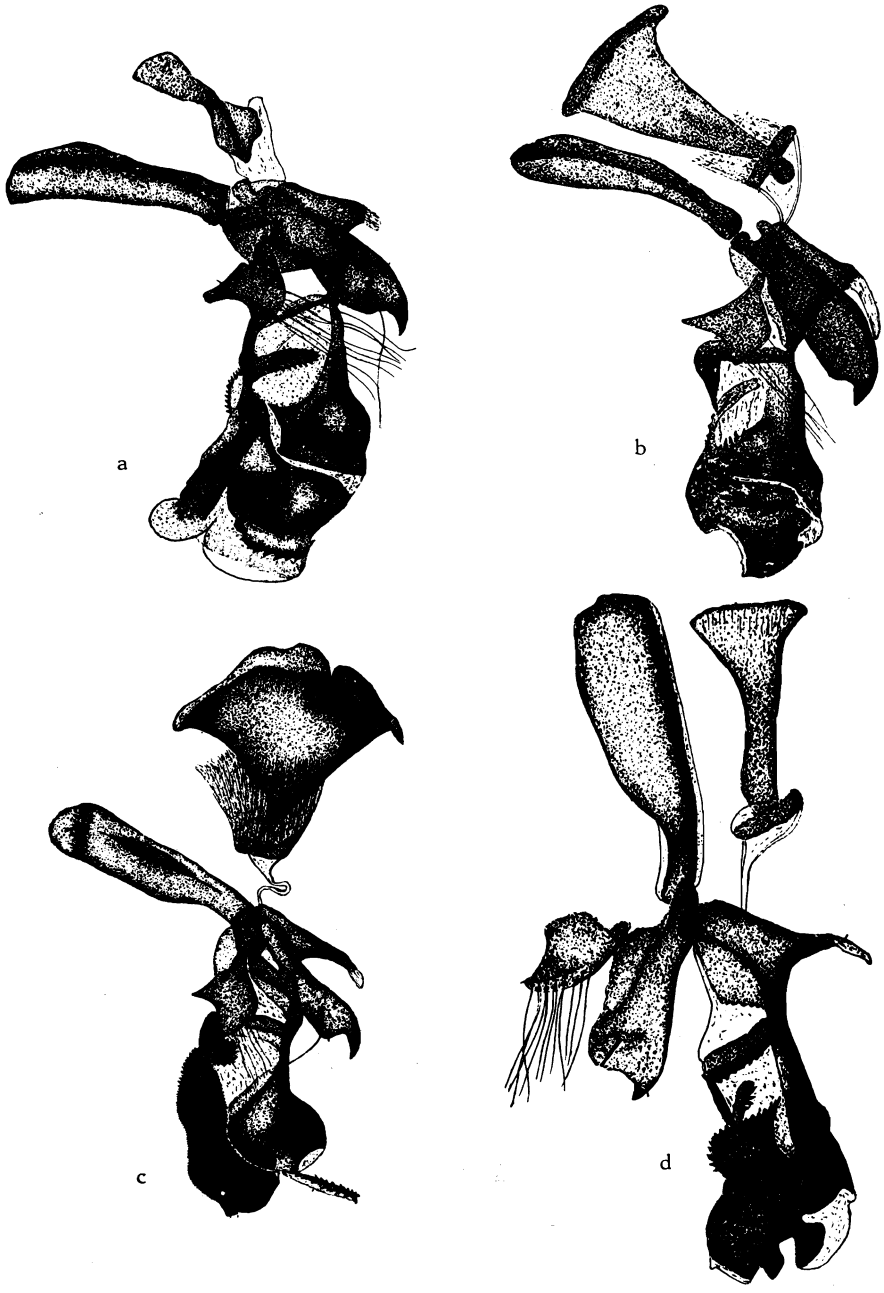


FIG. 93. — Phallosome of (a) *Auchmeromyia luteola* (FABRICIUS); (b) *A. choerophaga* (ROUBAUD); (c) *A. boueti* (ROUBAUD); (d) *A. bequaerti* ROUBAUD (after PATTON).

the whole of tropical Africa incl. the Cape Verde Islands, extending southwards as far as the N. Transvaal and the Natal Coast. I have received the following Congo material :

Collection Musée du Congo : [Terr. de Banningville, 1945 (1 ♀, leg. FAIN)]; [Kabinda, (2 ♂♂, leg. SCHWETZ)]; [Kivu : Mulungu, 25.VIII.1938 (1 ♂♀, leg. HENDRICKS)]; [Bukama, 4.VI.1911 (1 ♂♀, leg. BEQUAERT)]; [Mahagi-Niarembe, V.1935 (1 ♀, leg. CH. SCOPS)]; [Sandoa, 7.IV.1918 (1 ♂, leg. F. G. OVERLAET)]; [Élisabethville, VIII.1921 (1 ♀, leg. M. BEQUAERT)]; [Katanga : Kibimbi, 3.II.1911 (1 ♂, leg. L. BEOFUAERT)]; [Kwango : Dongo, 5.I.1940 (1 ♀, leg. VLEESCHOUWERS)]; [W. Ruwenzori, 2.300 m, 19.IV.1914 (1 ♂, leg. J. BEQUAERT)].

[2. — **Auchmeromyia boueti** (ROUBAUD).]

(Figs. 92, 93.)

Choeromyia boueti ROUBAUD, C. R. Acad. Sci., CLIII, 1911, p. 554; et Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 118, figs.; et Étud. Fa. Farasit. Afr. occ. franç., I, 1914, p. 40, figs.; PATTON, Ann. Trop. Med. Parasit., XXIX, 1935, p. 214, figs. 13-15.

I have seen a type specimen (♂) from the Haut-Sénégal (in collection Musée du Congo).

[3. — **Auchmeromyia choerophaga** (ROUBAUD).]

(Figs. 92, 93.)

Choeromyia choerophaga ROUBAUD, same references as for the foregoing species.

A. choerophaga is mainly a West African species, but I have received specimens also from Guar, Anglo-Egyptian Sudan (5 ♂♂, from wart-hog), and 1 ♂ from Otjimbombe, S. W. Africa, III.1923.

[4. — **Auchmeromyia bequaerti** ROUBAUD.]

(Figs. 92, 93.)

Auchmeromyia (*Choeromyia*) *bequaerti* ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 198; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, p. 41; BEQUAERT, Bull. Soc. Path. exot., VIII, 1915, p. 459, fig. 1; PATTON, Ann. Trop. Med. Parasit., XXIX, 1935, p. 205, figs. 6-9.

A. bequaerti was described from the Belgian Congo (Sankisia) and later found to be widespread in Eastern Africa and southwards to Zululand, where it is quite common near the burrows of wart-hogs and ant-bears.

Genus **CORDYLOBIA** GRUENBERG.

Cordylobia GRUENBERG, Sitzber, Ges. Naturf. Freunde Berlin, IX, 1903, p. 401; SURCOUF & GUYON, Bull. Mus. Nat. Hist. nat., 1907, p. 418; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 110; et Étud. Fa. Parasit. Afr. occ. franç., I, 1914, pp. 31 et 118; MALLOCH, Ann. Mag. N. H., (10), III, 1929, p. 275; PATTON, Ann. Trop. Med. Parasit., XXX, 1936, p. 57; TOWNSEND, Man. Myiol., V, 1937, p. 73; FAIN, Rev. Zool. Bot. Afr., LVIII, 1953, p. 306.

Type species : *O. anthropophaga* BLANCHARD from Senegal.

PATTON has written a detailed paper on the genus *Cordylobia*, in which he united with it the formerly distinct genera *Stasisia* SURCOUF and *Neocordylobia* VILLENEUVE from the Ethiopian region, as well as *Booponus* ALDRICH and *Elephantoloemus* AUSTEN from the Oriental region. Later, GRUNIN described another dermal myiasis producing fly, *Pavlovskiomyia inexpectata* GRUNIN (1947) from the Far East which, in a second paper (1949), he also transferred to *Cordylobia* following PATTON's suggestion.

I do not believe that all these dermal myiasis producing species of *Calliphorini* represent a phylogenetic unit, but that some of them may have evolved separately from more primitive genera, like *Hemigymnochaeta* for instance. On the basis of their morphological features, including the structure of the phallosome, I suggest the retention of the genera *Stasisia* and *Neocordylobia*, but agree that *Elephantoloemus* should be united with *Booponus*. GRUNIN's description, furthermore, shows clearly that his *Pavlovskiomyia inexpectata* also belongs to this genus, which is characterized mainly by a short, strikingly thickened arista being hardly longer than the 3rd antennal segment, and which is provided with only very short hairs above and below.

Up to now, two species are known, *C. anthropophaga* (BLANCHARD) and *C. ruandae* FAIN. Both are very different, and I had previously intended to erect a new genus for *C. ruandae*. The structure of the hypopygium, however, influenced me to retain the present status.

The features common to them and of generic importance may be summarized as follows :

Head with bare eyes, with the frons narrow or broad, in the latter case, *ev* and *f* are also developed in the male sex. Parafrontalia and -facialia beset with setae in full extent, facial ridge with short bristles in the lower third to half, vibrissa and peristomal bristles normally developed.

Thorax yellow-brown and black, the chaetotaxy seems to be subject to considerable variability, even in the same specimen; as a rule, the following arrangement can be stated : ac=2-3+3-4, dc=2+4-5, ia=1+2-3, ph=3, h=3-4, prs=1, n=2, sa=5 (2 of them short and placed behind the anterior bristle), pa=2, scutellum with up to 7 pairs of marginals and one pair of discals. Pro- and poststigma yellow, *pp* and *pst* present, st=1 : 1. Propleuron bare, prosternum haired. Wings hyaline or brownish tinged, costal spine

wanting, r_{4+5} dorsally with setae half way to *r-m*, R_5 open. Thoracic squama bare dorsally, broadly truncate. Legs yellow-brown, fore-tibia with a row of short *ad* and one submedian *pv*; mid-tibia with one submedian *av* and *ad* and 2 median *pd*; hind-tibia with a dense row of fairly long *ad*, a relatively short *av* present or wanting, *pd* bristles not marked.

Abdomen yellow-brown, with black pattern, or almost totally black. Median discals wanting on tergites I-IV, present on V. Cerci free, phallosome reminiscent of those of *Hemigymnochaeta*.

The genus *Cordylobia* is known only from the Ethiopian region.

KEY TO THE SPECIES.

1 (2) Arista with the longest hairs exceeding 4 times its basal diameter; male with the frons at the narrowest point not broader than twice the diameter of the anterior ocellus, *ev* and *f* wanting; female with the frons at vertex measuring about 3/7 of eye-length, abdomen yellow-brown with black pattern ..... 1. *C. anthropophaga* (BLANCHARD).

2 (1) Arista with the longest hairs not exceeding twice the basal diameter; male with the frons at the narrowest point about 3/5 of eye-length, *ev* and *f* present; female with the frons at vertex almost ½ as wide as the eye is long, abdomen almost totally glossy black ..... 2. *C. ruandae* FAIN.

[1. — **Cordylobia anthropophaga** (BLANCHARD).]

(Fig. 94.)

Ochromyia anthropophaga BLANCHARD, Bull. Soc. Ent. France, LXII, 1893, p. 127; GRUENBERG, Sitzber. Ges. naturf, Freunde Berlin, 1903, p. 412, figs. 1-10; GEDOELST, Arch. Parasit., IX, 1905, p. 568, fig. 5; et Bull. Soc. Path. Exot., I, 1910, p. 597; ROUBAUD, C. R., Acad. Sci., XLIII, 1911, p. 786; RODHAIN et BEQUAERT, Rev. Zool. Afr., II, 1913, p. 149; ROUBAUD, Etud. Fa. Parasit. Afr. occ. franc., I, 1914, p. 118, figs.; BLACKLOCK et THOMPSON, Ann. Trop. Med. Parasit., XVII, 1923, p. 443, figs.; BEQUAERT, Havard. Exp., II, 1930, p. 772; SÉGUY, Encycl. Ent. B 2, Dipt., VIII, 1935, p. 131; PATTON, Ann. Trop. Med. Parasit., XXX, 1936, p. 58, figs.; BERTRAM, Ann. Trop. Med. Parasit., XXXII, 1938, p. 433, figs. 1 et 2; FAIN, Ann. Soc. Med. Trop., XXXIII, 1953, p. 611, figs.

Cordylobia grünbergi DOENITZ, Sitzber. Ges. Naturf. Freunde Berlin, 1905, p. 245, figs. 1-5; ROUBAUD, Etud. Fa. Parasit. Afr. occ. franc., I, 1914, p. 120.

Cordylobia murium DOENITZ, id. ibid., ROUBAUD, id. ibid.

C. anthropophaga is a well-known dermal parasite, in the larval stage, of man, monkeys, dogs, cats, rodents and various other animals (comp. ROUBAUD and BLACKLOCK et THOMPSON). Its life-history has often been studied and the larval stages have been described several times. BERTRAM compares the

3rd larval stage with that of *S. rodhaini* (GEDOELST) which also causes myiasis in man.

Both sexes are predominantly yellow-brown, the thorax shows a black pattern consisting of two, ill-defined longitudinal vittae covering the area between *ia* and *dc*, or they may be more or less extended to both sides. The abdomen is provided with black bands, which are also subject to some variability, but the abdomen in the female never becomes almost totally black as in *C. ruandae*. The parafacialia are beset with fine, dark, but not densely placed setae, the buccae have dense, but short black setae, postbuccae and occiput with longer yellow hairs. Head in male with *iv* and *oc*, in female also with *ev*, *f* and 2 *fo*. Third antennal segment almost twice as long as the second. Hypopygium see fig. 94.

Length : 6-12 mm.

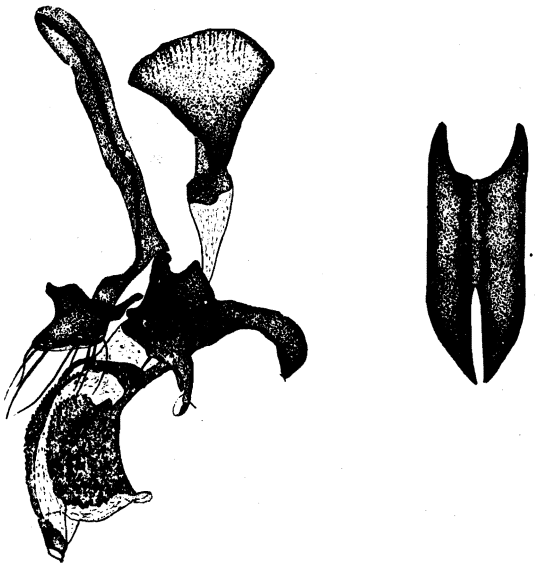


FIG. 94. — *Cordylobia anthropophaga* (BLANCHARD). Phallosome laterally and cerci in frontal view (after PATTON).

Distribution : Widely distributed in the Ethiopian region. In Southern Africa, it has been found as far southwards as Johannesburg, the Orange Free State, Natal and Swaziland.

Collection Musée du Congo : [Uvira : dans habitation, 1949 (1 ♂, leg. G. MARLIER)].

[2. — **Cordylobia ruandae** FAIN.]

(Fig. 95.)

Cordylobia ruandae FAIN, Ann. Soc. Belg. Med. Trop., XXXIII, 1953, p. 603, figs. 1-5.

Up to now, only a few specimens are known which were reared by Dr. A. FAIN from maggots in subcutaneous boils of the forest mouse, *Thamnomys surdaster* THOMAS and WROUGHTON. This rodent seems to be the only host.

C. ruandae is easily separable from *C. anthropophaga* by the features given in the key. It is interesting to note, that in both sexes the head bristles *iv*, *ev* and *f* are present but *fo* are wanting, even in the female. The body is glossy yellow-brown, provided with a black pattern which, in the male, is similar to that of *anthropophaga*. In the female, however, the abdomen is glossy black except the basal part of tergites I + II. Parafacialia are densely beset with black setae, postbuccae and the lower part of occiput show black hairs, the buccal setae are also longer than in *anthropophaga*. Third antennal segment about 2 ½ times as long as the second. The hypopygium (fig. 95) is very similar to that of *C. anthropophaga*.

Length : 7-10 mm.

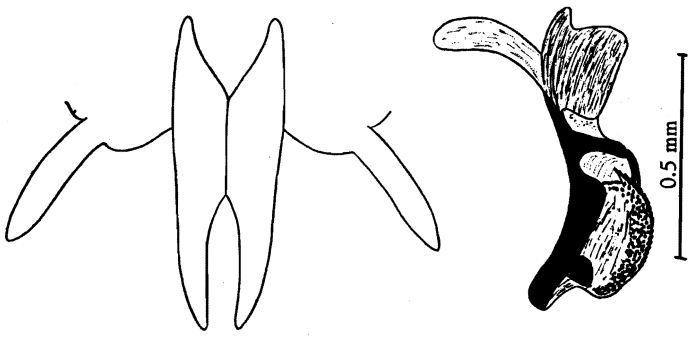


FIG. 95. — *Cordylobia ruandae* FAIN.
Cerci with paralobi and phallosome.
Paratype from Ruanda.

I have before me a paratypical pair from Musha, Ruanda, 1.400 m, and a further pair from the same place which Dr. FAIN has kindly presented to the S. A. Institute for Medical Research, Johannesburg.

[Genus **STASISIA** SURCOUF.]

Stasisia SURCOUF, Rev. Zool. Afr., III, 1914, p. 475; RODHAIN and BEQUAERT, Bull. Sci. Fr. Belg., (7), XLIX, 1916, p. 264; SÉGUY, Encycl. Ent. B 2, Dipt., VIII, 1935, p. 131; PATTON, Ann. Trop. Med. Parasit., XXX, 1936, p. 65; TOWNSEND, Man. Myiol., V, 1937, p. 86.

Type species : *C. rodhaini* GEDOELST from the Belgian Congo.

The reasons for keeping this genus distinct were discussed under *Cordylobia*. There is only one species known, the larval stages of which, like that of *Cordylobia anthropophaga* (BLANCHARD), cause dermal myiasis in man and various animals including antelopes (comp. RODHAIN and BEQUAERT, BERTRAM, FAIN).

[1. — **Stasisia rodhaini** (GEDOELST).]

(Fig. 96.)

Cordylobia rodhaini GEDOELST, Arch. Parasitol., XIII, 1910, p. 538, figs. 1-4; ROUBAUD, Etud. Fa. Parasit. Afr. occ. franc., I, 1914, p. 121; SURCOUF, Rev. Zool. Afr., III, 1914, p. 477; RODHAIN, C. R. Acad. Sci., CLXI, 1915, p. 323; RODHAIN and BEQUAERT, Bull. Sci. Fr. Belg., (7), XLIX, 1916, p. 265, figs.; BEQUAERT, Harvard Exp., II, 1930, p. 974; PATTON, Ann. Trop. Med. Parasit., XXX, 1936, p. 62; BERTRAM, Ann. Trop. Med. Parasit., XXXII, 1938, p. 431, figs. 1 and 2; FAIN, Rev. Zool. Afr., XLVIII, 1953, p. 306, figs. 1-4; et Ann. Soc. Belg. Med. Trop., XXXIII, 1953, p. 613, figs.

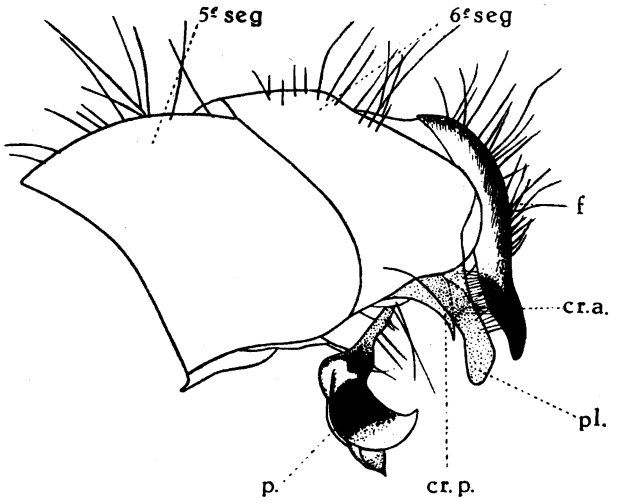


FIG. 96. — *Stasisia rodhaini* (GEDOELST).
Lateral view of hypopygium (after RODHAIN & BEQUAERT).
5e seg. = tergites 7+8; 6e seg. = epandrium; f. = cercus;
pl. = paralobus; cr.a. = ant. paramere; cr.p. = post. paramere;
p. = phallosome.

Adult specimens of *S. rodhaini* are rare in the collections, and I myself have only two females before me. According to RODHAIN and BEQUAERT, who gave a detailed description of this species, both sexes almost coincide in their external features. However, I found that my specimens show some differences from their description which seems to be based mainly on the male sex. I am therefore giving a short description based on my female specimens.

I have no doubt that the two specimens really belong to GEDOELST's species. In general appearance this fly is so striking and outstanding that there should not be any question about its status. Hypopygium, after RODHAIN and BEQUAERT, shown in fig. 96.

Female. — Frons at vertex measuring 3/7 of eye-length, widened to the antennal groove, frontal stripe subparallel, brown, parafrontalia with the upper part darkened, lower part, like the parafacialia, yellow brown and densely covered with a yellow toment. Ocellar triangle black, densely beset with hairs, of which one pair is a little thicker and longer than the others and evidently represent the *oc*; *iv* and *ev* developed, furthermore, the upper pair of *fo* is developed as short bristles, but *f* and the other pair of *fo* are wanting; row of *paf* complete and reaching the 2nd antennal segment. Parafrontalia and the upper half of parafacialia densely beset with black setae, the lower half is bare. Third antennal segment more or less blackened, about 2 ½ times as long as the second, arista with long hairs on both sides. Antennal groove strikingly deep, no median carina, facial ridge thick and in the lower half densely beset with short bristles. Bucca yellow-brown to orange, almost ⅓ as high as the eye is long, vibrissa and peristomal bristles normal, buccal hairs black and short, hairs on postbucca and occiput longer and yellow. Palpi and proboscis yellow-brown, the former relatively broad, with black bristles.

Thorax black-brown, partly yellow-brown, to a variable extent, densely covered with yellow toment. Distinct dorsal longitudinal vittae are not developed. Chaetotaxy : *ac*=2+4, *dc*=2+4, *ia*=1+3, *ph*=3, with a few longer hairs between them, *h*=3, *prs*=1, *n*=2, *sa* are increased up to 7, *pa*=2, scutellum with a great number of irregularly placed marginals and lateral discals. Prostigma yellow, 2 *pst* and *pp* each, *st*=1:1. Propleuron bare, prosternum and postalar declivity haired. Wings brownish tinged, veins at base yellow, then changing to black-brown, costal spine wanting, r_{4+5} terminally bent downwards, with a few hairs up to *r-m*, R_5 open, *m* bent up sigmoidally, squama yellow-brown, the lower broadly truncate, bare dorsally, halter yellow-brown. Legs predominantly black-brown, fore-tibia with short bristles only, mid-tibia with a short, but distinct submedian *ad* and two median *pv*, hind-tibia slightly bent, with a dense row of short *ad*, no further outstanding bristles.

Abdomen glossy black, without any dusting, but in the other specimen, which is probably not quite mature, shining red-brown. Hairs black and short, those of the posterior margins of the tergites also relatively short, all lying close to the ground.

Length : 12-13 mm, after RODHAIN and BEQUAERT, ranging from 11-14 mm in both sexes.

Distribution. — Generally noted as being restricted to the forest regions of equatorial Africa, particularly in the Belgian Congo. According to BERTRAM, however, this species seems to be widespread in tropical

Africa and reliable records are also known from the Gold Coast, Cameroons, French Equatorial Africa, Kenya, Tanganyika, S. Rhodesia and Angola. The two females before me were received from the following collections :

Collection Musée du Congo : [Mayidi, 1942 (1 ♀, leg. R. P. VAN EYEN)].

Collection S. A. Institute for Medical Research. Johannesburg : [Bwamba, Uganda (1 ♀)].

Genus **BENGALIA** ROBINEAU-DESVOIDY.

Bengalia ROBINEAU-DESVOIDY, Ess. Myiod., II, 1830, p. 425; SURCOUF and GUYON, Bull. Mus. Nat. Hist., 1912, p. 425; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, pp. 110 and 114; BEZZI, Ent. Mitt., II, 1913, p. 71; VILLENEUVE, Bull. Soc. Ent. Fr., 1913, p. 151; ROUBAUD, Étud. Fa. Parasit. Afr. occ. fr., I, 1914, p. 30; TOWNSEND, Ins. Ins. Mens., IV, 1916, p. 6; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 392; et Ann. Mag. N. H., (10), III, 1929, p. 273; TOWNSEND, Man. Myiol., V, 1937, p. 70; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 83.
Type species : *B. labiata* ROBINEAU-DESVOIDY from Bengal.

Ochromyia MACQUART, Suit. BUFFON, II, 1835, p. 248; ROUBAUD, Bull. Sci. Fr. Belg., (7), XLVII, 1913, p. 110; et Étud. Fa. Parasit. Afr. occ. fr., I, 1914, p. 31; TOWNSEND, Man. Myiol., V, 1937, p. 79.
Type species : *M. jejuna* FABRICIUS from Bengal.

Anisomyia WALKER, Proc. Linn. Soc. London, IV, 1860, p. 135; TOWNSEND, Man. Myiol., V, 1937, p. 67.
Type species : *M. favillavea* WALKER from Celebes.

Homodexia BIGOT, Bull. Soc. Ent. Fr, 1885, p. 26; TOWNSEND, Ins. Ins. Mens., IV, 1916, p. 7; et Man. Myiol., V, 1937, p. 79.
Type species : *H. obscuripennis* BIGOT from Ceylon.

Parabengalia ROUBAUD, Bull. Soc. Fr. Belg., (7), XLVII, 1913, p. 114; TOWNSEND, Man. Myiol., V, 1937, p. 79.
Type species : *M. jejuna* FABRICIUS from Bengal.

Eubengalia TOWNSEND, Phil. Jl. Sci., XXIX, 1926, p. 529; et Man. Myiol., V, 1937, p. 75.
Type species : *B. depressa* TOWNSEND nec WALKER.

Large flies of a general velvety-brown colour and more or less distinctly darkened hind abdominal margins. With respect to general appearance, they are sometimes confused with *Auchmeromyia* and *Cordylobia.*

Head with the eyes bare, widely separated in both sexes, frons at the narrowest point almost half as broad as the eye is long, in the male only a little narrower than in the female. Bristles in the female fully developed, in the male, the two *fo* are wanting. Parafacialia setulose in full extent. Antennal groove without, or with only a rudimentary carina; arista with long hairs on both sides. Clypeus in the Ethiopian species of normal shape, not strikingly projecting as in some Oriental species. Proboscis very stout, with some long hairs on its upper surface.

Thorax with *ac*=0+1, *dc*=2+4 (first 2 post *dc* weaker), *ia*=0+2, *ph*=1 (outer wanting), *h*=2-3, *prs*=1, *n*=2, *sa*=2-4, *pa*=2, *sc*=3-4+1-2, *st*=1 : 1. *pp* usually 2, *pst* mostly 1, but sometimes accompanied by more or less strong additional hairs. Propleura bare, suprasquamal ridge, supra-spiracular convexity without long and erect hairs, postalar declivity haired. Wings with R_5 open, r_1 bare, r_{4+5} setulose at base and for varying distances up to *r-m*, squama bare on the disc, large and truncate. Legs markedly different in both sexes. In the male, the first tibia is mostly armed with a comb of stout spinules on the upper half of the inner side and also the 2nd femur shows a similar comb in the apical ventral half. Furthermore, the hind and middle tibiae are provided with a tuft of long hairs in some species. The corresponding females lack these features, but on the other hand, the ventral side of the hind femur is often provided with strong bristles, whereas the males only have hairs there.

Abdomen intermediate between the *Calliphora*- and *Rhiniini*-type; 5th sternite in the male with an apical plate of characteristic shape. Hypopygium with free cerci and big paralobi composed of two parts, the upper one being small and hairless, the lower sometimes very large and provided with hairs; phallosome without spinus, theca and phallus well developed, vesicae mostly large and denticulate, phallus with additional processi of different shape which are important for separating the species.

It is necessary to discuss briefly the synonymy of some species. The two species named *gaillardi* SURCOUF and GUYON (1912) and *depressa* WALKER (1857) have been confused and redescribed under several names. The type of WALKER's *depressa*, a single female, is conserved in the British Museum. The late Major AUSTEN was asked by VILLENEUVE to check this specimen (cf. VILLENEUVE 1913) but unfortunately identified it as a species known at that time as *spurca* BRAUER and BERGENSTAMM. VILLENEUVE, therefore, synonymized *depressa* WALKER (1857)=*spurca* BRAUER and BERGENSTAMM (1895)=*gaillardi* SURCOUF and GUYON (1912). But one year later, VILLENEUVE (1914) corrected this statement in a foot-note, because SURCOUF himself had checked the type of *depressa* in the meantime and recognized that *depressa* was not identical with *spurca* BRAUER and BERGENSTAMM, or with *gaillardi* SURCOUF and GUYON. It was a distinct species conspecific with *limbata* BIGOT (1887) and *unicalcarata* VILLENEUVE (1931). To this list of synonyms I add with a ? also *tibiaria* VILLENEUVE (1926), a poorly described form, the type of which I could not examine.

TOWNSEND (1931, 1937) seems to have overlooked VILLENEUVE's footnote when the synonymized *depressa* WALKER with *spurca auct.* MALLOCH (1927), however, correctly identified *depressa* WALKER having had it checked once more by the late Mr. EDWARDS.

B. spurca BRAUER and BERGENSTAMM (1895) is a nomen nudum as confirmed by Dr. F. VAN EMDEN and Mr. H. OLDROYD at the British Museum. The first valid description of this fly is given by SURCOUF and GUYON (1912) as *gaillardi*. I think that according to the description and the drawing of the hypopygium,

depressa SURCOUF and GUYON (nec WALKER), published in the same paper, is also conspecific with *gaillardi*. *B. floccosa* WULP (1884) is conspecific with *B. mercenaria* SÉGUY (1933). This opinion is supported by a male specimen in the S. Afr. Museum, Cape Town, identified by VILLENEUVE as this species. *B. peuhi* is, up to now, referred to BRAUER and BEKGENSTAMM (1891) but they never really described this species, mentioning it as an nom. nud. only. The first valid description is that by VILLENEUVE (1914).

Bengalia species are known only from the Ethiopian, Madagascan and Oriental regions. The adults are often found sitting on plants, usually in the shade, and often enter houses where they are sometimes mistaken for *Cordylobia anthropophaga* or *Auchmeromyia luteola*. They are, however, quite harmless to man, feeding on other insects carried by ants. The fly watches the walking ants and suddenly jumps at the food and impales it with its proboscis, dragging it away from the ant's grip.

Bengalia depressa, as shown by ALTSON (1932), deposits the eggs in the moist soil near mating termites. The larvae hatch after a few hours or up to 2 days and are predacious on the sexual forms of termites of which only fragments of the skeleton are left. Pupation takes place in 9-10 days, the flies hatch after a further 11-12 days.

KEY TO THE SPECIES.

1 (4) Last abdominal tergite without median discal bristles 2

2 (3) Pteropleura with a few black stout bristles on upper margin, the fine hairs pale. Palpi very slender.

Only the female sex is known. The male should be easily recognizable by the stout pteropleural bristles. 12-14 mm. — French and Belg. Congo, Liberia ..... 1. *B. aliena* MALLOCH.

3 (2) Pteropleura without stout bristles on upper margin, with hairs only, all of which are black. Palpi rather stout.

Also of this species only the female sex is briefly described. 11 mm. — Kenya ..... 2. *B. africana* MALLOCH.

4 (1) Last abdominal tergite with at least one pair of median discal bristles 5

5 (22) Hind-tibia without postero-dorsal bristles 6

6 (15) Males 7

7 (8) Hind-tibia on the ventral side with short hairs only which do not surpass the tibial diameter.

Pteropleura with pale hairs only, rarely a few black ones among them. Fourth abdominal tergite with one pair of apicals placed close together. Apical plate projecting into a pair of tapered horns. 10-12 mm. — Ethiopian region .....
3. *B. spinifemorata* VILLENEUVE.

8 (7) Hind-tibia on the ventral side with long hairs surpassing the tibial diameter 9

9 (12) Hind-tibia with long hairs on the postero-ventral as well as the antero-ventral edge 10

10 (11) Apical plate with truncate posterior edges.
With respect to the outer features, very similar to the following species. 11-14 mm. — West and Central Africa .....
4. *B. gaillardi* SURCOUF and GUYON.

11 (10) Apical plate with pointed posterior edges.
Pteropleura with black hairs near the root of the wing, lower hairs pale. Fourth abdominal tergite with one pair of widely separated apical bristles. 9-13 mm. — Central, East and Southern Africa ..... 5. *B. floccosa* (WULP).

12 (9) Hind-tibia with long hairs on the antero-ventral edge only, the postero-ventral edge with short hairs 13

13 (14) Apical plate a little longer than broad, with a small, almost circular notch posteriorly.
Mostly darker coloured than the following species, but otherwise similar to it. 10-12 mm. — N. and S. Rhodesia, S. Africa ..... 6. *B. cuthbertsoni* n. sp.

14 (13) Apical plate broader than long, with a wide posterior emargination.
Normally lighter coloured than *B. cuthbertsoni*. 9-13 mm. — Central, East and Southern Africa .....
7. *B. depressa* WALKER.

15 (6) Females 16

16 (17) Abdominal sternites, except the first, with very stout marginal spines ..... 4. *B. gaillardi* SURCOUF and GUYON.

17 (16) Abdominal sternites without stout spines, with hairs and bristles only 18

18 (19) Pteropleural hairs pale also in the upper part, very rarely a few blackish ones near the root of the wing. Fourth abdominal tergite with a pair of apicals placed close together, separated from each other by a distance not, or very little more than half of that between the discals on the 5th tergite ..... 3. *B. spinifemorata* VILLENEUVE.

19 (18) Some of the hairs on upper portion of pteropleura blackish. The pair of apical bristles on 4th abdominal tergite separated by a distance almost as great as that between the discals on tergite V... 20

20 (21) Second abdominal sternite with a pair of strong median marginal bristles ..... 5. *B. floccosa* (WULP).
6. *B. cuthbertsoni* n. sp.

21 (20) Second abdominal sternite without a pair of strong median marginal bristles ..... 7. *B. depressa* WALKER.

22 (5) Hind-tibia with one or more distinct postero-dorsal bristles. (Only the female of *B. peuhi* is known up to now, which keys out here) 23

23 (24) Apical plate about twice as broad as long, without posterior emargination.
8-9 mm. — French Congo ..... 8. *B. minor* MALLOCH.

24 (23) Apical plate almost as long as broad 25

25 (26) Apical plate with a deep notch.
9 mm. — French Sudan ..... 9. *B. lepineyi* SÉGUY.

26 (25) Apical plate more or less quadrangular, posterior margin at most slightly emarginated.
Hypopygium reddish or black, 5th abdominal tergite with 1-3 pairs of discals. 12-14 mm. — Ethiopian region .....
10. *B. peuhi* VILLENEUVE.

[1. — **Bengalia aliena** MALLOCH.]

Bengalia (*Ochromyia*) *aliena* MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 407.

This species was based on a single female from Ndjoli, Gabon, and I have also received only a few female specimens, so that the male of this probably rare species remains to be discovered.

The female, however, is well characterized by the stout bristles on the upper pteropleuron, a feature which does not occur in any other *Bengalia* species of the Ethiopian fauna. Legs yellow, fore-tibia with 3 *ad* and one submedian *pv*, the lower part and the tarsus ventrally densely beset with short and thick hairs arranged as in a brush; mid-femur with 3 strong *ad*, mid-tibia with 2 *pd*, 1 *ad* and 1 *v*; hind-tibia and tarsus with brush-like hairs as on the fore-leg, the tibia with 2 *ad* and *av*, *pd* not developed. Abdomen with more or less distinct abdominal bands, 4th tergite with a pair of strong median marginals, the last tergite with a row of marginal bristles, discals not present on any tergite. Sternites with black marginal bristles and yellow hairs.

Collection Musée du Congo : [Ubangi : Nouv.-Anvers, 11.VIII. 1947 (1 ♀, leg. M. POLL)]; [Bambesa, 20.IX.1953 (1 ♀, leg. H. J. BRÉDO)]; [Libenge, 1933 (2 ♀♀ leg. J. VAN GILS)].

Collection American Museum, New York : [Robertsport, Liberia, 25.IV.1943 (1 ♀ leg. F. M. SNYDER)].

[2. — **Bengalia africana** MALLOCH.]

Bengalia (*Ochromyia*) *africana* MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 407.

This species, based on a single female from the Masai Reserve, Kenya, has remained unknown to me. The author compares it with *B. aliena* and places it in his key with those species which have no discal bristles on the last tergite. He describes it as follows : « A smaller and darker species than the above, with the pteropleural armature consisting of black hairs which are rather stiff above, but not in the form of stout bristles as in *aliena*. As in the latter the labrum is not distinctly protruded, and is in the form of a narrow rounded band of chitin, but the palpi are broader at apices than in that species, and practically all of the hairs on the pleura are black. The apex of third visible tergite has the two central bristles much shorter than usual, but the specimen is not exactly normal, so that this character may not be invariable; and the fourth tergite is slightly notched at apex in centre, which is not the case in *aliena* ».

I first wanted to refer the new *B. cuthbertsoni* to this species and have also labelled specimens of *B. cuthbertsoni* as *B. africana*. The wanting discals, however, suggest that *B. africana* should be regarded as a doubtful species and CUTHBERTSON's species described as new.

3. — **Bengalia spinifemorata** VILLENEUVE.

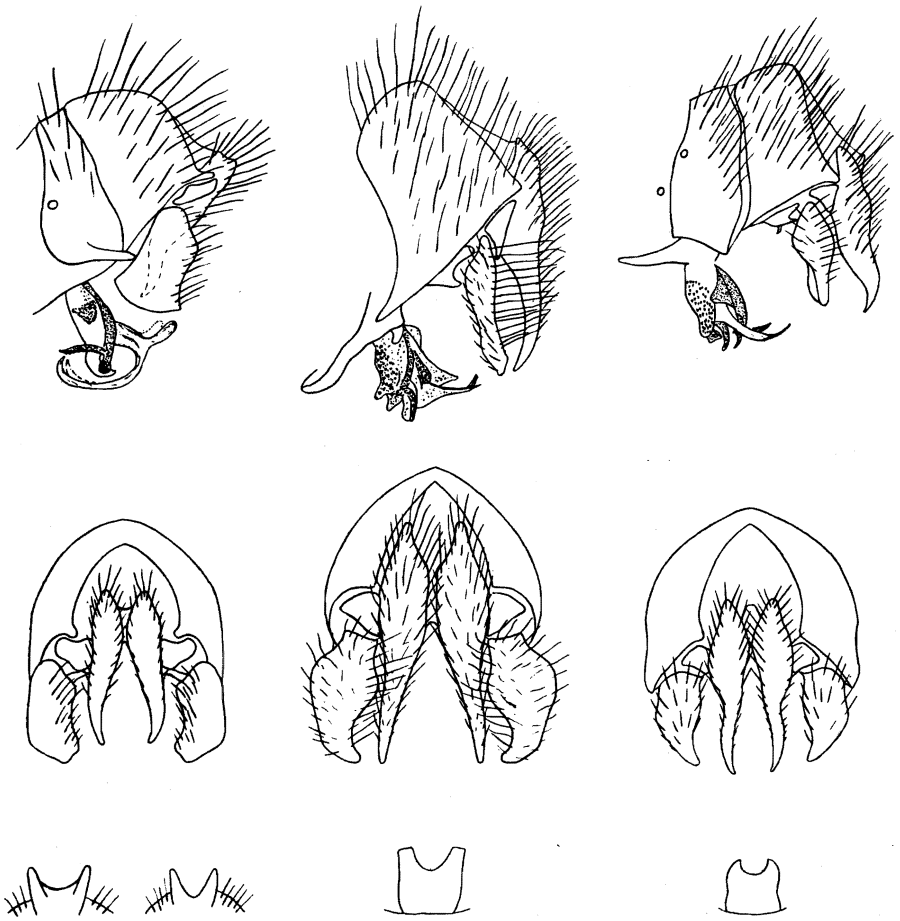
(Fig. 97.)

Bengalia spinifemorata VILLENEUVE, Bull. Soc. Ent. Fr., 1913, p. 153; et Bull. Soc. Ent. Fr., 1914, p. 253; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 410, fig. 12; et ibid., (10), IV, 1929, p. 119; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1933, p. 93.

B. spinifemorata is easily recognizable by the features given in the key. The hypopygium is of a very complicated structure (fig. 97) and, when mounted dry, it partly shrinks and becomes distorted showing sometimes a very unusual appearance. I thought for some time that there were two species mixed under the name *spinifemorata*, but have now come to the conclusion that there is really only one, the hypopygium of which is subject to a slight variability.

B. spinifemorata probably occurs all over the Ethiopian region and is recorded, or I have seen it, from Nigeria, the Belgian Congo, Uganda, Abyssinia, Tanganyika, Nyasaland, N. and S. Rhodesia, Transvaal, Natal and Cape Province. From the Belgian Congo, the following specimens are before me :

Collection Musée du Congo : [Élisabethville, III.1925 (1 ♂♀, leg. CH. SEYDEL); X.1926 (2 ♂♂, 1 ♀, leg. M. BEQUAERT); XII.1934 (1 ♂, leg. P. QUARRÉ)]; [Katanga : Kakinga, II.1931 (2 ♂♂, leg. H. J. BRÉDO)];



97 98 99

FIG. 97. — *Bengalia spinifemorata* VILLENEUVE. Hypopygium in frontal and in lateral view, two apical plates to show variability. Specimen from Natal.

FIG. 98. — *Bengalia gaillardi* SURCOUF & GUYON. Hypopygium in lateral and in frontal view, apical plate. Specimen from S.W. Africa.

FIG. 99. — *Bengalia floccosa* (WULP). Hypopygium in lateral and in frontal view, apical plate. Specimen from Natal.

[Katanga : La Panda, IX.1920 (1 ♀, leg. M. BEQUAERT)]; [Katanga : Kimilolo, XI.1920 (1 ♀, leg. M. BEQUAERT)]; [Thysville; 1929 (1 ♂, leg. M. DIDIER)]; Rutshuru, VI.1930 (1 ♂, leg. L. LIPPENS); [W. Kivu : Mulungu près Shabunda, 1939 (1 ♂, leg. HAUTMANN)]; [Kwandruma, VI.1937 (1 ♀, leg. H. J. BRÉDO)]; [Niotha, VII.1937 (1 ♀, leg. H. J. BRÉDO)]; [Jadotville, 1948 (1 ♀, leg. R. M. M. ADELAÏDE)]; [Lac Albert : Mahasi, VII.1937 (1 ♀, leg. H. GHESQUIÈRE)]; [Kibali-Ituri : Kilo, IV.1931 (3 ♀♀, leg. G. DU SOLEIL)]; [Ruanda : Astrida, III.1939 (1 ♀, leg. A. LESTRADE)].

4. — **Bengalia gaillardi** SURCOUF & GUYON.

(Fig. 98.)

Bengalia gaillardi SURCOUF and GUYON, Bull. Mus. Nat. Hist. nat., 1912, p. 427; VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 253; TOWNSEND, Man. Myiol., V, 1937, p. 80.

Bengalia spurca BRAUER and BERGENSTAMM, Denkschr. K. Akad. Wiss. Wien, LVIII, 1891, p. 420; et Sitzb. Akad. Wiss. Wien, (1), CIV, 1895, p. 597 (*nom. nud.*); VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 253; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 410, fig. 14; et (10), IV, 1929, p. 119 (syn. nov.).

Bengalia depressa SURCOUF and GUYON (*nec* WALKER), Bull. Mus. Nat. Hist. nat., 1912, p. 425, fig. 1; VILLENEUVE, Bull. Soc. Ent. Fr., 1913, p. 348; TOWNSEND, Ann. Mag. N. H., (10), VIII, 1931, p. 371 (syn. nov.).

The female sex of this species is easily recognizable by the stout spines on the abdominal sternites whereas the male is very similar to *B. floccosa* and distinguishable from it mainly by the shape of the apical plate and the hypopygium (fig. 98).

B. gaillardi is recorded, or I have seen it, from Gambia, Sierra Leone, Liberia, Togo, Ivory Coast, Nigeria, Uganda, Tanganyika and S. W. Africa. From the Belgian Congo, I received the following material :

Collection Musée du Congo : [Uele : Yakuluku, 25.III.1914 (1 ♂, leg. RODHAIN)]; [Uele : Buta, II.1938 (1 ♀, leg. J. VRYDAGH)]; [Uele : Bambesa, XII.1933 (2 ♂♂, leg. H. J. BRÉDO); X.1933 (3 ♂♂, 2 ♀♀, leg. J. LEROY)]; Rutshuru, 10.V.1936 (1 ♀, leg. L. LIPPENS); [Lac Albert : Kasenyi, 15.V.1935 (1 ♀, leg. H. J. BRÉDO); VII.1937 (1 ♀, H. J. BRÉDO)].

[5. — **Bengalia floccosa** (WULP).]

(Fig. 99.)

Calliphora floccosa VAN DER WULP, C. R. Ent. Soc. Belg., XXVIII, 1884, p. 292; VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 254; TOWNSEND, Man. Myiol., V, 1937, p. 80.

Ochromyia crassirostris KARSCH, Berl. Ent. Ztschr., XXXI, 1887, p. 377 (syn. nov.).

Bengalia mercanaria SÉGUY, Mem. Est. Mus. Zool. Univ. Coimbra, I, n° 67, 1933, p. 78; et encycl. Ent. Dipt., VIII, 1935, p. 133, fig. 3 (syn. nov.).

The hypopygium (fig. 99) is extremely similar to that of *B. cuthbertsoni*; the apical plate, however, has a broader semi-circular emargination and the hind-tibia in the male shows long hairs on both ventral edges. In *B. cuthbertsoni*, the incision of the apical plate is narrower and almost circular, and the hind-tibia of the male has long hairs only on the antero-ventral edge. I was not able to find satisfactory separating features for the females.

Collection Musée du Congo : [Lulua : R. Gashila, 5.X.1925 (1 ♂, leg. G. F. OVERLAET)]; [Lomami : Kambaye, X.1930 (1 ♂, leg. P. QUARRÉ)].

Collection Zool. Museum, Berlin : [Usambara, Tanganyika (1 ♂ ♀, leg. C. W. SCHMIDT, types of *O. crassirostris* KARSCH)]; [Langenburg, Tanganyika, 1898 (1 ♂, leg. FUELLEBORN)].

Collection S. African Museum, Cape Town : [Durban, Natal, XI.1915 (1 ♂, *floccosa* det. VILLENEUVE)].

Dept. of Research and Specialist Services, Salisbury : CUTHBERTSON's collection, restricted to S. Rhodesia, contains specimens from Darwin, Yumba, Salisbury and the Melsetter Distr.

Collection Museum für Naturkunde, Stuttgart : [Kware nr. Moshi, Tanganyika, I.1952 (1 ♂, leg. E. LINDNER)].

Collection S. A. Institute for Medical Research, Johannesburg : [Port. E. Africa : Maputo, IX.1950 and IV.1951 (3 ♂♂, 1 ♀, leg. T. S. DIAS)]; [Fontainhas, 1949 (2 ♂♂)]; [Natal : Mseleni, 6.II.1936 (1 ♂, leg. B. DE MEILLON)]; [Warner Beach (1 ♂, leg. J. MUSPRATT)]; [Pondoland, XI.1952 (1 ♂, leg. J. MUSPRATT)].

[6. — **Bengalia cuthbertsoni** n. sp.]

(Fig. 100.)

In the collection of the late Mr. CUTHBERTSON, now preserved in Salisbury, I found a number of *Bengalia* specimens, closely related to *B. floccosa* and *B. depressa*. The hypopygium is quite similar to those of these two species, but the apical plate shows a very narrow, almost circular emargination. The hind-tibia of the male has long hairs only on the antero-ventral edge, as in *B. depressa*. The female sex is, as far as I could determine, not separable from *B. floccosa*.

Male. — Frons at the narrowest point 5/12-1/3 of eye-length, slightly widened posteriorly. Colour of head brown to yellow. Chaetotaxy : 1 *iv*, 1 *ev*, 1 *f*, *fo* wanting, *paf* reach the middle of the 2nd antennal segment; parafrontalia and parafacialia beset with fine and short black hairs, buccae with pale hairs, 1/7-1/5 as high as the eye is long. Eyes long oval, facets small. Third antennal segment more or less darkened, about 3 times as long as the second, arista with long hairs above and below. Vibrissa long, a row of long black bristles on the peristome and some shorter

ones on the vibrissarium. Palpi yellow, proboscis red-brown, sometimes blackened basally.

Thorax brown, on the dorsum mostly strikingly blackened, olive-brown dusted, the margins of the scutellum reddish brown. Pteropleura with pale hairs below and black ones near the root of the wing. Chaetotaxy : *ac*=0+1, *dc*=2+4, *ia*=0+2, *ph*=1, *h*=2-3, *prs*=1, *n*=2, *sa*=2-3, *sc*=3+1. Prostigma yellow, 1 *pst* and 2 *pp*. Propleura bare, prosternum with pale hairs posteriorly. Wings hyaline, veins light-brown, halters yellow. Legs yellow-brown, femora more or less darkened, fore-femur with a row of long ventral bristles, fore-tibia with a strongly reduced basal comb, the spinules thicker, but not longer than the surrounding hairs, one long submedian *pv* and 3-4 *ad*; mid-femur with a comb of 6-10 spines, 6-8 long bristles on the basal half of the inner side, mid-tibia on the inner side of the apical half with dense hairs which partly reach the tibial diameter, one long submedian *ad*, one *av*, and 2 *pv* bristles; hind-femur on the ventral side with two rows of bristly hairs, tibia on the apical half of the antero-ventral edge with some long hairs, 2-3 *ad* and one submedian *av*.

Abdomen reddish brown, whitish dusted, the hind margins of the tergites and also the middle-line broadly darkened; fifth tergite as in *B. depressa* with one pair of widely separated discals; apical plate of the fifth sternite a little longer than broad, with a circular notch posteriorly. Hypopygium (fig. 100) black, cerci a little more slender than in *B. depressa*, phallosome very similar to this species.

Female. — There is one specimen before me which undoubtedly belongs to this species. The frons is broadest at vertex measuring here almost half of the eye-length. Towards the antennal groove it gradually widens. Buccae about ¼ as high as the eye is long. The legs are totally yellow-brown, tibiae and femora without combs and without tufted hairs. Second abdominal sternite with a pair of strong median marginal bristles. As far as I am aware it is not separable from *B. floccosa*.

Length : 10-12 mm.

EXPLANATION OF FIGURES 100 TO 104.

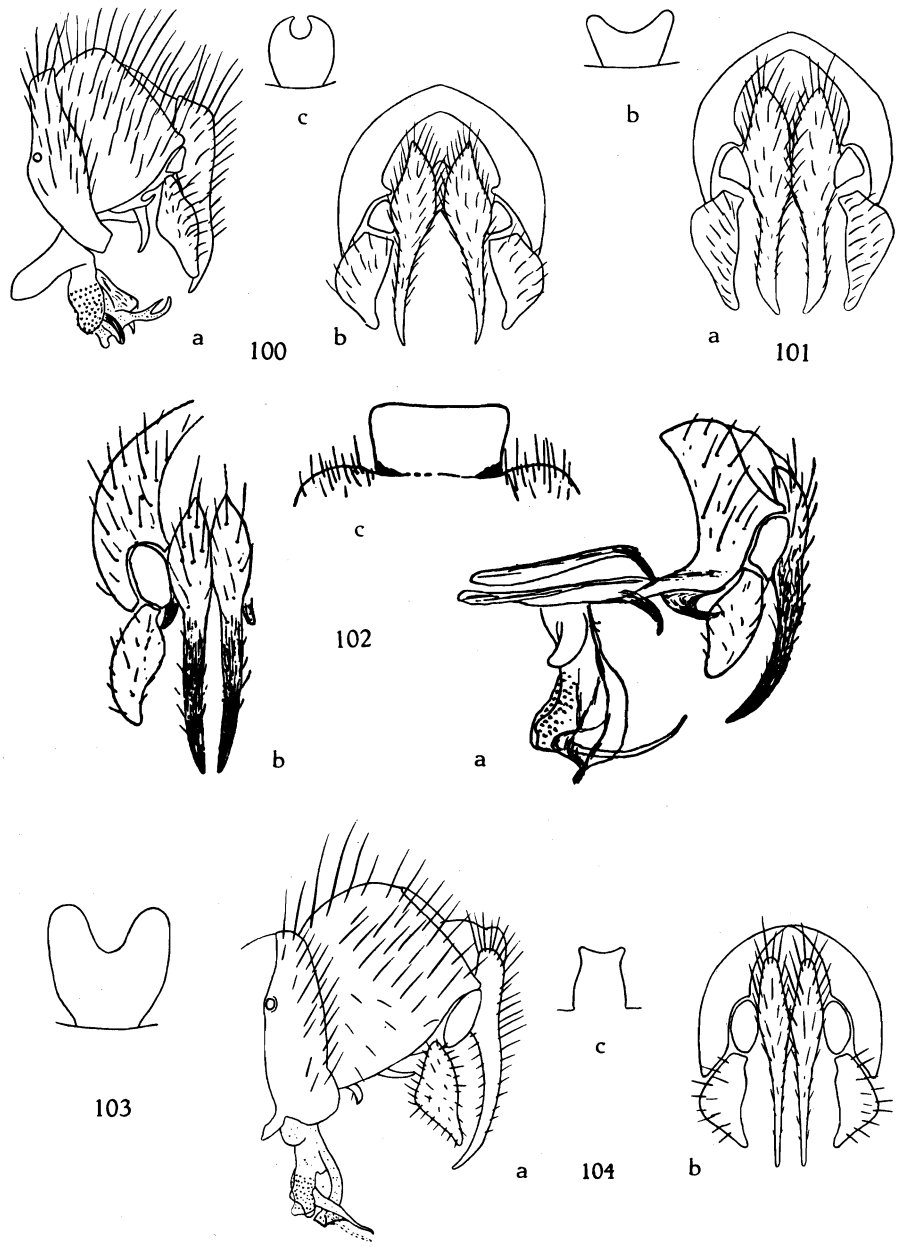
FIG. 100. — *Bengalia cuthbertsoni* n. sp. Hypopygium in lateral and in frontal view, apical plate. Paratype from S. Rhodesia.

FIG. 101. — *Bengalia depressa* WALKER. Cerci and paralobi in frontal view, apical plate. Specimen from Natal.

FIG. 102. — *Bengalia minor* MALLOCH. Hypopygium in frontal and in lateral view, apical plate (after MALLOCH). Type specimen from the French Congo.

FIG. 103. — *Bengalia lepineyi* SÉGUY. Apical plate of type specimen from the French Sudan (after SÉGUY).

FIG. 104. — *Bengalia peuhi* VILLENEUVE. Hypopygium in lateral and in frontal view, apical plate. Specimen from Transvaal.



FIGS. 100 TO 104.

Dept. of Research and Specialist Services, Salisbury :

Holotype : [Balla-Balla, S. Rhodesia, 29.XII.1932 (1 ♂, leg. A. CUTHBERTSON)].

Paratypes : [Balla-Balla, S. Rhodesia, XII.1932, I and III, 1933 (5 ♂♂, 1 ♀, leg. A. CUTHBERTSON)].

Collection S. A. Institute for Med. Research, Johannesburg : [Ndola, N. Rhodesia, XII.1950 (1 ♂)]; [Pretoria, Transvaal, 7.I.1951 (1 ♂, leg. F. ZUMPT)].

7. — **Bengalia depressa** WALKER.

(Fig. 101.)

Bengalia depressa WALKER, Trans. Ent. Soc. Lond., IV, 1857, p. 211; SURCOUF and GUYON, Bull. Mus. Nat. Hist. nat., 1912, p. 425, fig. 1; VILLENEUVE, Bull. Soc. Ent. Fr., 1913, p. 348; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 410, fig. 16; et ibid., (10), IV, 1929, pp. 119 et 335; ALSTON, Proc. Ent. Soc. Lond., 1932, p. 36.

Ochromyia limbata BIGOT, Bull. Soc. Zool. Fr., XII, 1887, p. 609; BEZZI, Ann. Mus. Civ. Genova, (2), XII, p. 189; et Bull. Soc. Ent. Ital., XXXIX, 1908, p. 76.

Bengalia unicalcarata VILLENEUVE, Bull. Soc. Ent. Fr., 1913, p. 348; et Bull. Soc. Ent. Fr., 1914, p. 254; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 410.

?*Bengalia tibiaria* VILLENEUVE, Rev. Zool. Afr., XIV, 1926, p. 69 (syn. nov.).

Judging from the structure of the hypopygium, *B. depressa* is closely related to *B. cuthbertsoni* and also *B. floccosa*. The apical plate, however, is broader than long and widely emarginated (fig. 101). This feature, in combination with the long hairs on the antero-ventral edge of the hind-tibia, makes it relatively easy to separate the male of *B. depressa* from the two other species. The females are distinguished by me by the wanting strong median marginal bristles on the second abdominal sternite. Whether this feature is always constant and not due to an overlapping variability, remains to be proved.

B. depressa seems to be distributed over Central, East and South Africa. In the collection of the S. Afr. Institute for Med. Research, Johannesburg, it is well represented by specimens from the Cape Province, Natal, Swaziland, Transvaal and S. Rhodesia. The Congo material comes from the following localities :

Mission G. F. DE WITTE : [Uele : Buta, 450 m, 11.IV.1935 (1 ♂)].

Collection Musée du Congo : Vitshumbi, 925 m, 15.IV.1936 (1 ♀, leg. L. LIPPENS); [Bambesa, 9-16.V.1938 (3 ♀♀, leg. P. HENRARD)]; [Albertville, 1-20.I.1919 (1 ♀, leg. R. MAYNÉ)]; [Lac Albert : Kasenyi, 15.V.1935 (1 ♀, leg. H. J. BRÉDO)]; [Haut-Uele : Mauda, III.1925 (1 ♀, leg. H. SCHOUTEDEN)]; [Lomani : Lulua, 1934 (2 ♀♀, leg. BOUVIER)]; [Urundi : Bumonge, 1934 (1 ♂, leg. A. LESTRADE)]; [Urundi : Rugari, 1918 (1 ♀, leg. DAMES DE MARIE)]; [Ruanda : Kibungu, 1937 (1 ♀, leg. R. VERHUIST)].

[8. — **Bengalia minor** MALLOCH.]

(Fig. 102.)

Bengalia (*Ochromyia*) *minor* MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 408, fig. 10.

I have not seen this species, known from two males from Yélimené, French Congo. The hypopygium (fig. 102) is very similar to that of *B. peuhi*, but the apical plate of the 5th sternite is about twice as broad as long, without a marginal notch.

As further characteristic features MALLOCH mentioned that the « fore tibia has no distinct short spine on the ventral surface in one of the specimens, but in the other there are a few quite inconspicuous black spines present basad of the middle, and in neither specimen is there a distinct hollowing out of the tibia ».

[9. — **Bengalia lepineyi** SÉGUY.]

(Fig. 103.)

Bengalia lepineyi SÉGUY, Encycl. Ent. B II, Dipt., VIII, 1935, p. 135, fig. 3.

This species is only known in the male sex and compared by the author with *B. minor* with respect to colour and chaetotaxis. Fore-tibia with at least 2 thick spines in the basal half of the inner side; hind femur with several rows of short bristles, those of the postero-ventral margin stronger and longer, hind-tibia with long hairs on both edges of the inner side. Fifth sternite with rounded posterior edges and a deep notch (fig. 103). The type-locality is Sokolo, Western French Sudan.

[10. — **Bengalia peuhi** VILLENEUVE.]

(Fig. 104.)

Auchmeromyia peuhi ERAUER and BERGENSTAMM, Denkschr. K. Akad. Wiss. Wien, LVIII, 1891, pp. 420 et 436 (nom. nud.).

Bengalia peuhi VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 253; MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 408, fig. 11; SÉGUY, Encycl. Ent., II, Dipt., VIII, 1935, p. 134, fig. 3; ALTSON, Proc. Ent. Soc. Lond., VII, 1932, p. 36.

B. peuhi is variable in some respects so that I first thought that I was dealing with two different species, the one having a yellow-brown hypopygium in the male and a row of discal bristles on the last tergite in both sexes, the other a black hypopygium and two discals only. But the study of further specimens reveals that there are transitional specimens in this respect, some having, for instance, on the one side of the tergite, one discal bristle, on the other 2-3. The shape of the hypopygium is identical, the apical plate only showing a slight variability (fig. 104). I therefore came to the conclusion that I was dealing with one species only.

Characteristic features of *B. peuhi*, are, in the male, the well-developed comb of the fore-tibia, the postero-dorsal bristles of the hind tibia, and the apical plate not having a deep notch as in *B. lepineyi*. The females of *B.*

lepineyi and *B. minor* are not yet known, so that *peuhi*-♀, up to now, keys out among the Ethiopian species, by the presence of discal bristles on the 5th tergite and of *pd* bristles on the hind-tibia, features which will also apply to the females of the other two species.

B. peuhi is not represented in the material from the Belgian Congo, and does not seem to have been recorded from this part of Africa. I have seen specimens from the Gold Coast, Nigeria, Anglo-Egyptian Sudan, S. Rhodesia, Bechuanaland, S. W. Africa, Port. E. Africa and Transvaal. It is also recorded from Nyasaland, Kenya, Abyssinia and Somaliland.

DOUBTFUL OR WRONGLY PLACED GENERA OF *CALLIPHORINI*.

The following genera have been placed by various authors in the *Calliphorini* :

[Genus **BEQUAERTIANA** CURRAN.]

Bequaertiana CURRAN, Amer. Mus. Nov., 340, 1929, p. 14; TOWNSEND, Man. Myiol., VI, 1938, p. 186.

Type species : *B. argyriventris* CURRAN from Liberia.

Dr. H. C. CURRAN, American Museum of Nat. History, New York, was kind enough to send me the type species. It certainly does not belong to the *Calyptrata*, but to an acalyptrate family near the *Lonchaeidae*.

[Genus **BRITEA** CURRAN.]

Britea CURRAN, Bull. Ent. Res., XVIII, 1927, p. 127; TOWNSEND, Man. Myiol., VI, 1938, p. 219.

Type species : *B. tachinoides* CURRAN from Kenya.

Dr. H. C. CURRAN kindly sent me the type species of this genus too. I would place it in the *Tachinidae*, whereas Dr. F. VAN EMDEN, Commonwealth Institute of Entomology, is of the opinion (by letter) that it belongs to the *Rhiniphorinae* and regards *Britea* as a synonym of *Styloneuria* BRAUER and BERGENSTAMM (Musc. Schiz. II, 1891, p. 61).

[Genus **KENIA** MALLOCH.]

Kenia MALLOCH, Ann. Mag. N. H., (9), XX, 1927, p. 387, et ibid., (10), III, 1929, p. 275; et ibid., (10), IV, 1929, p. 113; TOWNSEND, Ann. Mag. N. H., (10), VIII, 1931, p. 372; et Man. Myiol., V, 1937, p. 78; ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 187.

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

I have already referred to the status of this genus and expressed the opinion that it probably does not belong to the *Calliphorini*, but perhaps to the *Tachinidae*.

[Genus **ONESIHOPLISA** VILLENEUVE.]

Onesihoplisa VILLENEUVE, Bull. Ann. Soc. Ent. Belg., LXVI, 1926, p. 269; TOWNSEND, Man. Myiol., V, 1937, p. 160.
Type species : *O. umbrosa* VILLENEUVE from Belg. Congo.

This genus was based on *O. umbrosa* VILLENEUVE from Stanleyville. No further specimens or species of this genus have been recorded up to now. Superficially, *O. umbrosa* must be similar to the *Adichosina* species, but the arista is only short pilose, the hairs being hardly longer than the base of the arista. TOWNSEND, who may have seen the type, gives the following generic description :

« Length 6 mm. Very narrowed, metallic violet green to cupreous. Head as wide as high, frontal profile gently sloped and nearly as long as facial, clypeus moderately depressed and 2 ⅓ times as long as wide, epistoma but little elongate and nearly full width, facialia bare, haustellum little over ½ head height, palpi cylindric, antennal axis ¾ head height and well above eye middle, third antennal joint about 4 times second, arista long pubescent nearly to the tip, male vertex nearly ⅓ head and front equibroad, inner vertical bristles straight, 2 proclinate fronto-orbital bristles in male and frontalia nearly twice parafrontal width, parafacialia bare, cheeks ¼ eye-length. Lateral postscutellar plates setose; squamopleura, prosternum, propleura, postalar wall and tympanic pit bare; greater ampulla small and not raised. Three postsutural bristles, 2 sternopleural bristles, 3 lateral scutellar bristles, long decussate apical scutellar bristles, 1 small discal scutellar bristle. Apical cell widely open little before wing tip, third longitudinal vein bristles only at base, small crossvein somewhat inside tip of first longitudinal vein and straight, hind crossvein its length from cubitulus, latter a broadly arcuate obtuse angle, squamae small and subovate. Male claws long and pubescent. Male abdomen ovoconic, marginal rows of bristles on last two segments but open in middle on third segment. Male hypopygium very large, its first segment short and second not very long, fifth sternite lobes very large and broad. »

[Genus **PERISTASISEA** VILLENEUVE.]

Peristasisea VILLENEUVE, Bull. Ann. Soc. Ent. Belg., LXXIV, 1934, p. 187.
Type species : *P. luteola* VILLENEUVE from E. Africa.

This genus was evidently overlooked by TOWNSEND when compiling his Manual of Myiology. It was based on *P. luteola* VILLENEUVE, represented by 1 ♂ and 2 ♀♀ from E. Africa, probably Nyasaland. The author compares this species with *Paratricyclea* (= *Phumosia*) with respect to its general appearance, but says that the sternites are elongated and completely free. Prosternum and propleura are bare, but it is not mentioned

whether the supraspiracular convexity is haired or short pilose. The thoracic squama is described as being narrow and bare dorsally. A strange fact is that both sexes are said to be holoptic.

P. luteola is a totally red-yellow species. It has 3 post *dc*, 2 post *ac* and 2 post *ia*, last *ph* wanting, *st*=1 : 1. Abdominal tergites with marginal bristles only. Length : 7-8 mm.

This genus may be related to *Auchmeromyia* or *Hemigymnochaeta.*

CHRYSOMYIINI.

In the Ethiopian region, only the genus *Chrysomyia* is represented. The question has been raised (cf. HOLDAWAY, 1933) whether *C. albiceps* (WIEDEMANN), with respect to the outstanding structure of its hypopygium and the morphology of the larva, should be listed in a separate genus, for which BEZZI (1927) proposed the name *Achoetandrus*. The features mentioned above are really of such importance that a generic separation would be justified. On the other hand, *C. albiceps* is a species of great economic importance and for a long time has been known in literature on applied entomology only under the name *Chrysomyia*, so that most probably a change of name would cause great confusion. I therefore prefer to retain the old name, at least until an agreement has been reached among the applied entomologists to recognize generally the genus *Achoetandrus*.

Whether the *Chrysomyiini* genera of the New World (cf. HALL, 1948) are partly congeneric with *Chrysomyia*, must be decided by American authors.

Genus **CHRYSOMYIA** ROBINEAU-DESVOIDY

Chrysomyia ROBINEAU-DESVOIDY, Ess. Myod., II, 1830, p. 444. — RONDANI, Arch. Zool. Mod., III, 1864, p. 27. — SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 8. — HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 556. — TOWNSEND, Man. Myiol., V, 1937, p. 124. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135. — SÉGUY, Encycl. Ent., A XXI, 1941, p. 17. — HALL, Blowflies N. America, 1948, p. 103.

Type species : *C. regalis* ROBINEAU-DESVOIDY from South Africa.

Compsomyia RONDANI, Ann. Mus. Genova, VII, 1875, p. 425. — TOWNSEND, Man. Myiol., V, 1937, p. 126. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135.

Type species : *M. dux* ESCHSCHOLTZ from E. India.

Pycnosoma BRAUER and BERGENSTAMM, Denkschr. Akad. Wiss. Wien, LVI, 1894, p. 623. — SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 8; et ibid., 1928, pp. 103 et 114; et Encycl. Ent., A IX, 1928, p. 145. — TOWNSEND, Man. Myiol., V, 1937, p. 124.

Type species : *M. marginalis* WIEDEMANN from Africa.

Paracompsomyia HOUGH, Proc. Acad. Nat. Sci. Phil., L, 1898, p. 184. — TOWNSEND, Man. Myiol., V, 1937, p. 124.

Type species : *P. nigripennis* HOUGH from Somaliland.

Psilostoma SURCOUF, Arch. Mus. Hist. Nat. Paris, (5), VI, 1914, p. 58. — SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 3. — TOWNSEND, Man. Myiol., V, 1937, p. 130. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135.

Type species : *O. incisuralis* MACQUART from Australia.

Microcalliphora TOWNSEND, Proc. U. S. Nat. Mus., XLIX, 1916, p. 618. — SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 1. — HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 558. — TOWNSEND, Man. Myiol., V, 1937, p. 129. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135.

Type species : *L. varipes* MACQUART from Australia.

Achoetandrus (*Chrysomyia* subg.) BEZZI, Bull. Ent. Res., XVII, 1927, p. 235. — HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 558. — TOWNSEND, Man. Myiol., V, 1937, p. 122. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 175.

Type species : *M. albiceps* WIEDEMANN from the Cape.

Compsomyia SÉGUY (nec RONDANI), Encycl. Ent. Dipt., IV, 1927, p. 8, et 1928, p. 114; et Encycl. Ent., A IX, 1928, p. 144. — HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 557.

Type species : *M. albiceps* WIEDEMANN from the Cape.

Somomyia SÉGUY (nec RONDANI), Encycl. Ent. Dipt., IV, 1927, p. 8, et 1928, p. 114; et Encycl. Ent., A IX, 1928, p. 145. — HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 557.

Type species : *C. bezziana* VILLENEUVE from Africa.

Cyaneosomyia SÉGUY, Encycl. Ent. Dipt., 1928, p. 112. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135.

Type species : *C. phaonis* SÉGUY from China.

Pycnosomops TOWNSEND, Ent. News, XLV, 1934, p. 277; et Man. Myiol., V, 1937, p. 131. — S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 135.

Type species : *M. putoria* WIEDEMANN from Sierra Leone.

Head in male with the eyes touching or separated by up to one third of eye-length, bare, upper facets almost equal to lower ones, or they are greatly enlarged and more or less distinctly demarcated. The females are always dichoptic and the facets uniform. With respect to the chaetotaxy of the male, *oc* may be reduced, *iv* is always present, *ev* and *f* sometimes. In the female the chaetotaxy is complete, or the 2 *fo* may be wanting as in the other sex. Parafacialia beset with hairs at least in the upper part. Arista with long hairs on both sides.

Thorax, like the abdomen, metallic green, coppery or blue, with black pattern, *ac*=0+1-2, *dc*=0-3+2-5, *ia*=0-1+1-2, *ph*=0-1, but outer always wanting, *h*=2-3, *prs*=1, *n*=2, *sa*=3, *pa*=2, *sc*=3-6+2-3, *st*=1 : 1. *pp* always present, *pst* sometimes wanting; propleuron, prosternum and post-

alar declivity hairy, as well as the pre-alar knob. Supraspiracular convexity bare, suprasquamal ridge without tufted hairs. Wings hyaline or with the outer margin broadly infuscated, subcostal sclerite bare, stem-vein dorsally with a row of hairs, r_1 bare, r_{4+5} with hairs in the basal part, R_5 open. Thoracic squama broad and truncate, dorsally with erect hairs. Legs without outstanding features.

Abdomen of *Calliphora*-type, 5th sternite emarginated. Postabdomen in the male showing 3 free segments, the first very narrow, hypopygium typically shaped in each species with a phallosome of great multiplicity, which induced HOLDAWAY (1933) to propose a splitting of the genus *Chrysomyia* of the Old World into 3 distinct units.

The bionomics of several species which are important as myiasis-producing « blow-flies » have been studied by several authors, for instance *Chrysomyia albiceps* (WIEDEMANN) by SMIT (1931) and CUTHBERTSON (1933), *C. bezziana* VILLENEUVE by CUTHBERTSON (1933, 1934), *C. chloropyga* (WIEDEMANN) by SMIT (1931) and CUTHBERTSON (1938), *C. marginalis* (WIEDEMANN) by CUTHBERTSON (1938). The maggot of *C. albiceps* is armed with fleshy processes terminating in a brush of spinules which give the larva a characteristic and outstanding appearance. *C. bezziana* is an obligatory producer of wound-myiasis in man and animal, *C. albiceps*, *C. chloropyga*, *C. inclinata* and *C. marginalis* are known to cause facultatively traumatic myiasis (cf. ZUMPT, 1951).

KEY TO THE SPECIES.

1 (2) Prothoracic spiracle black to dark brown.

Body metallic green or blue, abdominal tergites with narrow dark bands along posterior margins. Only base of wing infuscated. Eyes of male almost touching, upper facets enlarged, transitional in size to the lower ones; in female, frons at vertex measuring about 3/5 of eye-length. Face yellow, frontal stripe red-brown, parafrontalia blackish, antennae orange. Acrostichals 0+1-2, *dc*=2+3-5, *ia*=0-1+2. 8-12 mm. — Ethiopian and Oriental regions ... 1. *C. bezziana* VILLENEUVE.

2 (1) Prothoracic spiracle white or yellow 3

3 (6) Bucca with a sharply demarcated, glossy black or reddish brown, undusted spot. Presutural *dc* wanting. Wing margin broadly infuscated 4

4 (5) Frons in male at the narrowest point less than 1/3, in female about 1/2 of eye-length.

Body dark green or blue, mesonotum with a more or less distinct, ‖ -like dark pattern in front of suture, abdomen broadly banded. Frons, antennae and face black, the latter yellowish pollinose. Acrostichals 0+1-2, *dc*=0+1-2, *ia*=0+1-2. 7-11 mm. — Tanganyika, Kenya, Belg. Congo ..... 2. *C. polymita* VILLENEUVE.

5 (4) Frons in male at the narrowest point about ½, in female ⅝ of eye-length.

Body a little more slender than in the foregoing species, in other main features, except the hypopygium, similar to it. 7-10 mm. — Tanganyika ..... 3. *C. vanemdeni* ZUMPT.

6 (3) Bucca without sharply demarcated glossy spot, but sometimes more or less shining under the pollinosity. Presutural *dc* present. Wing margin infuscated or hyaline 7

7 (8) Eyes in male touching, with sharply demarcated and strikingly large upper facets; female frons at vertex measuring about $^7/_{11}$ of eye-length, totally orange.

Body blue or bluish green, abdomen with black bands. Wing margin normally broadly infuscated, rarely hyaline. Face and antennae in both sexes bright yellow or orange. Acrostichals 0+1, *dc*=2-3+2-3, *ia*=0+1. 7-13 mm. — Ethiopian region and India west of the Indus .....
5. *C. marginalis* (WIEDEMANN).

8 (7) Eyes in male touching or widely separated, but never with strikingly large or sharply demarcated upper facets; frons of female at least darkened in the upper part 9

9 (12) Face bright yellow or orange, antennae with the third segment sometimes partly infuscated. Wing margin blackish, prostigmatic bristle always present 10

10 (11) Eyes in male touching; in female separated at vertex for about ½ of eye-length, but frons strikingly narrowed to the antennal groove, measuring about ⅖ of eye-length at the narrowest point, totally bluish-black coloured.

Body blue or dark green, abdominal tergites with dark bands. Acrostichals 0+1, *dc*=3+4, *ia*=0-1+2. 6-12 mm. — Ethiopian region ..... 5. *C. inclinata* WALKER.

11 (10) Eyes in male widely separated, frons at the narrowest point measuring about ½ of eye-length; female with the frons subparallel, width at vertex about ⅝ of eye-length, upper part black, lower reddish coloured.

Colouring as in the foregoing species; presutural *ia* always absent. 8-11 mm. — Ethiopian region .....
4. *C. laxifrons* VILLENEUVE.

12 (9) Face and frons blackish in ground colour, antennae blackish too or at least black-brown. If the buccae are yellowish, then the wing-margin is hyaline and the prostigmatic bristle normally absent 13

13 (20) Prostigmatic bristle present. Male with *ev* present or absent ... 14

14 (15) Body predominantly dark blue, mesonotum in front of suture with a black ⌋⌊-shaped pattern. Wings infuscated at base only.
Eyes in male almost touching or separated from each other by a distance up to 1/10 of eye-length, frontal width at vertex in female measuring almost 1/2 of eye-length. Acrostichals =0+1, *dc*=2-3+2-4, presutural *ia* wanting. 6-10 mm. — Widespread in S. Africa, locally in East and Central Africa, probably absent from West Africa ..... 7. *C. chloropyga* (WIEDEMANN) f. *typica*.

15 (14) Body mostly green, rarely coppery or bluish, mesonotum without a distinct ⌋⌊-shaped pattern 16

16 (17) Wing margin infuscated.
Morphologically not to be distinguished from the foregoing form. — Locally in West- and Central Africa ..... 7. *C. chloropyga* f. *taeniata* (BIGOT).

17 (16) Wing with only the base infuscated 18

18 (19) Male frons without *ev*, buccae in both sexes black.
A green form of *C. chloropyga* with reduced mesonotal pattern. — Everywhere in the Ethiopian region, but predominantly in the tropical zone. Also known from Madagascar ..... 7. *C. chloropyga* f. *putoria* (WIEDEMANN).

19 (18) Male frons with a well developed *ev*, buccae totally or for the greater part yellowish. See following species.

20 (13) Prostigmatic bristle wanting. Male frons with *ev* present.
Body green, sometimes bluish, without markings on presutural mesonotum; abdominal bands relatively broad. Eyes in male separated by 1/8-1/12 of eye-length. Buccae yellow to orange, sometimes partly darkened. Acrostichals 0+1, *dc*=2-3+2-3, *ia*=0+1. 6-10 mm. — Widespread in the tropical and subtropical parts of the Old World ..... 8. *C. albiceps* (WIEDEMANN).

[1. — **Chrysomyia bezziana** VILLENEUVE.]

(Fig. 105.)

Chrysomyia bezziana VILLENEUVE, Rev. Zool. Afr., III, 1914, p. 430; ROUBAUD, Ét. Fa. Parasit. Afr. occ. fr., I, 1914, p. 20, pl. IV; PATTON, Ind. J. Med. Res., VIII, 1920, p. 17, pl. III; et id., ibid., IX, 1922, p. 654; SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 13, figs.; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1933, p. 95, figs.; et Min. Agric. Salisbury, Bull., 917, 1934, 4 pp., 4 plts.; S. WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 140, fig. 66.

A species of great medical and veterinary importance, the larvae obligatorily causing wound myiasis. A closely related species is *C. megacephala* (FABRICIUS) of the Oriental region, the larvae of which, however, normally develop in carcasses and are only occasionally found as facultative wound

parasites. For separation of these two species see S. WHITE, AUBERTIN and SMART (1940). The hypopygium of *C. bezziana* is quite characteristic (fig. 105) and absolutely distinct from that of *C. megacephala*.

C.bezziana is probably to be found in almost all parts of tropical Africa, but the imagines are not commonly represented in the collections. The area of distribution evidently does not extend further southwards than S. Rhodesia, N. Transvaal and Bechuanaland.

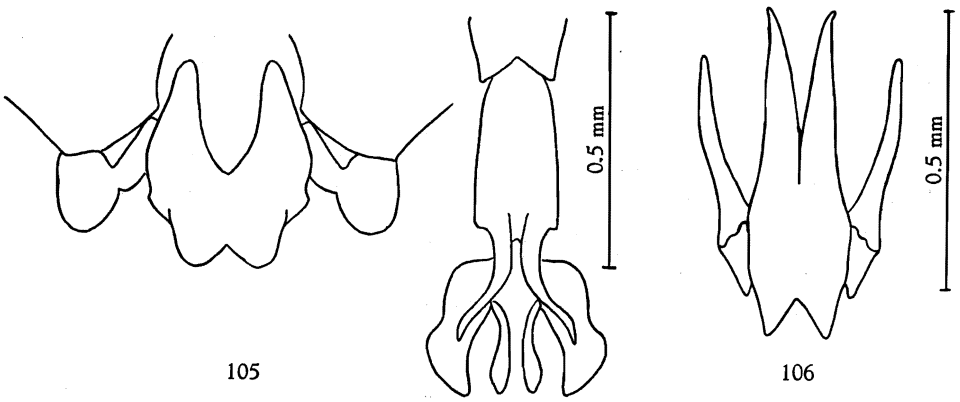


FIG. 105. — *Chrysomyia bezziana* VILLENEUVE. Cerci with paralobi and phallosome in frontal view. Specimen from S. Rhodesia.

FIG. 106. — *Chrysomia polymita* VILLENEUVE. Cerci with paralobi in frontal view (after ZUMPT). Holotype from N.W. Tanganyika.

There are no specimens represented in the material from the Belgian Congo but *C. bezziana* is known from this part of Africa. One ♂ in the collection of the S. African Institute for Med. Research, Johannesburg, was found at Tolwe, Transvaal, IX.1940.

2. — **Chrysomyia polymita** VILLENEUVE.

(Fig. 106.)

Chrysomyia polymita VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 177; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 106, figs. 30-31; ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 181, fig. 2.

Chrysomyia atrifrons MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 98; ? SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 115; ZUMPT, J. Ent. Soc. S. Africa, XVI, 1953, p. 181.

C. polymita is a Central African species probably being restricted to the higher mountains like its related species *C. vanemdeni* ZUMPT. These two species are easily separable from each other by the features given in the key, and they are also quite distinct with respect to the hypopygia (cf. figs. 106 and 107).

Mission G. F. DE WITTE : Tshamugussa (Bweza), 2.250 m, 10.VIII.1934 (3 ♂♂); vers mont Kamatembe, 2.300 m, 7-23.I.1935 (5 ♂♂, 9 ♀♀); Kilondo (près Gando), 2.000 m, 7-23.I.1935 (1 ♀).

Collection Musée du Congo : [N. E. Kivu : La Mutura, III.1928 (1 ♀, leg. C. SEYDEL)].

Collection Museum Wien : [N. W. Tanganyika (1 ♂♀, leg. GRAUER, types of *polymita* VILLENEUVE)].

Collection S. A. Institute for Med. Research, Johannesburg : [S. E. edge of Kenia Forest (1 ♂♀, paratypes of *atrifrons* MALLOCH)].

[3. — **Chrysomyia vanemdeni** ZUMPT.]

(Fig. 107.)

Chrysomyia vanemdeni ZUMPT J., Ent. Soc. S. Africa, XVI, 1953, p. 181, fig. 1.

Only known from Mufindi, 3.000 m, Southern Highlands of Tanganyika, and from the Kibo, 2.800 m.

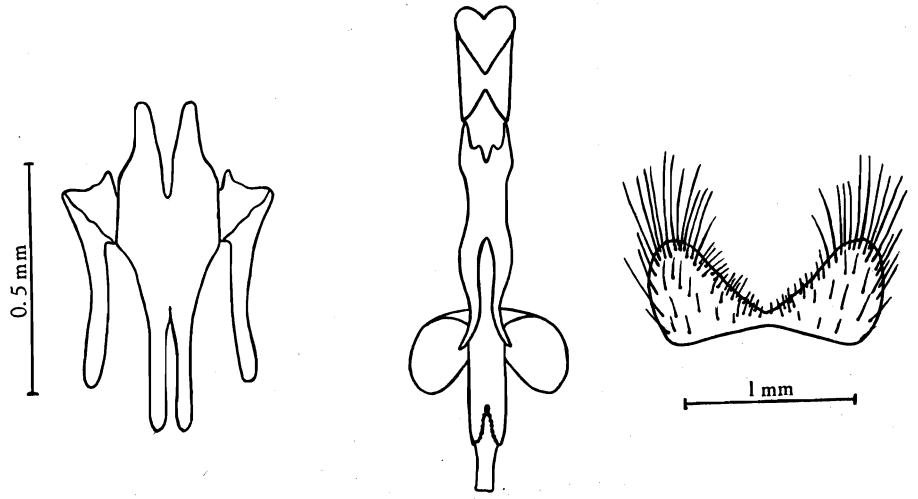


FIG. 107. — *Chrysomyia vanemdeni* ZUMPT.
Cerci with paralobi, phallosome and 5th. sternite in frontal view (after ZUMPT). Paratype from Mufindi, Tanganyika.

4. — **Chrysomyia laxifrons** VILLENEUVE.

(Fig. 108.)

Chrysomyia laxifrons VILLENEUVE, Bull. Soc. Ent. France, 1914, p. 178, fig. 2; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; ? SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 115.

This species is well characterized by its outer features as well as by the shape of the hypopygium (fig. 108). It is widely spread over the Ethiopian region, but evidently belongs to the rarer species.

Mission G. F. DE WITTE : Vers mont Kamatembe, 2.300 m, 7-23.I.1935 (1 ♀).

Collection HACKARS : W. Ruwenzori, 1.200-1.500 m, III.1937 (1 ♀).

Collection Musée du Congo : [Kivu : Katana, 1933 (1 ♀, leg. DE WULF)]; [Lulua : Kapanga, XI.1928 (1 ♀, leg. WALKER)]; Rutshuru, 12.V.1936 (1 ♀, leg. L. LIPPENS); [Élisabethville, XI.1911 (1 ♂ ♀, leg. MISS. AGRIC.)]; [Haut Uele : Moto, 1920 (1 ♂ ♀, leg. L. BURGEON)]; [Uele : Nepoko (1 ♀, leg. HENRION)]; [Ukaika, XII.1910 (1 ♂, 2 ♀ ♀, leg. GRAUER, type-locality)].

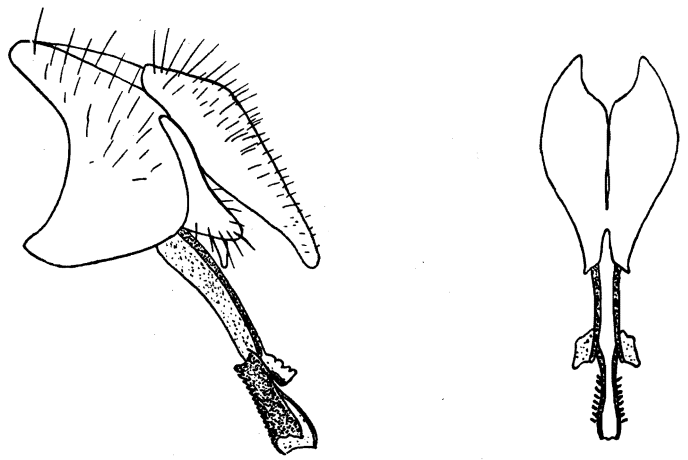


FIG. 108. — *Chrysomyia laxifrons* VILLENEUVE.
Hypopygium in lateral and frontal view.
Specimen from S. Rhodesia.

Collection British Museum, London : [Katanta, S. Leone, 19.IV.1912 (1 ♂, leg. SIMPSON)]; [Mt. Ufiome, Tanganyika, 1.VI.1930 (1 ♀)].

Collection Zool. Museum, Berlin : [Togo : Misahoehe, 10.IV.1894 (1 ♀, leg. E. BAUMANN)]; [S. Kamerun : Bipindi, (1 ♀, leg. G. ZENKER)]; [Span. Guinea : Alcu Benito, 16-31.VII.1906 (1 ♀, leg. G. TESSMANN)]; [O. Sudan : Gelo Fluss, (1 ♂ ♀, leg. O. NEUMANN)].

Collection S. A. Institute for Med. Research, Johannesburg : [Tanganyika : Aruscha, 30.VI.1931 (1 ♂, leg. F. ZIMMER)]; [S. Rhodesia : Chirinda Forest, XI.1930 (1 ♀, leg. A. CUTHBERTSON)]; [Transvaal : Tzaneen, I.1953 (1 ♀, leg. B. DE MEILLON)]; [Waterval Onder, 28.II.1952 (1 ♀, leg. H. PATERSON)]; [Pretoriuskop, Kruger Park, 5.III.1952 (1 ♀)].

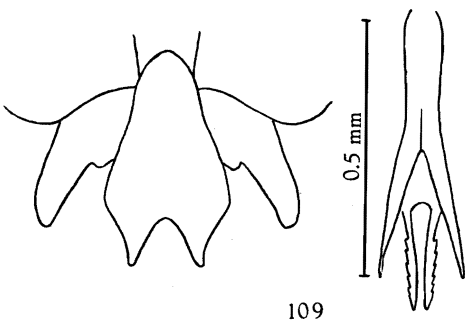
5. — **Chrysomyia inclinata** WALKER.

(Fig. 109.)

Chrysomyia inclinata WALKER, Trans. Ent. Soc. Lond., 1860, p. 311; CURRAN, Bull. Amer. N. H., LVII, 1928, p. 369.

Chrysomyia tellinii BEZZI, Bull. Soc. Ent. Ital., XXXIX, 1908, p. 82; VILLENEUVE, Bull. Soc. Ent. Fr., 1914, p. 179; MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 97; VILLENEUVE, Bull. Soc. Ent. Fr., 1926, p. 40; SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 110.

Chrysomyia roubaudi SÉGUY, Bull. Soc. Ent. Fr., 1925, p. 304; VILLENEUVE, Bull. Soc. Ent. Fr., 1926, p. 40; SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 110, figs. 41-42.



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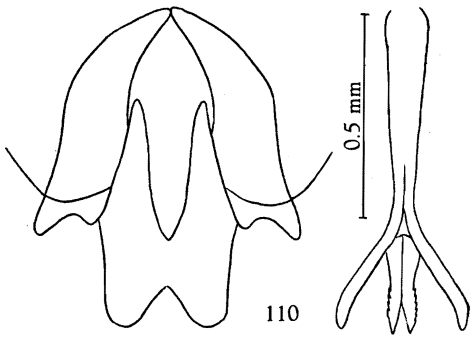

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FIG. 109. — *Chrysomyia inclinata* WALKER. Cerci with paralobi and phallosome in frontal view. Specimen from Monga, Belgian Congo.

FIG. 110. — *Chrysomyia marginalis* (WIEDEMANN). Cerci with paralobi and phallosome in frontal view. Specimen from Transvaal.

Recognizable without difficulty by the features given in the key. SÉGUY, in his revision of the *Chrysomyiini* (1928), does not mention this species, but listed as distinct species, *C. tellinii* and *C. roubaudi*. Both had already been synonymized with *C. inclinata* by VILLENEUVE in 1926. The features given by SÉGUY lie within the intraspecific variability. Also the shape of the cerci and paralobi is slightly variable, but the hypopygium (fig. 109) is nevertheless quite distinct from those of the other species.

Mission G. F. DE WITTE : Vers mont Kamatembe, 2.300 m, 7-23.I.1935 (2 ♂♂, 3 ♀♀); Nyasheke (volc. Nyamuragira), 1.820 m, 14-26.VI.1935 (1 ♀); [Uele : Monga, 450 m, 18.IV-8.V.1935 (1 ♂)].

Mission H. DAMAS : Lac Édouard W. Bugazia, 925 m, 13-16.V.1935 (1 ♀).

Collection Musée du Congo : [Lulua : Kapanga, VIII.1932 (1 ♂ ♀, leg. F. G. OVERLAET)]; [Bambesa, 11-14.V.1938 (4 ♀ ♀, leg. P. HENRARD)];

[Équateur : Flandria, IX.1935 (1 ♀, leg. J. GHESQUIÈRE)]; [Kibali Ituri : Kilo, 18.X.1930 (3 ♀♀, leg. G. DU SOLEIL)]; [N. Lac Kivu : Rwankwi, IV.1918 (2 ♀♀, leg. J. V. LEROY)]; [Terr. de Banningville, riv. Bas-Kwango, IV.1945 (1 ♀, leg. FAIN)]; [Stanleyville, 1927 (1 ♀, leg. A. HENRION)].

Collection Zool. Museum, Berlin : [Togo : Misahoehe, 10.IV.1894 (2 ♀♀, leg. E. BAUMANN)]; [Kamerun : Barombi (9 ♀♀, leg. PREUSS)]; [Buea, 900-1.200 m, 11.X.1910 (2 ♀♀, leg. HINTZ)].

Collection S. A. Institute for Med. Research, Johannesburg : Transvaal : White River, 6.III.1953 (1 ♂, leg. H. PATERSON); Natal : Durban, VII.1903 (1 ♂, leg. G. BURN); [Harding, II.1951, (1 ♀, leg. J. MUSPRATT)]; [Hluhluwe, 18.I.1950 (1 ♀, leg. F. ZUMPT)]; [Cape Province : Grahamstown, 7.I.1954 (1 ♀, leg. F. ZUMPT)]; [Mazeppa Bay, IV.1951 (1 ♀, leg. J. MUSPRATT)]; [Pt. St. John's (2 ♂♂, leg. H. PATERSON)].

I have seen this species furthermore from Sierra Leone, Liberia, Gold Coast, Nigeria, Tanganyika, S. Rhodesia and Port. E. Africa.

6. — **Chrysomyia marginalis** (WIEDEMANN).

(Fig. 110.)

Musca marginalis WIEDEMANN, Ausser. Zweifl. Ins., II, 1830, p. 395; AUSTEN, Ann. Mag. N. H., (7), XVII, 1906, p. 302; VILLENEUVE, Rev. Zool. Afr., III, 1913, p. 436; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1933, p. 101, pl. III; PATTON and CUSHING, Ann. Trop. Med. Parasit., XXVIII, 1934, p. 124, figs. 1-2; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 137, fig. 63.

Chrysomyia regalis ROBINEAU-DESVOIDY, Ess. Myod., II, 1930, p. 449; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 137.

Phumosia tessellata BIGOT, Ann. Soc. Ent. France, (5), VIII, 1878, p. 31; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 137.

Paracompsomyia nigripennis HOUGH, Proc. Acad. Philad., 1898, p. 184; ADAMS, Kansas Univ. Sci. Bull., III, 1905, p. 203; AUSTEN, Ann. Mag. N. H., (7), XVII, 1906, p. 302.

A very common fly throughout the whole Ethiopian region. Its area of distribution also includes Southern Arabia, India west of the Indus, and Madagascar.

C. marginalis, recorded as an occasional causal agent of traumatic myiasis (cf. ZUMPT, 1951), is well characterized by its outer features as well as the structure of the hypopygium (fig. 110). Very rarely there are specimens which lack the infuscation of the wing.

I have seen material from almost all parts of Africa south of the Sahara. The specimens before me from the Belgian Congo were collected in the following localities.

Mission H. DAMAS : Lac Édouard W., Bugazia, 925 m, 13-16.V.1935 (1 ♀).

Collection L. LIPPENS : Sud lac Édouard, Kamande, 925 m. 8.IV.1936 (69 ♂♂, 89 ♀♀).

Collection Musée du Congo : [Lulua : Kapanga, VIII.1932 (1 ♂, leg. G. F. OVERLAET)]; [Katwe, 1935, (1 ♂, 5 ♀♀, leg. MARLIER)]; [Ituri : Bunia, II.1934 (1 ♂, 5 ♀♀, leg. J. V. LEROY)]; [Kivu : Katana, 1933 (1 ♂, leg. DE WULF)]; [Kibali-Ituri : Kasenyi, 15.V.1935 (3 ♀♀, leg. H. J. BRÉDO)]; [Moyen Kwilu : Leverville, I.1914 (1 ♀, leg. P. VANDERIJST)]; [Kwango : Dongo 5.I.1940 (1 ♀, leg. VLEESCHOUWERS)]; Kamande, 22.IX.1935 (1 ♀, leg. L. LIPPENS); [Ruanda, Lac Mohasi, IV.1934 (1 ♂, leg. H. HEGH)].

7. — **Chrysomyia chloropyga** (WIEDEMANN).

f. **typica.**

Musca chloropyga WIEDEMANN, Zool. Mag., II, 1818, p. 44; et Ausser. Zweifl. Ins., II, 1830, p. 400; VILLENEUVE, Rev. Zool. Afr., III, 1914, p. 436; MALLOCH; Ann. Mag. N. H., (9), XVI, 1925, p. 99; SÉGUY, Encycl, Ent. Dipt., IV, 1928, p. 104, figs. 26-27; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; SMIT, 17th Rep. Dir. Vet. Serv. Onderst., 1931, p. 308, figs.; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1933, p. 99, figs.; PATTON and CUSHING, Ann. Trop. Med. Parasit., XXVIII, 1934, p. 128, figs. 3-4; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXVI, 1938, p. 56.

Somomyia anchorata BIGOT, Ann. Soc. Ent. France, (5), VII, 1877, p. 48; VILLENEUVE, Rev. Zool. Afr., III, 1913, p. 149.

Somomyia barbigera BIGOT, Bull. Soc. Zool. France, XXII, 1887, p. 597; VILLENEUVE, Rev. Zool. Afr., III, 1913, p. 149.

Paracompsomyia houghi ADAMS, Kansas Univ. Sci. Bull., III, 1905, p. 201; AUSTEN, Ann. Mag. N. H., (7), XVII, 1906, p. 301.

f. **putoria** (WIEDEMANN).

(Fig. 111.)

Musca putoria WIEDEMANN, Ausser. Zweifl. Ins., II, 1830, p. 403; VILLENEUVE, Bull. Soc. Ent. France, 1913, p. 367; et Rev. Zool. Afr., III, 1914, p. 440; MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 99; SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 106, figs. 32-36; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; HOLDAWAY, Bull. Ent Res., XXIV, 1933, p. 550; ZUMPT, Mem. Inst. Sci. Madagascar, A V, 1951, p. 67.

Somomyia punctifera BIGOT, Ann. Soc. Ent. France, (5), VII, 1877, p. 256; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 430.

Pycnosoma putoria var. *adoxa* SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 109 (syn. nov.).

Pycnosoma putoria var. *cyanea* SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 109 (syn. nov.).

Pycnosoma putoria var. *pulchra* SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 110 (syn. nov.).

f. **taeniata** (BIGOT).

Somomyia taeniata BIGOT, Ann. Soc. Ent. France, (5), VII, 1877, p. 36.

Chrysomyia megacephala var. *costata* VILLENEUVE, Bull. Soc. Ent. France, 1914, p. 180; SÉGUY, Encycl. Ent. Dipt., IV, 1928, p. 108, fig. 33; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369.

Chrysomyia nigriceps SÉGUY, (nec. PATTON), Bull. Soc. Ent. France, 1925, p. 303; VILLENEUVE, Bull. Soc. Ent. France, 1926, p. 40.

Chrysomyia trygaea SÉGUY, Bull. Soc. Ent. France, 1926, p. 87; et Encycl. Ent. Dipt., IV, 1928, p. 111, figs. 37-40.

Chrysomyia sensua CURRAN, Amer. Mus. Nov., 246, 1927, p. 5; et Bull. Amer. Mus. N. H., LVII, 1928, p. 369 (syn. nov.).

? *Chrysomyia epanalepsis* SÉGUY, Mem. L'I. F. A. N., n° 19, 1952, p. 163 (syn. nov.).

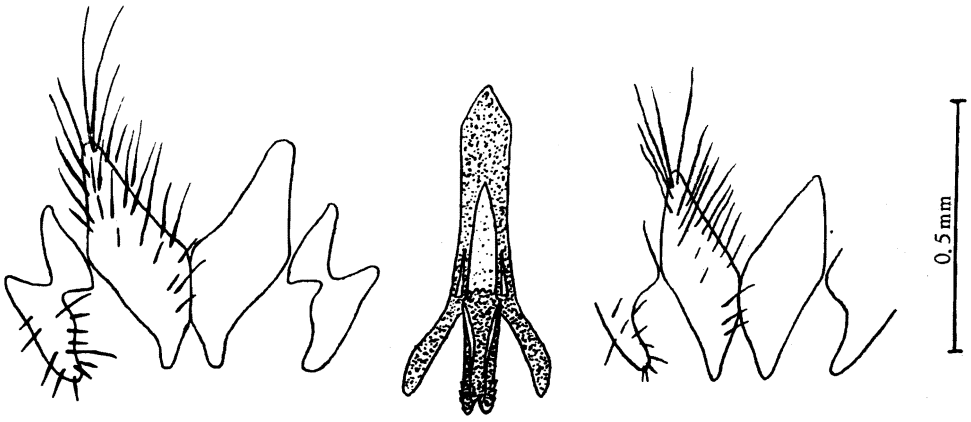


FIG. 111. — *Chrysomyia chloropyga* (WIEDEMANN) f. *putoria*.
Cerci with paralobi and phallosome (left) of a specimen from Lac Kivu; right, cerci with paralobi of a specimen from Yaoundé, Cameroons. There is a slight variability to be stadet.

This common species, distributed all over the Ethiopian region, shows a great variability with respect to the body-colour as well as in certain morphological features, including, to a certain degree, the shape of the cerci. However, the basal plan of the hypopygial structure (fig. 111) is quite distinct, compared with other *Chrysomyia* species, and on the other hand, the stated variability is perfectly transitional, even in specimens from the same locality.

This is true too, for instance, for the width of the male frons and for the colouring of the body which probably depends on some as yet unknown ecological factors. The typical form is mainly dark blue and shows a black, _||_ shaped pattern on the mesonotum; its wings are infuscated at base only. This form predominates in the southern parts of Africa, but it also occurs

at some higher altitudes of the tropics. A green form, in general appearance somewhat similar to *C. albiceps* (WIEDEMANN), is *putoria* WIEDEMANN, mostly listed as a distinct species. It generally replaces the *f. typica* in the tropical region, but is also found locally in Southern Africa. The genitalia of *putoria* are identical with those of *chloropyga* s. str. (also comp. VAN EMDEN, 1953), and I have also seen specimens which are transitional with respect to colouring. I therefore see no reason why these two forms should be kept as distinct species. They cannot even be regarded as true subspecies, because their areas of distribution overlap widely, and I have found localities near Johannesburg where they occur in the same place but at different seasons. We have, unfortunately, not yet found the time to examine this interesting fact experimentally in the laboratory. This will be done sometime in the future and will prove whether these forms are genetically isolated and whether the colouring is genetically fixed as a constant feature or dependent on phenological factors.

The third colour-form is *taeniata* BIGOT. It is similar to *putoria*, but the wing margin is infuscated as in *C. marginalis* (WIEDEMANN), *C. inclinata* WALKER a.o. species. Transitional specimens are still more common and evident here than in *chloropyga* s. str. and f. *putoria*, so that it is frequently difficult to decide whether the wing margin is distinctly infuscated or is to be regarded as hyaline. This form only occurs in the tropics, very often mixed with typical *putoria* in the same population.

Dr. F. VAN EMDEN, Commonwealth Institute of Entomology, London, has opposed this species concept (by letter) and recently broached the question once more at the International Congress of Entomology in Amsterdam (VAN EMDEN, 1953). Discussing the taxonomic value of the male genitalia of diptera, he says that there are groups in which the genitalia are of great value and really represent the only feature for separating the species, but that there are others in which they are almost similar and not useful for taxonomic purposes, e. g. in *C. chloropyga* and *C. putoria*.

It is a well-known fact, that not only in the diptera, but also in other orders of insects, there are groups in which the genitalia are of no use to the taxonomist, at least up to now. But I think that every morphological feature, including the hypoygium, must be weighted or valued according to the group in which it is used by the taxonomist. A feature like the position of a bristle, or the colour of the integument, or of hairs and toment, may be of great taxonomic value in one group, whereas it is quite useless in another one. The hypopygium is no exception in this respect. But when in a given group, for instance in *Chrysomyia* and *Sarcophaga*, the majority of the species are well characterized by the structure of the hypopygium, it is at least suspicious when a few species among them have identical hypopygia. Furthermore, when the other features used for separating them are transitional, or appear irregularly in different populations, the con-

clusion in my opinion, can only be that we are not dealing with distinct species, but with intraspecific units.

Chrysomyia chloropyga f. *typica* (WIEDEMANN).

Mission G. F. DE WITTE : Kilondo (près Gandjo), 2.000 m, 7-23.I.1935 (1 ♀); vers mont Kamatembe, 2.300 m, 7-23.I.1935 (5 ♀♀); Rutshuru, 1.285 m, 7.VI.1935 (1 ♀).

Mission H. DAMAS : Lac Mokoto, Kishale, 1.470 m, (1 ♂♀).

Collection Musée du Congo : [Ituri : Blukwa, 4.II.1929 (1 ♂, leg. A. COLLART)]; Kivu : Kisenyi, 1924 (1 ♂, leg. VAN SACEGHEM); [Katanga : Ditanto, X.1925 (1 ♀, leg. C. SEYDEL)]; [Léopoldville, 28.XII.1925 (1 ♀, leg. R. P. HULSTAERT)].

Chrysomyia chloropyga f. *taeniata* (BIGOT).

Mission G. F. DE WITTE : [Uele : Monga, 450 m, 18.IV-8.V.1935 (1 ♂♀)].

Collection HACKARS : W. Ruwenzori, 1.200-1.500 m, III.1937 (1 ♂).

Collection Musée du Congo : [Kwango : Monkona, 25.IX.1939 (5 ♀♀, leg. VLEESCHOUWERS)]; [Bambesa, XI.1933 (1 ♂, leg. H. J. BRÉDO)]; [Chambi, X.1933 (1 ♂, leg. DE WULF)]; [Rwankwi, IV.1948 (2 ♂♂, 2 ♀♀, leg. J. V. LEROY)]; [Kivu : Katana, 1933 (1 ♂♀, leg. DE WULF)]; [Mayumbe : Yumbi, 5.V.1926 (1 ♂♀, leg. A. COLLART)]; [Mayumbe : Luvu, 22.X.1923 (1 ♂, leg. A. COLLART)]; [Mongbwatu (Kilo), VIII.1937 (2 ♂♂, 1 ♀, leg. SCHEITZ)]; [Lulua : Kapanga, XI.1933 (1 ♂, leg. G. F. OVERLAET)]; Rutshuru, 12.V.1936 (12 ♂♂, 3 ♀♀, leg. L. LIPPENS); [Urundi : Kanyinya, 1946 (1 ♂, leg. DAMES DE MARIE)]; Stanleyville, 4.IV.1915 (1 ♀, leg. Exp. LANG-CHAPIN, paratype of *sensua*).

Chrysomyia chloropyga f. *putoria* (WIEDEMANN).

This extremely common form is represented in several hundred specimens from various localities all over the Belgian Congo, including the Parc National Albert.

8. — **Chrysomyia albiceps** (WIEDEMANN).

(Figs. 112, 113.)

Musca albiceps WIEDEMANN, Zool. Mag., III, 1819, p. 38; et Auss. Zweifl. Ins., II, 1830, p. 404; MACQUART, Dipt. Exot., III, 1843, p. 139, fig.; MALLOCH, Ann. Mag. N. H., (9), XVI, 1925, p. 99; SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 9; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; TOWNSEND, Ann. Mag. N. H., (10), VIII, 1931, p. 374; SMIT, 17th Rep. Dir. Vet. Serv. Onderst., 1931, p. 310, figs.; HOLDAWAY, Bull. Ent. Res., XXIV, 1933, p. 549, figs.; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1933, p. 94, figs.; PATTON, Ann. Trop. Med. Parasit., XXVIII, 1934, p. 217, figs. 1-4; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143, fig. 68; SÉGUY, Encycl. Ent., AXXI, 1941, p. 18, fig. 13.

Musca bibula WEIDEMANN, Auss. Zweifl. Ins., II, 1830, p. 672; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143.

Musca elara WALKER, List. Dipt., IV, 1949, p. 870; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143.

Musca emoda WALKER, List. Dipt., IV, 1849, p. 872; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143.

Musca himella WALKER, List. Dipt., IV, 1849, p. 876; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143.

Lucilia arcuata MACQUART, Mem. Soc. Sci. Lille, 1850, p. 220; et Dipt. Exot. Suppl., IV, 1850, p. 247; S.-WHITE, AUBERTIN and SMART, Dipt., VI, 1940, p. 143.

Lucilia testaceifacies MACQUART, Dipt. Exot. Suppl., IV, 1850, p. 247; S.-WHITE, AUBERTIN and SMART, Fa. Brit. India, Dipt., VI, 1940, p. 143.

Somomyia nubiana BIGOT, Ann. Soc. Ent. France, (5), VII, 1877, p. 38; AUBERTIN, Linn. Soc. J. Zool., XXXVIII, 1933, p. 429.

Paracompsomyia verticalis ADAMS, Kans. Univ. Sci. Bull., III, 1905, p. 202; CURRAN, Bull. Amer. Mus. N. H., LVII, 1928, p. 369; CUTHBERTSON, Proc. Rhod. Sci. Ass., XXXII, 1937, p. 95.

Chrysomyia cupronitens (RONDANI) VILLENEUVE, Bull. Soc. Ent. France, 1913, p. 367.

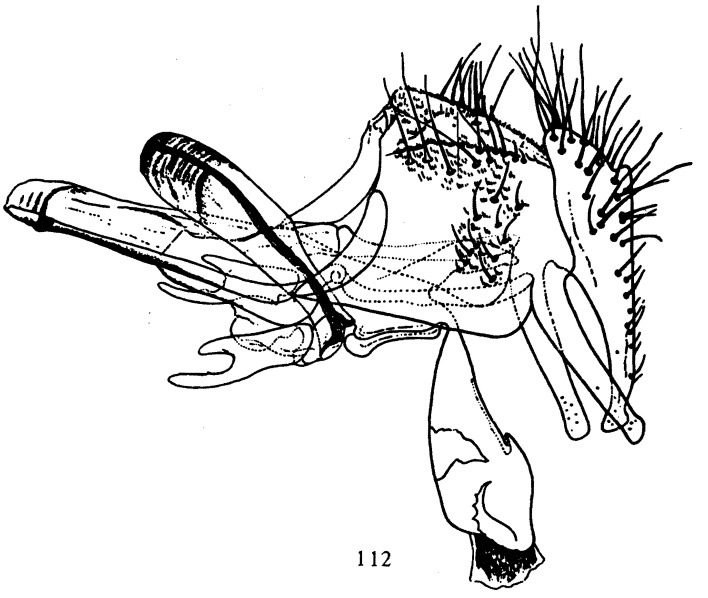
Compsomyia albiceps var. *flaviceps* (RONDANI) SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 11, fig. 13; et Encycl. Ent., A IX, 1928, p. 142, figs.; et Encycl. Ent., A XXI, 1941, p. 18.

Compsomyia albiceps var. *mascarenhasi* SÉGUY, Encycl. Ent. Dipt., IV, 1927, p. 11 (syn. nov.).

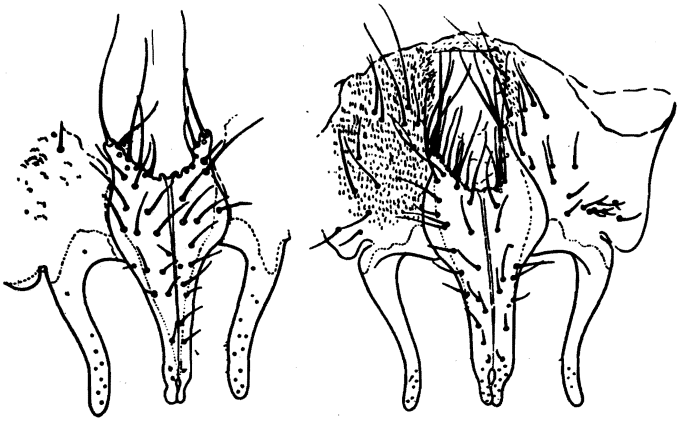
Chrysomyia albiceps var. *indica* PATTON and CUSHING, Ann. Trop. Med. Parasit., XXVIII, 1934, p. 221, fig. 5 (syn. nov.).

C. albiceps is another common species in the Ethiopian region. It is also found in the Mediterraneum, in Madagascar and in India. In the remaining Oriental region and in Australia, it is replaced by *C. rufifacies* (MACQUART), which is mostly considered as a distinct species and mainly separated from *C. albiceps* by a well developed prostigmatic bristle. HOLDAWAY (1933) has published a paper on the status of these two species and mentioned further features for distinguishing these two forms. I have seen a great number of specimens of *albiceps* from the Ethiopian and Palaearctic regions and found that none of HOLDAWAY's features is constant. There are occasional specimens of *albiceps* in Africa, which have, like *rufifacies*, a prostigmatic bristle sometimes asymmetrically developed. The other features mentioned by HOLDAWAY as typical for *rufifacies* also appear here and there in specimens of *albiceps*, determined by the lacking prostigmatic bristles. It can only be said that the features said to be characteristic for *albiceps* and *rufifacies* predominate in the Western or respectively Eastern part of the Old World.

The last deciding feature would be the hypopygium, which is figured and described from both species by HOLDAWAY (figs. 112 and 113). His



112



113

FIG. 112. — *Chrysomyia albiceps* (WIEDEMANN). Hypopygium in lateral view (after HOLDAWAY).

FIG. 113. — *Chrysomyia albiceps* (WIEDEMANN) and ssp. *rufifacies* (MACQUART). Cerci with paralobi in frontal view (after HOLDAWAY).

drawings show clearly that there are no differences of taxonomic importance between these two species; those he mentions lie within the intraspecific variability which is quite pronounced in other species of *Chrysomyia* too.

I can, therefore, only agree with PATTON and CUSHING (1934), who suggested the conspecificity of these two forms. They listed *rufifacies* as a variation and added another one, var. *indica*, which is intermediate between these two, basing their conclusions on the predominance of certain morphological features. But I do not believe that this solution is satisfactory. There are certainly several strains in *albiceps*, but we do not yet know enough about this matter. When the intraspecific variability is carefully studied, using the offspring of single females and specimens from different localities, it will perhaps be possible to get a better idea of the subspecific classification of *C. albiceps*.

At present I should consider *rufifacies* at most as a subspecies of *albiceps*. The synonyms of *rufifacies* are not listed above, but may be taken from HOLDAWAY (1933) and S.-WHITE, AUBERTIN and SMART (1940).

The hypopygium of this species is quite outstanding in its structure, the aedeagus being stout and short with the harpes closely applied to it. Still more unique is the morphology of the larva which has given rise to the question (see above) whether it would not be advisable to list *C. albiceps* in a separate genus.

Mission H. DAMAS : Ngoma (lac Biuniu), 1.500 m, 3-20.IV.1935 (1 ♀).

Collection L. LIPPENS : Sud lac Édouard, Kamande, 925 m, 13-16.V.1925 (1 ♂, 7 ♀♀).

Collection Musée du Congo : [Ituri : Bunia, II.1934 (4 ♂♂, 4 ♀♀, leg. J. V. LEROY)]; [Lulua : Kapanga, 3.XII.1932 (1 ♂, leg. G. F. OVERLAET)]; [Kivu : Katana, 1933 (1 ♂♀, leg. DE WULF)]; [Sankuru : Komi, XII.1930 (2 ♀♀, leg. J. GHESQUIÈRE)]; [Élisabethville, 6.IX.1923 (2 ♀♀, leg. C. SEYDEL)]; [Katanga : La Panda, IX.1920 (1 ♀, leg. M. BEQUAERT)]; [Katanga : Mwema, VII.1927 (2 ♀♀, leg. A. BAYET)]; [Katanga : Nyonga, V.1925 (1 ♀, leg. G. F. DE WITTE)]; [Kasenyi, 22.VIII.1925 (2 ♀♀, leg. H. J. BRÉDO)]; [Katwe, 1935 (2 ♀♀, leg. MARLIER)]; [Rwankwi, IV.1948 (1 ♀, leg. J. V. LEROY)]; [Lubumbashi, 1934 (1 ♀, leg. C. SEYDEL)]; [Kalina, XII.1946 (1 ♀, leg. E. DARTEVELLE)]; [Kasai : Bumba, 18.III.1940 (1 ♀, leg. J. J. DEHEYN)]; [Sankuru : Kondue (1 ♀, leg. E. LUJA)]; [Ruanda : Lac Mohasi, IV.1934 (1 ♀, leg. H. HEGH)].

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INDEX.

1. GENUS.

2. SPECIES.

CONTENTS

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