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## Revision of Afrotropical *Delia* Robineau-Desvoidy, 1830 (Diptera: Anthomyiidae), with descriptions of six new species

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### ABSTRACT

The Afrotropical *Delia* is revised to include 20 species. Six new species are described: *madagascariensis*, *ismayi*, *pseudovernalis*, *tibila*, *endorsina* and *cameroonica*. Three new synonymies are established: *Chortophila linearis* Adams, 1905 = *Hylemyia bracata* Rondani, 1866; *Hylemyia dispar* Bezzi, 1908 = *Hylemyia bracata* Rondani, 1866; and *Hylemyia capensis* Malloch, 1924 = *Hylemyia urbana* Malloch, 1924. *Hylemyia arambourgi* Ségué, 1938 is resurrected from synonymy. The *Delia bracata* section is expanded to include a new subsection, the *ventralis* subsection.

KEY WORDS: Afrotropical, Anthomyiidae, *Delia*, revision, taxonomy, new species, phylogeny, crop pests.

### INTRODUCTION

The genus *Delia* contains approximately 300–340 species world-wide (excluding Neotropical species). At present about 170 species are recorded from the Palearctic Region, and 162 species from the Nearctic Region, 44 of which are Holarctic. Griffiths (1991a, b, 1992, 1993) described 49 new species in his recent revision of the Nearctic species, nearly a third of the present Nearctic total, and similar intensive revisions in other parts of the world are expected to produce many more, especially in the Middle East, mountainous regions of Central Asia, Nepal, and Mongolia.

The first species of *Delia* to be described from the Afrotropical Region was under the name *Chortophila linearis* Adams (1905), which is synonymized with the widespread *D. bracata* (Rondani, 1866) in this revision. *Hylemyia dispar* Bezzi (1908) was described from Eritrea; this is also synonymized with *bracata*. Both these species were misidentified or unknown to previous authors, and their type material has not been examined until now. Stein (1913, 1914) described four species, Ségué (1938) one species, Malloch (1924a, b) two species, and Emden (1941b) two species.

My comments on *Anthomyia* (Ackland 2001: 2) regarding examination of the male genitalia, and the difficulty of identifying females applies equally to *Delia* species.

The Afrotropical species belong to three of the nine sections of *Delia* as proposed by Griffiths (1991a). Only one of these, namely the *bracata* section, does not occur in the Nearctic Region. This section is nevertheless well represented in the Afrotropical Region, and now includes 11 species, divided into two subsections, the *bracata* subsection (comprising the original *bracata* section) and the *ventralis* subsection. The other two sections (the *coarctata* and the *albula* sections) comprise only seven species, leaving two unplaced species which are only known from females.

*Delia* species are not easy to characterize: the Afrotropical species are generally grey dusted, rather drab, slender and inconspicuous flies, without any striking features. Some species have males with longer setae on some of the abdominal sternites and hind femora. Female identification is more difficult, depending on the examination and comparison of small differences of leg and thorax chaetotaxy. Ovipositor structure is also fairly uniform in the Afrotropical species, without any modifications of the cerci.

The *Delia*-group of genera are characterized by the structure of the hypandrium which is developed posteriorly into a pedestal-like extension that articulates with the pregonite (Griffiths 1991a: 957). The following genera (possessing this constitutive autapomorphy) are included in this grouping: *Delia*, *Leucophora*, *Eustalomyia*, *Hyporites*, *Engyneura*, *Heterostylodes*, *Phorbia*, *Subhylemyia* and *Hydrophoria*. Only *Delia* and *Leucophora* (Ackland 1995) have so far been recorded from the Afrotropical Region. Three species of *Eustalomyia* have been listed in the Afrotropical Catalogue (Pont & Ackland 1980: 717), but according to Michelsen (1988: 276) they belong to *Lasiomma*.

The larvae of Afrotropical *Delia* species are mainly phytophagous, and have been found in various cereal crops and grasses, including *Cynodon*, *Secale*, *Hordeum*, *Setaria*, *Pennisetum*, *Chloris*, *Sorghum*, and *Eleusine* species.

#### MATERIAL AND METHODS

This study has been based on material from the following museums, where not stated otherwise in the text (codens in parentheses): Australian National Insect Collection, C.S.I.R.O., Canberra, Australia (ANIC); The Natural History Museum, London, UK (BMNH); Deutsches Entomologisches Institut, Müncheberg, Germany (DEI); D.M. Ackland coll. (DMA); Kansas University Natural History Museum, Lawrence, USA (KUNHM); Museum Civico di Storia Naturale, Milan, Italy (MSNM); Muséum National d'Histoire Naturelle, Paris, France (MNHN); Museum für Naturkunde der Humboldt Universität, Berlin, Germany (ZMHU); Magyar Nemzeti Múzeum, Budapest, Hungary (MNM); Musée Royal de l'Afrique Centrale, Tervuren, Belgium (MRAC); Museo Zoologico La Specola, Florence, Italy (MZUF); Natal Museum, Pietermaritzburg, South Africa (NMSA); National Museum of Wales, Cardiff, UK (NMWC); National Museum of Namibia, Windhoek (NMWN); Oxford University Museum of Natural History, Oxford, UK (OUMNH); Museum of Zoology, Lund University, Sweden (MZLU).

Morphological terminology is based mainly on that of McAlpine (1981) with the following exceptions: I retain the term 'humeri' for the 'postpronotal lobes' of McAlpine; the postpronotal (humeral) setae are of little value in Anthomyiidae, but the two or three setae on the region posterior to the postpronotal lobe are significant. These setae (which are not given a specific name by McAlpine) would need to be called 'the post postpronotal setae', if the term postpronotal lobe is to be used. To avoid confusion, I have retained 'humeri' and 'posthumeral setae' in this paper. Other terms I have used are 'parafrontals' for 'fronto-orbital plates', and 'squama' for 'calypter'. Label data on holotypes are quoted as they appear; a single slash (/) indicates the end of a line of data. Supplementary information is given in square brackets. The citation of 'other material examined' was standardized for dates of collection and other data, and may not be exactly as found on the specimen labels. In the synonymy citations for each species misidentifications are enclosed in quotation marks.

Localities in South Africa are listed under current provincial names. The former Cape Province now comprises Eastern Cape, Western Cape, and Northern Cape. The former Transvaal Province includes Limpopo, North West, Mpumalanga and Gauteng. The former Natal province is now known as KwaZulu-Natal, and the Orange Free State as Free State.

Dissected specimens have their genitalia mounted in glycerol in a plastic tube on a staging pin. Drawings were made using a camera lucida.

The following abbreviations are used: *acr* – acrostichal seta(e); *dc* – dorsocentral seta(e); *acr:dc* ratio is the distance between the rows of the presutural *dc* and the outer row of the presutural *acr*, compared with the distance between the rows of presutural *acr*, and measured halfway between the anterior of scutum and the suture; *npl* – notopleural seta. This is expressed in the form of 5:3:5, which indicates that the *acr* rows are separated by 3/5 the distance between the *acr* and the *dc* row. Abbreviations for leg setae are as follows: *a* – anterior; *p* – posterior; *d* – dorsal; *v* – ventral; *ad* – anterodorsal; *pd* – posterodorsal; *av* – anteroventral; *pv* – posteroventral.

CHECKLIST OF AFROTROPICAL *DELIA* SPECIES*bracata* section*bracata* subsection

- bracata* (Rondani, 1866). Type locality: Italy, Parma.  
*linearis* (Adams, 1905). **Syn. n.** Type locality: Zimbabwe, nr Harare (Salisbury).  
*dispar* (Bezzi, 1908). **Syn. n.** Type locality: Eritrea.  
*albigena* (Villeneuve, 1911). Type locality: Syria, Mezzé.  
*flavitibia* (Karl, 1939). Type locality: Italy, Bologna.  
*arambourgi* (Séguy, 1938). Type locality: Kenya, Mt Elgon.  
*flavibasis* (Stein, 1903). Type locality: Egypt, Luxor.  
*bouhelieri* (Séguy, 1934). Type locality: Morocco, Casablanca.  
*hordacea* (Séguy, 1936). Type locality: Morocco, Rabat.  
*sedago* (Séguy, 1950). Type locality: Niger, Agadez.  
*urbana* (Malloch, 1924). Type locality: Australia, Sydney.  
*capensis* (Malloch, 1924). **Syn. n.** Type locality: South Africa.  
*madagascariensis* **sp. n.** Type locality: Madagascar.

*ventralis* subsection*ventralis* SPECIES GROUP

- ismayi* **sp. n.** Type locality: Kenya, Karasani.  
*ventralis* (Stein, 1914). Type locality: Kenya, Mt Kenya.  
*pseudovernalis* **sp. n.** Type locality: Kenya, Aberdare Range.  
*steiniella* (Emden, 1951). Type locality: Kenya, Kijabé.

## SPECIES SOLAE

- kigeziana* (Emden, 1941). Type locality: Uganda, Kigezi Prov., Mt Sabinio.  
*tibila* **sp. n.** Type locality: Ethiopia, Tibila.

*coarctata* section*mutans* subsection*andersoni* SPECIES GROUP

- andersoni* (Malloch, 1924). Type locality: Kenya, Mt Kenya.  
*endorsina* **sp. n.** Type locality: Malawi, Nyika National park.

*albula* section*hirticrura* subsection

- bisciliata* (Emden, 1941). Type locality: Kenya, Aberdare, Nyeri Track.

*platura* subsection*florilega* SPECIES GROUP

*florilega* (Zetterstedt, 1845). Type locality: Sweden.

*platura* SPECIES GROUP

*platura* (Meigen, 1826). Type locality: Germany.

*metatarsata* SPECIES GROUP

*metatarsata* (Stein, 1914). Type locality: Kenya, Mt Kenya.

*cameroonica* **sp. n.** Type locality: Cameroon, Mt Cameroon.

## unplaced species

*virgithorax* (Stein, 1913). Type locality: Ethiopia.

*modesta* (Stein, 1914). Type locality: Kenya.

PHYLOGENY OF AFROTROPICAL *DELIA**The Delia bracata* section

Hennig (1974a: 696) suggested that three species of *Delia* form a closely related group: *bracata*, *arambourgi*, and *flavibasis*. In these species the acrophallic sclerite is reduced to a flat plate lying between the paraphalli, the tips of which reach well past the acrophallus; the sclerotized dorsal prolongation of the distiphallus is short, and ends more or less above the bases of the paraphalli. The membranous extension of the distiphallus is also short, and ends before the tips of the paraphalli. This type of distiphallus is also found in other Afrotropical *Delia* species, and I therefore expand Hennig's concept of the *bracata* section to include a further six species, which are divided into two subsections, the *bracata* subsection and the *ventralis* subsection.

The monophyly of the *bracata* section is based on the following apomorphies:

- (1) Distiphallus with the short sclerotized dorsal prolongation, ending before or above the bases of the paraphalli.
- (2) Distal membrane of distiphallus also does not reach the tips of the paraphalli.

The possession of a discrete acrophallic plate may also be an apomorphic character for the *bracata* section, but is secondarily lost in the *ventralis* subsection.

*The Delia bracata* subsection

Diagnostic characters of this subsection are: sclerotized acrophallus plate (lying between the paraphallic processes) retained and prealar seta absent.

I include two further species, *urbana* and *madagascariensis* sp. n., in addition to the three species reported by Hennig (*bracata*, *arambourgi* and *flavibasis*).

*The Delia ventralis* subsection

There are six Afrotropical *Delia* species that appear to form a monophyletic group based on the following diagnostic combination of characters:

- (1) Sclerotised acrophallic plate absent (possibly secondarily lost). Gonopore situated in the membrane between dorsal prolongation and paraphalli, the prolongation ending before tip of paraphalli.
- (2) Surstylus in posterior view wider in basal 3/4, but strongly tapering in distal third (less so in *steiniella* and *ismayi*), with a median clustered group of setulae on the inner margin (except in *ismayi*).
- (3) Cercal plate short and wide, with a more or less rounded apex without long setae.

- (4) Paraphalli long and slender (shorter in *kigeziana*).
- (5) Sternite V lacking spinules apically on processes.
- (6) Tarsomere 2 on mid leg without a ventral swelling.

I include the following six species in the *Delia ventralis* subsection: *ventralis*, *steiniella*, *pseudoventralis* sp. n. and *ismayi* sp. n. in the *ventralis* species group, and *kigeziana* and *tibila* sp. n. as species solae.

The *ventralis* subsection agrees in some respects with the *elongata* section. A sclerotized acrophallus is also absent in this section, and the sternite V lacks spinules, but the gonopore is situated on the membrane at the end of the long dorsal prolongation above the tip of the paraphalli. The *ventralis* subsection is largely confined to the Afrotropical Region, though some species in the *bracata* subsection are found in southern and eastern regions of the Palearctic Region, and in one case, in Australia.

I include four species in the *ventralis* species group within the *ventralis* subsection, namely *ventralis*, *steiniella*, *pseudoventralis* and *ismayi*. They form a monophyletic group based upon the structure of sternite III. Sternite III in all these species is clothed with long setae and setulae on its posterior margin; these setae are isolated on a narrow sclerotized section of the sternite, separated from the larger anterior part by a weakly sclerotized seam (except possibly in *D. ismayi*); in addition tergites III and IV are short and posteriorly excavated, separated from each other and from tergites II and V by wide areas of flexible intersegmental cuticle; this enables the abdomen to be flexed upwards, consequently stretching the sternites, so that sternite III then lies in a horizontal position (Fig. 71) with the posterior setae projecting downwards at right angles to the abdomen. Conversely, when the abdomen is flexed downwards, the sternites contract and the narrow posterior section of sternite III, bearing the setae, is forced into a vertical position, and the setae then lie adpressed against sternite IV (Fig. 70). The setae in this condition are often difficult to see in dried material.

This mechanism is an apomorphy of the *ventralis* species group, and allows the fly to move the sternal setae quite rapidly up and down, perhaps an adaptation associated with pheromone dispersal during courtship, as already proposed by Hennig (1974a: 695). The same analogous situation is found in some species of the *Delia cardui* subsection, with long setae on sternite III (Holarctic species) where the tergites are shortened but the sternites do not have the weakened seam allowing folding of sternite III. I found no trace of a weakly sclerotized seam posteriorly to the setae in these species, but generally, sternite III is relatively shorter, and the abdomen can accommodate downward flexation without the need for the 'hinging' structure in the *ventralis* species group.

All the species in the *radicum* section (including the *cardui* subsection) have a sclerotized laterally compressed acrophallus, which is absent in the *ventralis* subsection. I conclude from this that the long setae on sternite III, together with the reduction in the length of the tergites with enlarged intersegmental membrane in some of the species in the *cardui* subsection, and in the *ventralis* species group in the *ventralis* subsection is a homoplasy. This has probably evolved independently, to provide a means of pheromone dispersal. Larvae of species in the *Delia cardui* subsection feed on Caryophyllaceae, whereas the only record of foodplant for the *ventralis* subsection is that of *steiniella*, bred from wheat in Ethiopia (Dr M. K. Billah, pers. comm.). The remaining two species of this subsection are *kigeziana* (Emden) and *tibila* sp. n. The former species has only



short setulae on sternites III and IV, but very long lateral setae on the processes of sternite V. The almost identical cercal plate and surstyli imply however that it belongs to the *ventralis* section. On the other hand *D. tibila* has long lateral setae on sternite IV. These species are designated as species solae in the *ventralis* subsection.

#### *The Delia coarctata section*

Paraphalli are present on the aedeagus in two small subsections of the *coarctata* section of *Delia* (Griffiths 1991b: 1141), namely the *mutans* (Huckett) subsection and the *bisetosa* (Stein) subsection. I refer two Afrotropical *Delia* species to the *coarctata* section, namely *andersoni* and *endorsina* sp. n. as they both possess denticles on the distiphallus. *D. andersoni* has these denticles apically, and the paraphalli are reduced to small ventral sclerotized stumps in the basal half of distiphallus. The denticles are subapical in *endorsina*, and reach back as far as the base of the paraphalli. The latter are well developed, slender, reaching well beyond the most distal denticles. The paraphalli in *andersoni* may be secondarily reduced.

There are some differences between these two species and those placed by Griffiths (1991b: 1145) in his *mutans* subsection (*arenicola* Griffiths, *nubilalis* (Huckett), *mutans*, and *carri* Griffiths), all Nearctic species. I therefore include them in the *andersoni* species group within the *mutans* subsection of the *coarctata* section. Synapomorphies for this species group are: cercal plate apically with only very short setae, and surstyli in lateral view with a median extension or flap on the posterior margin. The inner margins of processes of sternite V are raised and project downwards in lateral view.

#### *The Delia albula section*

##### *The Delia hirticrura subsection*

Griffiths (1993: 1473) included in his *D. hirticrura* subsection the Palaearctic species *hirticrura* (Rondani) and the Nearctic species *glabritheca* (Huckett) as species sola, and a further nine solely Nearctic species, which he grouped in the *lupini* (Coquillett) species group. The characteristics that he proposed for this subsection include:

- (1) Cercal plate up to twice as long as wide, with an angulate tip, and rather long lateral and apical setae.
- (2) Surstyli tapering or attenuate distally, with only very short setulae or microtrichia at their tips.
- (3) Hind femur with an interrupted row of *pv*.
- (4) Apical *pv* on fore tibia with a pointed tip.
- (5) Mid tarsomeres without long setae.

In spite of the rather unsatisfactory characterisation of this subsection (not including any autapomorphous characters) which Griffiths himself noted, the Afrotropical species *D. bisciliata* has many similarities with both *hirticrura* and *glabritheca*. The male of *D. bisciliata* has a long and narrow cercal plate, with a very acute tip, and fairly straight surstyli that taper to a narrow apex which is slightly upturned (as in *glabritheca*). However the processes of sternite V have no spatulate setae, which are present in *glabritheca*, but absent in *hirticrura*. The extensively setulose hind tibia of *glabritheca*, including numerous *p/pv*, is also present in *bisciliata*, but to a lesser extent in *hirticrura*. *D. bisciliata* is therefore included in the *hirticrura* subsection as a species sola.

### The *Delia platura* subsection

There are four Afrotropical *Delia* species which belong to this subsection. As accepted by Griffiths (1993: 1508) this subsection may not be monophyletic. Two of the species, *platura* and *florilega* were included by Griffiths in species groups bearing the same names. They are both very common and widely distributed pests on cultivated crops. The *florilega* species group have a fringe of dorsal setulae on mid tarsomere 1, and a single spine on each process of sternite V. The *platura* species group have an elongate-ovoid shaped cercal plate which is broadest beyond middle.

The two remaining Afrotropical *Delia* species, *metatarsata* and *cameroonica* sp. n. belong to the *Delia platura* subsection. The shape of the cercal plate in both species is similar to the cercal plate in the species of the *platura* species group, but the absence of a *pv* fringe on the hind tibia in the male implies that they belong elsewhere. There are two species *sola* that Griffiths did not include in any species group in the *platura* subsection, *flavogrisea* (Ringdahl) and *alaskana* (Huckett).

The genitalia and sternite V of *alaskana* figured by Griffiths (1993: figs 1694, 1701 and 1702) are similar to *metatarsata* (long, straight surstyli in lateral view, that are slightly upturned, and processes of sternite V with two rather small blunt spinules). The tarsi are unmodified in *alaskana* (also a light grey dusted species), whereas in both *metatarsata* and *cameroonica* the mid tarsomere 1 bears a fringe of dorsal setulae.

I therefore include *metatarsata* and *cameroonica* sp. n. in a new *metatarsata* species group in the *D. platura* subsection.

### Key to Afrotropical species of *Delia* (males)

- 1 Either sternite III or IV (Figs 39, 52, 58, 65, 80) with long tuft(s) of setae on posterior margin, that are either lying flat along the sternite, or erect and projecting ventrally at right angles to the sternite ..... 2
- Sternites with only normal dispersed setae or setulae that may be short or moderately long ..... 6
- 2(1) Sternite IV (Fig. 80) with a group of long setae on each posterior corner, that reach to apex of sternite V processes; sternite III with rather long but dispersed setae ..... **tibila** sp. n.
- Sternite III with long setae on posterior margin, either on whole width of sternite, or grouped into 2 tufts on either side of hind margin; sternite IV wider than sternite III and clothed only with short sparse setulae ..... 3
- 3(2) Prealar seta absent. Sternite III (Fig. 39) with 2 tufts of setae on posterior margin, apices of which hardly reach posterior margin of sternite IV. Distal section of aedeagus with 2 long and slender paraphalli ..... **ismayi** sp. n.
- Prealar seta present. Sternite III (Fig. 58) with either long setae on whole width, or setae on corners of posterior margin reaching past posterior margin of sternite IV (Fig. 52) ..... 4
- 4(3) Scutum with very distinct wide dark vittae, the median vitta being as wide as distance between the *dc* rows, this vitta extends posteriorly over scutellum and continues as a narrow darker vitta on postnotum. Mid tarsomere 1 without lengthened dorsal setulae. Setae on posterior margin of sternite III long (Fig. 65), normally erect, but



- reaching posterior margin of sternite IV when pressed against sternites, the tips fine. Setae at apex of processes of sternite V (Fig. 65) shorter than length of processes. Surstyli (Fig. 63) with apical third wide, inner margins apically less incised. Cercal plate with rounded apex ..... **steiniella** (Emden)
- Scutum without, or with only indistinct darker vittae, if present median vitta narrow. Postnotum without a darker vitta. Surstyli (Fig. 56) with apical third narrow, inner margins apically more incised ..... 5
- 5(4) Setae on posterior margin of sternite III robust (Fig. 58), without fine curling tips, and not reaching much beyond posterior margin of sternite IV (when in an adpressed position), and median setae as long as or longer than lateral setae. Sternite V (Fig. 58) with apical setae on processes shorter than length of processes. Mid tarsomere 1 on dorsal surface with lengthened setulae (about as long as depth of metatarsus). Hind femur with 8–9 fine *pv* medially, about as long as depth of femur. Anterior costal spicules about 1.5× width of vein C, costal spine also strong ..... **pseudoventralis** sp. n.
- Setae on posterior margin of sternite III longer (Fig. 52) with fine curling tips that reach well beyond posterior margin of sternite IV, median setae finer and shorter than laterals, hence a tendency for setae to divide partially into two tufts. Mid tarsomere 1 with setulae on dorsal surface short and less distinct. Hind femur with only 2–3 *pv* distally. Anterior costal spicules shorter, not longer than width of C ..... **ventralis** (Stein)
- 6(1) Prealar seta absent, or only represented by a fine hair ..... 7
- Prealar seta present, though sometimes short ..... 14
- 7(6) Mid tibia with 1–2 minute *av* ..... 8
- Mid tibia without *av* ..... 11
- 8(7) Arista (Fig. 29) relatively long haired, total width of hairing equal to width of postpedicel, length of longest hairs (in proximal half) about 5× basal diameter of arista. Abdomen long and narrow, tergites almost parallel-sided. Vein C ventrally, with a row of more or less distinct setulae. Postpedicel nearly 2.5 times as long as wide ..... **arambourgi** (Séguy)
- Arista short pubescent (Fig. 30), length of longest hairs at most twice basal diameter of arista ..... 9
- 9(8) Hind femur (Fig. 27) with numerous (8–12) *av* (especially medially) which at least twice as long as greatest depth of femur, and which have fine curling tips directed apically; fine *pv* and hairs also numerous and long ..... **urbana** (Mall.)
- Hind femur with less numerous *av*, which do not have curling tips ..... 10
- 10(9) Gena wider, 0.28–0.30× eye height. Eye margins on frons separated by narrow black frontal stripe. Scutum with major setae arising from brown spots. Sternites III and IV wider (Fig. 3), sternite IV nearly as wide as long. Surstylus (Fig. 1) in caudal view narrower in apical half, in lateral view (Fig. 2) almost straight. Ground colour of body and legs blackish with grey dust ..... **bracata** (Rond.)
- Gena narrower, 0.17–0.20× eye height. Eye margins on frons practically touching. Scutum with major setae not arising from brown spots. Sternites III and IV (Fig. 33) much longer than wide, sternite IV more than twice as long as wide. Surstylus

- in caudal view wider in apical half, in lateral view curving downwards .....  
 ..... **madagascariensis** sp. n.
- 11(7) Hind femur with 5–6 long *av* on whole length. Occipital setulae long, with numerous setulae forming a second row of setulae below upper row; genal setae biserial. Six pairs of presutural *acr*, which are quite long. Fore tibia without an apical *pv*. Hind tibia with 3 *av*. Dorsal surface of mid tarsomere 1 with some lengthened setulae, which are as long as depth of tarsomere and of equal length. Processes of sternite V (Fig. 74) with some long lateral setae with curling tips (longest as long as or longer than length of processes) ..... **kigeziana** (Emden)
- Hind femur with 3–4 *av* in distal half. Occipital setulae short, at most with only a few fine setulae below upper row; genal setae uniserial. Presutural *acr* short and fine. Fore tibia with a fine pointed apical *pv*. Hind tibia with 2 *av*. Mid tarsomere 1 on dorsal surface without any lengthened setulae. Processes of sternite V without long lateral curling setae. .... 12
- 12(11) Processes of sternite V not projecting downwards away from abdomen, and narrowing from base to apex. Fore tibia normally with 2 rather small *pv*, one beyond middle, other in distal quarter. Distal section of aedeagus without denticles (Fig. 15) ..... **flavibasis** (Stein)
- Processes of sternite V projecting downwards, and dilated medially where they wider than at base. Fore tibia normally with only 1 strong *pv* beyond middle. Distal section of aedeagus with denticles ..... 13
- 13(12) Distal section of aedeagus without distinct paraphalli (Fig. 88). Surstylus (Fig. 85) in caudal view slightly shorter, in lateral view less sinuate on anterior (ventral) margin ..... **andersoni** (Mall.)
- Distal section of aedeagus with long narrow paraphalli (Fig. 96) which extend beyond level of denticles. Surstyli (Fig. 91) in caudal view slightly longer and more slender, in lateral view (Fig. 92) more sinuate on anterior (ventral) margin ..... **endorsina** sp. n.
- 14(6) Mid tarsomere 1 with a long dorsal fringe of curving setulae, the longest setulae longer than depth of tarsomere ..... 15
- Mid tarsomere 1 without a dorsal fringe of curving setulae, though (*kigeziana*) some longer dorsal setulae may be present which are not longer than depth of tarsomere ..... 17
- 15(14) Upper part of occiput bare below the row of rather short and fine upper occipital setulae. Wing base slightly suffused pale brownish; large crossvein almost straight. Scutum without distinct vittae or shining patches, pale grey dusted ...  
 ..... **florilega** (Zett.)
- Upper part of occiput with numerous setulae below the upper row of rather long but fine upper occipital setulae. Wing base strikingly dark brown suffused and contrasting with whitish squamae; large crossvein sinuate. Scutum with distinct blackish shifting vittae ..... 16
- 16(15) Surstylus (Fig. 120) in lateral view more or less straight and not significantly wider in basal half. Sternites III and IV (Fig. 121) wider than long (sternite IV 1.4× wider). Hind marginal setae (Fig. 122) on tergites IV and V shorter .....  
 ..... **metatarsata** (Stein)

- Surstylus (Fig. 126) in lateral view bent downwards and wider in basal half, becoming slender and sinuate apically. Sternites III and IV (Fig. 127) longer than wide (sternite IV 0.9× wider). Hind marginal setae (Fig. 128) on tergites IV and V rather long ..... **cameroonica** sp. n.
- 17(14) Fore tibia with a very short pointed *pv* apical seta. Costal spines distinctly longer than small crossvein. Abdomen long, slender, and parallel-sided, about 3.5 times longer than wide. Upper occipital row of setulae bi- to triserial. Hind tibia with only 3–4 *pv*. Processes of sternite V (Fig. 74) with about 8–10 long curling lateral setae, which are about 1.5× length of processes and more or less ventrally directed. No blunt spines on inner apical margins of processes (Fig. 74) ..... **kigeziana** (Emden)
- Fore tibia with a distinct blunt apical *pv* spur. Costal spines short, at most as long as small crossvein. Abdomen shorter, at most 2–2.5 times as long as wide. Upper occipital row of setulae uniserial, at most a few scattered hairs below row. Hind tibia with row of erect *pv* setulae (10–25). Processes of sternite V with either short lateral setae, or if longer then setae not curling ..... 18
- 18(17) Hind tibia with 10–16 *pv* erect or semi-erect short setulae and hairs between *av*, *ad*, *pd*, and *pv* rows (6–8 *av*, 4–5 *a*, 3–4 *ad*, 3–4 *pd*, 10–16 *pv*, with a few *p* setulae. Processes of sternite V without blunt spines (Fig. 105) ..... **bisciliata** (Emden)
- Hind tibia with 20–25 short erect *pv* setulae, of more or less equal width, comb-like; few accessory setulae between *av*, *ad*, *pd*, and *pv* (3–5 *av*, 6–8 *ad*, 3–4 *pd*, 20–25 *pv*). Processes of sternite V with 2 short blunt spines on each inner margin apically (Fig. 116) ..... **platura** (Mg.)

#### Key to Afrotropical species of *Delia* (females)

It is possible that some couplets in this key will not lead to the correct species. Some species in the *ventralis* subsection were only available in small numbers of specimens collected in the 1930s, and were not in good condition. This made the use of small setal characters difficult, and possibly unreliable. Future collections of larger samples could indicate the variability of some of the characters used, and lead to a more accurate key to females.

- 1 Mid tibia with a small *av*, sometimes two present; prealar seta completely absent ..... 2
- Mid tibia without an *av* ..... 4
- 2(1) Arista with longest hairs at least 4–5 times as long as basal diameter of arista, total width of hairing almost as wide as width of postpedicel. Orbits infuscated with brownish dust. Abdomen with a more distinct median vitta, lateral areas of tergites much less dusted and with shining patches from some angles of vision. Scutum more distinctly vittate, especially postsuturally ..... **arambourgi** (Séguy)
- Arista with longest hairs, at most, not much longer than twice basal diameter of arista. Orbits dusted light greyish, without infuscation. Abdomen with indistinct and interrupted median vitta that consists of triangular spots on anterior half of

- tergites, lateral areas densely dusted greyish with almost no shining areas. Scutum presuturally very indistinctly vittate ..... 3
- 3(2) Hind femur with at least one of *av* distinctly longer than depth of femur. Arista very short pubescent, longest hairs near base not much longer than basal diameter of arista ..... **urbana** (Mall.)
- Hind femur with *av* shorter, none longer than depth of femur. Arista distinctly pubescent, the longest hairs distinctly longer than basal diameter of arista ..... **bracata** (Rond.)
- [The unknown ♀ of *madagascariensis* will probably key out at couplet 3, and may be separated from *urbana* and *bracata* by having only 2 *ad* and 2 *pd* on hind tibia. *D. virgithorax* (Stein), which is only known from the female, will also run down to this couplet, and can be distinguished from *urbana* and *bracata* by means of the grey dusted scutum with three distinct brownish vittae.]
- 4(1) Large crossvein strongly oblique and sinuate; mouth margin rather strongly produced; 3 posthumeral setae. Occiput with numerous setulae below upper occipital row. Prealar seta developed, about 2/3 length of posterior *npl*. Uppermost frontal seta level with anterior orbital seta, and closer to frontal stripe ..... **metatarsata** (Stein)
- Large crossvein either straight and upright, or only weakly sinuate; 2 posthumeral setae ..... 5
- 5(4) Prealar seta as long as posterior *npl*. One pair of presutural *acr* very long and strong, almost as long as 1st presutural *dc*. Scutum and abdomen with some blackish shining areas ..... **cameroonica** sp. n.
- Prealar seta at most 2/3 length of posterior *npl*, often absent ..... 6
- 6(5) Mid tibia with 2 *ad*; hind tibia with 3–5 *av*; fore tibia often with 2 *ad* setae. Parafacials when viewed from above in certain lights brassy bronze dusted, orbits dark brownish black. Scutum and abdomen with shifting vittae, on abdomen with dark wide median vitta, on scutum with dark wide lateral vittae, both rather shining and thinly dusted. Wing membrane infuscated brownish. Occiput with complete row of setulae below occipital row. Vein C with ventral setulae ..... **bisciliata** (Emden)
- Mid tibia with only 1 *ad* seta ..... 7
- 7(6) Fore tibia generally with 2 *pv* and prealar seta completely absent. Parafacial adjacent to lunule with orange brownish sheen stripe, depending on angle of vision. Abdomen entirely grey dusted with narrow brownish median vitta on tergites III–V only, on tergite V not reaching posterior margin. Knees and tibiae often orange-brown; mid tibia with *ad* twice as long as *pd* seta. Anterior costal spinules not longer than width of C. Scutum grey dusted with narrow presutural median vitta, which ends at suture, scutellum entirely grey dusted. Katepisternals 1+1 ..... **flavibasis** (Stein)
- Fore tibia generally with only 1 *pv*, if two are present (*pseudoventralis*) then prealar seta strong, and katepisternals 1+2 ..... 8
- 8(7) Anterior pair of presutural *acr* long and strong, twice length of other *acr*. Frontal triangle, when viewed from in front, with large round black velvety patch between anterior ocellus and cruciate interfrontal setae. Prealar seta short but differentiated from adjacent accessory setulae, nearly half length of posterior *npl*. Scutum and

- pleura with some darker shifting brown patches, but not distinctly vittate. Anterior costal spinules strong, about twice width of vein C ..... **tibila** sp. n.
- Presutural *acr* either almost completely absent, or very fine and hair-like, or if stronger then anterior pair not strongly contrasting in length with remaining presutural *acr*; if in doubt then scutum distinctly vittate and frontal triangle entirely grey dusted ..... 9
- 9(8) Scutum with three wide dark brown vittae, contrasting with underlying grey dusting, median vitta wide (extending beyond lines of presutural *acr*), presutural *dc* arising from dark spots partly joined, lateral dark vittae distinct and very wide. Prescutellar *acr* well developed, *acr:dc* ratio 10:8:10. Prealar seta very small or absent. Katepisternals 1+1. Median vitta on scutum continuing onto scutellum to tip. Abdomen with wide distinct median vitta which is as wide as depth of hind femur ..... **steiniella** (Emden)
- Scutum without vittae, or if present, are not strikingly contrasting with grey underlying dusting; not all other characters present ..... 10
- 10(9) Katepisternals 1+1 (fine setulose hair may be present below upper *p*, but it is finer than upper *p* and is at most only 1/3 as long) ..... 11
- Katepisternals 1+2 (lower *p* strong and at least 2/3 length of upper posterior) ..... **pseudoventralis** sp. n., **ventralis** (Stein)  
[This couplet may be unreliable, some females of these species may have shorter lower katepisternal setae; both are confined to the mountain areas of central Africa.]
- 11(10) No trace of developed lower posterior katepisternal seta ..... 12
- Lower posterior katepisternal seta represented by short fine setula, which is 1/3 length of upper *p*, or even shorter ..... **florilega** (Zett.), **platura** (Mg.)
- 12(11) Hind tibia with 1–3 fine semi-erect *pv* setulose hairs medially. Arista pubescent, with longest hairs fully equal to arisal diameter or slightly longer; presutural *acr* rows very close together, short but setose, hardly twice length of accessory scutal setulae, which are sparse; no developed prescutellar *acr*. Upper occipital setulae with irregular row of setulae below ..... **kigeziana** (Emden)
- Hind tibia without *pv* setulae or hairs. Arista with hairs slightly shorter than arisal diameter; presutural *acr* fine and hair-like, not differentiated from accessory scutal hairs ..... 13
- 13(12) Scutum with 5 indistinct brownish vittae which are not strongly differentiated from greyish dusting; median vitta narrower and less distinct, and it continues on to scutellum where it also narrower ..... **andersoni** (Mall.)
- Scutum with 5 more distinct brownish vittae which stand out from grey dusting, median vitta wider, its continuation on to scutellum also wide ..... **endorsina** sp. n.

#### Supplementary key to the *Delia bracata* subsection

This subsection contains some of the more widespread and abundant *Delia* species in the Afrotropical Region, including species of economic importance. A more detailed key to this group is thus provided.

## Key to males

- 1 Arista relatively long haired, length of longest hairs (in proximal half) up to 5× diameter of arista base (Fig. 29). Abdomen long and narrow, with almost parallel lateral margins. Vein C ventrally with row of setulae. Postpedicel almost 2.5 times as long as wide. Mid tibia with a small *av*. Terminalia: surstylus (Fig. 6) straight and of equal width for most of its length ..... **arambourgi** (Séguy)
- Arista short pubescent, length of longest hairs not much longer than twice basal arista diameter (Fig. 30). Terminalia: surstylus not as above (Figs 1, 12, 17, 31) ..... 2
- 2(1) Mid tibia without an *av*; fore tibia normally with 2 *pv*; hind femur (Fig. 23) with 4–6 *av* in distal half. Terminalia: cercal plate in lateral view (Fig. 13) extending between and beyond bases of surstyli, with rounded and widened apex (diagnostic for this species); surstyli at level of apex of cercal plate in caudal view (Fig. 12) widely separated ..... **flavibasis** (Stein)
- Mid tibia with 1–2 small *av* ..... 3
- 3(2) Hind femur (Fig. 27) with numerous (8–12) *av*, which are 2–3 times as long as greatest depth of femur and have fine curling tips directed apically; fine *pv* and hairs also numerous. Terminalia: surstylus as in Fig. 17. .... **urbana** (Mall.)
- Hind femur with less numerous *av* without curling tips (as in Fig. 25) ..... 4
- 4(3) Hind tibia with only 2 *ad* and 2 *pd*; all leg setae short and fine, hardly longer than tibial diameter. Sternites III and IV (Fig. 33) very long and narrow. Terminalia: surstylus (Fig. 31) in caudal view wide medially, in lateral view (Fig. 32) sinuate on anterior margin ..... **madagascariensis** sp. n.
- Hind tibia with 3 *ad* and 3 *pd*; leg setae longer. Sternites III and IV (Fig. 3) approximately quadrilateral. Terminalia: surstylus in caudal view (Fig. 1) sinuate and narrow in distal half, in lateral view straight on anterior margin (Fig. 2) ..... **bracata** (Rond.)

Although *D. modesta* (Stein) has been described from both sexes, I have not been able to find any specimens that might be referable to this species, and the original type material is reportedly lost. From the description, *modesta* might run down to *madagascariensis*.

## Key to females

- 1 Mid tibia without an *av*; fore tibia generally with 2 *pv*. Parafacials adjacent to lunule with orange-brown sheen-stripe, depending on angle of vision. Knees and tibiae often orange-brown ..... **flavibasis** (Stein)
- Mid tibia with a small *av* ..... 2
- 2(1) Arista with long hairs, length of longest hairs up to 5× diameter of arista base. Orbits infuscated with brownish dust. Abdomen with more distinct median vitta, lateral areas of tergites much less dusted and with shining patches from some angles of vision. Scutum more distinctly vittate, especially postsuturally ..... **arambourgi** (Séguy)
- Arista with longest hairs not much longer than twice diameter of arista base. Abdomen with indistinct and interrupted median vitta, lateral areas densely dusted



- greyish with practically no shining areas. Scutum presuturally very indistinctly vittate ..... 3
- 3(2) Hind femur with at least one of *av* distinctly longer than depth of femur (Fig. 28). Arista very short pubescent, longest hairs near base shorter, or as long as diameter of arista base ..... **urbana** (Mall.)
- Hind femur with *av* shorter, none longer than depth of femur (Fig. 26). Arista distinctly pubescent (Fig. 30), longest hairs distinctly longer than diameter of arista base ..... **bracata** (Rond.)

The female of *D. madagascariensis* sp. n. is unknown. It will probably key out at couplet 3, and differ from *urbana* and *bracata* by having the hind tibia with only 2 *ad* and 2 *pd*. It may be a synonym of the unrecognized *modesta*. As the male of *madagascariensis* is only known from Madagascar, and *modesta* has been described from Kenya, I prefer to treat these as distinct species until more material is available, especially males of *modesta* from the type locality.

#### TAXONOMY

Genus *Delia* Robineau-Desvoidy, 1830

Type species: *Delia floricola* Robineau-Desvoidy, 1830 by designation of Coquillett (1910).

There are no generic synonyms of *Delia* applicable to the Afrotropical fauna; for a full list of synonyms and references, see Griffiths (1991a: 953).

#### *Delia bracata* section

#### *Delia bracata* subsection

#### *Delia bracata* (Rondani, 1866)

Figs 1–5, 25, 26, 30, 44

*Hylemyia bracata* Rondani, 1866: 183; Stein 1907: 689.

*Hylemyia dispar* Bezzi, 1908: 116; Stein 1919: 151. **Syn. n.**

*Pegomyia albigena* Villeneuve, 1911: 23. Synonymy after Hennig 1974a: 747.

*Hylemyia flavitibia* Karl, 1939: 16. Synonymy after Hennig 1974a: 747.

*Chortophila linearis* Adams, 1905: 206; Malloch 1924b: 263 (in part). **Syn. n.**

“*Chortophila flavibasis* Stein”: Schnabl & Dziedzicki 1911: 101, figs 199, 200, 751.

“*Hylemyia flavibasis* Stein”: ?Emden 1941a: 213; 1941b: 265; 1948: 166 (in part); 1956: 530 (in part).

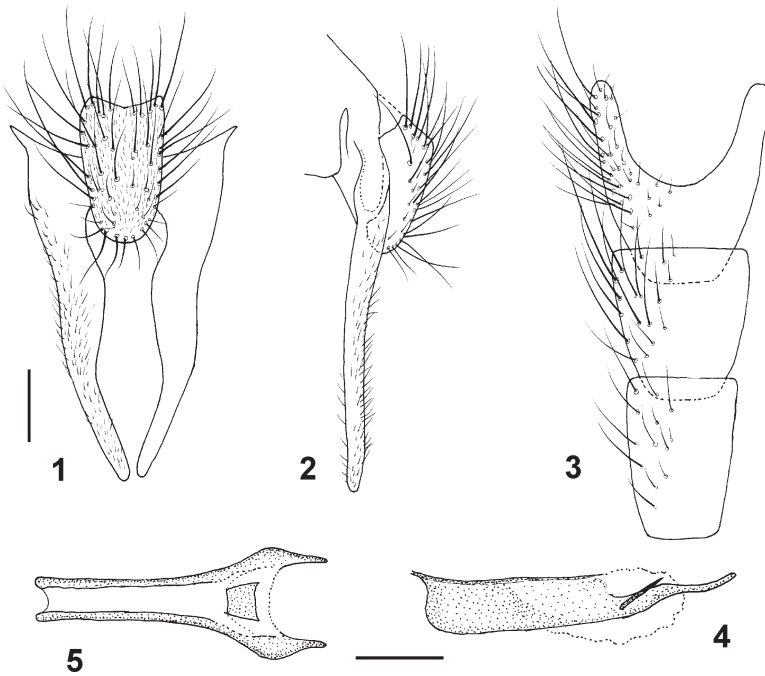
“*Delia flavibasis* (Stein)”: Ackland 1967: 119; 1968: 71.

*Delia bracata* (Rondani): Hennig 1974a: 747; Ackland 1977: 202; Pont & Ackland 1980: 716.

#### Diagnosis:

♂ Gena below eyes 0.20–0.30× eye height; arista pubescent, longest hairs not more than twice as long as basal diameter; prealar seta absent; scutum with major setae arising from brown spots; mid tibia with 1–2 short *av* in distal half; sternites III and IV more or less quadrilateral and without long curling setae; surstyli in caudal view (Fig. 1) narrower in apical half, sinuate, in lateral view (Fig. 2) straight.

♀ Arista as in male; parafacials medially without a shifting darker sheen-stripe; scutum with major setae arising from brown spots; mid tibia with a small *av* in distal half; abdomen with only very indistinct median vitta; hind femur (Fig. 26) with *av* in distal half shorter or at most equal to depth of femur.



Figs 1–5. *Delia bracata*, male (Zimbabwe): (1) cercal plate and surstyli; (2) ditto, lateral view; (3) sternites III–V, ventral view; (4) distiphallus, lateral view; (5) ditto, ventral view. Scale bar = 0.1 mm.

## Description:

### Male.

**Colour:** Frontal stripe, parafrontals, parafacials, genae and face varying from blackish to orange in ground colour, with greyish to whitish dusting; parafacial at level of arisal base with shifting blackish to orange sheen-stripe, which viewed from above is whitish grey dusted; occiput dark grey. Antennae dark brownish black, basal segments sometimes obscurely lightened orange. Palpi brown, sometimes paler basally; prementum of proboscis brownish with grey dust. Thorax dark in ground colour, with fairly dense brownish grey dusting, traces of vittae only visible presuturally when viewed from behind; scutum with major setae arising from brown spots; scutellum entirely grey dusted. Abdomen densely greenish grey dusted when viewed from behind, with distinct wide brown median vitta (about as wide as depth of hind femur), which does not extend across anterior margins of tergites. Prehypopygial tergites grey dusted. Wing membrane pale orange brownish tinged in basal half; veins orange; squamae concolorous with wing base, fringe pale yellow. Legs brown to orange-brown, knees sometimes paler orange.

**Head:** Eyes narrowly separated posteriorly (by  $1.25\times$  diameter of anterior ocellus). Frontal stripe distinct throughout (at narrowest part by less than diameter of anterior ocellus); parafacials medially equal to width of postpedicel; peristomal margin not projecting, face almost flat, distance between vibrissal setae equal to distance between them and nearest eye margin. Gena below lowest point of eye margin  $0.28\text{--}0.30\times$  eye

height; genal setae uniserial anteriorly; 4 pairs of frontal setae; 1 pair of fine interfrontal setulae at middle of frons; postpedicel not reaching peristomal margin (by almost its width); arista (Fig. 30) pubescent, longest hairs slightly longer to twice basal arista diameter. Proboscis short and slender, with short prementum (not as long as palpi and as wide as fore tibia). Upper occipital setulae short and fine, without setulae below row.

*Thorax*: Presutural *acr* fine and hair-like (not differentiated from accessory setulae), irregularly biserial, *acr:dc* ratio 10:3:10, no hairs between rows; 2 posthumeral setae; notopleural depression bare apart from two strong setae; prealar seta completely absent; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; 2 unequal proepisternals, 1 long proepimeral with ventral hair; kat-episternals 1+2, lower posterior nearly as long as upper (anterior seta often with 1–2 fine hairs below).

*Wing*: Vein C with anterior spinules short but not weak, as long as diameter of C, stronger spines before distal break nearly as long as small crossvein; lower surface of C bare. Large crossvein almost straight, last section of  $M_{1+2}$  1.6–1.7× length of preceding section. Lower squama about as long as upper. Wing length 4.25–5 mm.

*Legs*: Mid femur with 3 unequal *v* or *pv* in proximal half; hind femur (Fig. 25) with 5–6 *av* in distal half (longer than depth of femur, without curling tips), about 8–12 short fine *pv* on whole length; fore tibia with a short fine pointed *pv* apical, 1 *ad*, 1 *pv*; mid tibia with 1–2 short *av* in distal half, 0–1 *ad*, 1 *pd*, 2 *pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, 1–2 short *pv*. Pulvilli of fore legs slightly longer than tarsomere 5.

*Abdomen*: About 1.8–1.9 times as long as greatest width (at basal margin of sternite III), dorsoventrally compressed; sternite III nearly as wide as sternite IV (Fig. 3) (each about 1.4 times longer than wide); sternite V processes (Fig. 5) not longer than base, with a few short fine setulose hairs on inner margins, lateral setae not longer than processes. Surstyli (Fig. 1) 1.5× length of cercal plate, in caudal view apical half narrower and slightly elbowed, inner margins sinuate, clothed with fine hairs, in lateral view (Fig. 2) straight or slightly curved upwards. Cercal plate 2.3 times longer than wide, narrowly heart-shaped, apex rounded, bearing a few short setae; in lateral view apex is hidden by surstyli, not projecting between them. Pregonite with 2 setae; postgonite triangular without setae. Aedeagus with distal section (Fig. 4) 1.4 times as long as aedeagal apodeme, divided in slightly less than half (0.42×) into pair of free paraphallic processes. Acrophallus (Fig. 5) sclerotized, forming plate between bases of paraphallic processes. Aedeagal apodeme in dorsal view 3 times as long as wide anteriorly, excavated dorsally. Ejaculatory apodeme 0.27× length of aedeagal apodeme, expanded at one end.

#### *Female.*

*Colour*: Head dark in ground colour, but often with traces of translucent orange on genae and parafacials; frontal stripe varying from entirely orange to dark brown in posterior half; head densely dusted light olive-grey, more bronzy on parafrontals; parafacials, at level of antennal base, without shifting darker sheen-stripe. Thorax rather densely olive-grey dusted, sometimes with trace of brownish median vitta along *acr*, *dc* arising from brown spots; prementum dusted, palpi orange to brown. Abdomen dusted grey, without or with only a trace of median vitta. Wing membrane tinged pale orange-brown, veins orange. Legs brown, knees, coxae and tibiae paler orange, femora darker, dusted, not shining.

*Head:* Eyes widely separated (by 1.4–1.6× their transverse width); frontal stripe at level of middle orbitals as wide as each parafrontal, which is widened anteriorly to slightly more than width of postpedicel; gena below lowest point of eye margin 0.3× eye height; 1 short supravibrissal, 2 subvibrissals, 2–3 upcurved uniserial genal setae, and 2 stronger ventral postgenals. Parafrontal setae differentiated into 3 pairs of orbitals (all more or less laterocline), and 2 pairs of inclinate frontals; crossed interfrontal setae strong, placed at apex of frontal triangle. Proboscis relatively small and thin (as in male) prementum as long as palpi.

*Thorax:* *acr* very short and fine (not differentiated from accessory setulae and hairs); *acr:dc* ratio 10:3:10; 1+1 posthumeral; katepisternals 1+1. Prealar seta completely absent.

*Wing:* Vein C with marginal spinules short but not fine (equal in length to diameter of C), pair before distal break equal to length of small crossvein; large crossvein straight, last section of  $M_{1+2}$  is 1.6× length of preceding section. Wing length 4.5–5 mm.

*Legs:* Mid femur with 1–2 short *v* medially; hind femur with 3–4 *av* in distal 2/3, 1–2 apical *pv*; fore tibia with 1 *ad*, 1 *pv*; mid tibia with 1 small *av* in distal half, 1 long *ad* and 1 shorter *pd*, 1–2 *pv*; hind tibia with 2 *av*, 3 *ad*, 3 *pd* (distal one longest), 0 *pv*.

*Abdomen:* Postabdomen when fully extended as long as length of preabdomen. Tergites VI and VII sclerotized along posterior margins which bear single row of setulae, which are of different lengths, longest about half length of tergite; discs of tergites weakly sclerotized medially; tergite VIII with posterior margin as tergite VII, but sclerotisation forming two long narrow spurs; 6th and 7th spiracles both situated on segment VI (6th more or less medially at edge of tergite VI, 7th within posteroventral corners of tergite VI); sternites VI and VII long and narrow, bearing 4–5 short setulae on each posterior margin; sternite VIII (Fig. 44) represented by pair of short sclerites which are sclerotized mainly on posterior margin, each bearing two setulae, anteriorly becoming membranous; tergite X with transverse posterior margin, bearing numerous setulae posteriorly (one pair rather long); sternite X entirely pilose (as well as setulose); cerci rather short (slightly shorter than sternite X), projecting beyond sternite X by about half their length; 3 spermathecae of about equal size (about 0.04×0.03 mm), each with sclerotized stalk (0.01 mm long), leading to spermathecal duct; surface of spermathecae weakly ridged and with a few black dots, visible under high magnification.

Material examined: ETHIOPIA: 1♂ Lake Shola, 67°20'W:39°0'E, 12.viii.1973, R. Baker (BMNH); 2♀ Nazareth, alt. 1600 m, 19.x.1968, R. Kano & T. Ohse (DMA); 1♀ Awash R., Koka, alt. 1300 m, 12.x.1968, R. Kano & T. Ohse (DMA). KENYA: 1♂ Nairobi, 14.i.1957, on *Cynodon* sp. (BMNH); 1♀ Nairobi, 5500 ft, 9–13.xii.1970, A.E. Stubbs (BMNH); 3♀ Meru, vii. 1945, van Someren (BMNH); 2♂ 5–7000 ft, 24–29.xii.1970, A.E. Stubbs (BMNH); 3♂ 3♀ Ngong Hills, vi.1946, van Someren (BMNH); 1♂ 1♀ same data, vii.1943 (BMNH); 1♂ Lake Naiwasha, 6181 ft, 14.xii.1970, A.E. Stubbs (BMNH). LESOTHO: 1♂ 1♀ Roma Mission, Maseru Dist., valley floor, Old Lands, alt. 5500 ft, 4–13.i.1963, B. & P. Stuckenberg (NMSA). NAMIBIA: 1♀ Rundi Dist., Katara Okavango R., 17°48'56"S:18°53'38"E, 20–23.i.1998, Kirk-Spriggs & Marais, Malaise traps (NMWN). SOUTH AFRICA: *Western Cape:* 1♀ Arniston Coastal Dunes, Bredasdorp Dist., 22–23.x.1964, B. & P. Stuckenberg (NMSA); 1♂ 2♀ Brak R. mouth, Mossel Bay Dist., 23.x.1964, B. & P. Stuckenberg (NMSA); 1♀ Coldstream, Tsitsikama Area, 25–28.x.1964, B. & P. Stuckenberg (NMSA); 2♀ S.W. Cape, Brandkop Area, Calvinia Dist., 14.x.1964, B. & P. Stuckenberg (NMSA); 1♀ Du Toits Kloof, Paarl Dist., alt. 2000–3500 ft, 27–28.ix.1959, B. & P. Stuckenberg (NMSA); 1♂ 3♀ Montagu Pass, 3322Cd, Camfer-George Road, SAR bridge, 12.i.1983, P. Stabbins & R. Miller (NMSA); 1♂ Knysna, R.S.A. dist., Harkville Forest Res., 3423AA, 9–11.xi.1972, van Reenen & Mathebathe (NMSA); 1♂ 5 mls SE Oudshoorn, Klipriver Farm, R.S.A., 3322CA, 11–13.xi.1972, van Reenen & Mathebathe (NMSA); 1♂ Pakhuis Pass, east side, 3219Aa, alt. 600 m, 17.viii.1973, meadow with flowers, M.E. Irwin (NMSA); 1♀ Cogman's Kloof, Ashton-Montagu Road, 3320Cc, 11.i.1983, along river, P. Stabbins & R. Miller (NMSA). *Eastern*

*Cape*: 2♂ Van Staadens Pass, Port Elizabeth District, 30.x.1964, B. & P. Stuckenberg (NMSA); 2♀ Port Elizabeth district, Sardinia Bay, coastal dunes nr Skoenmakerskop, 3425Ba, 14.iii.1974, Stuckenberg & Irwin (NMSA); 1♂ Doornkloof Forest Res., Alexandria Dist., 11.xii.1967, B. & P. Stuckenberg (NMSA); 1♂ Resolution, Albany Dist., 19.iii.1928, A. Walton (NMSA); 1♂ 1♀ same data but 11.i.1929 (NMSA); 1♀ same data but 23.iii.1928 (NMSA); 3♀ Heuningklip R., 25 km W Queenstown, 3126DC, 27.x.1978, river bank, Miller & Londt (NMSA); 1♀ Kommandodrifdam, 45 km E Cradock, 3226AA, 28.x.1978, river below dam wall, Miller & Londt (NMSA); 1♀ Hogsback, North of Alice, 2–3.xi.1964, B. & P. Stuckenberg (NMSA); 1♀ Hogsback area, 3226DB, 18–19.i.1984, forest margins, D. & C. Barraclough (NMSA). *Free State*: 1♂ 5 mls W of Soutpan, 2825DB, borehole seepage, 3.ix.1972, M.E. Irwin (NMSA); 2♀ Golden Gate, GGHNP Survey, 23–29.i.1964, Vári & Martin (NMSA); 1♀ Van Staadens Pass, 20.iii.1954, L. Vári (NMSA); 4♀ Machaleen, 2.xii.1969, S. de Kock (NMSA). *Limpopo*: 2♂ Nylsvley Res., Naboomspruit, 24.xi.1976, P. Ferrar (NMSA). *Gauteng*: 1♀ Frankenwald, Johannesburg, 4.x.1976, P. Ferrar (NMSA); 1♂ Johannesburg, 4.v.1962, F. Zumpt (BMNH); 1♂ same locality, 5.ii.1960, F. Zumpt (BMNH). *KwaZulu-Natal*: 1♀ Giant's Castle Game Res., Injasuti area, SE2929AB, 5–11.vii.1983, J.G.H. Londt (NMSA); 1♂ Pietermaritzburg, Town Bush, 27.xii.1961; 1♂ 1♀ Pietermaritzburg, 23–24.x.1956, B. & P. Stuckenberg (NMSA); 1♀ Pietermaritzburg, Chase Valley, 20.xi.1963, B. & P. Stuckenberg (NMSA); 1♂ 1♀ Muden, 1.x.1956, B. & P. Stuckenberg (NMSA); 1♂ nr Lilana, Ahrens Dist., iv.1962, B. & P. Stuckenberg (NMSA); 4♂ Rietspruit farm, 13 km NE Pietermaritzburg, 29°32'27"S:30°29'04"E, 13.iii.1990, wetland & dam, A. Whittington (NMSA); 1♀ Midlands, Howick, 29°29'S:30°13'E, alt. 1060 m, 14.vii.1990, garden, vegetation, A.E. Whittington (NMSA); 1♀ Royal Natal Nat. Park, Tendele camp lights, 28°40'46"S:28°55'13"E, 16–18.ii.1990, A.E. Whittington (NMSA). *YEMEN*: 4♂ 19♀ San'a, 7900 ft, 10–15.x.1937, from lucerne, Dr Carl Rathjens (BMNH). *ZIMBABWE*: 2♂ 2♀ N. Vumba, 13.iii.1964, D. Cookson (NMSA); 1♀ Bulawayo, Hillside Dam, 31.viii.1956, C.N.S. (NMSA); 9♂ 10 km SE of Harare, 19.ii.1997, J.W. Ismay (DMA); 10♂ Harare, Nat. Botanic Gdns, 14.ii.1997, J.W. Ismay (DMA); 2♂ Harare, road to Nat. Botanic Gdns, 17.ii.1997, J.W. Ismay (DMA); 2♂ Harare, Plant Res. Inst., 21.ii.1997, J.W. Ismay (DMA); 1♂ Mazowe, 27.ii.1997, J.W. Ismay (DMA); 2♂ 4♀ Harare 12–13.ii.1997, J.W. Ismay (DMA); 57♂ 54 ♀ Salisbury, mainly 1901, F.L. Snow (lectotype and paralectotypes of *Chortophila linearis*, Adams, in KUNHM).

Notes: Types of *Hylemyia dispar* Bezzi: Dr Fabrizio Rigatoni (MSNM) kindly sent me three syntypes of *Hylemyia dispar* (2♂ 1♀). I have dissected one of the males, and designate it here as lectotype. It carries the following labels:

'LECTOTYPE ♂ / *Hylemyia / dispar* Bezzi / desig. D. M. / Ackland 2007' [white hand-written label with blue perimeter]; '291' [diamond-shaped hand-written label with double blue lined perimeter]; 'Eritrea / Andreini' [hand-written rectangular white label] (MSNM).

The lectotype is in acceptable condition, with all legs present, setae on thorax badly rubbed, mid tibia on each side with a small *av*, right arista broken off near base, left arista with the longest hairs less than twice as long as basal arista diameter. Abdomen dissected, and mounted in glycerol in a plastic tube.

Bezzi described *dispar* from an unknown number of specimens from three stations, 200, 291 and 299. There is no doubt that this is one of the original syntypes. The lectotype is a specimen of *D. bracata*; surstyli identical to those figured by Hennig (1974a: 748, text-fig. 628, holotype of *bracata*). Of the two remaining syntypes, the male is badly abraded. The only remaining right arista shows only very short arista hairs, but may be damaged; only the right tibia is present and is folded against the femur, and the presence of an *av* seta cannot be established. This male carries identical labels to the lectotype, and is almost certainly also *D. bracata*. The female syntype (?) is in poor condition, antennae and all legs other than right mid and hind legs are missing. The mid tibia has an *av* seta, and is presumably the same species as the lectotype. It carries only a diamond-shaped label, with the number '289'. This station number is not given in Bezzi's original description, creating doubt whether it really is a syntype, and I have not labelled it a 'paralectotype'.

Emden (1941b: 265) was the first to use the name '*dispar*' for a species of *Delia* with long arista hairs (as a subspecies of *flavibasis*). As Hennig indicated (1974b: 792) should Emden not have used the name *dispar* correctly, the next available name, *arambourgi* Séguy, 1938, should be used.

Types of *Chortophila linearis* Adams: these are in the KUNHM. Malloch (1924b: 265) examined some "paratypes" of *linearis*, and synonymized *linearis* with *flavibasis* Stein. *Delia bracata* (Rondani) was unknown to Malloch. Through the support of the staff at KUNHM (Zack Falin, Collection Manager & Jennifer Thomas, Assistant Collection Manager) I was able to examine the syntypes of *linearis*. There were in total 167 syntypes, the majority of them belonging to *Delia bracata*. They all carry a red label, with either 'Type' or 'Cotype' printed thereon. I regard all these as syntypes of equal status, especially as most of the specimens with a 'type' label are in poor condition. I designate a male as lectotype of *Chortophila linearis* which bears the following labels:

'LECTOTYPE ♂ / *Chortophila / linearis* Adams / designated 2007 / D. M. Ackland' [white rectangular label with blue perimeter]; 'Salisbury / S. Africa / F.L. Snow' [white rectangular label]; 'May 1901 / 5050 ft.' [white rectangular label]; 'COTYPE C. / *linearis* / C. F. Adams' [red rectangular label]; '*Delia bracata*



Rond. / male det D. M. / Ackland 2007' [white rectangular label] (KUNHM). In good condition, all legs present, both wings slightly torn on costa. Abdomen with genitalia dissected and mounted in glycerol in a plastic tube on staging pin. The genitalia of this lectotype agree with the figures of *bracata* given in this paper.

The remaining syntypes of *linearis* are as follows: 56♂ 54♀ *D. bracata* [labelled as paralectotypes]; 3♂ 2♀ *D. flavibasis*; 2♂ 1♀ *D. platura*; 5♂ 41♀ *Delia* spp. indet. [in bad condition]; 2♂ Muscidae sp. These are in KUNHM, except for 2♂ 2♀ paralectotypes which will be placed in the OUMNH.

**Discussion:** The combination *Delia linearis* (Stein 1898, described in *Hylemyia*) is in use for a widespread Holarctic species. Consequently the ICZN rules against secondary homonymy imply that Adams' (1905) name *linearis* (described in *Chortophila*) cannot be used in *Delia*. My present designation of a lectotype makes Adams' name a junior synonym of *D. bracata* (Rondani), so proposal of a replacement name is unnecessary.

Schnabl and Dziedzicki (1911: 101, figs 199, 200, 751) were the first to misidentify *D. bracata*, their drawings of the male hypopygium of "*Chortophila flavibasis*" clearly belonging to *bracata*, as pointed out by Hennig (1974a: 746). In his key to Afrotropical species of *Hylemyia* (Emden 1941b: 265) the species keyed out as "*flavibasis*" refers to *bracata* (1–2 minute *av* present on mid tibia). Emden (1948: 166) lists *flavibasis* from the Yemen, but these records are partly *flavibasis* and partly *bracata*. It should be noted that both species often occur together, for example J. Ismay collected both species at the same time in Harare, Zimbabwe in 1997.

Hennig (1974a: 747, text-figs 628–630) figured the genitalia of the holotype of *bracata*, which is in the MZUF, so there is no doubt about its identity. According to Hennig (loc. cit.) he examined a male of *flavitibia* (Karl) in 1953, which was described from one male and two females; material in the Entomological Institute, Bologna. This specimen was later destroyed in a post office van fire. Hennig was uncertain if the male was the specimen described by Karl, as there were many other examples of this species in the museum. The location of the types of *albigena* (Villeneuve) described from one male and two females from Syria (Anti Lebanon, Mezzé) is unknown, and Hennig has considered the types as destroyed (Hennig 1974a: 681).

In 1967 and 1968 I incorrectly used the name "*flavibasis*" for *bracata*, and "*arambourgi*" for *flavibasis*.

**Life history:** There appear to be no definite breeding records for *D. bracata* (Hennig 1974a: 750). Adults have been caught on lucerne and *Cynodon* sp.

**Distribution:** *D. bracata* has been recorded in the Afrotropical Region from Yemen, Eritrea, Ethiopia, Kenya, Zimbabwe, South Africa and Namibia. In the Palaearctic Region it is widespread from the Canary Islands, Spain, Portugal, Hungary, Greece, Cyprus, Tunisia, Israel, Syria, Iran to as far east as Nepal and India (Hennig 1974a: 750).

### *Delia arambourgi* (Séguy, 1938)

Figs 6–11, 24, 29, 45

*Hylemyia arambourgi* Séguy, 1938: 365.

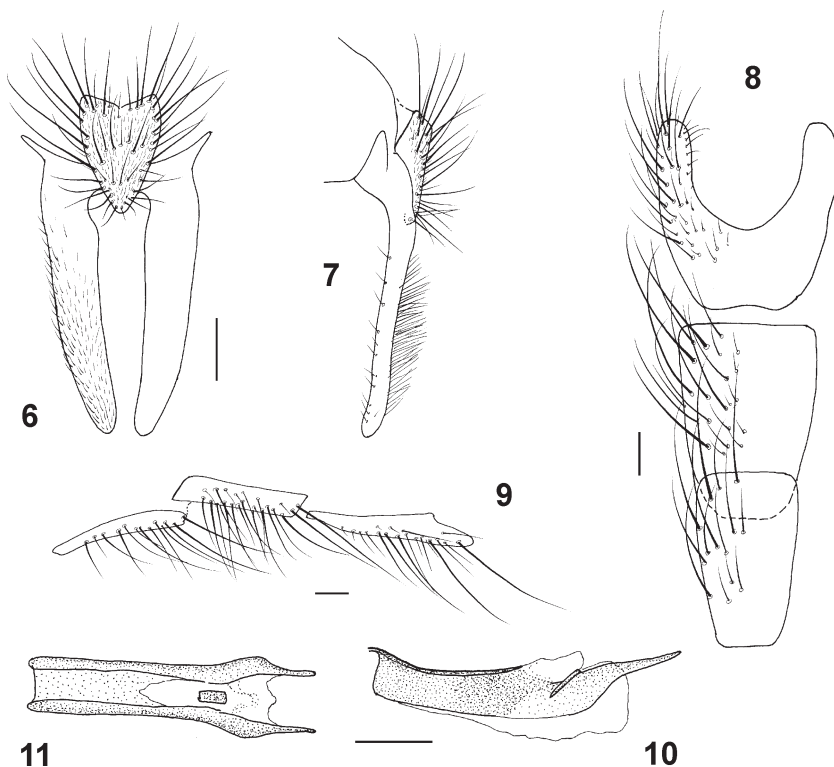
"*Hylemyia flavibasis dispar* Bezzi": Emden 1941a: 214; 1941b: 265.

"*Delia dispar* (Bezzi)": Hennig 1974b: 791; Pont & Ackland 1980: 716.

#### Diagnosis:

♂ Arista (Fig. 29) short plumose, total width of aristal hairing nearly as wide as postpedicel (longest hairs up to 5× width of aristal base); prealar seta absent; mid tibia





Figs 6–11. *Delia arambourgi*, male (Ethiopia): (6) cercal plate and surstyli; (7) ditto, lateral view; (8) sternites III–V, ventral view; (9) ditto, lateral view; (10) distiphallus, lateral view; (11) ditto, ventral view. Scale bar = 0.1 mm.

with a very small *av*; cercal plate (Fig. 7) in lateral view not projecting between surstyli; surstyli in caudal view (Fig. 6) of almost equal width throughout.

♀ Aristal hairing as in ♂; prealar seta absent; mid tibia with a small *av*; parafacial adjacent to lunule without darker sheen-stripe; abdomen with distinct median vitta.

#### Description:

##### *Male.*

**Colour:** Frontal stripe orange anteriorly, black posteriorly, parafrontalia blackish above, becoming orange in ground colour at level of lunule, genae range to dark brown, with greyish to whitish dusting; parafacial orange with darker reflections medially; occiput greyish brown, darker above. Antennae brownish black, basal segments sometimes obscurely lightened orange. Palpi brown, sometimes paler basally; prementum of proboscis dark brown with thin grey dust. Thorax mainly dark in ground colour, with fairly dense brownish grey dusting, pleura with slightly translucent orange-brown patches, slightly shining, with traces of darker brown vittae, median one continued onto scutellum. Abdomen viewed from above orange-brown, slightly shining, densely greenish grey dusted when viewed from behind, with distinct brown median vitta consisting of blackish triangular marks which are wider anteriorly, not quite reaching posterior margins. Hypopygium and sternite V orange-brown. Prehypopygial tergites

grey dusted. Wing membrane faintly greyish tinged; veins pale brown; squamae pale but with an orange border, fringe pale. Legs pale brown to orange-brown, knees and tibia sometimes paler orange; femora slightly shining.

*Head:* Eyes very narrowly separated posteriorly (by diameter of anterior ocellus), frontal stripe almost linear but distinct throughout; parafacials medially widening to almost width of postpedicel; peristomal margin not projecting, face almost flat, distance between vibrissal setae slightly more than distance between them and nearest eye margin; gena below lowest point of eye margin  $0.25\times$  eye height; 4 pairs of parafrontal setae on anterior half of frons; 1 pair of very short and fine interfrontal setulae on upper half of frons; genal setae uniserial anteriorly. Postpedicel not reaching peristomal margin (by almost its width); arista (Fig. 29) short plumose, maximum total width of hairing as wide as postpedicel. Proboscis short and slender, with short prementum (not as long as palpi and as wide as fore tibia). Upper occipital setulae short and fine, without setulae below row.

*Thorax:* Presutural *acr* fine and hair-like (not differentiated from accessory setulae), irregularly biserial, *acr:dc* ratio 10:4:10, no hairs between rows; 2 posthumeral setae; notopleural depression bare apart from two strong setae; prealar seta completely absent; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katepisternals 1+2, lower posterior nearly as long as upper.

*Wing:* Vein C with anterior spinules short, not longer than diameter of C, stronger spines before distal break nearly as long as small crossvein; lower surface of C bare. Large crossvein almost straight, last section of  $M_{1+2}$   $2.1\text{--}2.2\times$  length of preceding section. Lower squama smaller in area than upper. Wing length 5.0–5.5 mm.

*Legs:* Mid femur with 3–4 long *pv* in proximal half, median ones shorter; hind femur (Fig. 24) with about 6 *av* in distal 3/4 (longer than depth of femur, without curling tips), some shorter fine ventral hairs, and an almost complete row of long fine *pv* on whole length, longest almost twice as long as depth of femur; fore tibia with a short fine pointed apical *pv*, 1 short *ad*, 1 *pv*; mid tibia generally with a minute *av* in distal half (occasionally missing or broken off), 1 *pd*, 2 *pv*; hind tibia with 2 *av*, 2 *ad*, 3 *pd*, no *pv*. Pulvilli of forelegs as long as tarsomere 5.

*Abdomen:* About twice as long as wide (at basal margin of sternite III), dorsoventrally compressed; sternite III (Fig. 8) about 1.7 times longer than greatest width, sternite IV is 1.4 times longer than greatest width, both these sternites tapering slightly towards anterior margins, and with rather long erect setae which project ventrally (Fig. 9); sternite V processes (Fig. 8) about as long as base, a few fine hairs on inner margins, lateral setae as long as processes. Surstyli (Fig. 6) twice as long as cercal plate, in caudal view more or less parallel sided, and of equal width except for slightly tapering apical fifth; clothed with fine hairs, in lateral view (Fig. 7) more or less straight. Cercal plate about 1.3 times longer than wide, heart-shaped, with narrowly rounded apex, in lateral view apex is hidden by surstyli. Pregonite with 2 setae; postgonite triangular without setae. Aedeagus with distal section (Fig. 10)  $1.78\times$  longer than aedeagal apodeme, divided in distal half ( $0.45\times$ ) into pair of free paraphallic processes. Acrophallus (Fig. 11) sclerotized, forming plate between bases of paraphallic processes. Aedeagal apodeme in dorsal view about  $2.14\times$  as wide anteriorly, excavated on dorsal surface. Ejaculatory apodeme  $0.36\times$  as long as aedeagal apodeme, expanded at one end.

*Female.*

**Colour:** Head mainly dark in ground colour, dusted greyish white, occasionally patches of orange ground colour on posterior part of gena, anterior half of frontal stripe; frontal triangle and inner margins of parafrontals brassy brown dusted; parafacials adjacent to lunule without shifting sheen-stripe; anterior part of gena suffused with blackish brown dust, from low angle in front whole of head matt dark brown, contrasting with paler dusted lower occiput. Prementum brown, thinly dusted with slight shine. Thorax dark in ground colour, with grey and brown dusting; scutum, viewed from behind with traces of three broad darker vittae, especially presuturally. Wing pale brownish tinged, base not darker. Legs dark brown, tibiae and knees sometimes lightened orange. Abdomen olive-grey dusted, with distinct median vitta which widens on anterior margins of tergites.

**Head:** Eyes widely separated (by 1.5–1.6× their transverse width); frontal stripe at level of middle orbitals twice as wide as each parafrontal; parafrontalia widening anteriorly to width of postpedicel; parafrontal setae differentiated into 2–3 pairs inclinate frontals and 3 pairs of orbital setae, anterior one proclinate; crossed interfrontal setae strong, placed at apex of frontal triangle; gena below lowest point of eye margin 0.38–0.40× eye height; genal setae uniserial. Arista (Fig. 29) with total width of hairing almost equal to width of postpedicel. Proboscis relatively short, prementum shorter than palpi.

**Thorax:** *acr* short and fine (hardly differentiated from accessory setulae), biserial; *acr:dc* ratio 10:4:10; 1+1 posthumeral; katapisternals 1+1. Prealar seta absent.

**Wing:** Vein C with marginal spinules about 1.5× vein width, pair before distal costal break about 1.8× length of small cross vein; large crossvein straight, last section of  $M_{1+2}$  is 1.4–1.5× length of preceding section. Wing length 5 mm.

**Legs:** All setae longer and stronger than in male. Mid femur without ventral setae (or sometimes 1–2 fine *av* present in proximal half); hind femur with 4–5 short *av* in distal 2/3; fore tibia with strong *ad* just below middle, and an equally strong *pv* at almost same level; mid tibia with a small *av* in distal half (generally more distinct than in male, but occasionally missing or broken off), 1 very long *ad*, a shorter *pd* at same level, and 2–3 short *pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, 0 *pv*.

**Abdomen:** Tergites with short hind marginal setae, which are only slightly differentiated from discal setulae and hairs. Postabdomen (Fig. 45) similar to *D. braccata*, differing as follows: when fully extended 1.3× length of preabdomen; sternite 8 bearing 3 setae on each posterior margin; cerci rather longer, each bearing 1–2 longer setae.

**Types:** Hennig (1974b: 792) examined the types of *D. arambourgi* (29 examples in NMHNP) and figured the surstyli in his fig. 1170. At that time Hennig assumed that *dispar* (Bezzi, 1908) was an earlier name, and synonymized *arambourgi* with it. Emden (1941b: 265) was the first to use the name “*dispar*” for a species of *Delia* with long arisal hairs (as a subspecies of *flavibasis* (Stein)). I have examined the types of *Hylemyia dispar* Bezzi, and *dispar* is evidently a synonym of *D. braccata*. See under that species for details of *Hylemyia dispar*.

**Other material examined:** ETHIOPIA: 1♂ R. Alamala, on road to Koram [?], 7.ii.1936, Dr J.W.S. Macfie, det. *Delia dispar* by D.M. Ackland, 1994 (BMNH); 1♂ Alamala ford, 1. iii.1936 (BMNH); 2♂ Addis Ababa, over 8000 ft, 8.ix.1926, swept in field of Imperial Hotel, H. Scott (BMNH); 1♂ Wagira, Gara Mulata, [no date, pres. BMNH 1948], G. Kristensen, ex Wainwright coll. (BMNH); 1♂ 1♀ Djem-Djem Forest, 8000 ft, 23.ix.1926, J. Omer-Cooper (BMNH); 1♂ Assendabo, alt. 1600 m, 25.x.1968, R. Kano & T. Ohse (DMA); 1♀ Mulu, above Muger Valley, 8000 ft, 18–22.xii.1926, from marshy ground, H. Scott (BMNH). KENYA: 3♂ [on same mount] Muguga, x.1957, I.W.B. Nye, bred ex *Cynodon dactylon*, det. *Delia flavibasis* Stein subsp. *dispar* Bezzi by A.C. Pont, 1970, det. *Delia dispar* Bezzi by D.M. Ackland, 1994 (BMNH); 1♀ Muguga, 25.iv.1957, bred ex *Cynodon dactylon*, I.W.B. Nye (DMA); 1♂ Muguga, iv.1969, at light, C.F.

Dewhurst (BMNH); 4♂ same locality, ix.1969 (BMNH); 4♂ 8♀ Mt Elgon, alt. 7000–8000 ft, 28.xii.1980, P.S. Cranston (BMNH); 1♂ Nairobi, vii.1969, C.F. Dewhurst (BMNH); 1♂ Chyulu Hills, Tsavo West Nat. Park, 24–25.iv.1971, C.F. Dewhurst (BMNH). TANZANIA: 2♂ Mt Meru, Momela, 3°15'S:36°51'E, alt. 5500 ft, 12–13.i.1972, C.F. Huggins (BMNH).

Discussion: Bezzi (1908: 116) described *Hylemyia dispar* from Ethiopia based on “many specimens, all badly preserved, which appears very common in the area.” He mentioned that the arista was short pilose (“brevissime pilosa”) which suggests that it was not the species Emden (1941a: 214) recorded as *D. dispar* from Ethiopia (pilose arista), as a subspecies of *flavibasis*; most of these specimens are in the BMNH, and I have examined them. Emden (1941b: 265) in his key (couplet 3) characterized *flavibasis dispar* as “arista is wide, including plumosity, as the third antennal joint.” In the same key it should be noted that “*flavibasis* Stein” refers to *bracata* Rondani, and “*arambourgi* Séguy” refers to *flavibasis* Stein. Hennig (1974b: 791) synonymized *D. arambourgi* with *dispar* after examining the type series in MNHN. The species named as “*arambourgi* Séguy” in Bullock (1965) almost certainly refers to *D. flavibasis*, as he presumably used Emden’s key (1941b) to identify his material.

Life history: The only reliable record of the food plant of *D. arambourgi* is a note on the labels of 3♂ and 1♀ from Kenya, Muguga, “bred from *Cynodon dactylon*, I. W. B. Nye”.

Distribution: *D. arambourgi* is known only from Ethiopia, Kenya and Tanzania.

### *Delia flavibasis* (Stein, 1903)

Figs 12–16, 23

*Chortophila flavibasis* Stein, 1903: 121; 1913: 560.

*Hylemyia bouhelieri* Séguy, 1934: 75. Synonymy after Hennig 1974b: 806.

*Hylemyia hordacea* Séguy, 1936: 3; 1953: 87. Synonymy after Hennig 1974b: 806.

*Hylemyia sedaga* Séguy, 1950: 277. Synonymy after Hennig 1974b: 806.

*Hylemyia flavibasis* (Stein): Curran 1929: 247; ?Emden 1956: 530; ?Paterson 1956: 164.

“*Hylemyia arambourgi* Séguy”: Emden 1941a: 265; 1948: 166 (in part); 1951: 357 (in part); ?Bullock 1965: 645–661.

“*Delia arambourgi* Séguy”: Ackland 1967: 119; 1968: 71; Deeming 1971: 134.

*Delia flavibasis* (Stein): Hennig 1974b: 806; Ackland 1977: 203; Pont & Ackland 1980: 716.

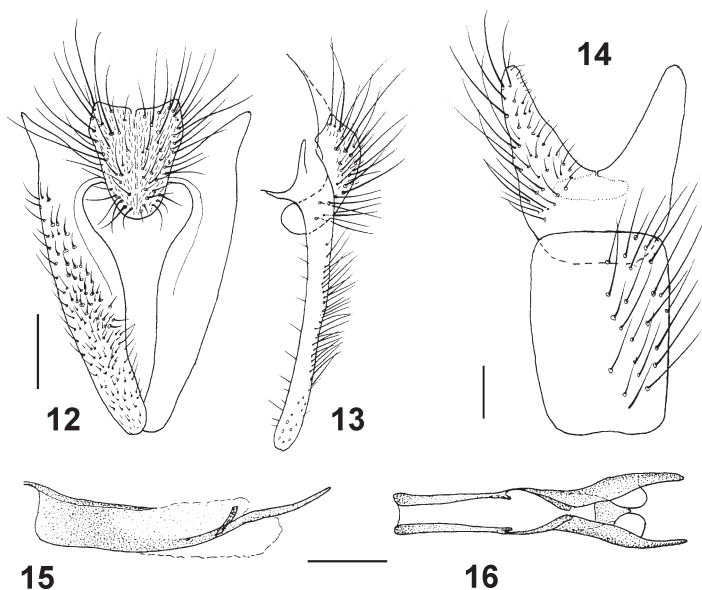
#### Diagnosis:

♂ Arista with hairs not, or only slightly longer than arisal diameter at base; parafrontals adjacent to lunule with darker shifting sheen-stripe; prealar seta absent; fore tibia with 1 *ad* and 1 *pd*; mid tibia without *av*; cercal plate in lateral view (Fig. 13) rounded and keel-like, produced between surstyli.

♀ Prealar seta absent; fore tibia with 2 *pv*; mid tibia without *av*; parafacials adjacent to lunule with darker shifting sheen-stripe.

#### Male.

*Colour*: Head dark in ground colour, frontal stripe matt black (orange in teneral specimens) when viewed from above, whitish grey from in front, parafrontals and parafacials from whitish to grey dusted depending on angle of view, parafrontals adjacent to lunule with shifting darker patch when viewed from side, parafacials below are lighter dusted; palpi and antennae dark brown, mentum dusted. Thorax dark in ground colour with dense grey dust, scutum almost bluish grey dusted just behind head, posteriorly from 2nd presutural *dc* to scutellum with darker and lighter grey and brown dust,



Figs 12–16. *Delia flavibasis*, male (S. Africa): (12) cercal plate and surstyli; (13) ditto, lateral view; (14) sternites IV–V, ventral view; (15) distiphallus, lateral view; (16) ditto, ventral view. Scale bar = 0.1 mm.

indistinctly and irregularly striped, pleura and postnotum lighter grey. Wing membrane light brownish tinged in basal half; squamae slightly paler than wing base. Legs brown dusted, knees and tibiae obscurely orange-brown. Scutellum as scutum, with faint brown dust on disc. Abdomen brown with shifting green-grey dust, darker brown median vitta which is as wide as width of femur; cercal plate and surstyli brown.

**Head:** Frontal stripe almost touching above, separated by less than diameter of anterior ocellus, parafrontals linear here, widening adjacent to lunule to about 0.8× width of postpedicel; gena below lowest point of eye margin as wide as postpedicel; genal setae uniserial; lower margin of head in profile slightly curved; peristomal margin in lateral view not projecting; 4 pairs of frontal setae which are fine and short; cruciate interfrontal setulae very fine and hair-like. Antennae short, 2 times as long as wide, not quite reaching peristomal margin; arista pubescent, hairs generally not longer than diameter at base. Mentum short, about 0.8× length of palpi.

**Thorax:** Presutural *acr* very short, hardly longer or stronger than scutal hairs, which are few in number, biserial, the rows separated from each other by 2× distance between *acr* and *dc* rows; notopleural depression bare apart from 2 strong setae; prealar seta absent; 1–2 unequal proepisternals and 1 long proepimeral with 2 associated hairs; scutellum bare on disc. Katepisternals 1+2, lower posterior seta about 0.8× length of upper, long hair present below anterior seta.

**Wing:** Stronger spines before distal break hardly as long as small crossvein, anterior spinules shorter than width of vein C, which is bare ventrally; lower squama shorter than upper. Wing length 4.5 mm.

**Legs:** Mid femur with 1–2 longer *v* at base; hind femur (Fig. 23) with 3–4 *av* in distal

half, median ones shorter, only 1–2 *pv* at apex; fore tibia with a very short pointed preapical *pv*, 1 longer preapical *d*, 0–1 *ad*, 1 *pd*; mid tibia *av* absent, 1 *ad*, 1 *pd*, 2 *pv*, all short; hind tibia with 2 *av*, 5 *ad*, 3 *pd*, lowest one longest, no *pv*. Pulvilli about as long as claws.

**Abdomen:** Slightly longer than thorax, in dorsal view with side margins slightly convex, tergite III is 2.4 times as wide as long, dorsoventrally compressed. Sternites III and IV from slightly narrower to as wide as sternite V, sternite IV (Fig. 14) not quite twice as long as wide, discal and lateral setae not very long. Surstyli (Fig. 12) narrowed basally when viewed caudally and becoming wider towards middle, in profile (Fig. 13) always curving slightly, i.e. convex on dorsal (posterior) surface. Cercal plate 1.5–2 times as long as wide, in profile always produced between surstyli, keel-like. Aedeagus (Fig. 15) with distal section 1.75 times as long as aedeagal apodeme, divided in about distal half into pair of free paraphallic processes. Acrophallus (Fig. 16) sclerotized, forming plate between bases of paraphallic processes. Aedeagal apodeme in dorsal view widely expanded anteriorly, twice as long as greatest width. Ejaculatory apodeme 0.44× length of aedeagal apodeme.

#### *Female.*

Differs from female of *D. braccata* as follows:

**Colour:** Parafacials at level of antennal base with distinct orange to black shifting sheen-stripe, which when viewed from above disappears. Abdomen with distinct median vitta (as opposed to male).

**Head:** Interfrontalia at level of anterior orbitals slightly wider than each parafrontal (0.3×); 2 pairs of inclinate frontal setae are shorter than those of *braccata*.

**Thorax:** Legs: Mid tibia without *av*.

**Abdomen:** Postabdomen apparently identical to *D. braccata*.

Types: Hennig (1974b: 807) designated a male lectotype of *flavibasis* (in DEI), type locality Egypt, Luxor. The types of *bouhelierei* Séguy, *hordacea* Séguy, and *sedaga* Séguy (in MNHN) were also examined by Hennig (loc. cit.) and synonymized with *flavibasis*. I also examined the type of *sedago* in 1974 and agree with Hennig's identification. I made the following notes:

Holotype ♂ "*Hylemyia sedago* ♂ Type / E. Séguy vid 48" [white label]; "TYPE" [red label]; "Agadez / Air SUD / 525 m. / 5.8.57" [white label]; "IPAN-1947 / L. Chopard / A. Villiers" [white label] (MNHN). Specimen dissected; right mid and hind legs missing; right wing missing; left postpedicel and arista missing.

Other material examined: ANGOLA: 1♂ 3 mls N Santa Comba, 7–8.iii.1971 (BMNH). BOTSWANA: 2♂ Lake Ngami, NE Sehithwa, 16–17.iv.1972 (BMNH). ETHIOPIA: 4♂ 5♀ Sinana, 47°E:7°N, alt. 2400 m, 5–18.x.2002, ex barley, J. Tafa (1♂ 1♀ in DMA). KENYA: 1♂ Muguga, 6–12.i.1969, M.C. Birch (DMA); 1♂ Kasanari, 10.viii.1989, swept savannah, J.W. Ismay (DMA); Solai, vi.1953, ex larva in stems of young barley, P.T. Walker (BMNH). MADAGASCAR: 2♂ 5♀ Madagascar Centre, Andringitra-Ambalavao, Plateau Saoindrana, alt. 2060 m, 14–17.i.1958, B. Stuckenberg (NMSA); 2♂ Anjavidilava, 2020 m, 17–21.i.1958, B. Stuckenberg (NMSA); 3♀ Pic Boby, alt. 2400 m, 11–14.i.1958, B. Stuckenberg (NMSA). MOZAMBIQUE: 3♂ Luabo, Lower Zambezi R., vii, viii.1957, P.J. Usher (NMSA). NAMIBIA: 1♂ 8♀ Rundu Dist., Katara Okavango R., 17°48'56"S:18°53'38"E, 20–23.i.1998, Kirk-Spriggs & Marais, Malaise traps (NMWN); 1♀ West Caprivi Pk., Kwando R., Susuwe, 17°45'37"S:23°20'25"E, 28.ix–2.x.1998, A.H. Kirk-Spriggs, Malaise trap, dry woodland (NMWN); 3♀ Tsumkwe Dist., Sikereti, 19°06'24"S:20°42'20"E, 28.xii.1998, Kirk-Spriggs, Marais & Mann, at light (NMWN). NIGERIA: 1♀ Gadam, 26.vii.1929, A.W. Taylor (BMNH); 3♂ [on same mount], Zaria, Guga Forest reserve, 11.ix.1971, J.C. Deeming (NMWC); 1♀ Zaria, Samuru, 2.vii.1967, larvae ex millet, J.C. Deeming (BMNH); 1♀ same locality, 6.vii.1966, ex guinea corn, G.T. York (BMNH); 1♂ Zaria, Dembi Wood, 29.viii.1971, J.C. Deeming (NMWC); 1♂ Makurdi, R. Benue bank,



30.iv.1972, J.L. Musa (NMWC); 1 ♀ Obudu Plat., cattle ranch, 19.xii.1970, M. Politzar (NMWC); 1 ♀ Obudu Plat., cattle ranch, 21.xii.1970, J. M. Phillips (NMWC); 1 ♀ Ile-Ife, 6.ix.1969, J.T. Medler (NMWC); SÃO TOMÉ: 1 ♂ 16.xi.1932, W.H. Tams (BMNH). SOUTH AFRICA: *Western Cape*: 1 ♂ 1 ♀ 10 km SE Vanrhynsdorp, along river, 3118DA, 14.x.1997, R.M. Miller (NMSA). *Eastern Cape*: 1 ♂ 1 km NW Somers East, 3225DA, 28–29.x.1978, picnic area stream, J. Londt & R. Miller (NMSA); 1 ♂ 1 ♀ Boesmansriviermond, 3326AD, 27–31.vii.1985, mill above caravan park, J. Londt (NMSA); 1 ♀ 5 km NE Queenstown, Bongolo Dam, 3126DD, 26.x.1978, dry river below wall, R. Miller & J. Londt (NMSA); 3 ♀ 16 mls E of Cradock Farm, “Who can tell”, alt. 1000 m, 11.iii.1972, leg. M.E. & B.J. Irwin (NMSA); 1 ♀ Coldstream, Tsitsikama area, 25–28.x.1964 (NMSA); 1 ♂ 1 ♀ Port St Johns, 20–25.xi.1961 (NMSA); 2 ♀ 10–22.xi.1995, A.J.T. Janse (NMSA). *Gauteng*: 1 ♂ Pretoria, Broederstroom, 12.viii.1963, Haeselbarth (NMSA); 1 ♀ Witwatersrand Univ., Johannesburg, 1.vi.1977, P. Ferrar (NMSA); 1 ♀ Johannesburg, 2628Aa, Highlands North, 12.viii.1981, R. Elferink (NMSA); 1 ♂ Johannesburg, 4.xi.1951, F. Zumpt (BMNH); 1 ♂ same data but 27.iv.1952 (BMNH). *Free State*: 1 ♂ 10 km N of Aberfeldy, Somerby Farm, 2828Bb, empoundment, 27.xii.1982, R. Miller & P. Stabbins (NMSA). *KwaZulu-Natal*: 1 ♀ Wartburg, 10.x.1989, open lot in town, grass, A.E. Whittington (NMSA); 2 ♀ Darvill maturation Ponds, Pietermaritzburg, 29°33'00"S:30°20'11"E, 27.vi.1990, D. Barraclough, S. Chinn & A. Whittington (NMSA); 1 ♀ Pietermaritzburg, Blackridge area, 20.iv.1982, grass on road margin, D.A. Barraclough (NMSA); 1 ♀ Dargle, 19.v.1964, margin of pasture, R. Miller (NMSA); 1 ♂ 6 ♀ Drakensberg, Giants Castle Res., alt. 5800 ft, 18–23.ix.1961, B. & P. Stuckenberg (NMSA); 2 ♂ 1 ♀ Royal National Park, from montane forest, alt. 1530 m, 16.ix.1965, B. & P. Stuckenberg (NMSA); 1 ♀ same locality, 12.ix.1963, B. & P. Stuckenberg (NMSA); 1 ♀ same locality, 13.ix.1963, B. & P. Stuckenberg (NMSA); 1 ♂ 3 ♀ Royal National Park, riverbank, alt. 1500 m, 12.ix.1963, B. & P. Stuckenberg (NMSA); 3 ♀ Royal Natal National Park, Tendele camp, 28°40'46"S:28°55'13"E, 16–18.iii.1990, A.E. Whittington (NMSA); 3 ♂ Cathedral Peak Forestry Res., Little ‘Berg Summits, Thermeda grassland, alt. 3500–6000 ft, iii.1959, B. & P. Stuckenberg (NMSA); 1 ♀ Organ Pipes Pass, at summit, *Erica* Consociates, 9600 ft, B. & P. Stuckenberg (NMSA); 1 ♀ Town Bush, Pietermaritzburg, 27.xii.1961, B. & P. Stuckenberg (NMSA); 2 ♂ Pietermaritzburg, ix.1953, at light, F. Zumpt (BMNH); 1 ♂ Balgowan, 21.vii.1956, B. & P. Stuckenberg (NMSA); 1 ♀ Muden, 1.x.1956, B. & P. Stuckenberg (NMSA); 2 ♂ Giant’s Castle Game Res., Injamuti area, SE2929AB, 5–11.xii.1983, J.G.H. Londt (NMSA); 2 ♂ 3 ♀ Weenen, vi–ix, 1934, H.P. Thomasset (BMNH); 1 ♂ 3 ♀ Weenen, 2840 ft, vii–ix.1923, in thorn country, H.P. Thomasset (BMNH); 3 ♂ 2 ♀ Weenen Nat. Res., 28°51'S:29°69'E, 1–4.x.1990, Thornveld, dam & sweep net, A.E. Whittington (NMSA); 2 ♂ same locality and date, Malaise trap (NMSA); 1 ♂ 3 ♀ Midlands, Howick, 29°29'S:30°13'E, 1060 m, garden vegetation, 14.vii.1990, A.E. Whittington (NMSA); 5 ♂ 6 ♀ Howick, 29°28'40"S:30°13'20"E, 8.vii.1990, mercury blended light, A.E. Whittington (NMSA); 2 ♂ 3 ♀ same data but 25.viii.1990 (NMSA); 1 ♂ same data but 17.vii.1990 (NMSA). *Limpopo*: 3 ♂ 2 ♀ Nylsvley Res., Naboomspruit, 24.xi.1976, P. Ferrar (BMNH). *Northern Cape*: 1 ♂ Lombard Nat. Res., 27°37'S:25°29'E, 1250 m, 12.iii.1991, sand, *Acacia*, thornveld, Londt & Whittington (NMSA); 1 ♀ Kuruman, nr Die Ong, 27°29'S:23°26'E, 1300 m, 13.iii.1991, mercury vapour lamp, Londt & Whittington (NMSA). *NAMIBIA*: 1 ♀ Windhoek Dist., Windhoek, 2218Cc, alt. 1600 m, 3.xi.1974, sandy river bottom, M.E. Irwin (NMSA). *SUDAN*: *West Darfur*: 1 ♂ 3 ♀ Jebel Marra, Killing, 7000 ft, 7.iv.1932, Miss M. Steele (BMNH). *UGANDA*: 4 ♂ 7 ♀ Mt Elgon, between Butandiga & Bulambuli, 8000 ft, 7.viii.1934, J. Ford (BMNH); 1 ♀ Kigezi dist., Mt Muhavura, 7000 ft, 29.ix.1934, F.W. Edwards (BMNH); 1 ♂ 1 ♀ Mt Elgon, Bulambuli, 9500 ft, viii.1934, J. Ford (BMNH); 1 ♀ Butandiga, 7000 ft, viii.1934, J. Ford (BMNH); 1 ♀ Ruwenzori Range, Kilembe, 4500 ft, xii.1934–i.1935, F.W. Edwards (BMNH); 1 ♂ Kigezi, Mafuga Forests, vi.1951, van Someren (BMNH); 1 ♂ Kawanda, 16.i.1958, light-trap, J. Bowden (BMNH). *YEMEN*: 3 ♀ Jebel Jihaf, 7000 ft, x.1937, H. Scott, E.B. Britton (BMNH); 1 ♂ 1 ♀ same data but 20.ii.1938 (BMNH); 4 ♀ San’a, 7900 ft, 10–15.x.1937, from lucerne, Carl Rathjens (BMNH); 2 ♂ 2 ♀ Ghaiman, 9 mls SE San’a, 8700 ft, 18.ii.1938, near irrigation stream, H. Scott, E.B. Britton (BMNH); 1 ♂ Ertil, 8–10 mls S San’a, 8000 ft, 24.ii.1938, on lucerne, H. Scott, E.B. Britton (BMNH). *ZIMBABWE*: 3 ♂ 10 km SE of Harare, 19.ii.1997, J.W. Ismay (DMA); 1 ♂ Harare, road to Nat. Botanic Gdns, 14.ii.1997, J.W. Ismay (DMA); 1 ♀ N. Vumba, 5.vii.1965, leg. D. Cookson (NMSA); Salisbury, 5.ii.1963, wheat stem (BMNH); 1 ♀ Domboshava, iii.1932, larvae in stems of rapoko *Eleusine aracorna* with larvae of *Hylemyia andersoni* Mall., det. *Hylemyia arambourgi* Ség. by Emden, 1940 (BMNH); 1 ♀ Salisbury, vi.1901, F.L. Snow, 5050 ft. (KUNHM); 1 ♀ same locality, v.1901, x.1901 (KUNHM); 2 ♂ same locality, v. & vi.1901, syntypes of *Chortophila linearis* Adams (KUNHM).

Discussion: In Emden’s key (1941b: 265) the species keyed out as “*flavibasis* Stein” is *bracata*. No records are given in this paper. In Emden’s paper on S.W. Arabia (1948: 166) some of the records for *flavibasis* are correctly named; the records for “*arambourgi*”

are partly *bracata* and partly *flavibasis*. In Emden's paper on the Ruwenzori Expedition (1951: 357) the records for "*arambourgi*" refer to *flavibasis*. Not all of the material listed by Emden in these papers could be found in the BMNH. Those that I could find are listed under material examined for each species.

Life history: Hennig (1974*b*: 807–808) states that the larvae of *flavibasis* live in various species of corn crops, *Secale cereale* L. (rye) in Morocco (Séguy 1934); *Hordeum vulgare* L. (barley) in Morocco (Séguy 1936); *Setaria italica* (L.) (millet) in Israel (Ackland 1968). The paper by Bullock (1965) on the control and life history of "*arambourgi*" almost certainly refers to *D. flavibasis*, as he used Emden's (1941*b*) key to identify his material. He mentions *H. vulgare* as a foodplant in Kenya, and also mentions *Penisetum clandestinum* Chiov. (kikuyu grass) and *Chloris gayana* Kunth. (Rhodes grass) in other parts of Africa. Deeming (1971: 174) recorded "*arambourgi*" on *Sorghum bicolor* L. (sorghum) and *Pennisetum typhoides* S. & H. (pearl millet) in Nigeria.

Other definite host plant records based on labels of specimens examined during this revision are: barley (Ethiopia and Kenya), millet (Nigeria), guinea corn (Nigeria), and stems of rapoko, *Eleusine coracana* L. in Zimbabwe.

Distribution: *D. flavibasis* is widely distributed in the Afrotropical Region, from Nigeria in the west to Yemen in the east to South Africa; also Madagascar. It has been recorded in the southern areas of the Palearctic region from Egypt, Morocco, Israel, Canary Isles, Spain (Hennig 1974*b*: 808). The records of "*flavibasis*" from Nepal and India (Ackland 1967: 119) refer to *bracata*.

### *Delia urbana* (Malloch, 1924)

Figs 17–22, 27, 28

*Hylemyia urbana* Malloch, 1924*a*: 139; Harrison 1953: 10.

*Hylemyia capensis* Malloch, 1924*b*: 263, 265; Emden 1941*b*: 265. **Syn. n.**

*Delia urbana* (Malloch): Hennig 1953: 669, figs 1–4; 1974*b*: 792; Colless 1982: 90.

*Delia capensis* (Malloch): Pont & Ackland 1980: 716.

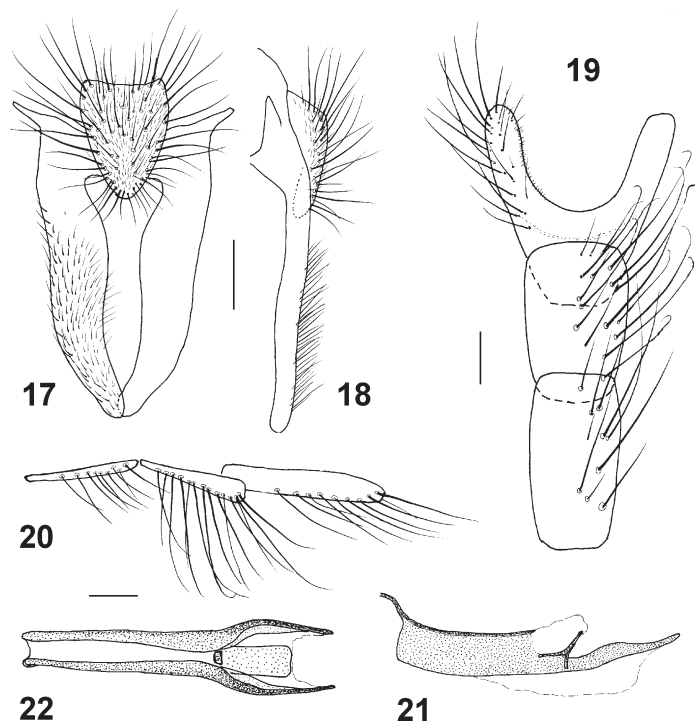
#### Diagnosis:

♂ Mid tibia with a small *av* in distal quarter; hind femur (Fig. 27) with long *av*, longest (about middle) being fully twice as long as depth of femur and have curled fine tips directed apically.

#### Description:

##### *Male.*

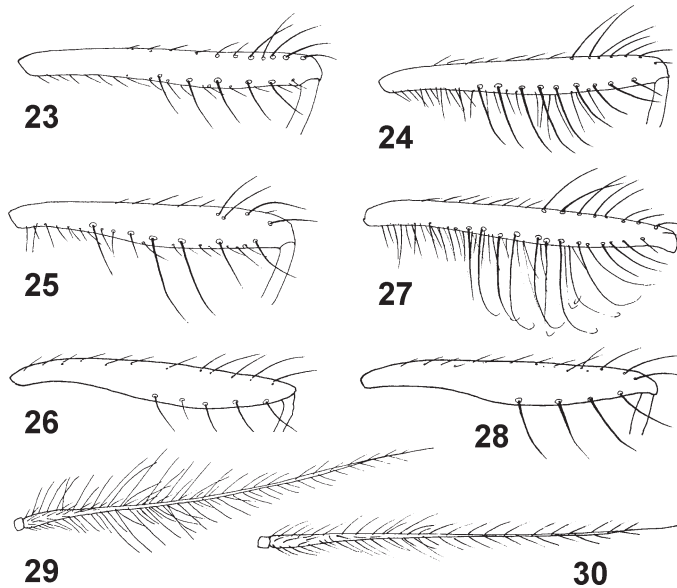
**Colour:** Frontal stripe, parafrontals, parafacials, genae and face pale reddish orange to blackish, with thin greyish dust; occiput darker above. Antennae brownish, basal segments paler orange-brown. Palpi brown; prementum brownish with thin dust. Thorax and scutellum light brownish olive to greyish dusted, pleura slightly translucent, scutum with very faint or more distinct median and lateral vittae. Wing membrane pale orange tinged, veins orange-brown; squamae whitish with pale fringe. Legs pale brownish orange, hardly shining. Abdomen dusted light brownish grey, only faintly shining when viewed from above, viewed from behind faint median vitta visible. Prehypopygial tergites dusted, sternites orange-brown.



Figs 17–22. *Delia urbana*, male (S. Africa): (17) cercal plate and surstyli; (18) ditto, lateral view; (19) sternites III–V, ventral view; (20) ditto, lateral view; (21) distiphallus, lateral view; (22) ditto, ventral view. Scale bar = 0.1 mm.

**Head:** Eyes narrowly separated posteriorly (by width of anterior ocellus); parafrontalia linear at this point, separated by very narrow frontal stripe which is hardly half width of anterior ocellus, widening anteriorly to slightly more than width of postpedicel; parafacial medially equal to width of postpedicel; peristomal margin not projecting, face almost flat, distance between vibrissal setae slightly more than distance between them and nearest eye margin; gena below lowest point of eye margin  $0.25\text{--}0.30\times$  eye height; 4 pairs of parafrontal setae on anterior half of frons; 1 pair of fine interfrontal setulae, slightly closer to upper frontal setae than to anterior ocellus; genal setae uniserial; postpedicel 1.6 times as long as wide, not reaching peristomal margin; arista slightly thickened at base, with very short pubescence. Proboscis rather short and slender, with short prementum (slightly shorter than palpi), about as wide as fore tibia. Upper occipital setulae fine and short, without setulae below row.

**Thorax:** Presutural *acr* absent (or represented by very fine hairs which are not longer or stronger than scutal accessory hairs), rows close together, *acr:dc* ratio 10:2:10; *dc* generally arising from small dark spots; 2 posthumeral setae; notopleural depression bare apart from 2 strong setae; prealar seta absent; scutellum with dorsal surface largely bare, dorsal preapicals short and fine, lower surface with a few fine pale hairs; 2 proepisternals without associated hairs, only 1 rather weak proepimeral without associated hairs; anepisternite without developed upper anterior setula; katepisternals 1+2 (lower *p* only slightly shorter than upper).



Figs 23–30. Hind femur and arista: (23–28) Hind femora: (23) *Delia flavibasis*, male; (24) *D. arambourgi*, male; (25) *D. bracata*, male; (26) ditto, female; (27) *D. urbana*, male; (28) ditto, female; (29, 30): Arista, male: (29) *D. arambourgi*, (30) *D. bracata*.

**Wing:** Vein C with anterior spinules short (not longer than diameter of C), stronger seta before distal break as long as small crossvein; lower surface of C bare. Large crossvein straight, last section of  $M_{1+2}$  2.0–2.3× length of preceding section. Lower squama narrow, smaller in area than upper. Wing length about 4 mm.

**Legs:** Mid femur with 3–4 long *pv* in proximal half; hind femur (Fig. 27) with 9–10 long erect *av* in distal half to 3/4, longest of them (medial) at least 2.5× height of femur, with their tips curled (bent or curved towards apex of femur), and numerous fine long *pv*; *a* and *ad* on hind femur are also long and numerous; fore tibia with 1 short fine *ad* and 2 *pv*, and a short pointed apical *pv*; mid tibia with 1 very short *av*, and 1 equally short *ad*, and 1 slightly longer *pd*; hind tibia with 2–3 *av*, 3–4 *ad*, 3 *pd*, without *pv*. Pulvilli somewhat enlarged (those of fore legs almost as long as tarsomere 5).

**Abdomen:** About 1.75 times as long as greatest width (at basal margin of tergite III), dorsoventrally compressed; sternite III (Fig. 19) nearly as wide as sternite IV (South Africa) to narrower than this (Australia), with long marginal and discal setae (Fig. 20). Sternite V processes (Fig. 19) without setae on inner margins, lateral setae not quite as long as processes. Surstyli in caudal view (Fig. 17) expanded medially, about twice as long as cercal plate; dorsal surface covered in fine erect hairs; in lateral view (Fig. 18) more or less straight (slightly sinuate). Cercal plate 1.6 times as long as wide, with narrowly rounded apex. Pregonite with 2 distal setae; postgonite with minute setula. Distal section of aedeagus (Fig. 21) rather short, 1.5× length of aedeagal apodeme, divided in distal half into pair of free paraphallic processes, and small weakly sclerotized plate-like acrophallus (Fig. 22), level with base of paraphalli. Aedeagal apodeme 2.25 times as long as wide in dorsal view, excavated on dorsal surface. Ejaculatory apodeme 0.42× length of aedeagal apodeme.

*Female.*

**Colour:** Dark in ground colour with shifting brown and grey dusting; frontal stripe dark brown posteriorly, orange-brown on anterior half. Viewed from front at a low angle frontal triangle is light brownish grey dusted with dark brown velvety round patch between anterior ocellus and cruciate interfrontals, and similar patch surrounding ocellar tubercle; parafrontals brassy brown dusted when viewed from above, which becomes darker brown from in front; parafacials brassy dusted; genae with darker shifting brown patch behind vibrissal area; occiput grey to brownish dusted; prementum dark brown, thinly dusted, semi-shining in parts; palpi dark brown. Thorax dark in ground colour, with shifting brownish olive to grey dusting; scutum with traces of shifting vittae and semi-shining areas, viewed from behind darker medially, two wide lateral vittae which are very indistinct, lateral declivities lighter grey dusted; pleura with weakly shining brown patches, especially on anepisternite and katepisternum. Wing membrane weakly brownish tinged, hardly darker basally; squamae white with whitish fringe. Legs dark brown, weakly dusted and semi-shining. Abdomen dark in ground colour, viewed from above tergites with many shining patches, especially medially and laterally. Viewed from behind distinct shining black median vitta becomes visible, anterior margin of tergite III and posterior half of tergite IV darker, otherwise greenish grey dusted.

**Head:** Eyes separated by  $1.45\text{--}1.50\times$  their transverse width; frontal stripe at level of middle orbitals twice as wide as each parafrontal which widen anteriorly to slightly more than width of postpedicel; parafacial at narrowest part slightly less than width of postpedicel. Frontal setae differentiated into 3 pairs of laterocline orbitals, and 2 pairs of inclinate frontals (all in line); crossed interfrontals strong, placed just above middle of interfrontalia; gena below lowest point of eye margin  $0.33\times$  eye height; 4–5 anterior genal setae immediately posterior to subvibrissal setae biserial and upwardly directed; upper occipital setae with scattered row of setulae below. Prementum and proboscis as in male.

**Thorax:** 2–3 presutural *acr*, one pair longer than rest (half length of 1st presutural *dc*); notopleural depression bare, apart from two strong setae. Prealar seta short and fine, but distinct ( $0.3\text{--}0.5\times$  length of posterior *npl*); scutellum with only 2–4 short hairs on disc; anepisternite without developed upper anterior setula; 2 proepisternal setae, one long, one short; one strong proepimeral seta with 2–3 associated hairs; katepisternals 1+1 (posterior seta with short hair below it).

**Wing:** Vein C with anterior spinules strong and rather long, those on section between costal breaks about  $2.5\times$  costal diameter, pair of stronger spines before distal break nearly  $1.5\times$  length of small crossvein; large crossvein straight, last section of  $M_{1+2}$   $1.7\text{--}1.8\times$  preceding section; lower squama smaller in area than upper. Wing length 4.75 mm.

**Legs:** Mid femur with a short *av* in proximal half, 2–3 short *pv* in proximal half; hind femur (Fig. 28) with 4–5 *av* in proximal half, which are slightly longer than greatest height of femur, only 2–3 short preapical *pv*; fore tibia with a strong *ad* (just below middle), a strong *pv*, more or less at same level; mid tibia with a small *av*, 1 long and strong *ad*, 1 *pd*, 2 *pv*; hind tibia with 2–3 *av*, 4 *ad*, 3 *pd*, without *pv*.

**Abdomen:** About 1.6 times as long as wide (at anterior margin of tergite III); tergites with rather short hindmarginal setae, most of them only half as long as tergites, including those on tergite V.



Types of *urbana*: Malloch described *urbana* from Sydney, Australia: 1 ♂ holotype, 8 ♂ paratypes, 2 ♀ paratypes. His statement that the 'types would be returned to Dr E.W. Ferguson.' Dr A.C. Pont (pers. comm.) advises that these types were originally in the Sydney School of Public Health and Tropical Medicine, but were transferred recently to the ANIC.

Holotype of *capensis*: ♂: SOUTH AFRICA: 'Holotype' [white printed circular label with red perimeter]; 'Capetown / Aug 1905 / G. A. K. Marshall / 1908–212' [rectangular printed white label]; '*Hylemyia / capensis* / Det. / J. R. Malloch Type' [white rectangular printed and handwritten label with black border]. In good condition, examined during present study (BMNH).

Paratype of *capensis*: 1♂ same data as holotype. In fair condition, right fore and mid leg missing (BMNH).

Other material examined: SOUTH AFRICA: *Western Cape*: 6♂ 8♀ Cape Peninsula, Witsands Dunes, 25–26.ix.1959 (NMSA); 2♂ Brak R. mouth, Mossel Bay Dist., 23.x.1964 (NMSA); 1♂ Groot R. Pass, nr Plettenburg Bay, indigenous forest, 11.ix.1959 (NMSA).

Discussion: Hennig (1953: 669–670) was the first author to provide drawings of the genitalia of *urbana*, based on two males from Australia in the DEI. Harrison (1953: 10) reported that a female of *urbana* was identified in Auckland, New Zealand, in an aeroplane coming from Sydney in April, 1952.

Colless (1982: 90) suggested that *urbana* (along with four other species of Australian Anthomyiidae) might be an introduced species, and compared *urbana* with *dispar* Bezzi (= *arambourgi* Séguy). *D. urbana* is in fact easily distinguished from *dispar* (the latter having longer arisal hairing and the male hind femur with shorter *av* on hind tibia which do not have fine and curling tips). I have examined many specimens of *urbana* from Australia and can find no difference (including the genitalia) from specimens (including the types) of *capensis* from Africa. I therefore synonymize the two names. Malloch's paper describing *urbana* was published on 2 July 1924, and his paper describing *capensis* in September of the same year. The distribution of *urbana* is similar to that of *Anthomyia punctipennis* Wiedemann which is found both in Africa and the Australian region, and both species are probably introductions to the latter area.

Life history: Colless (1982: 90) mentions a single record of *urbana* from cocoon masses of a pergid sawfly; otherwise there are a few known rearings from grass including *Cynodon dactylon* (L.). There are no breeding records from Africa.

Distribution: Australia (New South Wales, Queensland), New Zealand, and South Africa.

### ***Delia madagascariensis* sp. n.**

Figs 31–36

Etymology: The specific name refers to Madagascar where the holotype was collected.

Diagnosis:

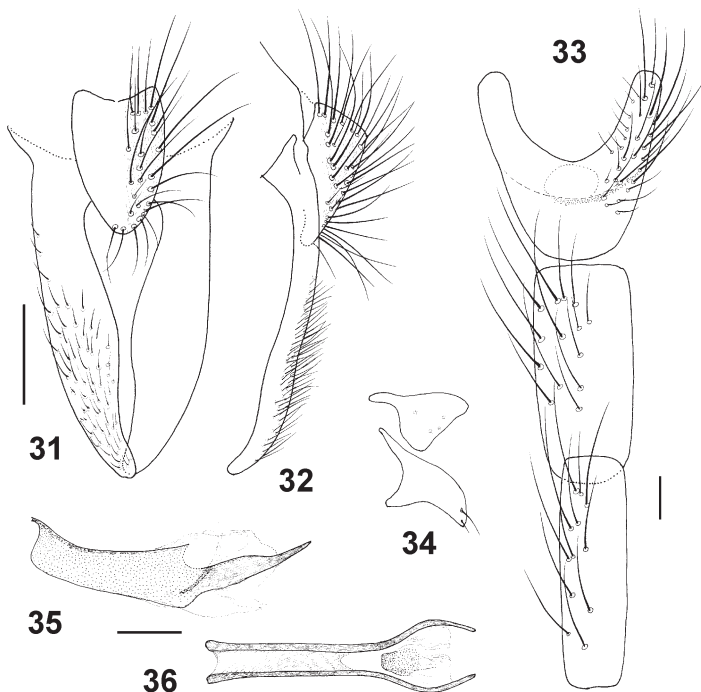
♂ Prealar absent, leg setae short and fine, the *av*, *ad* and *pd* on mid tibia hardly longer than diameter of tibia; hind tibia with 2 *ad* and 2 *pd*; *acr* short and fine, hardly differentiated from accessory setulae; large crossvein straight; sternites II and III (Fig. 33) very long and narrow.

Description:

*Male*.

*Colour*: Frontal stripe, parafrontals, parafacials, genae and face varying from blackish to orange in ground colour, with pale gold dusting; frontal stripe black when viewed from above or in front but when viewed from in front at a low angle silvery grey dusted; parafacial at level of arisal base with shifting blackish to orange sheen-stripe, which





Figs 31–36. *Delia madagascariensis* sp. n., paratype male (Madagascar): (31) cercal plate and surstyli; (32) ditto, lateral view; (33) sternites III–V; (34) gonites; (35) distiphallus, lateral view; (36) ditto, ventral view. Scale bar = 0.1 mm.

viewed from above is pale gold dusted; occiput dark grey, darker above. Antennae brown, basal segments sometimes obscurely lightened orange. Palpi brown, sometimes paler basally; prementum of proboscis brownish with thin grey dust. Thorax translucent brown in ground colour, with fairly dense olive-grey dusting, scutum viewed from behind with three faint diffused presutural wide brown vittae, scutum with major setae not arising from brown spots; scutellum olive-grey dusted, base tinged brownish. Wing membrane pale greyish tinged; veins pale brown; squamae concolorous with wing base, fringe pale yellow-white. Halteres yellow. Legs pale brown to orange-brown, coxae sometimes paler. Abdomen brown in ground colour, thinly dusted with shifting semi-shining patches and pale grey dusted areas, with wide diffused brown median vitta (about as wide as depth of hind femur), which becomes wider on tergite V. Prehypopygial tergites dusted.

**Head:** Eyes touching on frons, frontal stripe obsolete at this point, parafrontals linear, widening anteriorly but only about half width of postpedicel; parafacials medially only about half width of postpedicel, in profile almost disappearing; peristomal margin not projecting, face almost flat, distance between vibrissal setae nearly twice distance between them and nearest eye margin; gena below lowest point of eye margin narrow,  $0.17\text{--}0.20\times$  eye height; 3–4 pairs of frontal setae on anterior third of frons; 1 pair of fine interfrontal setulae at middle of frons; genal setae uniserial anteriorly; postpedicel not reaching peristomal margin (by almost its width); arista pubescent, longest hairs twice width of basal aristal diameter. Proboscis short and slender, with short prementum (not

as long as palpi and as wide as fore tibia). Upper occipital setulae short and fine, without setulae below row.

*Thorax*: Presutural *acr* fine and hair-like (not differentiated from accessory setulae), biserial, *acr:dc* ratio 10:3:10, no hairs between rows; 2 posthumeral setae, anterior seta short and only half length of posterior seta; notopleural depression bare apart from two strong setae; prealar completely absent; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katepisternals 1+2, anterior seta short, half length of upper posterior, lower posterior nearly as long as upper.

*Wing*: Vein C with anterior spinules short but not weak, as long as diameter of C, stronger spines before distal break nearly as long as small crossvein; lower surface of C bare. Large crossvein straight, last section of  $M_{1+2}$  1.6–1.9× length of preceding section. Lower squama smaller in area than upper. Wing length 4.5–5 mm.

*Legs*: Mid femur with 3 unequal *v* or *pv* in proximal half; hind femur with full row of long *av* and shorter *pv*, *av* without curling tips; fore tibia and mid tibia with all setae short and fine, fore tibia with 1 very short *ad* and a slightly longer *pv*, mid tibia with 1 *av* towards apex, 1 *ad*, 1 *pd* and 2 *pv*, all very short and fine, not longer than diameter of tibia; hind tibia with 1–2 *av*, 2 *ad*, 2 *pd*, no *pv* setulae.

*Abdomen*: Dorsoventrally compressed, viewed from above parallel-sided, 3 times as long as wide; sternite III (Fig. 33) long and narrow (3.75 times as long as greatest width), sternite IV nearly as long (2.2 times as long as wide); sternite V processes about as long as base, with a few short hairs on inner margins, lateral setae short, longest not longer than processes. Surstyli (Fig. 31) twice as long as cercal plate, in caudal view with inner margins sinuate, widening medially then tapering apically to about half this width, clothed in fine hairs; in lateral view (Fig. 32) with apical quarter downturned. Pregonite with 1–2 short setulae; postgonite triangular without setulae. Distal section of aedeagus (Fig. 35) with short paraphalli which are not quite half length of section, and are converging in ventral view (Fig. 36); small sclerotized acrophallus present between bases of paraphalli.

*Female*. Unknown.

Holotype: ♂ MADAGASCAR: 'Madagascar Centre / Vakaona 1520 m. / Andringitra Ambalavao / 21–24.i.1958 B. Stuckenberg'; 'HOLOTYPE ♂ / *Delia madagascariensis* / Ackland' [Rectangular red card]; 'Holotype' [Circular card with red perimeter]. Genitalia mounted in balsam on plastic slip on the pin (NMSA).

Paratypes: 3♂ same label as holotype (NMSA).

*Discussion*: *D. flavibasis* (which occurs in Madagascar) has no *av* on mid tibia, more distinct vittae on scutum with stronger *acr*, and discal scutellar setulae, a fine lower anterior katepisternal seta, abdominal tergites wider (tergite III 2.5–3.0 times as wide as long), margins of abdomen not parallel-sided, hind tibia with 3 *pd*. In addition the apex of the cercal plate in profile is broadened and projects between the base of the surstyli (Fig. 13). *D. madagascariensis* is probably more closely related to *D. bracata*, which has not so far been recorded from Madagascar. *D. bracata* agrees with *madagascariensis* in having a small *av* on the mid tibia; most of the characters mentioned above for *flavibasis* also apply to *bracata*, including shorter and wider tergites and sternites. The surstyli however curve slightly backwards in profile, and the apical halves are distinctly narrowed. Some of the characters of *madagascariensis* (prealar absent, hind tibia with 2 *ad* and 2 *pd*) are the same as those described for *modesta* (Stein), a

species known only from Kenya and only from the original description. See under *modesta* for further details.

Life history: Unknown.

Distribution: Only known at present from Madagascar.

*Delia ventralis* subsection  
*Delia ventralis* SPECIES GROUP

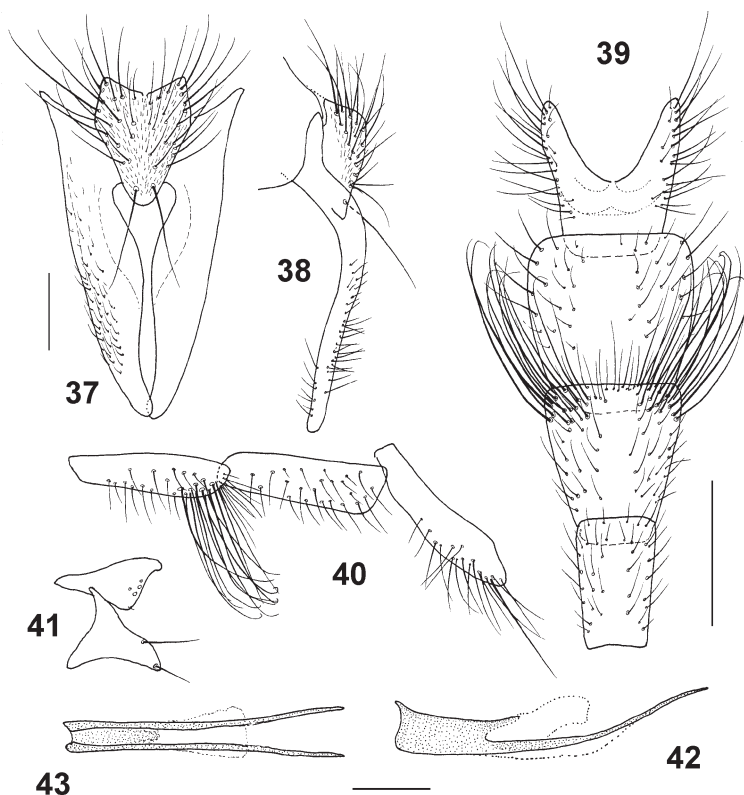
***Delia ismayi* sp. n.**

Figs 37–43

Etymology: I name this species after Dr J.W. Ismay, who collected this species in Kenya, and provided all of the Anthomyiidae he found in Africa and on many other expeditions he made to other parts of the world.

Diagnosis:

♂ Major scutal setae arising from small brown spots; eye margins practically touching on frons; scutal accessory setulae very sparse, short and fine; prealar absent; mid tibia without *av*; tergites III and IV shortened on posterior margin; sternite III (Fig. 40) with



Figs 37–43. *Delia ismayi* sp. n., male paratype (Kenya): (37) cercal plate and surstyli; (38) ditto, lateral view; (39) sternites II–V; (40) sternites III–V, lateral view; (41) gonites; (42) distiphallus, lateral view; (43) ditto ventral view. Scale bar = 0.5 mm.

long erect setae laterally on posterior margin; distiphallus (Fig. 43) with long narrow paraphalli.

**Description:**

*Male.*

**Colour:** Frontal stripe, parafrontals, parafacials, genae and face brownish orange to blackish, thinly dusted whitish grey; occiput dark grey to blackish, thinly dusted and semi-shining. Antennae dark brown. Palpi dark brown; prementum brownish, thinly dusted. Thorax and scutellum brownish grey in ground colour with thin dusting, pleurae orange-brown translucent in places, scutum with very obscure wider or narrower darker vittae, major setae arising from small brown spots; viewed from behind with narrow paler vittae along dorsoventral rows. Abdomen with ground colour as thorax, viewed from behind grey dusted with wide brown median vitta which is narrowly extended across base of tergites, and also widened posteriorly on each tergite. Prehypopygial tergites and epandrium dusted as rest of abdomen. Wing membrane light greyish tinged; squamae whitish grey (slightly lighter than wing base), veins light brownish. Legs brown to blackish, tibiae often paler orange-brown.

**Head:** Eye margins on frons practically touching, separated by less than diameter of anterior ocellus. Frontal stripe linear at this point; parafacial at narrowest part  $0.75\times$  width of postpedicel; peristomal margin not projecting, behind level of profrons; gena about  $0.23\times$  eye height; 4–5 pairs of parafrontal setae on anterior half of frons; 1 pair of very small interfrontal setulae; genal setae uniserial. Postpedicel not quite twice as long as wide, not reaching peristomal margin, arista pubescent, longest hairs not as long as basal diameter, base not abruptly swollen but tapering gradually to apex. Proboscis small and narrow, prementum hardly as long as palpi and only as wide as fore tibia. Upper occipital setulae short and fine, without setulae below row.

**Thorax:** Accessory setulae very sparse, short and fine. Presutural *acr* short and fine, biserial, rows separated by  $0.5\times$  distance between *acr* and *dc* rows, no hairs between rows; posthumeral setae 1+1; notopleural depression bare apart from two strong setae; prealar absent or represented by fine hair which is hardly distinguishable from accessory setulae; scutellum practically bare on disc apart from two fine lateral setulae; anepisternite without an upper developed setula; 2 proepisternals, 1 proepimeral with 1–2 associated hairs, katapisternals 1+2, lower posterior three quarters length of upper posterior seta. **Wing:** Vein C with anterior spinules short and weak (not longer than diameter of C), normally stronger setae before distal break only slightly longer than vein diameter; lower surface of C bare. Large crossvein straight, joining  $M_{1+2}$  almost at right angles, last section of  $M_{1+2}$  twice length of preceding section. Lower squama smaller in area than upper, not projecting. Wing length about 4 mm.

**Legs:** Slender, all setae short and weak. Mid femur with 3–4 longer *pv* in basal half; hind femur with 4–5 *av* in distal half, median setae short, becoming longer apically, no *pv* except for 1–2 apicals; fore tibia with a short fine pointed preapical *pv*, with 1 short *ad* and 1 slightly longer *pv* at about same level; mid tibia without *av*, 1 *ad* and 1 *pd*, both very short and fine, not longer than diameter of tibia; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, 0–1 *pv*. Pulvilli on fore legs as long as fore tarsomere 5.

**Abdomen:** About as long as thorax, in dorsal view about 3 times as long as greatest width, dorsoventrally compressed; tergites III and IV short and posteriorly excavated,

separated from each other and from tergites II and V by wide areas of flexible intersegmental cuticle; sternite III (Fig. 39) slightly longer than width at posterior margin, narrower on basal margin, with long setae on posterior corners, curling tips of which reach posterior margin of sternite IV; these setae are more or less divided by much shorter finer hairs medially on posterior margin; in lateral view (Fig. 40) they project more or less at right angles to abdomen. Sternite IV (Fig. 39) wide, quadrilateral with rounded lateral margins, and only with rather sparse lateral fine setulae, medially bare; sternite V (Fig. 39) with tapering processes, without setae on inner margins, lateral setae not longer than processes. Surstyli in caudal view (Fig. 37) twice as long as cercal plate, widened medially, gradually tapering to apex, dorsal surface laterally with fine hairs, in lateral view strongly bent in basal half (Fig. 38), then more or less straight and parallel-sided to apex. Cercal plate (Fig. 37) 1.25 times as long as wide, tapering sides with narrowly rounded apex, which bears two longer setae (as long as length of cercal plate). Pregonite with 2 distal setae; postgonite without distinct seta. Aedeagus (Figs 42, 43) with distal section 1.7 times as long as aedeagal apodeme, divided on more than distal half (1.6) into pair of long and straight slender paraphallic processes. Acrophallus absent. Aedeagal apodeme more or less flat, 3 times as long as wide in dorsal view, and very narrow at point of attachment to phallopore. Ejaculatory apodeme very small, widened at one end.

*Female.* Unknown.

Holotype ♂: KENYA: 'Holotype' [circular white label with red perimeter]; 'KENYA: Karasani / 10.viii.89, swept / savannah, J.W. Ismay' [rectangular white printed label]; 'HOLOTYPE / *Delia* / *ismayi* ♂ / D. M. Ackland' [rectangular white printed and written label with red border] (OUMNH). In good condition.

Paratypes: KENYA: 4♂ same data as holotype (OUMNH); 1♂ Ngong Hills, vi.1946, van Someren (V.G.L. van Someren collection, British Museum, 1959-468; Imp. Inst. Ent. Coll. No 10720), det. *Hylemyia ventralis* Stein, van Emden, 1947 (BMNH). SOUTH AFRICA: *North West*: 2♂ Rustenburg, 3.xii.1961, F. Zumpt (NMSA); 1♂ Potchefstroom, 27.1.1951, F. Zumpt (BMNH). *KwaZulu-Natal*: 1♂ Weenen Nat. Res., 28°51'S:29°59'E, thornveld, mercury vapour light, 3.x.1990, Whittington (NMSA).

Discussion: *D. ismayi* has been misidentified as *D. ventralis* by Emden (as listed above). I have not been able to find the specimen he recorded as '*Hylemyia ventralis*' from Natal, Weenen, vi-vii.23, H.P. Thomasset (Emden 1951: 362) which he stated was in the BMNH. This also probably belongs to *D. ismayi*, as *D. ventralis* appears to be restricted to the mountains of central Africa. See under the phylogeny of the *D. ventralis* subsection for notes on the ventral setae on sternite III.

Life history: Unknown.

Distribution: Known only from Kenya and South Africa.

*Delia ventralis* (Stein, 1914)

Figs 46, 50-55

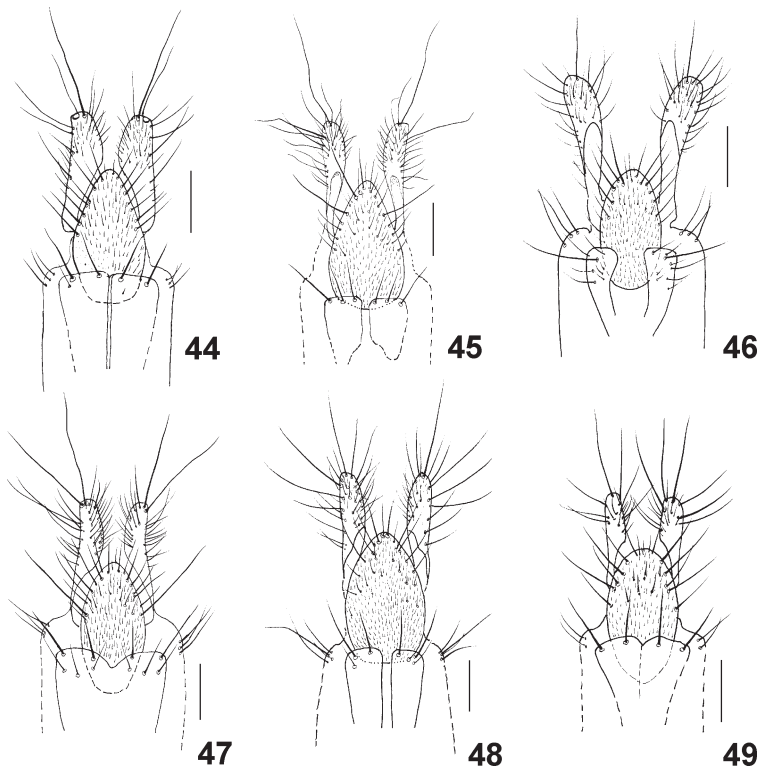
*Chortophila ventralis* Stein, 1914: 135; 1919: 154.

*Hylemyia ventralis* (Stein): Malloch 1924b: 262, 264; Emden 1941b: 266; 1951: 362; 1956: 530; Paterson 1956: 164.

*Delia ventralis* (Stein): Pont & Ackland 1980: 717.

Diagnosis:

♂ Abdomen with tergites III and IV posteriorly excavated, separated from each other and from tergites II and V by areas of membrane; sternite III (Fig. 52) bearing long



Figs 44–49. *Delia* spp., female abdomen, terminal segments, ventral view: (44) *D. bracata* (Zimbabwe); (45) *D. arambourgi* (Kenya); (46) *D. ventralis* (Uganda); (47) *D. steiniella* (Ethiopia); (48) *D. kigeziana* (Uganda); (49) *D. tibila* sp. n., female paratype (Ethiopia). Scale bar = 0.1 mm.

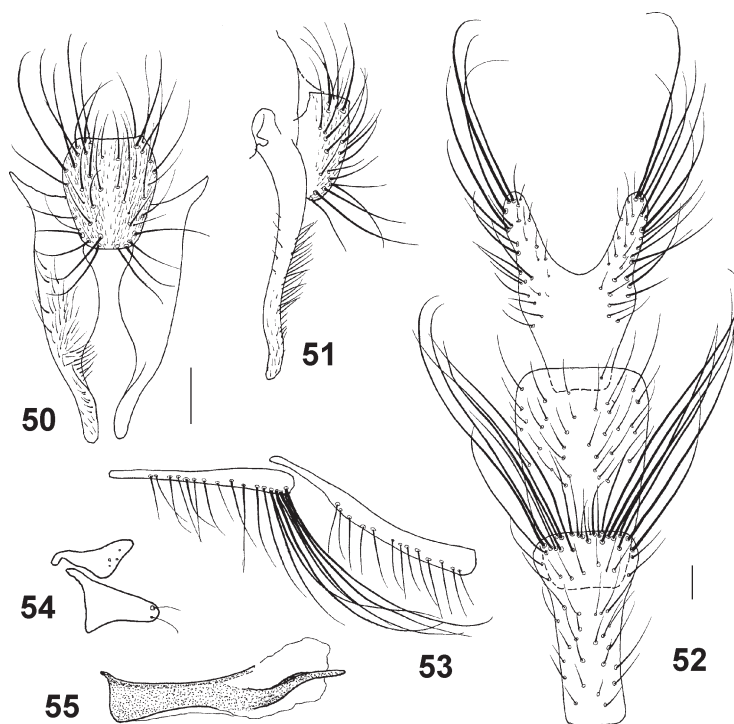
setae on posterior margin, which are either erect or depressed against sternite IV; sternite V processes (Fig. 52) with long apical setae (longer than length of processes).

#### Description:

##### *Male.*

**Colour:** Frontal stripe, parafrontals, parafacials and genae varying from orange-brown to blackish (with whitish brown dusting), parafacials viewed from in front sometimes slightly bronzy, without sheen stripe on parafrontal angle; face and occiput black (with greyish to brownish dust). Antennae entirely dark brown to black. Palpi black; prementum thinly dusted brownish, slightly shining. Thorax mainly black in ground colour, varying from thinly greyish brown dusting on pleura (a few sclerites slightly shining) to scutum rather densely brownish dusted with faint brownish vittae when viewed from in front; scutum viewed from behind with wide brownish median vitta bordered by two paler narrow dusted vittae between *acr* and *dc* rows; lateral declivities pale dusted. Abdomen varying from black to brownish with shifting darker median vitta which becomes diffused on tergites III and IV on whole width of tergites; pregenital sclerite brownish, thinly dusted; hypopygium thinly dusted. Wing membrane weakly greyish brown tinged, more strongly so basally; wing bases with brownish veins, not contrasting with membrane;





Figs 50–55. *Delia ventralis*, male (Uganda): (50) cercal plate and surstyli; (51) ditto, lateral view; (52) sternites III–V; (53) sternites III–IV, lateral view; (54) gonites; (55) distiphallus, lateral view. Scale bar = 0.1 mm.

squamae paler than wing base with rather distinct yellow border; halteres orange-yellow. Legs blackish brown, thinly dusted.

**Head:** Eyes without evident pubescence, separated by width of anterior ocellus; frontal stripe linear at narrowest point, widening anteriorly to about  $1.5\times$  width of parafacial at this level; parafrontals narrow posteriorly; parafacials about as wide as postpedicel; peristomal margin in lateral view not projecting beyond level of parafrontal angle; gena below lowest point of eye margin  $0.2\text{--}0.25\times$  eye height; 7–8 pairs of parafrontal setae on slightly more than anterior half of distance between antennal base and anterior ocellus; interfrontal setae well developed, at least half length of frontal setae; genal setae biserial with 2–3 upcurved setulae above lower row. Postpedicel  $1.8\text{--}2.0$  times as long as wide, apex not quite reaching peristomal margin; arista with short pubescence, longest hairs (on dorsal surface)  $1.3\text{--}1.5\times$  diameter of aristal base. Prementum short (not longer than depth of gena) and not swollen. Palpi slender. Occiput with an extra row of setulae below upper postocular setae.

**Thorax:**  $2+3\text{ }dc$ ; 3(–4) pairs of presutural *acr* (anterior pairs longest), rows close together, *acr:dc* ratio  $10:4:10$ ; 1+1 posthumeral; notopleural depression bare apart from two long setae; prealar  $0.5\text{--}0.7\times$  length of posterior *npl* and slightly finer (specimens from Kenya with prealar short and fine,  $0.2\times$  length of posterior *npl*); scutellum with its dorsal surface largely bare (only about 2–6 setulae on disc laterally within area bound

by basal and subapical scutellars; anepisternite without developed upper anterior setulae; proepisternal depression bare; katepisternals 1+2, lower posterior seta nearly as long as upper.

**Wing:** Vein C with rather strong marginal spinules (those between costal breaks about 1.5–2 times as long as C width, with pair before distal break more than twice as long; lower crossvein straight, joining  $M_{1+2}$  rectangularly to slightly oblique; last section of  $M_{1+2}$  1.8–1.9× length of preceding section. Lower squama not projecting beyond upper. Wing length 4.5–5.0 mm.

**Legs:** Mid femur with row of 4–6 *pv* on basal half (basal *av* short and weak); hind femur with complete row of *av*, only 1–2 *pv* apically; fore tibia with a small *ad* and a slightly longer *pv*, no blunt *pv* apical; mid tibia with 1 *ad*, 1 *pd*, 2 *p/pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, 0–1 *pv*; mid tarsomere 1 without outstanding dorsal setulae. Pulvilli on fore legs nearly as long as tarsomere 5.

**Abdomen:** About 2.2–2.3 times as long as greatest width at hind margin of tergite III, dorsoventrally compressed, tergites III and IV short and posteriorly excavated, separated from each other and from tergites II and V by wide areas of flexible intersegmental cuticle; sternite III (Fig. 52) longer than wide (about 2.5–3.0 times as long as wide), with hind margin expanded slightly and bearing long setae (longer than length of sternite); these setae are slender with fine curved tips, and are longer laterally, being much shorter medially and tending to form two groups. (Note: these setae may be either flattened against sternite, when they are sometimes difficult to see, or else erect and projecting vertically at right angles from sternite, probably associated with pheromone dispersal during courtship; see Figs 70, 71.) Sternite IV (Fig. 52) wide with only short setulae, in lateral view tips reaching past hind margin of tergite IV; sternite V processes (Fig. 52) with lateral setae becoming longer distally where they are much longer than length of processes; inner margins of processes with only fine hairs. Surstyli in caudal view (Fig. 50) expanded medially, becoming slender in apical third; in lateral view (Fig. 51) slightly sinuate. Cercal plate short and wide (1.2 times as long as wide), with rounded apical margin bearing 6–8 setae which are not as long as cercal plate. Pregonite bearing 2 short setae on distal margin; postgonite triangular without setae. Aedeagus with distal section (Fig. 55) about 1.5× length of aedeagal apodeme, divided on more than distal third (0.43×) by pair of free paraphallic processes and dorsal prolongation mainly membranous. Acrophallus absent. Aedeagal apodeme in dorsal view expanded anteriorly, excavated on dorsal surface, 2.25 times as long as greatest width. Ejaculatory apodeme 0.33× length of aedeagal apodeme.

#### *Female.*

**Colour:** Head dark as in male, parafacial without sheen stripe on orbits/parafacial area; frontal stripe entirely orange-brown or infuscated posteriorly. Thorax, abdomen and wing membrane as in male.

**Head:** Eyes widely separated (by 1.6–1.7× their transverse width). Frontal stripe at level of middle orbital setae 1.7–1.8 times as wide as parafrontal; which widens anteriorly to about 1.3× width of postpedicel. Three pairs of orbital setae outwardly directed; 3 pairs of frontal setae, placed in a line with orbitals; crossed interfrontal setae well developed, placed at apex of frontal triangle. Prementum as in male but slightly more robust.

*Thorax*: Katepisternals 1+2, lower posterior seta nearly as long as upper.

Wing length up to 6 mm.

*Legs*: Mid femur with only 1–2 *pv*, no *av*; hind femur with 3–5 *av* (rather short), 1–2 *pv*, no *av*; fore tibia with 1 *ad*, 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *p/pv*; hind tibia with 1–2 *av*, 4 *ad*, 3 *pd*, 1 *pv*.

*Abdomen*: Postabdomen when fully extended as long as preabdomen. Tergites VI and VII largely reduced to pairs of dorsocentral plates, continuous across dorsal surface only along posterior margins of segments where they bear rows of rather long setulae; 6th and 7th spiracles both posteriorly situated on segment VI (6th more or less at edge of tergite VI, 7th within posteroventral corners of tergite VI); sternite VIII (Fig. 46) represented by pair of short sclerites which are widely separated and converge anteriorly, bearing several setulae; sternite X rather small; cerci long and slender, extending well beyond posterior margin of sternite X by length of sternite X; 3 spermathecae of more or less equal size (about 0.03–0.04 mm).

Types of *D. ventralis* unknown, presumed lost.

Material examined: KENYA: Aberdare Range, 1♂ Mt Kinangop, 8000 ft, x.1934, J. Ford (BMNH); 4♂ Nyeri Track, 10500 ft, ii.1934, F.W. Edwards (BMNH); 2♂ Mt Elgon, heath zone, 10500–11500 ft, ii.1935, F.W. Edwards (BME Afr. Exped.) (BMNH); 1♂ Mt Elgon, Kathita R., 9900 ft, 9.vii.1949, J.A. Riley (OUEC Exped., 1949) (BMNH). UGANDA: Ruwenzori Range: 1♂ Mt Karangora, 9900 ft, xi.1934–i.1935, F.W. Edwards; 15♂ 16♀ Namwamba Valley, 11000 ft, xii.1924–i.1935, E.G. Gibbons; 1♂ 11000–12000 ft, xii.1934–i.1935, F.W. Edwards (BME Afr. Exped., 1935); 1♂ Bigo, 11400 ft, 20–22.vii.1952, D. S. Fletcher (Ruwenzori Exped., 1952); Mt Elgon, 1♂ Balirungi, 11200 ft, 1.viii.1952; 2♂ Bulambuli, 9500 ft, viii.1934, J. Ford; 1♀ same locality, 8.viii.1934, on *Lobelia aberdarica*, J. Ford; 2♀ between Butandiga & Bulambuli, 8000 ft, 7.viii.1934, J. Ford (all BMNH).

Discussion: *D. ventralis* was described from ‘7♂ and several ♀’, from the bamboo forest at 2870 m on Mount Kenya. Stein states in the original description that sternite II [= sternite III] is elongated and armed on the posterior margin, with a row of long erect hairs pointing downwards. Emden (1951: 362) drew attention to these ventral setae, and figured the abdomen of a male of the species he recognised as *ventralis*. The type material of *ventralis* was collected on an expedition to East Africa by Ch. Alluaud and R. Jeannel (from 1911–12) (Stein 1914). No mention is made in the publication of the deposition of any of the material collected; presumably it is in Paris. I have been unable to locate it, and Dr A.C. Pont, who has visited the MNHN, informs me it is not there; nor are there any syntypes amongst material from Stein’s collection in ZMHU.

The material of *D. ventralis* in the BMNH (identified mainly by Emden) consists of two closely related species, both having long setae on sternite III. They are separated in the male sex mainly by the nature and length of these setae, and also those on sternite V. Following the figure of the abdomen in Emden (1951) I have applied the name *ventralis* to this species (longer setae), and have named the other (shorter setae) as *pseudoventralis* sp. n. It should be noted that the species renamed as *steiniella* by Emden also has long setae on sternite III in the male; this species has differently shaped surstyli, and more distinct vittae on the scutum. Emden (1951: 362) lists a record of “*ventralis*” from Natal, Weenen, H.P. Thomasset (in BMNH). I have been unable to find this specimen, but it is probably the species described in this paper as *D. ismayi* sp. n. Other specimens of *ismayi* from S. Africa have also been named “*ventralis*” by Emden, and I have seen no specimens of *ventralis* further south than Kenya and Uganda, though it may well occur in Tanzania.

Drew (1963: 249) listed “*Hylemya ventralis* (Stein)” as a North American species first described as *Chortophila ventralis* by Stein (1914). This is incorrect. The North American species was first described as *Hylemyia ventralis* by Stein in 1920. Currently the North American (and Japanese) species is known by the subsequent name *Delia pectorator* Suwa (1984) to avoid secondary homonymy. It has no relevance to the present Afrotropical species (see Griffiths 1993: 1447).

Life history: Unknown.

Distribution: *D. ventralis* appears to be confined to Equatorial Africa; all of the material I have seen is from Uganda and Kenya, generally at high altitudes, ranging from 2438 to 3658 m. *D. ventralis* occurs in Kenya on Mt Elgon, Mt Kenya (type locality), and the Aberdares. *D. pseudoventralis* sp. n. also occurs on all these ranges. However, *D. ventralis* is the only one of these two species recorded from the far west of Uganda in the Ruwenzori Range.

### ***Delia pseudoventralis* sp. n.**

Figs 56–62

Etymology: The specific name *pseudoventralis* is derived from the Greek *pseudo-* (false), and indicating its close relationship with *D. ventralis*.

Diagnosis:

♂ Compared with *D. ventralis*: Sternite III (Fig. 58) with setae on posterior margin shorter (tips not reaching past posterior margin of sternite), these setae not shorter medially; sternite V processes (Fig. 58) with shorter apical setae.

Description:

*Male.*

Apart from the chaetotaxy of the male abdominal sternites, this species is very similar to *D. ventralis*. Only a few small differences have been noted. Most of the material I have examined is now 70 years old, and in poor condition. More recent material from the Teleki Valley in Kenya (4.ii.1979) is distinguishable from both *ventralis* and *pseudoventralis* in colour and other small characters, but as the male abdominal sternal chaetotaxy is the same as the other specimens I identify them as *pseudoventralis*, but exclude these specimens from the type series of *pseudoventralis*.

*D. pseudoventralis* males differ from *ventralis* as follows:

*Head*: Eyes slightly more separated at narrowest point on frons (by about 1.5× diameter of anterior ocellus), so that frontal stripe very narrow, but not linear.

*Thorax*: Prealar seta shorter, only 0.2× length of posterior *npl*.

*Wing*: Last section of  $M_{1+2}$  1.6–1.7× length of preceding section (*ventralis* 1.8–1.9×).

*Legs*: Mid tarsomere 1 with some longer dorsal setulae, especially in basal half where they are fully as long as depth of metatarsus and semi-erect.

*Abdomen*: Tergites III and IV short and posteriorly excavated, separated from each other and from tergites II and V by wide areas of flexible intersegmental cuticle; sternite III (Fig. 58) without posterior margin as expanded as in *ventralis*, bearing rather more robust setae without fine curling tips of *ventralis*, these setae not tending to be divided

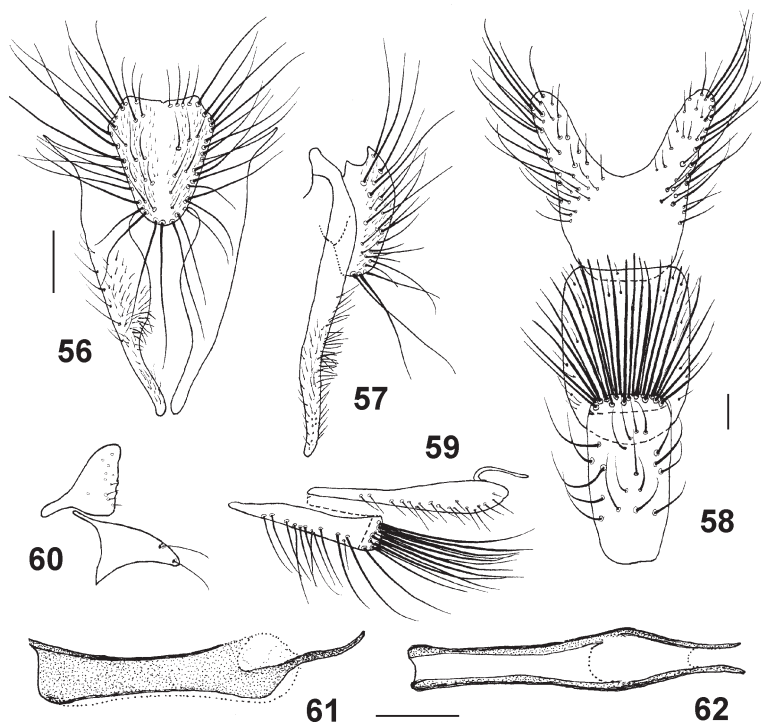
into two lateral groups and median setae longest, though not reaching past posterior margin of sternite IV. (As mentioned under *ventralis*, these setae are erectile and may be adpressed against the sternites, or erected at right angles to the plane of the sternites; both conditions can be found in dried specimens; see Figs 70, 71.) Sternite V (Fig. 58) has distal lateral setae shorter than *ventralis*, not longer than length of processes. Cercal plate and surstyli (Figs 56, 57) not significantly different from *D. ventralis*.

Holotype: ♂ KENYA: 'Holotype' [circular white label with red perimeter]; 'KENYA / Aberdare Range / x.1934 / B.M.E. Afr. Exp. / B.M. 1935-203' [rectangular white printed label]; 'NYERI TRACK / 10,500-11000 ft, / J. Ford' [rectangular white printed label]; 'HOLOTYPE ♂ / *Delia pseudoventralis* / D. M. Ackland' [white rectangular printed label with red perimeter] (BMNH). In reasonable condition.

Paratypes (all BMNH): KENYA: Mt Elgon: 9♂ heath zone, 10500-11500 ft, ii.1935, F.W. Edwards (B.M.E. Afr. Exped. B.M. 1935-203); 1♂ alpine zone, 12000-13000 ft, F.W. Edwards. Aberdare Range: 4♂ Nyeri Track, 10500-11000 ft, 28.x.1934, J. Ford (BME Afr. Exped., 1935-203); 3♂ same data, F.W. Edwards. Mt Kenya: 2♂ Kathita R., 9900 ft, 9.vii.1949, J.A. Riley.

Other material examined: KENYA: 3♂ 2♀ Teleki Valley, 4.ii.1979, on *Senecio brassica*, A. Smith; Aberdare Range: 7♀ Nyeri Track, 10000-11000 ft, x.1934, J. Ford (all BMNH).

Discussion: The males from the Teleki Valley in Kenya are much darker than from other material from Kenya; head and thorax dark brown to black, scutal vittae indistinct, frontal stripe and parafacials velvety black, wing base membrane more infuscated, prealar longer, dorsal surface of mid metatarsus with longer setulae, legs with longer setulae and hairs. As the sternal chaetotaxy is identical to the other material of *pseudoventralis*,



Figs 56-62. *Delia pseudoventralis* sp. n., male paratype (Kenya): (56) cercal plate and surstyli; (57) ditto, lateral view; (58) sternites III-V; (59) sternites III-IV, lateral view; (60) gonites; (61) distiphallus, lateral view; (62) ditto, ventral view. Scale bar = 0.1 mm.

these differences may not be significant. The two females caught at the same time as the males are not distinguishable from *ventralis*.

Life History: Unknown.

Distribution: Appears to be restricted to the mountains of Kenya; the specimens from the Teleki Valley in northern Kenya (Turkana) may represent a distinct species.

*Delia steiniella* (Emden, 1951)

Figs 47, 63–69

*Hylemyia trivittata* Stein, 1914: 132. Secondary junior homonym of *Pegomya trivittata* Stein 1898: 246, teste Hockett 1924: 35.

“*Hylemyia ventralis* Stein”: Malloch 1924b: 264.

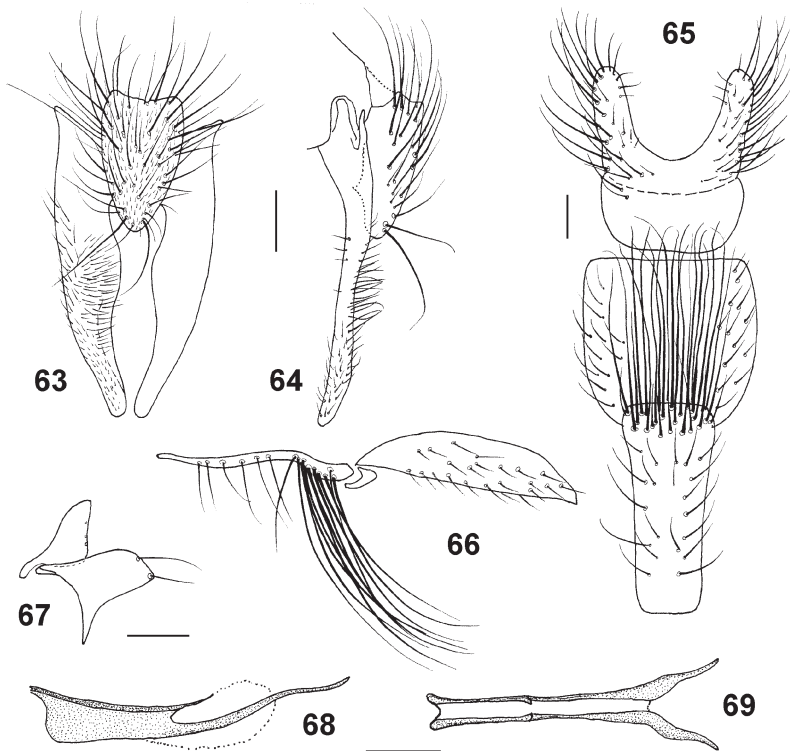
“*Hylemyia virgithorax* Stein”: Emden 1941a: 212, 214; 1941b: 266.

*Hylemyia steiniella* Emden, 1951: 363. Replacement name for *Hylemyia trivittata* Stein, 1914, not Stein 1898.

*Delia steiniella* (Emden): Pont & Ackland 1980: 717.

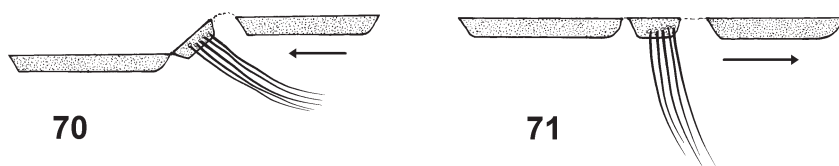
Diagnosis:

♂ Mid tibia without an *av*; prealar seta distinct, about half length of posterior *npl*; sternite III (Fig. 65) with erectile fan of long setae on posterior margin; surstylus (Fig. 63) not abruptly narrowed in distal third. Scutum with 3 distinct brown vittae.



Figs 63–69. *Delia steiniella*, male (Kenya): (63) cercal plate and surstyli; (64) ditto, lateral view; (65) sternites III–V; (66) sternites III–IV, lateral view; (67) gonites; (68) distiphallus, lateral view; (69) ditto, ventral view. Scale bar = 0.1 mm.





Figs 70–71. Diagram of sternal hinging mechanism in the *Delia ventralis* subsection: (70) sternite III with setae depressed; (71) ditto, setae erect. Arrow indicates direction of movement of sternite II.

### Description:

#### Male.

**Colour:** Frontal stripe, parafrontals, parafacials and genae black with silvery grey dusting; face and occiput black with silvery grey dusting. Antennae entirely black. Palpi black. Prementum black, thinly greyish dusted. Thorax greyish dusted; scutellum with 3 wide dark brownish vittae, median vitta from slightly to considerably wider than distance between presutural *acr* rows, continuing on to scutellum where it reaches tip; two wide lateral vittae commencing at 1st presutural *dc* and becoming wider postsuturally where it is wider than distance between intra-alar and 2nd postsutural *dc*; pleura grey dusted with shifting brownish patches. Abdomen viewed from behind light grey dusted with dark brown to blackish median vitta which widens out across posterior margins of tergites; sternites black with greyish dust; pregenital sclerite and hypopygium grey dusted. Wing membrane faintly greyish brown tinged; wing bases slightly brownish; squamae whitish with pale yellow border and fringe; halteres pale yellow. Legs entirely blackish with grey dust.

**Head:** Eyes with very sparse short hairs (only visible under high magnification), separated at narrowest point by about half diameter of anterior ocellus; frontal stripe narrow posteriorly; peristomal margin in lateral view not projecting beyond level of parafrontal angle; face not constricted ventrally (vibrissae separated by more than shortest distance from eye margin); 5–6 pairs of parafrontal setae on anterior half of frons; interfrontal setae short and fine; gena below lowest point of eye margin  $0.2 \times$  eye height; genal setae partly biserial. Postpedicel about twice as long as wide, apex not quite reaching peristomal margin; arista pubescent, longest hairs on dorsal surface near base about twice as long as diameter of slightly swollen base. Palpi slender. Prementum short. Occiput with numerous setulose hairs below occipital row.

**Thorax:** 3 pairs of presutural *acr* (middle pair longest), without hairs between rows; *acr:dc* ratio 10:6:10; 1+1 posthumeral; notopleural depression bare, apart from two long setae; prealar seta only about  $0.5 \times$  length of posterior *npl* and finer; scutellum with its dorsal surface largely bare medially, only 6–8 fine setulae inside of line between basal and subapical setae; 2 unequal proepisternals, 1 long proepimeral with 2–4 associated hairs; anepisternite without seta on its anterodorsal corner; proepisternal depression bare; katepisternals 1+2, lower posterior seta nearly as long as upper.

**Wing:** Vein C with short anterior spinules (those between breaks not longer than vein width, with pair before distal break hardly twice as long, lower surface largely bare, at most a few setulae basally; lower crossvein almost straight, joining  $M_{1+2}$  slightly obliquely; last section of  $M_{1+2}$   $1.7 \times$  length of penultimate section; lower squama smaller than upper. Wing length  $< 6$  mm.

Legs: Mid femur with 6 *pv* in proximal half, 5 shorter distal *pv*, 2 *p* preapicals; hind femur with 7 *av* in distal half, no developed *pv*; fore tibia with 1 *ad*, 1 *pv*; mid tibia with 1 *ad*, 1 *pd*, 2 *p* or *pv*; hind tibia with 3 strong *av*, 5 *ad*, 3 *pd* and 4–5 median *pv*; mid tarsomere 1 without developed dorsal setulae. Pulvilli of fore legs almost as long as tarsomere 5.

**Abdomen:** About as long as thorax, more or less parallel-sided and dorsoventrally compressed, hind marginal setae long and strong, placed some distance from posterior margins of tergites; tergites III and IV short and posteriorly excavated, separated from each other and from tergites II and V by wide areas of flexible intersegmental cuticle; sternite III (Fig. 65) longer than wide, (2.3–2.4 $\times$ ), with group of long multiserial setae on posterior margins, these setae when adpressed against sternite IV reach just past posterior margin of that sternite, and have fine tips; sternite IV (Fig. 65) more or less quadrilateral and bearing only short fine setae; sternite V processes (Fig. 65) about as long as basal part with lateral setae short and not becoming longer apically. Surstyli (Fig. 63) similar to *D. ventralis*, but inner margins less sinuate and distal third wider and not abruptly narrower but tapering, in lateral view (Fig. 64) also less sinuate. Cercal plate (Fig. 63) 1.5 times as long as wide, heart-shaped with narrowly rounded apical margin, bearing a few longer setae which are not however as long as cercal plate. Pregonite (Fig. 67) not much longer than wide, with two short setulae on distal margin; postgonite triangular without seta. Aedeagus with distal section (Figs 68, 69) almost twice (1.9 $\times$ ) as long as aedeagal apodeme, divided on distal half into pair of free paraphallic processes, dorsal prolongation membranous. Acrophallus absent. Aedeagal apodeme in dorsal view slightly expanded and excavated, 2.8 times as long as wide. Ejaculatory apodeme 0.45 $\times$  length of aedeagal apodeme, expanded at one end.

#### *Female.*

**Colour:** Dark as in male, with dense greyish dust; frontal stripe mainly black, but orange-brown in front, parafrontals grey dusted with inner margins infuscated, setae arising from brownish spots; parafrontals without sheen stripe. Thorax black in ground colour with grey dust; scutum with three wide brown vittae, median one extending beyond presutural *acr* and reaching tip of scutellum, lateral vitta reaching laterally to level of prealar seta. Wing membrane greyish with pale brownish base.

**Head:** Eyes widely separated (by 1.5 $\times$  their transverse width). Frontal stripe at level of middle orbital setae twice as wide as each orbit. Parafrontals widening anteriorly to about width of postpedicel. Parafrontal setae differentiated into 3 pairs of orbitals (anterior exclinate, posterior two setae reclinate) and 2–3 pairs of (inclinate) frontal setae, anterior pair much shorter; crossed interfrontal setae well developed. Prementum 0.36 times as long as head height.

**Thorax:** 3 pairs of presutural *acr*, middle pair longer and stronger than others, without hairs between rows; *acr:dc* ratio 10:9:10; prealar seta rather fine, but 0.5 $\times$  length of posterior *npl*; katapisternals 1+1.

**Wing:** Vein C with marginal spinules between breaks as long as vein width, or slightly longer, with longest of pair before distal break 1.5 times as long as small crossvein, with ventral surface between breaks with a few setulae; lower crossvein more or less straight, last section of  $M_{1+2}$  is 1.6 $\times$  length of preceding section. Lower squama smaller than upper. Wing length 5.5–6.0 mm.

Legs: Mid femur with 4 *av* and 1–2 very short *pv*; hind femur with 6 *av* in distal 2/3, no

*pv*; fore tibia with 1 *ad*, 1 *pv*; mid tibia with 1 very long and strong *ad*, 1 shorter *pd*, 2 *p* or *pv*; hind tibia with 2 *av*, 4–5 *ad*, 3 *pd*, no *pv*.

**Abdomen:** The postabdomen differs from *D. ventralis* Stein as follows: sclerites of sternite VIII (Fig. 47) largely separated by membrane, only joined on posterior margin, each bearing about 5 setulae in more than one row; sternite X with two longer setulae on lateral margins; cerci shorter than *ventralis*, with longer setulae.

Syntypes of *Hylemyia trivittata* Stein, 1914: KENYA: 4 ♀ Kijabé, in the Kikuyu escarpment, 2100 m, sta. 27, xii.1911. TANZANIA: 2 ♂ Kilimandjaro, upper margin of forest, near Bismarckhügel, 2700 m, iv.1911. All specimens apparently destroyed.

Other material examined: ETHIOPIA: 1 ♂ Mt Zuquala [Zukwala], c.9000 ft, 22.x.1926, J. Omer Cooper (BMNH); 1 ♀ Djem-Djem Forest, nearly 9000 ft, 24.ix.1926, H. Scott (BMNH); 1 ♂ [no locality] 38°31'E:9°03'N, alt. 2390 m, 15.viii.1938, Adugna, H. Coll., ex wheat (BMNH); 1 ♀ same data, 10.viii.1983, ex *Setaria* (BMNH); 2 ♂ 6 ♀ Sinana, 40°E:7°N, 2400 m, 5.xi.2002, ex wheat, J. Tafa; 1 ♀ same locality, 18.xi.2002, ex barley (1 ♂ 1 ♀ in DMA, rest returned to Nairobi). KENYA: 3 ♂ north of Mt Kenya, 6500–7250 ft, 19–20.ii.1911, T.J. Anderson, det. *Hylemyia ventralis* Stein by J.R. Malloch, det. *Hylemyia virgithorax* Stein by Emden, 1940 (BMNH); 1 ♂ Aberdare Range, Mt Kinangop, 9000 ft, 1.xi.1934, F.W. Edwards (BMNH); 1 ♂ Muguga, nr Nairobi, 6–12.i.1969, M.C. Birch (DMA); 3 ♂ Ruiru, 12.i.1969, at light, M.C. Birch (DMA). UGANDA: 1 ♀ Mt Elgon, Bulambuli, 9500 ft, viii.1934, J. Ford (BMNH).

**Discussion:** *H. trivittata* Stein was described from 4 ♀ and 2 ♂ from Kenya and Tanzania. The type material of this species appears to be lost (see under *D. ventralis*). Emden (1941a: 214) listed this species under the name “*Hylemyia virgithorax* Stein, 1913.” In 1951 (Emden 1951: 363) he was able to examine a female type of *H. virgithorax* and concluded that it was a species he had not previously seen (prealar seta absent and *acr* absent except towards scutellum). He accordingly supplied the replacement name ‘*steiniella*’ for *trivittata* Stein, 1914. The female of *steiniella* has a distinct prealar seta, and several presutural *acr*; occiput with numerous setulose hairs below upper postocular row.

According to the ICZN (1999), Article 59.3 states: “A junior secondary homonym replaced before 1961 is permanently invalid unless the substitute name is not in use and the relevant taxa are no longer considered congeneric”. As the name *steiniella* Emden was used in the Afrotropical Catalogue (Pont & Ackland 1980: 717), I interpret therefrom that *trivittata* Stein, 1914 is to be permanently rejected.

Syntypes of *Pegomyia trivittata* Stein (1898) have been examined by G. Griffiths (in litt.), who confirms that this species belongs to *Botanophila* in the current wide sense (or *Pegohylemyia* if this is broken down) and has been correctly interpreted in the North American literature.

**Life history:** *D. steiniella* has been bred from wheat and barley in Ethiopia, according to labels on specimens sent to me by Dr Maxwell Billah, Nairobi.

**Distribution:** Appears to be restricted to Ethiopia, Kenya and Uganda; also Tanzania (original description), material not seen.

#### Species solae

*Delia kigeziana* (Emden, 1941)

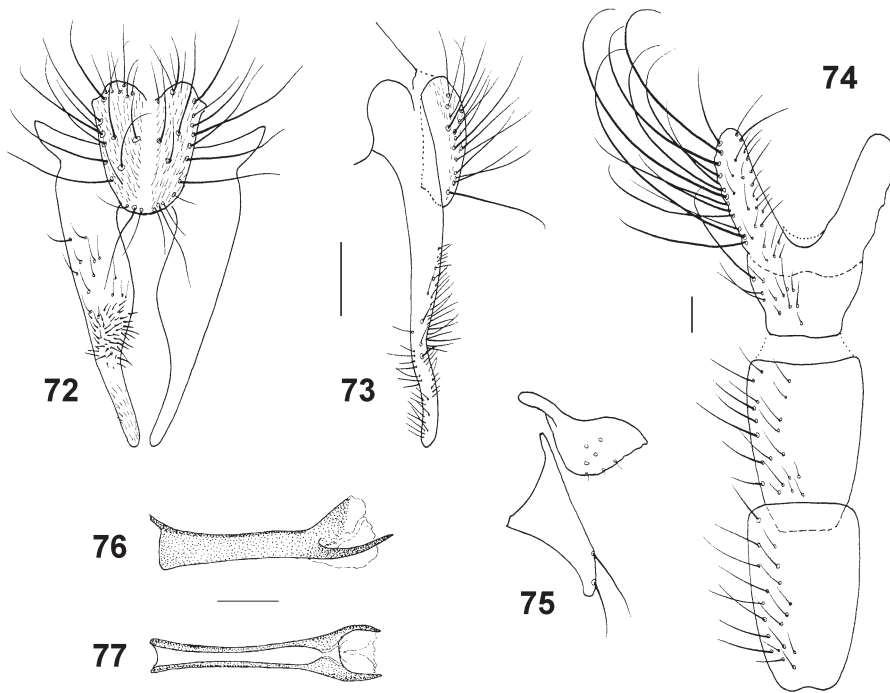
Figs 47, 72–77

*Hylemyia kigeziana* Emden, 1941b: 266; 1951: 360.

*Delia kigeziana* (Emden): Pont & Ackland 1980: 716.

#### Diagnosis:

♂ Genal setae biserial; upper occipital setulae long and fine, with numerous setulae below row; abdomen long and narrow; sternite V processes (Fig. 74) longer than base



Figs 72–77. *Delia kigeziana*, male paratype (Uganda): (72) cercal plate and surstyli; (73) ditto, lateral view; (74) sternites III–V; (75) gonites; (76) distiphallus, lateral view; (77) ditto, ventral view. Scale bar = 0.1 mm.

with very long lateral setae which have curling tips (longest nearly twice as long as processes).

#### Description:

##### *Male.*

**Colour:** Frontal stripe, parafrontals, parafacials, genae and face black in ground colour, with greyish dusting which varies from light grey to dark grey depending on point of view; parafacial at level of arista base, when viewed from directly in front, dark grey, contrasting with light grey dusted interfrontalia, genae and face; occiput dark grey. Antennae black, arista black. Palpi brownish black; prementum of proboscis black, thinly dusted. Thorax black in ground colour, with fairly dense shifting brownish grey dusting, pleura slightly shining in places; with 3–5 darker brown vittae which when viewed from in front with wide median vitta (wider than *acr* rows), two narrow vittae along *dc* rows (setae arising from dark spots), and two wide diffused lateral vittae; viewed from behind these vittae are more distinct as grey dusting between vittae is more paler and distinct; scutellum with trace of median brown vitta. Wing membrane very faintly brownish, base more brownish; veins brown; squamae whitish, fringe pale. Legs brown, thinly grey dusted, slightly shining. Abdomen black in ground colour, grey dusted when viewed from behind, with distinct wide black vitta (more than half width of abdomen) extending across anterior margins of tergites; tergites are partly shining from certain viewpoints. Prehypopygial tergites grey dusted.

**Head:** Eyes narrowly separated posteriorly (by diameter of anterior ocellus), frontal stripe at narrowest part half diameter of anterior ocellus); parafacial at level of arista slightly less than width of postpedicel, but becoming half this width below; peristomal margin hardly projecting, gena below lowest point of eye margin  $0.25\times$  eye height; face almost flat, distance between vibrissal setae more than distance between them and nearest eye margin; 4–5 pairs of parafrontal setae; 1 pair of fine interfrontal setulae of upper half of frons; genal setae biserial (1–3 upturned setae anteriorly above proclinate lower row). Postpedicel twice as long as wide, not reaching peristomal margin (by  $1/3$  its width); arista pubescent, longest hairs slightly longer than basal aristal diameter. Proboscis short and slender, with short prementum (not as long as palpi and as wide as fore tibia). Upper occipital setulae long and fine, with numerous setulae below row.

**Thorax:** 6 pairs of presutural *acr*, longest pair about half length of 1st presutural *dc*; *acr:dc* ratio 10:3:10, no hairs between rows; 2 posthumeral setae; notopleural depression bare apart from two strong setae; prealar varying from half length of posterior *npl*, to absent in some specimens; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katepisternals 1+2(3), lower posterior nearly as long as upper.

**Wing:** Vein C with anterior spinules as long as diameter of C, stronger spines before distal break at least twice this length, longer than small crossvein; lower surface of C bare. Large crossvein almost straight, last section of  $M_{1+2}$   $1.6\text{--}1.7\times$  length of preceding section. Lower squama shorter than upper and smaller in area. Wing length 5.5–5.7 mm.

**Legs:** Mid femur with 4 long *pv* in proximal half; hind femur with 5–6 long *av* on whole length (slightly longer than depth of femur, without curling tips), about 2–3 *pv* towards apex; fore tibia without *pv* apical, 1 *ad*, 1 *pv*; mid tibia without *av*, 0–1 *ad*, 1 *pd* at same level, 2 *pv*; mid tarsomere 1 with some slightly lengthened setae on dorsal surface (all same length, not fringe of long curved setae as in *metatarsata*); anterior and posterior setae on each mid tarsomere short and of equal length; hind tibia with 2–3 *av*, 4 *ad*, 3 *pd*, 3 *pv* in basal half. Pulvilli of fore legs slightly shorter than tarsomere 5.

**Abdomen:** Long and narrow, 3.5 times as long as greatest width, parallel-sided from tergites II to V, dorsoventrally compressed; sternite V somewhat projecting in lateral view; sternite III is 1.7 times as long as wide; sternite IV is 1.4 times as long as wide; both sternites III and IV (Fig. 74) with short discal and lateral setae; sternite V processes (Fig. 74) longer than base, with a few fine setulae on inner margins, lateral setae very long, with curling tips (longest nearly twice as long as processes, and very visible in dried specimens). Surstyli twice length of cercal plate (Fig. 72), in caudal view (Fig. 72) apical half narrower, inner margins sinuate, clothed with short setulae and hairs medially, in lateral view (Fig. 73) more or less straight, slightly sinuate apically. Cercal plate 1.2 times longer than wide, heart-shaped, apex rounded, bearing a few short setae apically. Pregonite (Fig. 75) becomes narrower apically, with 2 setae; postgonite without setae. Aedeagus with distal section (Figs 76, 77)  $1.4\times$  length of aedeagal apodeme, divided into pair of short free paraphallic processes, dorsal prolongation slightly shorter. Acrophallus absent. Aedeagal apodeme in dorsal view 2.5 times as long as greatest width, excavated on dorsal surface. Ejaculatory apodeme  $0.3\times$  length of aedeagal apodeme, expanded at one end.

*Female.*

**Colour:** More densely grey dusted than male. Head dark in ground colour, with dense brownish grey dust, less shifting than in male; frontal stripe varying from entirely dark brown to orange-brown in anterior half; parafacials at level of antennal base without shifting darker sheen-stripe or darker dusting; parafrontals darker on inner margins (along orbital setae); genae with brownish patch anteriorly close to vibrissa; occiput grey dusted; prementum thinly dusted, palpi dark brown. Thorax rather densely olive-grey dusted, with 3–5 vittae (as in male), those along *dc* more or less restricted to darker spots at bases of setae. Scutellum with brown median vitta (continuation of scutal median vitta as in male). Wing membrane tinged brownish grey, veins brown. Legs brownish black. Abdomen dark in ground colour, with wide median vitta (not as wide as in male).

**Head:** Eyes widely separated (by 1.6–1.7× their transverse width); frontal stripe at level of middle orbitals twice as wide as each parafrontal; parafrontals widening anteriorly to width of postpedicel. Parafrontal setae differentiated into 3 pairs of orbitals (all more or less exclineate), and 3 pairs of inclinate frontals, all in line; crossed interfrontal setae strong, placed at apex of frontal triangle; gena below lowest point of eye margin 0.5× eye height; genal setae uniserial. Proboscis relatively small and thin (as in male), prementum as long as palpi.

**Thorax:** *acr* shorter and finer than in male (hardly differentiated from accessory setulae and hairs); *acr:dc* ratio 10:2:10; 1+1 posthumeral; katepisternals 1+1 (sometimes short hair present below posterior seta). Prealar seta shorter than in male, sometimes completely absent.

**Wing:** Vein C with moderately long marginal spinules (twice as long as diameter of C), stronger pair before distal break equal to or longer than length of small crossvein; large crossvein straight, last section of  $M_{1+2}$  nearly twice (1.85×) length of preceding section. Wing length 4.5 mm.

**Legs:** Hind femur with 6 *av* (4 in distal half), and 1–2 apical *pv*; fore tibia with 1 *ad*, 1 *pv*; mid tibia without *av*, 1 long *ad* and 1 slightly shorter *pd* at same level, 1–2 *pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd* (distal one longest), 2 erect *pv* in basal half.

**Abdomen:** Postabdomen when fully extended about as long as preabdomen. Very similar to *D. bracata* Rond., differing only as follows: sclerites of sternite VIII (Fig. 48) each with 3–4 setulae on posterior margin; sternite X more robust and posterior margin more rounded.

**Lectotype** (examined): ♂ 'LECTOTYPE' [white circular printed label with purple border]; 'S. W. UGANDA / Kigezi Province / xi.1934 / B.M.E. Afr. Exp. / B. M. 1935–203' [rectangular printed white label]; 'Summit of / Mt Sabinio / 11–11500 ft / J. Ford' [rectangular printed white label] (BMNH). Lectotype fixed by Emden (1951: 361). In reasonable condition, with left hind tarsus missing.

**Paralectotypes** (all BMNH): UGANDA: 14♂ 5♀ Kigezi Prov., Mt Sabinio, alt. 11000–11500 ft, xi.1934, J. Ford; 15♂ 4♀ Kigezi Dist., Mt Mgahinga, alt. 10000–11000 ft, xi.1934, F.W. Edwards; 1♂ 1♀ same locality, alt. 8000 ft, 20.xi.1934, F.W. Edwards; 7♂ 5♀ same locality, alt. 11000 ft, 22.xi.1934, F.W. Edwards; 1♀ Mt Muhavura, 13500 ft, xi.1934, J. Ford; 1♂ 1♀ Kigezi Dist., Mt Muhavura, alt. 10000–12000 ft, 20.xi.1934, F.W. Edwards; 1♂ Kigezi Dist., Kanaba, alt. 7800 ft, xi.1934, F.W. Edwards.

**Discussion:** Emden (1951: 36) listed 1♂ type, 43♂ and 22♀ paratypes of *D. kigeziana* making a total of 66 specimens; I have only found 1♂ lectotype, 39♂ and 18♀ paralectotypes, making a total of 58 specimens. The whereabouts of the other types is unknown. *D. kigeziana* are apparently known only from the original material.



Life history: Unknown.

Distribution: S.W. Uganda, at altitudes 2377–4115 m.

***Delia tibila* sp. n.**

Figs 49, 78–83

**Etymology:** The specific name *tibila* refers to the type locality ‘Tibila’ and is a noun in apposition.

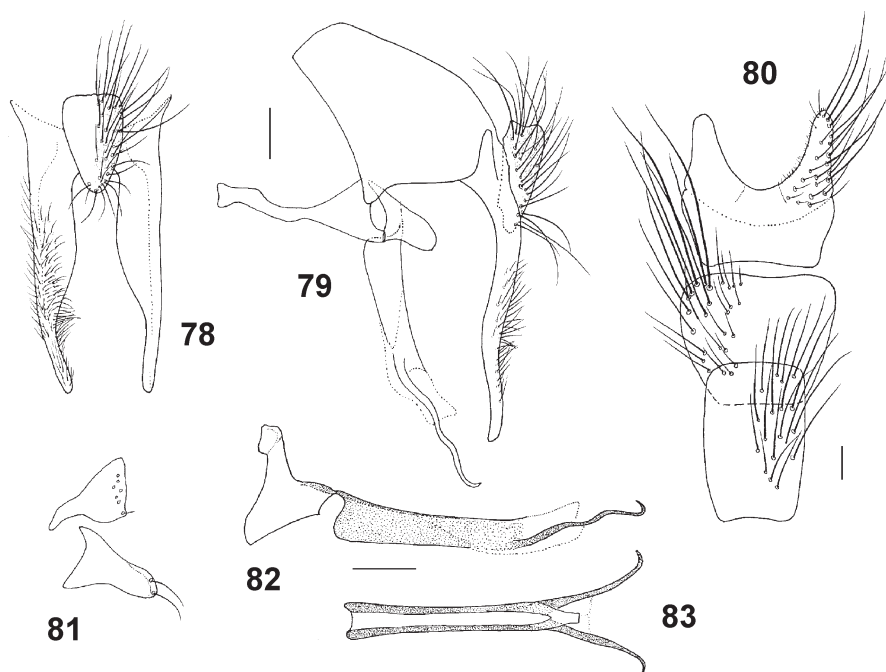
**Diagnosis:**

♂ Genal setae biserial; arista long pubescent, total width of hairing half width of postpedicel; 3 pairs of presutural *acr*; scutellum with 8–12 hairs on disc; vein C with robust anterior spicules, 1.5 times as long as diameter of vein; mid tibia without *av* or *ad* setae; hind tibia with 3–4 *av*; sternite V with long posterior lateral setae. Genitalia: paraphalli long and undulating in lateral view.

**Description:**

*Male.*

**Colour:** Frontal stripe, parafrontals, parafacials, genae and face black in ground colour, with light to dark grey dusting, viewed from in front parafrontals, parafacials and interfrontalia matt sooty black, from a lower angle frontal stripe and face become light greyish white dusted, contrasting with rest of head; from above parafrontals and



Figs 78–83. *Delia tibila* sp. n., male paratype (Ethiopia): (78) cercal plate and surstyli; (79) hypopygium, lateral view; (80) sternites III–V; (81) gonites; (82) distiphallus and basiphallus, lateral view; (83) distiphallus, ventral view. Scale bar = 0.1 mm.

parafacials are light grey; parafacial at level of arisal base without shifting sheen-stripe; occiput black with grey dust. Antennae entirely matt black. Palpi dark brown; prementum of proboscis dark brown, thinly dusted. Thorax black or dark brown in ground colour, with varying amounts of grey-brown dusting, pleura with shifting semi-shining patches; scutum with very indistinct brown vittae and grey shifting patches; viewed from behind median and lateral vittae are more distinct, lateral declivities grey dusted; scutellum as scutum, basal corners brown. Wing membrane brownish tinged, base of wing not significantly darker; veins brown; squamae creamy white, fringe white. Halteres pale yellow. Legs black, thinly dusted and slightly shining. Abdomen black in ground colour, viewed from above with shining black and dusted grey areas, from behind densely grey dusted with black median vitta (on tergite II slightly wider than hind tibia, on tergites III and IV becoming wider, on tergite V covering most of tergite except for grey dusted anterior lateral areas. Prehypopygial tergites black, thinly dusted, semi-shining; sternite V processes brown with reddish tinge.

*Head:* Eyes narrowly separated posteriorly (by diameter of anterior ocellus or slightly less), frontal stripe linear at narrowest part; parafacial at level of arista equal to width of postpedicel; peristomal margin not projecting, face slightly concave, distance between vibrissal setae more than distance between them and nearest eye margin. Gena below lowest point of eye margin  $0.30\text{--}0.35\times$  eye height; 6–7 pairs of frontal setae; 1 pair of fine interfrontal setulae on upper half of frons, closer to uppermost pair of frontal setae than to anterior ocellus; anterior genal setae biserial (4–5 upturned setae immediately posterior to subvibrissal setae); postpedicel twice as long as wide, not reaching peristomal margin (by  $0.25\times$  its width); arista long pubescent, longest hairs (on dorsal surface) twice length of basal arisal diameter, total width of hairing about half width of postpedicel. Proboscis with prementum slightly longer than palpi and as wide as postpedicel. Upper occipital setulae moderately long, with short row of setulae below row.

*Thorax:* 3 pairs of presutural *acr*, middle pair longer than others ( $2/3$  length of 1st presutural *dc*), biserial, without hairs between rows; *acr:dc* ratio  $10:6:10$ ; 3 posthumeral setae, outer seta short and fine (about  $1/3$  length of posterior posthumeral and much thinner, with 4–5 associated hairs; notopleural depression bare apart from two strong setae; prealar very small or absent (represented by fine setula which is only slightly differentiated from scutal accessory hairs; scutellum with about 12 hairs on disc centrally and basally; anepisternite without developed upper anterior setula; 2 proepisternal setae, one is half length of other, without hairs; 1 proepimeral seta, with 5–6 associated hairs; katepisternals 1+2, lower posterior nearly as long as upper.

*Wing:* Vein C with anterior spinules robust, 1.5 times as long as diameter of C, stronger spines before distal break as long as small crossvein, or slightly longer; lower surface of C bare. Large crossvein straight, last section of  $M_{1+2}$   $1.8\text{--}1.9\times$  length of preceding section. Lower squama not quite as large as upper. Wing length 5.5 mm.

*Legs:* Mid femur with 4 erect robust *pv* in proximal half (longest  $1.5\times$  depth of femur); hind femur with about 5 *av* in distal half, only 2–3 preapical, short blunt (? sometimes pointed) seta is present ventrally at extreme base of femur and only half as long as depth of femur; fore tibia with short pointed apical *pv*, 2 *pv*; mid tibia without *av* or *ad*, 1 *pd*, 1(2) *pv*, all very short, anterior surface of tibia with numerous semi-erect setulae and hairs which are as long as diameter of tibia; mid tarsomere 1 without lengthened

dorsal setae or fringe; hind tibia with 3 *av*, 4 *ad*, 3 *pd*, 5–6 short *pv* on proximal 3/4. Pulvilli of fore legs as long as tarsomere 5.

*Abdomen*: About 2.7 times as long as greatest width (at basal margin of sternite III), dorsoventrally compressed. Tergites III–V with long hindmarginal setae (about as long as tergites), those on tergites II–IV separated from actual margin by width of hind tibia. Sternite III (Fig. 80) narrower than IV (1.5 times longer than wide); sternite IV (Fig. 80) wider than long (0.7 times longer than wide) with group of 7–8 long setae on each posterior corner, which reach to tip of processes of sternite V; sternite V processes (Fig. 80) shorter than base, with numerous lateral setae not longer than processes. Surstyli (Fig. 78) twice as long as length of cercal plate, in caudal view (Fig. 78) wider basally, then abruptly narrowing in distal third, in lateral view (Fig. 79) sinuate. Cercal plate (Fig. 78) 1.7–1.8 times longer than wide, rounded apically, bearing a few short setae which are not longer than cercal plate. Pregonite (Fig. 81) longer than wide, with 2 short distal setae; postgonite (Fig. 81) triangular with or without minute setula on ventro-apical corner. Aedeagus with distal section (Figs 82, 83) slightly more than twice as long as aedeagal apodeme, divided on distal half into pair of free paraphallic processes which are very slender and sinuate in lateral view, diverging in dorsal view. Acrophallus absent. Aedeagal apodeme 2.25 times as long as anterior width in dorsal view, in lateral view anterior margin downturned. Ejaculatory apodeme 0.3 times as long as aedeagal apodeme, widely expanded at one end.

*Female.*

*Colour*: Dark in ground colour with shifting brown and grey dusting; frontal stripe dark brown posteriorly, orange-brown on anterior half, viewed from in front at a low angle frontal triangle is light brownish grey dusted with dark brown velvety round patch between anterior ocellus and cruciate interfrontals, and similar patch surrounding ocellar tubercle; parafrontals brassy brown dusted when viewed from above, which becomes darker brown from in front; parafacials brassy dusted; gena with darker shifting brown patch behind vibrissal area; occiput grey to brownish dusted; prementum dark brown, thinly dusted, semi-shining in parts; palpi dark brown. Thorax dark in ground colour, with shifting brownish olive to grey dusting; scutum with traces of shifting vittae and semi-shining areas, viewed from behind darker medially, two wide lateral vittae which are very indistinct, lateral declivities lighter grey dusted; pleura with weakly shining brown patches, especially on anepisternum and katepisternum. Wing membrane weakly brownish tinged, hardly darker basally; squamae white with whitish fringe. Legs dark brown, weakly dusted and semi-shining. Abdomen dark in ground colour, viewed from above tergites with many shining patches especially medially and laterally, viewed from behind distinct shining black median vitta becomes visible, anterior margin of tergite II and posterior half of tergite IV darker, otherwise greenish grey dusted.

*Head*: Eyes separated by 1.4–1.5× their transverse width; frontal stripe at level of middle orbitals twice as wide as each parafrontal which widen anteriorly to slightly more than width of postpedicel; parafacial at narrowest part slightly less than width of postpedicel; gena below lowest point of eye margin 0.33× eye height; frontal setae differentiated into 3 pairs of exclineate orbitals, and 2 pairs of inclinate frontals (all in line); crossed interfrontals strong, placed just above middle of frontalia; 4–5 anterior genal setae immediately posterior to subvibrissal setae biserial and upwardly directed. Prementum and proboscis as in male. Upper occipital setae with scattered row of setulae below.

*Thorax*: 2–3 presutural setae, one pair longer than rest (half length of 1st presutural *dc*); notopleural depression bare apart from two strong setae. Prealar seta short and fine, but distinct (1/3 to 1/2 length of posterior *npl*); scutellum with only 2–4 short hairs on disc; anepisternite without developed upper anterior setula; 2 proepisternal setae, one long, one short; one strong proepimeral seta with 2–3 associated hairs; katapisternals 1+1 (posterior seta with short hair below it).

*Wing*: Vein C with anterior spinules strong and rather long, those on section between costal breaks about 2.5× costal diameter, pair of stronger spines before distal break nearly 1.5× length of small crossvein; large crossvein straight, last section of  $M_{1+2}$  1.7–1.8× length of preceding section; lower squama smaller in area than upper. Wing length 4.7 mm.

*Legs*: Mid femur with a short *av* in proximal half, 2–3 short *pv* in proximal half; hind femur with 4–5 *av* in proximal half, which are not longer than greatest height of femur, only 2–3 short preapical *pv*; tibia with a strong *ad* (just below middle), a strong *pv*, more or less at same level (in one paratype on left leg only there is an extra *pv* towards apex); mid tibia without *av*, 1 long and strong *ad*, 1 *pd*, 2 *pv*; mid tibia with 2–3 *av*, 4 *ad*, 3 *pd*, without *pv*.

*Abdomen*: About 1.6 times as long as wide (at anterior margin of tergite III); tergites with rather short hindmarginal setae, most of them only half as long as tergites, including those on tergite V; postabdomen (Fig. 49) almost identical to *D. bracata*, perhaps cerci a little more slender.

Holotype: ♂ ETHIOPIA: 'Holotype' [circular white label with red perimeter]; 'ETHIOPIA/Tibila/7.xi.1968/Coll. R. Kano and T. Ohse' [rectangular white printed label]; 'HOLOTYPE ♂ / *Delia tibila* / D. M. Ackland' [rectangular red printed label]. In good condition, abdomen dissected and mounted in glycerol in a plastic tube (BMNH).

Paratypes: 2♂ 1♀ same data as holotype (BMNH).

*Discussion*: The absence of a sclerotized acrophallus combined with the shape of the surstyli (abruptly tapering in distal third in caudal view, with a tuft of hairs in inner margins) and longer setae on sternite IV, suggests that this species is correctly placed in the *D. ventralis* subsection.

*Life history*: Unknown.

*Distribution*: Only known at present from the type locality in Ethiopia.

*Delia coarctata* section

*Delia mutans* subsection

*Delia andersoni* SPECIES GROUP

*Delia andersoni* (Malloch, 1924)

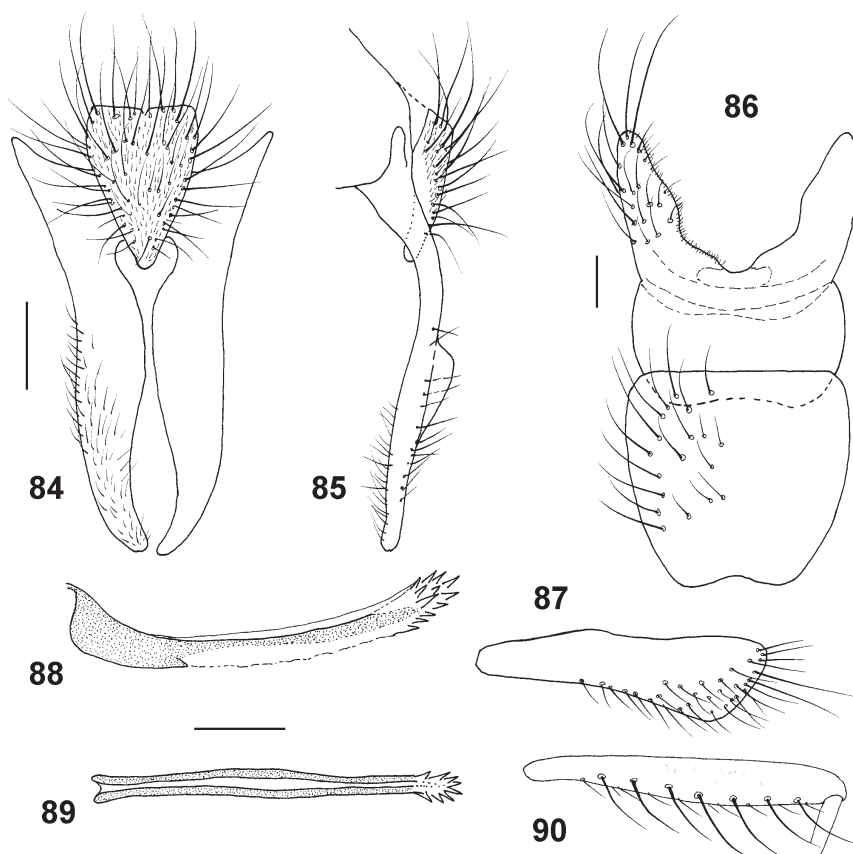
Figs 84–90, 99

*Hylemyia andersoni* Malloch, 1924b: 262, 264; Curran 1929: 247; ?Cuthbertson 1932: 32; Emden 1941b: 266; 1951: 333, 359.

*Delia andersoni* (Malloch): Pont & Ackland 1980: 716.

*Diagnosis*:

♂ Arista practically bare, longest hairs shorter than basal diameter; eye margins on frons almost touching; occiput below upper occipital row bare; prealar seta absent; presutural *acr* fine and hair-like, rows close together without hairs between rows; large crossvein almost straight; fore tibia with a short pointed *pv* apical seta; *ad* on mid tibia short or absent, only one *pd* seta.



Figs 84–90. *Delia andersoni*, male (Kenya): (84) cercal plate and surstyli; (85) ditto, lateral view; (86) sternites IV–V; (87) sternite V, lateral view; (88) distiphallus, lateral view; (89) ditto, lateral view; (90) hind femur. Scale bar = 0.1 mm.

#### Description:

##### *Male.*

**Colour:** Frontal stripe, parafrontals, parafacials, genae and face varying from blackish to orange in ground colour, with thin greyish dusting; parafacial at level of arisal base orange to blackish, viewed from above silvery white dusted, occiput dark grey. Antennae brownish black. Palpi brown; prementum of proboscis dark brown with thin grey dust, hence somewhat shining. Thorax dark in ground colour, with grey dusting, scutum viewed from behind with wide median vitta (wider than *acr* rows), traces of narrow dark vittae along *dc* rows (sometimes absent), and wider lateral vittae, all more distinct presuturally, very faint postsuturally. Scutellum with trace of brown median vitta. Abdomen dark brown in ground colour, with shining patches when viewed from above, densely greenish grey dusted when viewed from behind, with distinct wide brown median vitta (about as wide as depth of hind femur). Prehypopygial tergites grey dusted. Wing membrane pale brownish tinged in basal half; veins pale brown; squamae paler than wing base. Legs brown to orange-brown, slightly shining.

*Head:* Eyes separated by less than diameter of anterior ocellus, frontal stripe and parafrontals linear at narrowest point between eyes; parafacials medially 0.6–0.8× width of postpedicel; peristomal margin hardly projecting; gena below lowest point of eye margin 0.20–0.22× eye height; face almost flat, distance between vibrissal setae more than distance between them and nearest eye margin; 4 pairs of parafrontal setae; 1 fine pair of interfrontal setae; genal setae uniserial anteriorly (with 1 seta placed above row). Postpedicel twice as long as wide, not reaching peristomal margin by half its length; arista almost bare, longest hairs less than basal diameter. Prementum short (not as long as palpi) and as wide as fore tibia. Palpi slender. Occiput with upper occipital setulae moderately long and fine without setulae below row.

*Thorax:* Presutural *acr* fine and hair-like (not differentiated from accessory setulae), biserial, *acr:dc* ratio 10:2:10, no hairs between rows; 2 posthumeral setae; notopleural depression bare apart from two strong setae; prealar completely absent, or sometimes fine hair is present; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katapisternals 1+2 (sometimes short hair below anterior seta), lower posterior 0.7 times as long as upper.

*Wing:* Vein C with anterior spinules 1.25–1.5 times as long as diameter of C, stronger spines before distal break as long as small crossvein; lower surface of C bare. Large crossvein almost straight, last section of  $M_{1+2}$  1.6–1.7× length of preceding section. Lower squama smaller in area than upper. Wing length 4.25–4.5 mm.

*Legs:* Hind femur (Fig. 90) with 4–7 *av* in distal half, 1 apical *pv*; fore tibia with short fine pointed apical *pv*, and 1 *ad*, 1 *pd*, 1 *pv*, all short; mid tibia with very small *ad* (sometimes absent), only 1 *pd*, 2 *pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, 1–2 short *pv*.

*Abdomen:* About 2.5 times as long as greatest width (at basal margin of sternite III), parallel sided, dorsoventrally compressed; sternite IV (Fig. 86) as wide as base of sternite V, quadrilateral, with only short setulae; sternite V (Fig. 86) rather large, and projecting downwards in lateral view, processes 1.5× length of base, widened medially, with a few short fine hairs on inner margins, lateral setae (Fig. 87) not longer than processes. Surstyli (Fig. 84) 1.8–1.9× length of cercal plate, in caudal view expanded medially, then tapering and converging towards apices, inner margins sinuate, clothed with fine hairs, in lateral view (Fig. 85) slender, angled basally, apical half with expanded flange on posterior margin. Cercal plate (Fig. 84) heart-shaped, 1.2× longer than wide, narrowly heart-shaped, apex pointed, bearing a few short setae. Pregonite with 2 setae; postgonite triangular without setae. Aedeagus with distal section (Figs 88, 89) 2.5 times as long as aedeagal apodeme, without free paraphallic processes; in lateral view extremely slender, apically membranous and bearing 8–12 spicules. Aedeagal apodeme slender in lateral view, in dorsal view 2.6 times as long as greatest width, constricted medially, distal end joining phallopore rather wide. Ejaculatory apodeme half as long as aedeagal apodeme, long and slender.

*Female.* Similar to male, except for the following:

*Colour:* Parafrontals grey dusted but darkened brown between orbital setae row and eye margin; gena with shifting darker patch on anterior half which in certain lights reaches from eye margin to vibrissal seta; anepisternite with suffused brownish patch anteriorly; scutum more distinctly 5-vittate than male, *dc* lying on distinct narrow vitta and arising from dark spots; abdomen with distinct brown median vitta, wider basally



on tergites forming triangles, bordered by shifting grey dust, especially when viewed from behind; vitta on tergite V not reaching posterior margin. Head: eyes widely separated by 1.5–1.6× their transverse width; frontal stripe at level of middle orbitals twice as wide as each parafrontal; parafacial widening anteriorly to slightly more than width of postpedicel; parafrontal setae differentiated into 3 pairs of orbitals (all more or less exclinate), and 2 pairs of frontal setae; crossed interfrontals strong, and placed at apex of frontal triangle; gena below lowest point of eye margin 0.35× eye height.

*Thorax*: *acr* very fine and short (as in male); katepisternals 1+1; prealar seta absent, or in some specimens represented by short setula. Wing length 4.5 mm.

*Legs*: All setae stronger and longer than in male. Hind femur with 3–4 *av* in distal half, 1 preapical *pv*; fore tibia with 1 *av* and 1 *pv*; mid tibia with 1 long and strong *ad*, a slightly shorter *pd* at same level, 2 *pv*; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, no *pv* hairs or setulae.

*Abdomen*: Slightly longer than thorax (1.15×), dorsoventrally compressed, viewed from above widest at anterior margin of tergite II where it is half as wide as long; hind marginal setae on tergites short and weak (not longer than half length of each tergite), and not erect. Postabdomen (Fig. 99) practically identical to *D. braccata*.

Holotype: ♂ 'Holotype' [circular label with red perimeter]; 'N. of Mt Kenia / 8,300 ft / 18.2.11 / Brit. E. Africa' [rectangular white label]; 'T. J. Anderson' [rectangular white label]; 'Pres. by Inst. Bur. Ent. Brit. Mus. 1924–242' [rectangular white label]; '*Hylemyia andersoni* / det. J. R. Malloch, Type' [rectangular white label with black perimeter] (BMNH). Holotype in good condition, but antennae missing (as noted by Malloch), also right mid and hind legs missing.

Other material examined: ETHIOPIA: 1♂ Addis Ababa, Entotto, alt. 3000 m, 17.x.1968, R. Kano & T. Ohse (DMA). KENYA: 2♂ 1♀ Aberdare Range, Nyeri Track, alt. 10500 ft, 28.x.1934, J. Ford (BMNH); 1♂ Aberdare Range, Mt Kinangop (1°05'N:34°40'E), alt. 10000 ft, 26.x.1934, F.W. Edwards (BMNH); 1♂ 13♀ Mt Elgon, alt. 10250 ft, 24–25.i.1972, C.F. Huggins (BMNH); 1♀ Chyulu Hills, Tsavo West Nat. Park, 24–26.ix.1971, C.F. Dewhurst (BMNH); 1♂ Muguga, nr Nairobi, 6–12.i.1969, M.C. Birch (DMA); UGANDA: 1♂ Imatong Mts, alt. 10000 ft, ii.1936, D.R. Buxton (BMNH); 1♂ Mt Elgon, between Butandiga & Bulambuli, alt. 8000 ft, 7.viii.1934, J. Ford (BMNH).

Life history: Cuthbertson (1932: 32) reported the occurrence of *D. andersoni* in Zimbabwe "collected in cattle kraals, vleis etc., at Salisbury, Gatooma and Balla Balla during the wet season. Larvae were found in some stems of rapoko (a cereal), *Eleusine coracana*, sent from Domboshava Mission in March, 1932". There is a female of *D. flavibasis* in the BMNH with the following labels "1♀ Domboshava, iii.1932, larvae in stems of rapoko (*Eleusine coracana*) with larvae of *Hylemyia andersoni* Mall., det. *Hylemyia arambourgi* Ség. by Emden, 1940." I have not been able to trace any other material from this locality, and more evidence is required before this record can be accepted.

Distribution: *D. andersoni* is only known from Ethiopia, Kenya, Uganda. Curran (1929: 247) recorded this species from Kivu, Belgian Congo, now Democratic Republic of the Congo, but this record needs confirmation.

### ***Delia endorsina* sp. n.**

Figs 91–98

Etymology: The specific name *endorsina* is an anagram of *andersoni* and indicates its close relationship with *D. andersoni*.

**Diagnosis:**

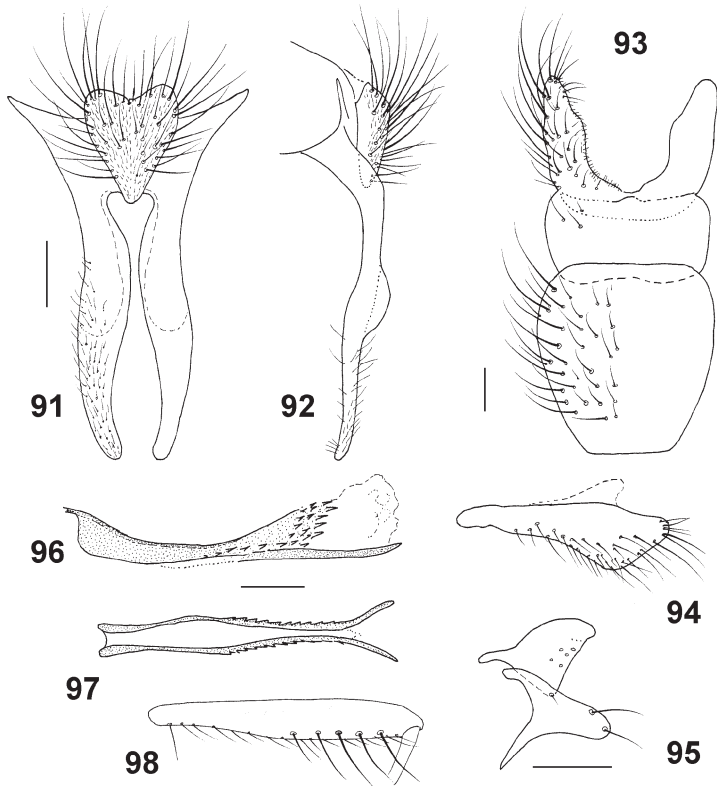
♂ Similar to *D. andersoni* and only reliably separated by examination of the genitalia.

**Description:***Male.*

Differs from *D. andersoni* as follows: mid tibia with distinct *ad*, *pd*, and 2 *pv*; these are not very long, but in the material available they are stronger than the setae (when present) on the mid tibia in *D. andersoni*. Surstyli (Figs 91, 92) longer in proportion to length of cercal plate, length from the apex of the cercal plate to apex of surstyli is 2.2–2.4× length of cercal plate (in *andersoni* 1.76–1.86×); distal section of aedeagus (Figs 96, 97) bearing long paraphalli (absent in *andersoni*) which reach slightly beyond apex of distal section, and which are (in ventral view) strongly diverging, spines of the distal section beginning medially and ending well before the apex. Wing length 4.5 mm.

*Female.*

**Head:** As in the female of *andersoni* the setae on mid tibia are much stronger than in the male; 2 of the 3 ♀ paratypes of *endorsina* differ from the ♀ of *andersoni* in having a small but distinct prealar seta, darker and more distinct scutal stripes, the median one



Figs 91–98. *Delia endorsina* sp. n., male paratype (Malawi): (91) cercal plate and surstyli; (92) ditto, lateral view; (93) sternites IV–V; (94) sternite V, lateral view; (95) gonites; (96) distiphallus, lateral view; (97) ditto, ventral view; (98) hind femur. Scale bar = 0.1 mm.

wider, especially its continuation onto the scutellum; frontal stripe darker, including the frontal triangle (which is not so clearly delineated), and the inner half of the parafrontals, the dusting being brassy brown. Wing length 5 mm.

Holotype: ♂ MALAWI: 'Nyika National Park / 2.iii.1987, 2607 m / J. & A. Londt, Nganda / summit-grassveld' (NMSA).

Paratypes: 1♂ 3♀ same data as holotype (NMSA).

Discussion: *D. endorsina* differs from *andersoni* mainly in the structure of the distiphallus, which has two long narrow paraphalli (absent in *andersoni*); the denticles on the distiphallus end below the dorsal prolongation, ending well before the tips of the paraphalli.

Life history: Unknown.

Distribution: Known only from the type locality in Malawi.

*Delia albula* section  
*Delia hirticrura* subsection  
*Delia bisciliata* (Emden, 1941)

Figs 100, 103–108

*Hylemyia bisciliata* Emden 1941b: 266; 1951: 358.

*Delia bisciliata* (Emden): Pont & Ackland 1980: 716.

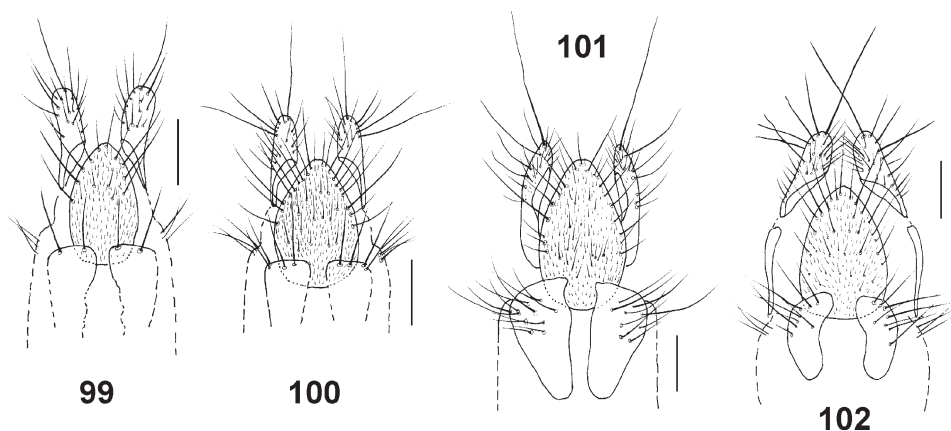
Diagnosis:

♂ Peristomal margin projecting beyond level of insertion of vibrissal setae; genal setae uniserial; prealar seta about 0.5 times as long as posterior *npl*; fore tibia with short blunt *pv* apical spur; hind tibia with full row of 10–12 *av*, 6 *ad*, 3–4 *pd* and about 12 *pv* which are partly biserial.

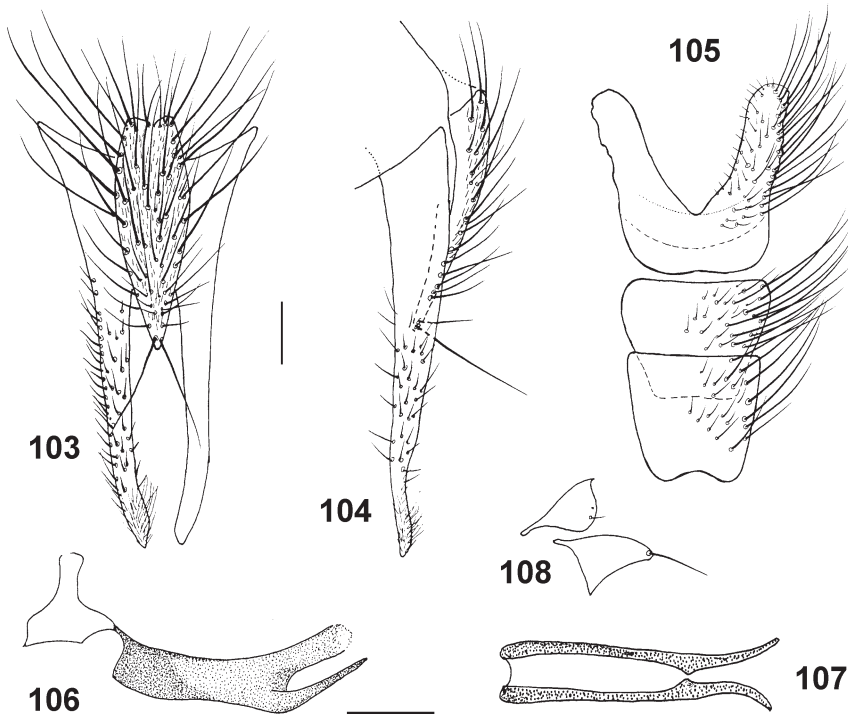
Description:

*Male*.

*Colour*: Frontal stripe, parafrontalia, genae and face black in ground colour, with dark



Figs 99–102. *Delia* spp., female abdomen, terminal segments, ventral view: (99) *D. andersoni* (Kenya); (100) *D. bisciliata* (Kenya); (101) *D. metatarsata* (Kenya); (102) *D. cameroonica* sp. n. (Cameroon). Scale bar = 0.1 mm.



Figs 103–108. *Delia bisciliata*, male paratype (Kenya): (103) cercal plate and surstyli; (104) ditto, lateral view; (105) sternites III–V; (106) basiphallus and distiphallus, lateral view; (107) distiphallus, ventral view; (108) gonites. Scale bar = 0.1 mm.

grey dusting which shifts according to angle of vision; head viewed from above with matt velvety black frontal stripe contrasting with golden brassy to whitish parafacials, from in front frontal stripe is light grey dusted with parafacials adjacent antennae darker than genae; genae with shifting areas of lighter and darker patches of dusting; occiput dark grey, blackish above. Antennae black with lighter grey dusting; arista black. Palpi black; prementum of proboscis black with thin grey dust. Thorax black in ground colour, with shifting areas of dark brownish grey dust and shining patches; scutum viewed from above with lighter grey vittae mainly visible presuturally; humeri lighter grey dusted; scutellum concolorous with thorax. Wing membrane brownish tinged; veins brown; squamae slightly paler than wing base, with light brown margin and paler fringe. Halteres pale brown. Legs black. Abdomen black in ground colour, laterally dusted when viewed from behind, with wide black median vitta which covers median third of width of abdomen and consists of triangular marks on each tergite with base along anterior margins of tergites. Prehypopygial tergites thinly grey dusted.

*Head:* Eyes separated posteriorly (by at least twice diameter of anterior ocellus), frontal stripe distinct throughout; parafrontals linear; parafacials medially equal to width of postpedicel; peristomal margin slightly projecting in lateral view, slightly in front of profrons, and projecting beyond level of vibrissae; gena below lowest point of eye margin  $0.33\text{--}0.35\times$  eye height; face concave, distance between vibrissal setae slightly more than  $(1.3\times)$  distance between them and nearest eye margin. Four pairs of parafrontal

setae on anterior half of frons; 1 pair of rather strong interfrontal setulae, half way between upper frontal setae and anterior ocellus; genal setae uniserial anteriorly. Postpedicel twice as long as wide, not reaching peristomal margin (by almost its width); arista very short pubescent, longest hairs hardly as long as basal arista diameter. Proboscis short, with prementum as long as palpi and slightly wider than fore tibia. Upper occipital setulae with a few setulae below row.

*Thorax*: 1 pair of presutural *acr* longer, differentiated from accessory setulae, *acr:dc* ratio 10:5:10, no hairs between rows; 2 posthumeral setae; notopleural depression bare apart from two strong setae; prealar about half length of posterior *npl*, but finer, placed midway between suture and supra-alar seta; scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katepisternals 1+2, lower posterior 2/3 as long as upper.

*Wing*: Vein C with anterior spinules short but not weak, as long as or slightly longer than diameter of C, stronger spines before distal break nearly as long as small crossvein; lower surface of C bare. Large crossvein very slightly sinuate, last section of  $M_{1+2}$  1.30–1.35× length of preceding section; lower squama smaller in area than upper. Wing length 3.5–4 mm.

*Legs*: Mid femur with 3–4 *av* in proximal half, rest of *av* very short and not erect, 3–4 *pv*; hind femur with 3–5 *av* in distal half (not longer than depth of femur), about 3–4 preapical *pv*; fore tibia with a short fine blunt apical *pv*, 1 median *pv*; mid tibia normally without an *av*, but lectotype has a small rather distal *av* on left tibia only, 2 *ad*, 2 *pd*, 2 *pv*; mid tarsomere 1 without lengthened dorsal setulae, hind tibia with full row of 10–12 *av*, 6–8 *ad*, 3–5 *pd* (distal one longest), and about 12 *pv* on most of length, these being partly biserial; some extra setae also between *av* and *ad* setae.

*Abdomen*: About 2.3 times as long as greatest width (at basal margin of sternite III dorsoventrally compressed; sternite III (Fig. 105) nearly as wide as sternite IV; sternite IV (Fig. 105) more or less quadrilateral, with curving lateral margins. Sternite V processes (Fig. 105) 1.75× length of base, with a few short fine setulose hairs on inner margins, lateral setae numerous (about 26–30), of more or less equal length (as long as processes). Surstyli 1.1–1.2× length of cercal plate, in caudal view (Fig. 103) becoming narrower with pointed apices, outer margins clothed with fine hairs, in lateral view (Fig. 104) straight or slightly downcurved. Cercal plate twice as wide as long, apex narrowly rounded, apical setae short. Pregonite (Fig. 108) with 1 seta; postgonite triangular without setae. Aedeagus with distal section (Figs 106, 107) rather short, 1.2 times as long as aedeagal apodeme, divided in distal 2/3 into pair of free paraphallic processes, dorsal prolongation as long as paraphalli. Aedeagal apodeme rod-like, in dorsal view about 8–9 times as long as width. Ejaculatory apodeme 0.16–0.17 times as long as aedeagal apodeme.

#### *Female.*

*Colour*: Head dark in ground colour with shifting dark grey to bronzy dust; frontal stripe black, sometimes dark brown anteriorly, viewed from above matt black, from in front becoming increasingly light brown and then contrasting with deep matt black parafrontals; parafacials deep golden dusted when viewed from in front; frontal triangle bronzy dusted with black spot in front of anterior ocellus; genae greyish dusted with darker shifting patch (when viewed laterally), leaving narrow lighter strip level with

lower margin of eye; occiput with darker and lighter shifting brown dust; prementum brown, semi-shining; palpi brown. Thorax black in ground colour with shifting lighter brown dust and darker semi-shining patches; scutum when viewed from above with wide lateral chocolate brown vittae and indistinct median and paramedian vittae, humeri and notopleural area light grey dusted. Wing membrane tinged brownish, veins brown. Legs blackish brown, semi-shining. Abdomen black in ground colour, viewed from above somewhat shining, viewed from a lower angle from behind with wide brown median vitta and darker lateral and anterior patches on each tergite, median vitta bordered with grey dust.

*Head*: Eyes widely separated (by 1.3–1.4× their transverse width); frontal stripe at level of middle orbitals twice as wide as each parafrontal; parafrontalia widening anteriorly to about 1.5× width of postpedicel. Parafrontal setae differentiated into 3 pairs of orbitals (all more or less lateroocline), and 2 pairs of inclinate frontals; postpedicel not quite twice as long as wide, not reaching peristomal margin; crossed interfrontal setae placed at apex of frontal triangle; gena below lowest point of eye margin 0.4× eye height; 1 pair of strong vibrissal setae, with short supravibrissal setula, 2 subvibrissals, 2 upcurved uniserial genals, 3–4 postgenal setae. Prementum as long as palpi.

*Thorax*: *acr* very short and fine (not differentiated from accessory setulae and hairs), 1 pair of longer presutural *acr* (about half length of 1st presutural dorsoventrals), biserial, no hairs between rows; *acr:dc* ratio 10:7:10; 1+1 posthumeral. Notopleural depression bare, apart from 2 strong setae. Prealar seta about half length of posterior *npl* but finer; scutellum almost bare on disk; anepisternite without developed upper anterior setula; 2 proepisternal setae (one short), 1 proepimeral seta, katepisternals 1+1.

*Wing*: Vein C with marginal spinules only slightly longer than vein diameter, stronger pair before distal break equal to length of small crossvein; large crossvein straight, last section of  $M_{1+2}$  is 1.3× length of preceding section. Vein C bare ventrally. Lower squama not projecting, smaller in area than upper. Wing length 4.0 mm.

*Legs*: Mid femur with 1 *av* in proximal half, a few short *pv*; hind femur with 4–5 *av* in distal half; fore tibia with 1 *ad*, 1 *pv* at same level; mid tibia without *av*, 2 *ad*, 2 *pd*, 2 *pv*; hind tibia with 4–5 *av*, 3–4 *ad*, 3–4 *pd*, no *pv*.

*Abdomen*: About as long as thorax, tergites with only short hindmarginal setae (including tergite V without long discals). Postabdomen when fully extended as long as preabdomen; very similar to *D. braccata*, only differing as follows: sclerites of sternite X (Fig. 100) each bearing 3 or 4 setulae on posterior margin; sternite X wider; cerci slightly shorter and more widely set apart.

Lectotype ♂: 'LECTOTYPE' [circular printed white label with purple border]; 'KENYA: /Aberdare Range. /x.1935 /B. M. E. Afr. /B. M. 1935–203' [white printed rectangular label]; 'Nyeri Track. / 10500 ft / F.W. Edwards' [white printed rectangular label]; '*Hylemyia / bisciliata* sp. n. / van Emden det. 1940' [white printed and written rectangular label]; 'type' [red handwritten rectangular label] (BMNH). Lectotype in good condition with all legs and wings intact. There is a label in the drawer next to the lectotype 'Lectotype fixed by Emden, 1951:361'.

Paralectotypes (all BMNH): KENYA: 34♂ 15♀ Aberdare Range, 28.x.1934, B.M.E. Afr. Exp. B.M. 1935–203, Nyeri Track, alt. 10500 ft, J. Ford; 4♂ 2♀ Mt Kinangop, alt. 10000 ft, 26.x.1934, F.W. Edwards. UGANDA: 1♂ Imatong Mts, alt. 10800 ft, ii.1936, D. R. Buxton; 1♂ Kigezi Dist., Mt Muhavura, alt. 7000 ft, 29.ix.1934, F.W. Edwards.

Other material examined (all BMNH): KENYA: 1♂ Mt Kenya, Kathita R., alt. 9900 ft, 9.viii.1949, J.A. Riley; 1♂ 3♀ Mt Kenya, N side, heather, stream, alt. 11000–12000 ft, 20–22.xii.1980, P.S. Cranston; 1♂ Embu, 20.ii.1914.



**Discussion:** There is an additional male (not described here) in the BMNH which may be this species, caught together on Mt Kenya with 1♂ and 3♀ by P. Cranston (data listed above), which has slightly different genitalia. These differ from *D. bisciliata* as follows: cercal plate slightly shorter and wider, with a more rounded apex; surstylus in caudal view slightly wider, in lateral view with the apex not upturned; processes of sternite V slightly longer; distal section of aedeagus with paraphalli slightly longer. Further material may show that these small differences are constant.

**Life history:** Unknown.

**Distribution:** The original material on which Emden based this species in 1941 was from Kenya and Uganda. Very few further specimens have been found since then, all of them on Mt Kenya, the most recent being collected in 1980.

*Delia platura* subsection  
*Delia florilega* SPECIES GROUP  
*Delia florilega* (Zetterstedt, 1845)

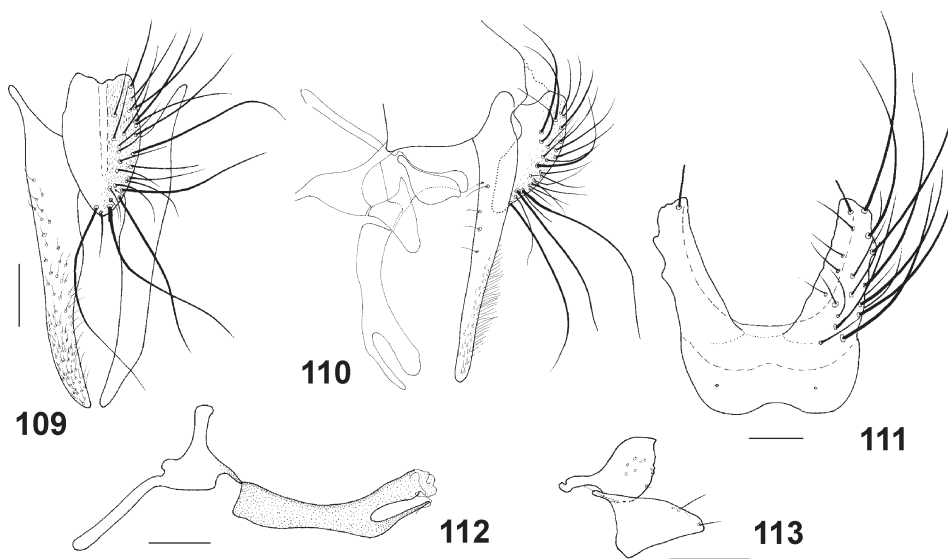
Figs 109–114

*Aricia florilega* Zetterstedt, 1845: 1555. For a full list of synonymies see Hennig (1974b: 823) and Griffiths (1993: 1568).

*Chortophila trichodactyla* Rondani, 1866: 164. Synonymy after Ringdahl 1933: 24.

**Diagnosis:**

♂ Hind femur with row of 10–15 *pv* on distal half to 2/3 which are abruptly cut off, not much shorter basally than distally; mid tarsomere 1 with fringe of long setulae on dorsal surface; hind tibia with continuous row of 18–20 *pv* setulose hairs of equal length. Sternite V processes with only one blunt apical seta.



Figs 109–113. *Delia florilega*, male (Britain): (109) cercal plate and surstyli; (110) hypopygium, lateral view; (111) sternite V; (112) basiphallus and distiphallus, lateral view; (113) gonites. Scale bar = 0.1 mm.

Description: see Hennig (loc. cit.) and Griffiths (loc. cit.).

Lectotype ♂ of *florilega* in MZLU, designated by Hennig (1974b: 824).

Syntypes of *trichodactyla* in MZUF, reviewed by Hennig (loc. cit.).

Other material examined: ZIMBABWE: 1♂ N. Vumba, 5.vii.1965, D. Cookson (NMSA).

Discussion: This is the first and only record so far of the occurrence of this species in the Afrotropical Region. The single male from Zimbabwe may be an accidental introduction; no details of its capture were recorded on the label.

Life history: *D. florilega* is a widespread agricultural pest, feeding in the larval stage on a wide range of cultivated plants, as well as sprouting seedlings of legumes. For a detailed survey of the biological literature, see Griffiths (1993: 1572).

Distribution: *D. florilega* is widespread in the Nearctic and Palearctic regions, reaching east as far as China.

*Delia platura* SPECIES GROUP

*Delia platura* (Meigen, 1826)

Figs 114–118

*Anthomyia platura* Meigen, 1826: 171.

*Chortophila cilicrura* Rondani, 1866: 165; Stein 1913: 560.

*Hylemyia cilicrura* (Rondani): Malloch 1924b: 263; Emden 1941b: 266; 1948: 166; 1951: 358; 1956: 530; Patterson 1956: 164.

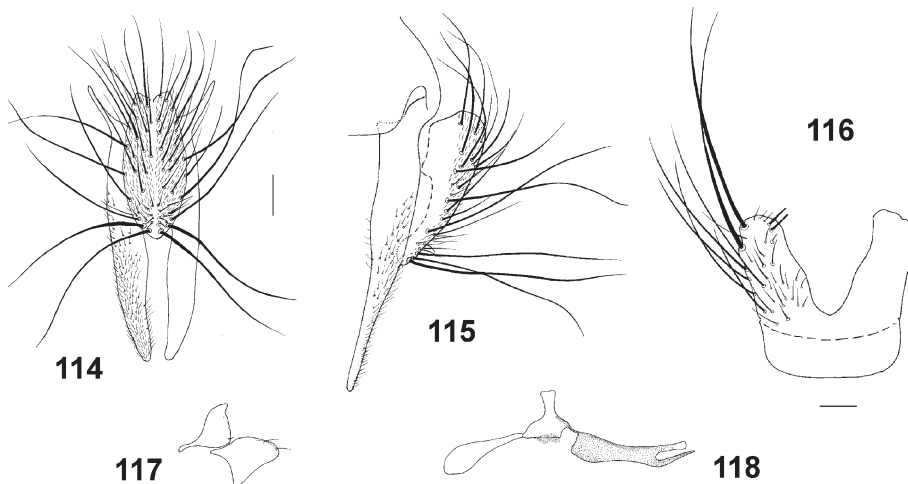
*Phorbia cilicrura* (Rondani): Cuthbertson 1936: 57.

*Delia platura* (Meigen): Pont & Ackland 1980: 716.

For a full list of synonyms see Hennig (1974c: 881) and Griffiths (1993: 1578).

Diagnosis:

♂ Hind femur without extended row of *pv*, only a few preapical setae; hind tibia with row of numerous (23–30) *pv* setulose hairs of equal length (similar to *D. florilega*); mid tarsomere 1 without fringe of long setulae on dorsal surface. Sternite V processes with two blunt apical setae.



Figs 114–118. *Delia platura* (Mg.), male (Britain): (114) cercal plate and distiphallus; (115) ditto, lateral view; (116) sternite V; (117) gonites; (118) basiphallus and distiphallus, lateral view. Scale bar = 0.1 mm.

Description: see Griffiths (1993).

Lectotype ♂ of *platura* in MNHN, designated by Hennig (1974c: 884).

Syntypes of *cilicrura* in MZLS.

Other material examined: Too numerous to list in full. I have seen specimens from Ethiopia, Kenya, Lesotho, Namibia, Nigeria, Ruanda, South Africa, Uganda, Yemen, Zimbabwe. Probably found throughout the Afrotropical Region where suitable crops are grown.

Life history: *D. platura* is a cosmopolitan pest of agricultural crops, feeding on cruciferous roots, also cereals and a wide range of other crops. For a detailed survey of the biological literature, see Griffiths (1993: 1588).

Distribution: Cosmopolitan.

#### *Delia metatarsata* SPECIES GROUP

#### *Delia metatarsata* (Stein, 1914)

Figs 101, 119–124

*Chortophila metatarsata* Stein, 1914: 136; 1919: 154.

*Hylemyia metatarsata* (Stein): Emden 1941b: 267; 1951: 367.

*Delia metatarsata* (Stein): Pont & Ackland 1980: 716.

#### Diagnosis:

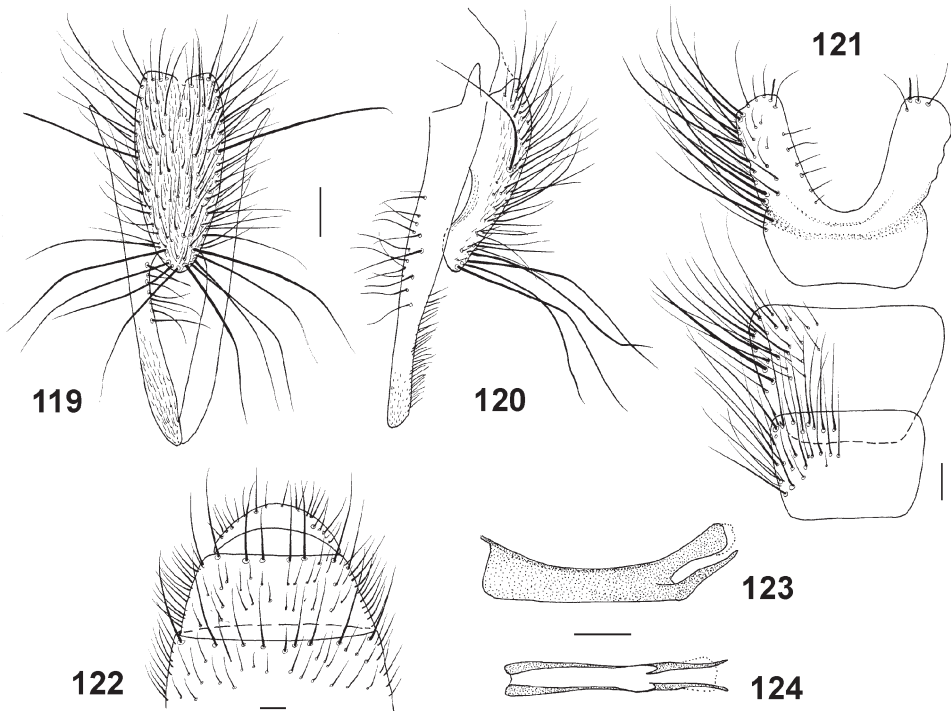
♂ 3–4 pairs of long presutural *acr*, one pair longer than the others; 3 posthumeral setae; base of wing brownish and large crossvein sinuate; hind femur without *pv*; fore tibia with a long straight blunt preapical *pv*; mid tarsomere 1 with long dorsal fringe; tergites IV and V (Fig. 122) with hindmarginal setae not longer than tergites; surstyli (Fig. 119) in lateral view straight.

#### Description:

##### *Male.*

*Colour:* Frontal stripe, parafrontals, parafacials, genae and face black in ground colour, with shifting thin brownish grey dust; parafacials from above whitish grey dusted (tinged with pink), at level of arisal base with pale bluish grey dust depending on point of view. Antennae dark brownish black, with brown dust, arista dark brown. Palpi black; prementum of proboscis black dusted. Thorax and pleura dark in ground colour, with brownish grey dusting, traces of 5 dark vittae when viewed from behind: wide median vitta, 2 narrow vittae which in line with presutural *dc*, stopping short of suture, and postsuturally pale dusted; and 2 wide lateral setae; scutum semi-shining from some angles; scutellum concolorous with scutum. Wing membrane brownish tinged in basal half, but not on posterior half of wing; veins brown; squamae whitish, upper squama with brown border, lower squama pale bordered. Legs black, slightly shining. Abdomen black in ground colour, densely dusted dark grey, when viewed from behind, dust becomes paler; wide black median vitta present, covering central third of each tergite and widening on basal and posterior margins of each tergite so that latter (and lateral margins) are black. Sternites, prehypopygial tergites and genitalia brownish black.

*Head:* Eyes narrowly separated posteriorly (by 1.2–1.0× diameter of anterior ocellus), frontal stripe distinct throughout (at narrowest part by slightly less than diameter of anterior ocellus); parafacial medially equal to width of postpedicel; peristomal margin slightly projecting, face concave, distance between vibrissal setae more than distance



Figs 119–124. *Delia metatarsata* (Stein) (Kenya): (119) cercal plate and surstyli; (120) ditto, lateral view; (121) sternites III–V; (122) tergites IV–V and syntergosternite 7+8, dorsal view; (123) distiphallus, lateral view; (124) ditto, ventral view. Scale bar = 0.1mm.

between them and nearest eye margin. Gena below lowest point of eye margin  $0.30\text{--}0.37\times$  eye height; genal setae biserial posteriorly, with 5–6 strong upcurved uniserial setae level with anterior eye margin. 6–7 pairs of strong parafrontal setae, which mainly inclinate and cross each other (interspersed with a few finer setulae); 1 pair of interfrontal setulae on upper half of frons (closer to anterior ocellus than to lunule). Postpedicel not quite twice as long as wide, not reaching peristomal margin (by half its width); arista with very short pubescence, longest hairs not as long as aristal diameter. Proboscis short and slender, with short prementum (about as long as palpi and as wide as fore tibia). Upper occipital setulae long and fine, with numerous setulae below row, lower part of occiput with rather long dense coarse setulae.

**Thorax:** 3–4 pairs of long presutural *acr*, one pair longer than rest ( $0.6\times$  length of posterior presutural *dc*); *acr:dc* ratio 10:10:10, with a few fine hairs between rows; 3 posthumeral setae, outer seta about half length of others, with some long hairs around base; notopleural depression bare apart from two strong setae; prealar short and fine, but distinct ( $0.5\text{--}0.6$  length of posterior *npl*); scutellum bare on disc centrally and basally; anepisternite without developed upper anterior setula; katepisternals 1+2, lower posterior nearly as long as upper, with numerous rather long hairs on disc.

**Wing:** Vein C with anterior spinules short and weak, hardly as long as diameter of C, spines before distal break hardly differentiated from anterior spinules; lower surface of

C bare. Large crossvein strongly sinuate, last section of  $M_{1+2}$  equal to length of preceding section. Lower squama smaller in area than upper. Wing length 5.5–6.0 mm.

Legs: With rather lengthened and semi-erect hairs on tibiae. Mid femur with full row of short *av* which longer basally, and full row of longer *pv*; hind femur with about 6–7 long *av* in distal half, merging into shorter and more numerous *av* in basal half, no *pv*; fore tibia with long straight blunt preapical *pv* and 1 long median *pv*; mid tibia without *av*, 0–1 *ad*, 1 *pd*, 2 *pv*; mid tarsomere 1 with long dorsal fringe of curved setae and with posterior apical setulae on each tarsomere longer than anterior setulae; hind tibia with 2 *av*, 7–8 *ad*, 2 *pd*, 12–15 erect *pv* on almost whole length.

*Abdomen*: About 1.8–2.0 times as long as greatest width (at basal margin of tergite III), dorsoventrally compressed; stronger hindmarginal setae on tergites IV and V (Fig. 122) not longer than length of tergites. Sternite V (Fig. 121) short (1.3 times as wide as long); sternite IV (Fig. 121) is 1.4 times as wide as long (wider posteriorly) with numerous long lateral setae; sternite V (Fig. 121) with processes longer than base, with about 5 long fine setulose hairs on inner margins, lateral setae long and numerous; apex of processes with 1 short and rather blunt setae amongst 2–3 finer pointed seta. Surstyli (Fig. 119) about as long as cercal plate, narrow in caudal view, with some long setulae on inner margins in basal half, in lateral view (Fig. 120) more or less straight. Cercal plate twice as long as wide, with 8–10 very long bent setae apically, and pair of longer median lateral setae. Aedeagus with distal section (Figs 123, 124) 1.35× length of aedeagal apodeme, divided on slightly less than distal third (0.30) into pair of free paraphallic processes and dorsal prolongation of about same length. Acrophallus absent. Aedeagal apodeme in dorsal view weakly expanded anteriorly, 4.2 times as long as greatest width. Ejaculatory apodeme 0.24 times as long as aedeagal apodeme, expanded at one end.

*Female*. As in male except for the following:

*Colour*: Frontal triangle dusted light brownish; parafrontals dark brownish dusted, darker than parafacials; gena with shifting brownish patch anteriorly adjacent to vibrissa; wing membrane as in male, but wing base not so infuscated.

*Head*: Eyes widely separated (by 1.20× their transverse width); frontal stripe at level of middle orbitals 1.6× width of parafrontal; parafrontalia widening anteriorly to slightly more than width of postpedicel. Parafrontal setae differentiated into 5 pairs of orbital setae (more or less exclinate) and 5 pairs of frontal setae (more or less inclinate), all strong; uppermost 4 pairs of frontal setae overlap anterior 3(4) pairs of orbital setae, so that setae biserial in middle of parafrontal; crossed interfrontal setae strong, placed at apex of frontal triangle; gena below lowest point of eye margin 0.4× eye height.

*Thorax*: 3 posthumeral; katapisternals 1+2, lower posterior setae short and fine. Prealar seta as in male. Wing length 6.1 mm.

Legs: Fore tibia with 1 *ad*, 1 *pv*; mid tibia without *av*, 3 strong *ad*, 3 strong *pd*, and 2 long *pv*; hind tibia with 3 *av*, 6 *ad*, 4 *pd*.

*Abdomen*: Postabdomen when fully extended about as long as preabdomen. Tergites VI and VII weakened centrally but with continuous row of setulae along posterior margin. Spiracles 6 and 7 both situated on tergite VI, spiracle 6 medially on lateral margin, spiracle 7 laterally on posterior margin (in row of setulae); sternites VI and VII oblong,

4 times as long as wide with a few posterior setulae. Tergite VIII divided into 2 elongate plates which become wider anteriorly, but continuous along posterior margin which bears about 12 longer setae; sternite VIII (Fig. 101) represented by pair of elongate sclerites which pointed on inner posterior corner and each bear 7–8 laterally directed setulae medially; sternite X setulose and pilose; cerci not projecting significantly beyond tip of sternite X, bearing pair of long setulae. Three spermathecae of equal size, almost spherical, 0.040×0.035 mm.

Holotype: Stein described this species from a single male collected on Mt Kenya, alpine prairies with *Senecio arborescens*, 4000–4100 m, ii.1912. The location of this holotype is unknown, and is presumed lost.

Material examined: KENYA: 8♂ 2♀ Aberdare Range, Mt Kinangop, alt. 12000 ft, 30.x.1934, F.W. Edwards (BMNH).

Discussion: There is little doubt about the identity of *D. metatarsata*. Stein's figures (1914: 137) of the dorsal fringe on mid tarsomere 1 and the darker base to wing can only refer to this species.

Life history: Unknown.

Distribution: Only recorded from Kenya (Mt Kenya and the Aberdare Range).

### ***Delia cameroonica* sp. n.**

Figs 102, 125–130

Etymology: Named after the type locality, Mt Cameroon.

Diagnosis:

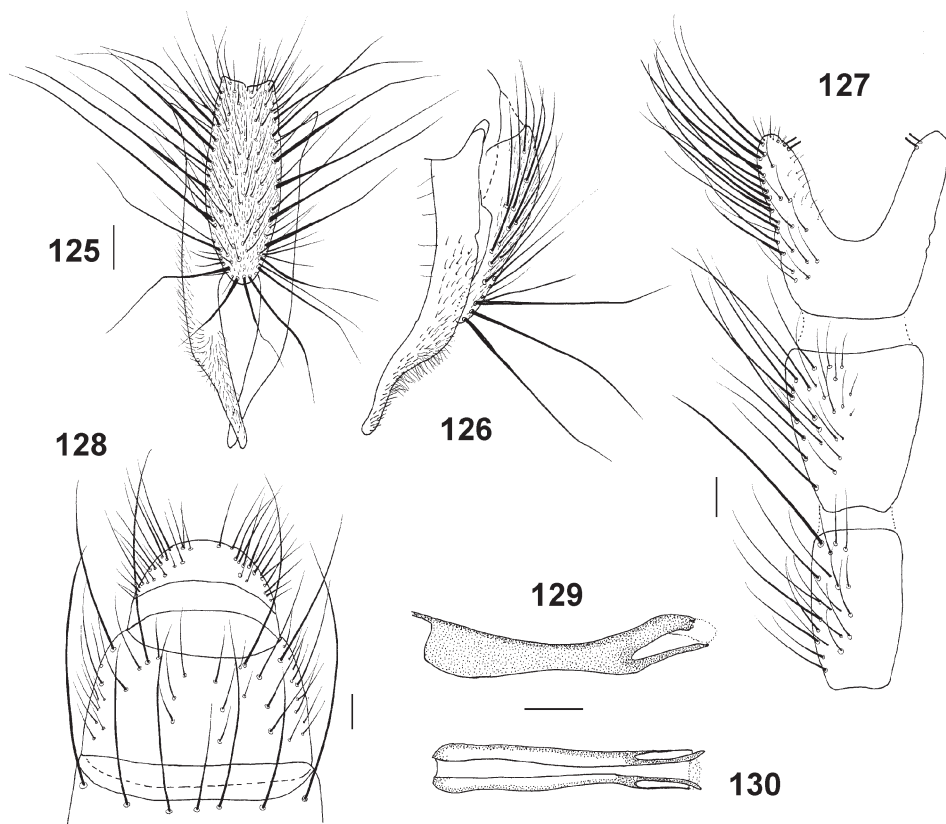
♂ Differs from *D. metatarsata* mainly in the genitalia and sternite V. Only two post-humeral setae present; hind femur with *pv* in distal half; tergites IV and V (Fig. 128) with long hindmarginal setae, longer than tergites; surstyli in lateral view sinuate.

Description:

*Male.*

*Colour:* Frontal stripe, parafrontals, parafacials, genae and face black in ground colour, with dark grey dusting which shifts according to angle of vision; head viewed from above with matt velvety black frontal stripe contrasting with whitish grey parafacials, from in front the frontal stripe is light grey dusted with the parafacials adjacent to antennae light brassy grey dusted; gena with grey dusting (varying from dark to light according to angle of vision); occiput dark grey, lighter above. Antennae black with brownish dusting; arista black. Palpi black; prementum of proboscis black with thin grey dust, semi-shining. Thorax black in ground colour, with shifting areas of dark brownish grey dust and shining patches; scutum viewed from above with obscure darker vittae and brown patches, viewed from in front anterior half of presutural area light grey dusted; humeri lighter grey dusted; scutellum concolorous with thorax, sides greyish dusted. Wing membrane brownish tinged at base, becoming hyaline in apical third; veins brown; squamae pale brownish tinged, fringe pale brown. Halteres pale orange. Legs black, weakly shining. Abdomen black in ground colour, laterally dusted grey when viewed from behind, with a wide black median vitta which covers median third of width of abdomen and consists of triangular marks on each tergite with the base along the anterior margins of tergites, lateral margins of tergites darker. Prehypopygial tergites grey dusted.





Figs 125–130. *Delia cameroonica* sp. n., male holotype (Cameroon): (125) cercal plate and surstyli; (126) ditto, lateral view; (127) sternites III–V; (128) tergites IV–V and synergosternite 7+8, dorsal view; (129) distiphallus, lateral view; (130) ditto, ventral view. Scale bar = 0.1 mm.

**Head:** Eyes narrowly separated posteriorly (by nearly  $2\times$  diameter of anterior ocellus), frontal stripe distinct throughout, and about equal to width of anterior ocellus at narrowest point; parafrontals linear above, becoming only slightly wider at level of anterior frontal setae; parafacial medially equal to width of postpedicel; peristomal margin slightly projecting in lateral view, level with profrons, and slightly projecting medially beyond level of vibrissae; gena below lowest point of eye margin  $0.3\times$  eye height; face concave, distance between vibrissal setae slightly more ( $1.3\times$ ) than distance between them and nearest eye margin. 6–7 pairs of unequal parafrontal setae on anterior half of frons; 1 pair of weak interfrontal setulae just above uppermost pair of frontal setae, half way between them and anterior ocellus; genal setae uniserial anteriorly. Postpedicel not quite twice as long as wide, not reaching peristomal margin (by half its width); arista pubescent, the longest hairs (dorsally at base) hardly as long as basal aristal diameter. Proboscis short, with prementum as long as palpi and as wide as fore tibia. Upper occipital setulae long and fine without setulae below row.

**Thorax:** 2–3 pairs of biserial presutural *acr*, the 2nd pair ( $3/4$  length of presutural *dc*) with 1–2 isolated hairs between rows; *acr:dc* ratio 10:6:10; 2 posthumeral setae;

notopleural depression bare apart from the two strong setae; prealar seta about 2/3 length of posterior *npl*, equally strong, placed midway between suture and supra-alar seta; scutellum bare on disc centrally and basally; anepisternite without a developed upper anterior setula; katepisternals 1+2, lower posterior 2/3 as long as upper.

Wing: Vein C with anterior spinules short and rather weak, as long as diameter of C, the stronger spines before distal break hardly half length of small crossvein; lower surface of C bare. Large crossvein slightly sinuate, last section of  $M_{1+2}$  1.5–1.6× length of preceding section; lower squama nearly as large in area as upper. Wing length 5.5 mm. Legs: Mid femur with an almost full row of fine *av* and *pv*; hind femur with *av* and *pv* in distal half; fore tibia with a robust long blunt *pv* apical, 1 long median *pv*; mid tibia without *av*, 2 longer *ad*, 2 *pd*, 2 *pv*; mid tarsomere 1 with a long dorsal fringe of curving setulae; hind tibia with a full row of 8–10 *av*, 5–6 *ad*, 4–5 *pd* (distal one longest), and about 20–25 *pv* on whole length, and almost as many ventral *pv* hairs.

*Abdomen*: About 2.8 times as long as greatest width (at basal margin of sternite III), dorsoventrally compressed; tergites IV and V (Fig. 128) with long hindmarginal setae; sternite III (Fig. 127) parallel-sided, 1.6 times as long as wide, with 1 longer lateral posterior seta; sternite IV (Fig. 127) widening towards posterior margin, 1.2 times as long as wide; sternite V (Fig. 127) processes 1.5× length of base, with a few short fine setulose hairs on inner margins, and 2–3 short blunt setulae on inner margins towards tip, lateral setae numerous (about 20), slightly longer than processes. Surstyli (Fig. 125) shorter than cercal plate (0.8×), in caudal view becoming narrower in apical third and inwardly directed, outer margins clothed with fine hairs, in lateral view (Fig. 126) sinuate and tapering rather abruptly in apical third. Cercal plate (Fig. 125) much longer than wide (2.7–2.8×), apex rounded, with long lateral and apical setae. Aedeagus with distal section (Figs 129, 130) 1.27× length of aedeagal apodeme, divided on about distal quarter (0.28) into a pair of free paraphallic processes and dorsal prolongation about the same length. Acrophallus absent. Aedeagal apodeme rod-like, in dorsal view 5.5 times as long as wide. Ejaculatory apodeme 0.27× length of aedeagal apodeme.

#### *Female.*

*Colour*: Head dark in ground colour with shifting greenish grey to bronzy brown dust; frontal stripe black in dorsal half, orange anteriorly; viewed from a low angle in front becoming light grey dusted and then contrasting with the darker brown parafrontals; parafacials brownish grey dusted when viewed from in front; frontal triangle obscurely brownish dusted, with a black spot in front of anterior ocellus; gena greyish dusted with a darker triangular shifting patch (when viewed laterally), leaving a narrow lighter strip level with lower margin of eye; occiput with darker and lighter shifting brown dust; antennae and arista black; prementum brown, semi-shining; palpi brown. Thorax black in ground colour with shifting lighter brown dust and darker semi-shining patches; scutum when viewed from above with obscure brown vittae and indistinct presutural median and paramedian vittae, humeri and notopleural area obscurely light grey dusted. Wing membrane tinged brownish, darker basally, veins brown. Upper squama pale brown, with brown border and pale fringe. Legs blackish brown, semi-shining. Abdomen black in ground colour, viewed from above somewhat shining, viewed from a lower angle from behind with a wide brown median vitta and darker lateral and anterior patches on each tergite, median vitta bordered with grey dust.

**Head:** Eyes widely separated (by 1.20–1.25× their transverse width); frontal stripe at level of middle orbitals twice as wide as each parafrontal; parafrontalia widening anteriorly to about 1.2× width of postpedicel. Parafrontal setae differentiated into 3 pairs of orbitals (all more or less exclinate), and 2–3 pairs of inclinate frontals; the uppermost frontal seta set closer to margin of frontal stripe than is the anterior orbital seta (setae not in a line); postpedicel not quite twice as long as wide, not reaching peristomal margin; crossed interfrontal setae strong, placed at apex of frontal triangle; gena below lowest point of eye margin 0.38× eye height; genal setae uniserial anteriorly. Prementum as long as palpi.

**Thorax:** 3 pairs of well developed presutural *acr* (middle pair longest and nearly as long as 1st presutural *dc*), biserial, no hairs between rows; *acr:dc* ratio 10:6:10; 1+1 posthumeral. Notopleural depression bare apart from the 2 strong setae. Prealar seta as long as posterior *npl*; scutellum almost bare on disk; anepisternite without a developed upper anterior setula; 2 proepisternal setae (ventral one short), 1–2 proepimeral seta (with 2 short associated hairs); katapisternals 1+1 (damaged, possibly 2+2, the ventral setae short and fine, according to the remaining scars).

**Wing:** Vein C with marginal spinules only slightly longer than vein diameter, the stronger pair before the distal break not very distinct and shorter than small crossvein; large crossvein sinuate, last section of  $M_{1+2}$  is 1.3–1.4× length of preceding section. Vein C bare ventrally. Lower squama not projecting, equal in area to upper. Wing length 5.4 mm.

**Legs:** Mid femur with 1–2 *av* in proximal half, a few short *pv*; hind femur with about 7 *av* in distal half; fore tibia with 1 median *ad*, 1 *pv* at same level; mid tibia without *av*, 2 *ad*, 2 *pd*, 2 *pv*; hind tibia with 2–3 *av*, 6 *ad*, 3 *pd*, no *pv*.

**Abdomen:** About as long as thorax, tergite III with hindmarginal setae slightly shorter than tergite; tergite V without long discal and lateral hindmarginal setae. Postabdomen (Fig. 102) very similar to *D. metatarsata* Stein, except that the cerci shorter and converging beyond apex of sternite X.

**Holotype:** ♂ REPUBLIC OF CAMEROON: 'Holo- / type' [circular white printed label with red border]; 'MT. CAMEROON: / 1st Plateau / 12.i.1932 / M. Steele / B. M. 1934–240' [rectangular white printed label]; 'HOLOTYPE ♂ / *Delia / cameroonica* / Ackland' [rectangular written white label with red border]. Left hind leg missing, thorax damaged; abdomen dissected and genitalia placed in glycerol in a plastic tube on staging pin (BMNH).

**Paratypes:** 5♂ 1♀ same data as holotype, except for 3♂ and 1♀ from 2nd Plateau. 1♂ paratype carries a label '*Hylemyia bisciliata* Emd., det van Emden, 1942' (BMNH).

**Other material examined:** 3♂ same data as holotype except from 2nd Plateau; these specimens are in very poor condition (BMNH).

**Discussion:** Closely related to *metatarsata*, and no doubt it evolved in isolation on Mt Cameroon. Although the type material is in poor condition, the distinct genitalia make this species easy to recognise.

**Life history:** Unknown.

**Distribution:** Only known from Mt Cameroon.

#### Unplaced species

#### *Delia virgithorax* (Stein, 1913)

*Hylemyia virgithorax* Stein, 1913: 556; 1919: 152; Emden 1951: 363.

*Delia virgithorax* (Stein): Pont & Ackland 1980: 717.

Stein described *H. virgithorax* from 2♀. I was able to examine a specimen labelled 'holotype' in February 1995, loaned from the ZMHU. This is a syntype that was retained

by Stein in his personal collection. The female syntype examined in 1951 by Emden (1951: 363) was sent to him by Dr A. Soós from the MNM and was destroyed in 1956, along with many other Anthomyiidae. I made a description of the female syntype in Berlin as follows:

Labels: ♀ syntype: “Abyssinia / Kovács”. [white printed rectangular label]; “Dire-Daua / 1911.11.19” [white written /printed rectangular label]; “Zool. Mus. / Berlin” [pale yellow printed label]; “*Hylemyia / virgithorax* St.” [white written rectangular label] (ZMHU). In good condition, all appendages present except left hind leg missing.

**Colour:** Head rather densely pale grey dusted, including occiput. Gena anteriorly with shifting patch, pale orange-brown from some angles. Interfrontalia orange-brown. Antennae brown, basal segments lightened reddish. Palpi dark brown, obscurely reddish brown basally. Mentum brown with greyish dust, hardly shining. Thorax pale greyish dusted, scutum viewed from in front with very distinct dark brownish median vitta, half width of distance between *dc*, reaching from 1st presutural *dc* to scutellum, becoming slightly wider posteriorly. Also pair of similar lateral vittae, their inner margins along the intra-alar setae, reaching from posthumeral setae to posthumeral callus; humeri and notopleuron grey dusted. Scutellum grey dusted. These vittae do not alter when scutum is viewed from behind. Pleura and postnotum grey dusted. Wings membrane, veins and squamae yellow to pale orange-yellow tinged, especially anteriorly. Squamae and halteres yellowish. Abdomen grey dusted, with brown median vitta, narrow posteriorly, but widening anteriorly on each tergite.

**Head:** Eyes separated at level of ocellar triangle by nearly  $0.5\times$  head width. Interfrontalia at middle with slightly concave margins, width at narrowest part equal to twice width of adjacent parafrontal. A pair of cruciate interfrontal setae, about as long and strong as the upper orbital setae; 3 orbitals, 3 frontal setae. Occipital setulae very short and fine, in one row. Postpedicel 2.4 times as long as wide, not reaching peristomal margin. Arista pubescent, hairs slightly longer than diameter of arista base. Gena in lateral view nearly  $0.3\times$  head height, genal setae uniserial. Palpi as long as prementum, latter not swollen but rather wide, in lateral view three times as long as wide, length  $2/3$  of eye height.

**Thorax:** *acr* practically absent, only represented by a very few irregular fine biserial hairs, rows slightly closer to each other than to *dc* rows, only a pair of prescutellar *acr* visible. Whole of scutum with very few accessory setulae or hairs. Prealar seta absent. No dorsal anterior anepisternal setulae present. Katepisternals 1+2, lower posterior  $3/4$  length of upper. Scutellum practically bare on disc.

**Wing:** Vein C bare on ventral surface, anterior spinules as long as diameter of vein, stronger setae before distal break as long as small crossvein. Large crossvein rather upright, hence ratio of penultimate section of  $M_{1+2}$  to last section is 4:6. Wing length 5 mm.

**Legs:** Fore tibia with 1 *av*, 1 *ad*, and 1 *pv*. Mid tibia with 1 long *ad*, which is 2.5 times as long as diameter of tibia, 2 shorter *pd*, and 2 small *p* setae. Mid femur with only 1 short basal *av*. Hind femur with 7–8 short *av*, no *pv* except 1 apical seta. Hind tibia with 2 *av*, 4 *ad*, 4 *pd*, 4–5 very short *pv*. All pulvilli very short, hardly as long as claws.

**Abdomen:** Setae on posterior margins of tergites rather weak and short, especially tergites IV and V, where they are hardly half length of tergites.

**Discussion:** Emden (1941a: 214) mentions 1♂ of *virgithorax* (collected on the Entomological expedition to Abyssinia, 1926–7) from Abyssinia, Mount Zukwala, ca.

900 ft, 22.x. by sweeping rushes in lake (Omer-Cooper); 1 ♀ Jem-Jem Forest, nearly 9000 ft, 24.ix. (Scott). He also stated that it was known from Kilimanjaro, Mt Elgon, Mt Kenya, Aberdares, Kikuyu Esc. (R.E.). All these records refer to *D. steiniella* Emden, and are listed under that species.

Emden (1941b: 266 in key) incorrectly synonymized *Hylemyia trivittata* Stein, 1914 with *H. virgithorax* Stein, 1913, in the belief that there was only one species with a trivittate scutum, and that the absence of a prealar seta in *virgithorax* was abnormal. He corrected this synonymy in 1951 (Emden 1951: 361). In the same paper he gave the new name *steiniella* for *H. trivittata* Stein, 1914, not *Pegomyia trivittata* Stein, 1897 (see under *D. steiniella* for full details).

No other specimens of *D. virgithorax* (apart from the types) have therefore been recorded, and the species is known only from the female syntype. I have not seen any males which could be referred to *virgithorax*.

Differentiation of the females of *D. steiniella* from *D. virgithorax*, the latter in parentheses:

*Colour*: Interfrontalia dark brown posteriorly (orange-brown); scutum with median vitta continuing onto scutellum (to scutellum); wing membrane and veins greyish brown (yellow to orange-yellow tinged).

*Head*: Interfrontalia with straight margins (slightly concave margins); occiput with short setulae below upper postocular row (bare); 3–4 rows of distinct presutural *acr* (practically absent, only a few irregularly fine hairs); prealar short but distinct (absent); katepisternals 1+2, lower posterior seta 0.75× length of upper seta.

Life history: Unknown.

Distribution: Only known from the type locality in Ethiopia.

### *Delia modesta* (Stein, 1914), **comb. n.**

*Hylemyia modesta* Stein, 1914: 133; 1919: 151; Malloch 1924b: 263, 265; Emden 1941b: 268; 1956: 530; Pont & Ackland 1980: 718.

Stein described *modesta* from 4♂ and 4♀ from 4 localities in Kenya. The important characters in his description of the male were:

Gena 0.1–0.13 of eye height; thorax clear chocolate, matt, with 3 wide vittae which are a little darker but scarcely visible; prealar absent; *acr* very fine and very short, biserial; katepisternals 1+2; abdomen linear, very narrow and elongated, dorsoventrally compressed, dusted greyish chocolate; mid tibia with 1 *ad*, 2 *pd*, 2 *p* setae; hind femur with complete rows of long fine setae; squamae whitish yellow.

Malloch (1924b: 265) had not seen this species, but this did not deter him from including it in a key, using some of the characters mentioned in Stein's description. Emden (1941b: 268) also failed to recognise this species. He mentioned the lack of a prealar seta, and the narrow genae.

Emden (1956: 530) mentioned a pair from Gatsibu (Ruanda) which (in his opinion) fitted Stein's description very well; he continued by listing several characters by which the male specimen from Gatsibu differed from Stein's description:

Abdomen only depressed at base.

Sternites II–IV with rather long erect setulose hairs in 2–3 irregular rows, more numerous and less strong than in *echinata* (Séguy).

Fore tibia in addition to a *pv* near middle, with a smaller one near apical one-fifth and a small *ad* beyond middle.

Mid tibia with 1 *pd* and 2 *p* setae.

Hind tibia with 3–4 *ad*, 3 *pd*, 2(–3) *av*, the proximal *ad* and *pd* being smaller “and have apparently been overlooked by Stein” [They would not have been overlooked if Stein’s species was different to Emden’s specimen].

Of the female of this pair Emden said: “The ♀ has a shifting spot on upper part of parafacial like *arambourgi* (= *flavibasis*)”. It is unlikely that the male from Gatsibu is *modesta* in view of the differences from Stein’s description, in which the hind tibia have 2 *ad* and 2 *pd*. Unfortunately, of this pair from Gatsibu, which were deposited in the MRAC in Tervuren (Brussels), only the female can now be found (communication from Dr M. De Meyer). It carries the following label:

“COLL. MUS. CONGO / Ruanda:Gatsibu / 1800m. terr. Biumba/ P. Basilewsky 6-11-53” [white printed rectangular label]; “*Hylemyia* / *modesta* Stein / van Emden det. 1955” [white printed/handwritten rectangular label].

This female is in poor condition, right antennae, right mid leg missing; left wing damaged along costa; right fore leg glued to polyporus mounting strip. This is a female of *Delia flavibasis* (Stein). The specimen has the following characters which are contrary to Stein’s description of *modesta* but agree with *flavibasis*:

**Colour:** Parafacials opposite base of antennae with a darker brownish orange shifting patch (sheen-stripe); scutum with distinct brown spots around bases of setae. Wing membrane faintly tinged light brownish.

**Head:** Gena below lowest point of eye margin 0.2× eye height.

**Thorax:** 3 pairs of short and fine presutural *acr*, biserial, no hairs between rows; *acr:dc* ratio 10:6:10. Wing: large crossvein slightly sinuate. Legs: fore tibia with 1 *ad*, 2 *pv*; mid tibia apparently without *av*, 1 strong *ad* (*pd* not visible); hind femur with about 4–5 *av* in distal half, no *pv* except 1 apical; hind tibia with 2 *av*, 4 *ad*, 3 *pd*, no *pv*.

**Discussion:** In common with both Malloch and Emden, I have not seen any male specimens from Kenya that agree sufficiently with Stein’s description. The only Afrotropical *Delia* species which could be *modesta* is *D. madagascariensis* described in this paper. The male of this species has rather narrow genae (0.17–0.20× eye height), hind tibia with 2 *ad* and 2 *pd*, prealar absent. Until further material (especially males) is available from the African mainland, I prefer not to synonymize these species; in the meantime *modesta* remains an unrecognized species.

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## REFERENCES

- ACKLAND, D.M. 1967. Diptera from Nepal, Anthomyiidae. *Bulletin of the British Museum (Natural History), Entomology* **20** (4): 107–139.
- 1968. Notes on some Anthomyiidae (Diptera) from Israel, including the description of a new species of *Leucophora* Robineau-Desvoidy. *Israel Journal of Entomology* **3** (2): 69–76.
- 1977. Some Anthomyiidae from Southern Spain, with descriptions of two new species (Insecta, Diptera). *Steenstrupia* **4** (18): 195–209.
- 1995. Two new species of *Leucophora* Robineau-Desvoidy, 1830 Diptera: Anthomyiidae from southern Africa. *Annals of the Natal Museum* **36**: 87–95.
- 2001. Revision of afrotropical *Anthomyia* Meigen, 1803 (Diptera: Anthomyiidae), with descriptions of ten new species. *African Invertebrates* **42**: 1–94.
- ADAMS, C.F. 1905. Diptera africana. *Kansas University Science Bulletin* **3**: 149–208.
- BEZZI, M. 1908. Ditteri Eritrei raccolti dal Dott. Andreini e dal Prof. Tellini. Parte seconda. Diptera cyclorrhapha. *Bollettino della Società Entomologica Italiana, Firenze* **1907**: 3–199.
- BULLOCK, J.A. 1965. The control of *Hylemyia arambourgi* Ségué (Dipt., Anthomyiidae) on barley. *Bulletin of Entomological Research* **55**: 645–661.
- COLLESS, D.H. 1982. Australian Anthomyiidae (Diptera). *Australian Journal of Zoology* **30** (1): 81–91.
- CURRAN, C.H. 1929. Voyage au Congo de S.A.R. le Prince Léopold de Belgique (1925). Diptera. 4. Dolichopodides, Bombylides, Mycétophilides, Diopsides, et Muscides. *Revue de Zoologie et de Botanique Africaines* **17**: 245–248.
- CUTHBERTSON, A. 1932. Notes on the habits of some Diptera in Rhodesia. *Proceedings and Transactions of the Rhodesia Scientific Association* **31**: 31–36.
- 1936. Biological notes on some Diptera of Southern Rhodesia. *Occasional Papers of the Rhodesia Museum* **5**: 46–63.
- DEEMING, J.C. 1971. Some species of *Atherigona* Rondani (Dipt., Anthomyiidae) from Northern Nigeria, with special reference to those injurious to cereal crops. *Bulletin of Entomological Research* **61**: 133–190.
- DREW, W.A. 1963. Nearctic Genera of Anthomyiini (Muscidae, Diptera). *Publications of the Museum, Michigan State University, Biological Ser.* **2** (4): 193–272.
- EMDEN, F.I. VAN. 1941a. Entomological expedition to Abyssinia, 1926–27. Diptera Cyclorrhapha: Muscidae, I. *Annals and Magazine of Natural History* (11) **8**: 210–234.
- 1941b. Keys to the Muscidae of the Ethiopian Region: Scatophaginae, Anthomyiinae, Lispinae, Fanniinae. *Bulletin of Entomological Research* **32** (3): 251–275.
- 1948. Diptera: Muscidae. *Expedition to South-West Arabia, 1937–8*. Vol. 1. London: British Museum (Natural History), pp. 161–175.
- 1951. Muscidae C.—Scatophaginae, Anthomyiinae, Lispinae, Fanniinae and Phaoniinae. *Ruwenzori Expedition 1934–35*. Vol. 2. London: British Museum (Natural History), pp. 325–710.
- 1956. Contributions à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953) 108. Diptera Muscidae. *Annales du Musée Royal du Congo Belge, Sér. 8°, Sci. Zool.* **51**: 506–531.
- GRIFFITHS, G.C.D. 1991a. Anthomyiidae [part]. In: Griffiths, G.C.D., ed., *Flies of the Nearctic Region*. Vol. 8, part 2. **7**: 953–1048.
- 1991b. Anthomyiidae [part]. In: Griffiths, G.C.D., ed., *Flies of the Nearctic Region*. Vol. 8, part 2. **8**: 1049–1240.
- 1992. Anthomyiidae [part]. In: Griffiths, G.C.D., ed., *Flies of the Nearctic Region*. Vol. 8, part 2. **9**: 1241–1416.
- 1993. Anthomyiidae [part]. In: Griffiths, G.C.D., ed., *Flies of the Nearctic Region*. Vol. 8, part 2. **10**: 1417–1632.
- HARRISON, R.A. 1953. Notes on Diptera. *The New Zealand Entomologist* **1** (3): 9–11.
- HENNIG, W. 1953. Die Gattungen *Delia* und *Paregle* in Australien. *Beiträge zur Entomologie* **3** (6): 668–671.
- 1974a. 7(1), Fam. 63a. Anthomyiidae [Part.]. In: Lindner, E., ed., *Die Fliegen der Palaearktischen Region*. **306**: 681–776.

- 1974b. 7(1), Fam. 63a. Anthomyiidae [Part.]. In: Lindner, E., ed., *Die Fliegen der Palaearktischen Region*. **307**: 777–872.
- 1974c. 7(1), Fam. 63a. Anthomyiidae [Part.]. In: Lindner, E., ed., *Die Fliegen der Palaearktischen Region*. **308**: 873–920.
- HUCKETT, H.C. 1924. A systematic study of the Anthomyiinae of New York, with especial reference to the male and female genitalia. *Cornell University Agricultural Experiment Station. Memoir* **77**: 1–91. Ithaca, New York.
- ICZN. 1999. *International Code of Zoological Nomenclature*. Fourth edition. London: The International Trust for Zoological Nomenclature.
- KARL, O. 1939. Eine neue Anthomyiidae (Diptera) aus Italien. *Bolletino Istituto Entomologica Universiitio Bologna* **11**: 16–18.
- MALLOCH, J.R. 1924a. Notes on Australian Diptera No II. *Proceedings of the Linnean Society of New South Wales* **49** (14): 138–146.
- 1924b. Exotic Muscaridae (Diptera). – XIII. *Annals and Magazine of Natural History* (9) **14**: 257–274.
- MCALPINE, J.F. 1981. Morphology and terminology—adults. In: McAlpine, J.F. et al., eds, *Manual of Nearctic Diptera*. Vol. 1. Monograph 27. Ottawa: Research Branch, Agriculture Canada, pp. 9–63.
- MEIGEN, J.W. 1826. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insecten*. 5. Hamm.: Schultz, pp. xii+412, pls 42–54.
- MICHELSSEN, V. 1988. A world revision of *Strobilomyia* gen. n.: the anthomyiid seed pests of conifers (Diptera: Anthomyiidae). *Systematic Entomology* **13**: 271–314.
- PATERSON, H.E. 1956. East-African Muscidae (Diptera). (Ergebnisse der Deutschen Zoologischen Ostafrika-Expedition 1951/1952. Gruppe Lindner, Stuttgart, Nr. 20.). *Beiträge zur Entomologie* **6**: 154–179.
- PONT, A.C. & ACKLAND, D.M. 1980. 83. Family Anthomyiidae. In: Crosskey, R.W., ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History), pp. 715–718.
- RINGDAHL, O. 1933. Översikt av i Sverige funna Hylemyia-arter. *Entomologisk Tidskrift* **54**: 11–35.
- RONDANI, C. 1866. Anthomyiinae italicae collectae distinctae et in ordinum dispositae. *Atti della Societa Italiana di Scienze Naturali, Milano* **9**: 68–217.
- SCHNABL, J. & DZIEDZICKI, H. 1911. Die Anthomyiden. *Nova Acta Academiae Caesarea Leopoldino-Carolinae Germanicum Naturae Curiosorum* **95**: 53–358, pls 3–37.
- SÉGUY, E. 1934. Diptères d'Afrique. *Encyclopédie Entomologique*, Ser. B/II (Diptera) **7**: 63–80.
- 1936. Un nouveau muscide nuisible à l'orge au Maroc. Liste des Diptères vivant sur les Hordeum. *Bulletin de la Société des sciences naturelles du Maroc* **16**: 3–5.
- 1938. Mission scientifique de l'Omo, Diptera I. Nematocera et Brachycera. 4 (Zool.). *Mémoire du Muséum National d'Histoire naturelle, Zoologie* **8**: 319–380.
- 1950. Contribution à l'étude de l'Aïr (Mission L. Chopard et A. Villiers). *Mémoires de l'Institut Français d'Afrique Noire* **10**: 272–282.
- 1953. Diptères du Maroc. *Encyclopédie Entomologique*, Ser. B/II (Diptera) **11** (1947–1953): 77–92.
- STEIN, P. 1898. Nordamerikanische Anthomyiden, Beitrag zur Dipterenfauna der Vereinigten Staaten. *Berliner Entomologische Zeitschrift* **42** (3, 4): 161–288.
- 1903. In: Becker, T. Ägyptische Dipteren. (Fortsetzung und Schluss). *Mitteilungen der Zoologischer Museum, Berlin* **2** (3): 67–195.
- 1906. Die Afrikanischen Anthomyiden des Königl. Zoologischen Museums zu Berlin. *Berliner Entomologischer Zeitschrift* **51**: 33–80.
- 1907. Anthomyiidae. In: Becker, T. et al., eds, *Katalog der paläarktischen Dipteren*, Vol. 3. Budapest: G. Wesselényi in Hódmezővásárhely, pp. 599–747.
- 1913. Neue afrikanische Anthomyiden. *Annales Historico-Naturales Musei Nationalis Hungarici* **11**: 457–583.
- 1914. Anthomyiidae. In: *Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911–1912)*. Résultats scientifiques. Part **33**. Insectes Diptères IV. Paris: Schulz, pp. 101–143.
- 1918. Zur weitem Kenntnis außereuropäischer Anthomyiden. *Annales Historico-Naturales Musei Nationalis Hungarici* **16**: 147–244.
- VILLENEUVE, J. 1911. Diptères nouveaux recueillis en Syrie par M. H. Gadeau de Kerville et décrits. *Bulletin de la Société des Amis des Sciences Naturelles de Rouen* **12**: 12.
- ZETTERSTEDT, J.W. 1845. *Diptera Scandinaviae deposita et descripta*. **4**. Lund: Officina Lundbergiana, pp. 1218–1738.

