

## **Bombyliidae (Diptera) from Southern Spain, with descriptions of twelve new species.**

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The present collection numbers 473 specimens and belongs to three different institutions. The bulk of it (408 specimens) was assembled during a joint expedition of the Zoological Museums of Copenhagen, Denmark, and Helsinki, Finland, under the leadership of Drs. L. Lyneborg and W. Hackman, and gives a comprehensive idea of the Bombyliid fauna of Southern Spain in early spring. This material was collected between 3 March and 8 May 1966. The other collectors were Messrs. Ole Martin and Søren Langemark.

The remaining 65 specimens belong to the Canadian National Collection of the Entomological Research Institute, in Ottawa, Canada, and were collected by Dr. J. R. Vockeroth between 9 and 30 July 1960 at altitudes ranging between 700 and 2550 m. Taking this fact into account the species concerned may also be considered as vernal, at least those caught above the 1000 m line.

The collection includes no less than 27 genera of which 5 are new to Spain (*Empidideicus*, *Glbellula*, *Oligodranes*, *Heterotropus* and *Desmatoneura*). The two last named genera are new to Europe as well. Dr. J. M. Andréu-Rubio, in his catalogue of Spanish Bombyliidae (1961), records 26 genera. He lists a total of 174 species from Spain proper. The number of species represented in the collection is 64 (a further species, *Aphoebantus lyneborgi* n. sp. from N. Morocco has been added, merely for the sake of convenience). An unexpectedly large number of these are new: eleven. It must also be noted that altogether 14 of the species reviewed here are new to Spain, which enlarges the number of already known Bombyliids of that country by 8 %.

Apart from its intrinsic value the collection is revealing in that it brings to light a rather unexpected fact, viz. that the European Bombyliid fauna is still far from well known. It also gives a useful hint as to how more new or little-known species are to be found, namely by collecting the smaller species in early spring or at high altitudes.

Most of the specimens collected in 1966 by Dr. Leif Lyneborg and his assistants are not indicated by collectors names and are in the Zoological Museum of the University of Copenhagen, but those specimens indicated as collected by Dr. W. Hackman are in the Zoological Museum of Helsinki. The specimens collected in 1960 by Dr. J. R. Vockeroth are in the Entomology Research Institute of Ottawa. Duplicates of most species have been kept in the Royal Institute for Natural Sciences, Brussels.

I thank Dr. Leif Lyneborg, Dr. W. Hackman and Dr. J. F. McAlpine for submitting to me this exceptional material, which it was all the more pleasant to study as most of the specimens are in excellent condition.

***Amictus variegatus*** (Meigen), 1835.

Material. — GRANADA: Salobrena 6 km W. Motril, 0—50 m, 1 ♂, 24 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 6 ♂ 5 ♀, 20—21 April 1966.

Distribution. — Recorded from "Southern Europe and North Africa" by Séguy and Engel. I know the species only from Spain and from France near the Pyrénées (Banyuls; Séguy, 1926).

***Conophorus fuliginosus*** (Wiedemann ap. Meigen), 1820.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♀, 23 April 1966; Rio Guadelfeo, Orgiva, 300 m, 3 ♂, 2, 4 and 18 April 1966.

Distribution. — Southern France, Portugal, Spain, Morocco, Algeria, Tunisia.

***Conophorus macroglossus*** (L. Dufour), 1852.

Material. — ALMERIA: Alhama 5 km W, 200—500 m, 11 ♂ 1 ♀, 17—28 March 1966, (1 ♂ 1 ♀ leg. W. Hackman).

Distribution. — This is an exclusively Spanish species which has been found in the Provinces of Alicante, Barcelona, Coruna, Madrid, Murcia, Teruel and Zaragossa (J. M. Andréu-Rubio, 1961: 17). It had not yet been found in the Almeria Province.

Remarks. — Of the twelve specimens caught only one is a female. This scarcity of the females is typical of the species. It is only in 1962 that a specimen of this sex was caught by A. Collart near Barcelona (François, 1962:2). The length of the proboscis and the characteristic and motley infuscation of the wings make this species quite easy to identify.

**Usia aenea** (Rossi), 1794.

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2400 m, 1 ♂ 1 ♀, 22 July 1960 (J. R. Vockeroth).

Distribution. — An exclusively Mediterranean species, it has been found in Portugal, Spain, S. France, Italy (Ligurian Alps; Abruzzi, Sicily), Greece, Syria, N. Morocco.

**Usia aurata loewi** Becker, 1906.

Material. — GRANADA: Pinus Puente 15 km NW Granada, 500—1000 m, 5 ♀, 17 April 1966.

Distribution. — An exclusively Spanish subspecies of the widely distributed *aurata* (F.).

Remarks. — I have seen specimens from San Fernando (Czerny & Strobl) which agree well with the Copenhagen Museum material except for the length of the proboscis and of the pile on mesonotum, which in the latter material is shorter. In the absence of male specimens it would be inadvisable to draw any conclusions from such differences. These small forms (3—4 mm) are generally overlooked and consequently insufficiently known.

**Usia grata** Loew, 1856.

Material. — ALMERIA: Alhama 5 km W, 200—500 m, 2 ♀, 17 March 1966. — GRANADA: Pinus Puente 15 km NW Granada, 500—1000 m, 1 ♀, 27 April 1966.

Distribution. — Spain. Originally described from Andalusian material by Loew; Engel (1932) records a male from Egypt (?) and J. M. Andréu-Rubio (1961) gives records from the Spanish provinces of Alicante, Almeria, Jaén, Madrid, Murcia and Sevilla.

Remarks. — Efflatoun Bey in his monograph of the Egyptian Bombyliidae Homoeophthalmae (1945:202) mistakenly records it as a synonym of *aurata* (F.), from Egypt. *Aurata* and *grata* cannot be confused. I have seen specimens of both species. The ♂ of *grata* is holoptic, *aurata* not; moreover *aurata* has strikingly developed genitalia, which *grata* has not; the ♀ of *aurata* has a much narrower frons than *grata*.

**Usia martini** n. sp. (Figs. 1 a, b).

Material. — GRANADA: Sierra Nevada near Padul, 1300 m, 2 ♀, holotype and paratype, 1 May 1966. Holotype in Zoological Museum, Copenhagen. Paratype in R. Inst. nat. Sc., Brussels.

Diagnosis, ♀. — A small (less than 3 mm), black, whitish and brownish pollinose species, with broad, oval abdomen which is not banded transversely, with tegument of thorax and abdomen not conspicuously pitted. Hairs on body short, longer only on ocellar tubercle and on hind margin of scutellum. As a rule hairs on dorsal side of body black or at least dark, white or whitish on ventral side. Tegument of body dull, slightly shiny on abdominal tergites only, under the pruinescence. Seems to belong to Paramonov's *versicolor* group (1950).

Description, ♀. — Head: frons dull, entirely pollinose, brownish on upper part, greyish on lower part which bears minute, dark reddish hairs; genae glabrous, rather more developed than is the rule in this genus, buccal cavity very shallow; hairs on greyish pollinose occiput longer but still rather short, shorter than the basal antennal joints; ocellar tubercle with distinctly longer hairs; proboscis almost 2,5 times as long as head; first and second antennal joints with very short, dark hairs, third antennal joint (Figs. 1 a, b) lanceolate but distinctly blunted at tip, with an oval, preapical, dorsolateral pit in which a very short rod is visible as a brilliant white spot, third joint thickly covered with microtrichia and also with a few longer hairs at base of preapical pit; frons rather narrow, hardly broader than ocellar tubercle, the head being a little more than 5 times as broad as the interocular space at vertex.

Thorax: ground colour dull black but with a brownish pruinosity and, centrally, a double longitudinal blackish-brown stripe which reaches more than halfway down to the scutellum, laterally two less distinct spots of the same colour; mesonotum neither conspicuously wrinkled nor pitted, hairs sparse, short, distinctly longer on hind margin of scutellum; pleura dull black, greyishly pulverulent.

Abdomen: broadly oval, distinctly broader than thorax; tegument black, slightly shiny, not distinctly pitted, covered with a brownish, almost golden pruinosity; hairs on tergites above, minute, not dense, black; laterally and beneath, on sternites, longer, whitish or yellowish; in profile the abdomen shows above a succession of slight ridges and depressions.

Wings: of a uniformly brownish tinge and with dark brown veins; cubital fork long, beginning distinctly beyond apex of discal cell, latter cell and 2nd basal cell of equal length;  $R_5$  3,5 times longer than apical transverse vein of discal cell; r-m cross-vein situated slightly beyond middle of discal cell; vein 1A straight; anal cell pedunculate, with a stalk longer than m-cu transverse vein; axillary lobe slightly narrower than anal cell; knob of halteres whitish, without dark spot.

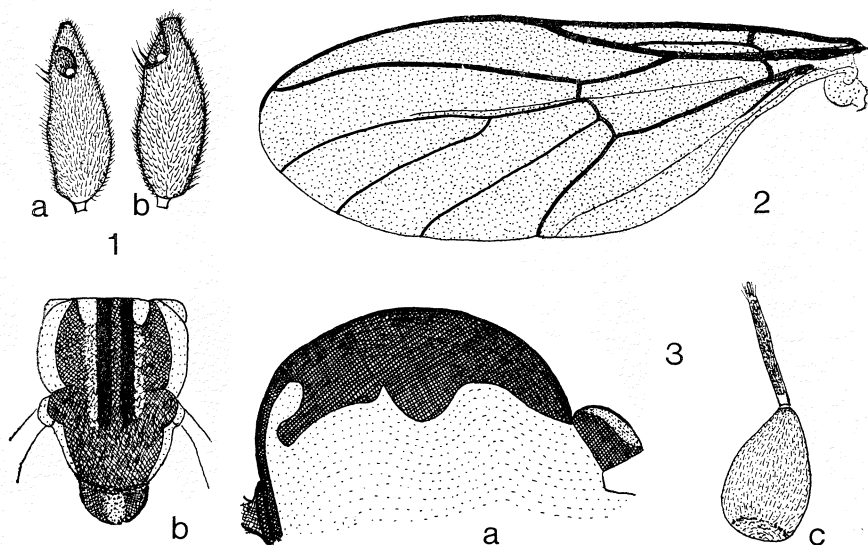
Legs: white haired, tibiae with numerous rows of minute white hairs; all 3 pairs of femora with hairs shorter than femoral breadth.

Measurements: length of body 2,52 mm, of wing 2,73 mm, maximum breadth of abdomen 1,33 mm, breadth of thorax 1,05 mm.

This species is named in honour of Mr. Ole Martin.

**Toxophora maculata** (Rossi), 1790.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 4 ♂ 2 ♀, 23 April and 5 May 1966.



Figs. 1—3. — 1. *Usia martini* n. sp., female, holotype; third antennal joint, a. In dorsal view, b. In profile. — 2. *Empidideicus hispanus* n. sp.; left wing of female holotype. — 3. *Empidideicus hackmani* n. sp.; a. Thorax in lateral view, b. Same in dorsal view, c. Third antennal joint in lateral view.

Distribution. — This rather rare though in the Mediterranean basin ubiquitous species is also found in S. Egypt, in the Crimea, in the Caucasus, Kazakhstan, Persia and Baluchistan.

**Empidideicus hispanus** n. sp. (Fig. 2).

Material. — ALMERIA: Cabo de Gata, 0—50 m, 1 ♀, holotype, 26 March 1966. In Zoological Museum, Copenhagen.

Diagnosis, ♀. — Minute (1,5 mm), brownish species, with many yellow markings, yellow face, black frons, yellow scutellum, without so much as an indistinct longitudinal stripe on mesonotum, wings with distinct brownish tinge and a long  $M_1$ - $M_2$  fork, halteres bright yellow, abdomen with bright yellow hind margins above, legs mostly yellow, coxae I and II almost entirely yellow.

Description, ♀. — Head: dull black with yellow face, yellowish brown microtrichia on frons and antennae, short hairs on occiput; frons at vertex between 1,5 and 2 times as broad as ocellar tubercle; terminal style of third antennal joint not much shorter than third joint (2:3); proboscis about as long as the head is high.

Thorax: dorsum dull black, without visible longitudinal stripes, narrowly yellow anteriorly next to yellow alar calli; mesonotum laterally yellow, the yellow areas completely surround the black dorsum; scutellum yellow with, laterally, a brown hind border and (? only in type) a small brownish spot on disc; propleura yellow, pleura otherwise grey and black with numerous yellow spots, almost bare; hairs on mesonotum reddish, very short, rather dense, erect; a few blackish, bristle-like, small hairs near base of wing.

Abdomen: brown, with distinct yellow hind margin on tergites: linear on the two first tergites, then broadening gradually until the last three tergites appear almost entirely yellow; laterally the tergites are entirely or almost entirely yellow; sternites practically completely yellow; hairs yellow and very short.

Wings (Fig. 2): dark brownish, distinctly and densely covered with microtrichia, fork of veins  $M_1$ - $M_2$  long, more than twice as long (19:8) as its basal stalk (19:17 in *E. carthaginiensis* Beck.); anal cell broader than axillary lobe; knob of halteres bright yellow; squama alaris dirty white.

Legs: coxae I and II yellow, brown at their base, coxae III almost entirely brown; femora dorsally brown with more or less extensive yellow base and tip, ventrally yellow; tibiae entirely yellow.

low, slightly darkened near apex; tarsi brownish; claws and pulvilli well developed; hairs short and yellow, no spines or spicules except very tiny ones at tip of tibiae.

Measurements: length of body 1,54 mm, of wing 1,82 mm, breadth of wing 0,67 mm; maximum breadth of abdomen 0,88 mm, breadth of thorax near wing 0,60 mm.

Remarks. — Seven species of *Empidideicus* were known from the Palaearctic Region, only one of which was European. These minute flies are very rare in collections and it is most likely that many more species are still to be discovered. The genus is new to Spain.

*E. hispanus* n. sp. is closely related to *E. carthaginiensis* Beck.; it differs from it in having a yellow scutellum, brownish wings, apparently no longitudinal stripes on mesonotum, bright yellow knobs on halteres, a narrower wing with longer  $R_1$ - $R_2$  fork and a narrower axillary lobe.

***Empidideicus hackmani* n. sp.** (Figs. 3 a, b, c).

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2200 and 2400 m, 2 ♀, holotype and paratype, 30 July 1960 (J. R. Vockeroth). Holotype in Canadian National Collection, Ottawa; paratype in R. Inst. nat. Sc., Brussels.

Diagnosis, ♀. — Minute (1,20 mm), yellow-haired, dull, dark brown species, with many pale yellowish and whitish markings and with hyaline wings; face entirely, frons and occiput partly pale yellow, thorax peripherally yellow with a distinct, double, longitudinal black stripe centrally; abdomen distinctly broader than thorax and with pale-yellow, almost white hind margins on tergites; wing with marginal and second submarginal cell wanting; legs with brown femora and whitish tibiae.

Description, ♀. — Head: face and frons immediately above antennae pale yellow, discal part of frons brown but on either side a relatively large, pale yellow triangle, ocellar tubercle brown, occiput also brown except for a lateral, pale yellow triangle immediately behind eyes; hairs rather sparse, minute, yellow; first and second antennal joints yellowish brown, third joint (Fig. 3 c) brown, style longer than basal width of third joint; proboscis brown, with longer yellow hairs at the base, a little more than twice as long as the head.

Thorax (Figs. 3 a, b): pale yellow but with most of the mesonotum brown, with a distinct central, dark brown double stripe

above, which reaches more than halfway down to the scutellum and is made more distinct by a narrow, adjacent, longitudinal, greyish pollinose area; though it seems to be slightly variable the brown pattern on the mesonotum may prove to be of specific value as it is almost identical in both specimens (desiccation tends to make the contours a little indistinct); very small, sparse, yellowish white hairs on mesonotum; scutellum brown with yellow tip.

Abdomen: velvety black with, on tergites, an increasingly broader, yellowish white hind margin, which occupies more than half the surface of the three last tergites, laterally the tergites are almost entirely yellowish white, sternites brown and yellow; hairs yellow, denser and longer than on mesonotum.

Legs: anterior coxae almost entirely yellow, coxae II and III mostly brown, femora brown but yellow at either tip, tibiae whitish, slightly darker at apex, metatarsus pale yellow, tarsi otherwise brown; claws and pulvilli well developed.

Wings: hyaline but slightly darkened by numerous brown microtrichia, brown veins; no discal cell; fork of  $M_1$ - $M_2$  about twice as long as its stalk; anal cell and axillary lobe equally broad. The wings of both type and paratype are damaged. Knobs of halteres almost pure white.

Measurements: (dried specimen) length of body 1,19 mm, of wing about 1,40 mm (damaged), max. breadth of wing 0,56 mm, max. breadth of thorax 0,39 mm, of abdomen 0,60 mm.

Remarks. — This species is at once distinguished from other known species by the yellow face, the yellow frons with a brown disc and by the partially yellow occiput.

It is named in honour of Dr. W. Hackman.

### ***Cyrtosia pruinosula* n. sp. (Figs. 4 a, b, c, d).**

Material. — ALMERIA: Rioja 10 km N, 50—200 m, 1 ♂, holotype, 12 March 1966; Tabernas 8 km N, 200—500 m, 1 ♀ paratype, 14 March 1966. Holotype in Zoological Museum, Copenhagen. Paratype in R. Inst. nat. Sc., Brussels.

Description, ♂♀. — A tiny, slender species of less than 3 mm; ground colour dull black but body almost entirely greyish pollinose, devoid of conspicuous yellow spots; the humeral and postalar calli, the hind borders of the abdominal tergites from a dirty white to a slightly yellowish shade. Face pointed and, like genae and mouth margin, yellow; head otherwise black with a



greyish bloom, proboscis 1,5 times as long as head (100:61); the greyish, not sharply delimited pollinose markings on mesonotum are shaped as follows: behind each humeral callus an ill-defined spot from which originates a thin, longitudinal stripe; these two stripes are separated by a black area about as broad as length of third antennal joint without its style, and they lose themselves in an extensive greyish pulverulent zone which covers almost the entire posterior third of mesonotum (without scutellum); in the ♀ the central black area is divided by a linear, longitudinal, pale grey stripe; laterally the anterior greyish bloom

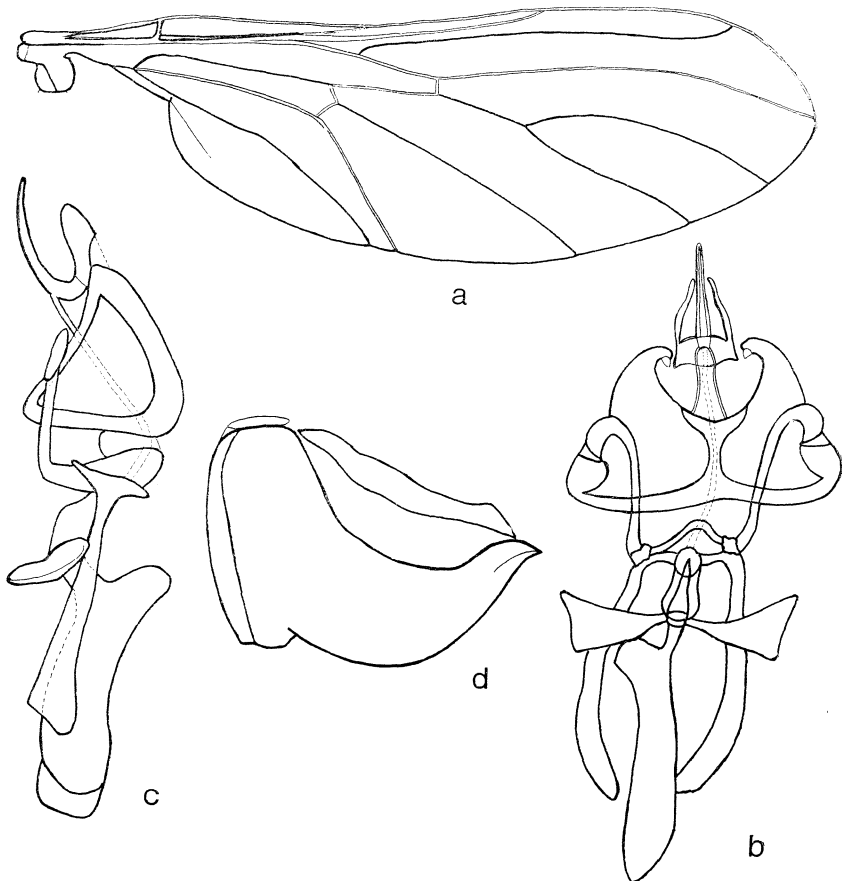


Fig. 4. *Cyrtosia pruinosula* n. sp.; a. Right wing of female paratype, b. Hypopygium of holotype, ventral view (damaged, see text), c. Same in lateral view, d. Epandrium in lateral view.

extends towards the base of the wings and covers the entire pleura and coxae; the whole thorax is covered with a pale, not very dense pubescence; scutellum greyish pollinose.

Abdomen: eight visible segments, the first seven with a linear, dirty white hind border, the 8th more broadly yellowish white at end; short, whitish pubescence which is sparser in ♀ than in ♂; abdomen slightly clubbed at end in ♂ because of the rather large genitalia. Epandrium with two broad, apical lamellae. ♂ hypopygium (Figs. 4 b, c, d): it should be noted that the phallosome is accidentally partly severed from the gonocoxites and that consequently the upper part of the phallosome is ruptured.

Legs: ♂, femora dark brown, tibiae and tarsi lighter, with yellow "knees" and a broadly yellowish base on metatarsus; ♀, yellow tipped femora, yellow tibiae with slightly darker apex, brown tarsi, but basal part of metatarsus yellowish as in ♂; hairs on legs mostly white.

Wings (Fig. 4 a): typical of the genus, long, greyish hyaline, slightly iridescent, alula vestigial, third longitudinal vein unforked, discal cell absent, anterior border of wing conspicuously depressed; knob of halteres white, laterally more or less blackened.

Measurements: length of body, ♂ 1,5 ♀ 2,6 mm, of wing, ♂ 2.1 ♀ 3,8 mm.

Remarks. — Although Engel, in his revision (1933) of the Palaearctic fauna, has made a meritorious effort to put some semblance of order into the systematics of the genus, it is still very poorly known. Few specimens are to be found in collections; the descriptions are widely scattered and often unsatisfactory; there is practically no useful iconography; the study of the ♂ genitalia, an indispensable means to the separation of the species, has been so far neglected. It is therefore well-nigh impossible to divide the genus in groups of related species. The present species is conspicuous by the absence of distinct yellow markings and by the greyish pruinescence which covers most of the body. According to Engel's table it runs down to *tetragramma canariensis*. Thanks to the helpfulness of Dr. H. Schumann, Zoologisches Museum der Humboldt Universität zu Berlin, I have been able to examine Engel's type, a wingless male. It is distinct from *pruinosa* by the following characters: larger (3,5 mm), pubescence on mesonotum darker, denser and longer, scutellum with denser, relatively longer, brown hairs (on *pruinosa* the hairs are white); abdomen relatively

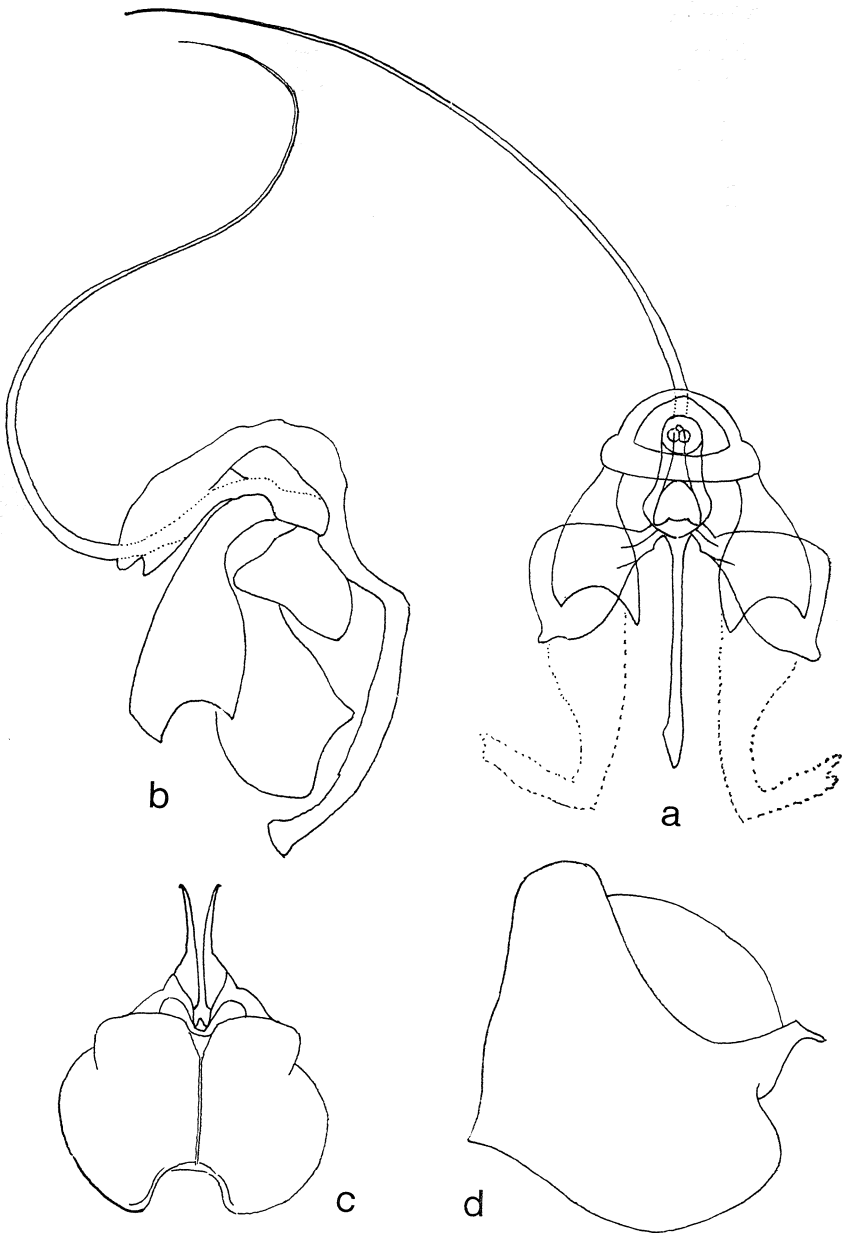


Fig. 5. *Cyrtosia canariensis* Engel, type; a. Phallosome in dorsal view, b. Same in lateral view, c. Gonopods in dorsal view, d. Epandrium in lateral view.

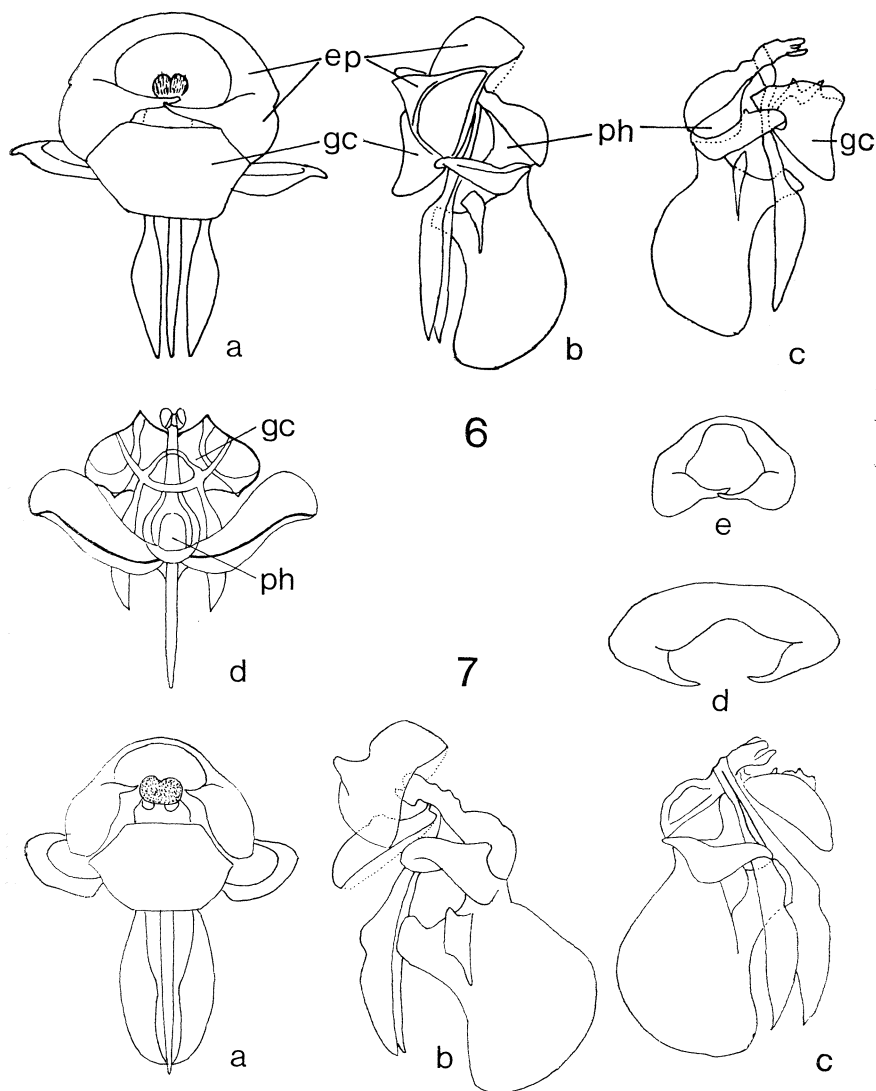
shorter, thick set, compressed, hairs on tergites in ♂ adpressed, very dense, forming almost a pile on the anal segments, epandrium reddish brown, shiny, densely haired; halteres pale brown, knob brown; the ♂ genitalia are very different (Figs. 5 a, b, c, d). Among the species described by Efflatoun (1940:34) *Cyrtosia abragi* has much in common with *pruinosa* but can be separated from it by the yellow lower part of the frons, the distinctly yellow humeral and postalar calli, the several yellow spots on pleura, the presence of a distinct yellow hind border on all abdominal tergites etc.

From what I have been able to learn about *Cyrtosia* there is little doubt that Engel's *tetragramma canariensis* is a species in its own right, which is not even closely allied to *tetragramma*.

#### Genus *Glabellula* Bezzi, 1902.

In Europe this genus has been recorded so far only from the high Scandinavian North, from Holland, Austria and Greece. It has now been found in Spain and is certainly a native of several other European countries. Most authors who have written about this genus have stated that the metamorphosis was unknown. This may be because they have generally overlooked an interesting note made by De Meijere in Tijdschrift voor Entomologie, 1924, LXVII p. XXXV, which was repeated in his additions to the list of Netherlandish Diptera of 1928 and 1935 (ibidem 1928, LXXI: 23 — among the Empididae — and 1935, LXXVIII:203). I believe these references to be generally unknown. V. S. van der Goot (1963:18) includes the species among the Bombyliidae of Holland and records it as a possible parasite of *Formica*. As Netherlandish ("Dutch") is not readily understood outside Holland and Belgium it may be useful to give a translation of the text of the first of these references. De Meijere reports on Diptera new to the fauna of Holland.

"Among insects captured in nests of *Formica exsecta* Nyl. at Nunspeet, on July 22 1923, the speaker has found a most remarkable Dipteron. The tiny, shining little fly showed a very peculiar venation which made it difficult to define even the family to which it belonged. After some research it proved to be *Glabellula* (first and successively *Platygaster* — *Sphaerogaster* — *Glabella*, but it appeared that these names were already in use) *arctica* Zetterstedt, a very rare little fly, first discovered in the high North,



Figs. 6—7. — 6. *Glabellula sufflava* n. sp., holotype; a. Hypopygium with epandrium in dorsal view, b. Same in lateral view, c. Hypopygium in lateral view, d. Same in dorsal view, e. Epandrium in apical view. — 7. *Glabellula canariensis* Frey, paratype; a. Hypopygium with epandrium in dorsal view, b. Same in lateral view, c. Hypopygium in lateral view, d. Epandrium in apical view.

near the North Cape, on August 17 1821 and later also mentioned from England and Siberia, without anything of its manner of life having until now come to light. The first author, Zetterstedt, considered it as belonging to the Acroceridae, with which it has indeed in common a thick-set and arched thorax and abdomen. But the halteres are not covered by large squamae and, for other reasons as well, the species was included by Loew among the Bombyliidae. Other species parasitizing Hymenoptera are found among these, so that the animal might well prove to be a parasite of *Formica*. The best description . . . etc.”

***Glbellula sufflava* n. sp.** (Figs. 6 a, b, c, d, e).

Material. — GRANADA: Sierra Nevada Highway, 2200 m, 1 ♂, holotype, 1 ♀, paratype, 27 July 1960 (J. R. Vockeroth). Holotype in Canadian National Collection, Ottawa. Paratype in R. Inst. nat. Sc., Brussels.

Description, ♂♀. — Measurements: length of body, ♂ 1,12, ♀ 1,22 mm, of wing ♂ 1,22, ♀ 1,33 mm. Very near *Glbellula canariensis* Frey of which, thanks to the kindness of Dr. W. Hackman, I have been able to study a ♂ and a ♀ paratype. *Glbellula sufflava* differs however by the following characters. Face yellow, hairs on thorax whitish, yellow spots on thorax more extensive and more distinct: there is one laterally on the mesonotum, just before the transverse suture, and a smaller one on the mesopleuron before the base of the wing; humeral and postalar calli distinctly yellow; the yellow spot above coxae I is joined to a metapleural spot, next to the halteres, by a narrow yellow membrane; the ♂ has two yellow spots on mesonotum anteriorly (not to be confused with the yellow humeral calli); ♂ tergites 1—2 without whitish hind border except laterally; tergites 3—4 with a distinct one; tergites 5—7 are almost entirely yellow laterally; ♀ tergites without yellow hind border before on tergite 4 and this very inconspicuous, distinct hind borders on tergites 5—7. Femora yellow at tip, elsewhere chocolate brown, tarsi of a paler brown than femora and tibiae. The male genitalia (Figs. 6 and 7), are different, i.e. in that *canariensis* has the epandrium with relatively shorter apical processes (Fig. 7 d) which do not overlap, whereas they do so in *sufflava* (Fig. 6 e); the latter has distinctly better developed gonocoxites, triangular in profile, in *canariensis* they are flat, lens-shaped in profile.

Genus **Apolysis** Loew, 1860.

The Palaearctic representatives of this genus are very little known. As far as I can make out there are not 20 specimens recorded from the various European museums, barely half the material found in the South African Museum alone. This is no doubt due to the minute size of these flies (2—3 mm) which makes them both difficult to spot and awkward to catch. The genus was erected by Loew in 1860 for a South African species, *A. humilis*. In 1873 Loew created a second species for material (♂ and ♀) found in Turk-estan (*A. eremophila*). *Cyrtosia cinerea* Perris, 1839, from France and *C. andalusica* Strobl, 1898, from Spain, were shown also to belong to the genus *Apolysis*. Further specimens from Croatia, Tunis and Ismailia (Egypt) were allotted to *eremophila* and *humilis*. In 1938 Hesse revised the South African species and, for the first time since the creation of the genus, really serviceable figures (♂ genitalia and antennae) were provided for the distinction of the species. Engel's revision of the Palaearctic species of the genus (1933:127), though useful, is unreliable because the *A. humilis* supposedly found in Tunis is not *humilis* and because several species are lumped together in what he considers to be *eremophila*. Efflatoun (1945:103) also records *eremophila* from Egypt but judging from his description one can safely conclude that this is an altogether different species. Paramonov's revision (1947:213) is not very satisfactory either, from lack of material and because he has neither studied the types nor figured whatever material was at hand. Thus the work which Hesse did thirty years ago for the South African species remains to be done for the Palaearctic ones.

Apart from the Spanish material from the Copenhagen Museum and from the Entomology Research Institute, Ottawa, the study of which is the subject of the present paper, I have at my disposal two specimens (1 ♂ 1 ♀) of *eremophila* (sensu Villeneuve), from Croatia, originating from the Villeneuve collection in the R. Inst. nat. Sc., Brussels. Considering the dearth of usable figures of Palaearctic *Apolysis* I give sketches of the wing and genitalia (♂) of this species as well as of the Spanish species which is hereafter described as new.

**Apolysis montivaga** n. sp. (Figs. 8 a, b, c, d).

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva.

300 m, 1 ♂, holotype, 23 April 1966; Sierra Nevada near Padul, 1300 m, 1 headless ♂, paratype, 1 May 1966; Maitena, 900 m, 1 ♀ (? same species), 10 July 1960 (J. R. Vockeroth). Holotype in Zoological Museum, Copenhagen. Paratype in R. Inst. nat. Sc., Brussels.

Diagnosis, ♂♀. — A minute fly, 1,85 mm in total length, wing 1,85 mm, entirely dull black with white hairs, greyish or brownish grey pollinosity on frons and face, anterior part of mesonotum, pleura and on anal sternites and tergites.

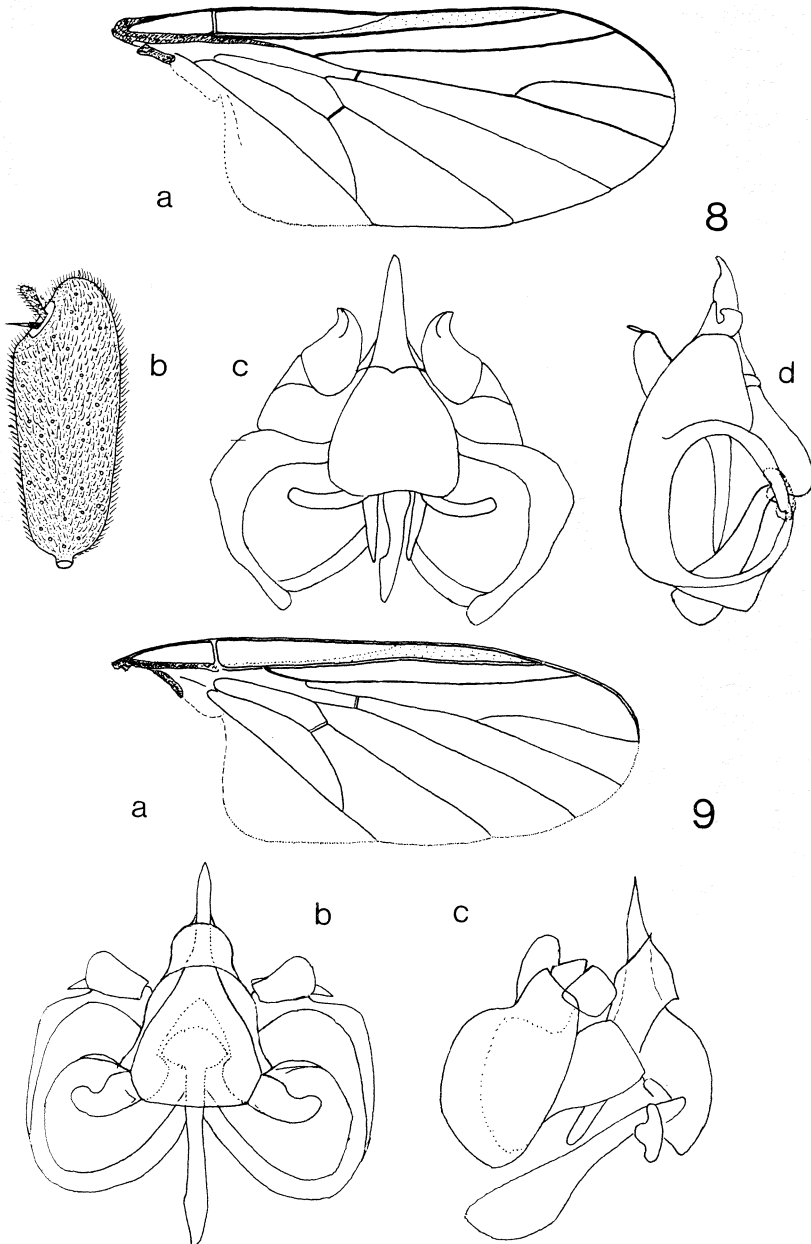
Description, ♂♀. — Head: proboscis projecting only slightly beyond extended antennae, not outranging them by more than the length of the two basal antennal joints; palps not conspicuous and apical joint not thickened; third antennal joint elongated, sausage-like (Fig. 8 b.); male holoptic.

Thorax: mesonotum black though anteriorly greyish pollinose, without any distinct longitudinal stripe. Abdomen: posterior margin of tergites very narrowly pale brown; dorsum and sides of tergites with sparse, short, erect white hairs which are more conspicuous in ♂ than in ♀; minute, white, relatively numerous hairs on epandrium in ♂; except for the anal tergites and sternites the abdominal segments are of a deep black, devoid of pollinosity; in ♀ the intersegmental membrane protrudes markedly along the dorso-ventral suture and the first tergite is entirely black; ♂ hypopygium: see figs. 8 c, d. Wing: (Fig. 8 a) brownish, cinereous hyaline, moderately iridescent, not milky white, with dark brown veins; the ambient vein delimitates clearly axillary lobe and alula; basal cells of equal length; lower cubital branch equal in length with part of 3rd longitudinal vein situated between middle cross-vein and cubital fork (much shorter in *cinerea*, 9:13); ♂ with halteres black, knob sometimes whitened at tip and underneath, ♀ with yellowish knob (? same sp.).

N.B. The ♀ has not been given the rank of paratype because she may well belong to yet another species, with yellow knobs of halteres, shorter lower cubital fork (16:19, see above) etc. Although these may be mere manifestations of sexual dimorphism too little is known about the taxonomy of *Apolysis* and there is not enough material available, to allow me to give a well considered opinion.

Remarks. — Engel (1933:128) lists 3 Palearctic species: *andalusica* Strobl, *eremophila* Loew and *humilis* Loew. The last one is a South African species and is unlikely to be found much





Figs. 8—9. — 8. *Apolysis montivaga* n. sp.; a. Right wing of male paratype, b. Third antennal joint of male holotype, c. Hypopygium in dorsal view of paratype, d. Same in lateral view. — 9. *Apolysis eremophila* Loew (sensu Villeneuve); a. Right wing of male, b. Hypopygium in dorsal view, c. Same in lateral view.

farther north. On the other hand *A. cinerea* (Perris), which Engel considers a synonym of *eremophila*, is almost certainly a valid species. This leaves us with 3 Palaearctic species from which *montivaga* can be differentiated as follows. From *eremophila* (sensu Villeneuve) it can easily be distinguished by the wing, as the ambient vein stops before the axillary lobe in *eremophila* and the first basal cell is longer than the second (Fig. 9 a), and also the male genitalia (Figs. 9 b, c) are different. From *eremophila* sensu Engel *montivaga* is different through the less extensive grey pollinosity, the very short palps which do not reach half-way down the third antennal joint, the absence of any distinct longitudinal stripe on mesonotum, the only moderately iridescent wings, the dark brown veins etc. From *andalusica* it is distinguished by the absence of longitudinal stripes on mesonotum, by the not yellow but dark brown veins on the wing, by the at least partly dark halteres, by the entirely black first tergite. From *cinerea* it can be separated by the much longer cubital fork and by the closed and pedunculate anal cell.

***Geron albidulus* n. sp.** (Figs. 10 a, b).

Material. — TERUEL: Albarracin, 1200 m, 1 ♂, holotype, 26 July 1965 (V. S. van der Goot). — GRANADA: Sierra Nevada, N. slope Veleta, 2200 m, 1 rather denuded ♂, paratype, 30 July 1960 (J. R. Vockeroth). Holotype in Zoölogisch Museum der Universiteit van Amsterdam. Paratype in Canadian National Collection, Ottawa.

Diagnosis, ♂. — Small, black species (2,5 and 3,5 mm), with pure white hairs on entire body, hairs on face long and dense, wings vitreous hyaline, whitish pruinosity on face, frons, antennae, occiput, pleura, coxae, sides of mesonotum and base of abdomen (in well preserved specimens), silvery white scales on thorax and rest of abdomen.

Description, ♂. — Head: face entirely devoid of scales, densely covered with long, white hairs, centre of face from clypeus upwards narrowly bare, as is also a small crescent immediately under the antennae; face and frons: ground colour black under a whitish pruinosity; frons with minute, adpressed, silvery scales and no hairs; antennae with first joint whitish pollinose, bearing long, rather sparse white hairs and no scales, about twice as long as second joint which is barrel-shaped and slightly broader than

first joint; third antennal joint a little less than two and a half times the length of first joint; eyes in actual contact above, for about three times the length of the ocellar tubercle.

Thorax: a slight, narrow, greyish central stripe on anterior third of mesonotum (only to be seen in well preserved specimens).

Abdomen: with numerous, silvery white, brilliant scales and long, relatively dense hairs.

Hypopygium: gonocoxites with two diverging, narrow and pointed, prong-like appendices on the ventral side above (Fig. 10 a), the two branches of the epiphallus very long, widely bifurcating and characteristically shaped (Fig. 10 b).

Wings: length 3 and 3,7 mm, vitreous hyaline, not milky whitish except for the axillary lobe, with yellowish or brownish veins, Sc. hardly discernible,  $R_5$  a little more than twice as long as transverse vein closing the discal cell apically, halteres with yellowish stem and white knob.

Legs: blackish brown, metatarsus sometimes yellowish, silvery white scales.

Remarks. — The new species is nearly related to *intonsus* Bezzi, but can be distinguished from this by the smaller size and the distinctly different male genitalia. It is also quite near *emiliae*

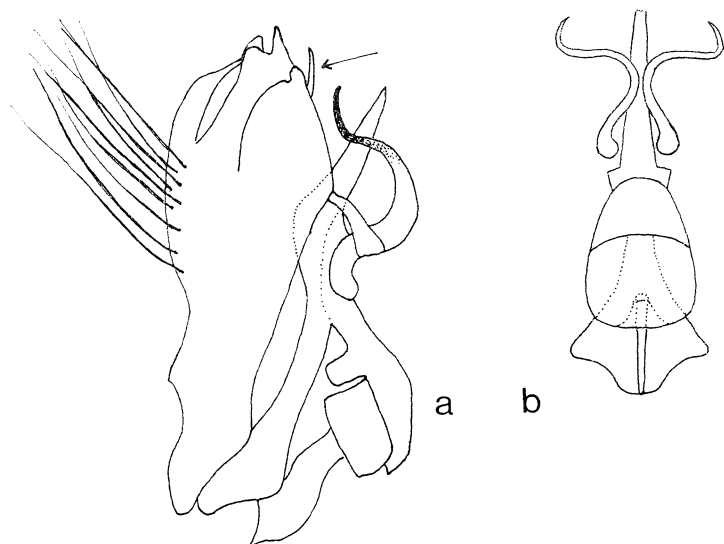


Fig. 10. *Geron albidulus* n.sp.; a. Hypopygium in lateral view of holotype, b. Phallosome in frontal view of paratype.

Zaitzev, from Kazakhstan, but differs from this by the shape of the phallus and of the rami of the epiphallus.

**Oligodranes langemarki** n. sp. (Figs. 11 a, b).

Material. — GRANADA: Barranco de Miranda, 8 km SW Or-giva, 300 m, 2 ♀, holotype and paratype, 16 and 23 April 1966. Holotype in Zoological Museum, Copenhagen. Paratype in R. Inst. nat. Sc., Brussels.

Diagnosis, ♀. — A very small (less than 2,5 mm), black, *Phthiria*-like, distinctly hump-backed species, with sparse and short, whitish pubescence on entire body, uniformly hyaline wings, 3rd antennal joint with a dorsal, upwardly directed, style-like process (as in *Apolysis*), discal cell present, two submarginal and three posterior cells, first basal cell hardly longer than second; r-m situated near base of discal cell, and abdominal segments black with very narrow yellowish-white hind margins.

Description, ♀. — Head: frons dull black, slightly depressed centrally and also distinctly transversely towards apex; the part on which the antennae are situated, however, slightly tumid; frons at apex distinctly broader than ocellar tubercle, almost twice as broad, face practically non-existent; upper part of frons with very sparse, yellowish-white, erect hairs; anterior part of frons and genae greyish pollinose and with more numerous and longer hairs of the same colour; inner margin of eyes only gradually diverging anteriorly, frons consequently not much broader at level of antennae than at apex; antennae black with small basal joints, combined, slightly longer than half the length of third joint, with very small, sparse, yellowish-white hairs; third joint (Fig. 11 b) club-shaped, laterally compressed, broadening towards tip, with a distinct, dorsal, preapical excavation from which protrudes a rather stout, upwardly directed, style-like process (no hair-like style is visible); proboscis about twice as long as head; occiput with longer and more abundant hairs, welt-like protuberances well visible, elongate, as in *Usia*.

Thorax: roundly convex when seen laterally, distinctly humped, black with vague, greyish markings anteriorly on mesonotum, the latter part anteriorly and laterally and also pleura with a greyish-white pruinosity; mesonotum almost hairless: short, white, erect hairs only on anterior part and laterally between humeral callus and base of wing, hairs on discal part rare and weak; scutel-

lum with a few feeble, bristle-like hairs on hind margin; pleura hairless; one of the specimens shows a distinct pronotal ledge in neck region, as in *Platypygus*.

Abdomen: black, convex and carinate below, with 8 visible tergites, elongated and pointed at apex, a little broader than thorax; 1st tergite and all sternites grey-pollinose; on tergites and sternites the hairs are sparse, erect and very short, they are a little longer and more abundant laterally; tergites and sternites with a linear, yellowish-white hind border; one of the specimens (the paratype) with the three basal sternites brownish-red.

Wings (Fig. 11 a): uniformly hyaline, without a prediscaidal spot or a stigma, but cell Sc is slightly opaque, yellowish-grey; pale brown veins; r-m situate opposite base of discal cell, thus is 1st basal cell hardly longer than 2nd; axillary lobe well developed, triangularly lobate; alula large, lobate; halteres with yellow stalk and unspotted, pure-white knob.

Legs: dark-brown to black, rather long, without any spines on femora below, only with short hairs; elsewhere hairs short, downy, inconspicuous; no distinct spicules; apical spurs on tibiae minute; claws and pulvilli well developed.

Measurements: length of body about 2,34 mm, of wings about 2,80 mm, breadth of abdomen 0,88 mm, of thorax 0,80 mm.

This species is named in honour of Mr. Søren Langemark.

Remarks. — I at first felt doubtful about the generic status of this tiny but remarkable species. It has the antennae of an *Apolysis* but a closed discal cell. The general appearance is that of a *Phthiria* but differs in antennae and wing venation; it has neither the abdomen nor the antennae of a typical *Usia*. At first sight it did not seem to be an *Oligodranes* either, because of the

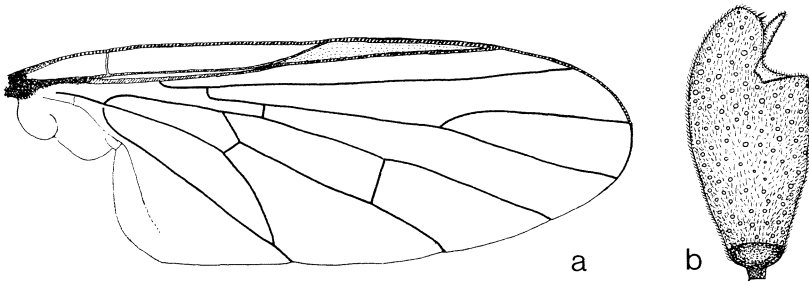


Fig. 11. *Oligodranes langemarki* n. sp.; a, Right wing of female paratype, b, Third antennal joint of female holotype.

*Apolysis*-like antennae and the apparently one-jointed palpi (I have not been able to ascertain whether they are one- or two-jointed); also the occipital welt-like excrescences (Okzipitalschwiele *sensu* Engel) are present, the intersegmental membranes are distinct and, far from being situated on or beyond middle of discal cell, the r-m cross-vein is very proximal, which considerably reduces the length of the first basal cell.

On the other hand, *sensu* Melander (1946:451) and Hesse (1938: 861), the present species is an *Oligodranes* and there is not much doubt that, on the whole, it has more in common with this genus than with any other genus whatsoever. It is thus fairly certain that this species belongs to *Oligodranes*, even though it is a rather aberrant representative of it. A study of the male genitalia will be necessary to settle the matter once and for all.

*Oligodranes* was as yet unknown from the Western Mediterranean, though in 1941 Séguy described an *O. hyalipennis* from the Atlantic coast of Morocco (Agadir). Of the five known Palaearctic *Oligodranes* species *hyalipennis* Séguy seems to be nearest to the species described here. *Langemarki* differs from it in having shorter hairs on thorax and abdomen and no distinct longitudinal stripe on mesonotum.

***Phthiria barbatula* n. sp.** (Figs. 12, 13 b, 14 b).

Material. — GRANADA: Sierra Nevada, N.slope Veleta, 2200 m, 1 ♂, holotype, 20 July 1960 (J. R. Vockeroth). Deposited in Canadian National Collection, Ottawa.

Description, ♂. — Small (3 mm), entirely blackish-brown to olive brown, slightly shiny.

Head: antennae with third antennal joint (Fig. 12) narrow, with a hardly distinguishable dorsal process and almost thrice as long as basal segments; face only moderately produced (Fig. 13 b), not more than the length of basal antennal joints; hairs on frons shorter and not so dense as in *pulicaria* and *lacteipennis*; hairs on frons, antennae and ocellar tubercle black, elsewhere whitish; oral margin narrowly shiny; face and frons (as well as anterior part of mesonotum, pleura, coxae and abdomen laterally) whitish pollinose.

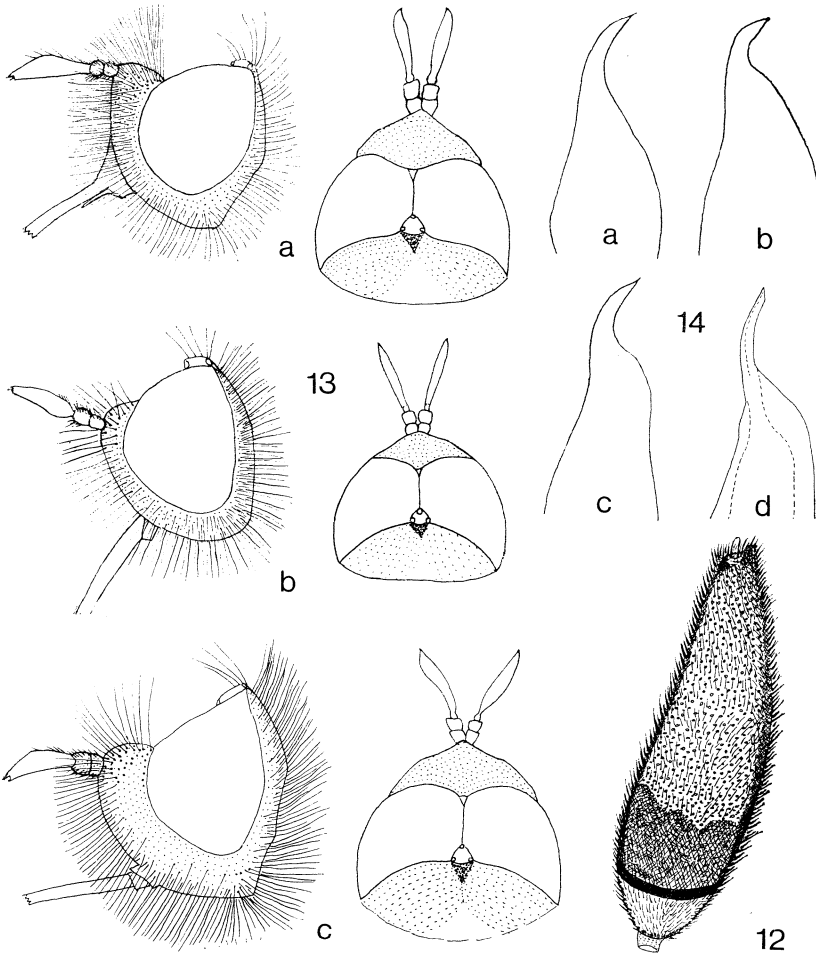
Thorax: devoid of yellowish markings and of longitudinal grey stripes.

Wings: long (3.4 mm) and broad, with a distinctly yellow stigma and yellow veins. Halteres yellow with brownish knobs.

Abdomen: without spots or stripes, hind border of tergites not differently coloured.

Male genitalia: with a quite distinctive phallus (Fig. 14 b).

Remarks. — Though the hairs on the head of this species is not entirely and exclusively whitish, the species is nearer to *canescens* Lw. (1846:390,3) and *xanthaspis* Bezzi (1925: 192) than to *pulica-*



Figs. 12—14. — 12. *Phthiria barbatula* n. sp.; third antennal joint of holotype. — 13. Heads in lateral and dorsal views of males of a. *Phthiria lacteipennis* Strobl, b. *Ph. barbatula* n. sp., holotype, c. *Ph. pulicaria* (Mikan). — 14. Phallus in lateral view of a. *Phthiria lacteipennis* Strobl, b. *Ph. barbatula* n. sp., holotype, c. *Ph. pulicaria* (Mikan), d. *Ph. umbripennis* Loew.

*ria* and *lacteipennis*. It is distinguished from the former two species by the black hairs on frons, antennae and ocellar tubercle, by the entirely olive brown and black legs, by the absence of any longitudinal stripes on mesonotum, by the shape of the third antennal joint and of the phallosome. The species *pulicaria* and *lacteipennis* have a distinctly more produced face and an altogether different third antennal joint (Figs. 13 a, c).

***Phthiria lacteipennis* Strobl, 1909 (Figs. 13 a, 14 a).**

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♀, 23 April 1966; Sierra Nevada, N. slope Veleta, 2400 & 2250 m, 2 ♂, 22 and 24 July 1960 (J. R. Vockeroth).

Distribution. — Southern Spain only.

Remarks. — This rare, or at least very little known species is characterized by vitreous wings with milky white alula, by the absence of a yellow spot on the scutellum and of a yellow border behind the eyes; all tergites and sternites are grey.

The present specimens agree well with a male of the original specimens of Czerny and Strobl, which I have seen, except for the presence of a slight discoloration on the apex of the scutellum and a rather longer cubital fork, which starts opposite the transverse vein closing the discal cell. The present specimens also have a slightly less developed axillary lobe. Such differences can be accounted for by mere individual variation.

***Phthiria pulicaria* (Mikan), 1796 (Figs. 13 c, 14 c).**

Material. — GRANADA: Maitena, 900 m, 3 ♀, 11 July 1960 (J. R. Vockeroth).

Distribution. — Found practically everywhere in Europe: from Sweden and Finland to S. Spain (including Great Britain) and from the Atlantic coast of France to the U.S.S.R. Also recorded from Northern Africa, Asia Minor and Central Asia.

Remarks. — These specimens differ slightly from Engel's description by the reddish hairs at the base of the antennae, by the absence of black hairs on the anal segment and by the colour of the scutellum: it is almost entirely yellow, only narrowly darkened laterally.

***Phthiria umbripennis* Loew, 1846 (Fig. 14 d).**

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2400 m, 7 ♂ 1 ♀, 27 and 30 July 1960 (J. R. Vockeroth).



Distribution. — Spain, Corsica, Italy, Sicily, Greece, Dalmatia, Syria, Palestine, Morocco.

**Heterotropus nigrithorax** n. sp. (Figs. 15, 16 a, b, c).

Material. — ALMERIA: Albufera, 0—50 m, 1 ♂, holotype, 1 ♂ 2 ♀, paratypes, 29 March 1966; Cabo de Gata, 0—50 m, 5 ♂ 5 ♀, paratypes, (2♂ 1 ♀ leg. W. Hackman), 24 March 1966; 1 ♂ 1 ♀, paratypes, 26 March 1966; 1 ♂ 2 ♀, paratypes, 13 April 1966 (W. Hackman). Holotype and 8 paratypes in Zoological Museum, Copenhagen. 4 paratypes in Zoological Museum, Helsinki. 6 paratypes in R. Inst. nat. Sc., Brussels.

Diagnosis, ♂♀. — Middle-sized *Heterotropus* (about 5 mm) with shiny black head and thorax, mouth cavity and margins and central part of face yellow; proboscis short; abdomen ivory yellow with, in the ♀, a distinctive but often vague or incomplete black

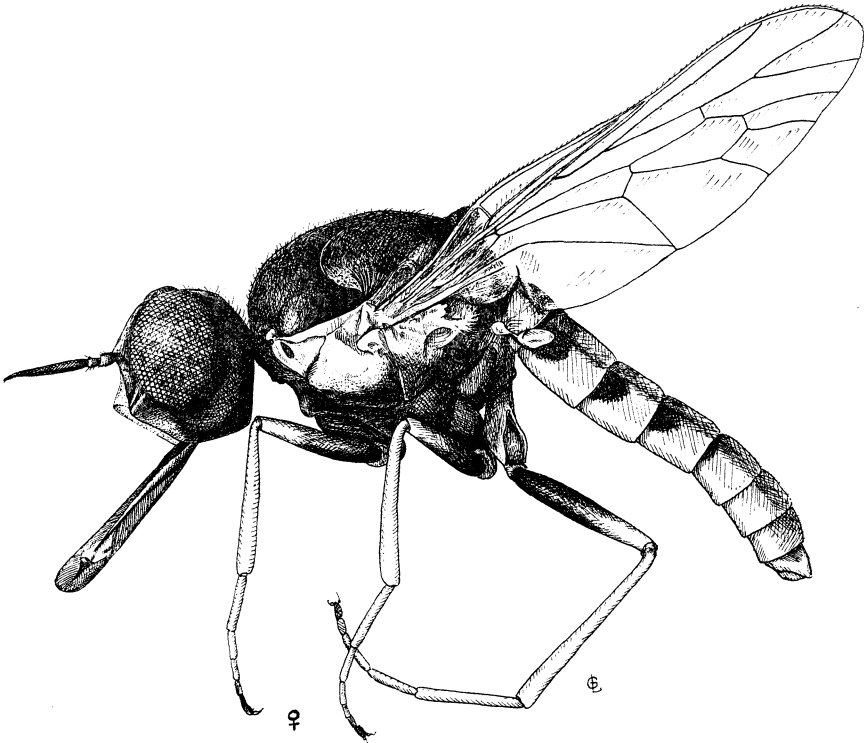


Fig. 15. *Heterotropus nigrithorax* n. sp.; habitus of female paratype.

pattern (Fig. 16 b) mostly on tergites 2—4, tergite 1 always unmarked, tergite 8 always dark; in ♂ irregular and badly defined dark anterior transverse bands, but tergite 1 always pale; wings with golden yellow veins; legs pale yellow except for the last tarsal joint and the basal two-thirds of the femora, which are shiny black or dark brown.

Description, ♂♀. — Head: entirely shining black except for the oral opening and its margin which are pale yellow as is also a triangle above the anterior mouth margin, of which the apex is situated slightly above the antennae; in the male sex also the frons is entirely yellowish white; face conically produced, frons in ♀ broad, almost half as broad at level of antennae as the entire head and hardly narrower towards vertex; ocellar triangle broad, almost half as broad as distance between the eyes at vertex (7:16); in ♂ eyes holoptic from ocellar triangle down to only a short distance above antennae, only separated by a very narrow black margin (distinctly narrower than anterior ocellus), frons in ♂ thus triangular and very small, smaller than ocellar triangle. Antennae (Fig. 16 a): with basal joints yellow, third joint to a variable degree yellow at base, apically dark brown, sometimes entirely brown, first joint narrow, second joint sub-globular, third joint laterally compressed, narrowly lanceolate, more than twice as long as two basal joints taken together (15:6 with style); proboscis short and thick, not extending beyond tip of antennae;

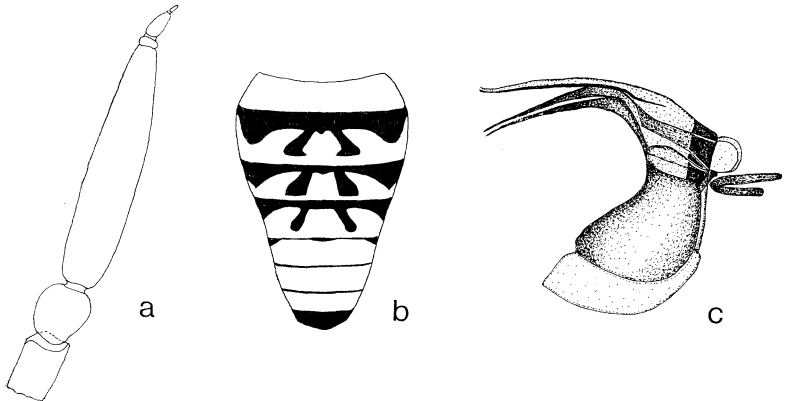


Fig. 16. *Heterotropus nigrithorax* n. sp.; a. Antenna in lateral view of female paratype, b. Abdominal pattern in some female paratypes, c. Hypopygium in lateral view.

white, erect hairs on face and frons scarce, more abundant on occiput.

Thorax: entirely shiny black except for a broadish, pale yellowish or white area laterally, extending from base of wings to humeral calli; short white erect hairs, longer in the ♂ than in the ♀, rather close set on mesonotum in ♂; prosternum yellowish white; scutellum and postalar calli varying in colour from black to brown; no spots or stripes on mesonotum whatsoever.

Abdomen: shiny, with a very distinctive black pattern in the ♀ (Fig. 16 b) which is often incomplete or badly defined; in the ♂ with irregular black, transverse, anterior bands of variable distribution, so much so that certain specimens seem to have a completely ivory yellow abdomen but bands are usually present and tend to be broader discally and laterally; in both sexes tergite 1 is always ivory yellow; in ♀ tergite 8 always brown; tergites 5—7 are often entirely or almost entirely whitish or pale yellow in both sexes; sternites yellow; on dorsum only short yellowish white erect hairs in ♀, longer and thicker in ♂. Hypopygium: Fig. 16 c.

Wings (Fig. 15): short and broad, entirely milky-white with pale-yellow veins and no pterostigma; first posterior cell very broad; the broadened axillary lobe gives the wing a truncated aspect; squamae and halteres white or very pale yellow.

Legs: rather short and strong for a Bombyliid; coxae black or brown, apically yellow; femora with basal two-thirds black and apical third or less yellow; tibiae pale yellow and white, tarsi yellow, pretarsus brown and, on first pair of legs, broader than other joints; pulvilli as long as claws; hairs white to yellow. In many specimens the anterior tibiae are longitudinally distinctly bicolorous, the anterior part being white, the posterior yellow.

Measurements. Length of body from 4,10 to 5,48 mm; of wings from 3,56 to 4,10 mm; relative breadth of head and of frons in ♀ (max.) 100:46; relative maximum and minimum breadth of frons in ♀ 100:81.

Remarks. — This is the first time that a representative of this genus is found within Europe's limits, though several species have been discovered in N. Africa, from Morocco to Egypt, and in the Near East. The genus is also known to occur, but rarely, in N. America, Ethiopian Africa and in the Oriental region. Certain species of the genus belong to the rare Bombyliidae to show, occasionally, a positive phototropism.

This species has some features in common with *H. elephantinus* Séguy (1929:62) from Chad (only the ♂ is known), which also has a completely black thorax and, in the ♂, an ivory-white abdomen without any particular dark pattern etc. But in opposition to *elephantinus*, *H. nigrithorax* has a shiny black occiput as is also the mesonotum instead of dull black, the third antennal joint is twice as long as the basal joints together, the femora and tibiae are vigorous, the former not whitish but black or brown except for the apical third, the metatarsus is entirely pale, not narrowly so at base only, the abdomen has in general black markings on at least a few anterior tergites. I do not think that Engel's *elephantinus* from Egypt is the same species as Séguy's.

***Dischistus notatus* Engel, 1933.**

Material. — GRANADA: Sierra de Contraviesa, Rabite, 1300 m, 1 ♀, 2 May 1966.

Distribution. — Not found outside Spain. Algeciras, Valencia (Saler), Granada.

Remarks. — The degree of infuscation of the wing is variable and is less pronounced among females than among males.

***Bombylius ater* Scopoli, 1763.**

Material. — GRANADA: Sierra de Contraviesa near Rabite, 1300 m, 1 ♀, 2 May 1966; Pinus Puente 15 km NW Granada, 500—1000 m, 5 ♂, 27 April 1966.

Distribution. — A common species widely distributed in the Palaearctic Region.

***Bombylius canescens* Mikan, 1796.**

Material. — GRANADA: Pinus Puente 15 km NW Granada, 500—1000 m, 1 ♂, 27 April 1966.

Distribution. — Common in the whole of Europe; found also in Asia and in North Africa.

***Bombylius cruciatus* Fabricius, 1798.**

Material. — GRANADA: Barranco de Algarrobo 12 km SW Orgiva, 1 ♂, 25 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 12 ♂ 3 ♀, 16—21 April 1966; Mecina Bombarón, 5 ♂, 8 May 1966.

Distribution. — This handsome species, a powerful flier and a great hoverer, is found in Southern Europe, W. Asia and N. Africa. It is found everywhere in the Iberian peninsula.

**Bombylius discolor** Mikan, 1796.

Material. — GRANADA: Sierra Nevada near Padul, 1300 m, 2 ♂ 3 ♀, 1 May 1966; 1 ♀, 8 April 1966.

Distribution. — It would seem that *discolor* is a more northerly species than the nearly related *medius*. Though this last species has been discovered in Sweden (Lyneborg, 1965), *discolor* is much more common in Northern Europe where it has been found almost everywhere except in the extreme north. *Medius* has been recorded neither from Denmark nor from Great Britain or the Netherlands. In Belgium it seems to occur only occasionally: I have seen one single correctly identified specimen, from Ter Hulpen (Brussels). From Spain *discolor* has been quoted only twice (J. M. Andréu Rubio, 1961: 29).

**Bombylius fimbriatus** Meigen, 1820.

Material. — GRANADA: Sierra de Contraviesa near Rabite, 1300 m, 8 ♂ 2 ♀, 8 April 1966, 1 ♂ 1 ♀, 2 May 1966; Pinus Puente 15 km NW Granada, 500—1000 m, 4 ♂ 8 ♀, 27 April 1966; Sierra Nevada near Padul, 1200 m, 5 ♂ 2 ♀, 1 May 1966.

Distribution. — This is a more characteristically southern species than its near relative *B. major* and has not been discovered north of France (Paris is, as far as I know, its northern limit); also Central Europe, W. Asia, N. Africa.

**Bombylius fulvescens** Wiedemann ap. Meigen, 1820.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 5 ♂ 3 ♀, 16—23 April 1966.

Distribution. — Southern Europe; also Central Europe and S. Russia, Palestine and N. Africa.

Remarks. — A variable species in which the femora are blackened to a variable degree.

**Bombylius major** Linné, 1758.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♂ 1 ♀, 21—23 April 1966.

Distribution. — A well known Holarctic species which appears in the early spring. All 3 specimens belong to the form *australis* Loew, 1855.

**Bombylius medius** Linné, 1758.

Material. — ALMERIA: Rioja, 50—200 m, 1 ♂, 7 March 1966; Alhama 5 km W, 200—500 m, 7 ♂ 6 ♀, 17—28 March 1966 (3 ♂

3 ♀ leg. W. Hackman). — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 4 ♂, 16—21 April 1966; Sierra de Contraviesa near Rabite, 1300 m, 3 ♂, 8 April 1966; Pinus Puente 15 km NW Granada, 500—1000 m, 1 ♂ 4 ♀, 27 April 1966; Sierra Nevada near Padul, 1200 m, 1 ♀, 8 April 1966.

Distribution. — Native of many European countries; N. Africa, Asia Minor, Turkestan, W. Siberia.

Remarks. — It is a moot point whether the different species described by Loew in 1855 (Neue Beiträge) are valid species or merely forms or races. Engel (1934) considers them as “varieties” of *medius*. More material should be gathered and series of the genitalia examined before giving a well considered opinion. Judging from the material before me, however, it is quite clear, that *medius* and *punctipennis* coexist in the South of Spain and exhibit distinct characters (see below). These characters do not show any sign of overlapping, at least not in such material as I have been able to examine until now.

#### ? *Bombylius nubilus* Mikan, 1796.

Material. — GRANADA: Pinus Puente 15 km NW Granada, 500—1000 m, 1 ♂, 27 April 1966.

Distribution. — This by no means common species has been found in S. Europe (Spain, Dalmatia, Greece), in Central Europe (Austria, Czechoslovakia, Hungary, Bessarabia), S. Russia (Crimea, Ukraine, Caucasus), Asia Minor (Syria, Mesopotamia, Armenia); a “variety” *algericus*, was described by Villeneuve from Algeria. This enumeration reveals surprising gaps: the species does not seem to have been found in France, nor in Italy; in N. Africa it is only known from Algeria.

Remarks. — I rather doubtfully refer this specimen to *nubilus* Mikan, with which species it has a number of characters in common. But it has also some rather unusual features for a *nubilus*: it is much smaller (4,10 mm) than the smallest specimens I have seen as yet; the femora are olive-brown, not black; the scutellum shows a number of long, black hairs; the third antennal joint and the proboscis are not conspicuously hairy as is usual in this species; the wings are entirely infuscated, the anterior and basal parts being very dark. Several forms or subspecies have been described and this may be a further one, but *nubilus* is a rather variable species and more material will be required before committing oneself.

**Bombylius punctipennis** Loew, 1855.

Material. — ALMERIA: Alhama 5 km W, 200—500 m, 1 ♀, 28 March 1966. — GRANADA: Pinus Puente 15 km NW Granada, 500—1000 m, 4 ♂, 27 April 1966.

Distribution. — The more meridional parts of Europe (S. and Central Spain, Greece) and Asia Minor. I have also seen numerous specimens from N. Africa: mostly from Algeria but also from Tunisia and Morocco.

Remarks. — Loew (1855:12) gives the following distinctive characters: "Er unterscheidet sich von *B. medius* . . . durch die weiß-gelbliche Behaarung der Schenkel, durch die viel weniger mit Schwarz gemengte Behaarung des Bauchs und viel sparsamere schwarze Borsten am Seitenrande der vorderen Einschnitte, ferner durch weniger ausgeprägte dunkle Haarstrieme der Brustseiten und durch das Verschwinden des Doppelfleckens in der Behaarung vorn auf der Oberseite des Thorax . . ., das 3. Fühlerglied gleichmäßiger zugespitzt". Kertész, in his catalogue (1909: 142) and Paramonov in his revision of the genus *Bombylius* (1926:146) consider *punctipennis* a valid species. Later Paramonov (1931 and 1940: 349) reduced it to a subspecies of *medius*. Engel (1934:243) considers it merely as a variety of the latter species. I am inclined to regard it as a "good" species. Externally it can be quite readily distinguished from *medius* and the genitalia are rather different. Nevertheless I am aware that the differences are not altogether above discussion and for all I know *B. discolor*, *medius* and *pictipennis* may, from N. to S., be three successive races of one single species. But intermediate forms, if they exist, have not come to my knowledge and, whatever the taxonomic status of these three forms, they have distinctive characters and a proper geographical range, and should consequently be retained as valid taxonomic entities.

**Bombylius vulpinus** Wiedemann ap. Meigen, 1820.

Material. — GRANADA: Salobreña 6 km W Motril, 0—50 m, 1 ♀, 24 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 8 ♂ 5 ♀, 16—21 April 1966.

Distribution. — Southern and Central Europe, North Africa and Asia Minor. Also found in S. Russia, in the Netherlands and in Belgium.

Remarks. — The thorax is usually devoid of any black hairs

but some female specimens may show a very few, scattered, black hairs in the yellow-grey pile.

**Acanthogeron senex** (Wiedemann ap. Meigen), 1820.

Material. — GRANADA: Barranco de Algarrobo, 12 km SW Orgiva, 300 m, 1 ♂, 25 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 15 ♂ 2 ♀, 20—21 April 1966.

Distribution. — Spain and N. Africa.

Remarks. — I am quite unable to decide whether these specimens belong to *A. senex* or *biroi*. They have in common with *senex* the absence of black hairs on the humeral callus and on the pleura, and the presence of yellow or whitish macrochaetae near the root of the wing; on the other hand, like *biroi*, they have black hairs on the posterior part of the mesonotum, numerous and long black hairs along the hind margin of the tergites and broadly blackened femora (the hind femora rather less so); what is more the corresponding females do have black hairs on the humeral region. I very much suspect that *senex* and *biroi* are either one and the same species or only two forms or perhaps races of one single species.

The genus *Acanthogeron* is badly in need of a revision. It was not, as several authors seem to believe, erected by Bezzi in 1921 (Ann. S. Afr. Mus., XVII:35, no mention whatsoever of *Acanthogeron*) but in 1925 (Bull. Soc. R. ent. Egypte, 1924:164).

**? Acanthogeron separatus** (Becker), 1916.

Material. — GRANADA: Torrenueva E Motril, 0—50 m, 1 ♂ 3 ♀, 10—14 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♀, 21—23 April 1966; Sierra Nevada near Padul, 1200 m, 1 ♂, 8 April 1966.

Distribution. — Recorded from Spain, N. Africa, the Canary Islands and Syria.

Remarks. — I am by no means certain that these specimens are Becker's *separatus*, they do not coincide any too well with Engel's redescription. In the ♀ specimens before me the ruff-like occipital collar is not "von hellbräunlich weißen Haaren gebildet", but the long hairs show a silvery whitish hue (like the beard and the mystax), which is in striking contrast with the dull greyish pile of the anterior part of the mesonotum; there is long, black hairs along the upper margin of the genae and on the two first antennal joints; these show also yellowish-brown hairs, mostly underneath,



but also, to a lesser extent, above; the same yellowish-brown hairs are seen in the oral cavity, at the base of the proboscis; the frons of the female is jet-black and shiny, which Engel does not mention; the femora have yellow scales and mostly black hairs underneath instead of white scales and white hairs.

**Systoechus gradatus tesquorum** Becker, 1916.

Material. — GRANADA: Mecina Bombarón, 800 m, 1 ♂ 3 ♀, 8 May 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♀, 21 April 1966; Sierra Nevada, N. slope Veleta, 2550 m, 1 ♂, 24 July 1960 (J. R. Vockeroth).

Distribution. — Originally described from Spain and Corsica; according to Engel (1935:283) also found in Hungary and Bulgaria.

**Cytherea infuscata** (Meigen), 1820.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♂, 21 April and 5 May 1966.

Distribution. — Already known from the Provinces of Alicante, Avila, Badajoz, Granada, Madrid, Murcia, Saragossa (Andréu-Rubio, 1961:40). Has also been discovered in N. Africa and Asia Minor.

**Lomatia infernalis** Schiner, 1868.

Material. — ALMERIA: Punta Sabinal, 0—50 m, 4 ♂ 8 ♀, 26 April 1966 (W. Hackman). — GRANADA: Torrenueva E Motril, 0—50 m, 5 ♂ 8 ♀, 17 April 1966; Barranco de Algarrobo 12 km SW Orgiva, 300 m, 1 ♂, 25 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 7 ♂ 7 ♀, 16—23 April 1966; Sierra Nevada Highway, 2200 m, 1 ♂, 27 July 1960 (J. R. Vockeroth).

Distribution. — Originally caught in Spain it has further been recorded from Hungary, Albania, Bulgaria, Greece, Syria, Palestine and Armenia.

Genus **Stomylomyia** Bigot, 1887.

Engel (1935:390) reduced this genus to the position of a subgenus of *Plesiocera* Macquart but this decision is questionable. Bigot erected the genus *Stomylomyia* for a new species which he called *leonina*. This is almost certainly a synonym of Loew's "*Tomomyza*" *europaea* which is a fairly variable species. Bezzi (1921a:474) showed that the genus *Tomomyza* was exclusively South African and referred the Palaearctic species grouped under

that name to the genus *Stomylomyia*, which had been mistakenly sunk as a synonym of *Tomomyza* (Kertész, 1909:85). Paramonov (1929:92) treated *Stomylomyia* as a valid genus. Engel (l.c.) relegated it to the position of a subgenus of *Plesiocera* with the following justification "Wenn man das Hauptkennzeichen dieser Gattung (*Plesiocera*), das . . . Merkmal des schnauzenartig vorgezogenen und aufgestülpten Mundrandes annimmt, so ist kein Grund vorhanden, nicht auch die Gattung *Stomylomyia* mit *Plesiocera* zu vereinigen, bzw. erstere als Untergattung von letzterer zu betrachten, denn die Anzahl der Unterrandzellen ist kein Hindernis dafür, haben wir doch verschiedene Gattungen, in denen 2 und 3 Unterrandzellen auftreten". The presence of 2 or 3 submarginal cells has no absolute significance, it may or may not have a generic connotation: in certain groups of species it has not but in others it most decidedly has, e.g., among the Exoprosopines. Hesse (1956:99), having compared *Stomylomyia europaea* with the South African species of *Plesiocera*, lists the following differences: "three submarginal cells in the wings, a tuft of hairs on the metanotum, longer hairs on abdomen, denser hairs on body, well devel-

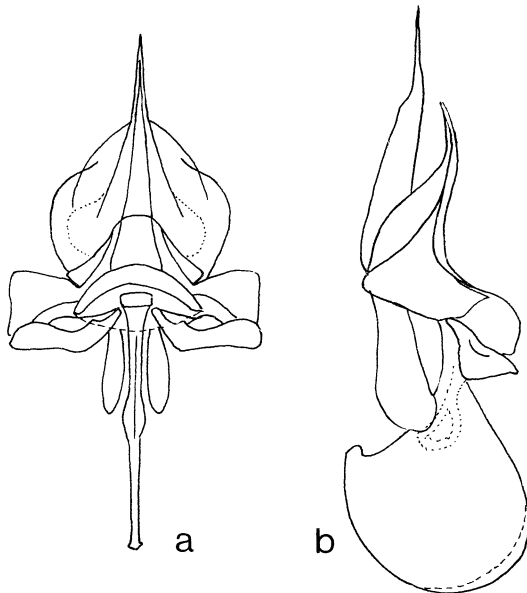


Fig. 17. *Stomylomyia tenella* (Loew); a. Phallosome in dorsal view, b. Same in lateral view.

oped spicules on front tibiae, a more distinct indentation in hind margin of eye etc." No species of *Plesiocera* s.str. are presently available to me but some time ago I made a sketch of the genitalia of *P. algira* (v. François, 1967:5, fig. 12) and they are quite similar to those of the South African species as figured by Hesse (l.c.). As *Stomylomyia tenella* has a distinctly different epiphallus (Fig. 17) I find it preferable to keep *Stomylomyia* as a valid genus, at least provisionally, until I have some *Plesiocera* s.str. at my disposal for further study.

***Stomylomyia tenella*** (Loew), 1869 (Figs. 17 a, b).

Material. — GRANADA: Barranco de Miranda, 8 km SW Orgiva, 300 m, 10 ♂ 4 ♀, 20—23 April 1966; Mecina Bombarón, 800 m, 1 ♂, 8 May 1966.

Distribution. — An exclusively Spanish species and until now found only in the southern provinces of Granada and Murcia. According to Bezzi (1925:200) also indigenous to Algeria.

Remarks. — The abdomen of the ♀ is broader, flatter; the 2 longitudinal grey stripes on the mesonotum are less distinct; there are more black hairs along the posterior margin of the tergites; the hind femora are yellow (black in the ♂); the ocellar tubercle occupies a little more than half the distance between eyes at vertex; the ♀ seems as a rule to be larger than the ♂. Hypopygium : Figs. 17 a, b.

***Aphoebantus scutellatus*** (Meigen), 1838 (Figs. 18 a, c).

Material. — GRANADA: Barranco de Miranda, 8 km SW Orgiva, 300 m, 10 ♂ 10 ♀, 20—23 April 1966 and 5 May 1966; Torrenueva E Motril, 0—50' m, 5 ♂ 6 ♀, 17 April 1966; Salobreña, 6 km W Motril, 0—50 m, 2 ♂, 24 April 1966.

Distribution. — A species by no means rare in Spain but as yet not recorded from any other country. I have recently seen specimens from Portugal (Villa Nova, 21.VII.1963, Dr. J. Leclercq leg.). A related species from Morocco is described hereafter.

Remarks. — It is necessary to point out an error in Engel's table of the Palaearctic species (1935:397) because it is liable to cause trouble in the identification of the ♂ of the species. In couplet 10, "Stirnhaare schwarz" should be "Stirnhaare weiß". I must add that the character given in couplet 1 to separate *Cononedys*, which Engel considers a subgenus of *Aphoebantus*, from *A. proper*, is very unreliable.

***Aphoebantus lyneborgi* n.sp.** (Figs. 18 b, d).

I have caught near Tangier, Morocco, in 1966, an *Aphoebantus* which, though closely related to *scutellatus*, is sufficiently different from it to justify its erection as a new species. It is dedicated to Dr. Leif Lyneborg.

Material. — Morocco, Bight of Tangier, 0—50 m, 23 May — 10 June 1966, 1 ♂ (holotype), 3 ♀ (paratypes), F. J. J. François leg. In the collections of the Royal Institute for Natural Science, Brussels.

Description, ♂♀ (Figs. 18 b, d).

Like *A. scutellatus* but differs from it by the following characters:

- Frons in ♂ with mixed black and whitish hairs; *scutellatus* has no erect black hairs on at least the lower  $\frac{2}{3}$  of the frons.
- The eyes, in the ♂, are not quite holoptic but narrowly separated, the distance between them at the vertex being less than the breadth of the anterior ocellus; in *scutellatus* the eyes are, in the ♂, shortly holoptic.
- The relative length of the joints which form the style of the third antennal segment, is different (Figs. 18 c, d).
- Anterior part of wing distinctly darker, 2 spots on wing (on r-m and on m-cu) more distinct.
- r-m situated on anterior half of discal cell; in *scutellatus* it is situated on the middle of this cell or it is slightly distal.

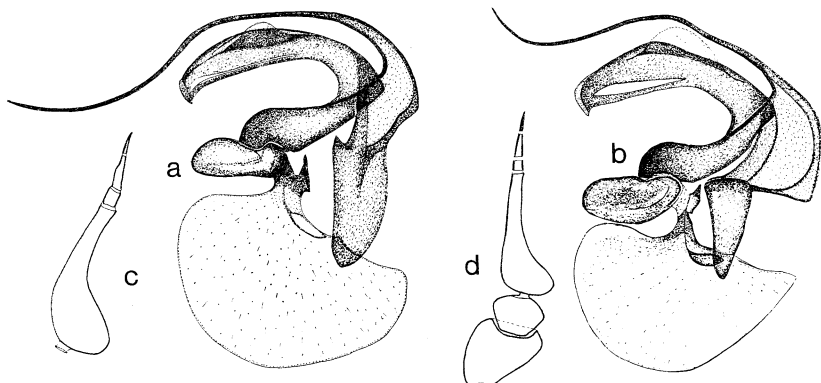


Fig. 18. a. Phallosome in lateral view of *Aphoebantus scutellatus* (Meigen), b. Same of *A. lyneborgi* n.sp., holotype, c. Third antennal joint of male of *A. scutellatus* (Meigen), d. Antenna of *A. lyneborgi* n.sp., female paratype.

- f. Lateral veins of 2nd posterior cell almost parallel; they are distinctly diverging in *scutellatus*.
- g. Femora and terminal segments of tarsus black, tibiae and metatarsi I and II yellowish red.
- h. The phallosome (Figs. 18 a, b) is different: the phallus is distinctly shorter in *lyneborgi* and its base differently shaped; the epiphallus is humped above in *lyneborgi*, regularly rounded in *scutellatus*.

**Petrorossia hesperus** (Rossi), 1790 (Figs. 19 a, b, c, d).

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♂, 5 May 1966; Granada, 700 m, 1 ♀, 15 July 1960 (J. R. Vockeroth); Sierra Nevada Highway, 1650 m, 1 ♀, 27 July 1960 (J. R. Vockeroth).

Distribution and remarks. — There is little doubt that this is the "*Bibio*" *hesperus* which Rossi described in his "Fauna Etrusca" (1790:277). I have not seen the type nor even specimens from Tuscany but this species is common in the South of France and Corsica, and in Spain. I have also seen a good series from

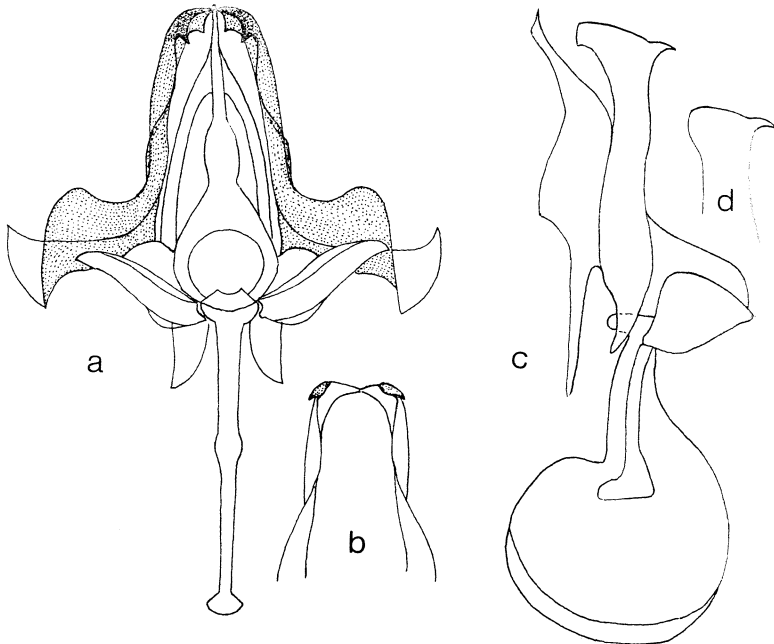


Fig. 19. *Petrorossia hesperus* (Rossi); a. Phallosome in dorsal view, b. Same, variation, c. Phallosome in lateral view, d. Same, variation.

Morocco (Tangier). Several other, undescribed, species are very near this one and are practically indistinguishable except by the male genitalia, which are indeed so different as to leave no doubt about the validity of these species.

This remark holds true for the whole genus. When Engel revised it (1936:407) he disregarded the genitalia and consequently accepted only five valid species for the whole Palaearctic region. It has now become apparent that many species thus escaped his investigations. In his monograph on the Transcaucasian Bombyliidae alone, Zaitzev (1966:214—225) described ten additional species; many more will no doubt be discovered in the future.

*Hesperus* is a very variable species, as the examination of about 50 specimens of divers origins has revealed. The extent of the black markings on the legs is variable; in the male the hind femora are generally almost entirely black, the other legs can be entirely yellow, partly yellow and black or almost entirely black; in most females the tibiae and femora are entirely yellow save for an elongated black spot above on the hind femora. The coloration of the wing also varies appreciably. I have seen specimens with hyaline wings, others with the wings definitely yellow (no distinct dark pattern is, however, present); the females have more frequently wings with yellow base and foreborder than the males. Even the male genitalia (or at least the epiphallus) vary rather markedly (Figs. 19 a, b and c, d). It must be noted that between the extremes of these variations numerous intermediary degrees exist which preclude the presence of several species.

***Desmatoneura flavifrons* (Becker), 1915 (Figs. 20 a, b).**

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♂, 5 May 1966.

Distribution. — Southern Spain. J. M. Andréu-Rubio (l.c.:42) has reported its presence in the provinces Alicante, Murcia, Saragossa. Granada must now be added.

Remarks. — This species was mistakenly placed by Becker in the genus *Plesiocera*, from which it differs by having only the oral margin produced and not the entire face, by the normally developed axillary lobe and alula, by the course of the 2nd longitudinal vein which starts at right angles near the middle cross vein etc. The male genitalia (Fig. 20 a) are also quite differently shaped (François, 1967: Figs. 1—10). *Desmatoneura argentifrons* Wil-

liston, *Chionamoeba nivea* (Rossi), type species of *Chionamoeba* Sack, and a few other species of the same "genus" though not all, *Chiasmella brevipennis* Bezzi and *Plesiocera flavifrons*, all belong to the same genus, namely *Desmatoneura* Williston (1895). These species are mainly characterized by a broad, shiningly pruinose frons, by the absence of bristly black hairs on face, frons, vertex and mesonotum, by the hollow, often poorly developed, 1st antennal joint and by strikingly similar genitalia. *Chiasmella brevipennis*, of which I have lately seen Bezzi's two specimens, is only an aberrant species of the genus *Desmatoneura*; it has peculiar characters of its own, like the abruptly tapering abdomen, but also many characters in common with the other species of *Desmatoneura*, i.a. the evidently similar genitalia (Greathead, 1967:239, Fig. 42). It could be considered at most as a subgenus of *Desmatoneura*.

It seems evident to me that, in the reallocation of the species between the different genera of this group, more attention will have to be paid to the genitalia. These obviously related species, forming a transition between Homoeophthalmae and Tomophthalmae, present morphological characters merging into one another: for instance, the plumula and the apical tuft of the third antennal joint can in one and the same genus — *Desmatoneura* for one — be either present, vestigial or absent, whereas the male genitalia seem to lend themselves rather well to generic apportioning. This might well apply to the assignment of the genera to the several subfamilies involved. The present limits of such subfamilies as Tomomyzinae, Lomatiinae and Anthracinae seem to me rather unsatisfactory.

#### **Anthrax anthrax** (Schrank), 1781.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♂, 21 April 1966.

Distribution. — Everywhere in Europe. Also found in N.Africa, the Canary Islands, Asia Minor, the Caucasus and the Crimea, Persia, Siberia, Mongolia, China.

#### **Anthrax binotatus** (Schiner), 1862.

Material. — ALMERIA: Alhama 5 km W, 200—500 m, 4 ♂, 17, 19 and 28 March 1966. — GRANADA: Rio Guadalfeo, Orgiva, 300 m, 2 ♂, 4 and 11 April 1966.

Distribution. — Central and Southern Europe, Crimea, Caucasus, Asia Minor, N. Africa.

Remarks. — These specimens have entirely hyaline wings except for three small spots, one on the middle cross-vein, the prediscoidal spot, and a small spot just opposite it, in the first basal cell; the extreme base of the wing is blackish grey.

**Anthrax trifasciatus** Meigen, 1804.

Material. — GRANADA: Granada, 700 m, 1 ♀, 9 July 1960 (J. R. Vockeroth).

Distribution. — Found almost everywhere in the Palaearctic region, including Siberia and China. In Belgium only the subspecies *leucogaster* is found and this seems to be its northern limit, though it may well be found in Holland, south of the great rivers.

**Anthrax trifasciatus leucogaster** Wiedemann ap. Meigen, 1820.

Material. — GRANADA: Granada, 700 m, 1 ♂, 13 July 1960 (J. R. Vockeroth).

Distribution. — More or less like *trifasciata trifasciata*. It seems to reach farther north than the typical form.

**Anthrax varius** Fabricius, 1794.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 5 ♂ 1 ♀, 20 April — 5 May 1966; Sierra Nevada, N. slope Veleta, 2400 m, 1 ♂, 25 July 1960 (J. R. Vockeroth).

Distribution. — From Denmark (Lyneborg, 1965) and Finland to Southern Spain, Central and Southern Europe, Western U.S.S.R., Asia Minor; never recorded from N. Africa.

**Anthrax virgo** Egger, 1859.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♂ 1 ♀, 20 and 21 April 1966.

Distribution. — Found in all the Mediterranean countries: S. Europe, N. Africa and Asia Minor.

**Exoprosopa italica** (Wiedemann ap. Meigen), 1820.

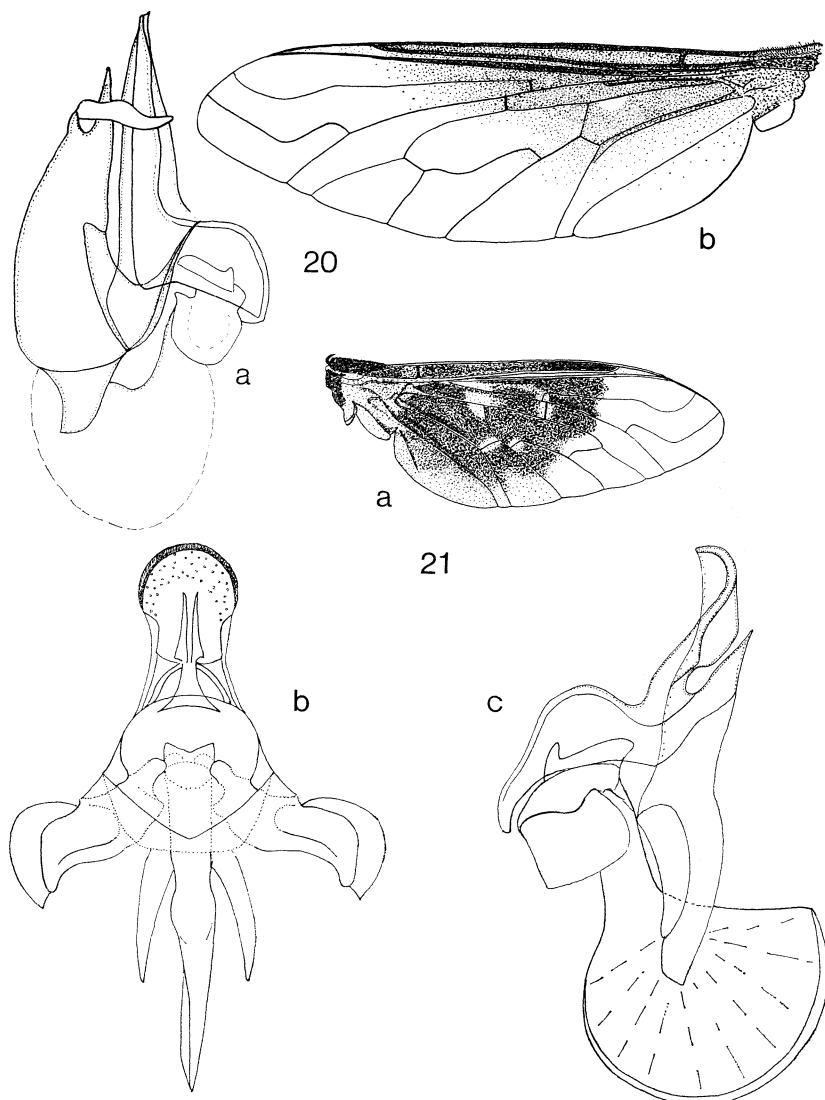
Material. — GRANADA: Granada, 700 m, 1 ♂, 15 July 1960 (J. R. Vockeroth).

Distribution. — Italy, Spain. Western Mediterranean (Paramonov, 1928).

**Exoprosopa jacchus** (Fabricius), 1805.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♂, 5 May 1966.





Figs. 20—21. — 20. *Desmatoneura flavifrons* (Becker); a. Hypopygium in lateral view, b. Left wing of male. — 21. *Thyridanthrax hispanus* (Loew); a. Right wing of male, b. Phallosome in dorsal view, c. Same in lateral view.

**Distribution.** — Western (except the British Isles and Holland), Central and Southern Europe, S. Russia, Asia Minor, N. Africa.

**Remarks.** — The most common (in Southern countries) and earliest on the wing of the *Exoprosopa* species. It appears as early as April in the Mediterranean countries but is usually only met with in great numbers from mid-May till early June.

***Thyridanthrax elegans*** (Wiedemann ap. Meigen), 1820.

**Material.** — GRANADA: Granada, 700 m, 6 ♂ 1 ♀, 15 July 1960 (J. R. Vockeroth); Maitena, 900 m, 10, 11 July 1960 (J. R. Vockeroth).

**Distribution.** — S. Europe, N. Africa and Asia Minor: Portugal, Spain, France, Corsica, Sicily, Corfu, Greece, Morocco, Egypt, Syria, Lebanon.

***Thyridanthrax fenestratus*** (Fallén), 1814.

**Material.** — GRANADA: Sierra Nevada, N. slope Veleta, 2400 m, 6 ♂, 25 July 1960 (J. R. Vockeroth).

**Distribution.** — According to Loew (1869:158) and Bezzi (1925: 235) this species is not found in Southern Europe, where it is replaced by the sister species *perspicillaris* and *hispanus*. This is only partly true: *fenestratus* is, no doubt, a more typically northern than southern species and it may be of some interest to try to circumscribe its real geographical distribution as known to-day. It must first be noted that all references to it are by no means acceptable. It took dipterists 55 years to distinguish the first described species, *fenestratus* (1814), from the very similar looking *perspicillaris* and *hispanus* (1869). Even afterwards all available evidence is far from trustworthy. *Thyridanthrax fenestratus* is one of the very few Bombyliidae to be met with as far North as Lapland. It is also found elsewhere in the three Scandinavian countries concerned and in Denmark. Further south it is found in Western Europe, including Great Britain and the greater part of France. It has been recorded from Spain but, according to Andréu-Rubio (1961:52), mostly by mistake: he accepts as correctly labelled only a single male from Lérida, among more than 500 specimens identified as *fenestratus*. The six specimens from Andalusia under review (I have checked the genitalia of one of them) are thus quite interesting but one must keep in mind that they were caught at 2.400 m above sea level. The species is also quite certainly indigenous to Central Europe (Switzerland, Germany, Austria,

Czechoslovakia), to the U.S.S.R. including W. Siberia, to the Caucasus (Zaitzev, 1966) and to Palaearctic China (Séguy, 1963). It seems to be absent from the Balkans. It has not been found in Rumania, as there is no reference to the species in the works of Weinberg and Dusha who have been for some years actively studying i.a. the Bombyliidae of Rumania. Nor has it in any dependable source that I know of, been recorded from S. Italy, Albania, Greece, Turkey, Syria or Palestine. It has been allegedly found in N. Africa: in Algeria (Künckel, 1894) and in Egypt, Suez (Bezzi, 1925). It is preys on the Acridiid, *Dociostaurus maroccanus* (Thunb.), as is asserted by Künckel d'Herculeis (l.c.) and the authors of "La lutte contre les sauterelles en Algérie" (1929), it ought to have been located in the whole of the Mediterranean Basin, which is far from being the case. The southern limit of *fenestratus*'s geographical range thus remains problematic.

**Thyridanthrax fimbriatus** (Meigen), 1804.

Material. — GRANADA: Torrenueva E Motril, 0—50 m, 8 ♂ 1 ♀, 10—17 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 1 ♂, 5 May 1966; Sierra Nevada, N. slope Veleta, 2400 m, 1 ♂ 1 ♀, 25 July 1960 (J. R. Vockeroth).

Distribution and remarks. — As I have shown (François, 1967a: 289) the obsolescent "*Anthrax*" *fimbriatus* Meigen (= in parte *afér* auctt. nec. F.) has had to be revided for a southern species of *Thyridanthrax* which is exteriorly quite similar to *afér* (a typical case of sibling species) but with an obviously different epiphallus. Meigen's *fimbriatus* seems to be restricted to Southern Europe and the Mediterranean Basin, where it is quite common.

**Thyridanthrax hispanus** (Loew), 1869 (Figs. 21 a, b, c).

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 3 ♂ 4 ♀, 20—23 April 1966.

Distribution. — Found in the whole of Spain and in Spain only, though it is likely to exist in French Roussillon, in Portugal and in Morocco.

Remarks. — This by no means rare species has, since its discovery, been known long in the ♀ sex only; the ♂ was unknown to Engel in 1936. For the genitalia and the wing see Figs. 21 b, c and 21 a.

**Thyridanthrax perspicillaris** (Loew), 1869.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva,

300 m, 2 ♂ 1 ♀, 21 and 23 April 1966; Sierra Nevada Highway, 2200 m, 1 ♂, 27 July 1960; N. slope Veleta, 2400 m, 1 ♂, 25 July 1960 (J. R. Vockeroth).

Distribution. — Native to the whole of Southern and part of Central Europe; also found in N. Africa, Asia Minor and the U.S.S.R.

**Hemipenthes vockerothi** n.sp. (Figs. 22 a, b, c).

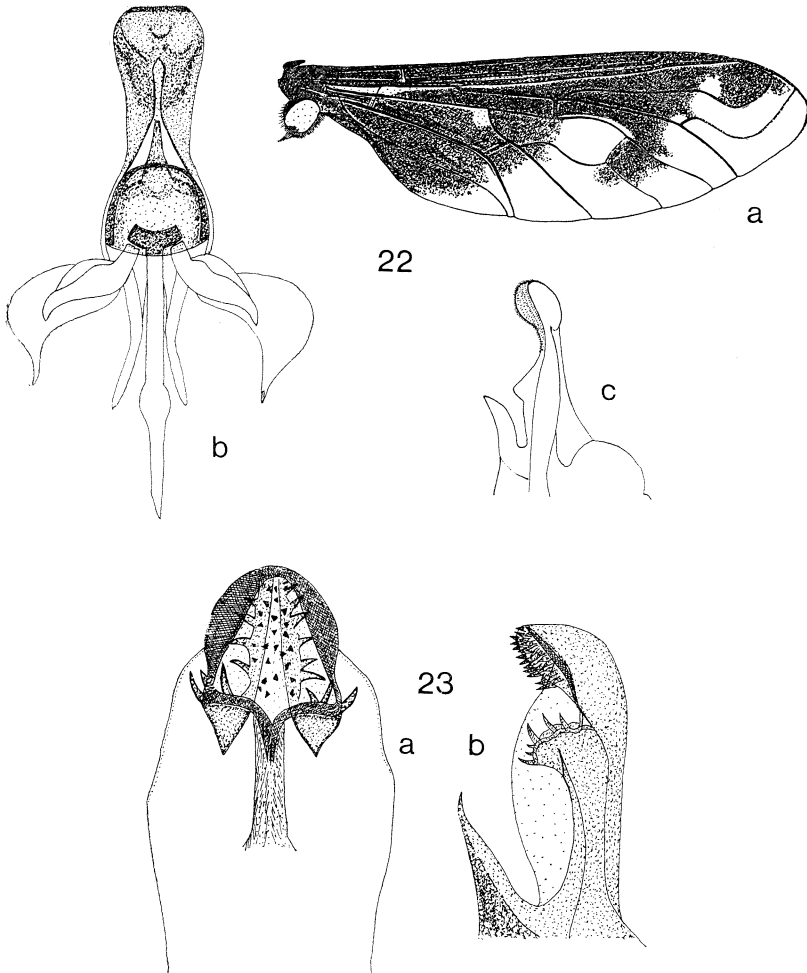
Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2550 m, 1 ♂, holotype, 23 July 1960 (J. R. Vockeroth). In Canadian National Collection, Ottawa.

Diagnosis, ♂. — A *Hemipenthes* of medium size (about 11 mm), with an entirely black body, with mostly black but also some yellowish brown tomentum and black hairs; wing with a typical blackish-brown infuscation (Fig. 22 a) and without fenestrae, marginal cell entirely infuscate but for a small preapical hyaline spot, middle of wing with a dark, broadish, hook-like band, bordering the apex of the discal cell and penetrating well into the 3rd posterior cell; anal cell and axillary lobe broadly hyaline at apex; dorsum of abdomen with anterior transverse bands of white scales on tergites 1 and 4, narrower and situated posteriorly on tergites 6 and 7, a narrow, incomplete band of minute reddish scales on anterior part of tergite 3 and apparently also on tergites 5 and 6; hairs in collar black beneath, plumula yellowish brown, hairs on pleura black; tibiae I and II brownish-red.

Description, ♂. — Head: frons at apex less than twice as broad as ocellar tubercle (5:3), 1st antennal joint long, about 3 times as long as second, its apical half distinctly broader and thickly covered with coarse black hairs, 3rd joint brown, longer than the two black basal ones combined (5:4), its bulb-shaped base short and its style-like part long, almost three times as long (without the apical style) as bulb; proboscis short, entirely, but for the labellae, concealed in oral cavity; face pointed, black hairs and brownish-yellow scales on both face and frons, as also on occiput, scales and hairs more abundant on anterior margin of buccal opening, occipital cavity bordered by thick, short, brownish-black hairs.

Thorax: hairs in collar yellowish-brown above, black beneath; mesonotum with short, soft, black, erect hairs and minute hair-like yellowish-brown scales, lateral whitish stripes well developed,

post-alar bristles black and brownish-red, bristles along hind border of scutellum black; pleura exclusively black-haired, even metapleural tuft, plumula yellowish-brown. Abdomen: 1st tergite with a lateral tuft of white hairs, a transverse band of erect, pale-yellow hairs, and another one behind it formed of pure-white, half erect, elongated, hair-like scales; other tergites with erect,



Figs. 22—23. — 22. *Hemipenthes vockerothi* n. sp., holotype; a. Right wing, b. Phallosome in dorsal view, c. Apex of phallosome in lateral view. — 23. *Villa fasciculata* Becker; a. Apex of phallosome in dorsal view, b. Same in lateral view.

soft black hairs and tiny, brilliant black scales; transverse bands as described in diagnosis; lateral tufts along tergites composed of long, thick, black hairs except along 1st and 4th tergites; ventrum black-haired; hypopygium ♂, see Figs. 22 b, c. Wing: Fig. 22 a, long (12,3 mm for a body-length of 11,2 mm), infuscation as described in diagnosis, 1st posterior cell widely open on wing margin, discal cell obtuse, broader at apex than at base and with distinctly curved anterior and posterior veins; alula vestigial, alar squamae brown, thoracic squamae black, halteres black with a yellowish-white tip. Legs: black except for tibiae I and II which are brownish-red; black hairs, spines and spicules from coxae to tarsi.

This species is dedicated to Dr. J. R. Vockeroth who first caught it.

Remarks. — This species is very near *H. hamiferus* (Loew), so much so that I believe Zaitzev's two ♀ of *hamiferus* from Andalusia (Zaitzev, 1966:198) to belong to the species here described. Distinguishing characters are as follows: different shape of the wing infuscation, the central black hook being broader and penetrating well into the 3rd posterior cell, under the discal cell; collar black beneath; exclusively black hairs on pleura and black metapleural tuft; jet black scales on the legs; differently shaped phallosome.

***Villa cingulum*** (Wiedemann ap. Meigen), 1820.

Material. — GRANADA: Sierra Nevada Highway, 1400 m, 1 ♀, 27 July 1960 (J. R. Vockeroth).

Distribution. — Originally described from Portugal. Séguy later recorded it from Spain.

Remarks. — This rare species, of which I had only seen one single specimen before (also from Spain), is relatively easy to identify because the third antennal joint, seen from above, has a distinctly elongated conical shape, which is exceptional among *Villa* species. Face with snow-white hairs and scales; in ♀ two transverse bands of snow-white scales on abdomen above: a very narrow one anteriorly on tergite 2 and a very broad one on tergite 4; tergite 7 entirely covered with the same kind of scales and with two lateral tufts of long, pure white, hair-like scales; the black hairs on hind margin of tergites and laterally along abdomen are thick and bristle-like.

**Villa circumdata** (Meigen), 1820.

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2400 m and 2550 m, 2 ♀, 25 and 20 July 1960 (J. R. Vockeroth).

Distribution and remarks. — It is at present quite impossible to give the distribution of this species with any precision because it has usually been confused with other species, mostly with *venusta*. The examination of Meigen's types has shown that the true *circumdata* is not the *circumdata* of most authors (Lundbeck, Verrall, Engel, Lyneborg), which as the dissection of the genitalia has revealed is in fact *V. venusta* (Meigen), 1820 (François, 1968, in press). I have seen specimens of *circumdata* from France and from Spain.

**Villa distincta** (Meigen), 1838.

Material. — ALMERIA: Almeria, 0—50 m, 1 ♂ reared 23 March 1966 from a pupa of a noctuid moth (W. Hackman); Albufera, 0—50 m, 1 ♀, 29 March 1966; same locality, 1 ♂, 14 April 1966 (W. Hackman); Punta Sabinal, 0—50 m, 1 ♀, 26 April 1966 (W. Hackman); Cabo de Gata, 0—50 m, 1 ♀, 13 April 1966 (W. Hackman); Rioja, 50—200 m, 1 ♀, 1—9 April 1966 (W. Hackman). — GRANADA: Torrenueva E. Motril, 0—50 m, 2 ♂ 13 ♀, 10—17 April 1966; Barranco de Miranda, 8 km SW Orgiva, 300 m, 2 ♀, 20—23 April 1966.

Distribution. — This species has not yet been recorded outside Spain. I have however seen specimens from Cavalière (France, Var) and Bastia (France, Corsica) in the Villeneuve collection.

Remarks. — The principal characters of this frequently misinterpreted species are as follows. An often large-sized, robust *Villa* of well over 10 mm length (the smaller specimens are more slender than the larger); its general colouring varies from whitish-grey to pale brown; the pile of well preserved specimens shows a silvery sheen on abdomen and thorax and looks as if it had been shorn. Face (♂♀) with yellow hairs and scales on its discal part, laterally hairs and scales are often distinctly more whitish; occiput covered with snow-white scales. Wings: vitreous, costal cell slightly opaque, space between veins Sc and R<sub>1</sub> narrowly yellow, base of wing yellowish-white; r-m often situated well beyond basal third of discal cell which, although variable in shape, is often shortish and broad; final loop of vein R<sub>2+3</sub> oval; patagium and costagium thickly covered with silvery white scales (♂) or in variable degree with shiny yellow and black ones (♀); knob of the

halteres from white to pale yellow. Abdomen: five distinct transverse bands of yellowish scales present, that on tergite 4 covers most of its surface; lateral black tufts on tergites 5—6 small and short, separated by a narrow tuft of yellow and whitish hairs and scales; all sternites densely covered with whitish and yellowish hairs. Male genitalia: the phallosome shows a certain degree of variability and can easily be confused with that of *V. circumdata* Meigen, when viewed from an antero-superior angle; this last species can however be immediately distinguished from *V. distincta* by the brown infuscation on the fore-border and base of the wing.

***Villa fasciculata* Becker, 1916 (Figs. 23 a, b).**

Material. — GRANADA: Sierra Nevada, N.slope Veleta, 2400 m, 2 ♂, 25 July 1960 (J. R. Vockeroth).

Distribution. — A rare and handsome species which was known until now only from the Eastern Mediterranean: Dalmatian coast, Greece, Cyprus. New to Spain.

Remarks. — This species has some unusual features for a *Villa*. The ♂ genitalia (Figs. 23 a, b) are also quite distinctive: the epiphallus with its almost wild profusion of spines and spicules is remarkable in a genus where this organ, as a rule, is quite plain.

***Villa hottentotta* (Linné), 1758.**

Material. — ALMERIA: Rioja, 50—200 m, 1 ♀, 12—20 April 1966 (W. Hackman); Alhama, 200—500 m, 3 ♂, 17—28 March 1966 (1 ♂ leg. W. Hackman). — GRANADA: Barranco de Algarrobo 12 km SW Orgiva, 300 m, 2 ♂ 1 ♀, 25 April 1966; Barranco de Miranda 8 km SW Orgiva, 300 m, 2 ♂ 2 ♀, 16 April — 5 May 1966; Rambla de Aculas 10 km E Orgiva, 400 m, 1 ♂, 27 April 1966; Rio Sucio 5 km NW Orgiva, 700 m, 1 ♂, 3 April 1966; Pinus Puente 15 km NW Granada, 500—1000 m, 1 ♂, 27 April 1966; Sierra Nevada near Padul, 1300 m, 1 ♂, 4 May 1966; Granada, 700 m, 1 ♀, 15 July 1960 (J. R. Vockeroth).

Distribution. — A common and widely distributed species. In Europe it has been recorded from Spain, Italy, France, Belgium, Holland, Denmark and Sweden; it has not been found in Great Britain, at least not under the present name; also recorded from Central Europe and generally all the countries of the Mediterranean Basin; Western U.S.S.R., Caucasus, Asia Minor and supposedly N. Persia, North Africa. Séguy (1963) records it from China.



Remarks. — With *Exoprosopa jacchus* (F.) the earliest of the Exoprosopines to appear in spring. The colour varies from whitish yellow to golden yellow. A generally large and stocky *Villa*, it may confusingly vary in size and bulk, the smaller specimens appearing a good deal more slender. As far as my experience goes the brownish infuscation of the anterior part of the wing never extends beyond the costal cell and the extreme base of the wing; the patagium in both sexes is black, brown and yellowish in a varying degree, never predominantly white or silvery.

**Villa ixion** (Fabricius), 1794.

Material. — ALMERIA: Punta Sabinal, 0—50 m, 1 ♀, 26 April 1966 (W. Hackman). — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 7 ♂ 2 ♀, 16 April — 5 May 1966.

Distribution. — Already known from NE (Barcelona) and Central Spain (Hervàs). From Spain to Greece, but curiously enough never mentioned in North Africa.

Remarks. — Varies in colour from pure white to yellow; the ♀ I have seen were always more yellowish than the ♂; a small species without lateral black tufts along tergites 5—6 and with a phallosome devoid of its usual (in *Villa*) hooks, the apex of the epiphallus being whole (François, 1966: fig. 14).

Designation of a lectotype. — Thanks to the kindness of Dr. Leif Lyneborg, I have been able to examine the 3 specimens of the Fabricius collection (Zimsen, 1964:463.274). All three are females and headless; two have lateral tufts of black scales along the abdominal tergites 5 and 6, one has no such tufts. This last specimen is designated as lectotype, the other two as paralectotypes.

**Villa leucostoma** (Meigen), 1820.

Material. — GRANADA: Barranco de Miranda 8 km SW Orgiva, 300 m, 5 ♂, 21 and 23 April 1966.

Distribution. — Originally caught in the South of France, its Northern limit seems to be the Département of the Seine et Loire. Generally found in Southern Europe, it is not uncommon in Spain and also N. Africa, and Séguy (1934) has recorded it from Tozeur, in Tunisia.

Remarks. — This species has been overlooked by Engel in his monograph on the Palaearctic Bombyliidae. It is sometimes considered as a form of *V. cingulata* but it is in fact a quite distinct

species. The male genitalia (François, 1966: compare figs. 9 and 13) have not much in common. According to Séguy (1934) this species preys on the caterpillar of *Constantia* sp.

A smallish, slender *Villa* (7—10 mm), with white hairs and scales on the face, silvery scales on the occiput; hairs on dorsum of thorax yellow, on pleura white; thoracic bristles yellow, a few weak, black ones on hind margin of scutellum; abdomen with a conspicuous yellow transverse band (laterally white) on tergites 2 and 4, on tergite 3 a similar band is either linear or absent; lateral margin of tergite 3 black-haired to a variable degree; scales on tergite 7 yellow but the apical tufts white; lateral black tufts along tergites 5—6 short and thick, consisting mostly of black scales; wings hyaline with yellowish costal cell and base; ♂ patagium white, costagium with shining black scales; knob of the halteres whitish, laterally pale yellow; legs black with white scales.

***Villa melanura*** (Loew), 1869.

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2200, 2400 and 2550 m, 4 ♂ 4 ♀, 20, 24, 25 and 30 July 1960 (J. R. Vockeroth).

Distribution. — Spain. Paramonov and Engel record it from Armenia and Turkestan, respectively.

Remarks. — Engel's redescription (1937:591) is based on specimens from Turkestan and Armenia and though I am not convinced that these are identical with Loew's Spanish species, I must admit that the description suits these Spanish specimens well.

***Villa modesta*** (Meigen), 1820.

Material. — GRANADA: Sierra Nevada, N. slope Veleta, 2400 m, 1 ♂, 22 July 1960 (J. R. Vockeroth).

Distribution. — From the Netherlands to the Mediterranean; Central Europe, Turkey, Turkestan.

Remarks. — This species has been repeatedly confused with either *hottentotta* or *paniscus* and in his revision of the Palaearctic species Engel (1937) has reduced its status to that of a subspecies of *hottentotta*. It can easily be distinguished from the *paniscus* by the less elongated and slender shape, by the anteriorly and basally lighter coloured wings and by the ♂ genitalia which are quite different. From *hottentotta*, with which it certainly has more in common, it differs by the silvery white patagium and the abdomen

devoid of yellowish transverse bands, in the ♂, also by the silvery white scales on the occiput; the ♂ genitalia have almost the same shape.

This species should be easily identified, in the ♂ sex at least, by the use of the following characters which, as far as my experience goes, are reliable.

Large *Villa* of about 15 mm (there are smaller specimens) with typically contrasted hairs on abdomen laterally: yellow from tergite 1 to 4, black along tergites 5 and 6, white or yellow at tip of abdomen (tergite 7); with hyaline wings, base, costal and first basal cells varying in colour from slightly opaque dirty grey to pale brown (in *paniscus* generally dark brown to black), patagium in ♂ silvery white; face with erect yellow hairs and scales; frons with erect black hairs and yellow scales; ocellar triangle, in ♂, distant from the eye by about the breadth of one lateral ocellus; occiput with silvery white scales in both sexes; postalar setae yellow, those on the hind margin of scutellum mostly black; abdominal tergites with small, brilliant black scales, well developed pile and no, or poorly developed, yellow transverse bands of scales in the ♂, in the ♀ with erect hairs on dorsum not so thick but with three distinct transverse bands of yellow scales; lateral black tufts of tergites 5—6 thick and broad; knob of halteres yellow, paler at the tip.

### Summary.

Sixty-five species in twenty-seven genera of Bombyliidae are recorded from Southern Spain based on collections made in 1960 and 1966. Five genera and fourteen species are new to Spain. Twelve species, *Usia martini* n. sp., *Empidideicus hispanus* n. sp., *E. hackmani* n. sp., *Cyrtosia pruinosa* n. sp., *Glabellula sufflava* n. sp., *Apolysis montivaga* n. sp., *Geron albidulus* n. sp., *Oligodranes langemarki* n. sp., *Phthiria barbatula* n. sp., *Heterotropus nigrithorax* n. sp., *Aphoebantus lyneborgi* n. sp. (from N. Morocco) and *Hemipenthes vockerothi* n. sp., are described as new to science. Taxonomic discussions are given of a number of other species.

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