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**SOME ANTHOMYIID FLIES FROM MONEGROS, SPAIN
(DIPTERA: ANTHOMYIIDAE)**

By MASAOKI SUWA and JAVIER BLASCO-ZUMETA

Abstract

SUWA, M. and BLASCO-ZUMETA, J. 2003. Some anthomyiid flies from Monegros, Spain (Diptera: Anthomyiidae). *Ins. matsum. n. s.* 60: 43–54, 20 figs.

Nineteen species of Anthomyiidae are recorded from Monegros, Spain. One of them, *Botanophila* sp., seems to be an undescribed species closely related to *B. turcica* (Hennig), though it is not given a name as the single available specimen is severely damaged. *Delia echinata* (Séguy), a widely distributed species in the Holarctic region, is recorded as new to the mainland of Spain. Among the species dealt with here coprophagous or saprophagous species are comparatively rich.

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INTRODUCTION

The Anthomyiidae are mostly known from temperate to subarctic ranges in the northern hemisphere. They have well been investigated in Europe, especially in central and northern parts, and about 460 species have been recorded from Europe as a whole. The Spanish fauna of Anthomyiidae has, however, rather poorly been investigated, about 60 or a little more species being known to occur in the mainland (Czerny & Strobl, 1909; Hennig, 1966–1976; Ackland, 1977; Michelsen & Báez, 1985). The country has areas of various climates, mild coasts, dry inlands, and woody mountains like the Pyrenees. It is not unreasonable to expect much more species of the group in the country.

In the Afrotropical region about 70 species of Anthomyiidae have been recorded, and most of them are endemic to the region, but with no endemism in the genera. This may indicate that the Afrotropical fauna is descended from the ancestors originated from the northern area, Europe. It is, therefore, important to know the anthomyiid fauna in the Mediterranean range including Spain for better understanding of the faunal relation between Europe and Afrotropics.

In recent years the junior author (Javier Blasco-Zumeta) has made investigations on the arthropod fauna at Retuerta de Pina in the Monegros region southeast of Zaragoza, Spain, with various methods, namely, net-sweeping, Malaise traps, Moericke traps, Wilkening traps, coloured dishes, and carrion traps. This is a report on the anthomyiid flies among the collection. Most of the specimens are determined as *Delia platura* (Meigen, 1826), a serious agricultural pest known as the seedcorn maggot in its larval stage, and the remainings are classified into 18 species.

Excluding two undetermined species, most of the species recorded in this paper are widely distributed in the Palaearctic or the Holarctic region, some others are Mediterranean elements, e.g. *Anthomyia confusanea* Michelsen, 1985, *Anthomyia quinquemaculata* Macquart, 1839, and *Leucophora subsponsa* Michelsen, 1985, and no species are endemic to Spain. It may be difficult to expect many endemic species in the Spanish anthomyiid fauna as the country is a part of the European continent and moreover the anthomyiid flies are regarded to have a comparatively great dispersal ability (Griffiths, 1997).

The Anthomyiidae are mainly phytophagous, and species belonging to *Botanophila*, *Delia* or *Pegomya* are usually predominant in main distribution ranges. Coprophagous or saprophagous species are, however, relatively rich among the species dealt with here. This may be a reflection of the area investigated.

ENUMERATION

1. *Adia cinerella* (Fallén, 1825)

Anthomyia (*Chortophila*) *cinerella*: Czerny & Strobl, 1909: 243.

Paregle cinerella: Hennig, 1967: 161; Ackland, 1977: 206.

Adia cinerella: Michelsen & Báez, 1985: 290.

Material examined. 55 ♂, 35 ♀, 1990–1992.

Distribution. Holarctic and Oriental regions.

Remarks. This is widely distributed in the northern hemisphere, and abundant especially in pasture lands, the larvae feeding on animal faeces.

2. *Anthomyia confusanea* Michelsen, 1985

“*Craspedochoeta pullula* (Zetterstedt)”: Hennig, 1966: 44, *partim*.

Anthomyia confusanea Michelsen in Michelsen & Báez, 1985: 285.

Material examined. 1 ♀, 10.ii.1990, coloured dishes; 1 ♀, 22.iv.1990, coloured dishes; 2 ♀, 26.i.1991, coloured dishes; 1 ♀, 16.i.1991, pitfall trap with beer; 3 ♀, 9.ii.1991, coloured dishes; 1 ♂, 20.ii.1991, coloured dishes; 2 ♂, 25.iii.1991, coloured dishes; 1 ♂, 1 ♀, 9.iv.1991, coloured dishes; 2 ♀, 25.iv.1991, coloured dishes; 2 ♀, 7.v.1991, coloured dishes; 1 ♂, 1 ♀, 7.v.1991, Malaise trap; 1 ♂, 24.v.1991, Malaise trap.

Distribution. Western Palaearctic region (Europe to Kashmir; Canary Islands).

Remarks. According to Michelsen & Báez (1985) the former concept of “*pullula* Zetterstedt, 1845” in Europe includes two distinct species, one is *A. liturata* (Robineau-Desvoidy, 1830) (= *pullula*) common throughout central and northern Europe, and the other is *A. confusanea* Michelsen, 1985, more common in southern Europe. The material examined is referred to the latter species, *A. confusanea*.

This is a member of the *Anthomyia punctipennis* section in the sense of Griffiths (2001). The North American *A. semiinfuscata* Griffiths, 2001, a member of the section, was described on the basis of material including some specimens reared from mushrooms of *Rhizopogon*, *Russula* and *Amanita*.

3. *Anthomyia imbrida* Rondani, 1866 (Fig. 1)

Anthomyia imbrida: Hennig, 1968: 205; Ackland, 1977: 206; Michelsen, 1980a: 283.

Material examined. 2 ♀, 22.iv.1990, coloured dishes; 1 ♀, 9.iv.1991, coloured dishes; 1 ♀, 25.iv.1991; 1 ♀, 7.v.1991, Moericke trap; 1 ♀, 7.v.1991, coloured dishes; 1 ♂, 20.v.1991, Moericke trap; 1 ♀, 20.vi.1991, coloured dishes; 1 ♀, 27.v.1991, Malaise trap.

Distribution. Europe; North Africa; Middle East; China.

Remarks. *A. imbrida* and the succeeding two species belong to the *Anthomyia pluvialis* section in the sense of Griffiths (2001). This section is equivalent to *Anthomyia* Meigen in the restricted sense of Suwa (1987, 1999) and of most authors prior to Michelsen (1985) who expanded the generic concept.

So far as known the larvae of this section are saprophagous or coprophagous, being reared from vertebrate droppings, bird nests, mushrooms, and other organisms. No information is available on the biology of *A. imbrida*. Although the present species is widely distributed in the Palaearctic region, it seems to be much less common than the following *A. pluvialis*.

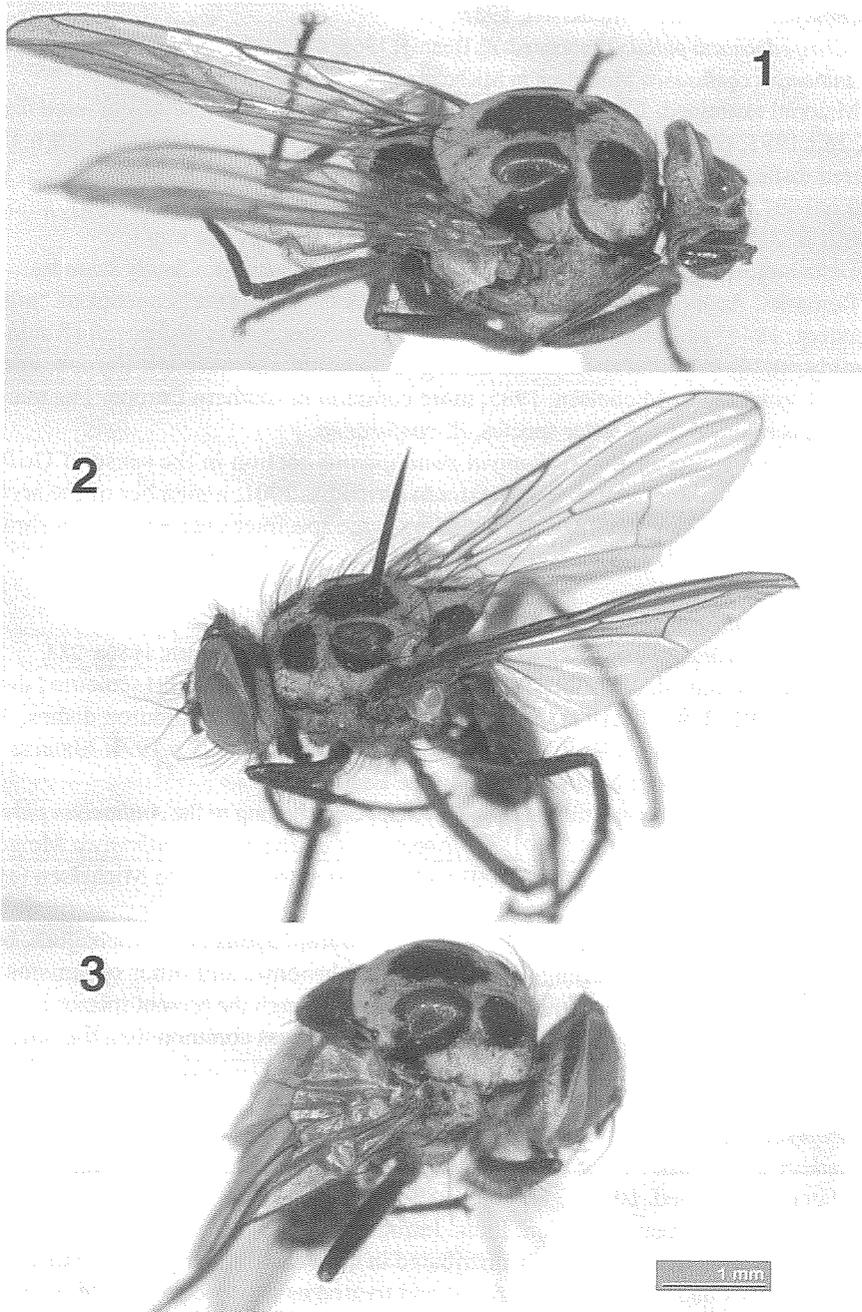
4. *Anthomyia pluvialis* (Linnaeus, 1758) (Fig. 2)

Anthomyia pluvialis: Hennig, 1968: 207, *partim*; Ackland, 1977: 208; Michelsen, 1980a: 285.

Material examined. 102 ♂, 126 ♀, 1989–1992.

Distribution. Palaearctic region; India. Introduced to Australia and to North America.

Remarks. This species is widely distributed in the Palaearctic region. *A. pluvialis* and its allied species had often been confused and treated as a single species (e.g. Hennig, 1968) until Michelsen (1980a) clarified the entity of the complex. Although the rearing records of “*pluvialis*” in Europe from animal faeces, bird nests, mushrooms, and other organisms compiled by Hennig (1968) need verification, it is not curious to rear the true *pluvialis* from such organisms.



Figs. 1–3. *Anthomyia* spp., ♂. 1, *A. imbrida*, abdomen removed; 2, *A. pluvialis*; 3, *A. quinquemaculata*.

5. *Anthomyia quinquemaculata* Macquart, 1839 (Fig. 3)

“*Anthomyia pluvialis* (Linnaeus)”: Hennig, 1968: 207, *partim*.

“*Anthomyia procellaris* Rondani”: Ackland, 1977: 208.

Anthomyia quinquemaculata: Michelsen, 1980a: 287, *partim*.

Material examined. 1 ♂, 1 ♀, 9.iv.1991, coloured dishes; 1 ♀, 25.iv.1991, Moericke trap; 1 ♂, 7.v.1991, Malaise trap; 1 ♀, 20.x.1991, Moericke trap.

Distribution. Canary Islands; Southern Europe; North Africa.

Remarks. By Michelsen (1980a) *Anthomyia benguellae* Malloch, 1924, distributed in the Afrotropical and Oriental regions was synonymised with *A. quinquemaculata*, from which it is, however, distinguished by small but stable differences in the male genitalia (Michelsen, 1997). Biological information is not available on these species. It may be worthy to note that a few specimens reared from moistened rock hyrax dung in Namibia were recorded as ?*benguellae* by Ackland (2001).

6. *Botanophila* sp. (Figs. 4–10)

Material examined. 1 ♂, 7.v.1991, coloured dishes.

Distribution. Spain.

Remarks. Judging from the male genital structures this may be an undescribed species closely related to *B. turcica* (Hennig, 1972). It is distinguished from the latter by the surstylus (Figs. 7–9) with a small process near apex (cf. Figs. 454 and 552 of Hennig, 1972, for *turcica*). The pregonite (Fig. 10) has only a single seta, and the postgonite has no setae discernible. It should be given a name in future when specimens in better condition will be available.

7. *Delia echinata* (Séguy, 1923)

Material examined. 1 ♂, 20.ii.1991, coloured dishes; 3 ♂, 25.iii.1991, coloured dishes; 1 ♂, 24.v.1991, Malaise trap.

Distribution. Holarctic region; northern part of Oriental region.

Remarks. Although *D. echinata* is a common species in the Holarctic region including the Canary Islands, it seems to be new to the mainland of Spain. The larvae of this species feed on leaves, stems or shoots of various plants of Caryophyllaceae and Chenopodiaceae. The species is economically known as a pest of spinach and carnations.

8. *Delia platura* (Meigen, 1826)

Delia platura: Ackland, 1977: 204.

Material examined. Numerous specimens of both sexes, 1989–1992.

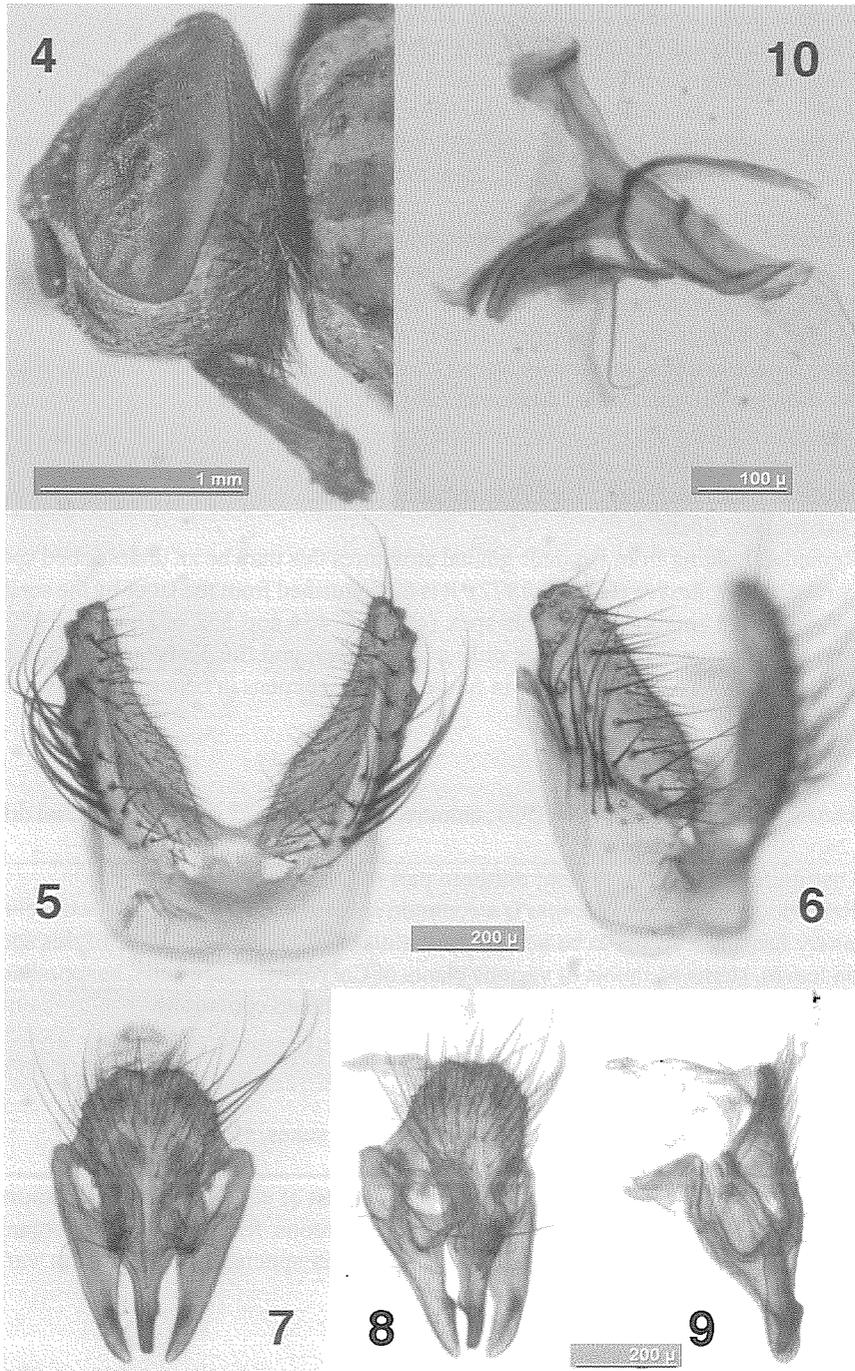
Distribution. Almost cosmopolitan.

Remarks. *D. platura* is a worldwide agricultural pest of which the larvae are known as the seedcorn maggots. The larvae are practically omnivorous, feeding on diverse organisms originated from plants and often from animals. This species is abundant in various environments from seashore to alpine ranges.

9. *Lasiomma seminitidum* (Zetterstedt, 1845)

Lasiomma meadei: Ackland, 1977: 205.

Material examined. 2 ♂, 7.i.1994, Malaise trap; 1 ♂, 20.i.1991, Malaise trap; 3 ♂, 9.ii.1991, Moericke trap; 1 ♂, 9.ii.1991, Malaise trap; 5 ♂, 9.ii.1991, coloured dishes; 1 ♂, 20.ii.1991, coloured dishes; 1 ♂, 9.iii.1991, coloured dishes; 6 ♂, 9.iv.1991, coloured



Figs. 4–10. *Botanophila* sp., ♂. 4, head, most setae missing; 5, 5th sternite, ventral view, setae around apices of processes missing; 6, ditto, ventrolateral view; 7, hypopygium, dorsal view, a few long setae on left anterolateral margin of cercal plate missing; 8, ditto, dorsolateral view; 9, ditto, lateral view; 10, aedeagus, right lateral view, left hypandrium and pregonite removed.

dishes; 1♂, 7.v.1991, coloured dishes; 1♂, 9.ii.1992, Wilkening trap on *Pinus halepensis*; 4♂, 25.ii.1992, Wilkening trap on *Pinus halepensis*.

Distribution. Europe.

Remarks. This species was already recorded from Spain on the basis of specimens collected in Almeria (Ackland, 1977). Some members of *Lasiomma* have been reared from bird nests and animal faeces. Their larvae may feed on various organisms. The present species (as *Opsolasia meadei*) was also reared from the nests of various birds (Collin, 1939).

10. *Leucophora cinerea* Robineau-Desvoidy, 1830

Hammomyia albiseta: Czerny & Strobl, 1909: 244.

Leucophora cinerea: Hennig, 1967: 116.

Material examined. 1♂, 25.iv.1991, coloured dishes.

Distribution. Europe; China; North America.

Remarks. So far as known the larvae of *Leucophora* species are cleptoparasites in the nests of ground-nesting bees or wasps. The present *L. cinerea* has records of host association with halictid bees and sphecoid wasps in Europe, of which the records with wasps (*Dinetus pictus* (Fabricius, 1793), Astatidae; *Diodontus tristis* (van der Linden, 1829), Pemphredonidae) were accepted as reliable by Volkart (1987) (through Griffiths, 1996).

11. *Leucophora personata* (Collin, 1921)

Leucophora personata: Ackland, 1977: 206.

Material examined. 1♂, 1♀, 25.iv.1991, coloured dishes; 2♂, 7.v.1991, coloured dishes.

Distribution. Palaearctic region.

Remarks. This species has some records of specimens which were captured in the act of following *Andrena* bees (Collin, 1921).

12. *Leucophora subsponsa* Michelsen, 1985

Leucophora subsponsa Michelsen in Michelsen & Báez, 1985: 292.

Material examined. 1♂, 20.ii.1991, Moericke trap; 2♂, 20.ii.1991, coloured dishes; 3♂, 25.iii.1991, coloured dishes; 2♂, 25.iii.1991, Malaise trap; 7♂, 9.iv.1991, coloured dishes; 1♂, 25.iv.1991.

Distribution. Spain; Canary Islands. Probably widely distributed in the Mediterranean subregion (Michelsen & Báez, 1985).

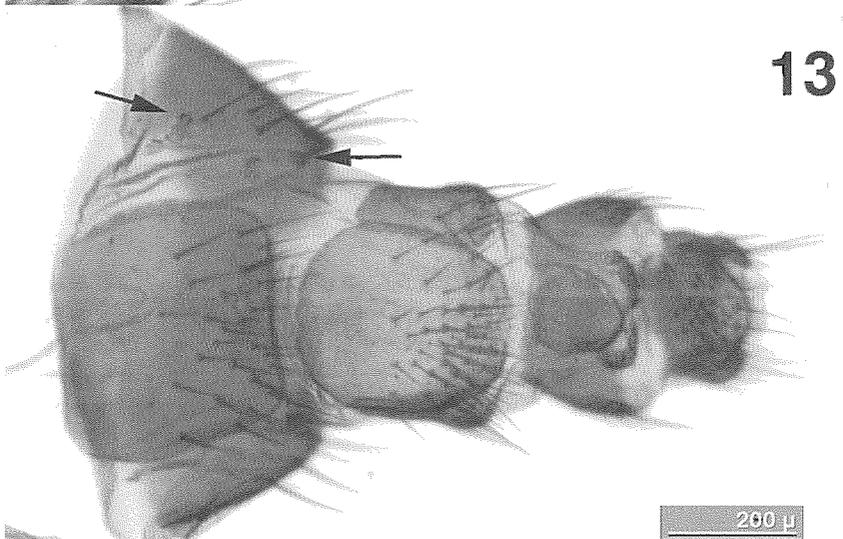
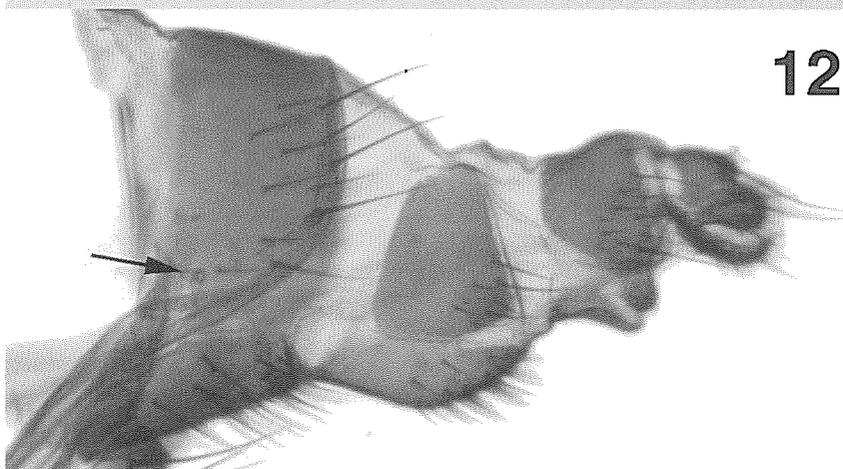
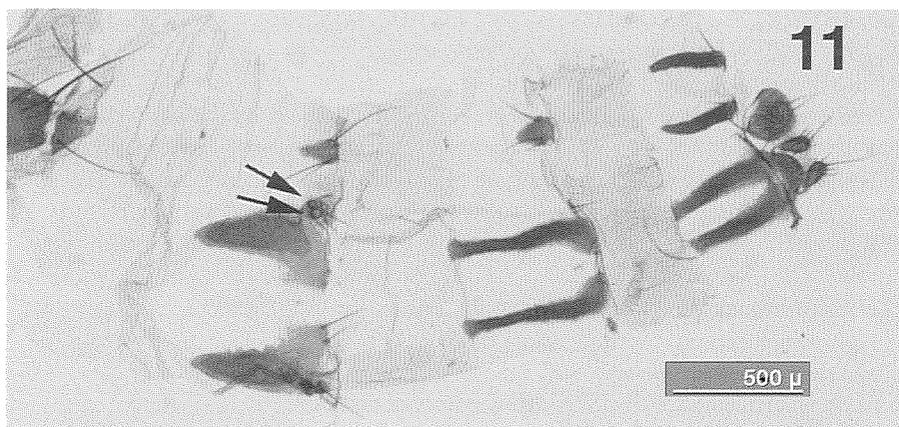
Remarks. As the present specimens have a short *ors* on each parafrenal (not confirmed in some severely damaged specimens), they may be referred to *L. subsponsa*. Slight differences from the original description of the species are found: Mesonotum with a faint brownish median vitta often discernible; distance between vibrissae always longer than that between posterior ocelli inclusive; epistoma protruded forward as far as or a little beyond parafrenal angle. The genital structures are similar to those of *L. sponsa* (Meigen, 1826) as stated in the original description of *L. subsponsa*.

13. *Paregle audacula* (Harris, 1780) (Fig. 11)

"*Anthomyia* (*Anthomyia*) *radicum* (Linnaeus)": Czerny & Strobl, 1909: 242.

"*Paregle radicum* (Linnaeus)": Hennig, 1967: 165; Ackland, 1977: 205.

Material examined. 1♀, 9.ii.1992, Malaise trap; 1♀, 25.ii.1992, Wilkening trap on



Figs. 11–13. Ovipositors. 11, *Paregle audacula*; 12, *Pegomya cunicularia*, lateral view; 13, ditto, ventral view. Arrows indicating spiracles.

Pinus halepensis.

Distribution. Holarctic region. Introduced to Australia (Tasmania and Victoria).

Remarks. So far as known the larvae of *Paregle* are exclusively coprophagous, developing only in mammalian faeces (Griffiths, 2001). *P. audacula* has been reared from faeces of various mammals.

14. *Pegomya cunicularia* (Rondani, 1866) (Figs. 12–13)

Pegomya cunicularia: Michelsen, 1980b: 301.

Material examined. 1 ♀, 9.vi.1991, sweeping on *Tamarix canariensis*; 1 ♀, 20.vi.1991, Malaise trap.

Distribution. Palaearctic region.

Ovipositor (Figs. 12–13). 6th and 8th tergites entire; 7th tergite widely divided into a pair of lateral plates; 6th spiracle situated on 6th tergite anterolaterally; 7th spiracle on membrane just behind 6th tergite and near posterolateral corner of the tergite.

Remarks. This is a leaf-miner on various plants of Chenopodiaceae (*Atriplex*, *Chenopodium*, *Beta* and *Spinacia*). The larvae form blotch-mines in the leaves of host plants.

15. *Pegomya flavifrons* (Walker, 1849) (Fig. 14)

Pegomya albimargo (Pandellé): Ackland, 1977: 202.

Material examined. 1 ♀, 9.iv.1991, Malaise trap.

Distribution. Holarctic region.

Ovipositor (Fig. 14). 6th tergite entire, with membranous area anteromedially; 7th

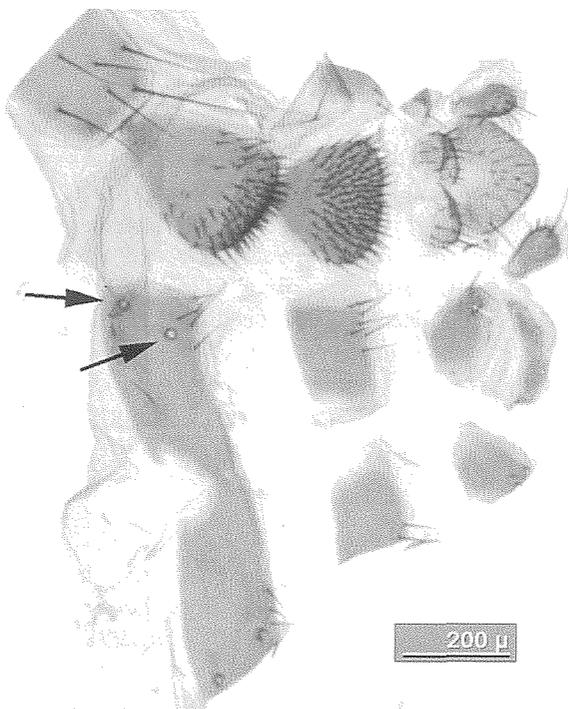


Fig. 14. Ovipositor of *Pegomya flavifrons*. Arrows indicating spiracles.

and 8th tergites divided into lateral plates; 6th and 7th spiracles situated on 6th tergite laterally.

Remarks. This species has been reared from various plants of Caryophyllaceae as a leaf-miner.

16. *Pegomya suaedae* Hering, 1927

Pegomya suaedae: Ackland, 1977: 202; Michelsen & Báez, 1985: 280.

Material examined. 1 ♂, 16.xii.1989, coloured dishes.

Distribution. France; Spain; Canary Islands; Tunisia.

Remarks. This is known as a leaf-miner on *Suaeda fruticosa* and *Beta vulgaris* (Chenopodiaceae) in its larval stage.

17. *Pegomya* sp. (Figs. 15–20)

Material examined. 2 ♀, 25.iv.1991, coloured dishes; 1 ♀, 7.v.1991, Malaise trap; 3 ♀, 13.viii.1992, carrion trap.

Distribution. Spain.

Ovipositor (Figs. 15–20). 6th to 8th tergites entire; 7th and 8th tergites extended posterolaterally, thereon with some recurrent and large-socketed spinules; 6th spiracle at anterolateral corner of 6th tergite or on membrane just near the corner; 7th spiracle on membrane near posterolateral corner of 6th tergite; 7th sternite composed of anterior bare plate and posterior spinulose extension, the spinules being recurrent and large-socketed; 8th sternite represented by a pair of spinulose plates.

Remarks. This species is characteristic in the ovipositor as mentioned above. Ovipositors of this type are seen in some species of the *Pegomya terebrans* superspecies in the sense of Griffiths (1982), e.g. the North American *P. carduorum* Hockett, 1939, and *P. indicta* Hockett, 1939, and the Japanese *P. auricolor* Suwa, 1971. In Europe there are “three” species belonging to this superspecies, namely “*P. terebrans* (Rondani, 1866)” in the sense of Hennig (1973), *P. fodiens* (Hendel, 1925) and *P. varipes* (Pokorný, 1889), of which the latter two species have much different ovipositors. Judging from the male genital structures “*P. terebrans*” is closely related to *P. carduorum* and to *P. auricolor*.

Hennig (1973) synonymized *Pegomya indigena* Villeneuve, 1923, described from France and *Anthomyia (Pegomyia) hyoscyami* var. *nigricornis* Strobl, 1909, from Spain with *P. terebrans* described from Austria. According to Griffiths (1982), the conspecificity of all the specimens discussed by Hennig (1973) is doubtful. The females of these taxa have not been reported. The present Spanish female specimens may be referred to *P. terebrans* or one of its allies.

The larvae of this superspecies are, so far as known, leaf-miners on Compositae plants, e.g. *Cirsium*, *Carduus*, *Cynara*, *Synurus* and *Artemisia*.

18. *Phorbia fumigata* (Meigen, 1826)

Phorbia securis: Hennig, 1969: 313.

Material examined. 4 ♂, 16.xii.1989, coloured dishes; 1 ♂, 10.ii.1990, coloured dishes; 1 ♂, 22.iv.1990, coloured dishes; 5 ♂, 9.ii.1991, coloured dishes; 4 ♂, 20.ii.1991, coloured dishes; 1 ♂, 19.ii.1991, Malaise trap; 1 ♂, 9.iii.1991, Moericke trap; 8 ♂, 9.iii.1991, coloured dishes; 3 ♂, 25.iii.1991, Moericke trap; 2 ♂, 25.iii.1991, coloured dishes; 3 ♂, 9.iv.1991, coloured dishes; 2 ♂, 25.iv.1991; 1 ♂, 13.viii.1992, carrion trap.

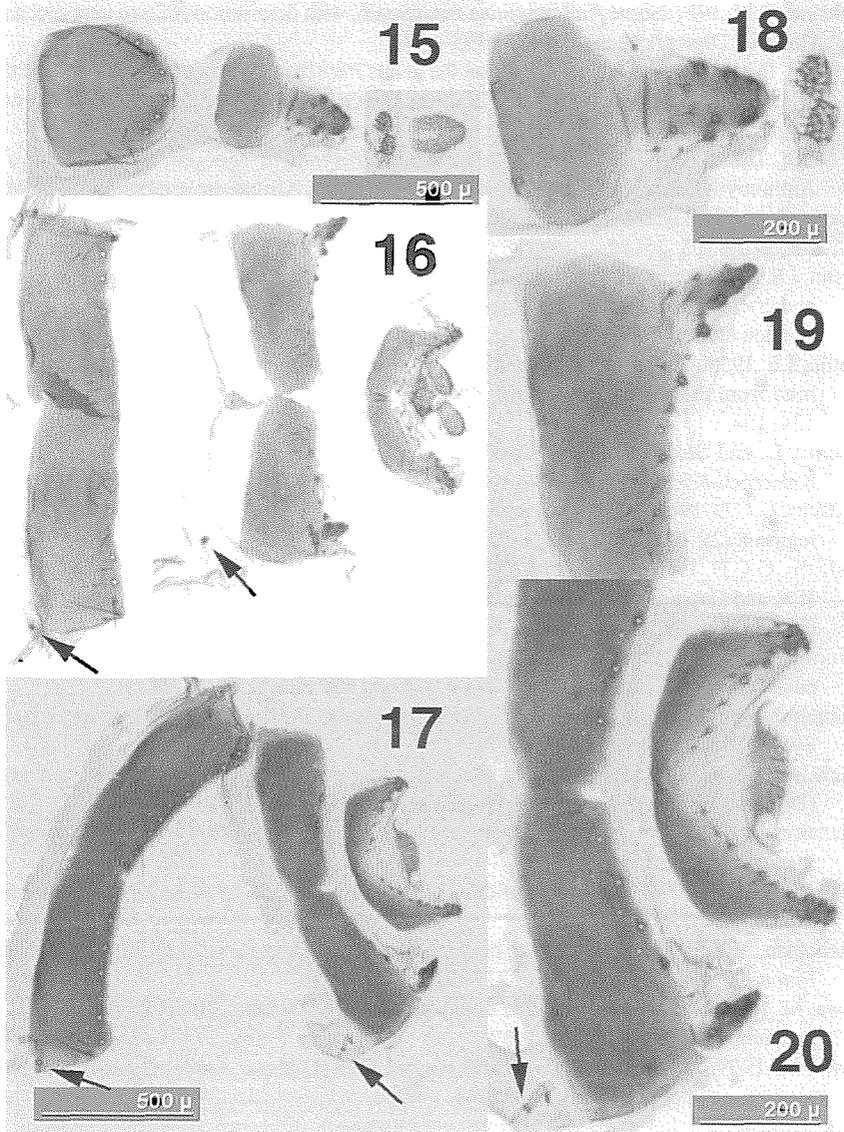
Distribution. Europe.

Remarks. This species belongs to the *Phorbia fumigata* group in the sense of Ackland (1993), which comprises four Palearctic and one Holarctic species.

All known larvae of *Phorbia* develop as stem-borers in grasses, and they are considered to be serious pests of cultivated cereals especially in eastern Europe (Griffiths, 1996).

19. *Subhylemyia longula* (Fallén, 1824)

Anthomyia (*Chortophila*) *longula*: Czerny & Strobl, 1909: 243.



Figs. 15–20. Ovipositor of *Pegomya* sp. 15, sternites; 16, tergites and cerci; 17, tergites; 18, 7th and 8th sternites; 19, 7th tergite; 20, 7th, 8th and 10th tergites. Arrows indicating spiracles. Figs. 15–16 and 18–19, same specimen; Figs. 17 and 20, another specimen.

Subhylemyia longula: Hennig, 1974: 685; Ackland, 1977: 205.
 Material examined. 1 ♂, 9.iv.1991, coloured dishes; 2 ♂, 7.v.1991, coloured dishes.
 Distribution. Holarctic region; India.
 Remarks. This species is a scavenger in the larval stage, confirmed to be reared from dead snails (Beaver, 1969).

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