

## Two new species of *Sciophila* Meigen (Diptera: Mycetophilidae) from Turkey, with a key to the Western Palaearctic species of the *S. lutea* Macquart group

DIMITAR BECHEV<sup>1</sup> & HASAN KOÇ<sup>2</sup>

<sup>1</sup>Department of Zoology, University of Plovdiv, Tzar Assen 24, BG-4000 Plovdiv, Bulgaria.  
E-mail: bechev@pu.acad.bg

<sup>2</sup>Department of Biology, Science and Arts Faculty, Muğla University, 48170 Kötekli, Muğla, Turkey.  
E-mail: khasan@mu.edu.tr

### Abstract

Two new species, *Sciophila muglolutea* **sp. n.** and *S. turkolutea* **sp. n.**, from southeastern Turkey are described and illustrated. The second record of *S. delphis* Chandler, previously known only from the holotype, is reported. A key to the Western Palaearctic species of the *S. lutea* Macquart group is provided, and data on the distribution of the Palaearctic species are presented.

**Key words:** Mycetophilidae, *Sciophila*, taxonomy, Mediterranean refugium, distribution

### Introduction

The genus *Sciophila* Meigen is widely distributed in the Afrotropical, Nearctic, Neotropical, Oriental, and Palaearctic Regions (Bechev 2000). In the Palaearctic Region, about 60 species are known. The adults are most common in forest habitats and generally do not inhabit dry areas. The larvae are sporophagous or mycetophagous, and develop on sporophores of polypores, in decaying wood, or in fruiting bodies of basidiomycete fungi.

In a revision of the genus *Sciophila* Meigen in the Holarctic Region, Zaitzev (1982) included nine species that are similar in external characteristics and genitalia to *S. lutea* Macquart. More recently, five additional species from the Mediterranean were described (Chandler 1994, Chandler & Blasco-Zumeta 2001, Chandler *et al.* 2006). The group now includes four Nearctic species, the Holarctic *S. modesta* Zaitzev and *S. vakulenkoii* Stackelberg, and eight Palaearctic species (Table 1).

The species of the *S. lutea* group have the following characters: wing membrane with macro- and microtrichia, ventral lobe of gonostyle with two long tube-like megasetae,

anterior portion of median lobe of gonostyle with three long tube-like megasetae, and large tergite 9 apically with two strong marginal setae. The species differ in the form of tergite 9 and mainly in the distal margin of the dorsal gonocoxal lobe and gonocoxal apodeme.

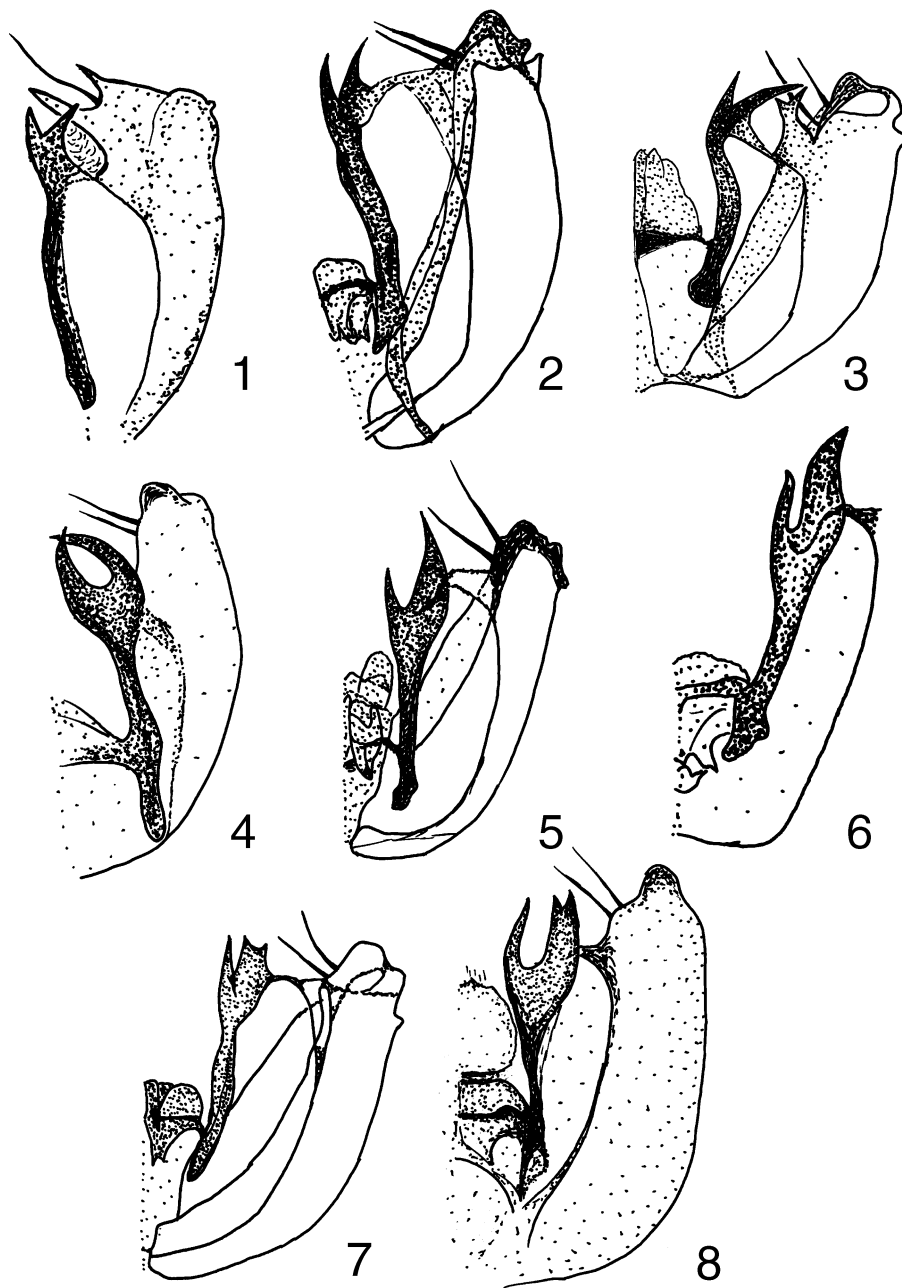
Our objectives are to provide a key to the Western Palaearctic species of the *Sciophila lutea* group, describe two new species from southeastern Asiatic Turkey, and draw some conclusions about the distribution of Mediterranean species of the group.

**TABLE 1.** Species of the *Sciophila lutea* group in the Palaearctic Region, with their distributions (according to Chandler 1994, 2004; Chandler & Blasco-Zumeta 2001; Chandler *et al.* 2006; Zaitzev 1982; and original data).

| Species  | Distribution  |
|--|---|
| <i>corlutea</i> Chandler in Chandler & Blasco-Zumeta, 2001 | Switzerland, Channel Islands, French mainland and Corsica   |
| <i>delphis</i> Chandler in Chandler & Blasco-Zumeta, 2001  | Greek mainland, South-eastern part of Asiatic Turkey  |
| <i>eryngii</i> Chandler, 1994                              | Cyprus, Israel, Asiatic Turkey  |
| <i>iberolutea</i> Chandler & Blasco-Zumeta, 2001           | Spanish mainland, Malta, Morocco, Algeria   |
| <i>kashmirensis</i> Zaitzev, 1982                          | Jammu and Kashmir (India)   |
| <i>lutea</i> Macquart, 1826                                | Widely distributed in Europe south to Croatia, Siberia, Tajikistan  |
| <i>modesta</i> Zaitzev, 1982                               | Switzerland, Estonia, Russia: Dikson Peninsula, Wrangel Island, Karelia, Volgograd Province, Moscow Province; North America |
| <i>muglolutea</i> n. sp.                                   | South-eastern part of Asiatic Turkey  |
| <i>pandora</i> Chandler, Bechev & Caspers, 2006            | Crete Island  |
| <i>stackelbergi</i> Zaitzev, 1982                          | Tajikistan, Turkmenistan  |
| <i>turkolutea</i> n. sp.                                   | South-eastern part of Asiatic Turkey  |
| <i>vakulenkoi</i> Stackelberg, 1943                        | Novaya Zemlya Island (Russia); Hershel Island (Canada)  |

## Materials and methods

The material was collected during the day, using an aerial net, and preserved in alcohol. Male genitalia were studied in glycerol after maceration in warm potassium hydroxide (10 % KOH). Tergite 9 was not removed. The types are deposited in the collection of the University of Plovdiv (UP). Data on the geographical distribution of species are from the works of Zaitzev (1982, 1994), Chandler & Blasco-Zumeta (2001), Chandler (2004), and Chandler *et al.* (2006).



**FIGURES 1–8.** Dorsal lobe of gonocoxite and gonocoxal apodeme: dorsal view, half, tergite 9 not included. **1.** *Sciophila lutea*. **2.** *S. corlutea*. **3.** *S. iberolutea*. **4.** *S. muglolutea* sp. n. **5.** *S. eryngii*. **6.** *S. pandora*. **7.** *S. delphis*. **8.** *S. turkolutea* sp. n. Figs 2, 3, 5, and 7 are after Chandler and Blasco-Zumeta (2001); Fig. 1 after Zaitzev (1982).

**Key to males of the Western Palaearctic species of the *S. lutea* group**

1. Dorsal gonocoxal lobe with 1 long seta (Fig. 1) ..... *S. lutea* Macquart
- Dorsal gonocoxal lobe with 2 long setae ..... 2
2. Gonocoxal apodeme poorly developed ..... *S. modesta* Zaitzev
- Gonocoxal apodeme strongly developed, ending about distal margin of gonocoxite... 3
3. Dorsal gonocoxal lobe with bifid process (Fig. 3) .....  
..... *S. iberolutea* Chandler & Blasco-Zumeta
- Dorsal gonocoxal lobe rounded ..... 4
4. Distal part of gonocoxal apodeme bifurcate, with processes similar in form ..... 5
- Distal part of gonocoxal apodeme bifurcate, with processes different in form ..... 6
5. Apodemal processes outwardly directed (Fig. 2) ..... *S. corlutea* Chandler
- Apodemal processes convergent and crossed apically (Fig. 4) ..... *S. muglolutea* **sp. n.**
6. Outer apodemal process narrow and pointed ..... 7
- Outer apodemal process broad and shallowly bifurcate apically ..... 8
7. Outer apodemal process inwardly directed (Fig. 5) ..... *S. eryngii* Chandler
- Outer apodemal process outwardly directed (Fig. 6) .....  
..... *S. pandora* Chandler, Bechev & Caspers
8. Outer apodemal process broad (Fig. 7) ..... *S. delphis* Chandler
- Outer apodemal process elongate (Fig. 8) ..... *S. turkolutea* **sp. n.**

New data and description of new species

***Sciophila delphis* Chandler in Chandler & Blasco-Zumeta, 2001**

(Figs. 7, 9)

**Material.** Turkey: Denizli, Tavas, Kizilca Borough (37° 29' N/ 29° 10' E), 1100 m, 13.06.2003, Leg. H. Koç, A. Karaman & O. Ozgül, 1 male.

**Habitat.** Rocky and gravelly area on the shore of a mountain stream flowing in a mixed forest. The vegetation consists of *Juniperus* sp., *Quercus* sp., *Pinus* sp., *Juncus* sp., *Verbascum* sp. and *Muscari* sp.

**Remark.** Until now, the species was known only from the holotype (Greece: Fokis, Delphi).

***Sciophila muglolutea* sp. n.**

(Figs. 4, 10)

**Holotype male:** Turkey: Muğla, Fethiye, Seki Plateau (36° 49' N/ 29° 33' E), 1122 m, 28.06.2003, Leg. H. Koç & O. Ozgül (in coll. UP).

**Head.** Brown. Antenna yellow, flagellomeres about 3x as long as broad. Palpus yellow.

Thorax yellow. All hairs and setae yellow. Laterotergite and mediotergite bearing setae.

**Legs.** Yellow, with dark patch below trochanters. Setae on coxae, tibiae, and tarsi brown, spurs yellow.

**Wing.** Length 3.6 mm. With both macrotrichia and microtrichia, long setulae above and below Sc, R1, and R5. Vein Sc2 level with base of Rs; R4 close to Rs, forming quadrate cell; r-m shorter than stem of median fork. Halter yellow.

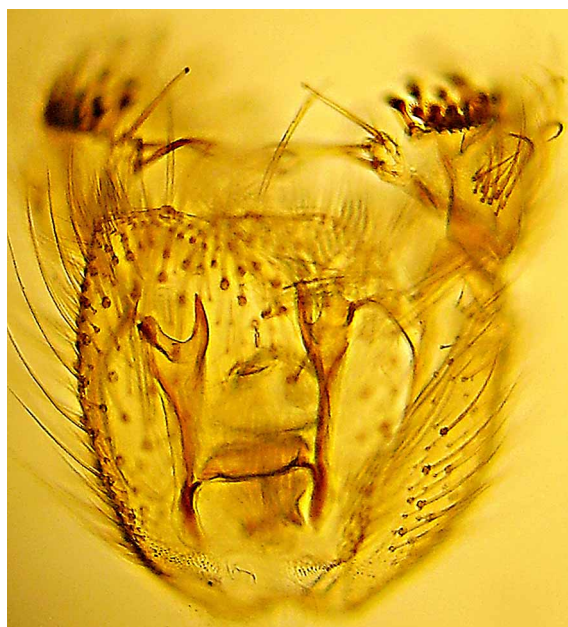
**Abdomen.** Yellow, with brownish hairs. **Genitalia** (Figs. 4, 10). Apical part of dorsal gonocoxal lobe rounded, without processes. Gonocoxal apodeme with bifurcate apical process, its branches pointed apically, long and curved, convergent and crossed apically. Elongate ventral lobe of gonostyle with 2 long tube-like megasetae, anterior portion of median lobe with 3 megasetae. Apical portion of gonostyle with numerous dark, rather long-stalked, forked megasetae. Tergite 9 with 2 long setae, about 1.4 times as long as broad. Apical margin curved in proximal direction.

**Female.** Unknown.

**Differential diagnosis.** Convergetly curved apodemal processes.

**Etymology.** The name is an adjective based on occurrence in the Muğla Region and relationship to *S. lutea*.

**Habitat.** Reed formations and rocky edges of a mountain stream. The vegetation consists of *Salix* sp., *Nerium oleander*, and *Cupressus sempervirens* in the rocky areas and *Juncus* sp., *Avena* sp., *Trifolium* sp., *Tordylium* sp., and *Typha* sp. in the reed formations.



**FIGURE 9.** Male genitalia of *Sciophila delphis*, specimen from Turkey, dorsal view.

*Sciophila turkolutea* sp. n.

(Figs. 8, 11)

**Holotype male:** Turkey: Denizli, Acipayam, Kizilca Borough Road 10 km (37° 28' N/29° 13' E), 1287 m, 22.04.2003, Leg. H. Koç, A. Karaman & O. Ozgül (in coll. UP).

**Head.** Brownish. Antenna yellow, flagellomeres about 2.5x as long as broad. Palpus yellow.

**Thorax.** Yellow-brownish. All hairs and setae yellow. Laterotergite and mediotergite bearing setae.

**Legs.** Yellow, with dark patch below trochanters. Setae on coxae, tibiae, and tarsi brown, spurs yellow.

**Wing.** Length 3.9 mm. With both macrotrichia and microtrichia, long setulae above and below Sc, R1, and R5. Vein Sc2 about level with base of Rs; R4 close to Rs, forming quadrate cell; r-m shorter than stem of median fork. Halter yellow.

**Abdomen.** Yellow, with yellowish hairs. **Genitalia** (Figs. 8, 11). Apical part of dorsal gonocoxal lobe rounded, without processes. Gonocoxal apodeme with bifurcate apical process. Outer process apically also bifurcate. Elongate ventral lobe of gonostyle with 2 long tube-like megasetae, anterior portion of median lobe with 3 megasetae. Apical portion of gonostyle with numerous dark, rather long-stalked, forked megasetae. Tergite 9 with 2 long setae, about 1.3 times as long as broad. Apical margin nearly straight.

**Female.** Unknown.

**Differential diagnosis.** *Sciophila delphis* has apodemal processes different in form, but in *S. turkolutea* the outer process is long and bifurcate apically, whereas in *S. delphis* it is broad.



FIGURES 10–11. Male genitalia, dorsal view. 10. *Sciophila muglolutea* sp. n. 11. *S. turkolutea* sp. n.

**Etymology.** The name is an adjective based on occurrence in Turkey and relationship to *S. lutea*.

**Habitat.** A mixed forest along a mountain stream. The vegetation consists of trees (*Salix* sp., *Pinus* sp., *Quercus* sp.) and herbaceous plants (*Trifolium* sp., *Vicia* sp., *Equisetum* sp., *Juncus* sp., *Urtica* sp.).

## Conclusions

The Mediterranean region is not well studied with regard to the fungus gnats (families Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae, and Mycetophilidae), and some parts such as Turkey are almost completely unexplored. Data on the species in the *S. lutea* group provide information from which we draw the following conclusions:

(1) The Mediterranean region appears to be a center of species diversity for the *S. lutea* group. Of 12 Palearctic species, seven are distributed here, and six of them have never been recorded outside the region (Table 1). In the Western Mediterranean, two species are known to occur and in the Eastern Mediterranean, five species are known.

(2) The Mediterranean species of the *S. lutea* group should be considered stenochoric and stenotopic forms with relict characters. Perhaps they are Tertiary relicts that migrated southward and survived the Pleistocene glaciation in the Mediterranean refugium.

(3) The species *S. iberolutea* and *S. corlutea* survived in the Atlantic-Mediterranean secondary refugium (according to de Lattin 1949, 1967); *S. delphis*, *S. eryngii*, *S. muglolutea*, and *S. turkolutea* in the Ponto-Mediterranean; and *S. pandora* in the Cretan secondary refugium.

(4) *Sciophila corlutea* has probably expanded its range from the Atlantic-Mediterranean center to the north and northeast (Table 1).

## Acknowledgements

We thank the authorities of TÜBİTAK (Turkey) (Research Project No 2245) and FSI—University of Plovdiv (Project 05-B-49) for financial support. We also thank Peter Chandler for his valuable notes and editing of the English. Two anonymous reviewers are thanked for their comments and suggestions.

## References

- Bechev, D. (2000) World distribution of the genera of fungus gnats (Diptera: Sciaroidea, excluding Sciaridae). *Studia dipterologica*, 7, 543–552.
- Chandler, P. (1994) The fungus gnats of Israel (Diptera: Sciaroidea, excluding Sciaridae). *Israel*

- Journal of Entomology*, 28, 1–100.
- Chandler, P. (2004) Fauna Europaea: Mycetophilidae. In: de Jong, H. (Ed.), *Fauna Europaea: Diptera: Nematocera*. Fauna Europaea version 1.1. Available from: <http://www.faunaeur.org>. (accessed 03 March 2006)
- Chandler, P., Bechev, D. & Caspers, N. (2006) The fungus gnats (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae) of Greece, its islands and Cyprus. *Studia dipterologica*, 12 (2005), 255–314.
- Chandler, P. & Blasco-Zumeta, J. (2001) The fungus gnats (Diptera, Bolitophilidae, Keroplatidae and Mycetophilidae) of the Monegros Region (Zaragoza, Spain) and five other new European species of *Pyratula* Edwards and *Sciophila* Meigen. *Zapateri*, 9, 1–24.
- de Lattin, G. (1949) Beiträge zur Zoogeographie des Mittelmeergebietes. *Zoologischer Anzeiger*, Supplementband 13, 143–151.
- de Lattin, G. (1967) *Grundriß der Zoogeographie*. Verlag Gustav Fischer, Jena, 602 pp.
- Zaitzev, A. (1982) Holarctic fungus gnats of the genus *Sciophila* Meig. Nauka, Moscow, 1–76. [In Russian].
- Zaitzev, A. (1994) Fungus gnats of the fauna of Russia and adjacent regions. Part 1. Nauka, Moscow, 1–288. [In Russian].