

ACARTOPHTHALMIDAE, PSEUDOPOMYZIDAE AND XYLOMYIDAE – THREE FAMILIES OF DIPTERA NEW TO THE PORTUGUESE FAUNA

Rui Andrade¹ & Ana Rita Gonçalves²

¹Rua Calouste Gulbenkian 237 4H3, Porto, Portugal – ruiamandrade@yahoo.com

²Science Museum, Laboratório Chimico, Largo Marquês de Pombal, 3000-272 Coimbra, Portugal – anagoncalvesm@gmail.com

Abstract: New records are presented for three families of Diptera for mainland Portugal, namely Acartophthalmidae (*Acartophthalmus bicolor*), Pseudopomyzidae (*Pseudopomyza atrimana*) and Xylomyidae (*Solva marginata*). Additional information is given for each record, thus expanding the existing knowledge about the recorded species.

Key words: Diptera, Acartophthalmidae, Pseudopomyzidae, Xylomyidae, new records, distribution, Portugal.

Acartophthalmidae, Pseudopomyzidae and Xylomyidae – Tres familias de Diptera nuevas para la fauna portuguesa

Resumen: Se presentan citas nuevas de Portugal continental de tres familias de Diptera: Acartophthalmidae (*Acartophthalmus bicolor*), Pseudopomyzidae (*Pseudopomyza atrimana*) y Xylomyidae (*Solva marginata*). Se aportan datos adicionales en cada cita, ampliando así el conocimiento existente sobre estas especies.

Palabras clave: Diptera, Acartophthalmidae, Pseudopomyzidae, Xylomyidae, nuevas citas, distribución, Portugal.

Introduction

The fauna of Diptera from Portugal is still very poorly known, and this happens even with regard to the number of families present in the Portuguese territory. In the last decade, since the publication of the catalogue of the Diptera from Spain, Portugal and Andorra (Carles-Tolrá Hjorth-Andersen, 2002), several families of Diptera have been added to the list of those known from Portugal (Zuijlen, 2003; Díaz *et al.*, 2005; Carles-Tolrá, 2006; Carles-Tolrá & Rosado, 2009; Evenhuis *et al.*, 2009; Carles-Tolrá, 2009; Roháček *et al.*, 2009; Andrade & Almeida, 2010a, 2010b; Ebejer & Andrade, 2010; Carles-Tolrá & Andrade, 2011; Andrade, 2011). Up to now, 95 dipteran families are known from Portugal (91 from mainland Portugal, 66 from the Madeira archipelago and 57 from the Azores archipelago). Given that there are some common European families not yet known for this country, it is expected that this list will continue to rise in the following years. In this article we cite the occurrence of three new families of Diptera for the Portuguese mainland fauna: Acartophthalmidae, Pseudopomyzidae and Xylomyidae. The first two are entirely new to the country, while Xylomyidae was already known from the archipelago of Madeira with the record of *Solva nigritibialis* (Macquart in Webb & Berthelot, 1838) (Carles-Tolrá Hjorth-Andersen, 2002).

Acartophthalmidae is a family of minute flies (1.0–2.5 mm), dark coloured, with only three species in one genus known from Europe (Oosterbroek, 2006). Species from this family are distinguished by large, divergent postocellar bristles, absence of true vibrissae, tibiae without dorsal preapical bristle, costa with only a humeral break and closed anal cell (Papp & Ozerov, 1998). Adults have been found over a variety of decomposed matter, such as fungi, rotten meat, droppings and wood (Oosterbroek, 2006). Because of this, it has been assumed that larvae from species of this family are saprophagous.

The family Pseudopomyzidae is composed of minute-sized to moderate (1.7–5.5 mm) flies that occur in most conti-

nents, although in Europe it is represented by a single species, *Pseudopomyza atrimana* (Meigen, 1830), a transpalearctic taxon known from the following countries (or regions) in Europe: Austria, Czech Republic, Finland, Germany, Great Britain, Hungary, Italy, Moldavia, Norway, Poland, Romania, Russia (CET, NET), Slovakia, Spain, Sweden, Switzerland and The Netherlands (Roháček, 2012). *P. atrimana* is small (1.7–2.5 mm) and glossy dark coloured. It has convergent postocellar bristles and the vibrissae are present. Arista long and pubescent. Legs of moderate size and without dorsal preapical bristle on the tibiae. Costa with humeral and subcostal breaks, subcosta incomplete and closed anal cell (Oosterbroek, 2006).

The European fauna of Xylomyidae is composed of two genera with a total of eight species, three in the genus *Xylomya* Rondani, 1861 and five in *Solva* Walker, 1860 (Rozkošný, 2013). Adults from this family are mostly medium sized (6.0–20.0 mm) and with elongated bodies, usually without bristles. The eyes are separated in both sexes, and the flagellum is composed of eight segments. The scutellum is without spines, and in the wing the m3 and anal cells are closed. In the mid and hind tibiae an apical spur is present (Oosterbroek, 2006).

Results

Acartophthalmus bicolor Oldenberg, 1910 (Acartophthalmidae)

Portugal: Aveiro, Estarreja, Canelas e Fermelã, 40°43'26.6"N, 8°33'53.8"W. The specimen from the year 2013 was collected with a vial just a few centimetres from a dead rat (*Rattus* sp.). The two specimens from 2014 were collected with a vial near several dead Louisiana crawfish (*Procambarus clarkii* (Girard, 1852)), an exotic crustacean pest very common in the area. The area is a cattle pasture adjacent to a marshland. Among the most common plant species are *Salix atrocinerea*, *Alnus glutinosa*, *Frangula alnus*, *Rubus* sp. and *Hedera* sp.

19.vii.2013, 1♂, A. Gonçalves & R. Andrade leg.; 19.iii. 2014, 2♂, R. Andrade leg. The specimens are preserved in 70% ethanol and deposited in the first author's private collection.

Identified using Shtakel'berg (1988).

***Pseudopomyza atrimana* (Meigen, 1830) (Pseudopomyzidae)**

Portugal: Braga, Esposende, Fonte Boa e Rio Tinto (Marachão), 41°30'16.9"N, 8°43'10.6"W. Collected with a net while sweeping through herbaceous vegetation near the margin of an artificial pond. The site is located on the margins of the Cávado River. Among the most common plant species are the following: *Salix atrocinerea*, *Quercus robur*, *Lythrum salicaria*, *Sambucus nigra*, *Eucalyptus* sp. and *Pinus pinaster*.

15.vi.2013, 2♂ and 2♀; 16.vi.2013, 3♀, R. Andrade leg. The specimens are preserved in 70% ethanol and deposited in the first author's private collection.

Identified using Oosterbroek (2006).

***Solva marginata* (Meigen, 1820) (Xylomyidae)**

Portugal: Porto, Vila Nova de Gaia, Avintes (Parque Biológico de Gaia), 41°05'52.9"N, 8°33'27.2"W. Collected with a vial. The site is an urban park situated in the valley of the river Febros, a tributary of the river Douro. A significant area of the park is forested and, among others, the following plant species can be found: *Quercus robur*, *Salix* spp., *Alnus glutinosa*, *Sambucus nigra*, *Frangula alnus* and *Rubus* sp.

6.vii.2013, 1♀, R. Andrade leg. The specimen is preserved in 70% ethanol and deposited in the first author's private collection.

Identified using Lindner (1936-38).

Discussion

This new record of *Acartophthalmus bicolor* for continental Portugal expands the list of European countries in which this species can be found, joining Austria, the British Islands, Czech Republic, Finland, Germany, Hungary, Romania, Central Russia, Northwest Russia, Spain, Switzerland and Ukraine (Ozerov, 2013). The specimens were found in close proximity to decomposing animals (a rat and several Louisiana crawfish). The biology and behaviour of *A. bicolor* were studied by Ozerov who mentions field observations of females ovipositing on a dead snake (*Elaphe schrenkii* Strauch, 1873). Larvae were later reared from rotten flesh under laboratory conditions (Ozerov, 1987). Given the current knowledge on the biology of this species, the association of these specimens with dead animals was most likely not coincidental.

It is known that males of this species wait for females near decaying material, where they defend territories from other males (Papp & Ozerov, 1998), so we feel this is the most likely explanation for this close association.

The biology of *Pseudopomyza atrimana* is very poorly known. It occurs in forest habitats where adults were recorded swarming over tree logs (Frey, 1952). In Slovakia, a mass occurrence of this fly was recently recorded in a heap of cut grass where several flies were observed mating (Roháček, 2012). According to this author, this goes against previous assumptions about the biology of this species that stated that it could breed under the bark of dead trees (the fact that adults were only collected on freshly cut logs might indicate that they were there only to feed on the sap). Also, according to Roháček (2012), there are records that link this species to decomposing vegetation, which combined support the idea that larvae could feed on this substrate.

In our case, all the specimens were collected while sweeping through herbaceous vegetation near the margins of an artificial pond, and not very far away from the Cávado River. This fits well with previous records where the species was found near water (Roháček, 2012). It might be worthy to mention a relatively high abundance on the spot where the flies were collected of flowering *Galium* cf. *palustre* (Rubiaceae), which could be a source of food for these flies.

Solva marginata has a wide distribution across Europe, to which Portugal is a new but not surprising record, given that it was already known from Andorra, Austria, Belgium, Bulgaria, France, Czech Republic, Denmark, France, Germany, Great Britain, Hungary, Italy, Netherlands, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland and Ukraine (Woodley, 2011). The sole specimen of *S. marginata* was collected, typically, in a forested area. The adults of this species can be found resting on trees, trunks and stumps while the larvae live under bark and in rotten deciduous trees (Rozkošný, 1973). The larvae of the Palaearctic species of this family feed, above all, on dead or injured larvae of other insects, but the younger ones probably feed on sap (Krivoshina, 1988).

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► **Fig. 1.** Locations where the specimens referred in this study were collected: **a)** Marachão; **b)** Parque Biológico de Gaia and **c)** Canelas e Fermelã.

► **Fig. 2.** **a)** One of the male specimens of *Acartophthalmus bicolor* collected while perching in a grass leaf near dead *Procambarus clarkii*, probably defending the territory from other males; **b)** one of the specimens of *Pseudopomyza atrimana* collected; **c)** the female specimen of *Solva marginata* collected. Photos are not to scale.



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