

## First record of *Prociphilus (Meliarhizophagus) fraxinifolii* (Riley) [Hemiptera: Aphididae] in the Iberian Peninsula

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*Prociphilus (Meliarhizophagus) fraxinifolii* is recorded for the first time on *Fraxinus pennsylvanica* in Spain. The species, which is of Nearctic origin, is also present in Europe in Hungary (from 2003), Serbia (from 2006) and Bulgaria (from 2007).

On 17 June 2011, spectacular malformations and pseudogalls were observed at the base of a number of *Fraxinus pennsylvanica* Marsh. plants (Figs 1A–D and 2A,B) in landscaped areas in two localities in León province [León (42°36'50"N/5°34'1"W) and Valdevejas [León (42°27'48"N/6°4'39"W)]. They had been caused by apterae and alatae viviparae from a pemphigine species which, after being studied, were identified as belonging to the Nearctic species *Prociphilus (Meliarhizophagus) fraxinifolii* (Riley, 1879). This is the first record of the species in the Iberian Peninsula and the fourth in Europe (Coeur d'acier *et al.*, 2010). The samples are deposited in the Zoological Collection (CZULE) of the University of León.

In Europe, another two species of *Prociphilus* live on species of *Fraxinus*: *Prociphilus (Prociphilus) bumeliae* (Schrank, 1801) and *Prociphilus (Prociphilus) fraxini* (Fabricius, 1777). Their primary host is *F. excelsior* and their secondary host species are *Abies* spp., on which they are radicolous. They can be identified using the descriptions and keys by Smith (1974), Heie (1980) and Blackman & Eastop (1994). To date, only three species from the genus *Prociphilus* have been recorded in the Iberian Peninsula: *P. (Prociphilus) fraxini*, *P. (Prociphilus) oleae* (Leach) and *P. (Stagona) pini* (Burmeister), with morphological data and keys (Pérez Hidalgo & Nieto Nafria, 2003) for their identification.

The genus *Prociphilus* Koch contains around 50 species grouped into six subgenera: *Prociphilus*, *Meliarhizophagus* Smith, *Neoparaclitus* Strom, *Paraprocephalus* Mordvilko, *Pulvius* Sanborn and *Stagona* (Koch). These aphids vary considerably in size, ranging from the rather small *P. (Stagona) pini* to the very large *P. (Prociphilus) fraxini*, with fully developed waxy plates on the head, thorax and abdomen and with or without poriform siphunculi. The median vein of the anterior wings of the alatae is simple and the secondary sensoria ciliate. Although details of the biology of some species are not known, available data suggest that they are mostly dioecious, their primary host being certain species of Oleaceae, Caprifoliaceae, Aceraceae and Rosaceae, and the secondary host plants from various families on which they are radicolous (Pérez Hidalgo & Nieto Nafria, 2003). The only species in the subgenus *Meliarhizophagus* is *P. (Meliarhizophagus) fraxinifolii* which, according to Blackman & Eastop (1994), is holocyclic monoecious on

American species of *Fraxinus*: *F. nigra*, *F. pennsylvanica*, *F. quadrangulata*, *F. sambucifolia*, *F. uhdei* and *F. velutina*.

*Prociphilus fraxinifolii* apterae viviparae (Fig. 2C) are 2.3–3.0 mm long and yellowish-green to pale green under the filamentous layer of wax covering them. The fundatrices have five antennal segments and eyes formed only by the triommatidium. The apterous fundatrigenae have six antennal segments and several ommatidia, as well as the triommatidium (Fig. 2E). The alatae viviparae (Fig. 2D) are 1.4–2.8 mm long (3.3–5.20 in *P. fraxini*), with a greenish-orange abdomen in life due to the yellowish colour of the embryos inside; they also have two pairs of cereous plates in the anterior region of the head and a well defined pair in the posterior area (Fig. 2F) and 1–5 irregular secondary sensorial rhinaria at the base of antennal segment VI.

Colonies are formed by apterae and alatae that curl terminal leaves (Figs 1A,–C and 2A,B). Little is known about the biology of the species, but according to Smith (1974) the alatae viviparae reproduce continuously from April to October and the alate sexuales from October to November, though in the studied collections, alatae did not occur from mid-August. During the unfavourable season they live in roots and are ant-attended (Smith, 1974).

Despite the spectacular malformations and large quantity of honeydew excreted (Fig. 1E) by these aphids, they do not seem to cause any significant harm to trees, though the leaves they colonize frequently dry prematurely (Fig. 1F). The species is not ant-attended, at least in the aerial part of the plant, and is strongly predated by *Anthocoris nemoralis* (Fabricius, 1794) (Hemiptera: Anthocoridae) and Chamaemyiidae larvae (Diptera).

This is a common species, widely distributed in the United States, Canada and Mexico (Smith & Parron, 1978; Peña Martínez, 1985; Maw *et al.*, 2000) and introduced in Chile (Carrillo, 1977), South Africa (Müller & Schöll, 1958; Blackman & Eastop, 1994) and Europe (Coeur d'acier *et al.*, 2010). Since it was discovered in Hungary (Remaudière & Ripka, 2003) it has been recorded in Serbia in 2006 (Petrović-Obradović *et al.*, 2007) and in Bulgaria in 2007 (Trenchev & Trencheva, 2009), though it is potentially more widely distributed in Europe due to the use of its host plant (*F. pennsylvanica*) in gardening, which according to Remaudière & Ripka (2003) was introduced in 1783.



**Fig. 1** Malformations or pseudogalls caused by *Prociphilus (Meliarhizophagus) fraxinifolii* on *Fraxinus pennsylvanica* (A–D); honeydew excreted on a leaf (E); and prematurely dried shoots (F).



**Fig. 2** Malformations caused by *Prociphilus (Meliarhizophagus) fraxinifolii* on a shoot (A) and a *Fraxinus pennsylvanica* leaf (B). Colony of apterae viviparae and nymphs with and without wing sketches (C); alate viviparous female (D); head of the apterous viviparous female (E); and head and thorax of the alate viviparous female (F). Photos C and D by Ángel Umaran.

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### Premier signalement de *Prociphilus (Meliarhizophagus) fraxinifolii* (Riley) [Hemiptera: Aphididae] dans la péninsule Ibérique

*Prociphilus (Meliarhizophagus) fraxinifolii* est signalé pour la première fois sur *Fraxinus pennsylvanica* en Espagne. Cette espèce, qui est d'origine néartique, est également présente en Europe en Hongrie (depuis 2003), Serbie (depuis 2006) et Bulgarie (depuis 2007).

### Первое обнаружение *Prociphilus (Meliarhizophagus) fraxinifolii* (Riley) [Hemiptera: Aphididae] на Пиренейском полуострове

В Испании для *Prociphilus (Meliarhizophagus) fraxinifolii* была впервые зарегистрирована на *Fraxinus pennsylvanica*. Этот вид, имеющий неарктическое происхождение, также присутствует в Европе. В Венгрии - с 2003 года, в Сербии - с 2006 года и в Болгарии - с 2007 года.

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