

## First records of the exotic leafhopper *Sophonia orientalis* (Matsumura, 1912) (Hemiptera: Auchenorrhyncha: Cicadellidae) for the Iberian Peninsula and mainland Europe

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**Abstract:** The Asian leafhopper *Sophonia orientalis* (Matsumura) is recorded from mainland Europe for the first time, from Gibraltar and southern Spain. The status of this species as an invasive species elsewhere is highlighted and its potential to damage agriculture is discussed.

**Key words:** Hemiptera, Auchenorrhyncha, Cicadellidae, *Sophonia orientalis*, Europe, Iberian Peninsula.

### Primer registro del cicadélido *Sophonia orientalis* (Matsumura, 1912) (Hemiptera: Auchenorrhyncha: Cicadellidae) para la Península Ibérica y Europa continental

**Resumen:** Se cita el cicadélido *Sophonia orientalis* (Matsumura) en la Europa continental por primera vez, de Gibraltar y el sur de España. Se discute su estatus como especie invasora y su potencial como especie problemática para la agricultura.

**Palabras clave:** Hemiptera, Auchenorrhyncha, Cicadellidae, *Sophonia orientalis*, Europa, Península Ibérica.

### Introduction

The leafhopper *Siphonia orientalis* (Matsumura, 1912) (Cicadellidae: Nirvaninae) is a native of Asia, from Pakistan to Japan (Li & Chen, 2005). However, it has become well established as an invasive species in the Hawaiian islands (Jones *et al.*, 1998; Jones *et al.*, 2000) and more recently in Madeira and La Palma (Canary Islands), both members of the Macaronesian island group (Aguin-Pombo *et al.*, 2007). *S. orientalis* is a highly polyphagous phloem feeder, feeding on native and exotic plants in Hawaii (Jones *et al.*, 2000) and Madeira (Aguin-Pombo *et al.*, 2007), including a wide range of economically important crop species (Alyokhin *et al.*, 2001).

Colonisation of the Mediterranean, either via dispersal or introduction with imported plant material, was extremely likely, given that most of the Macaronesian Islands have similar ecological conditions to the Mediterranean and are within fairly close proximity of the region (Aguin-Pombo *et al.*, 2007). Here, we report the presence of *Sophonia orientalis* from Gibraltar, where it is clearly well established, and provide a record from nearby southern Spain, which the species must also, no-doubt, have colonised. These appear to constitute the first records of this species for Iberia and for mainland Europe.

### Studied Material

Most of the specimens were collected with a Rothamsted light trap at the Gibraltar Botanic Gardens, Gibraltar (36°07'53" N, 5°21'05" W, 30 m.a.s.l.), an area of some 6 ha that holds a collection of over 1700, largely exotic species of plants including some of the species listed by Aguin-Pombo *et al.* (2007) as food plants of *S. orientalis* in Madeira. Data for specimens collected in Gibraltar are: 7♂♂ & 5♀♀ during August 2010; 4♂♂ & 2♀♀ during September 2010; 2♀♀ during October 2010; all Leg. C. Perez & K. Bensusan. An additional specimen was collected at Sierra del Arca, San Roque (Cádiz), Andalucía, Spain (36°14'50" N, 5°20'39" W, 180 m.a.s.l.), Leg. J.L. Torres 03.ix.2009, sieving leaf litter under *Chamaerops humilis* L. amongst native, low maquis and garigue habitat.

Specimens from Gibraltar have been deposited in the National Museum of Wales, Cardiff, the collection of the Gibraltar Ornithological & Natural History Society, Gibraltar and the private collection of Manuel Baena, Córdoba, Spain. The specimen from southern Spain is in the private collection of J.L. Torres.

### Diagnostic characters

Much of the earlier literature (summarized in Aguin-Pombo *et al.* 2007) uses the name *Sophonia rufascia* (Kuoh & Kuoh, 1983). This

was synonymised with *Sophonia orientalis* (Matsumura) by Webb & Viraktamath (2004). *S. orientalis* is a characteristic and easily recognisable species and a photograph is included (fig. 1). It is the only member of the cicadellid subfamily Nirvaninae to be found in Europe. The male genitalia structure is illustrated in Aguin-Pombo *et al.* (2007).

### Discussion

All specimens collected in Gibraltar were found in an exotic garden and it is in such anthropogenic habitats where the *Sophonia orientalis* will probably be most successful, although it should be noted that the species attacks a range of native species both in Hawaii and Macaronesia. The circumstances of capture of the single Spanish specimen suggest that this species may spread into natural habitats too, as it has done in Madeira (Aguin-Pombo *et al.*, 2007). *S. orientalis* feeds on a number of economically important plants, including fruiting species such as *Citrus* L., and has the potential to become a pest in Macaronesia and the Mediterranean (Alyokhin *et al.*, 2001; Aguin-Pombo *et al.*, 2007). *Citrus* are cultivated extensively only a few kilometres away from Gibraltar and it is possible that *S. orientalis* could become a pest at these plantations. However, Alyokhin *et al.* (2001) did not observe significant die-back of plants in Hawaii as a result of *S. orientalis* and found that a number of native parasitoid species were attacking the eggs of this leafhopper. Biological control methods may have unintended consequences on native fauna (Alyokhin *et al.*, 2001; Johnson *et al.*, 2001), including Hemiptera (Johnson *et al.*, 2005) and their application should not be considered whilst the species is not causing serious economic damage. Gibraltar has mild winters (mean ca. 13°C during January), but these are not as mild as in Madeira (mean ca. 16°C during January) and temperatures just a few kilometres inland from Gibraltar can be markedly lower during the winter period. It remains to be seen whether such conditions suit, or alternatively limit rapid dispersal of *S. orientalis* in Iberia.

So far only very limited sampling has been made in Gibraltar but peak numbers occurred in August and September. In Madeira the species appeared active almost throughout the year with peak numbers of adults occurring between July and January (Aguin-Pombo *et al.*, 2007). It seems likely that multiple overlapping generations may occur if weather conditions allow.



Fig. 1. General habitus of male of *Sophonia orientalis*. Length ca. 4 mm.

**References:** AGUIN-POMBO, D., A.M. FRANQUINHO AGUIAR & V.G. KUZNETSOVA 2007. Binomics and Taxonomy of Leafhopper *Sophonia orientalis* (Homoptera: Cicadellidae), a Pacific Pest Species in the Macaronesian Archipelagos. *Annals of the Entomological Society of America*, **100**(1): 19-25. ● ALYOKHIM, A.V., P. YANG & R. MESSING 2001. Distribution and parasitism of *Sophonia rufofascia* (Homoptera: Cicadellidae) eggs in Hawaii. *Annals of the Entomological Society of America*, **94**(5): 664-669. ● JOHNSON, M.T., P.A. FOLLETT, A.D. TAYLOR & V.P. JONES 2005. Impacts of biological control and invasive species on a non-target native Hawaiian insect. *Oecologia*, **142**: 529-540. ● JOHNSON, M.T., P. YANG, J.T. HUBER & V.P. JONES 2001. Egg parasitoids of *Sophonia rufofascia* (Homoptera: Cicadellidae) in Hawaii Volcanoes National Park. *Biological Control*, **22**: 9-15. ● JONES, V.P., P.A. FOLLETT, R.H. MESSING, W.B. BORTH, J.S. HU & D.E. ULLMAN 1998. Effect of *Sophonia rufofascia* (Homoptera: Cicadellidae) on guava production in Hawaii. *Journal of Economic Entomology*, **91**: 693-698. ● JONES, V.P., P. ANDERSON-WONG, P.A. FOLLETT, P. YANG, D.M. WESTCOT, J.S. HU & D.E. ULLMAN 2000. Feeding damage of the introduced leafhopper *Sophonia rufofascia* (Homoptera: Cicadellidae) to plants in forests and watersheds of the Hawaiian Islands. *Environmental Entomology*, **29**: 171-180. ● KUOH, C. & J. KUOH 1983. New species of *Pseudonirvana* (Homoptera, Nirvanidae). *Acta Entomologica Sinica*, **26**: 316-325. ● LI, Z.Z. & X.S. CHEN 2005. A checklist and key to species of the genus *Sophonia* (Insecta: Auchenorrhyncha: Cicadellidae: Nirvaninae) in China with descriptions of two new species. *Journal of Natural History*, **39**: 71-78. ● WEBB, M.D. & C.A. VIRAKTAMATH 2004. On the identity of an invasive leafhopper on Hawaii (Hemiptera, Cicadellidae, Nirvaninae). *Zootaxa*, **692**: 1-6.

## Nuevos datos sobre distribución y biología de los Orussidae ibéricos (Hymenoptera: Symphyta, Orussoidea, Orussidae)

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**Resumen:** Se aportan nuevas citas ibéricas y datos de biología de *Orussus abietinus* (Scopoli, 1763) y *Orussus taorminensis* (Trautmann, 1922). *O. abietinus* se cita por primera vez de Castilla y León.

**Palabras clave:** Hymenoptera, Orussidae, *Orussus abietinus*, *taorminensis*, distribución, biología, España.

### New data on the Iberian Orussidae (Hymenoptera: Symphyta, Orussoidea, Orussidae)

**Abstract:** New Iberian records of *Orussus abietinus* (Scopoli, 1763) and *Orussus taorminensis* (Trautmann, 1922), with some biological data. *O. abietinus* is recorded from the Castilla y Leon administrative region (Spain) for the first time.

**Key words:** Hymenoptera, Orussidae, *Orussus*, *abietinus*, *taorminensis*, distribution, biology, Spain.

### Introducción

La familia Orussidae es un pequeño grupo de himenópteros que engloba unas 85 especies en todo el mundo (Pesarini & Turrisi, 2004). Incluidos tradicionalmente en el suborden Symphyta, sus larvas se apartan del régimen fitófago del grupo y son ectoparásitas de larvas de insectos xilófagos. Son considerados un grupo raro en el que numerosas especies se conocen por contados ejemplares de pocas localidades, incluso en muchas especies sólo se conoce el material típico. La filogenia y la biogeografía del grupo han sido analizadas en tres excelentes trabajos por Vilhelmsen (2003, 2004, 2007).

Fig. 1. A la izquierda, hembra de *Orussus taorminensis* de Arcos de la Frontera, Cádiz (25-III-2002); a la derecha, hembra de *Orussus abietinus* de Lores, Palencia (11-VI-2005). On the left, female of *Orussus taorminensis* from Arcos de la Frontera, Cádiz (25-III-2002); on the right, female of *Orussus abietinus* from Lores, Palencia (11-VI-2005).

