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To cite this article: Nélio Freitas & Dora Aguin-Pombo (2004) Is the leafhopper *Asymmetrasca decedens* (Paoli, 1932) invading Madeira Island?, *Annales de la Société Entomologique de France*, 40:1, 103-104, DOI: [10.1080/00379271.2004.10697408](https://doi.org/10.1080/00379271.2004.10697408)

To link to this article: <https://doi.org/10.1080/00379271.2004.10697408>



Published online: 31 May 2013.



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Is the leafhopper *Asymmetrasca decedens* (Paoli, 1932) invading Madeira Island?

Nélio FREITAS⁽¹⁾ & Dora AGUIN-POMBO^{*(1, 2)}

(1) Department of Biology, University of Madeira, Campus da Penteada, P-9000 Funchal, Madeira, Portugal.

(2) CEM, Centre of Macaronesian Studies, University of Madeira, Campus da Penteada, P-9000 Funchal, Madeira, Portugal.

Many species have increased dramatically their distribution as the result of great mobility and globalisation (Frank & McCoy 1995). Once a species has been established as a pest its control can be difficult, costly and time consuming. If an immigrant species reaches an oceanic island as Madeira where ecosystems are fragile, enemy free and usually very rich in endemic species but low competitive, their impact can be dramatic (Howarth & Ramsay 1991).

The impact of continental usually highly polyphagous species of Empoascini to agriculture has already been reported for other Macaronesian islands. In Tenerife, two continental species, *Empoasca fabalis* and *Jacobiasca lybica*, have built up populations becoming pests to sweet potatoes and vineyards, respectively (Lorenzo Fernández & Hermoso Mendoza 2001; Pérez Padrón & Carnero Hernández 1980). In this work *A. decedens*, an species widely distributed in Mediterranean region, is recorded from Madeira and its possible effects to local flora and agriculture are discussed.

Material studied – **FUNCHAL: Lido**, 25 m, on *Ricinus communis* L.: 24.3.2001, 4 ♀♀; 7.7.2001, 10 ♀♀; 18.8.2001, 1 ♂, 5 ♀♀; 15.9.2001, 4 ♀♀; on *Lavatera cretica* L.: 27.1.2001, 1 ♀. **Rochinha**, 150 m, on *Passiflora edulis* Sims: 3.9.2000, 2 ♂♂, 3 ♀♀; 20.1.2001, 3 ♀♀. **Santa Catarina's Park**, 54 m, on *Tagetes minuta* L.: 28.10.2000, 2 ♂♂, 2 ♀♀; 5.2.2001, 4 ♂♂, 11 ♀♀; 24.3.2001, 1 ♂, 8 ♀♀; on *Schinus molle* L.: 28.10.2000, 8 ♀♀., 5.2.2001, 4 ♂♂, 11 ♀♀; 24.3.2001, 1 ♂, 1 ♀; 14.4.2001, 8 ♀♀; 17.6.2001, 2 ♂♂, 10 ♀♀; 7.7.2001, 2 ♂♂; 27.7.2001, 15 ♂♂; 15.9.2001, 17 ♂♂, 27 ♀♀; 19.9.2001, 1 ♀; 23.2.2001, 1 ♂, 8 ♀♀. **Municipal Garden**, 42 m, on *Enterolobium cyclocarpum* (Jacq.) Driseb: 28.10.2000, 1 ♀. – **MACHICO: Paraiso**, 30 m, on *Ricinus communis* L.: 23.9.2001, 2 ♂♂; 29.9.2001, 2 ♂♂, 11 ♀♀; 9.7.2002, 41 ♂♂, 204 ♀♀;

14.5.2002, 9 ♂♂, 130 ♀♀. Santo da Serra: 672 m, on *Dahlia* sp. 1 ♀. – **SANTA CRUZ: Reis Magos**: 19 m, on *Ricinus communis* L.: 16.2.2002, 1 ♂, 9 ♀♀. – **SANTANA: Faial**, 32 m, on *Ricinus communis* L.: 30.6.2002, 1 ♂, 3 ♀♀.

Results – An extensive sampling over two years in Madeira on about 250 plant species including wild, ornamental, agricultural and fruit trees showed that *A. decedens* occurs on seven species of plants from six different families. These not recorded previously as food plants of this species. Two of them, *Dahlia* sp. and *Tagetes minuta* L. are small herbaceous ornamental plants; the other two, *Schinus molle* L. and *Enterolobium cyclocarpum* (Jacq.) are ornamental trees. Of the remaining plants, *Passiflora edulis* Sims, is an herbaceous fruit plant and *Ricinus communis* L. and *Lavatera cretica* L. are both wild plants. Most specimens were found to be associated with ornamental plants but it was more abundant on *Ricinus communis* L. which is widely spread, chiefly in the south of the island, below 400 m.

A. decedens was present on a wide number of habitats ranging from disturbed areas, parks and gardens but was never found in agricultural fields and native laurel forest. Although sampling was done throughout the Island, it was found mainly in the southeastern part at altitudes below 500 m. Specimens were collected during the whole sampling period, starting from January until October, being more common from May to September.

Discussion – *A. decedens* has probably been introduced accidentally in Madeira with ornamental plants through plant trade or otherwise. There are strong reasons to believe that *A. decedens* can become a great problem to agriculture and local flora. The first reason is that more than 75% of its known hosts are present in Madeira, and of these, two thirds are common and economically important plants as subtropical fruit trees. The most

* Corresponding author. E-mail : aguin@uma.pt
 Accepted le 13-05-2003.

concerning situation is that this species is a pest to *Vitis vinifera* (Alticag & Akten 1993), one of the main cultures in the Island. The culture of the world famous Madeira wine represents 57.1% of the permanent cultures of this island (DRE 1999).

On the other hand, not only *A. decedens* shows a great resistance to normal insecticides (Rigo & Mori, 1997) but also natural enemies are very reduced in oceanic islands. In addition to this, the climatic conditions are very suitable for the development of several annual generations. The temperatures preferred by this species, above 20°C (Torres *et al.* 2002), are common from June to October in Madeira. Under these temperatures at least 5 generations are possible however the presence of males from February to October suggests that more generations may occur.

In addition to this, *A. decedens* has a great potential for spreading as a pest (Torres *et al.*, 1998) and proba-

bly also for host plant range expansion. Indeed it has a remarkable capability to feed on ornamental plants many of which (as those reported here) are from different regions or even different continents outside its known area of distribution.

Immigrant species as non-indigenous insects and snails appear to be the primary cause of extinction for native invertebrates on islands (Horwath, 1990). Therefore, if we take into account that in Madeira 30% of invertebrates are endemic, monitoring these leafhopper populations in order to undertake the necessary measures to avoid the accidental introduction of undesired organisms is an urgent task.

Acknowledgements – We wish to thank Paula Fernandes, Ricardo Costa, Pedro Gonçalves, Samantha Hughes, Minh Há, Adeline Soulier-Perkins, A. Navon, A. Hermoso Mendoza and G. Seljak who helped in different ways to this work.

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