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DETECTION OF *DREPANAPHIS ACERIFOLIAE* (THOMAS) [HEMIPTERA: APHIDIDAE: DREPANOSIPHINAE] ON SUGAR MAPLE TREES, *ACER SACCHARINUM*, IN SPAIN*

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Abstract: The nearctic species *Drepanaphis acerifoliae* (Thomas) is reported for the first time in the Iberian Peninsula, on sugar maple trees (*Acer saccharinum*) used in landscape gardening. The species, already known in Europe (Italy), was detected in Lleida, Spain, in 2006 and in two localities in León province in 2007, where abundant colonies were causing problems due to the honeydew they excreted. Metric and meristic data on the alatae viviparous females and sexuals (oviparous females and males) are given.
Key word: *Drepanaphis acerifoliae, Acer saccharinum,* Metric and meristic data, Spain.

Presencia de *Drepanaphis acerifoliae* (Thomas) [Hemiptera: Aphididae: Drepanosiphinae] sobre arces plateados, *Acer saccharinum*, en España
Resumen: Se cita por vez primera en la Península Ibérica la especie neártica *Drepanaphis acerifoliae* (Thomas) sobre arces plateados, *Acer saccharinum*, empleados en jardinería. La especie conocida ya en Europa (Italia), se detectó en España en el año 2006 en Lleida y en 2007 se recogió en dos localidades de la provincia de León, donde las colonias eran abundantes y causaban molestias por la melaza que excretaban. Se aportan datos métricos y merísticos de las hembras vivíparas aladas y sexuados (hembras ovíparas y machos).
Palabras clave: *Drepanaphis acerifoliae, Acer saccharinum,* datos métricos y merísticos, España.

Introduction

The detection of invading aphids in Spain, mainly as a result of the introduction of ornamental plants, has been constant in recent years though no specific prospecting or sampling expeditions have been carried out (Mansilla *et al*., 2001; Mier Durante & Pérez Hidalgo, 2002; Hermoso de Mendoza *et al*., 2002; Pérez Hidalgo & Nieto Nafría, 2005; Ilharco *et al*., 2005). Neither specific studies on their biology, damage or control strategies have been made except in the cases of *Toxoptera citridicus* (Kirkaldy, 1907) which can cause serious problems in citrus crops (Álvarez *et al.*, 2007), and *Myzocallis walshii* (Monell, 1879) and *Monelliopsis caryae* (Monell, 1879) that cover with honeydew, respectively American red oaks (*Quercus rubra* L.) and walnut trees (*Juglans nigra* L.) (Pons *et al*., 2006a,b).

The latest species to be detected is *Drepanaphis acerifoliae* (Thomas, 1878) [painted maple aphid; puceron de l'erable], one of the 16 species in the nearctic genus *Drepanaphis* Del Guercio, 1909, all living on Aceraceae (Blackman & Eastop, 1994; Remaudière & Remaudière, 1997), and the only one in the genus detected in European territory so far.

Studied material

Populations of the species were located on *Acer saccharinum* L. in the provinces of Lleida [Lleida (41º36'29" N / 0º37'09" E; 7th June, 2006; L-545)] and León [Astorga (42º27'39" N / 6º3'17" W; 4th August, 2007; LE-3071, LE-3135) and León (42º36'26" N / 5º33'53'' W; 8th August, 2007; LE-3072)], and monitored until the appearance of sexuals and leaf fall.

The aphid samples are deposited in the aphidological collection of the University of León and contain nymphs, viviparous alatae females, males and oviparous females. Ants (pending registration number) and bugs associated with the aphid colonies were also captured and deposited respectively in the Entomological Collection of the Museu de Ciències Naturals of Barcelona (Barcelona, Spain) and in the Manuel Baena collection (Córdoba, Spain).

Diagnostic characters

Drepanaphis acerifoliae viviparous females are always alatae (figs. 1a,b), robust and large (1.9 to 2.9 mm). The femurs of the front legs are strongly developed and adapted to jumping (figs. 4c-e). When alive, head and thorax are reddish-brown and the abdomen is pale green, covered in more or less abundant evenly distributed whitish wax: three striking longitudinal bands on head and pronotum, irregularly-shaped marks on meso-, metathorax and first abdominal segments, and abundant cottony wax on posterior region of abdomen (figs. 1a,b). Wings with veins heavily black-bordered (figs. 1a,b; 2c). Antennae 1.7 to 1.9 times the body length; antennal segment III bearing 8 to 13 ciliate secondary sensoria (fig. 2a) and processus terminalis 6.9 to 11.2 times the base of last antennal segment. Dorsal tubercles on

abdominal segments I to IV well developed and those on III and IV also more pigmented (figs. 1c; 2b). Cornicles truncate and dark. Cauda ending in button-like shape (fig. 2b). Nymphs yellowish-green, lacking sclerotisation (fig. 1d).

Oviparous females dark green to black (fig. 1f) with postcornicular portion of abdomen (urites VI to VIII) strongly elongate or subtubular (fig. 3a); dorsoabdominal tubercles not present; dorsal setae flabellate, capitate or bifurcate (figs. 3b-d); hind tibiae with 22 to 67 pseudosensoria.

The males resemble the viviparous alatae, but they have more pigmented antennae, more secondary sensoria (100-133, 50-55, 14-22, respectively) on antennal segments III, IV and V (fig. 4a), dorsoabdominal pigmentation more extended and tubercles of abdominal segments I, II and IV less developed (figs. 1e; 4b).

Distribution

The species is widely distributed in North America (its area of origin), and has been recorded in 33 of the 48 continental United States and five provinces in Canada (Smith & Parron, 1978; Maw *et al.*, 2000). It has been reported in northern Italy (Milan and Como) (Lozzia & Binaghi, 1992; Colombo *et al*., 1996) and current populations are commonly found on A. *saccharinum* in the central region of the country (S. Barbagallo, pers. comm.).

Biology

The species lives in more or less numerous colonies on the underside of *Acer saccharinum* and *A. rubrum* L. leaves and occasionally on *A. saccharum* Marsh, and other maple trees in its original distribution area (Smith & Dillery, 1968). It is monoecious and holocyclic and the sexuals develop from mid September. In the populations in León (Astorga), it has been observed predation by *Adalia bipunctata* (L.) (Coccinellidae), *Anthocoris pilosus* (Jakovlev) (Anthocoridae) and *Passer domesticus* L. (Passeridae); the colonies are attended by *Lasius niger* (Linnaeus) (Formicidae). It usually cohabits with other species of Drepanosiphinae (*Drepanosiphum oregonense* Granovsky) and Chaitophorinae (species of *Periphyllus*).

Possible damage and prospects for control

The silver maple is increasingly being used as an ornamental tree in urban landscapes. As *Drepanaphis acerifoliae* produces a large quantity of honeydew, infestations by the aphid in these trees can cause aesthetic damage, soil street furniture and be troublesome for inhabitants because of the falling honeydew; therefore control measures may be necessary. The use of insecticides in urban areas implies a risk for public health and can have an extremely negative effect on auxiliary fauna that act on aphids (Raupp *et al*., 1992). For these reasons, less aggressive control strategies must be used. Greater knowledge of the biology of *D. acerifoliae* (phenology and factors influencing its population dynamics) and methods for evaluating damage are necessary. Also are necessary studies about the presence and efficacy of autochthonous natural enemies for to be able to put financially and environmentally sustainable control methods into effect.

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Fig. 1. *Drepanaphis acerifoliae* (Thomas): viviparous alatae females (**a-c**), viviparous alatae female nymph (**d**), male (**e**) and oviparous females (**f**) cohabiting with *Periphyllus* (yellowish and brownish specimens).

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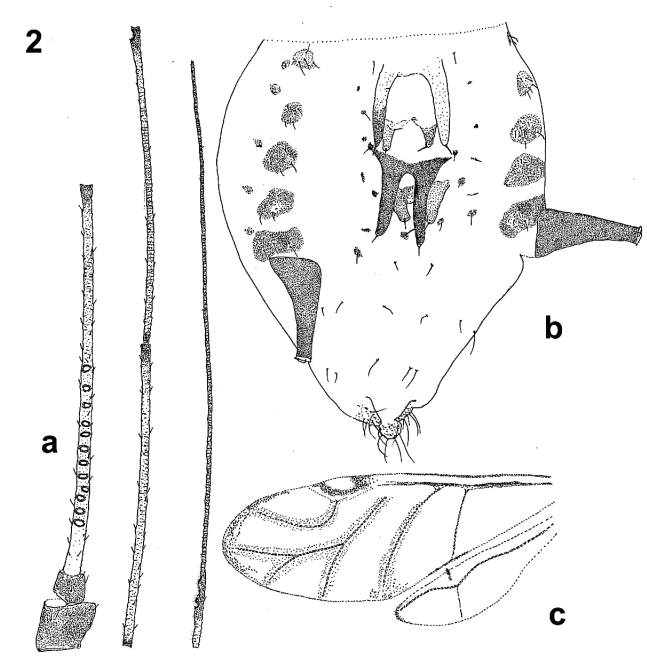

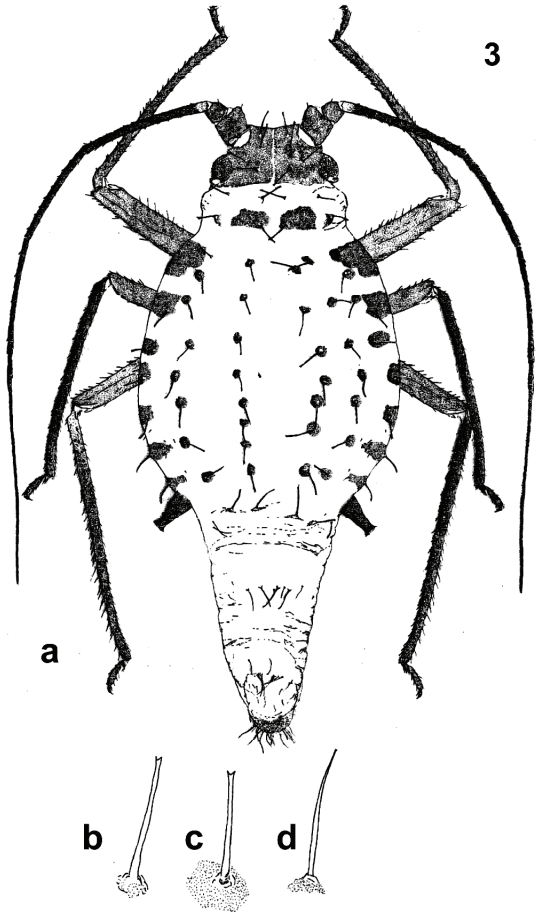

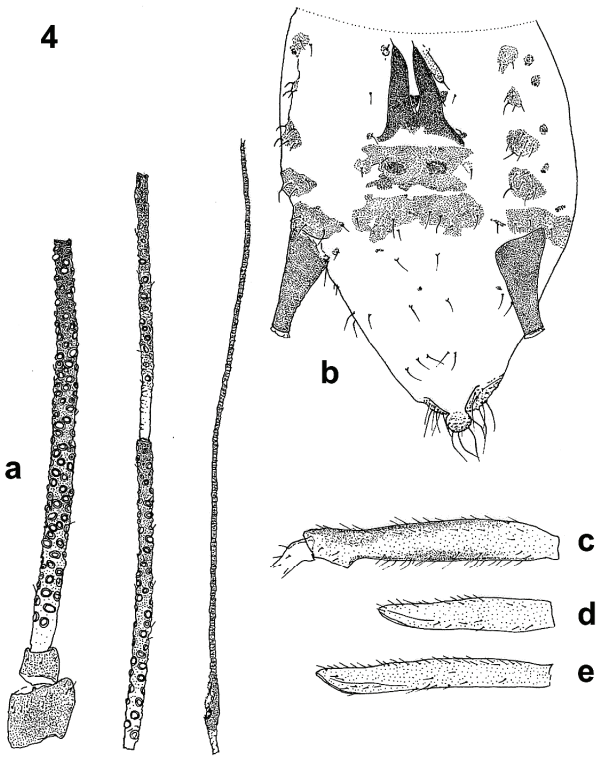

Fig. 2. *Drepanaphis acerifoliae* (Thomas): Viviparous female: antenna (**a**), abdomen (**b**) and wings (**c**).

Fig. 3. *Drepanaphis acerifoliae* (Thomas): Oviparous female: habitus (**a**) and magnification of setae on head (**b**), urite III (**c**) and urite VIII (**d**).

Fig. 4. *Drepanaphis acerifoliae* (Thomas): Male: antenna (**a**) and abdomen (**b**) and viviparous alatae females: anterior (**c**), middle (**d**) and hind (**e**) femur.