

First Record of the Invasive Australian red gum lerp psyllid, *Glycaspis brimblecombei* Moore, 1964 (Hemiptera: Psylloidea: Aphalaridae), in Jordan

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Abstract

The Australian red gum lerp psyllid, *Glycaspis brimblecombei* Moore, 1964, and its parasitoid *Psyllaephagus bliteus* Riek, 1962 (Hymenoptera: Encyrtidae) are recorded for the first time in Jordan. Other insect species associated with the psyllid are also recorded. Digital images of the pest, its natural enemies, and other associated insects are provided. The distribution of this introduced pest in Jordan is still unknown and further research is needed to evaluate its damage and to construct an integrated management program.

Keywords: *Eucalyptus camaldulensis*; *Psyllaephagus bliteus*; biological control; natural enemies; pest management.

Introduction

Psylloidea (Hemiptera: Sternorrhyncha) (jumping plant-lice or psyllids) constitute one of the superfamilies of Sternorrhyncha with more than 4,000 described and probably just as many undescribed species (Burckhardt *et al.*, 2012). There were 33 previously recorded species of Psylloidea from Jordan. Their distributions within and outside Jordan were given as well as their host plants and zoogeographic affinities (Al Khawaldeh *et al.*, 1997). Recently, the bay sucker, *Lauritrioza alacris* (Flor) (Hemiptera: Trioziidae) was recorded for the first time in Jordan (Bader *et al.*, 2021).

Glycaspis brimblecombei is a native psyllid in Australia which feeds on *Eucalyptus camaldulensis* Dehnh. (Myrtaceae) and other *Eucalyptus* species (Moore, 1970). It was first recorded outside Australia in California in 1998 on *E. camaldulensis* (Brennan *et al.*,

1999). Later, it was reported from the Iberian Peninsula in 2007 (Hurtado Hernández and Reina Belinchón, 2008; Valente and Hodkinson, 2009), Italy (Laudonia and Garonna, 2010; Garonna *et al.*, 2011), France (Cocquempot *et al.*, 2012), Montenegro (Malumphy *et al.*, 2013), Greece (Bella and Rapisarda, 2013), Turkey (Karaca *et al.*, 2015) and Cyprus (Karaca *et al.*, 2017), Croatia (Pintar *et al.*, 2020). In Africa, *G. brimblecombei* was reported from Algeria (Reguia and Peris-Felipo, 2013), Mauritius (Sookar, Seewooruthun & Ramkhelawon, 2003), Morocco (Maatouf and Lumaret, 2012), Tunisia (Ben Attia and Rapisard, 2014) and South Africa (Bush *et al.* 2016), and Zambia (Chungu *et al.*, 2016).

The objective of this paper is to officially record *G. brimblecombei* from Jordan as well as its associated natural enemies.

Materials and Methods

Infested leaves of *E. camaldulensis* were collected in plastic bags and then kept in the refrigerator for several hours. Adult insects were picked up with a fine brush immersed in 70% alcohol. Adults were identified morphologically according to the description and illustrations of Moore (1964), descriptions and key provided in Hollis (2004) and keys developed by Halbert *et al.* (2001) and Laudonia and Garonna (2010). Male genitalia were also examined to confirm the identification. Voucher specimens of the psyllids and all other insects associated with it were collected and deposited at the University of Jordan Museum. Digital images of adult flies were taken using a 65 mm macro lens mounted on a Canon (Tokyo,

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Japan) 5D Marl IV camera with an LED ring light. Images were stacked using Helicon Focus software and then processed using Adobe Photoshop 2020.

Results and Discussion

Conical, white, scale-like coverings (Figure 1) were first observed on the leaves of *E. camaldulensis* in Day Abi Said (North Jordan) in 2021. The insect causing these white lerps was identified as *G. brimblecombei* Moore, 1964. After our initial observation, the insect was seen in other parts of Jordan in Ajloun, Jerash, and Amman. Almost all trees were infested with different infestation densities. The origin of the infestation is expected to be a natural extension of the geographical distribution from neighboring countries.

The eggs are laid in clusters on leaf surfaces (Figure 2). The first instar nymphs build their lerps as soon as they start feeding. The lerp is attached to the leaf surface. The following instars (Figure 3) increase the diameter and height of the lerp by adding new sugary secretions under its outer edge. The secretions appear as an opaque thick liquid which solidifies soon after contact with the air (Hollis, 2004). After the nymphs become adults, they leave the lerp and fly to feed on new *E. camaldulensis* trees (Laudonia and Garonna, 2010). Adults (Figure 4) of *G.*

brimblecombei are 2–4 mm long, light green in color (Figure 5), with dark eyes (Karaca *et al.*, 2017).

The parasitoid *Psyllaephagus bliteus* Riek, 1962 (Hymenoptera: Encyrtidae) was collected from the infested leaves (Figure 6). This parasitoid was recovered from *G. brimblecombei* in Greece (Bella and Rapisarda 2013), Italy (Caleca *et al.*, 2011), Spain (Pérez-Otero *et al.*, 2011), Turkey (Karaca *et al.*, 2015), and Algeria and Morocco (Reguia and Peris-Felipo 2013). It is assumed that it was introduced by coincidence associated with its host, *G. brimblecombei*.

Several insect species were seen associated with the psyllid: the Cardinal Ladybird (Figure 7), *Novius cardinalis* (Mulsant, 1850) (Coleoptera: Coccinellidae), ants (Hymenoptera: Formicidae), the oriental wasp, *Vespa orientalis* (Hymenoptera: Vespidae), honeybees, *Apis mellifera* (Hymenoptera: Apidae), and other wild bees, *Anthocoris* sp. (Hemiptera: Anthocoridae) were observed and collected. Before an integrated pest management program is suggested, some necessary data should be collected about the distribution of this pest in Jordan, assessment of its damage to established trees and new seedlings, presence of other host species, its number of generations a year, and the presence of native natural enemies and their role in reducing its populations.



Figure 1. *Glycaspis brimblecombei* lerps on *Eucalyptus camaldulensis*.



Figure 2. Egg cluster of *Glycaspis brimblecombei* on *Eucalyptus camaldulensis* leaf. Enlarged eggs.

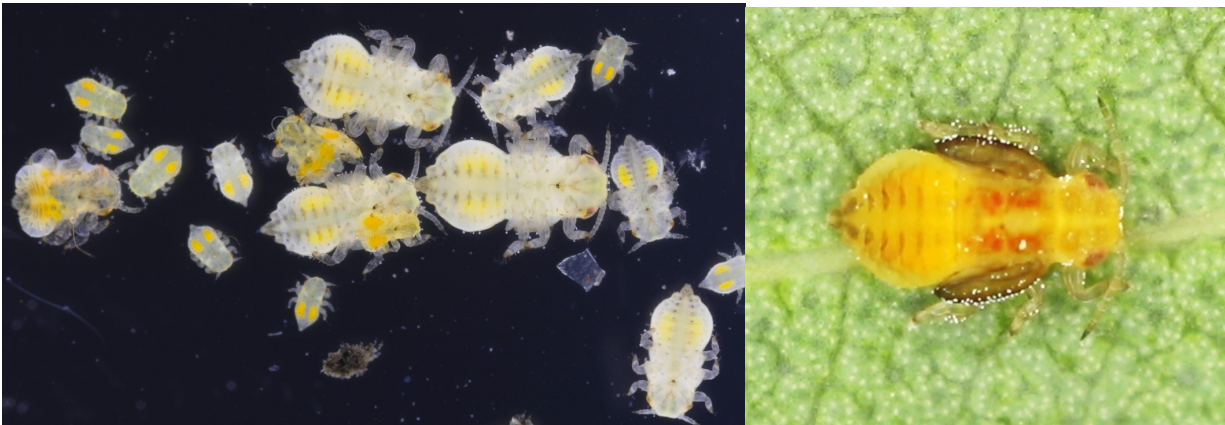


Figure 3. Different nymphal instars of *Glycaspis brimblecombei* extracted from under the lerps and a late instar nymph.



Figure 4. *Glycaspis brimblecombei* adult male.



Figure 5: *Glycaspis brimblecombei* adult female.

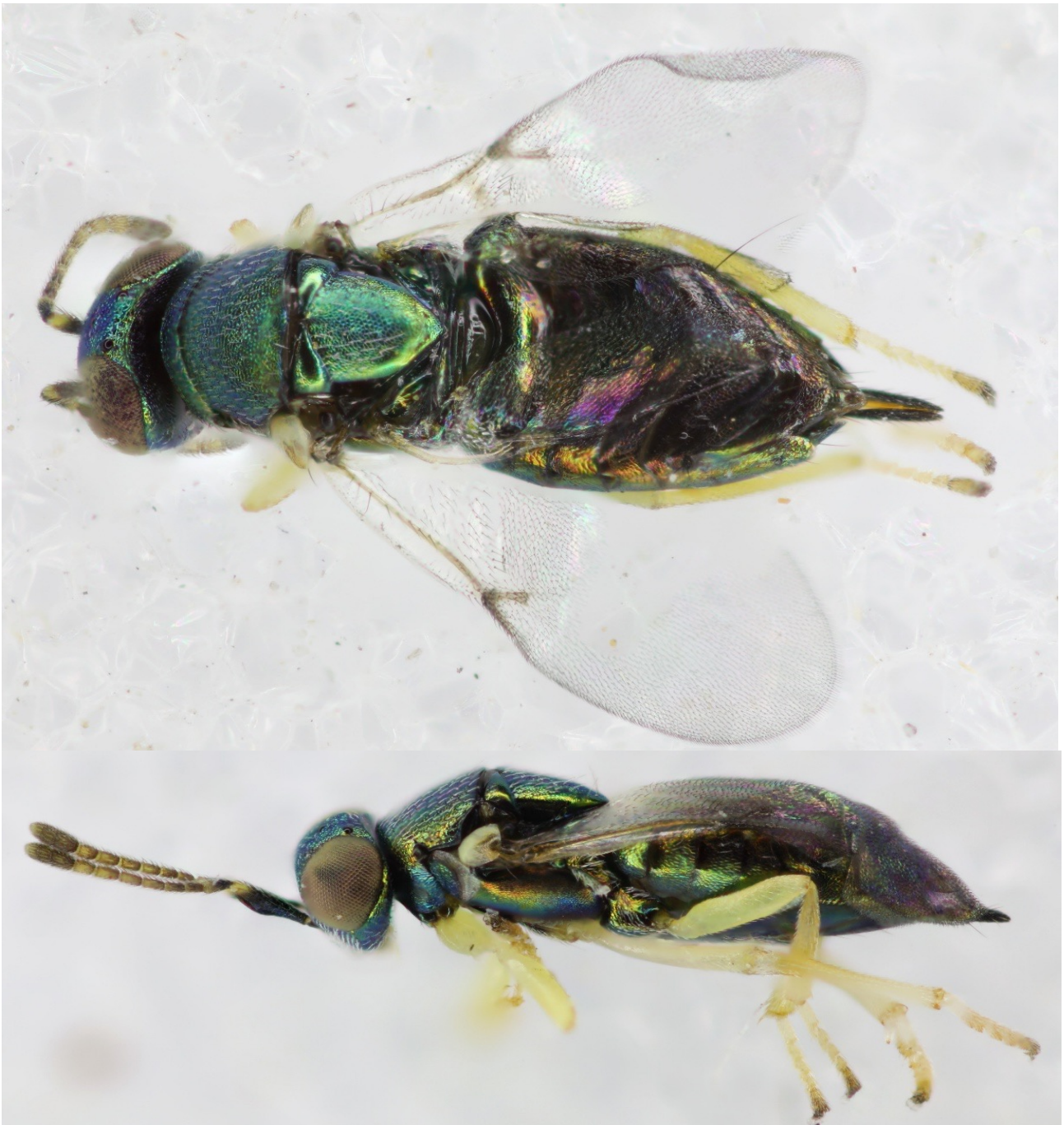


Figure 6. The parasitoid *Psyllaephagus bliteus* Riek, 1962 (Hymenoptera: Encyrtidae) (Dorsal and lateral views)



Figure 7. The Cardinal Ladybird, *Novius cardinalis* (Mulsant, 1850).

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