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FIRST RECORD FROM GREECE OF THE INVASIVE RED GUM LERP PSYLLID *GLYCASPIS BRIMBLECOMBEI* MOORE (HEMIPTERA PSYLLIDAE) AND ITS ASSOCIATED PARASITOID *PSYLLAEPHAGUS BLITEUS* RIEK (HYMENOPTERA ENCYRTIDAE)

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Bella S., Rapisarda C. – First record from Greece of the invasive red gum lerp psyllid G*lycaspis brimblecombei* Moore (Hemiptera Psyllidae) and its associated parasitoid *Psyllaephagus bliteus* Riek (Hymenoptera Encyrtidae).

The occurrence of the invasive pest red gum lerp psyllid *Glycaspis brimblecombei* Moore (Hemiptera: Psyllidae), infesting *Eucalyptus camaldulensis* Dehnh. (Myrtaceae), is reported for the first time from mainland Greece and the Ionian island of Corfu. This species, native to Australia, has been first reported for the Palaearctic Region in 2008, when it has been recorded from the Iberian Peninsula, subsequently spreading to other Mediterranean countries. Updated information on geographical distribution is provided. Association with its specific antagonist *Psyllaephagus bliteus* Riek (Hymenoptera: Encyrtidae) was also observed and level of parasitism was investigated. The spread of *P. bliteus* in Greece is due to an accidental introduction, probably together with its host, as already happened in New Zealand, Brazil, Spain, Italy and Morocco.

KEY WORDS: *Eucalyptus camaldulensis*, new psyllid pest, natural enemy, Greek mainland, Corfù.

INTRODUCTION

During the last few decades a number of *Eucalyptus*-infesting insects originating from Australia became established in Europe. One of the most recently introduced species is *Glycaspis brimblecombei* Moore (Hemiptera: Psyllidae), commonly known as the red gum lerp psyllid.

Originally described from Australia, this species has shown an invasive behaviour in these last 15 years and has spread across several continents outside its native range. It was first detected in the United States of America (BRENNAN *et al.*, 1999) and subsequently recorded from Central and South America, Africa and Europe (for details see Table 1).

Adults and nymphs of the psyllid feed on sap and produce large amounts of honeydew on which sooty mould develops; adults are highly mobile and live freely on the foliage, while all nymphal instars construct white conical lerps using wax and honeydew secretions. Lerps on leaves look like armored scale covers. Damage includes leaf discoloration and, in case of heavy infestations, severe leaf drop and twig dieback, occasionally the whole tree death (LAUDONIA & GARONNA, 2010).

Glycaspis brimblecombei feeds on different species of *Eucalyptus* (Myrtaceae) (BRENNAN *et al.*, 2001) but in the Mediterranean basin it associates mainly with red eucalyptus (*E. camaldulensis*), frequently used in urban and rural forestry programmes (PERIS-FELIPO *et al.*, 2011). In the first record of this insect in Europe by HURTADO & REINA (2008) and by VALENTE & HODKINSON (2009) it has been forecast that "*Eucalyptus camaldulensis* is a common tree of the Mediterranean Region, and it is possible that *G. brimblecombei* may become a more serious pest elsewhere".

Against the psyllid biological control programs have been implemented in several countries. The parasitoid *Psyllaephagus bliteus* Riek (Hymenoptera: Encyrtidae) was imported from Australia and introduced to California, where it established and quickly became effective (PAINE *et al.*, 2000); consequently, it was released in Mexico (2002: PLASCENCIA *et al.,* 2005) and Chile (2003: IDE *et al.,* 2006). In several countries, such as New Zealand, Brazil, Spain, Italy and Morocco, the parasitoid was not deliberately introduced but probably was introduced with its psylloid and established itself (CALECA *et al.*, 2011). *Psyllaephagus bliteus* is an endoparasitoid that delays development until the psyllid host reaches the late fourth or fifth instars. It pupates within the remains of the host (SULLIVAN *et al.*, 2006).

Observations made during summer 2013 have led to discover both the red gum lerp psyllid and its parasitoid. To our knowledge this is the first report of the two species in Greece.

FINDING SITES IN GREECE AND SAMPLING METHODS

During the second half of August 2013, a survey on insect pests has been carried out in the city of Igoumenitsa (mainland Greece) and in Corfu island. Visual inspections of *Eucalyptus camaldulensis* in several urban and rural sites allowed to evidence the presence of numerous adults, nymphs and lerps of *Glycaspis brimblecombei*; in particular, lerps often showed a small round hole, the emergence orifice of the associated parasitoid *Psyllaephagus bliteus*. Locations (with geographical coordinates and altitudes) of all collection sites are given in Table 2.

In order to estimate the intensity of infestation by the red gum lerp psyllid and the parasitisation by *P. bliteus*, in the

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Table 1 – Countries, year of discovery and references of *Glycaspis brimblecombei.*

Countries	Year of discovery	References
U.S.A.	1998	Brennan *et al*., 1999
Mexico	2000	Cibrián *et al*., 2001
New Zealand	2001	Withers, 2001
Hawaii Islands	2001	Nagamine & Heu, 2001
Chile	2002	Sandoval & Rothmann, 2003
Brazil	2003	Santana *et al*., 2003
Mauritius	2001	Sookar *et al*., 2003
Madagascar	2004	Hollis, 2004
Argentina	2004	Bouvet *et al*., 2005
Uruguay	2006	Baldini *et al.,* 2006
Ecuador	2006	Onore & Gara, 2007
Venezuela	2007	Rosales *et al*., 2008
Spain, Portugal	2007	Hurtado & Reina, 2008
Peru	2008	Burckhardt *et al*., 2008
Italy	2010	Laudonia & Garonna, 2010
Canary Islands	2010	Malumphy, 2010
Sicily	2011	Lo Verde *et al*., 2011
Sardinia	2011	Pibiri, 2011
Morocco	2011	Bami, 2011; Ibnelazyz, 2011
France, Corsica	2011	Cocquempot *et al*., 2012
South Africa	2010	Hurley & Greyling, 2013
Colombia	2012	ICA, 2013

Table 2 – Sampling sites of the red gum lerp psyllid *Glycaspis brimblecombei* in mainland Greece (*) and in Corfu island.

Locality	Latitude N	Longitude E	Altitude (m a.s.l.)
Igoumenitsa*	39° 29’	20° 15’	4
Benitses	39° 32’	19° 54’	6
Lefkimmi	39° 24’	20° 04’	6
Kassiopi	39° 47’	19° 45’	8
Corfu (city)	39° 37’	19° 55’	10
Roda	39° 47’	19° 48’	27
Agios Mattheos	39° 29’	19° 52’	140
Sinarades	39° 34’	19° 50’	151
Kato Garouna	39° 32’	19° 51’	225
Pelekas	39° 35’	19° 49’	247

locality where the heaviest attack by the psyllid has been noted (in the town of Benitses) five terminal shoots up to 40 cm long per tree were collected from five plants; leaves from each branch were counted and separated between non-attacked leaves and leaves with presence of lerps. Different stages of the psillyd were preserved in 70% alcohol, marked and prepared by the standard methods (Conci *et al*., 1993). In order to roughly estimate the parasitisation level by *P. bliteus*, lerps were analysed and those ones showing the parasitoid exit hole were counted; lerps without hole were removed and observed under light stereomicroscope counting the number of nymphs with active parasitisation. Examined material is stored in the collection of the Department of Agri-food and Environmental Systems Management, University of Catania.

PEST ABUNDANCE AND PARASITISATION RATE

Totally 500 leaves have been examined from the five selected plants, of which 62 showed no presence of the psyllid (with an attack involving more than 85% of the leaves). On remaining 438 leaves, 713 lerps of all young instars where totally counted, of which 168 parasitized by *Psyllaephagus bliteus*. In conclusion, in the sample examined the encyrtid was present on 23.6% of parasitizable nymphs of *G. brimblecombei*.

CONCLUSIVE REMARKS

Glycaspis brimblecombei shows a very rapid spread in different areas of the world, becoming a major pest of *Eucalyptus* trees. The rapid colonization in Mediterranean countries by the pest is creating a strong need to study it biology, ecology and especially invasion dynamics, aiming at better understanding its potential distribution, its possible impact on both ornamental and forest populations of *Eucalyptus* trees, as well as the specific and generic potential of its natural enemies. On the whole, the symptoms observed in Greece did not seem severe, probably due to the presence of *Psyllaephagus bliteus*, but since the same pest has caused more serious damage in other countries where it has been established for some time, attention must be paid to possible future phytosanitary developments.

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