First record of native predators on the invasive species *Thaumastocoris peregrinus* (Hemiptera:Thaumastocoridae) in *Eucalyptus* in Argentina

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RESUMEN. Se han observado, repetidamente, a dos predadores nativos consumiendo a *Thaumastocoris peregrinus* Carpintero & Dellapé (Hemiptera: Thaumastocoridae), chinche del eucaliptus. Para identificar a estos predadores y corroborar si estas especies pueden utilizar a *T. peregrinus* como alimento aceptable, se obtuvieron muestras de huevos de ambas especies de predadores del arboretum de la Universidad Nacional de Luján. Las ninas fueron criadas por separado en condiciones de laboratorio y alimentadas *ad libitum* con ninas y adultos de *T. peregrinus*. Se registró el número de presas consumidas diariamente y el tiempo de desarrollo. Las especies de predadores fueron identificadas como *Atrachelus cinereus* Fabricius (Hemiptera: Reduviidae) y *Podisus australis* Berg (Hemiptera: Pentatomidae). Este trabajo presenta el primer registro de predadores nativos utilizando a esta especie invasora como fuente de alimento sobre *Eucalyptus camaldulensis* en la provincia de Buenos Aires, Argentina.


ABSTRACT. Two native predators have been repeatedly observed consuming the bronze bug, *Thaumastocoris peregrinus* Carpintero & Dellapé (Hemiptera: Thaumastocoridae). To identify these predators and to corroborate whether these species can use *T. peregrinus* as a suitable food item, egg samples of both predator species were collected from the arboretum at the Universidad Nacional de Luján. Nymphs were reared individually under laboratory conditions and fed *ad libitum* with nymphs and adults of *T. peregrinus*. The number of prey consumed daily and the development time were recorded. The predator species were identified as *Atrachelus cinereus* Fabricius (Hemiptera: Reduviidae) and *Podisus australis* Berg (Hemiptera: Pentatomidae). This research presents the first report of native predators using this invasive species as a food resource in *Eucalyptus camaldulensis* forest in Buenos Aires province, Argentina.

The bronze bug, *Thaumastocoris peregrinus* (Hemiptera: Thaumastocoridae) Carpintero & Dellapé, 2006, is an *Eucalyptus* sap-feeding insect native to Australia that has become a serious invasive pest damaging commercially grown *Eucalyptus* in the Southern Hemisphere. Since *T. peregrinus* was first reported outside Australia, in South Africa (Jacobs & Neser, 2005), populations have grown explosively and it has attained wide distribution over several regions in South America and more recently in Europe (Carpintero & Dellapé, 2006; Martinez & Bianchi, 2010; Wilcken et al., 2010; Ide et al., 2011; Laudonia & Sasso, 2012). In Argentina, this insect was recorded for the first time in April 2005, as *T. australicus* Kirkaldy, in the province of Buenos Aires and has become a key pest species associated with the production of *Eucalyptus* trees (Noack & Coviella, 2006; Mareggiani et al., 2011; Botto & Andorno, 2012).

The pest causes the canopy to turn silver-yellow and as the infestation progresses the canopy subsequently shifts to a brown and red coloration, which makes the trees look bronzed (Jacobs & Neser, 2005). In Rio Grande do Sul, Brazil, Garlet et al. (2012) observed a peak in the insect population between January and March (summer months), and concluded that high temperature and low relative humidity are ideal conditions for the development and reproduction of *T. peregrinus*.

The introduction of species into new environments and their establishment as invasive species constitutes a growing worldwide problem. One reason for this phenomenon is the absence of natural controls in the new invaded range (Carvallo, 2009). A biological control program is the best alternative to deal with most forest pests due to the high cost of chemical control and because there are no available pesticides for *Thaumastocoris* in Argentina. Biological control offers a relatively safe and effective means to reduce insect populations. A biological control strategy would involve searching for natural enemies both in the native range and in the new environment.

Two mymarid wasps, *Cleruchoides noackae* Lin & Huber and an unidentified species of *Stethynium* Enoch, have been confirmed as parasitizing the eggs of *T. peregrinus* in Australia (Lin et al., 2007). *Cleruchoides noackae* has been introduced in South Africa and South America (Nadel & Noack, 2012), however, to date, the efficacy of this natural enemy has not been published. Souza et al. (2012) reported *Supputius cincticeps* Stål, (Hemiptera: Pentatomidae: Asopinae) preying on *T. peregrinus* in Brazil, constituting the first record of natural enemies feeding on the bronze bug in South America.

In Argentina, given the outbreak of *T. peregrinus* on *Eucalyptus* plantations across Buenos Aires province, an intensive sampling program was conducted from December 2010 to February 2011 to search for local natural enemies. The sampling was conducted in the Experimental *Eucalyptus* forest at Universidad Nacional de Luján (S34.6, W59.1). Two bug predators, one Reduviidae and one Pentatomidae, were repeatedly observed consuming *T. peregrinus* on *Eucalyptus* foliage. Eggs of each predator species were collected from leaves of *E. camaldulensis* infested with *T. peregrinus* and reared individually under standard laboratory conditions (26 °C and 60% RH). Ten nymphs of each predator species were fed *ad libitum* with large nymphs (IV and V instars) and adults of *T. peregrinus*. Consumption and developmental time of each nymphal stage of the predators were recorded. Adult specimens of each predator species obtained in the laboratory were placed in tubes with 70% alcohol and identified by Dr. Cecilia Melo and Dr. Pablo Dellapé as *Atachelus cinereus* Fabricius (Hemiptera: Reduviidae: Harpactorinae) and *Podisus australis* Berg (Hemiptera: Pentatomidae: Asopinae) (fig. 1). Voucher specimens were deposited in the collection of the Museo de La Plata.

Both species were able to complete their nymphaal development with *T. peregrinus* as the only food resource, consumption of *T. peregrinus* per *A. cinereus* nymph was 101.7 ± 4.63 and its developmental time was 34.0 ± 0.58 days. The average consumption of *T. peregrinus* by *A. cinereus* nymphs was lower than that observed for other predator species (Souza et al., 2012). *Atachelus cinereus* is a predator species widely distributed throughout Argentina and other Central and South American countries (Melo et al., 2004; Carpintero & De Biase, 2011; Coscarón & Martin Park, 2011; Melo et al., 2011). It has been reported to feed on small insects, especially leafhoppers (Hemiptera: Auchenorrhyncha) (Nanni et al., 2011). Only one nymph of *Po-
disus australis survived to adulthood. Podisus australis has been recorded in Argentina and Uruguay. Although little information is available about the feeding habits of this species (Del-lapé et al., 2003), it was observed feeding on larvae of the eucalyptus weevil, Gonipterus spp. (Herting, 1973). Because P. australis is considered to be a generalist species, it is likely that it exploits this new food source, because both phytophagous species share the same habitat (Souza et al., 2012).

This report provides the first record of these two native predators feeding on T. peregrinus, and, along with the information provided by Souza et al. (2012), suggests that the bronze bug could be starting to integrate into the local trophic structure on Eucalyptus in its new adopted range.

Such information improves the understanding of the interactions between native predators and exotic insects and could thus be useful for integrated pest management.

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