



Parasitoids of the Australian citrus whitefly, *Orchamoplatus citri* (Takahashi) (Hemiptera, Aleyrodidae), with description of a new *Eretmocerus* species (Hymenoptera, Aphelinidae)

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Abstract

A field survey for potential biological control agents of the Australian citrus whitefly, *Orchamoplatus citri* (Takahashi), resulted in the discovery of three species of chalcid parasitoids (Hymenoptera, Chalcidoidea), viz.: *Cales orchamoplati* Viggiani & Carver, a species belonging to a genus that is currently unplaced to family within Chalcidoidea, and two species of Aphelinidae, *Encarsia iris* (Girault) and *Eretmocerus orchamoplati* sp. nov. *Orchamoplatus citri* is the first host record for *E. iris*. Morphological diagnoses are given, and DNA sequence data of the 28S rDNA and the cytochrome oxidase I genes are provided to define species at the molecular level.

Key words: Australia, parasitoid, biological control, taxonomy, survey

Introduction

The Australian citrus whitefly, *Orchamoplatus citri* (Takahashi, 1940) (Hemiptera: Aleyrodidae), is an endemic Australian whitefly that feeds only on species of citrus (Martin 1999). In Australia, the species is a minor pest (Cooper 1961, Hely 1968). In New Zealand, the whitefly was first detected in Auckland in 2000 and has since spread to Kerikeri, Gisborne, and Bay of Plenty, where it is causing damage to a range of citrus varieties. Prior to this study, the only definitive record of a parasitoid of the Australian citrus whitefly was *Cales orchamoplati* (Viggiani & Carver) from South Australia (Viggiani & Carver 1988). Earlier records of parasitoids of the Australian citrus whitefly are fragmentary. Parasitised *O. citri* have been recorded from Western Australia, but the parasitoids were not identified (Russell 1958). In 1978, two species of *Encarsia* (as *Encarsia* sp. and *Prospaltella* sp.) (Hymenoptera: Aphelinidae), which were presumably reared from *O. citri*, were introduced into the Cook Islands by E.W. Valentine for control of *O. mammaeferus* (Quaintance & Baker) (Walker & Deitz 1979).

Small parasitic wasps of the family Aphelinidae are among the most important natural enemies of whiteflies. Many species attack economically important hosts and are therefore potential biological control agents (Greathead 1986, Rosen & DeBach 1991, De Barro & Coombs 2009). Aphelinid wasps are primarily associated with Hemiptera, including whiteflies (Aleyrodidae), scale insects (Diaspididae), and aphids (Aphidoidea). The most important parasitoids of whiteflies are species of *Encarsia* Förster and *Eretmocerus* Haldeman (De Barro & Coombs 2009).

Encarsia is the largest genus of Aphelinidae, currently containing almost 400 described species (Noyes 2003). *Encarsia* species have been of particular interest to economic entomologists because several species have been used, or are currently being used, successfully for pest control (De Barro & Coombs 2009). In Australia, 94 *Encarsia* species have been recorded, although it is estimated that the number of species could be two to three times higher than currently known (Schmidt & Polaszek 2007).