

THE RELATIONSHIP BETWEEN PARASITOIDS AND THEIR NATIVE WHITEFLY HOSTS IN AUSTRALIA—THE DEVELOPMENT OF RULES FOR HOST SPECIFICITY TESTING

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ABSTRACT. Australia has a large, often unique whitefly fauna represented by more than 200 species in 40 genera, many of which are unique to this continent. Among these though are several exotic pest species such as *Aleurodicus dispersus*, *Bemisia tabaci* biotype B, *Siphoninus phillyreae* (ash whitefly), and *Trialeurodes vaporariorum*. While some of these are under biological control, others such as *S. phillyreae* are not under effective control in Australia. Ash whitefly, however, has been effectively controlled by the aphelinid parasitoid *Encarsia inaron* in both the United States and New Zealand. While it would be desirable to introduce this agent to Australia, legislation requires first that the level of risk posed to Australia's native whitefly fauna be assessed.

The key means of assessing risk is through host specificity testing, in which non-targets of varying levels of relatedness to the target are screened in quarantine against the candidate agent to determine whether they are likely to be attacked. In the case of whitefly species, this is not currently possible as the phylogenetic relationships among the 140 or so described genera are unknown. In the past, a best guess has often been employed, but we believe there is a more effective way of choosing non-target species for testing for this system.

In this talk, we first describe the use of molecular and morphological systematics to estimate the phylogenetic relationships among the Australian whitefly genera. Second, we review the world literature and compare it against strategic collecting in Australia, to demonstrate a basic rule that appears to underlie host selection by species of *Encarsia*. Together these two sources of information can be used to provide a structure that will enable host specificity testing lists to be developed for use in Australia with any prospective exotic whitefly parasitoids.