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## Two new species of *Encarsia* Förster (Hymenoptera, Aphelinidae) and first description of the male *E. plana* Viggiani & Ren from China

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### Abstract

Two new species of *Encarsia* Förster (Hymenoptera: Aphelinidae) are described from China, *Encarsia floralis* Wang, Huang & Polaszek, **sp. nov.** and *Encarsia maculiformis* Wang, Huang & Polaszek, **sp. nov.**, and the male of *Encarsia plana* Viggiani & Ren (1987) is newly described.

**Key words:** new species, whitefly, Aleyrodidae, armoured scale insect, Diaspididae, parasitoid

### Introduction

*Encarsia* Förster is the largest and most diverse genus in the family Aphelinidae (Hymenoptera: Chalcidoidea), currently containing 427 described species worldwide (Noyes 2014). Most species of *Encarsia* are primary parasitoids of whiteflies (Aleyrodidae) and armoured scale insects (Diaspididae), with a few species known from aphids (Hormaphididae) (Evans *et al.* 1995) and eggs of Plataspidae (Williams & Polaszek 1996). Males, however, are very often hyperparasitoids of females (or males) of their own or other species (Williams & Polaszek 1996), and the males of certain species have been recorded as hyperparasitoids of Psyllidae (Viggiani 1984; Polaszek *et al.* 1992), and parasitoids of lepidopteran eggs (Polaszek 1991; Polaszek *et al.* 1995; Hunter *et al.* 1996) and Cicadellidae eggs (Polaszek & Albarracin 2011).

The taxonomy of *Encarsia* in China began with the descriptions of several species by Silvestri (1926, 1928, 1931), mainly during his investigations into the natural enemies of citrus scale insects, whiteflies and other pests from China. The most recent revision of Chinese *Encarsia* is by Huang & Polaszek (1998), who reviewed early studies in China and recorded 76 species, including 29 new species. To date, a total of 84 *Encarsia* species, including *Encarsiella*, are known from China, including Taiwan, of which 44 species are associated with Aleyrodidae and 17 species with Diaspididae (Huang 1994; Huang & Polaszek 1996, 1998; Shih *et al.* 2008).

In this paper two new species of *Encarsia*, *E. floralis* Wang, Huang & Polaszek, **sp. nov.** and *E. maculiformis* Wang, Huang & Polaszek, **sp. nov.**, are described from Fujian and Hainan provinces, China. In addition, the male of *E. plana* Viggiani & Ren (1987) is described for the first time.

### Material and methods

*Encarsia* parasitoids, reared from their hosts, were preserved in 75% ethanol after emergence. The body colour was described and photographed from ethanol-preserved specimens before clearing and slide-mounting. The specimens were slide-mounted for species identification following the method outlined by Noyes (1982). The specimens in ethanol were photographed with a MicroPublisher 5.0 RTV camera attached to a Zeiss Stemi 2000-C stereo zoom

(Fig. 23). Legs mostly white, but hind coxae basally brown. Petiole brown, tergites and sternites of metasoma dark brown except apex of T7 brown-yellow (Fig. 20); genitalia with basal three-fourths dark brown and apical one-fourth white (Fig. 26).

**Head.** Head slightly wider than mesosoma; frontovertex large, with two brown carinae starting from middle of vertex margin and, forming a V-shape, extending laterally to ocelli (Fig. 21). Maxillary palps short, 2-segmented, and labial palps 1-segmented. Mandibles with three teeth. Antennal formula 1:1:0:6; pedicel shorter than each flagellar segment; lengths of F1–F6, 44: 50: 47: 49: 50: 52; each flagellar segment with 5–7 longitudinal sensilla (Fig. 24).

**Mesosoma.** Mid-lobe of mesoscutum mostly with longitudinal hexagonal cells or reticulation, with 2+1+2 setae; side-lobe of mesoscutum with 1 seta, axilla with 1 seta; scutellum with placoid sensilla distantly placed, closer to fore pair than to hind pair of setae, distance between fore pair of scutellar setae slightly greater than that between hind pair (Fig. 25). Fore wing 2.69× as long as maximum width of wing disc; marginal fringe rather long, 0.42× as long as maximum width of disc; submarginal vein with 2 setae, anterior margin of marginal vein with 6 setae, basal cell with 1 seta; wing disc densely setose (Fig. 23); stigmal vein short, and postmarginal vein absent (Fig. 22). Tarsal formula 5: 5: 5.

**Metasoma.** Metasoma 1.67× as long as mesosoma; petiole with distinct sculpture; tergites 1–7 with setae as follows: T1, 0+0; T2–T4, 2+2 each; T5, 6; T6, 4 between cercal plates; T7, 4 in one row. Genitalia without distinct digital lobes (Fig. 26).

**Female** (Figs 27–33). Detailed characters for the female are given in Huang & Polaszek (1998: 1939). Body rather flat and narrow. Head slightly wider than mesosoma; frontovertex large, with two brown carinae starting from middle of vertex margin and, forming a V-shape, extending laterally to ocelli (Fig. 28). Fore wing 2.72–2.82× as long as maximum width of wing disc, with narrow stigma, ciliation on disc unusual, consisting of scattered, very short setae with a rather large base (Fig. 30).

**Species group placement.** Not established.

**Host.** An unidentified diaspidid (Hemiptera: Diaspididae) scale on bamboo. Viggiani & Ren (1987) recorded this species from a diaspidid, ? *Bambusaspis* sp.

**Distribution.** China (Fujian, Hainan, Guangdong).

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