Two new species of *Encarsia* (Hymenoptera: Aphelinidae), parasitoids of whiteflies (Homoptera: Aleyrodidae) from Mexico

**Svetlana N. Myartseva**

División de Estudios de Postgrado e Investigación, UAM Agronomía y Ciencias, Universidad Autónoma de Tamaulipas, Cd. Victoria, 87149, Tamaulipas, México

Corresponding author: smyartse@uat.edu.mx

**Abstract.** Descriptions of two new species, *Encarsia madera* sp. nov. and *Encarsia mexicella* sp. nov., reared from whiteflies in Tamaulipas, Mexico, are given and illustrated.

**Key words:** Aphelinidae, *Encarsia*, new species, Mexico.

**Introduction**

*Encarsia* Förster is the largest and economically important genus in the family Aphelinidae (Hymenoptera: Chalcidoidea). Many species have great role in the biological control of insect pests in agricultural and natural landscapes. Some species were introduced into Mexico to combat whiteflies (Aleyrodidae) and armored scale insects (Diaspididae) (Myartseva and Ruiz-Cancino, 2000). This genus currently contains over 400 described species in the world fauna (Heraty et al., 2007; Schmidt and Polaszek, 2007; Myartseva and Evans, 2008).

The genus *Encarsia* is currently represented in Mexico by 89 species, including 48 species described as new for science recently by Myartseva and Evans, 2008 and Myartseva et al., 2008. During our investigations of Aphelinidae on fruits and ornamentals in the State of Tamaulipas in 2007 some new species of *Encarsia* were reared from whiteflies, collected on ornamental trees. In this article are described and illustrated two new species of this genus.

**Material and methods**

The methodology given by Noyes (1982) for Chalcidoidea is adapted, with small modifications, for collecting and rearing parasitoids. Whitefly pupae and soft scales were collected from fruit and ornamental trees in different areas, and parasitoids were reared in the laboratory. Based on the published descriptions and keys to *Encarsia* species (Woolley, 1997; Hayat, 1998; Huang and Polaszek, 1998; Myartseva and Evans, 2008), two species are determined as new to science.

1. *Encarsia madera* Myartseva, sp. nov. (Figs 1-6)

**Female.** Length of body: 0.7 mm.

Coloration. Head yellow, face light yellow, eyes dark brown; antennae yellow. Mesosoma yellow; pronotum and anterior margin of mid lobe of mesoscutum brown, lateral margins of axillae, anterior and posterior margins of propodeum bordered dark brown. Fore wings hyaline. Legs whitish yellow. Petiolus brown. Gaster yellow, with basal and fifth tergites and sides of sixth tergite brown. Apices of third valvula black.

Structure. Head 1.3 times as wide as high. Frontovertex 0.5x head width. Malar sulcus present. Ocelli arranged in small obtuse triangle; distance between hind ocelli slightly less than distance from hind ocellus to eye. Mandible (Fig. 1) with 3 weekly expressed teeth and appears without teeth. Antennae (Fig. 2) inserted immediately below the level of lower margin of eyes.
Radicle 2 times as long as wide. Scape 4.2 times as long as wide. Pedicel 1.5 times as long as wide. First funicle segment quadrate, second and third segments 2 times and 1.8 times as long as wide, respectively. Club 3-segmented, slightly wider than funicle and slightly shorter than funicle and pedicel combined. Second-sixth flagellar segments each with 3 sensilla. Midlobe of mesoscutum with 4 pairs of setae. Each axilla with one, side lobe with 3 setae. Scutellar placoid sensilla widely spaced, separated by a distance about 7x width of one sensillum.

Distance between anterior pair of scutellar setae slightly shorter than distance between posterior pair of setae (35:37). Fore wings without asetose area around stigma vein, 2.6 times as long as maximum width of wing. Marginal fringe about 0.2x wing width. Marginal vein (Fig. 3) subequal to submarginal vein, with 5 long setae along anterior margin. Base of wing with 3 setae under apical part of submarginal vein. Hind wing 7.5 times as long as maximum width of wing, its marginal fringe 1.3 times as long as wing width. Tarsal formula 5-5-5.


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Midtibial spur (Fig. 4) about as long as basitarsus; basitarsus about as long as next two tarsal segments combined. Propodeum very narrow medially. Second-seventh tergites with 2+2, 2+2, 2+2, 4, 4 and 4 setae, respectively. Seventh tergite (Fig. 5) slightly elongate, 0.8 times as long as wide. Ovipositor (Fig. 6) exerted, 1.7 times as long as middle tibia; third valvula about 0.5 times as long as second valvifer.

Material. HOLOTYPE, female: MEXICO, Tamaulipas, Ciudad Madero, ex Aleyrodidae (possibly Tetraleurodes sp.) on Pseudoacacia sp., 12.XII. 2007 (coll. S.N. Myartseva). Holotype is in the Entomological Museum of the University of California, Riverside, California, U.S.A.

Comments. Encarsia madera sp. n. is close to E. perplexa Huang and Polaszek, E. dominicana Evans and E. tapachula Myartseva. From E. perplexa new species differs as follows: head without dark transverse crossband; fore wings hyaline; gaster yellow, with basal, fifth tergites and sides of sixth tergite brown; mandible very undistinctly tridentate; scape 4.2 times as long as wide; midlobe of mesoscutum with 4 pairs of setae; marginal vein with 5 setae along anterior margin; third valvula 0.5 times as long as second valvifer. (In E. perplexa: head with dark transverse crossband between eyes; fore wings infuscate; gaster brown with two basal and seventh tergite yellow; mandible distinctly tridentate; scape 5 times as long as wide; midlobe of mesoscutum with 10-14 setae; marginal vein with 7-8 setae along anterior margin; third valvula 0.7 times as long as second valvifer.)

From E. dominicana new species differs as follows: head without brown transverse crossband; fore wings hyaline; axillae yellow; gaster yellow with basal, fifth tergites and sides of sixth tergite brown; mandible very undistinctly tridentate; marginal vein with 5 setae along anterior margin; third valvula 0.5 times as long as second valvifer; seventh tergite elongate. (In E. dominicana: head with brown transverse crossband at level of foramen; fore wings infuscate; axillae brown; gaster yellow with fourth-sixth tergites brown; mandible distinctly tridentate; marginal vein with 7 setae along anterior margin; third valvula 0.4 times as long as second valvifer; seventh tergite distinctly transverse.) The new species differs from E. tapachula as follows: fifth tergite and sides of sixth tergite brown; scape 4.2 times as long as wide, second-third funicle segments 2.0 and 1.8 times as long as wide, respectively; club slightly shorter than funicle and pedicel combined; midlobe of mesoscutum with 4 pairs of setae; fore wing 2.6 times as long as wide; midtibial spur as long as basitarsus; ovipositor 1.7 times as long as middle tibia. (In E. tapachula: gastral tergites fourth posteriorly, fifth completely, sixth anteriorly brown; scape 3 times as long as wide, second-third funicle segments 1.4 and 1.2 times as long as wide, respectively; club as long as funicle and pedicel combined; midlobe of mesoscutum with 3 pairs of setae; fore wing 3.3 times as long as wide; midtibial spur 0.7 times as long as basitarsus; ovipositor 2 times as long as middle tibia.)

2. Encarsia mexicella Myartseva, sp. nov.

(Figs 7-10)

Female. Length of body: 0.6 mm.

Coloration. Head yellow, occiput brownish, antennae whitish yellow. Mesosoma yellow, pronotum black, midlobe of mesoscutum brownish, with sides and posterior margin yellow; axillae brownish, side lobes whitish yellow except apices infuscate, scutellum whitish yellow, propodeum whitish yellow with sides brownish, metapleura brownish. Fore wings hyaline. Legs whitish. Metasoma yellow, tergites 5th-6th completely and 4th and 7th on sides brownish, third valvulae whitish. Apices of styles black.

Structure. Head as wide as mesosoma, slightly wider than high. Frontovertex 0.5x head width. Ocelli arranged in slightly obtuse triangle. Eyes about 1.3 times as long as cheeks. Antennae (Fig. 7) inserted below the lower margin of eyes. Radicle 2 times as long as wide. Scape about 4 times as long as wide. Pedicel about 1.7 times as long as wide and longer than first funicle segment. Funicle segments subequal in length and width, about 1.7 times as long as wide each. Club 3-segmented, first and second segments subequal in length and about 1.4 times as long as wide each, third segment elongate (1.5x longer). Club slightly longer than funicle. Second-third funicle segments and second-third club segments with one sensillum each. Midlobe of mesoscutum with 4 pairs of thin setae, situated symmetrically, and about 1.2 times as wide as long. Scutellum about 1.7 times shorter than midlobe and about 1.8 times as wide as long. Scutellar placoid sensilla closely placed, separated by a distance less than one diameter of a sensillum. Anterior pair of scutellar setae shorter than posterior pair of setae. Distance between anterior setae shorter than that between posterior setae (18:23), Fore wings uniformly setose, about 2.9 times as long as wide, with 2-3 basal group setae, its marginal fringe about 0.5x wing width. Marginal vein (Fig. 8) with 5 long setae along anterior
margin, stigmal vein short and smoothly joining marginal vein. Submarginal vein slightly shorter than marginal vein. Hind wing 7.4 times as long as wide, its marginal fringe about 1.6 times as long as maximum width of wing. Tarsal formula 5-5-5. Midtibial spur (Fig. 9) shorter than basitarsus (14:17); basitarsus very slightly longer than next two tarsal segments combined. Gastral tergites 4th-5th with two and one pairs of setae, respectively. Ovipositor (Fig. 10) very slightly exserted, about 1.3 times as long as middle tibia; third valvula about 0.7 times as long as second valvifer.

Material. HOLOTYPE, female: MEXICO, Tamaulipas, Ciudad Victoria, ex Aleyrodidae (possibly Tetraleurodes sp.) on Leucophyllum frutescens, 5.XI. 2007 (coll. E. Ruiz-Cancino)

Holotype is in the Entomological Museum of the University of California, Riverside, California, U.S.A.

Comments. Evans and Polaszek (1997) suggested in a separate citrella-complex the strenua species-group of Encarsia: citrella (Howard), paracitrella Evans and Polaszek, pseudocitrella Evans and Polaszek and unicitrella Evans and Polaszek. New Mexican species, E. mexicella sp. nov. can be placed into this group which also includes Nearctic and Neotropical species. Female of E. mexicella has mesosoma and metasoma with obvious dark markings; stigmal vein smoothly joining marginal vein; tarsal formula 5-5-5; fore wing uniformly setose; distance between scutellar placoid sensilla less than one diameter of a sensillum; club 3-segmented. In coloration and structure E. mexicella is close to E. unicitrella and E. paracitrella, but can be easily distinguished by following: gastral tergites fifth-second completely; fourth and seventh tergites on sides brown; fore wings hyaline; second funicle segment with one sensillum; midlobe of mesoscutum with 4 pairs of slender setae situated symmetrically; fore wing with 1-2 basal group setae; ovipositor 1.3 times as long as middle tibia; third valvula 0.4 times as long as ovipositor. (In E. unicitrella: gastral first and second tergites and central area of third-fifth tergites brown; fore wings under marginal vein very slightly infuscate; second funicle segment without sensilla; midlobe of mesoscutum with one pair of slender setae at posterior margin; fore wing with 3-4 basal group setae; ovipositor 0.9 times as long as middle tibia; third valvula 0.3 times as long as ovipositor.) The new species differs from E. paracitrella as follows: the gastral tergites fifth-sixth completely; fourth and seventh on sides brown; club 3-segmented; first funicle segment without sensilla; midtibial spur distinctly shorter than basitarsus; fore wing with 1-2 basal

group setae; ovipositor 1.3 times as long as middle tibia; third valvula 0.4 times as long as ovipositor. (In *E. paracitrella*: first and second gastral tergites laterally, third-sixth centrally brown; club 2-segmented; first funicle segment with one sensillum; midtibial spur as long as basitarsus; fore wing with 7 basal group setae; ovipositor as long as middle tibia; third valvula 0.2 times as long as ovipositor.)

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**References**


