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A NEW PARASITOID OF WHITEFLIES FROM MEXICO, WITH A KEY TO NEW WORLD SPECIES OF THE GENUS *ENCARSIELLA* (HYMENOPTERA: APHELINIDAE)

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ABSTRACT

A new species, *Encarsiella tamaulipeca* Myartseva and Coronado-Blanco *sp. nov.*, from Mexico is described and illustrated. A new combination is proposed, *Encarsiella narroi* (Gomez & García) from *Encarsia*. A key to the species of *Encarsiella* (females) of the New World is given.

Key Words: *Encarsiella sp. nov.*, distribution

RESUMEN

Se describe e ilustra una nueva especie: *Encarsiella tamaulipeca* Myartseva *et* Coronado-Blanco *sp. nov.* de México. Se propone una nueva combinación de *Encarsia narroi* Gómez & García a *Encarsiella narroi* (Gómez & García). Se incluye la clave de las especies de *Encarsiella* (hembras) del Nuevo Mundo.
Translation provided by author.

Among the parasitic Hymenoptera, species of the family Aphelinidae (Chalcidoidea) are among the most important biological control agents of insect pests. Aphelinid species play a significant role in ecosystems as natural enemies of many homopteran hosts and have been used successfully as biological control agents in Mexico and in many parts of the world (Clausen 1978).

The genus *Encarsiella* Hayat (1983) belongs to the subfamily Coccophaginae *sensu* De Santis (1948) and Hayat (1985), tribe Pteroptricini Ashmead, that also includes the genera *Encarsia* Foerster, *Dirphys* Howard, *Bardylis* Howard, *Coccophagoides* Girault and *Pteroptrix* Westwood (Hayat 1998). Relationships within the family Aphelinidae have been studied by many taxonomists, but the classification of the aphelinid genera into subfamilies and tribes is still in formative stages (Hayat 1994, Yasnosh 1976, Shafee & Rizvi 1991 and Hayat 1998).

Encarsiella is characterized by having an 8–segmented antenna in both sexes, the third segment of the club oblique or transverse at apex, linea calva absent, stigmal vein narrow, submarginal vein with 2-4 long setae, mesoscutum with a variable number of setae but always more than 6 and the axilla elongate and strongly projecting forward.

ENCARSIELLA IS CLOSELY TO THE GENERA *DIRPHYS* AND *ENCARSIA*.
THE DIFFERENCES AMONG THESE GENERA ARE SHOWN IN THE FOLLOWING KEY:

1. Axillae small and separated medially by more than the maximal length of an axilla. Mid lobe of mesoscutum with reduced number of setae arranged in bilateral symmetry. Scutellum distinctly wider than long . . . . . *Encarsia* Foerster

— Axillae large and separated medially by less than the maximal length of an axilla. Mid lobe of mesoscutum with many scattered setae, not arranged in bilateral symmetry 2

2. Side lobes divided; sculpture of mesoscutum aciculate. Scutellar placoid sensilla closely placed, separated by about diameter of a sensillum . . . . . *Dirphys* Howard

— Side lobes not divided; sculpture of mesoscutum imbricate-reticulate. Scutellar placoid sensilla widely placed, separated by distance distinctly longer than diameter of a sensillum . . . . . *Encarsiella* Hayat

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Most *Encarsiella* species are solitary endoparasitoids of whiteflies belonging to the subfamily Aleurodicinae (Homoptera, Aleyrodidae). However, *Encarsiella boswelli* (Girault) is known to attack eggs of Heteroptera (Polaszek & Hayat 1990), and an undescribed species from India was reared from nymphs of Psyllidae (Huang & Polaszek 1996).

Nine species of *Encarsiella* are known worldwide; of these, four are recorded in the New World: *E. aleurodici* (Girault), *E. magniclava* (Girault), *E. pithecura* Polaszek, and *E. noyesi* Hayat (Huang and Polaszek 1996; Martin and Polaszek 1999). The latter species is widely distributed in Central America and has been used in biological control programs of *Aleurodicus cocois* (Curtis) (Cock 1985). Some undescribed species are known from the New World. The correct identification of the parasitoids reared from pests species is essential to the success of biocontrol programs.

G. Viggiani (1986) stated new combinations for *Encarsiella aleurodici* from *Encarsia* and *Encarsiella magniclava* from *Coccophagus*. We propose a new combination—*Encarsiella narroi* (Gómez & García), comb.n. from *Encarsia.* This species was reared from *Aleurodicus* sp. collected on *Bauhinia variegata* L. and *Hibiscus* sp. in Mexico, Coahuila State (Gómez and García 2000). The description and illustrations of this species show characteristics belonging to *Encarsiella,* especially the number of setae on the mesoscutum (42 pairs according to the authors) and the structure of the antennal club. Thus, *Encarsiella narroi* (Gómez & García), comb.n. is the fifth species of this genus known from the New World.

Encarsiella noyesi was described from Mexico, reared from *Aleurodicus dugesii* Cockerell in the State of Guanajuato, and from *Aleurothrixus floccosus* (Maskell) on *Citrus aurantifolia* (Christm.) Swingle, in the State of Yucatán (Polaszek and Hayat 1992). We reared *E. noyesi* from Aleurodicinae whiteflies in the State of San Luis Potosí (new record for this State), and from an aleyrodid species in the State of Tamaulipas (new record for this State). In addition, a new species of *Encarsiella* was reared from an undetermined species of Aleurodicinae on *Psidium guajava* L. in the State of Tamaulipas.

The abbreviations R = radicle, S = scape, P = pedicel and F = funicle segment are used in the following description of the new species and key to the species of *Encarsiella* (females) of the New World.

ENCARSIELLA TAMAULIPECA MYARTSEVA AND CORONADO-BLANCO *SP. NOV.*

(Figs. 1-3)

Description

FEMALE (Figs. 1-2). Length: 0.75-0.82 mm (N = 8 specimens on points, 2 on slides); holotype – 0.75 mm.

Coloration

Head black, face ferrugineous from anterior oculus to interantennal prominence and whitish below (except upper margin of mouth, hind part of cheeks and antennal scrobes). Pedicel and antennal club brown, scape (except distal half dorsally brown) and F3 whitish, F1-F2 pale brown. Mesosoma and metasoma black. Legs yellowish-white, middle and hind coxae, hind femur black, middle femur and hind tibia infuscate. Wings hyaline. Sheaths of ovipositor whitish.

Head

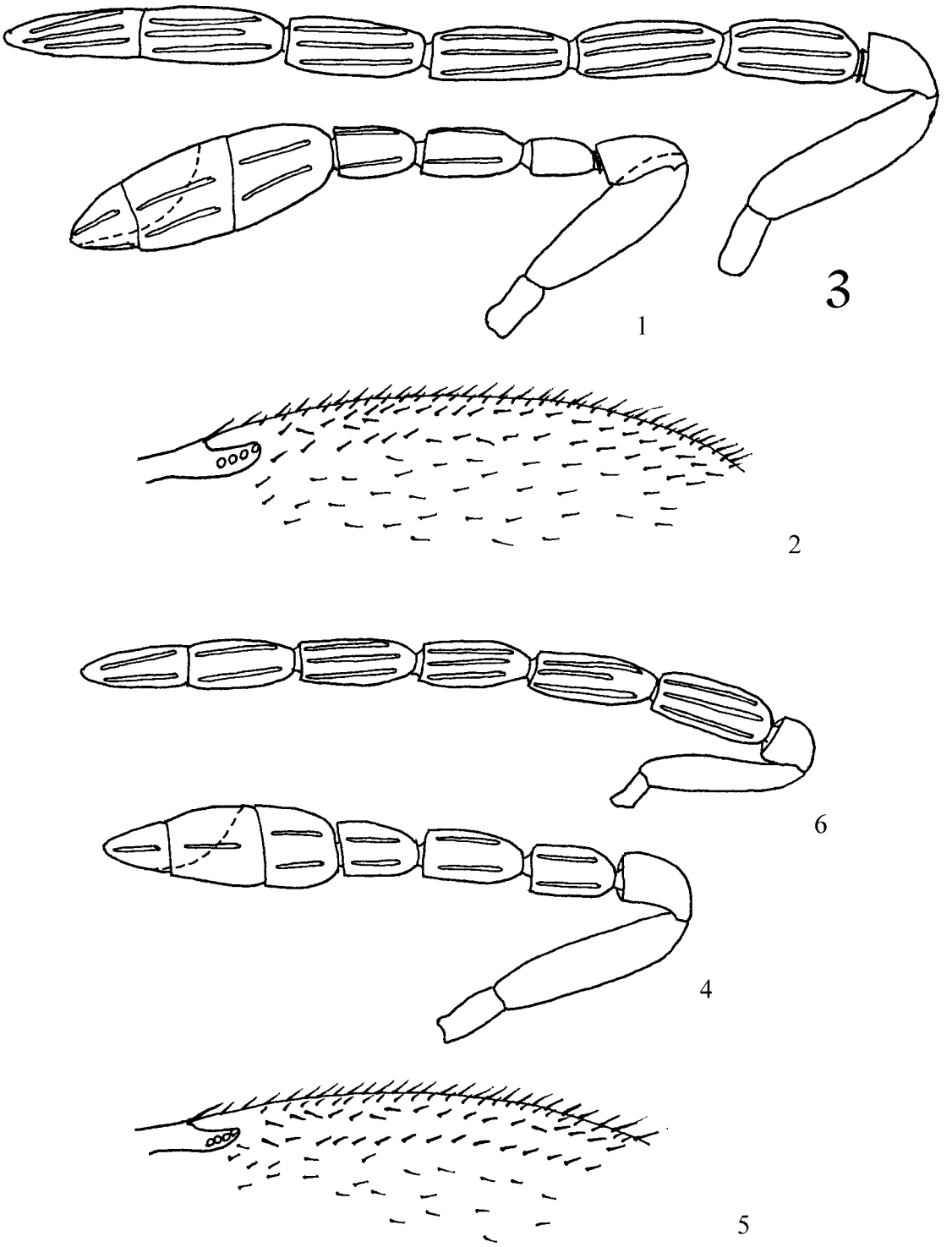
Wider than high and as wide as mesosoma. Frontovertex 2× as wide as long, about 0.5× head width. Occipital margin slightly rounded and concave. Ocelli in slightly obtuse triangle; lateral ocelli close to occipital margin, at a distance of less than diameter of an oculus, and about 2 diameters of an oculus from eye margins. Eyes about 2× longer than cheeks. Malar sulcus present. Antenna (Fig. 1) inserted immediately under lower margin of eyes, closer to mouth margin than to eye margins. Antennal segments R–F_3 and club (3–jointed) with the following ratios, length/width: R-15:9, S–60:15, P–22:13, F_1–18:12, F_2–25:14, F_3–20:15, club–67:20. Pedicel slightly longer than F_1; club slightly longer than funicle and scape. F_2, F_3 and club joints with two longitudinal sensilla each, sensilla absent on F_1. A very thin anellus is also present.

Mesosoma

Sculpture of dorsum with more or less hexagonal cells, sides of mesoscutum and scutellum with longitudinal cells. Mesoscutum slightly wider than long, with many setae varying in number from 54 to 64. Scutellum about 2× wider than long, with 2 pairs of long setae. Axilla with one seta, lateral lobes with three setae. Fore wing more than 2× longer than wide, marginal fringe about 0.14× wing width. Length of marginal vein equal to submarginal vein, postmarginal vein absent, stigmal vein very short. Strong setae in two rows on anterior margin form narrow bare band, interrupted near vein by a few setae (Fig. 2). Base of wing with 7-10 setae. Marginal vein with 10-13 setae, marginal fringe 2.5× maximum wing width, discal setae uniformly distributed, hind wing more than 4.5× as long as wide. Tibial spur of middle leg slightly shorter than basitarsus.

Metasoma*:* rounded at apex, about 0.67 times length of mesosoma (in dry specimens). Ovipositor exserted, its exserted part 0.5x length of gaster (in dry specimens); ovipositor longer than middle tibia (14:11), sheaths about 0.5x inner plates.

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Figs. 1-3. *Encarsiella tamaulipeca, sp. nov.*: 1- antenna, female (× 200), 2- marginal part of forewing (× 280), 3– antenna, male (× 200).

Figs. 4-6. *Encarsiella noyesi* Hayat: 4- antenna, female (× 200), 5– marginal part of fore wing (x 280), 6– antenna, male (× 200).

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MALE (Fig. 3). **Coloration**. Similar to female in color, but face brown; legs black, except apices of fore and middle femora, apices of fore and hind tibiae, and the apical half of mid tibia and tarsi which are whitish.

Antenna (Fig. 3) inserted at level of lower eye margin, at equal distance from margins of eye and mouth. Funicle 4–segmented, club 2–segmented. Antennal segments with the following ratios length/width: R–11:8, S–50:13, P–17:13, F_1–31:14, F_2–36:15, F_3–35:15, F_4–34:16, F_5–35:16, F_6–34:13. Pedicel slightly less than 0.5× F_1; club as long as the two preceeding segments together. F_1 – F_6 with 3 longitudinal sensilla each. Forewing with bare base. Mesoscutum wider than long; scutellum about 1.5× wider than long.

Diagnosis. Using the key and the revision of *Encarsiella* species of the world provided by Polaszek and Hayat (1992), *E. tamaulipeca* sp. nov. is close to *E. aleurodici* in coloration of body and antenna, and also the following morphological features: long pedicel (P > F_1) and club (>F_1 – F_3), absence of sensilla on F_1, and setaceous wing base. It differs from *E. aleurodici* in the following: female with antennal anellus and anterior margin of fore wing with bare band; length of marginal vein equal to submarginal vein, and marginal fringe longer (0.14× maximum wing width) (in *aleurodici* it is very short), ovipositor slightly longer than mid tibia (14:11); male antennal club equal to lengths of two preceeding segments.

Material Examined. Holotype, female: Mexico, Tamaulipas, Ciudad Victoria, *ex* Aleyrodidae on *Psidium guajava*, 7-8-XII-1995, E. Chouvakhina; paratypes: same data as holotype, 6 females (all on points); 27-X-1999, S. Myartseva, 1 female, 1 male, on slides.

The holotype and one paratype are deposited in the National Museum of Natural History, Washington, D.C., USA; two paratypes in the Department of Zoology, Institute of Biology, National Autonomous University of Mexico, Mexico City, D.F., Mexico; two paratypes in the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; one paratypeon point and one female and one male on slides in the Insect Museum, Universidad Autónoma de Tamaulipas, Ciudad Victoria, Tamaulipas, Mexico.

Etymology. *Encarsiella tamaulipeca* is named after the State of Tamaulipas where it was discovered.

ENCARSIELLA NOYESI HAYAT, 1983

Material Examined.

Mexico, San Luis Potosí, Xilitla, *ex* Aleyrodidae, 10-XI-1999, S. Myartseva, 16 females, 17 males, MIFA (UAT); Tamaulipas, Jaumave, *ex* Aleyrodidae, 36 females, 2 males, 30-IV-2000 (S. Hernández-Aguilar); USA, California, Riverside, UCR Quarantine culture, A. Briones, emerged 3-IV-2000 from *Aleurodicus dugesii* Cockerell, 7 females, 1 male, orig. from Mexico, Jalisco, Guadalajara, 5-V-1997 (D. Headrick).

Morphological differences were observed among populations of *Encarsiella noyesi* reared in several regions. For example, Mexican specimens are different from those described by Hayat, who studied specimens reared from June to August from Trinidad, St. Vincent and Tobago. The Mexican specimens are smaller (female body length 0.52-0.67 mm, male 0.45-0.62 mm) and some females have only the F_3 pale yellow (also observed in specimens from California). Living female specimens have a violet-bluish face and pearlish-bluish-white scutellum. Dry female specimens are lighter yellow than the Californian specimens and the basal third of the mesopleurum is black; P equal to F_1; and F_1 usually has longitudinal sensilla (Figs. 4-6) (also observed in specimens from California); lateral lobes with three setae; marginal fringe of forewing longer (0.14× wing width); and ovipositor exserted and slightly longer than midtibia. Male specimens have F_2-F_4 more pallid and pedicel length about 0.5× F_1.

KEY TO FEMALES OF *ENCARSIELLA* SPECIES OF THE NEW WORLD

1. Scutellum entirely black 2

— Scutellum pallid. 3

2. Discal setae on forewing uniformly distributed; marginal vein longer than submarginal vein. Ovipositor as long as mid tibia . . . . . .*E. aleurodici* (Girault)
Distribution: Barbados, Ecuador, Trinidad (Polaszek and Hayat 1992).

— Forewing with a long band bare of setae along anterior margin (Fig. 3); marginal vein equal to submarginal vein in length. Ovipositor 1.3× longer than mid tibia . . . . . *E. tamaulipeca* sp. nov.
Distribution: Mexico.

3. Mesoscutum entirely dark. F_1 less than 2× as long as wide. Club slightly less than 3× as long as wide. Forewing with 2 large setae on submarginal vein 4

— Mesoscutum pale, excluding the anterior edge and notauli. F_1 2.4× as long as wide. Club slightly less than 2× as long as wide. Forewing with 2 large setae and 2-4 smaller setae on submarginal vein . . . . . *E. magniclava* (Girault)

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Distribution: Guyana, Panama (De Santis 1979).

4. Base of forewing with an infuscated area. Antennal scrobes and clypeus entirely pale; pedicel and scape entirely pale . . . . . *E. pithecura* Polaszek
Distribution: Belize (Martin and Polaszek 1999).

— Base of fore wing hyaline. Antennal scrobes and clypeus completely dark; pedicel and scape partly or entirely dark 5

5. Forewing with a long band bare of setae along anterior margin and without asetose area below stigmal vein. F1 without sensillum and F2 somewhat longer than F1 and F3. . . . . *E. noyesi* Hayat
Distribution: Anguilla, Antigua, Barbados, Costa Rica, Grenada, Mexico, Peru, St. Vincent, Tobago (Polaszek and Hayat 1992).

— Forewing without a long band bare of setae along anterior margin and with asetose area below stigmal vein. F1 with one sensillum, F1-F3 of about equal length . . . . . *E. narroi* (Gómez & García), comb.n.
Distribution: Mexico (Gómez and García 2000).

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REFERENCES CITED

CLAUSEN, C. P. 1978. Introduced parasites and predators of arthropod pests and weeds: A world review. Agriculture Handbook 480, U.S. Department of Agriculture. Washington, D.C. 545 pp.

COCK, M. J. W. (ed.). 1985. A review of biological control of pests in the Commonwealth Caribbean and Bermuda up to 1982. Technical Communication, Commonwealth Institute of Biological Control 9: 1-218.

DE SANTIS, L. 1948. Estudio monográfico de los afelínidos de la República Argentina (Hymenoptera, Chalcidoidea). Revista del Museo de la Plata (Nueva Serie), 5 (Sección Zoología): 23-280.

DE SANTIS, L. 1979. Catálogo de los Himenópteros Calcidoideos de América al Sur de los Estados Unidos. Publicación especial, Comisión de Investigaciones Científicas de la Provincia de Buenos Aires. La Plata, Argentina. 488 pp.

GOMEZ, J., AND O.GARCIA. 2000. A new species of *Encarsia* (Hymenoptera: Aphelinidae), a parasitoid of whitefly *Aleurodicus sp.* (Homoptera: Aleyrodidae) in Mexico. Pan-Pacific Entomologist 76: 49-51.

HAYAT, M. 1983. The genera of Aphelinidae (Hymenoptera) of the world. Systematic Entomology 8: 63-102.

HAYAT, M. 1985. Family Aphelinidae. pp. 226-232. *In* Subba Rao, B. R. and M. Hayat (eds.). The Chalcidoidea of India and the adjacent countries. Part 1. Review of families and keys to families and genera. Oriental Insects 19: 163-310.

HAYAT, M. 1994. Notes on some genera of the Aphelinidae (Hymenoptera: Chalcidoidea), with comments on the classification of the family. Oriental Insects 28: 81-96.

HAYAT, M. 1998. Aphelinidae of India (Hymenoptera: Chalcidoidea): a taxonomic revision. Memoirs on Entomology, International, Publ. Assoc. Publishers, Gainesville, Florida, 13. 416 pp.

HUANG, J., AND A. POLASZEK. 1996. The species of *Encarsiella* Hayat (Hymenoptera: Aphelinidae) from China. Journal of Natural History 30: 1649-1659.

MARTIN, J., AND A. POLASZEK. 1999. A new genus of Neotropical whitefly, secreting blue-iridescent wax (Sternorrhyncha, Aleyrodidae, Aleurodicinae), and its parasitoids (Hymenoptera, Aphelinidae). Journal of Natural History 33: 1545-1559.

POLASZEK, A., AND M. HAYAT. 1990. *Dirphys boswelli* (Hymenoptera: Aphelinidae), an egg-parasitoid of Plataspidae (Heteroptera). Journal of Natural History 24: 1-5.

POLASZEK, A., AND M. HAYAT. 1992. A revision of the genera *Dirphys* Howard and *Encarsiella* Hayat (Hymenoptera: Aphelinidae). Systematic Entomology 17: 181-197.

SHAFEE, S. A., AND S. RIZVI. 1991 (1990). Classification and phylogeny of the family Aphelinidae (Hymenoptera: Chalcidoidea). Indian Journal of Systematic Entomology 7: 103-115.

VIGGIANI, G. 1986. Notes on some species of *Coccophagus* Westwood, *Coccophagoides* Girault, *Encarsia* Foerster and *Encarsiella* Hayat (Hymenoptera: Aphelinidae), mainly from the Nearctic and Neotropical regions. Bolletino del Laboratorio di Entomologia Agraria "Filippo Silvestri" Portici 43: 59-78.

YASNOSH, V. A. 1976. Classification of the parasitic Hymenoptera of the family Aphelinidae (Chalcidoidea). Entomological Review 55: 114-120.

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