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

Authors: S. N. Myartseva, and J. M. Coronado-Blanco
Source: Florida Entomologist, 85(4) : 620-624
Published By: Florida Entomological Society
URL: https://doi.org/10.1653/0015-4040(2002)085[0620:ANPOWF]2.0.CO;2
A NEW PARASITOID OF WHITEFLIES FROM MEXICO, WITH A KEY TO NEW WORLD SPECIES OF THE GENUS ENCARSIELLA (HYMENOPTERA: APHELINIDAE)

S. N. MYARTSEVA ¹² AND J. M. CORONADO-BLANCO ¹

¹UAM Agronomía y Ciencias, Universidad Autónoma de Tamaulipas, 87149 Ciudad Victoria Tamaulipas, México

²National Institute of Deserts, Flora, and Fauna, Ministry of Nature Protection of Turkmenistan 744000 Ashgabat, Turkmenistan

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 (Gómez & 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 ENCARSIIA.

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
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. pitheca* 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 cocus* (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 narrovi* (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 narrovi* (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 dugesi* 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 undescribed 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 TAMAILIPECA
**MYARTESEVA 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. Metasoma 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–F3 and club (3–jointed) with the following ratios, length/width: R:15:9, S:60:15, P:22:13, F1–18:12, F2–25:14, F3–20:15, club–67:20. Pedicel slightly longer than F1, club slightly longer than funicle and scape. F4, F5, and club joints with two longitudinal sensilla each, sensilla absent on F1. 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 0.5× length of gaster (in dry specimens); ovipositor longer than middle tibia (14:11), sheaths about 0.5× inner plates.
Figs. 1-3. *Encarsiella tamaulipec*ae, *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 (× 280), 6- antenna, male (× 200).
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 wing length/ratios: R = 11:8, S = 50:13, P = 17:13, F1–31:14, F2–36:15, F3–35:15, F4–34:16, F5–35:16, F6–34:13. Pedicel slightly less than 0.5× F1; club as long as the two preceeding segments together. F1–5 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 > F1), and club (F2 > F3), absence of sensilla on F1, 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 length) (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. Chouvakina; 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 paratype 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.

---

**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. F1 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. F1 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)
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. pithecira 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).

ACKNOWLEDGMENTS

The authors thank V. A. Triapitzin (Universidad Autónoma de Tamaulipas, Ciudad Victoria, Mexico and Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia) for valuable consultations; M. Hayat (Department of Zoology, Aligarh Muslim University, Aligarh, India) and G. A. Evans (Entomology and Nematology Department, University of Florida, Gainesville, Florida, USA) for sending important articles on the Aphelinidae and also for reviewing the manuscript; Mrs. E. Ya. Chouvakhina, who collected specimens of Encarsia norae and for critically reviewing an earlier version of this manuscript. CONACyT, Mexico, through the “Cátedras Patrimoniales de Excelencia” Program, and Research Project 31620-B, provided funding.

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 afelíni-dos 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 Cal-cidoideos 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 Aleurodon 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.

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.

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

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

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

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

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

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

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

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