

## Species-group *cubensis* of the genus *Encarsia* Förster, 1878 (Hymenoptera: Aphelinidae) from Mexico with description of a new species

### Виды рода *Encarsia* Förster, 1878 группы *cubensis* (Hymenoptera: Aphelinidae) из Мексики с описанием нового вида

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KEY WORDS: Aphelinidae, *Encarsia*, taxonomy, Mexico, new species, key.

КЛЮЧЕВЫЕ СЛОВА: Aphelinidae, *Encarsia*, таксономия, Мексика, новый вид, определительный ключ.

ABSTRACT. *Encarsia trjapitzini* Myartseva, **sp.n.** from the state of Michoacán, Mexico, is described and illustrated. Data on hosts and distribution, and a key to females of six Mexican species of the *cubensis* species-group are given.

РЕЗЮМЕ. Описан и иллюстрирован новый вид *Encarsia trjapitzini* Myartseva, **sp.n.** из штата Мичоакан, Мексика. Приведены данные по хозяевам, распространению и таблица для определения самок шести мексиканских видов группы *cubensis*.

#### Introduction

The family Aphelinidae belongs to the superfamily Chalcidoidea and contains about 1350 species from 36 genera of the world fauna [Kim & Heraty, 2012; Noyes, 2012]. Species of this family are primary or secondary parasitoids of Hemiptera, generally of families Aleyrodidae, Diaspididae and Coccidae.

*Encarsia* is one of the largest and economically most important genera of the Chalcidoidea, comprising about 400 species worldwide [Hayat, 2011; Noyes, 2012]. Some species were introduced into several countries, including Mexico, as agents of biological control of hemipteran pests, primarily pests of citrus and other agricultural crops [Myartseva & Ruíz-Cancino, 2000; Myartseva & Evans, 2008].

Mexican fauna of the Aphelinidae was recently revised by Myartseva et al. [2012]. This revision contains morphological and biological data on 184 species from 12 genera occurring in Mexico, including 21 introduced species. In this work, 94 Mexican species of *Encarsia* are divided into 20 species-groups, according to the recent revisions of the genus [Evans & Polaszek,

1997; Heraty & Polaszek, 2000; Hayat, 2011].

In this paper, we describe a new species of *Encarsia* of the *cubensis* species-group and give a taxonomic list of other five species of this group occurring in Mexico. A key to these species is also provided.

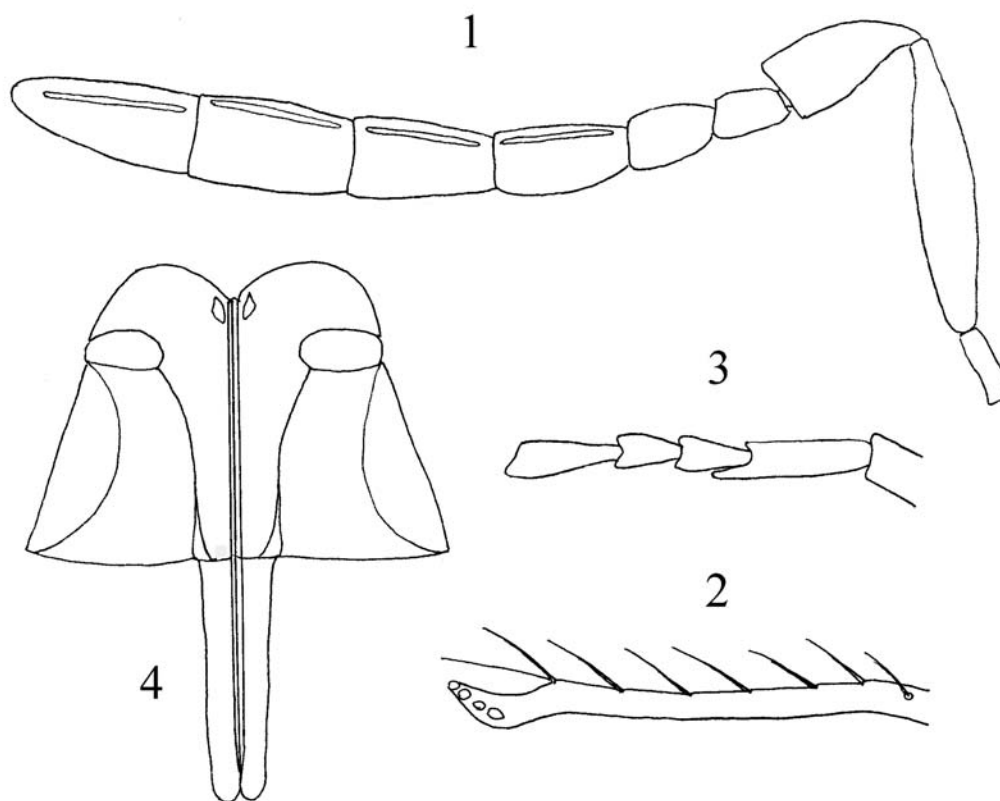
#### Taxonomic part

Family Aphelinidae  
Genus *Encarsia* Förster, 1878  
*Cubensis* species-group

This species-group was recognized by Gahan [1931], and a revision with complete diagnosis of this species-group together with a key to six species was published by Evans & Polaszek [1998]. Seven species were known in this species-group in the World fauna until now [Heraty et al., 2007]. All species are distributed exclusively in the Neotropical region, except for *E. nigricephala* which is also known from Oceania.

General morphological characters of the *cubensis* species-group are: female with tarsal formula 5-4-5, fore wing with asetose area around stigmal vein, mesoscutum with two pairs of setae on its mid lobe, scutellar placoid sensilla widely spaced, first flagellar segment the shortest; male with two apical segments of club fused, second flagellar segment (rarely also first segment) with ovoid sensory/glandular structure covered by plate [Evans & Polaszek, 1998].

Species of this group are parasitoids of whiteflies. Some species have economic importance as natural enemies of dangerous pests of agricultural crops. For example, *E. nigricephala* Dozier, 1937 is one of the most effective parasitoids of the *Bemisia tabaci* (Genadius, 1889) species complex, and *E. quaintancei*



Figs 1–4. *Encarsia trjapitzini* sp.n.: 1 — female antenna, 2 — marginal and stigmal veins of fore wing, 3 — middle tarsus and spur of middle tibia, 4 — ovipositor.

Рис. 1–4. *Encarsia trjapitzini* sp.n.: 1 — усик самки, 2 — маргинальная и стигмальная жилки переднего крыла, 3 — средняя лапка и шпора средней голени, 4 — яйцеклад.

Howard, 1907 is a parasitoid of the banded-winged whitefly *Trialeurodes abutiloneus* (Haldeman, 1850) [Evans & Polaszek, 1998].

*Encarsia cubensis* Gahan, 1931

HOSTS. *Aleurothrixus floccosus* (Maskell, 1896), *Aleurotrachelus trachoides* (Back, 1912), *Bemisia tuberculata* Bondar, 1923 [Heraty et al., 2007].

DISTRIBUTION. Brazil, Cuba, Dominican Republic, Guadeloupe, Haiti, Mexico (locality unknown), Puerto Rico, USA (Florida) [Noyes, 2012].

*Encarsia guamuchil* Myartseva et Evans, 2008

HOSTS. *Tetraleurodes* sp. [Myartseva & Evans, 2008].

DISTRIBUTION. Mexico (Guerrero, Tamaulipas).

*Encarsia hamoni* Evans et Polaszek, 1998

HOSTS. *Bemisia tabaci*-species complex, *Tetraleurodes ursorum* (Cockerell, 1910) and *Tetraleurodes* sp. [Heraty et al., 2007].

DISTRIBUTION. Mexico (Sinaloa, Tamaulipas) and USA (Florida) [Myartseva & Evans, 2008; Noyes, 2012].

*Encarsia nigricephala* Dozier, 1937

HOSTS. *Aleurodicus dispersus* Russell, 1965, *Aleurotrachelus atratus* Hempel, 1922, *Bemisia tabaci*-complex, *Dialeurodes kirkaldyi* (Kotinsky, 1907), *Crenidorsum* sp., *Tetraleurodes acaciae* (Quaintance, 1900), *Trialeurodes floridensis* (Quaintance, 1900), *T. abutiloneus* (Haldeman, 1850), *T. vaporariorum* (Westwood, 1856) [Heraty et al., 2007].

DISTRIBUTION. Brazil, Barbados, Colombia, Dominican Republic, El Ecuador, French Polynesia, Guadeloupe, Guatemala, Honduras, Jamaica, Mexico (Distrito Federal, Sinaloa, Tabasco, Tamaulipas), Nauru, Puerto Rico, Reunion, USA, Venezuela [Myartseva & Evans, 2008; Noyes, 2012].

*Encarsia quaintancei* Howard, 1907

HOSTS. *Aleurothrixus floccosus* (Maskell, 1896), *Trialeurodes abutiloneus* (Haldeman, 1850), *Bemisia tabaci*-complex, *Trialeurodes vaporariorum* (Westwood, 1856), *T. packardi* (Morrill, 1903) [Heraty et al., 2007; Myartseva & Evans, 2008].

DISTRIBUTION. Brazil, El Salvador, Guadeloupe, Jamaica, Mexico (Distrito Federal, Quintana Roo, Sinaloa, Yucatán), Puerto Rico, USA, Venezuela [Myartseva et al., 2012; Noyes, 2012].

*Encarsia trjapitzini* Myartseva, **sp.n.**  
Figs 1–4.

**MATERIAL.** Holotype: ♀, Mexico, Michoacán, 30 km N Lazaro Cardenas, 7.VIII.1984, G. Gordh, UCRC Ent. 54336. The holotype is deposited in the Entomological Museum of the University of California, Riverside, California, USA.

**DESCRIPTION. Female.** Body length: 0.6 mm.

**Coloration.** Head brown. Antenna light yellow, radicle and two apical segments of club slightly infusate. Mandible yellow. Malar sulcus black. Pronotum, mid lobe of mesoscutum and axillae brown, scutellum light yellow. Fore wing hyaline. Legs light yellow. Gaster yellow with lateral dark spots on each tergite, excluding tergite 7. Ovipositor light yellow, apices of stylets dark.

**Structure.** Head 1.3 times as wide as high; frontovertex widely transversely striate, slightly shorter than half of head width. Distance between hind ocelli 1.3 times as long as distance from ocellus to eye. Eye setose, about 1.5 times as long as cheek. Mandible with three large teeth. Antennae inserted immediately below level of lower margin of eyes. Distance between toruli about 0.7 times as long as distance from torulus to eye. Antennal radicle 3.5 times as long as wide. Scape about 5.0 times as long as wide. Pedicel twice as long as wide. Two basal segments of funicle are the shortest, first segment 1.3 times as long as wide, second segment about 1.7 times as long as wide and third segment 2.5 times as long as wide. Club 3-segmented, slightly longer than funicle and pedicel combined, and slightly wider than funicle. Flagellar segments 3–6 with single longitudinal sensillum. Mid lobe of mesoscutum and axillae with broad hexagonal sculpture. Mid lobe with 3 pairs of long symmetrical setae. Each axilla with one thin seta. Lateral lobe with 3 thin setae. Scutellum about 0.6 times as long as mid lobe of mesoscutum and about 2.3 times as wide as long. Scutellar placoid sensilla ovoid and widely spaced, separated by distance about 6.0 times as long as width of sensillum. Anterior pair of scutellar setae slightly shorter than posterior pair of setae. Distance between bases of anterior setae slightly longer than distance between bases of posterior setae. Fore wing with asetose area around stigmal vein, 2.8 times as long as maximum width of wing, its marginal fringe about half of wing width; base of wing with 3 setae. Marginal vein slightly longer than submarginal vein, with 6 setae along anterior margin. Hind wing about 9.0 times as long as maximum width of wing, its marginal fringe about 1.7 times as long as wing width. Tarsal formula 5-4-5. Mid tibial spur about half as long as basitarsus. Gastral tergites 2–7 with 2,2,2,4,2 and 4 setae, respectively. Ovipositor not exerted, about 1.1 times as long as mid tibia; third valvula about 0.9 times as long as second valvifer.

**Male.** Unknown.

**COMMENTS.** *Encarsia trjapitzini* **sp.n.** is close to *E. quaintancei*, but can be easily distinguished from this species by its yellow gaster with dark lateral spots on tergites 2–6 and 3-segmented antennal club.

In *E. quaintancei* the gaster is entirely dark brown and the antennal club is 2-segmented. Differences from other Mexican species of the *cubensis* species-group are given in the key.

**ETYMOLOGY.** Named after Dr. Vladimir A. Trjapitzin who has made valuable contribution to the study of Encyrtidae of the World fauna.

**KEY TO FEMALES OF MEXICAN SPECIES OF THE CUBENSIS SPECIES-GROUP**

1. Mid lobe of mesoscutum with 4 setae ..... 2
- Mid lobe of mesoscutum with 6–8 setae ..... 5
2. Gaster completely yellow ..... 3
- Gaster dark brown with central portion yellow ..... 4
3. First flagellar segment twice as long as wide; apical segment of club with pointed apex. Mid lobe of mesoscutum with anterior third to half dark brown .....  
..... *nigricephala* Dozier
- First flagellar segment 0.7 times as long as wide; apical segment of club with rounded apex. Mid lobe of mesoscutum dark brown with yellow margins .....  
..... *guamuchil* Myartseva & Evans
4. Second flagellar segment longer than third segment; club 2-segmented. Third valvula 0.6 times as long as second valvifer ..... *cubensis* Gahan
- Second flagellar segment shorter than third segment; club 3-segmented. Third valvula 0.4 times as long as second valvifer ..... *hamoni* Evans & Polaszek
5. Gaster completely dark brown. First-second flagellar segments equal in length; club 2-segmented. Fore wing with marginal fringe 0.3 times as long as wing width .....  
..... *quaintancei* Howard
- Gaster yellow with dark lateral spots. First flagellar segment 0.8 times as long as second segment; club 3-segmented. Fore wing with marginal fringe half as long as wing width ..... *trjapitzini* Myartseva, **sp.n.**

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**References**

- Dozier H.L. 1937. Descriptions of miscellaneous chalcidoid parasites from Puerto Rico // Journal of Agriculture of the University of Puerto Rico. Vol.21. P.121–135.
- Evans G.A., Polaszek A. 1997. Additions to the *Encarsia* parasitoids (Hymenoptera: Aphelinidae) of the *Bemisia tabaci* complex (Hemiptera: Aleyrodidae) // Bulletin of Entomological Research. Vol.87. P.563–571.
- Evans G.A., Polaszek A. 1998. The *Encarsia cubensis* species-group (Hymenoptera: Aphelinidae) // Proceedings of the Entomological Society of Washington. Vol.100. No.2. P.222–233.

- Gahan A.B. 1931. A new species of *Encarsia* from Cuba (Hymenoptera: Aphelinidae) // Proceedings of the Entomological Society of Washington. Vol.33. P.121–122.
- Hayat M. 2011. Additions to the Indian Aphelinidae (Hymenoptera: Chalcidoidea) – III: The genus *Encarsia* Förster // Oriental Insects. Vol.45. No.2–3. P.202–274.
- Heraty J.M., Polaszek A. 2000. Morphometric analysis and descriptions of selected species in the *Encarsia strenua* group (Hymenoptera: Aphelinidae) // Journal of Hymenoptera Research. Vol.9. No.1. P.142–169.
- Heraty J., Woolley J., Polaszek A. 2007. Catalog of the *Encarsia* of the World. <http://www.faculty.ucr.edu/~heraty/Encarsia.cat.pdf> 87 pp. (work in progress) (Last updated: February 20, 2013).
- Howard L.O. 1907. New genera and species of Aphelininae, with a revised table of genera // Technical Series. United States Department of Agriculture, Bureau of Entomology. No.12. Part 4. P.69–88.
- Kim J.-W., Heraty J. 2012. A phylogenetic analysis of the genera of Aphelininae (Hymenoptera: Aphelinidae), with a generic key and descriptions of new taxa // Systematic Entomology. Vol.37. P.497–549.
- Myartseva S.N., Evans G.A. 2008. Genus *Encarsia* Förster of Mexico (Hymenoptera: Chalcidoidea: Aphelinidae). A revision, key and description of new species. Serie Avispas Parasíticas de Plagas y otros Insectos. No.3. Universidad Autónoma de Tamaulipas, Ciudad Victoria, México. 320 pp.
- Myartseva S.N., Ruíz-Cancino E. 2000. Annotated checklist of the Aphelinidae (Hymenoptera: Chalcidoidea) of Mexico // Folia Entomológica Mexicana. Vol. 109. P.7–33.
- Myartseva S.N., Ruíz-Cancino E., Coronado-Blanco J.M. 2012. Aphelinidae (Hymenoptera: Chalcidoidea) de importancia agrícola en México. Revisión y claves. Serie Avispas Parasíticas de Plagas y otros Insectos. No.8. Universidad Autónoma de Tamaulipas, México. 413 pp.
- Noyes J.S. 2012. Universal Chalcidoidea Database [online]. Worldwide Web electronic publication. <http://www.nhm.ac.uk/entomology/chalcidoids/index.html> (Last updated: June 2012).