

A new species of the genus *Encarsia*
(Hymenoptera: Aphelinidae) — parasitoid of
Aleurocybotus occiduus Russell (Hemiptera: Aleyrodidae)
from Mexico

Новый вид рода *Encarsia*
(Hymenoptera: Aphelinidae) — паразитоид
Aleurocybotus occiduus Russell (Hemiptera: Aleyrodidae)
из Мексики

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КЛЮЧЕВЫЕ СЛОВА: Aphelinidae, *Encarsia*, Aleyrodidae, Мексика, новый вид, обзор.

ABSTRACT. *Encarsia longitarsis* Myartseva, **sp.n.** from the State of Sinaloa, México is described and illustrated. A review of parasitoid species of the whitefly *Aleurocybotus occiduus* Russell is given.

РЕЗЮМЕ. Описан и иллюстрирован новый вид *Encarsia longitarsis* Myartseva, **sp.n.** из штата Синалоа, Мексика. Дан обзор видов паразитоидов белокрылки *Aleurocybotus occiduus* Russell.

Introduction

The genus *Aleurocybotus* Quaintance et Baker, 1914 (fam. Aleyrodidae) includes three species, which are distributed in the Nearctic and Neotropical regions, their host plants are grasses from the families Poaceae and Cyperaceae [Evans, 2008]. *Aleurocybotus occiduus* Russell, 1964 was described from California and later was found in other southern states of the USA, and also in Hawaii, El Salvador and Peru. 14 species of grasses were recorded as hosts of this whitefly. *A. occiduus* is known as important pest of rice and sorghum in El Salvador [Serrano et al., 2006].

In Mexico, *A. occiduus* was registered for the first time in December 2006 [Ortega-Arenas et al., 2008]. Colonies of whitefly in north of the State of Sinaloa infested maize, sorghum, sugarcane and several wild graminous plants. Its nymphs developed successfully on 8 plant species: on wild grasses *Sorghum halepense*, *Cenchrus ciliaris*, *Cynodon dactylon*, *Chloris gayana*,

Echinochloa colonum (Poaceae), *Cyperus rotundus* (Cyperaceae) and on cultivated crops, *Sorghum vulgare* and *Saccharum officinarum* (Poaceae). In north Sinaloa, in Guasave and Los Mochis regions, grain crops (maize, sorghum, wheat, grasses and sugarcane) are grown on 60 000 hectares [Vejar-Cota, 2007b]. Complete development of *A. occiduus* can continue 36–50 days on *C. rotundus* in California [Poinar, 1965]. Farmers of Guasave region found that this whitefly was a serious pest of maize, sorghum and sugarcane and assistance of government agencies was needed to control this new cereal pest.

Due to economic importance of *A. occiduus* as a new regional pest of agricultural crops, we tried to find and identify its natural enemies, i.e. parasitic wasps belonging to Chalcidoidea. This article includes the description of a new species *Encarsia longitarsis* Myartseva, **sp.n.**, and a review of parasitic wasps reared from the whitefly *A. occiduus*, according to the original and previously published data.

During July–November 2007, the period of more active infestation and spread of the whitefly on *Saccharum* spp. and other Poaceae in Guasave, Sinaloa, nymphs and puparia were collected on leaves of those plants and later transferred into laboratory for rearing parasitoids. Reared parasitoids were kept in 70% alcohol. Parasitoid specimens were studied and identified in the Biological Laboratory of División de Estudios de Postgrado e Investigación, UAM Agronomía y Ciencias, Universidad Autónoma de Tamaulipas, Cd. Victoria, México.

Some specimens were dissected and mounted on slides in Canada balsam for morphological studies. Certain keys were used for identification of parasitic wasps [Noyes et al., 1997; Noyes, 2004; Myartseva & Ruíz Cancino, 2004; Myartseva, 2006].

Type and paratypes of the new species are deposited in the Entomological Museum of the University of California in Riverside, State of California, USA and in the Insect Museum of the Tamaulipas University, Ciudad Victoria, Tamaulipas, Mexico.

Encarsia longitarsis Myartseva, **sp.n.**

Figs 1–5.

MATERIAL. Holotype: ♀, México, Sinaloa: Guasave, Ejido A. Ruíz Cortinez, ex *Aleurocybotus occiduus* Russell on *Saccharum* sp., VII-XI. 2007, G. Vejar-Cota. Paratypes: 5 ♀♀ 2 ♂♂, same data as in holotype.

DESCRIPTION. Female. Length of body: 0.8 mm.

Coloration. Head brownish-black, antennae yellow. Postocellar bars black. Mesosoma brownish-black, except lateral lobes, lateral margins of mesoscutum, anterior margin and longitudinal median band on scutellum, brownish yellow. Fore wings hyaline. Legs light yellow. Gaster yellow, with black lateral spot on each tergite, 6th to 7th tergites yellow, apices of stylets black. Dorsal side of gaster with brown longitudinal spot medially.

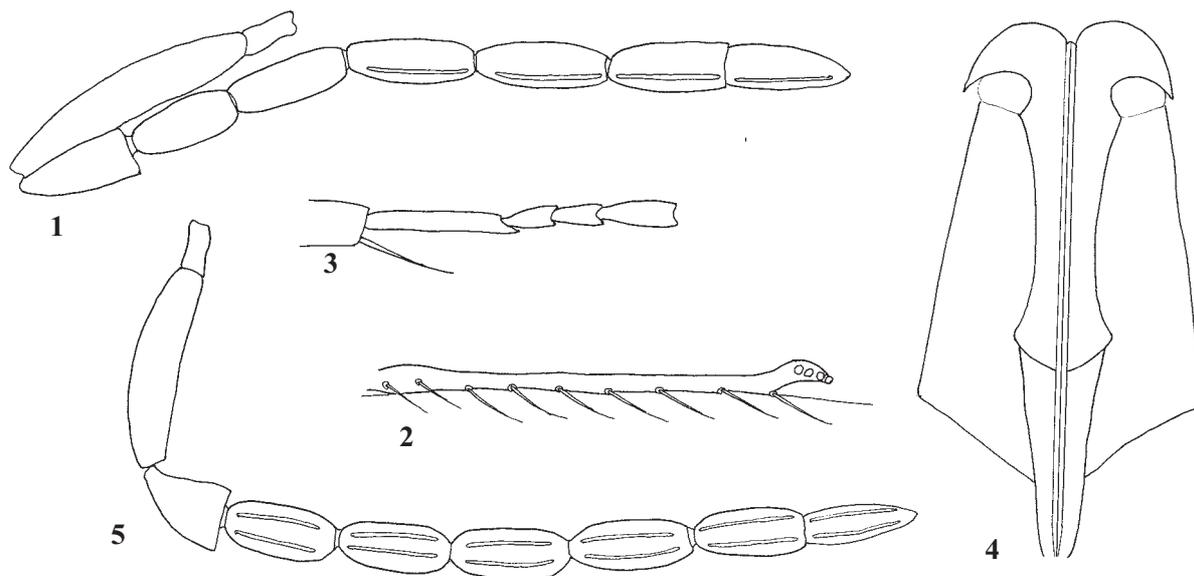
Structure. Head about 1.3x as wide as height; frontover-
tex about 0.6x head width. Occiput transversely striate above foramen. Postocellar bars strong, 4 setae situated behind each bar. Eyes setose, about 1.7x as long as cheeks. Mandible tridentate. Antennae (Fig. 1) inserted immediately under the level of lower margin of eyes. Distance between toruli about 0.7x as long as distance from torulus to eye margin and about 1.5x as long as distance to mouth margin. Inner margins of eyes and toruli with a row of short setae. Antennal radicle about 2 times as long as wide. Scape about 5.6 times as long

as wide. Pedicel twice as long as wide. First funicular segment slightly shorter than subsequent segments (17:21), about 2 times as long as wide, 2nd to 4th segments 2.6, 2.5 and 2.3 times as long as wide, respectively. Club 2-segmented, very slightly shorter than two preceding funicle segments combined or equal to them. Every 3rd to 6th flagellar segments with a single sensillum. Midlobe of mesoscutum and axillae smooth. Midlobe with 6 pairs of symmetric setae. Each axillae and lateral lobe with 1 and 3 setae respectively. Mesoscutum about 1.4 times as wide as long, scutellum about 1.6 times as wide as long. Scutellar placoid sensilla ovoid and widely spaced, separated by a distance of about 4x width of sensillum. Distance between anterior pair of scutellar setae about as long as or very slightly shorter than distance between posterior pair of setae. Metanotum with median prominence. Fore wing about 3 times as long as maximum width of wing, uniformly setose, its marginal fringe about 0.2x wing width; with 5–6 setae in the basal group. Marginal vein (Fig. 2) slightly longer than submarginal vein, with 7 setae along anterior margin. Marginal fringe of hind wing about 1.5 times as long as maximum width of wing. Tarsal formula 5–4–5. Midtibial spur (Fig. 3) about 0.6 times as long as basitarsus; basitarsus long, only slightly shorter than all subsequent tarsal segments combined. 2nd to 7th gastral tergites with 2, 2, 2, 2, 4 and 4 setae, respectively. Ovipositor (Fig. 4) slightly exerted, about 1.25 times as long as middle tibia; third valvulae about 0.6 times as long as second valvifer.

Male. Body length: 0.6–0.7 mm.

Coloration of head and mesosoma as in female. Venation of fore wing infusate. Gaster blackish brown.

Structure. Head slightly wider than high. Eyes 1.2 times as long as cheeks. Antennal scape (Fig. 5) about 4.2 times as long as wide, pedicel 1.5 times as long as wide. First funicular segment about twice as long as wide, subsequent segments slightly more than 2 times as long as wide. Club slightly shorter than two preceding funicular segments combined. Each flagellar segment with two sensilla. Sculpture and



Figs 1–5. *Encarsia longitarsis* Myartseva, **sp.n.**: 1 — female antenna, 2 — marginal vein of fore wing, 3 — midtibial spur and middle tarsus, 4 — ovipositor, 5 — male antenna.

Рис. 1–5. *Encarsia longitarsis* Myartseva, **sp.n.**: 1 — усик самки, 2 — маргинальная жилка переднего крыла, 3 — шпора средней голени и средняя лапка, 4 — яйцеклад, 5 — усик самца.

Table. Parasitic wasps (Hymenoptera: Chalcidoidea) reared from *Aleurocybotus occiduus*
 Таблица. Паразитические перепончатокрылые (Hymenoptera: Chalcidoidea), выведенные из *Aleurocybotus occiduus*

Parasitoids	Country	References
Fam. Aphelinidae		
<i>Encarsia longitarsis</i> sp.n.	Mexico, Sinaloa	our data
<i>Encarsia luteola</i>	USA, California	Noyes, 2008
	Mexico, Sinaloa	our data
<i>Encarsia protransvena</i>	Mexico, Sinaloa	our data
<i>Eretmocerus</i> spp.	Mexico, Sinaloa	our data
Fam. Encyrtidae		
<i>Metaphycus</i> sp.	Mexico, Sinaloa	our data
Fam. Eulophidae		
<i>Euderomphale hyalina</i>	USA, California	La Salle & Schauff, 1994

setation of mesosoma as in female. Fore wing 2.6 times as long as maximum width of wing, its marginal fringe 0.4 times as long as wing width, base with 4 short setae. Hind wing about 10 times as long as maximum width of wing, its marginal fringe 1.6 times as long as wing width. Genitalia 0.7 times as long as middle tibia.

COMMENTS. *E. longicornis* **sp.n.** is close to *E. variegata* Howard, 1908, but differs by follows: in *E. variegata*: face yellow, antennal radicle infusate, scutellum iridescent (in living females), silvery white, gaster without median elongate spot, ovipositor 1.7 times as long as middle tibia, third valvula 0.7 times as long as second valvifer, sculpture of mesoscutum and axillae distinctly reticulate, basitarsus of middle leg slightly longer than two subsequent tarsal segments combined; in *E. longitarsis*: face brownish-black, antennal radicle yellow, scutellum brownish black, gaster with median elongate spot, ovipositor 1.25 times as long as middle tibia, third valvula 0.6 times as long as second valvifer, sculpture of mesoscutum and axillae smooth, basitarsus of middle leg very slightly shorter than three subsequent tarsal segments combined.

E. longicornis **sp.n.** belongs to the '*luteola*' species group, which includes 6 species in Mexico: *E. haitiensis* Dozier, 1932, *E. hispida* De Santis, 1948, *E. meritoria* Gahan, 1927, *E. variegata*, *E. formosa* Gahan, 1924, and *E. luteola* Howard, 1895 [Myartseva & Varela-Fuentes, 2005].

Two species of chalcidoid wasps are known as parasitoids of *A. occiduus* in California, USA: *E. luteola* Howard (fam. Aphelinidae) and *Euderomphale hyalina* (Compere et Annecke, 1961) (fam. Eulophidae). A complex of parasitic wasps was reared in Sinaloa from this whitefly: *Encarsia longitarsis* **sp.n.** described in this article, *E. luteola*, *E. protransvena* Viggiani, 1985, undescribed species of *Metaphycus* (Encyrtidae), and three unidentified species of the genus *Eretmocerus*. Thus, complex of parasitic wasps attacking whitefly *A. occiduus* includes more than six species from four genera and three families of Chalcidoidea (Table).

E. luteola has many other hosts belonging to the Aleyrodidae: *Aleurocanthus* sp., *Aleyrodes* sp., *Bemisia*

tabaci Gennadius, 1889, *Dialeurodes* sp., *Dialeurodicus* sp., *Tetraleurodes acaciae* (Quaintance, 1900), *Tetraleurodes* sp., *Trialeurodes abutiloneus* (Haldeman, 1850), *T. fernaldi* (Morrill, 1903), *T. packardi* (Morrill, 1903), *T. vaporariorum* (Westwood, 1856), *T. variabilis* (Quaintance, 1900), *Trialeurodes* sp. [Noyes, 2008; Myartseva & Evans, 2008]. This species inhabits the Neotropical region: Brazil, Cuba, Guadeloupe, Martinique, Puerto Rico, U.S.A., introduced into Israel; Mexico — Colima, Guerrero, Sinaloa, Tamaulipas.

E. protransvena also has many other hosts belonging to the Aleyrodidae: *Aleurocanthus* sp., *Aleurolobus* sp., *Aleuroplatus elemarae* Mound & Halsey, 1978, *Aleuroplatus ilicis* Russell, 1944, *Aleurotrachelus rubi* Takahashi, 1933, *Bemisia tabaci*, *Crenidorsum* sp., *Dialeurodes citri* (Ashmead, 1885), *D. kirkaldyi* (Kotinsky, 1907), *Dialeurodicus* sp., *Parabemisia myricae* (Kuwana, 1927), *Singhiella citrifolii* (Morgan, 1893), *Trialeurodes abutiloneus*, *T. packardi*, *T. vaporariorum*, *T. variabilis* [Noyes, 2008; Evans, 2007; Myartseva & Evans, 2008]. This species inhabits many countries: Australia, Brazil, Cayman Islands, China, Colombia, Egypt, Fiji, Hawaii, Honduras, Iran, Pacific Islands, Puerto Rico, Spain, Taiwan, U.S.A.; Mexico — Sinaloa.

The biodiversity and activity of parasitoids in north of Sinaloa controlled *A. occiduus* in 2007 [Vejar-Cota, 2007a, b], and the cereal whitefly also has its populations beyond the economical level.

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