Russian Entomol. J. 12(4): 381–384

New species of the genus *Euderomphale* Girault, 1916 (Hymenoptera: Eulophidae) — parasitoids of whiteflies (Homoptera: Aleyrodidae) from Mexico

Новые виды рода *Euderomphale* Girault, 1916 (Hymenoptera: Eulophidae) — паразитоиды белокрылок (Homoptera: Aleyrodidae) из Мексики

S.N. Myartseva
С.Н. Мярцева

National Institute of Deserts, Flora and Fauna, Ashgabat 744000 Turkmenistan.
Национальный институт пустынь, флоры и фауны, Ашхабад 744000 Туркменистан.
División de Estudios de Postgrado e Investigación, U.A.M. Agronomía y Ciencias, Universidad Autónoma de Tamaulipas, Ciudad Victoria, Tamaulipas 87149 México.
Отдел аспирантуры и научных исследований, Агрономический факультет Автономного Университета штата Тамаулипас, Сьюдад Виктория, Тамаулипас 87149 Мексика.

KEY WORDS: Eulophidae, Entedoninae, Euderomphalini, *Euderomphale*, Aleyrodidae, taxonomy, Mexico.
КЛЮЧЕВЫЕ СЛОВА: Eulophidae, Entedoninae, Euderomphalini,*Euderomphale*, Aleyrodidae, таксономия, Мексика.

ABSTRACT. Two new species of the genus *Euderomphale* are described from Mexico: *chapultepec* sp.n. and *mexicana* sp.n. Both species were reared from whiteflies belonging to the subfamily Aleyrodinae of the family Aleyrodidae. A key to species of the genus *Euderomphale* of North and Central America is given.

РЕЗЮМЕ. В статье описаны два новых вида рода *Euderomphale* из Мексики: *chapultepec* sp.n. и *mexicana* sp.n. Оба вида были выведены из белокрылок, относящихся к подсемейству Aleyrodinae семейства Aleyrodidae. Дается определительная таблица видов рода *Euderomphale* Северной и Центральной Америки.

Introduction

About 1200 species of whiteflies are known in the world fauna (Homoptera: Aleyrodidae) [Mound & Halsey, 1978]. Most species are distributed in the tropics. The family Aleyrodidae has been studied very poor in Mexico. 65 species from 28 genera are known now from this country [Mejia*et al*., 1994]. Several whiteflies have an economic importance as pests of agricultural crops and ornamentals and as vectors of plant viral diseases. Therefore the study of natural enemies of whiteflies as agents of biological control of these pests in many countries is of large importance.

Parasitoids of whiteflies are known in the following families of Hymenoptera: Aphelinidae, Eulophidae, Signiphoridae and Platygastridae. 35 species of parasitoids of whiteflies from the family Aphelinidae were found in Mexico, mostly from the genera *Encarsia* and *Eretmocerus* [Myartseva & Ruiz, 2000]. Parasitoids of whiteflies of the family Eulophidae belong only to the subfamily Entedonina and the tribe Euderomphalini. This tribe contains 7 genera with 24 species. In their excellent systematic review of the tribe Euderomphalini La Salle and Schauff [1994] divided all genera into two groups: the *Entedononecremnus* group and the *Euderomphale* group. Most species being restricted to the tropics, only the genus *Euderomphale* is almost cosmopolitan; 11 species from 5 genera were found in the New World:*Euderomphale* Girault (5 species),*Neopomphal*e La Salle & Schauff (2 species),*Aleuroctonus* La Salle & Schauff (one species),*Dasyomphale* La Salle & Schauff (one species) and *Entedononecremnus* Girault (2 species). Only the last genus was previously known for Mexico [La Salle & Schauff, 1994; Myartseva & Ruiz, 2001]. The author reared three new species of the genus *Entedononecremnus* from Mexican whiteflies [Myartseva, in press], two new species of *Euderomphale* (a new genus for Mexico) are described in this article. A key to 7 species of *Euderomphale* of North and Central America is given.

Genus *Euderomphale* Girault, 1916

Type species: *Euderomphale fuscipennis* Girault, 1916: 410 [= *E. flavimedia* (Howard, 1881)], original designation.

The genus *Euderomphale* was described by Girault from Maryland, USA. Species of this genus from Eu-

Printed in 2004.

rope, India, Madagascar, Madeira, North and Central America were described later [La Salle & Schauff, 1994]. Now *Euderomphale* contains 15 species; it is the biggest and widely distributed genus of the tribe Euderomphalini. La Salle separated two species groups within the genus *Euderomphale*: the *flavimedia* group, containing 13 species, and the *sinuata* group, containing two species. He also found a brachypterous species of *Euderomphale*, this representing the first record of brachyptery in the Euderomphalini [La Salle, 1999].

Generally *Euderomphale* differs in its morphology from other genera of the tribe Euderomphalini by presence of the large axilla, which is completely separated from the mesoscutum by a distinct suture; malar sulcus incomplete and directed posteriorly away from the mouth margin. La Salle and Polaszek [2000] discovered the presence of antero-lateral abdominal glands in *Euderomphale cortinae* Graham and *E. flavimedia* (Howard). These morphological structure was known earlier only in the family Braconidae, subfamily Braconinae [Quicke *et al*., 1997]. A single pair of the glands is situated in both sexes between the terga and sterna of the second metasomal segment. They are believed to produce an odoriferous secretion, but the exact function of glands in *Euderomphale* is unknown as well as in the braconines. It is the first report of the presence of these glands in a member of the Chalcidoidea [La Salle & Polaszek, 2000].

Species of *Euderomphale* are specialized parasitoids of whiteflies of the subfamily Aleyrodinae (family Aleyrodidae). These hosts belong to the genera *Bemisia, Asterobemisia, Aleyrodes, Aleurocybotus, Tetraleurodes, Aleurochiton* and *Aleurolobus*. New species from Mexico were reared from *Aleyrodes* sp. and *Aleurothrixus floccosus* (Maskell).

Key to species of *Euderomphale* of North and Central America

1. Axilla sinuate and concave anteriorly. Frontovertex with a distinct transverse carina; posterior ocelli situated behind this carina. Prepectus free ..... *sinuata* group....2
— Axilla smoothly rounded anteriorly. Frontovertex smoothly rounded posteriorly; posterior ocelli situated on top of the head. Prepectus partly fused to mesopleuron anteriorly ..... *flavimedia* group....3
2. Wings strongly reduced, not extending behind the first gastral tergite and infumated. Gaster uniformly dark brown ..... *sinuata* La Salle, 1999
— Wings normal, extending to or behind the apex of abdomen, hyaline or very slightly infumated. Gaster yellow or pale brown, with dark transverse strips .... *suzannae* La Salle, 1999
3. Fore wings with an infumation beneath the marginal vein 4
— Fore wings hyaline .... *hyalina* (Compere & Annecke, 1961)
4. Infumation extends approximately to the middle of wing. Second funicular segment about 0.7x as long as pedicel. Marginal vein more than 3x as long as submarginal vein ..... *quercicola* Dozier, 1933
— Infumation extends to the posterior margin of wing 5
5. Antennal clava as long as the scape, terminal spine nearly as long as third claval segment; second funicular segment about 2.5x as long as first funicular segment. Marginal vein subequal to the submarginal one; marginal fringe about 4x shorter than maximal wing width . Male scape slender ..... *flavimedia* (Howard, 1881)
— Antennal clava shorter than scape, terminal spine about 0.5x as long as third claval segment; second funicular segment does not exceed 2x as long as first funicular segment. Marginal vein of variable length, but not subequal to the submarginal; marginal fringe about 4x shorter than maximal wing width. Male scape widened 6
6. Marginal vein about 1.5x as long as submarginal vein. Second funicular segment about 0.5x as long as pedicel; clava about 1.6x as long as wide. Fore tarsi white, except apical segment; pedicel whitish-yellow. In male scape less 2x as long as wide ..... *mexicana* sp.n.
— Marginal vein about 0.6x as long as submarginal vein. Second funicular segment about 0.4x as long as pedicel; clava about 3x as long as wide. Fore tarsi brown; pedicel brown basally. In male scape about 3x as long as wide ..... *chapultepec* sp.n.

Description of new species

Euderomphale chapultepec Myartseva, **sp.n.**
Figs 1–3.

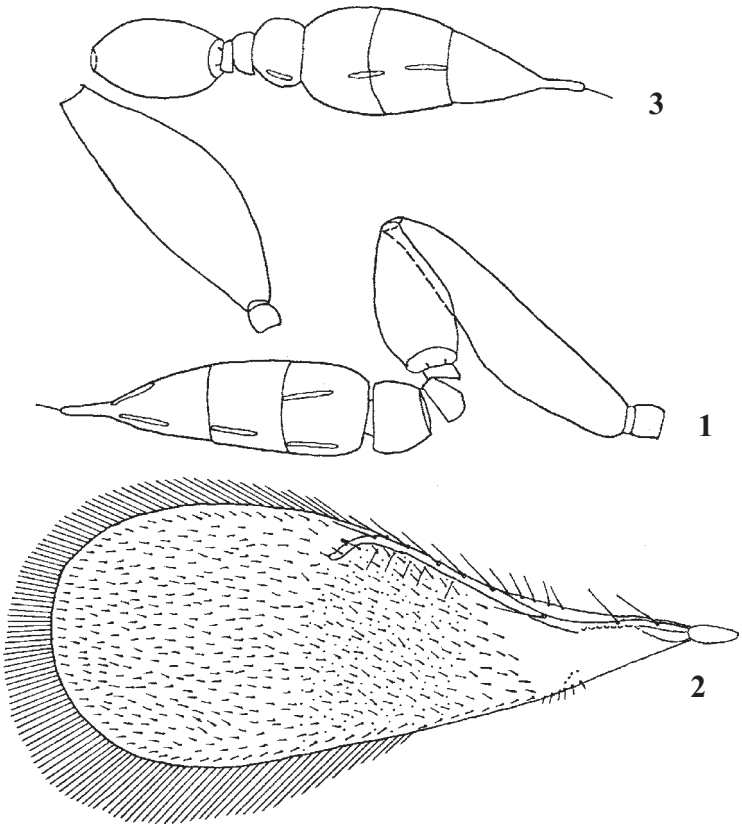
Type material. Holotype female, mounted on a slide, labelled: Mexico, Mexico City, Chapultepec, ex *Aleyrodes* sp., 21−VI−2000 (D.Kasparyan). Paratypes − the same data as holotype, 4 ♂♂ on slides, 4 ♂♂ in alcohol.

The holotype (♀) and ♂ paratype are deposited in the Entomological Museum of University of California, Riverside, USA; 7 ♂♂ paratypes are deposited in the National Museum of Natural History, Washington, D.C., USA; the Natural History Museum, London, United Kingdom; the Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia; the Entomological Museum of University of Tamaulipas, Ciudad Victoria, Mexico.

DESCRIPTION. Female – body length 0.78 mm.

Coloration. Head black, with light metallic lustre; antennal scape brown, pedicel yellow with brown base, funicle and clava greyish; labial and maxillary palpi black. Mesosoma black, with light metallic lustre; legs black, fore tarsi brown, middle and hind tarsi white, except black apical segment; fore wings with infumation beneath marginal and stigmal veins, extending to posterior margin of wing; venation fuscous. Metasoma brown to black, with light metallic lustre, second tergite yellow. Ovipositor sheaths black.

Structure. Head not wider than mesosoma, more wide than high (about 1.3x). Frontovertex about 0.5x head width. Ocelli in obtuse triangle; posterior ocelli separated from eye margin by a distance slightly shorter than that between posterior and anterior ocelli. Occipital margin almost straight. Labial and maxillary palpi 1-segmented each, labial palpi widened. Mandibles with two teeth. Eyes with parallel inner margins, slightly more 2x as long as cheeks. Antennae (Fig. 1) inserted immediately above the level of lower eye margin. Radicula very short and quadrate; scape about 4.5x as long as wide; pedicel about 2x as long as wide and about 0.5x as long as scape; funicular segments transverse, the first 0.6x as long as wide, the second 0.8x as long as wide and 2x as long as first segment; clava slightly more 3x as long as wide, with a long apical spine, about 0.5x as long as third claval segment. Mesosoma polished and shining; scutellum about



Figs 1–3. *Euderomphale chapultepec*, sp.n.: 1 — antenna, female, 2 — fore wing, 3 — antenna, male.

Рис. 1–3. *Euderomphale chapultepec*,sp.n.: 1 — усик самки, 2 — переднее крыло, 3 — усик самца.

2x as wide as long. Fore wing (Fig. 2) about 2.5x as long as wide, marginal fringe about 5x shorter than maximal wing width. Marginal vein about 0.6x as long as submarginal vein; stigmal vein about 0.4x as long as marginal vein. Midtibial spur shorter than basitarsus (about 0.7–0.8x). Metasoma slightly longer than mesosoma, rounded, polished, the second tergite very weakly sclerotized. Ovipositor almost not exserted, about 1.4X as long as middle tibia, sheaths about 0.6x as long as inner plates.

Male. Body length 0.76–0.90 mm.

Similar to female in coloration and structure, except for genitalia and: antennal scape widened and about 3x as long as wide (Fig. 3); eyes slightly less 2x as long as cheeks; frontovertex more than 0.5x head width; labial palpi not widened; phallobase of genitalia about 0.5x as long as middle tibia.

COMMENTS. Differences of *E. chapultepec* sp.n. from other American species of *Euderomphale* are given in the key.

Euderomphale mexicana Myartseva, **sp.n.**
Figs 4–6.

Type material. Holotype ♀, mounted on a card (antenna and fore wing mounted on a slide), labelled: México, Tamaulipas, Gomez Farias, Nacimiento, ex *Aleurothrixus floccosus* (Maskell), 16–XI–1998 (S. Myartseva). Paratypes – same data as holotype, 1 ♂ (mounted on a slide); Ciudad Victoria, sweeping, 11–XI–1998, ♀ (mounted on a slide) (S. Myartseva).

The holotype (♀) and ♂ paratype are deposited in the Entomological Museum of University of California, Riverside, USA; a ♀ paratype is deposited in the National Museum of Natural History, Washington, D.C., USA.

DESCRIPTION. Female – body length 0.60 mm.

Coloration. Head black, with light metallic lustre; antennal scape brown, pedicel light yellow, funicle and clava infuscate to light brown. Mesosoma black, with light metallic lustre; legs black, all tarsi white, except black apical segment; fore wings with infumation beneath marginal and stigmal veins; venation brown. Metasoma dark brown to black, with light metallic lustre, second tergite light brown. Ovipositor sheaths brown.

Structure. Head not wider than mesosoma, more wide than high (about 1.3x). Frontovertex about 0.6x head width. Ocelli in obtuse triangle; distance between posterior oculus and eye margin subequal to that between posterior and anterior ocelli. Labial palpi widened. Eyes about 2.5x as long as cheeks. Antennae (Fig. 4) inserted immediately above the level of lower eye margin. Scape about 4x as long as wide; pedicel 1.8x as long as wide and about 0.5x as long as scape; funicular segments transverse, the first 2x as wide as long, the second 1.5x as wide as long; clava 1.6x as long as wide, terminal spine about 0.5x as long as third claval segment. Mesosoma polished and shining; scutellum about 2x as wide as long. Fore wing (Fig. 5) about 2.5x as long as wide, marginal fringe slightly more 5x shorter than maximal wing width. Marginal vein about 1.5x as long as submarginal vein; stigmal vein about 0.2x as long as marginal vein. Midtibial spur shorter than basitarsus. Metasoma subequal in length to mesosoma, rounded, polished and shining. Ovipositor exserted, about 1.4x as long as middle tibia; sheaths about 0.6x as long as inner plates.

Male. Body length 0.60 mm.

Similar to female in coloration and structure, except for genitalia and: antennal scape strongly widened and flattened, 1.7x as long as wide (Fig. 6); eyes about 1.6x as long as cheeks; labial palpi not widened; phallobase of genitalia about 0.6x as long as middle tibia.

COMMENTS. Differences of *E. mexicana* sp.n. from other American species of *Euderomphale* are given in the key.

ACKNOWLEDGEMENTS. The author is very thankful to Dr. A.B. Hamon (Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, Florida, USA) for identification of whiteflies, Dr. E. Ruiz Cancino (U.A.M. Agronomia y Ciencias, Universidad Autonoma de Tamaulipas, Ciudad Victoria, Mexico) for help in collecting trips, Dr. D.R. Kasparyan (Zoological Institute of Russian Academy of Sciences, Sanct Petersburg, Russia) for collecting interesting material on whiteflies. The work was partially funded through the Project of CONACYT "Taxonomy of four families of Hymenoptera Parasitica important for biological control of pests in Mexico".

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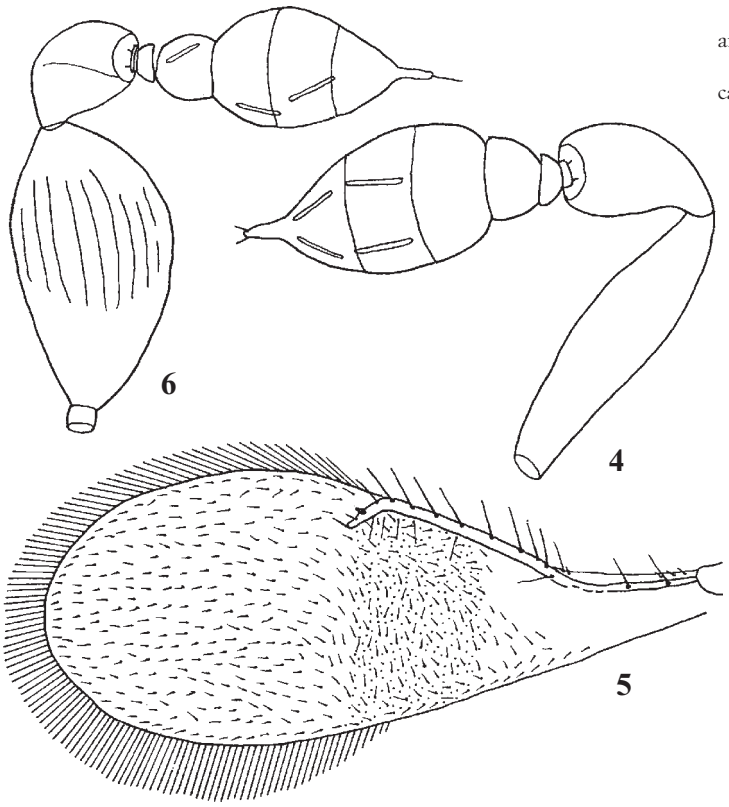

Figs 4–6. *Euderomphale mexicana*, sp.n.: 4 — antenna, female, 5 — fore wing, 6 — antenna, male.

Рис. 4–6. *Euderomphale mexicana*, sp.n.: 4 — усик самки, 5 — переднее крыло, 6 — усик самца.

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