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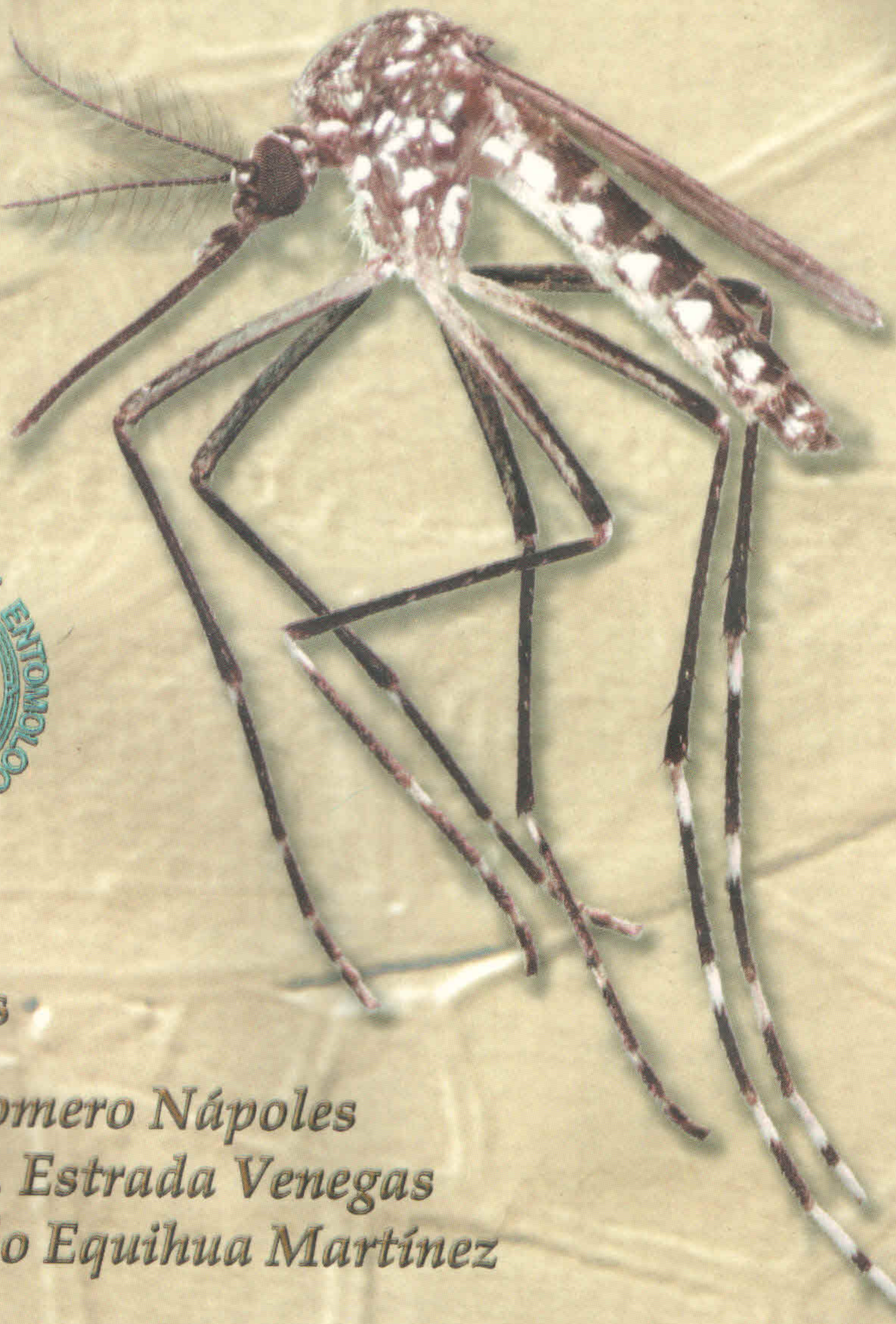

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TWO SPECIES OF THE GENUS *METAPHYCUS* MERCET (HYMENOPTERA: ENCYRTIDAE), PARASITOIDS OF WHITEFLIES (HOMOPTERA: ALEYRODIDAE) IN MEXICO.

Dos especies del género *Metaphycus* Mercet (Hymenoptera: Encyrtidae), parasitoides de mosquitas blancas (Homoptera: Aleyrodidae) en Mexico.

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Introduction.

The species of encyrtid genus *Metaphycus* Mercet are known as primary endoparasitoids of scales from the families Coccidae and Diaspididae. About 30 species have been used in the world for the biological control of about 20 pest species of soft scales and armoured scales (Noyes & Hanson,1996). De Bach (1974) suggested the introduction of *Metaphycus helvolus* (Compere) into California and its use against the soft scale *Saissetia oleae* (Olivier), saved about $300,000 US dollars per year in 1960-1970. Many species are known also as parasitoids of Pseudococcidae, Eriococcidae, Asterolecaniidae and other families of Coccoidea. Some species have been reported as parasitoids of Psyllidae (Noyes y Hanson, 1996; Guerrieri y Noyes, 2000). Parasitism on Aleyrodidae is extremely rare.

Polaszek *et al.* (1992) reported that one species from genus *Metaphycus* was reared from nymphs of the whitefly *Bemisia tabaci* Gennadius; it was the first record for *Metaphycus* from Aleyrodidae. Later, *Metaphycus angustifrons* Compere was recorded from the whitefly *Aleurothrixus floccosus* (Maskell) in USA, Florida, although it is know as parasitoid of the coccid species *Coccus hesperidum* L.; other undetermined species of *Metaphycus* have been reared from Aleyrodidae in the New World from *Aleurothrixus floccosus* in Brazil, *from Bemisia* tabaci in Venezuela (Noyes & Hanson, 1996; Schuster et al, 1998), and from *Aleurodicus cocois* (Curtis), *A. maritimus* Hempel and *Paraleyrodes* sp. in Trinidad (Kairo *et al.*, 2001).

During our search of whiteflies parasitoids in Mexico, we reared one species of encyrtid from Aleyrodinae (possible from *Tetraleurodes* sp.) in Tamaulipas, which was described as *Ooencyrtus aleyrodis* (Myartseva & Ruíz, 2002). Another encyrtid species was reared from Aleurodicinae in Guerrero; it is described here as *Metaphycus acapulcus*, sp.n. The study of morphological characteristics of these whiteflies parasitoids showed that both species are very similar and must refer to the genus *Metaphycus*. Thus, we propose the new combination *Metaphycus aleyrodis* (Myartseva & Ruíz), comb.nov. from *Ooencyrtus*. In this article are given also the main morphological characteristics of whiteflies parasitoids as separate species groups in the genus *Metaphycus*, and the key for their identification.

Materials and Methods.

In June 2000, were collected in Acapulco, Guerrero, whitefly specimens on *Pithecellobium* sp. leaves. In laboratory conditions in Ciudad Victoria, Tamaulipas, from this material were reared parasitoids, which were kept in 70% alcohol. To study morphology and identify these parasitoids, some specimens were mounted on slides in Canada balsam. For identification of family, genus and species of parasitoids were used special keys: Timberlake, 1916; Trjapitzin, 1989; Noyes et al., 1997; Guerrieri & Noyes, 2000. A study of morphology of this and similar species was established, that first species was reared earlier in Mexico from whitefly also (Myartseva & Ruiz, 2002) refers to *Metaphycus*, and both species can compose separate group of whitefly parasitoids in this genus.

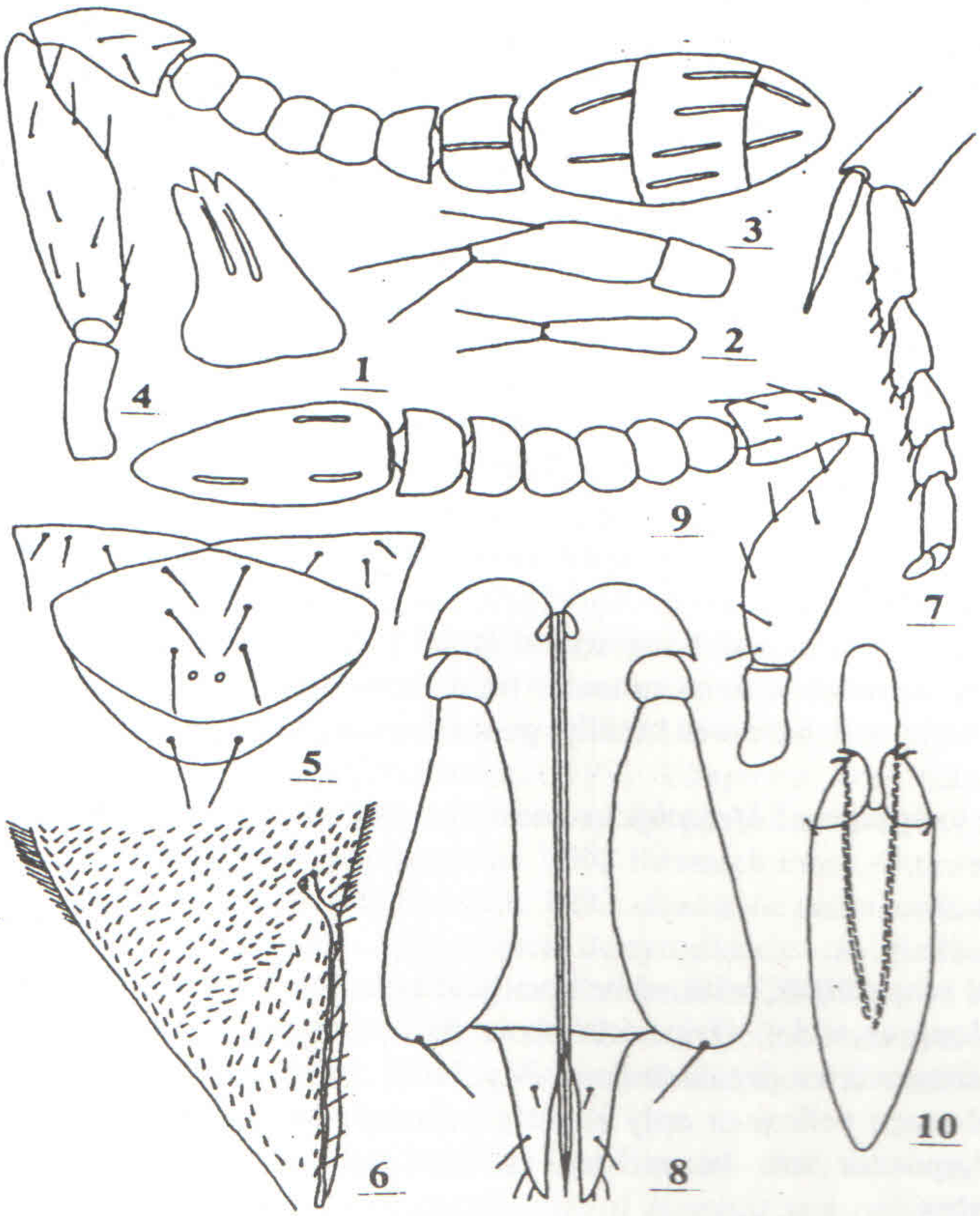
Results and Discussion.

The description of the new species, *M. acapulcus*, and the key to species of *Metaphycus* known as whiteflies parasitoids, are included.

Metaphycus acapulcus Myartseva et Ruíz, sp.n.
(Figuras 1-10)

- Female. Length: 0.7-0.9 mm.
- Coloration. Head black; antennae yellowish, radicula, base of scape and of pedicel, 1st-4th funicle segments and club slightly infuscate. Mesosoma black. Legs whitish yellow, fore femora slightly infuscate, middle femora dark in basal half, tibiae with dark band near base. Fore wings hyaline, venation yellowish. Metasoma yellow, more pale on base, with brownish sides of tergites and fully last tergite. Sheaths of ovipositor brown.
- Morphology. Head more wide than high; frontovertex about 0.3x as wide as maximum width of head. Ocelli in about rectangle triangle; posterior ocelli separated from margin of eyes by a distance less than diameter of an ocellus. Eyes with fine pubescence, 2x as long as cheeks, with row of setae on face along inner margin. Malar sulcus present. Mandibles tridentate, middle one slightly longer (Figura 1). Labial palpi 1-segmented, maxillary palpi 2-segmented (Figuras 2,3). Sculpture of face fine reticulate, on genae elongate. Antennae (Figura 4) inserted below the level of low margin of eyes. Antennal scrobes deep and jointed above the level of the middle of head. Distance between toruli 2.4x longer than distance between torulus and mouth margin and 1.5x longer than distance between torulus and eye margin. Radicle about 3x as long as wide. Scape subcylindrical, very slightly widened on ventral side medially, 4x as long as wide. Pedicel 2x as long as wide and subequal in length to the first three funicle segments combined. All funicle segments transverse, 1st-5th subequal in length, 6th 1.5x longer; 1st-4th segments slightly, 5th 1.7x, 6th 1.5x as wide as long. Club about 1.7x as long as wide and slightly shorter than funicle. 6th funicle segment with sensillum. Mesoscutum without notaular lines, about 1.8x as wide as long, with 28-33 black setae. Scutellum as long as mesoscutum, slightly wider than long and with 4 pairs of long setae (Figura 5). Axillae with 3 setae each. Sculpture of mesoscutum fine retitulate, of axillae and sculellum - shallow reticulate, rather visible on the apex. Fore wings 2.3x as long as maximum wing width, with short marginal fringe. Linea calva interrupted below and closed posteriorly by one row of setae. Base with bare area (Figura 6). Midtibial spur (Figura 7) equal in length to basitarsus. Middle tarsi with

short spines. Metasoma shorter than mesosoma, pygostyli placed closer to base of gaster than to apex. Ovipositor (Figura 8) not exserted, as long as middle tibia; third valvula about 0.4x as long as second valvifer.



Figs. 1-10. *Metaphycus acapulcus*, sp.n.: 1-mandible, 2-labial palpus, 3-maxillary palpus, 4 - antenna, female, 5-scutellum and axillae, 6-basal part of fore wing, 7-midtibial spur and tarsus, 8-ovipositor, 9-antenna, male, 10-genitalia.

- Male. Length: 0.6 – 0.7 mm.

In coloration, male is similar to female, but antennae whitish-yellow, all femora infuscate and metasoma brownish. Frontovertex 0.4x as long as head width. Ocelli in obtuse triangle, posterior ocelli separated from eye by distance slightly more than diameter of an ocellus. Scape (Figura 9) 3x as long as wide, pedicel 1.7x as long as wide, club 2.3x as long as wide and shorter than 5 preceding funicular segments combined. Eyes 1.5x as long as cheeks. Distance between toruli subequal to distance between torulus and eye margin, and 1.4x longer than distance between torulus and mouth margin. Sculpture of

mesoscutum distinct, reticulate, with slightly longitudinal cells, on scutellum more deep, longitudinally-striate. Phallobase of genitalia (Figura 10) 3x as long as wide: digital sclerites with two teeth on apex.

- Material. Holotype (female): Mexico, Guerrero, Acapulco, ex Aleurodicinae on *Pithecellobium* sp., 12-VI-2000 (S. Myartseva). Paratypes (1♀. 8 ♂) same data as the holotype. Holotype and paratypes (4 males) are deposited in UCR (Entomological Museum of the University of California, Riverside, USA). Paratypes (1 female and 4 males) are preserved in UAT (Insects Museum, Ciudad Victoria, Tamaulipas, Mexico).
- Comments. *Metaphycus acapulcus* sp.n. is distinguished from *Metaphycus aleyrodis* (Myartseva et Ruíz) by the following characters: in acapulcus, female – scutellum with 4 pair of setae, frontovertex 0.3x as wide as head width, scape 4x as long as wide, ovipositor as long as middle tibia and third valvula 0.4x as long as second valvifer; male – scutellum with 4-3 pairs of setae, 3rd-5th funicle segments very slightly wider than long. In aleyrodis, female – scutellum with 3 pairs of setae, frontovertex 0.5x as wide as head width, scape 3x as long as wide, ovipositor longer than middle tibia and third valvula 0.6x as long as second valvifer; male - scutellum with 3-2 pairs of setae, 3rd-5th funicle segments 2x as wide as long.

Metaphycus aleyrodis and *M. acapulcus* compose a distinct group of species, which are apparently specific parasitoids of whiteflies, jointed by its morphological peculiarities: 2-segmented maxilary palpi and 1-segmented labial palpi, tridentate mandible with longer middle tooth, mesoscutum without notaular lines, scutellum with 3-4 pairs of strong and long setae, fore wing with bare area basally, general coloration dark.

Key to species of *Metaphycus* known as whiteflies parasitoids

1. Females.....2
- Males.....4
2. Antennal scape black, with white apex and base jointed along dorsal margin, about 2.5x as long as wide. Ovipositor about 5x as long as third valvula. Head 5-6x as wide as frontovertex (by Annecke & Mynhardt, 1972).....*M. angustifrons* Compere
- Antennal scape yellow or only slightly infuscate on base, more than 3x as long as wide. Ovipositor less 4x as long as third valvula. Head less 5x as wide as frontovertex.....3
3. Scutellum with 3 pairs of setae. Scape slightly more than 3x as long as wide, yellow. Ovipositor 2.3x as long as third valvula...*M. aleyrodis* (Myartseva et Ruíz)
- Scutellum with 4 pairs of setae. Scape 4x or more as long as wide, with slightly infuscate base. Ovipositor 3.6x as long as third valvula..... *M. acapulcus*, sp.n.
4. Head about 3.5x as wide as frontovertex. Scape black, with apex and base jointed along dorsal margin, white..... *M. angustifrons*
- Head less than 3x as wide as frontovertex. Scape whithish-yellow.....5
5. Scutellum with 3-2 pairs of setae. 3rd-5th funicle segments about 2x as wide as long..... *M. aleyrodis*
- Scutelum with 4-3 pairs of setae. 3rd-5th funicle segments only slightly wider than long..... *M. acapulcus*

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