

Original paper
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DESCRIPTION OF A NEW SPECIES OF THE GENUS *ALEUROPLEUROCELUS* DREWS & SAMPSON (HEMIPTERA: ALEYRODIDAE) AND A NEW COUNTRY RECORD FOR A SPECIES OF THE GENUS FROM MEXICO

DESCRIPCIÓN DE UNA NUEVA ESPECIE DEL GÉNERO *ALEUROPLEUROCELUS* DREWS & SAMPSON (HEMIPTERA: ALEYRODIDAE) Y UN NUEVO REGISTRO PARA UNA ESPECIE DEL GÉNERO DE MÉXICO

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ABSTRACT. In this study a new species of whitefly is described, *Aleuropleurocelus mixtecus* Carapia-Ruiz. The species was found on *Hyptis capitata* Jacq. in the Mexican states of Oaxaca and Puebla. Microphotographs of morphological structures of the puparium are provided and separation from related species of *Aleuropleurocelus* is briefly discussed. Additionally, the species *Aleuropleurocelus cecropiae* (Bondar) is herein reported for the first time from Mexico (Oaxaca, Tamaulipas). The previous report for the species is from Brazil.

Key words: Sternorrhyncha; Aleyrodinae; whiteflies; distribution

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RESUMEN. En el presente estudio se describe una nueva especie mosca blanca, *Aleuropleurocelus mixtecus* Carapia-Ruiz. La especie fue encontrada sobre *Hyptis capitata* Jacq. en los estados mexicanos de Oaxaca y Puebla. Se proporcionan microfotografías de estructuras morfológicas de puparios y se discute brevemente la separación con otras especies cercanas de *Aleuropleurocelus*. Además, la especie *Aleuropleurocelus cecropiae* (Bondar) se reporta por primera vez para México (Oaxaca, Tamaulipas). El reporte previo para la especie es de Brasil.

Palabras clave: Sternorrhyncha; Aleyrodinae; moscas blancas; distribución



INTRODUCTION

Drews and Sampson (1956) erected the genus *Aleuropleurocelus* for the species *A. laingi* from California. Currently, 25 species are known, of those 24 are distributed in the southwestern United States and Mexico and one species in Brazil, *A. cecropiae* (Bondar). Eighteen species of *Aleuropleurocelus* have been reported from Mexico and 13 have been recently described by Carapia-Ruiz (2020), Carapia-Ruiz *et al.* (2018a; b), Carapia-Ruiz and Sánchez-Flores (2019), Sánchez-Flores and Carapia-Ruiz (2018), and Sánchez-Flores *et al.* (2018a; b; 2020). Whitefly specimens collected on *Hyptis capitata* Jacq. (Lamiaceae), in the states of Oaxaca and Puebla, were examined and exhibited particular characteristics with considerable differences to those present in the known species of *Aleuropleurocelus*; therefore, in the present study this new species of *Aleuropleurocelus* is described. Additionally, the species *Aleuropleurocelus cecropiae* is reported for the first time from Mexico.

MATERIALS AND METHODS

The Aleyrodidae collection (VECR) at Escuela de Estudios Superiores de Xalostoc, Universidad Autónoma del Estado de Morelos (EESX-UAEM), was studied and some specimens of *Aleuropleurocelus* collected in Oaxaca, Mexico in 2002 were found. Because of the distinct features present on the specimens, they could not be identified as one of the previously described species in *Aleuropleurocelus*. Only a few specimens were available, and the collecting data did not include the host plant where the insects was found. Because of that, new collections were carried out in a locality 20 km south of Putla, Oaxaca (2018) and in Tlalcualpicán, Puebla (2019). The collected specimens were processed, and they were mounted on slides, following the methodology by Martin (2004), for analysis under a microscope in the Entomology Laboratory of the EESX-UAEM. The examination was performed using a phase contrast compound microscope Motic BA 320 (4X, 100X, 400X 1000X). The terminology follows that of Drews and Sampson (1956) and Martin (2005).

Regarding the new country record of *Aleuropleurocelus cecropiae* for Mexico, it was determined after the examination and identification of specimens collected on *Curatella americana* L. (Dilleneaceae) in Putla, Oaxaca and specimens found on *Psidium guajava* L. (Myrtaceae) at El Limón, El Mante, Tamaulipas. The identification of these specimens was confirmed by examining type specimens of *A. cecropiae* from Brazil previously determined by Bondar and deposited in the collection of the British Museum of Natural History (BMNH).

RESULTS AND DISCUSSION

Aleuropleurocelus mixtecus Carapia-Ruiz sp. nov. (Figs. 1–8)

Description.

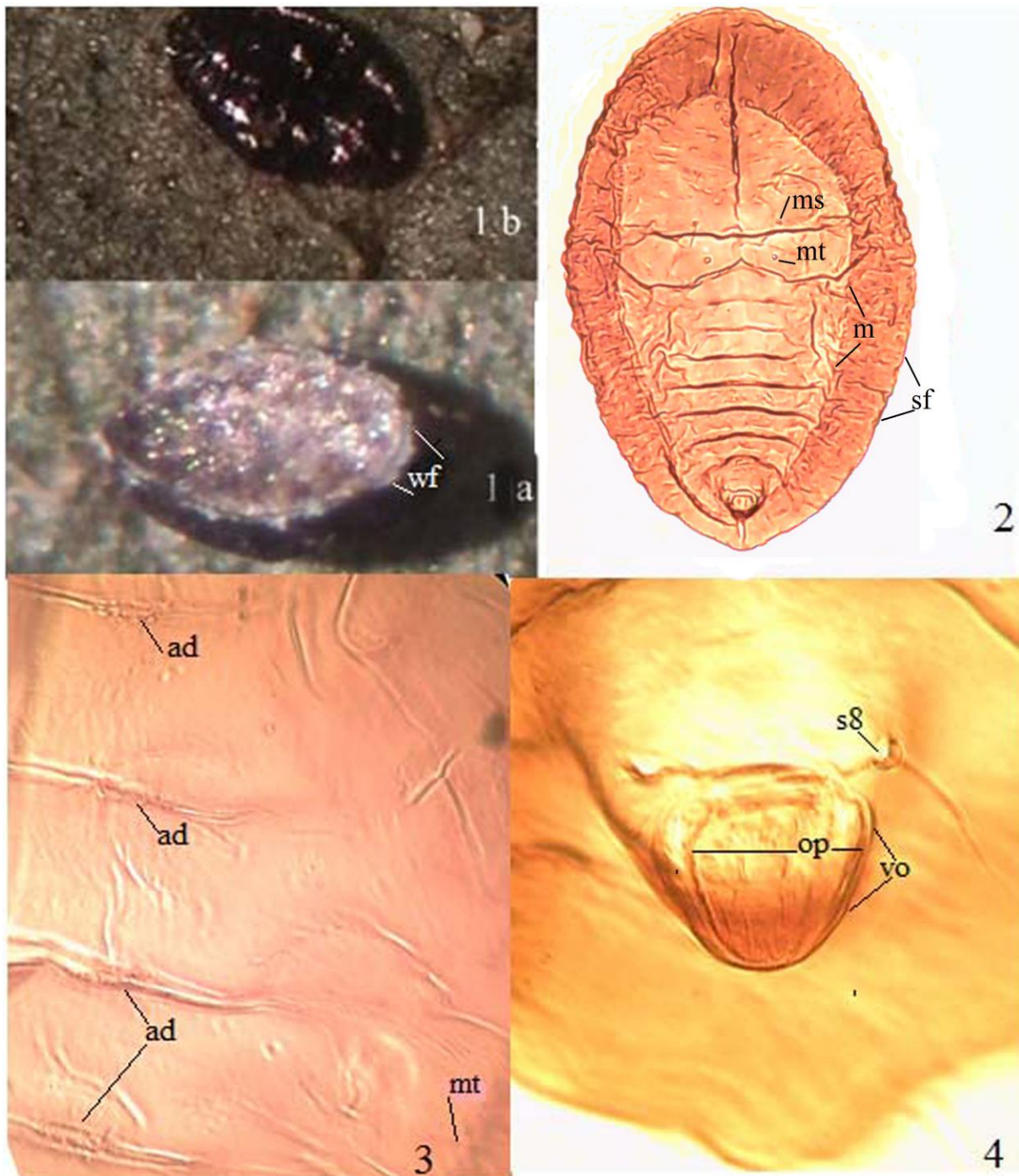
Puparium. Boat form (semielliptical), length 580–750 μm , width 350–450 μm (Fig. 2). Deflected margin approximately 70 μm . Dorsal surface, usually with irregular folds (Fig. 2).

Submargin and margin. Submarginal area (submarginal band) with an irregular band of microtubercles on the lateral half, close to the margin. Margin with teeth of 2.5–3 μm in width (Figs. 6, 8). Subdorsum and the rest of the submargin smooth, not sculpted with tubercles or imbrications (Figs. 5, 6).

Cephalothorax. Without eyespots. Two pairs of small, elongated tubercles 4–7 μm in length and 3 μm in width on of the cephalic area; cephalic setae absent (Fig. 2). Thorax with two depressions on each side of the subdorsum; longitudinal moulting suture length 350 μm , without defined tubercles; transverse molting



suture length 330 μm , almost reaching the apparent margin (submarginal fold). Area between submargen and metathoracic suture 280–297 μm in length. Meso-metathoracic suture well-defined; metathorax 40 μm along midline; mid thoracic area with two pairs of setae, mesothoracic setae 48 μm long and metathoracic setae 50 μm long (Fig. 2).



Figures 1–4. *Aleuropleurocelus mixtecus* Carapia-Ruiz sp. nov. 1) pupa *in situ*, (a) venter, (b) dorsum; 2) puparium (on slide); 3) detail of the abdomen; 4) vasiform orifice, ad = abdominal depression, m = margin, ms = mesothoracic seta, mt = metathoracic seta, op = operculum, sf = submarginal fold, s8 = base of dorsal seta A8, vo = vasiform orifice, wf = wax fringe.

Abdomen. Dorsum with abdominal segments I-VIII clearly visible along midline. Length of segments: I 37 μm , II 35 μm , III 33 μm , IV 33 μm , V 33 μm , VI 35 μm , VII 31 μm , VIII 50 μm (from abdominal suture VII to anterior margin of the vasiform orifice). A pair of small abdominal depressions per segment 3–6 μm long and 10–16 μm wide, located anteromedially. Abdominal segments almost smooth along the midline (Fig. 3).

Vasiform orifice. Semicordiform, 40 μm long and 36 μm wide; operculum 37 μm long and 30 μm wide, with four irregular longitudinal grooves and spinules on the terminal area, completely covering the lingula and most of the area of the vasiform orifice; orifice ring not defined in its anterior margin. Lingula 20 μm long and 12 μm wide; *eighth abdominal setae anterolateral* to vasiform orifice. Posterior part of vasiform orifice elevated. Caudal protuberance slightly developed. Distance from the posterior margin of the vasiform orifice to the apparent margin 38 μm (Fig. 4).

Venter. Antennae 26–30 μm long, extending posteriorly to level of prothoracic legs. Prothoracic legs 55 μm long on basal part and 28 μm on distal part; mesothoracic legs 75 μm long basally and 50 μm distally; metathoracic legs 76 μm long basally and 52 distally; adhesive sacs of legs 10–15 μm in diameter; base of legs almost smooth, with only 2–4 spinules 2–3 μm long and 1–2 μm wide (Fig. 7). A pair of prominent thoracic adhesive sacs in median area. Well-defined abdominal setae on segment VIII, 12 μm long, anterior to the spiracle (Fig. 8).

Chaetotaxy. Dorsum without cephalic setae; one pair of 48 μm long mesothoracic setae, one pair of 50 μm long metathoracic setae, the mesothoracic setae are closer to each other than the metathoracic setae; one pair of 52 μm long setae on the abdominal segment VIII, each arising from a tuberculiform base; two 102 μm long caudal setae; setae absent on anterior margin; two 10 μm long setae on posterior margin.

Type material. Holotype. Puparium. Mexico: Oaxaca: 20 km south of Putla (16° 59' 17" N, 91° 55' 12" O), collected on leaves of *Hyptis capitata* Jacq. (Lamiaceae), 25-ii-2018, Carapia-Ruiz, V. E. Coll., Deposited in Colección Nacional de Insectos (CNIN), Instituto de Biología, Universidad Nacional Autónoma de México (UNAM), Mexico City. Paratypes (puparia): same data as the holotype (2 CNIN, 24 VECR). Puebla: Tlalcualpicán, collected on leaves of *Hyptis capitata* Jacq., Álvarez-Martínez, L. A. Coll. (10 VECR).

Etymology. The specific epithet *mixtecus* refers to the Mixteca region, in the state of Oaxaca, where the holotype and most of the paratype specimens were collected.

Hosts plant. *Hyptis capitata* Jacq. (Lamiaceae).

Distribution. This species is known from the Mexican states of Oaxaca and Puebla.

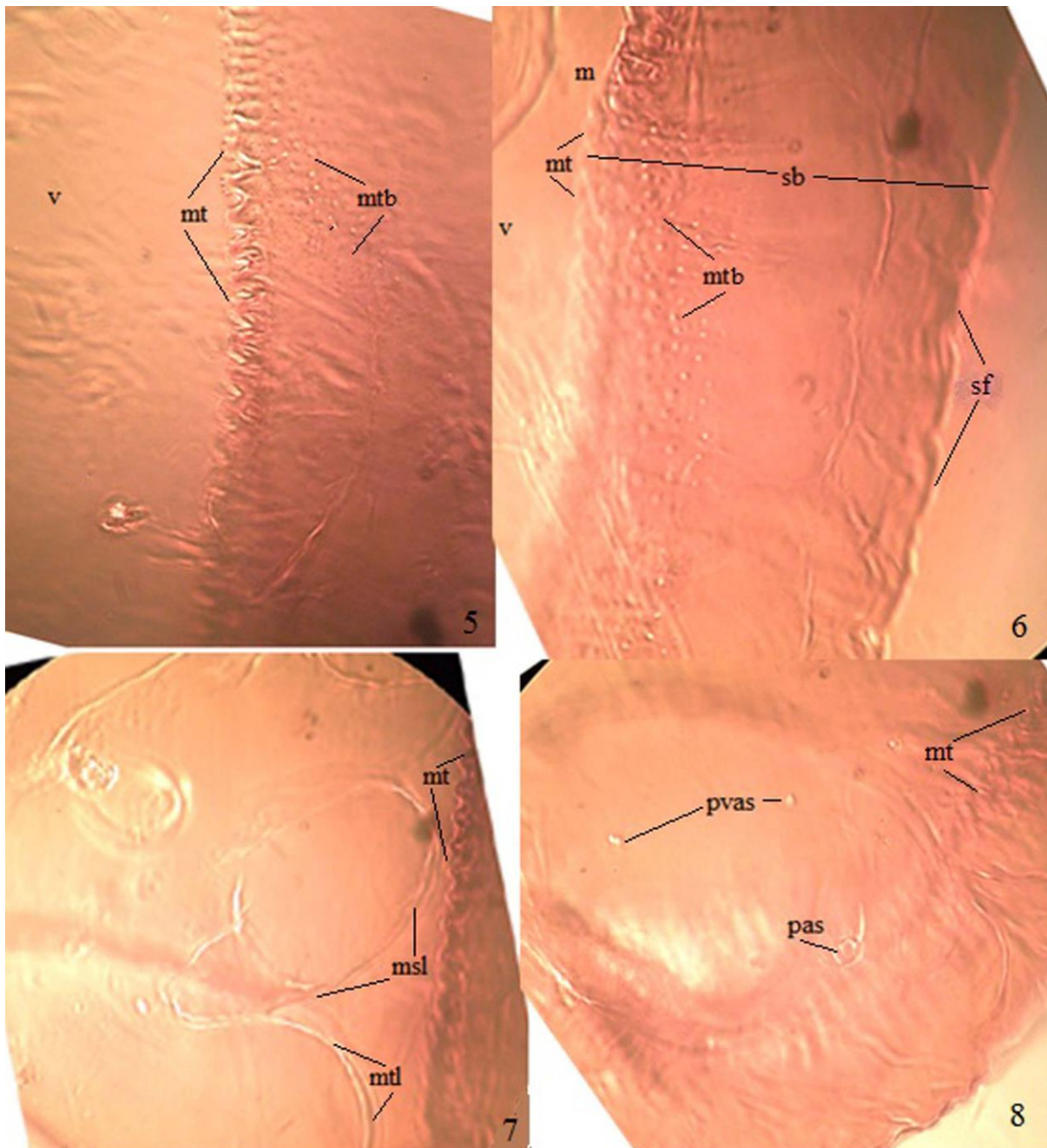
Puparium in situ. Boat form. Dorsum black, venter pale, yellowish-white. With a narrow fringe of wax around the body margin, where the adherence to the leaf surface begins. Fringe of wax little or no visible in dorsal view. (Fig. 1a, b). Usually located on the underside of the leaves of *Hyptis capitata*.

Taxonomic comments. *Aleuropleurocelus mixtecus* is a species closely related to *A. nigrans* (Bemis). Both species have a pale ventral surface and exhibit the transverse molting suture ending before the submargin. Although *A. bidentatus* Sánchez-Flores & Carapia-Ruiz presents a similar transverse suture, it can be distinguished by its double row of teeth, the abundant wax secretion, a wide fringe of wax directed toward the dorsal surface, and a narrow fringe of wax directed ventrally. *Aleuropleurocelus mixtecus* can be distinguished from congeners by having an almost smooth dorsal and ventral surface, lack of well-developed abdominal depressions or imbrications in the subdorsal region, and the presence of few microtubercles close to the marginal teeth in the submarginal area.



New country records for *Aleuropleurocelus cecropiae* (Bondar).

Aleuropleurocelus cecropiae (Bondar) (Fig. 9) was previously known only from Brazil (Bondar, 1923). Specimens of this species were found by the author on leaves of *Curatella americana* L. (Dilleniaceae) at 25 km south of Putla, Oaxaca (20-xii-2018) and on leaves of *Psidium guajava* L. (Rutaceae) at El Limón, El Mante, Tamaulipas (2-i-2019). A total of 25 specimens of this species are deposited in the VECR collection. These new distribution records expand the species range to the North American continent.



Figures 5–8. *Aleuropleurocelus mixtecus* Carapia-Ruiz sp. nov. 5) margin and submargin; 6) submarginal band; 7) thorax (ventral view); 8) posteroventral abdominal area, msl = mesothoracic leg, mt = marginal teeth, mtb = microtubercles, mtl = metathoracic leg, pas = posteroventral abdominal spiracle, pvas = posteroventral abdominal seta, sb = submarginal band, sf = submarginal fold, v = venter.



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Figure 9. Ventral view of the puparium of *Aleuropleurocelus cecropiae* (Bondar).



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