

Taxonomy and systematics

A new species of *Aleuropleurocelus* (Hemiptera: Aleyrodidae) and key to the *ceanothi* group from Mexico

Una especie nueva de Aleuropleurocelus (Hemiptera: Aleyrodidae) y clave para el grupo ceanothi de Mexico

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Abstract

A new species of whitefly, *Aleuropleurocelus tecomastans*, is described. The studied specimens were found in the municipality of Acapulco, State of Guerrero, Mexico on *Tecoma stans* (L.) (Bignoniaceae) leaves. A dichotomous key to identify members of *Aleuropleurocelus* group *ceanothi*, defined by a transverse suture of the molt which reaches the submarginal line, is provided. Photographs of morphological pupal structures are given and diagnostic separation to other related species is discussed.

Keywords: Aleyrodinae; *Aleuropleurocelus ceanothi*; Whitefly

Resumen

Una especie nueva de mosca blanca, *Aleuropleurocelus tecomastans*, es descrita. Los especímenes estudiados fueron encontrados en el municipio de Acapulco, Estado de Guerrero, México sobre *Tecoma stans* (L.) (Bignoniaceae). Se provee una clave dicotómica para identificación de especies de *Aleuropleurocelus* grupo *ceanothi*, definido por una sutura transversa de la muda que termina en la línea submarginal. Se proporcionan fotografías de las estructuras morfológicas del pupario y se analiza la separación diagnóstica en otras especies relacionadas.

Palabras clave: Aleyrodinae; *Aleuropleurocelus ceanothi*; Mosca blanca

Introduction

The genus *Aleuropleurocelus* was described by Drews and Sampson (1956), comprising 8 species and an identification key to all Californian species was included (Drews & Sampson, 1958). Later Dooley et al. (2010) described *A. nevadensis* Dooley, while Polaszek and Gill (2011) added *A. hyptisemoryi* Gill to the genus. Nowadays, 19 species of Mexican species of *Aleuropleurocelus* are known and have been largely studied by Carapia-Ruiz (2023), Carapia-Ruiz (2020a, b), Carapia-Ruiz and Sánchez-Flores (2019a, b), Carapia-Ruiz et al. (2018a, b, 2020, 2023), Sánchez-Flores and Carapia-Ruiz (2018a, b), Sánchez-Flores et al. (2018a, b, 2020, 2021). The genus is segregated into 3 major groups: *abnormis* (semioval), *nigrans*, and *ceanothi* according to Dooley et al. (2010) and Sánchez-Flores et al. (2021).

The *ceanothi* group, in which the transverse suture of molt ends at the submarginal line is included, *A. granulata* (Sampson & Drews), and the morphologically related species *A. sampsoni* Sánchez-Flores & Carapia-Ruiz and *A. pseudogranulata* Carapia-Ruiz & Sánchez-Flores. While collecting puparia of Aleyrodidae in Acapulco Guerrero, an unknown species of this group with distinctive characters was found. The objective of this contribution is to describe a new species and provide a key to all species of *Aleuropleurocelus* group *ceanothi*.

Materials and methods

The specimens were collected on the underside of the leaves of *Tecoma stans* (L.) in Acapulco, Guerrero. The specimens once taken were retained ethanol and thus transferred to the Laboratorio de Entomología, Escuela de Estudios Superiores de Xalostoc of the Universidad Autónoma del Estado de Morelos, to be fully processed and mounted in permanent preparation with Canada balsam on slides for further study under stereomicroscope and facilitating identification following specialized literature such as Drews and Sampson (1958), Martin (2004, 2005), and Sanchez-Flores et al. (2021). After preparations, specimens were observed under a Motic BA 320 phase contrast optical microscope considering several magnifications: 4X 100X, 400X and 1,000X. The terminology used follows Drews and Sampson (1956) and Martin (2005). The studied specimens are deposited at Colección Nacional de Insectos (CNIN), Instituto de Biología, Universidad Nacional Autónoma de México, México City, Mexico.

Description

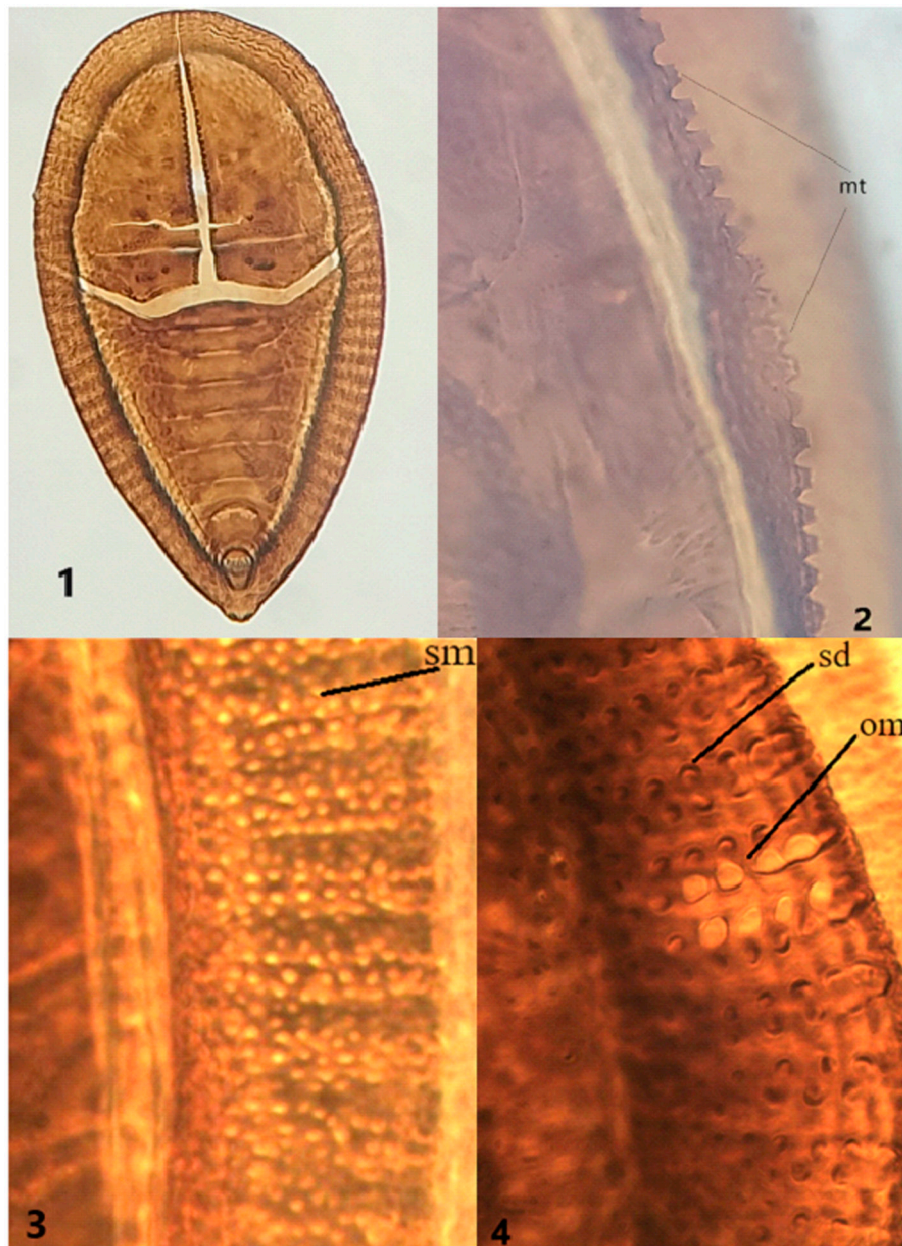
Aleuropleurocelus tecomastans n. sp. Carapia-Ruiz (Figs. 1-9)

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Diagnosis. Pupa boat-shaped, transverse molting suture reaches the submarginal line, dorsum and venter black, eye spots with tubercles, abdominal depressions present, middle area of abdominal segments smooth, abdominal VIII setae anterolateral to the vasiform orifice very small.

General form: pupae *in situ*. Dorsal and ventral surface of pupae black, a thin fringe of wax is distinguished around the body margin.

Specimens on slides: semioval body (Fig. 1). Deflexed submargin. Margin: with 61-68 pairs of marginal teeth with 2-3 acute terminal protrusions (Fig. 2), submargin with a regular band of small tubercles (Fig. 3); subdorsum: with a band of crescent tubercles (Fig. 4). Cephalothorax: longitudinal molting suture with a row of defined tubercles on each side giving the appearance of a zipper, transverse molting suture ends at the apparent margin (submarginal fold), well defined meso-metathoracic suture (Fig. 5), ocular markings (eye spots) indicated by pale coloration and 5-7 pairs of pale tubercles in the subdorsal area near the submarginal line, cephalic setae absent; mid thoracic zone with 2 pairs of setae, the mesothoracic and the metathoracic. Abdomen: dorsum with abdominal segments I-VIII clearly visible in the middle part (Fig. 6). With abdominal depressions in the middle area of the segments (Fig. 7), cuticle in the middle of the abdominal segments smooth. Vasiform orifice: elongated semicordiform (Fig. 8); elevated; operculum with 4 irregular longitudinal furrows and spinules at the apex, completely covering the lingula and most of the vasiform orifice, ring of the orifice defined in its anterior part, abdominal VIII setae anterolateral to the vasiform orifice very small, caudal protuberance developed. Pores, normally as follows: 8 pairs in the cephalic area, 6 on submedian area and 2 posterior to eye spots; 4 pairs in the mesothorax, 2 on submedian area and 2 in the subdorsal area of the mesothorax; medial area of abdominal segments I, III, V, VII with 2 pairs each segment, segment VIII with 2 pairs; subdorsal area of abdominal segments II, IV, V, with 2 pairs of pores in each segment (Fig. 9). Venter: legs prothoracic, mesothoracic, metathoracic with apical adhesive sac, thoracic adhesive sacs near the base of the first pair of legs, base of the legs with a wide irregular

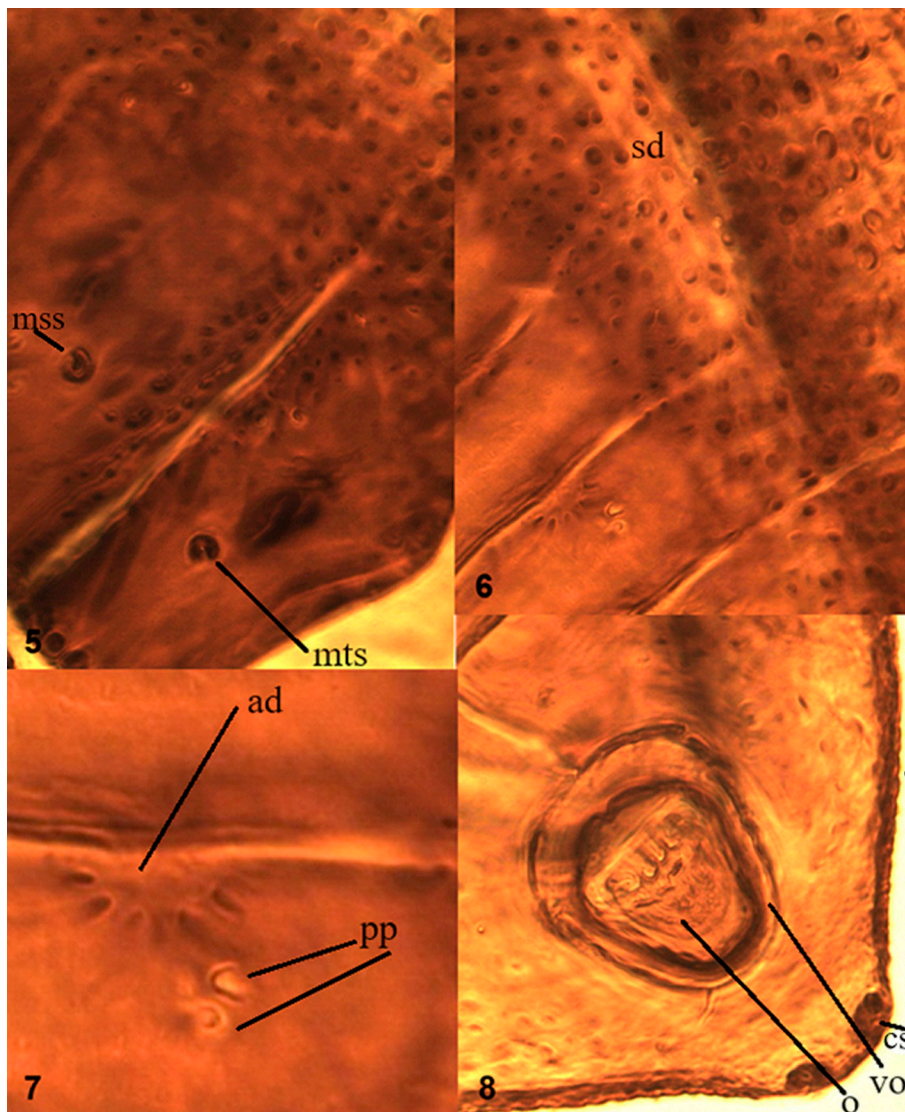


Figures 1-4. *Aleuopleurocelus tecomastans*. 1) Puparium; 2) marginal teeth; 3) submarginal area; 4) subdorsal area. mt = Marginal teeth, om = ocular mark, sd = subdorsum, sm = submargin.

band of 2-4 spinules, thoracic and abdomen cuticle smooth, well defined abdominal setae of segment VIII, posteriorly present a pair of spiracles. Chaetotaxy: a pair of anterior marginal setae present (near marginal teeth), cephalic setae absent, mesothoracic, metathoracic and caudal setae well developed, very small abdominal VIII

setae, located anterolateral to the vasiform orifice, and posterior marginal setae small.

Measurements. Specimens on slides: body 550-650 μm long by 300-400 μm wide. Submargin approximately 45-55 μm . Cephalothorax: 230-280 μm , longitudinal molting suture, 240-360 μm , transverse molting suture



Figures 5-8. *Aleuropleurocelus tecomastans*. 5) Thoracic area; 6) submedia and subdorsal area; 7) depression and pore of abdominal segment IV; 8) vasiform orifice. ad = Abdominal depression, cs = caudal seta, mss = mesothoracic seta, mts = metathoracic seta, o = operculum, pp = pore porete, sd = subdorsum, vo = vasiform orifice.

220-250 μm , the metathorax 30-45 μm long in its middle area, cephalic elongated structures of 8-10 μm long by 3-5 μm wide. Abdomen: abdominal segments length for segment I 22-26 μm , segment II 22-26 μm , segment III 25-30 μm , segment IV 26 -30 μm , segment V 27-32 μm , segment VI 26-29 μm , segment VII 23-27 μm , and segment VIII (from suture VII-VIII to vasiform orifice) 40-50 μm , distance from vasiform orifice to apparent margin 25-35 μm ; abdominal depressions segments with

approximate length in segment I 3-5 μm long by 10-12 μm wide, in segment II 3-4 μm long by 12-15 μm wide, in segment III 3-4 μm long by 10-13 μm wide, in segment IV 3-4 μm long by 10-14 μm wide, in segment V 5-7 μm long by 10-15 μm wide, in segment VI 5-6 μm long by 9-11 μm wide. Vasiform orifice: 46-50 μm long by 32-38 μm of broad at the widest part; operculum 25-30 μm long by 22-26 μm wide. Venter: prothoracic legs 75-77 μm long, mesothoracic legs 75-78 μm long, metathoracic

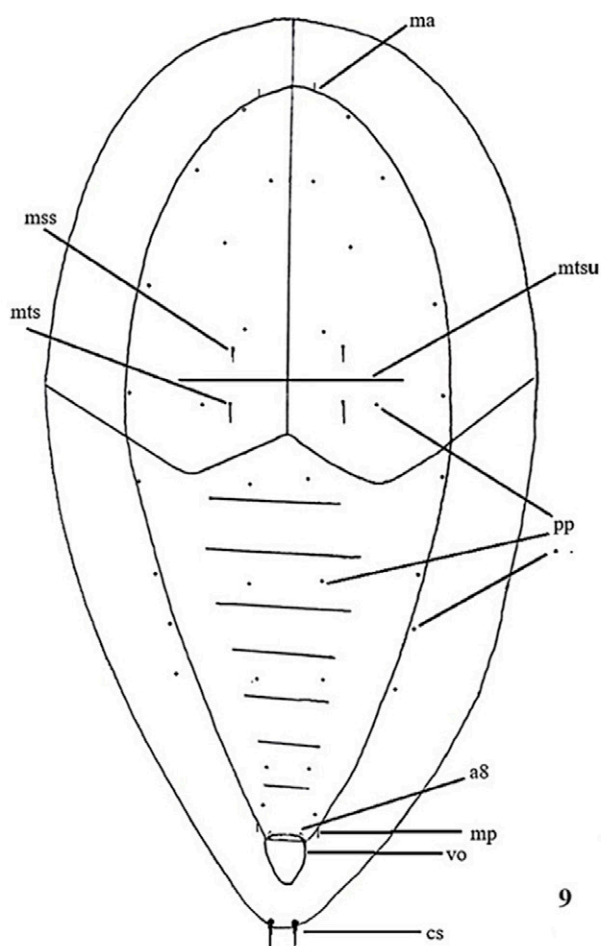


Figure 9. *Aleuropleurocelus tecomastans*. Pores and setae distribution. a8 = VIII abdominal segment seta, cs = caudal seta, ma = marginal anterior seta, mp = marginal posterior seta, mss = mesothoracic seta, mts = metathoracic seta, mtsu = metathoracic suture, pp = pore porete, vo = vasiform orifice.

legs 85-89 μm long, thoracic adhesive sacs of 16-20 μm in diameter, base of the legs spinules 4 μm long and 2 μm wide. Setae: anterior marginal setae approximately 7 μm long, mesothoracic setae approximately 15 μm long, metathoracic setae approximately 20 μm long, abdominal VIII setae 3-4 μm long, caudal seta approximately 20 μm long, and posterior marginal seta approximately 10 μm long.

Taxonomic summary

Type locality: northeast of Acapulco, Guerrero, Mexico

Type material: holotype, puparium: Acapulco, Guerrero, Mexico, in leaves of *Tecomastans* (Bignoniaceae), 8-iv-2021, Col. V. E. Carapia-Ruiz, deposited in CNIN (Colección Nacional de Insectos, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City, Mexico), HOM-TIP-170. Paratypes: puparia, same data as holotype, 2 deposited in CNIN, HOM-PAR-171, HOM-PAR-172.

Etymology: the suffix name is based on a combination of the host plant's scientific name where specimens were associated.

Distribution: Acapulco, Guerrero, Mexico.

Plant associations: *Tecoma stans* (Bignoniaceae).

Remarks

Aleuropleurocelus tecomastans is placed within the *ceanothi* group by the transverse molting suture reaches the apparent margin (submarginal line). The new species is similar in appearance to *A. granulata*, *A. sampsoni*, and *A. pseudogranulata* but can be differentiated by the presence of abdominal depressions which is opposite as shown in *A. granulata*, *A. sampsoni*, *A. pseudogranulata* or *A. ceanothi*. Also *A. asciculatus* presents a subdorsal fold which is absent in the other species.

Key to species of *Aleuropleurocelus* group *ceanothi*

1. With bands of dense wax on dorsum, pores of double wall on dorsum 2
- Without such bands or pores 3
2. (1) Two bands of dense wax on dorsum (1 thin band on subdorsum and 1 wide band on submedian area) *ornatus* Drews & Sampson
- One band of dense wax on subdorsum *sampsoni* Sánchez Flores & Carapia-Ruiz
3. (1) Tubercles on submedian surface absent 4
- Tubercles on submedian surface present 8
4. (3) Without evident tubercles on subdorsal surface 5
- With evident tubercles on subdorsal surface 6
5. (4) Longitudinal suture of the molt with tubercles on metathorax *laingi* Drews & Sampson
- Longitudinal suture of the molt without tubercles on metathorax *coachellensis* Drews & Sampson

6. (4) Subdorsal fold absent..... 7
— Subdorsal fold present..... *asciculatus* Carapia-Ruiz
7. (6) 2 pair of thoracic adhesive sacs, submarginal band with pores..... *erigonium* Carapia-Ruiz
— Without tubercles on the anterior and posterior part of the abdominal segments, abdominal depressions present
..... *tecomastans* n. sp.
8. (3) With 2 pairs of thoracic adhesive sacs, submedian area with tubercles only on the anterior part of the abdominal segments; marginal teeth without 2 or more evident prostrutions 9
— With a pair of thoracic adhesive sacs, submedian area with tubercles on the anterior and posterior part of the abdominal segments; marginal teeth with evident prostrutions; transversal suture of the molt curved 10
9. (8) Half posterior of puparium in elliptic form *sierra* (Sampson)
— Half posterior of puparium in triangular form *ceanothi* (Sampson)
10. (8) Vasiform orifice semicircular, venter of abdomen with posterior area very narrow, transversal suture of the molt almost straight on median area *granulata* Sampson & Drews
— Vasiform orifice elongated, clearly more long than wide, venter of abdomen with posterior area triangular in form, transversal suture of the molt curved on median area *pseudogranulata* Carapia-Ruiz

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