VENEZALEURODES PISONIAE, A NEW GENUS AND SPECIES OF WHITEFLY FROM VENEZUELA (HOMOPTERA: ALEYRODIDAE)

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The following description provides a name for an injurious whitefly. F. A. Lee, University of Florida, Gainesville, asked that the species be described, and I am happy to comply with his request.

Regarding the insect, Mr. Lee (personal communication) stated, “The aleyrodid is of considerable economic importance in Venezuela. It is a vector of the leaf curl virus of tobacco.”

In spite of its reported involvement with tobacco, only adults of the species have been seen on this plant. Mr. Lee stated further, “I have examined many fields of leaf curl diseased tobacco and have never found the immature forms of this aleyrodid present and rarely the adult. . . . Indications are that whiteflies are forced to tobacco [from their normal host] but remain on the plant only long enough to feed briefly.” According to Mr. Lee, the aleyrodid’s true host, *Pisonia*, is cut periodically in the tobacco growing area of Venezuela, and at such times the adults fly to other nearby plants.

To date, the insect is known to develop only on *Pisonia macranthocarpa* Donn. Sm. (Nyctaginaceae) in Venezuela. Since this plant occurs in Colombia, Ecuador, Central America, and Mexico, the insect may have a wider distribution and a greater potential as a vector of leaf curl virus of tobacco than present records indicate.

Most of the terminology used here is explained in my former treatment of the genus *Trialeurodes* Cockerell (Russell 1948) and the tribe Trialeurodini (Russell 1947).

*Venezaleurodes*, new genus

Type-species, *Venezaleurodes pisoniae*, new species.

*Venezaleurodes* belongs in the Trialeurodini, and appears to be most closely related to *Trialeurodes*. Pupae of the new genus differ from those of *Trialeurodes* as defined by Russell (1948) as follows: Mature pupa with the ventral surface not swollen and not encircled by a band of wax, and the dorsum not elevated from the leaf surface; submarginal setal bases very indistinct but in 6 pairs when visible; with short, cylindrical tubular pores without associated porettes; and with cylindrical setae having rounded apices. Mature pupa of *Trialeurodes* with the ventral surface of the body swollen and encircled by a band of thin, translucent wax, and the dorsum of the body thus raised from the surface of the leaf; submarginal setae or setal bases readily visible and in 13 or 15 pairs; without cylindrical tubular pores; and without cylindrical setae. The larvae of *Venezaleurodes* also differ from those of *Trialeurodes* in having only 6 pairs of submarginal setae, and the third-stage larva has short, cylindrical tubular pores and cylindrical setae. The tubular pores resemble somewhat the disk pores of *Aleurothithius* Quaintance and Baker, which also rise above the derm but which are rounded apically and have associated porettes.
The cylindrical setae are more slender than the tubular pores and appear to be hollow with thin walls. The tubular pores and cylindrical setae are distinctive, and separate this genus from all other genera of the Aleurodinae that I know.

**Generic Description**

**Habit:**—Living on the lower surface of leaves.

**Pupa:**—With a waxy secretion on dorsum. Body flat, its ventral surface not swollen and not encircled by a hand of wax.

*Margin and submargin:* Margin smooth or crenulate. Anterior and posterior marginal setae present. Submargin not separated from dorsal disk by a ridge or furrow. Submarginal setal bases poorly defined, in 6 pairs. Submarginal ridges defined. Tracheal pores absent. Submarginal papillae, disk pores and porettes present.

*Dorsal disk:* Short, cylindrical tubular pores with dark rims and without associated porettes arising from the derm. Disk pores and porettes present. Papillae present or absent. Cylindrical, atypical setae present; typical setae in a cephalic, first and eighth abdominal, and caudal, pair. Transverse molting suture just anterior to thoracoabdominal one; intersegmental sutures well defined in median and submedian areas; submedian depressions present in sutures; pockets present in posterior suture. Median length of abdominal segment 7 no more than 1/3 that of segment 6. Vasiform orifice and operculum cordate or subcordate; lingula elongate and lobed, contained in the orifice, with a pair of elongate setae arising ventrally at base of terminal lobe. Caudal furrow present.

*Ventral surface:* Antenna short, reaching to anterior thoracic spiracle; apparently 2-segmented, abruptly tapered distally, the end finger-like and covered with minute spines, a minute seta just before base of tapered area. Thoracic and abdominal tracheal folds evident. Thoracic and posterior abdominal spiracles small, subequal in size; anterior abdominal pair much smaller than others or not apparent. Beak blunt, apparently 2-segmented, with minute setae at base, and at apex of distal segment. Legs short and stout, 3 segments suggested, with setae on basal area and with minute setae or setal bases near disk of each leg. A pair of inconspicuous adhesive sacs on mesothorax. Ventral abdominal setae present. Male organ not observed.

**Third-stage Larva:**—Shape, margin, and submargin much as in pupa but without submarginal papillae. Dorsum much as in pupa but with all types of pores and cylindrical setae much less numerous. Vasiform orifice shorter in comparison with its length than in pupa. Antenna slender.

**Second-stage Larva:**—Similar to third-stage larva but without tubular pores and cylindrical setae, and with fewer disk pores and porettes.

**First-stage Larva:**—Margin smooth. Submarginal setae of later instars located on margin, elongate and slender, 4 pairs on cephalic segment, 1 pair on prothorax, and 1 pair on abdominal segment 8. Eye-spots apparent. Tubular pores absent. Disk pores and porettes sparse. Cylindrical setae absent. Vasiform orifice near posterior end of body; operculum transverse; lingula not lobed, caudal furrow absent. Legs and antennae elongate and slender, distinctly segmented.
ADULT:—Parts of compound eye joined by a few facets. Antenna 7-segmented; segments I and II with numerous scattered spines and with minute slender setae; segments distad of II with bands of minute spines alternating with smooth bands; some segments beyond II with sensory setae and circular sensoria; each of the latter with fringed margin and a short sensory seta; distal end of VII tapered, with a terminal seta. Each wing with an elongate vein that approaches the distal margin; forewing with a claval suture. Male claspers curved inward on ventral margin near posterior end, apices acute. Aedeagus slender, distal end curved upward.

Venezaleurodes pisoniae, new species

(Fig. 1)

Pupa:—Mature pupa with a copious amount of a white, matted, felt-like secretion on the dorsum in available dead specimens; appearance unknown in living insects. Wax not observed on ventral surface.

Flat dorsally and ventrally. Colorless or pale yellow, membranous. Broadly elliptical, widest across midlength, 0.75-1.00 mm long and 0.50-0.70 wide.

Margin and submargin: Margin smooth or with weak crenulations, 22-30 in 100 μ. Anterior marginal setae 15 μ long, posterior marginal 28. Submarginal not deflexed. Submarginal setal bases almost or quite obscure; 5 pairs on cephalothorax and 1 pair on abdominal segment 8 when visible, located slightly mesad of row of submarginal papillae. Submarginal ridges moderately defined, same width as crenulations at margin, extending to or slightly proximal of submarginal papillae. Thoracic tracheal pore areas not apparent, or indicated by the prominence of 1-3 marginal crenulations or submarginal ridges; the abdominal one indicated by the presence of 2-5 rounded designs on the submarginal ridges. Papillae arranged in an irregular single row at inner edge of submargin, the majority 2-3 times the diameter of a papilla from the body margin; 13-17 on cephalothorax and 15-21 on abdomen, on each half of body; papillae usually directed vertically; their bases circular and 8-10μ in diameter, broadly and bluntly conical and rising only slightly above the body surface; the margin of the base and the apex of the cone usually fairly distinct, but the remainder of the papilla indistinct; disk pore associated with each papilla located adjacent to, or as much as the diameter of the base from, the papilla; a minute, indistinct porette in each papilla; rarely a few papillae modified into rounded, granular tuberclelike structures quite different in appearance from the conical papillae.

Dorsal disk: Tubular pores approximately 4μ long and 4μ in diameter arising from body surface; numerous, distributed over most of dorsum and into the submargin between, and a row distad of, submarginal papillae; absent from median area of abdominal segment 7, entirely or almost entirely absent from abdominal segment 8 except in outer subdorsum and submargin; absent between and distad of submarginal papillae when numerous tuberclelike papillae are present on dorsum. Disk pores about 2 μ in diameter and very minute porettes present; usually at least 2 submedian and 2 or 3 subdorsal pairs on each body segment but number
Fig. 1 a-g, *Venezaleurodes pisoniae*. Pupa: 1 a-f, 1, dorsal half of body; a, portion of margin and submargin; b, portion of submargin showing lateral view of submarginal papilla, disk pore, and tubular pore; c, portion of derm showing lateral and dorsal view of tubular pores; d, cylindrical seta; e, dorsal tuberclelike papilla with disk pore and porette; f, vasiform orifice. Adult: g, forewing. (Drawings by Arthur D. Cushman.)
varying, very rarely much more numerous and apparently replacing some tubular pores. A papilla usually associated with at least 1 subdorsal disk pore and porette on each half of body but sometimes developed with most disk pores; the papillae usually weakly developed, coarsely granular, membranous, and inconspicuous, but rarely strongly developed, tubercle-like and as much as 18 μ in diameter; disk pores adjacent to, and porettas in, the papillae. Cylindrical setae 4-7 μ long and 2 μ in diameter, located in submedian and subdorsal area of abdominal segment 7 near posterior suture and on segment 8 anterior and laterad of vasiform orifice, present posteriorly to tubular pores; sparse and smaller than normal when numerous tubercelike papillae are present on dorsum. Cephalic setae 25-45 μ long, first abdominal 25-40; eighth abdominal 25-40, located opposite, or slightly posterior to, anterior margin of vasiform orifice, slightly more than diameter of its base from orifice; caudal setae 45-60 μ long, their bases in submargin about in line with outermost tubular pores. Transverse molting suture curved posteriorly from its midpoint, then recurved and terminating in subdorsum opposite its midpoint. Intersegmental sutures terminating in inner subdorsum except for penultimate and posterior ones that usually extend to submargin. Pockets less than the width of one part. Median length of abdominal segment 7 approximately 1/5-1/4 that of segment 6. Vasiform orifice elongate cordate, 50-72 μ long and 48-60 wide, located its width from posterior abdominal suture and about twice that distance from posterior body margin; its bottom extending just over 1/2 length of orifice, just anterior to posterior margin of operculum; its rim thin, rising above derm, with a median rounded tooth at end; its inner sides lightly ridged; its bottom smooth anteriorly, with curved dentate markings directed caudad, posteriorly. Operculum subcordate, 36-44 μ long and 44-52 wide. Lingula with 3 pairs of lateral lobes and a terminal lobe, reaching end of orifice; 48-60 μ long, and 24-28 wide across anterior lobes, its setae 24-28 μ long. A narrow, shallow furrow each side of orifice, opening into the caudal furrow at end of orifice. Caudal furrow well-defined, fairly broad at base, then narrowed and terminating at the tracheal pore area. Caudal ridges defined, lightly sculptured by diagonal or transverse depressed lines for entire length or only on posterior portion.

Ventral surface: Thoracic tracheal folds without characteristic markings; abdominal one with a few minute spines anteriorly. Each leg apparently with 4-6 minute setae located at intervals around basal margin; with 1 short seta on inner basal area of anterior, and 1 longer seta on each middle and posterior leg; 2 minute setae or setal bases near disk on each leg. Beak with a pair of minute setae at base of proximal segment, and 3 pairs at apex of distal segment. A median pair of minute setae or setal bases just anterior to mouth parts, and a submedian minute pair mesad of disk of posterior leg. Ventral abdominal setae 20-32 μ long, not reaching posterior abdominal spiracles.

Third-stage larva:—A small amount of white powdery wax on dorsum. Derm colorless. Submarginal ridges weak, the majority slightly longer than wide. Submarginal setal bases indistinct. Submarginal papillae, disk pores and porettas absent. Tubular pores scattered on dorsum except in median area of abdomen and close to body margin. A subdorsal pair of
disk pores and porettes on most segments and a submedian pair on abdominal segment 1. A papilla appearing as a differentiated granular area associated with most disk pores. A pair of subcircular or oblong, usually 8-shaped pores opposite widest part of vasiform orifice, on abdominal segment 7 on one half of body and on segment 8 on the other half, in available specimens. Cylindrical setae totaling 2-4 on abdominal segment 8. Vasiform orifice practically as wide as long and nearly equidistant from posterior suture and posterior body margin; its bottom extending just anterior to posterior edge of operculum, lightly ridged, not sculptured as in pupa; rim with a rounded, median posterior tooth. Operculum broadly curved posteriorly, slightly wider than long. Lingula with 2 pairs of lateral lobes. Caudal setae arising from body margin. Anterior abdominal spiracles not observed.

Second-stage larva:—No waxy secretion noted. Similar to third-stage larva except dorsal papillae poorly defined and much less numerous, tubular pores absent except for 2 on abdominal segment 8, vasiform orifice closer to posterior body margin, caudal furrow barely or not evident.

First-stage larva:—Eyespots circular. A pair of disk pores and porettes on abdominal segment 3. Papillae absent. Subcircular, 8-shaped pores on abdominal segments 7 and 8 as in later instar larvae. Eighth abdominal setae cephhalaterad of vasiform orifice. Vasiform orifice reaching submargin, operculum transversely rectangular. Antennal segments I and II short, with a short seta near base, III elongate, with a short seta at distal third and at apex. Legs with an elongate seta on inner margin of coxa and on outer margin of tibia, a very short seta on inner margin of tibia; tarsal digitule elongate, slender throughout. A pair of elongate setae just anterior to mouth parts, and a pair of minute setae at apex of beak.

Adult:—Parts of compound eye joined by 4 facets. Antennal segment III as long as combined length of IV-VII; IV, VI, and VII subequal in length and somewhat shorter than V; segment III with a poorly defined sensorium at basal fourth, a sensory seta near distal end, and 2 sensoria at distal end; IV with a sensory seta at distal third; V and VI each with a sensorium at apex and VI also with an elongate sensory seta slightly before the sensorium; VII with 2 elongate sensory setae at mid-length, and a sensorium at distal fourth; seta at apex of VII as long as greatest diameter of segment. Forewing (in specimens not treated with caustic) with 3 dark spots as shown in Fig. 1 g.

Material studied:—Holotype, mounted pupa from Pisonia macranthocarpa Donn. Sm. (Nyctaginaceae), Ipare, near Altagracia de Orituco, State of Guairi, Venezuela, November 1966, received from Frank A. Lee, in USNM. Paratypes, numerous unmounted and 83 mounted specimens of all stages from P. macranthocarpa, Altagracia de Orituco, 1 March 1961, and Guatopo, Ipare, and Lezama, near Altagracia de Orituco, November 1966; all received from Frank A. Lee. Most paratypes are in the collection of the U. S. National Museum, Washington, D. C. Others are in the Florida State Collection of Arthropods, Gainesville, Fla., and in the British Museum (Natural History), London, England.

Insects were abundant, but they did not entirely cover the lower surface of the leaves. There was no evidence of parasitism in the material.
Only one of 42 mounted pupae had numerous, well-developed tubercle-like papillae on the dorsal surface. Because of their unusual size and number, this specimen appeared superficially to be very different from the other pupae.

LITERATURE CITED


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