Description of a new species of Toumeyella Cockerell (Hemiptera, Coccidae) from Mexico, with a taxonomic key to Mexican species

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ABSTRACT. Description of a new species of Toumeyella Cockerell (Hemiptera, Coccidae) from Mexico, with a taxonomic key to Mexican species. A new species of soft scale insect from Mexico, Toumeyella fontanai Kondo & Pellizzari sp. nov. is described and illustrated. A taxonomic key to the species of scale insects of the genus Toumeyella Cockerell known in Mexico is provided.

KEYWORDS. Acacia; coccid; soft scales; Toumeyella fontanai.

RESUMO. Descrição de uma nova espécie de Toumeyella Cockerell (Hemiptera, Coccidae) do México e chave do gênero para as espécies mexicanas. Uma nova espécie de cochonilha do México, Toumeyella fontanai Kondo & Pellizzari sp. nov., é descrita e ilustrada. Uma chave taxonômica para separar as espécies de cochohnilhas do gênero Toumeyella Cockerell que ocorrem no México é fornecida.

PALAVRAS-CHAVE. Acacia; coccídeo; cochonilha; Toumeyella fontanai.

According to the scale insects database ScaleNet (Ben-Dov et al. 2010), currently there are 14 species of soft scale insects included in the genus Toumeyella Cockerell, which are distributed in Brazil (2 spp.), Cuba (1 sp.), Mexico (4 spp.) and the United States (9 spp.).

The four species of Toumeyella hitherto recorded from Mexico are: T. erythrinae Kondo & Williams, 2003 (Fig. 1A), T. mirabilis (Cockerell, 1895) (Fig. 1B), T. parvicornis (Cockerell, 1897) (Figs 1E & F) and T. salli (Signoret, 1873) (no available photos).

Signoret (1873) described T. salli based on a specimen sent to him from Mexico. The original description in French by Signoret was translated (Kondo & Williams 2004) as follows: “A species of monstrous size, which was collected in Mexico on an undetermined plant, and donated by M. Sallé. Its size is 2 cm long by 1.5 cm wide and 0.5 cm high. The insect is brownish with some pale shading, a bit yellow. It is rugose on the sides”. These authors slide-mounted the large, pinned holotype specimen of Neolecanium salli Signoret, redescribed and illustrated it based on cuticular morphology and transferred it from the genus Neolecanium Parrott to Toumeyella which they considered to be a senior synonym (Kondo & Williams 2004). The host of T. salli is unknown.

The erythrina scale, Toumeyella erythrinae, is also a large species, which can grow up to 2.1 cm long and 2.0 cm wide, is a pest of Erythrina coralloides (Fabaceae), a common street tree in Mexico City, and was described by Kondo and Williams (2003) based on the adult female and first-instar nymph. The biology and damage caused by T. erythrinae was summarized by Kondo and Williams (2003).

Cockerell (1895) briefly described the Mesquite scale, Toumeyella mirabilis from specimens collected in Tucson (Arizona, USA), off Prosopis juliflora var. glandulosa (Fabaceae). Several years later, Ferris (1921) and Ferris & Kelly (1923) listed this species as present in some Mexican localities (Aguascalientes, Baja California Norte, Baja California Sur). Toumeyella mirabilis was redescribed by Hodgson (1994) based on non type-material collected in Arizona and Texas off Prosopis sp. and Xanthocephalum (Asteraceae).

The pine tortoise scale, Toumeyella parvicornis is a well known species, redescribed on a modern basis by Williams & Kosztarab (1972). It is associated with Pinaceae and is widely distributed, from Canada to Mexico (Williams & Kondo 2008). Toumeyella parvicornis has both a bark (Fig. 1E) and leaf form (Fig. 1F) (Hamon & Williams 1984; Williams & Kondo 2008) and occasionally it is damaging to pine seedlings and saplings (Hamon & Williams 1984).

On December 8, 2006, near Tlacotepec city (state of Puebla, Mexico), a single soft scale insect specimen was collected on a wild Acacia sp. (Fabaceae) growing in the maquis (“matorral” in Spanish) by the entomologist Paolo Fontana. The host plant was also infested by Coccus longulus (Douglas) (Fig. 1C & D). The insect was sent to the second author who slide-mounted the insect and recognized it as an undescribed species belonging to the genus Toumeyella. The specimen was later sent to the first author who confirmed its novelty, and prepared a description of the species. Here we describe the new species based on the adult female. Although we were reluctant to describe a new species based on a single specimen, the combination of morphological features of the
discovered insect justified the description of a new species, however, there is a risk that the specimen described here may not be representative of the species.

**MATERIAL AND METHODS**

The specimen was slide-mounted following the procedure described by Ben-Dov & Hodgson (1997). The terminology of morphological features follows mostly that of Hodgson (1994) and the illustration of the adult female (Fig. 2) shows the dorsum on the left and the venter on the right with enlargements of important features around the margin.

Specimen depository. CNIN: Instituto de Biología, Departamento de Zoología, Universidad Autónoma de México, Apartado Postal 70–153, Mexico city, D.F. 04510, Mexico.

**RESULTS AND DISCUSSION**

Genus *Toumeyella* Cockerell

Type-species: *Lecanium (Toumeyella) mirabile* Cockerell, 1895: 2.

Diagnosis (Adapted from Williams & Kosztarab 1972). Body of adult female convex to globular, often irregular in outline, naked or with thin glassy test. Dorsum. Derm heavily sclerotized at maturity. Dorsal tubercles absent. Unilocular or bilocular microducts present; aggregations of pores rarely present. Preopercular pores present, large. Anal plates with varying number of apical, subapical and fringe setae. Hypopygial pores present. Preopercular pores present, large. Anal plates with vary-ingly differentiated from marginal setae, numbering 3 per stigmatic area, or completely absent. Vent. Antenna and legs greatly reduced. Legs without tibio-tarsal sclerotization. Quinquelocular pores completely absent. Venter. Antenna and legs greatly reduced. Antennae usually 6 segmented. Spiracular pore bands widening broadly from each spiracle to spiracular cleft, about 30–50 pores wide near body margin. 4

4. Spiracular clefts present, well developed; spiracular setae well differentiated from marginal setae, numbering 3 per spiracular cleft. 4'. Spiracular clefts absent; spiracular setae absent or not differentiated from marginal setae. 4'. 3': Antennae usually 6 segmented. Spiracular pore bands widening broadly from each spiracle to spiracular cleft, about 30–50 pores wide near body margin. 4

4. Spiracular clefts present, well developed; spiracular setae well differentiated from marginal setae, numbering 3 per spiracular cleft. 4'. Spiracular clefts absent; spiracular setae absent or not differentiated from marginal setae. 4'.

**Toumeyella fontanai** Kondo & Pellizzari, sp. nov.


Material studied. Holotype: adult female (CNIN). Type-locality: Mexico, state of Puebla, Cacalotepac, 11km SW Tlacotepec city, 18°36'23.1"N, 097°35'55.3"W, 8.xii.2006, coll. P. Fontana, ex *Acacia* sp.

Description. Adult female (Figs. 1C, D & 2). Body round in shape, posterior end elevated, 2.8 mm at highest point. Derm grayish brown in color, with a pinkish cream narrow submarginal band; dorsum with a pinkish cream colored V-shaped elevation, with outer sides of elevation deeply depressed. Insect in life 5.2 mm long and 5.2 mm wide.

Mounted material. (Fig. 2) Body outline oval, body 5.7 mm long, 5.8 mm wide.

Dorsum. Derm membranous. Dorsal setae bluntly to sharply spinose, straight or slightly curved, each 20–33 μm long, scattered evenly. Dorsal microducts each about 5 μm wide, with a long terminal filament, evenly scattered. Simple pores each 5–6 μm wide, evenly scattered. Preopercular pores numerous, present in a rather dense mid-dorsal line extending from area anterior to anal plates to head near margin, and also scattered throughout most of dorsum, but absent from margin and submargins, each pore 7.5–13.0 μm wide. Dorsal tubular ducts, dorsal tubercles and pocket-like sclerotizations absent. Anal plates together quadrate, with rounded angles, plates located about 1/4 of body length from posterior margin, each plate 250–255 μm long, 130–135 μm wide, anterolateral margin 150–155 μm long, posterolateral margin 220–225 μm long, with 3 apical setae on posterior inner margin, plus 1 pair of long fringe setae, about 5 ventral subapical setae and numerous hypopygial setae. Anal ring with 10 setae (not illustrated). A sclerotic area present around anal plates.

Marginal setae bluntly to sharply spinose, straight to slightly bent, each 25–43 μm long, arranged in a single irregular row, with 8–10 on each side between anterior and posterior stigmatic areas. Stigmatic clefts shallow, with 3 stigmatic setae per stigmatic area, median seta longest, 47–55 μm long, lateral setae each 14–28 μm long. Eyes not detected.

Venter. Derm entirely membranous. Preopercular disc-pores each 7–9 μm wide, mostly with 5 loculi (range 3–6), present around vulvar area and in a submedial line between vulva and posterior spiracle on each side. Spiracular disc-pores mostly...
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with 5 loculi (range 3–8), each pore 6.3–9.5 µm wide, present in a broad band as wide as peritremes, extending laterally from each spiracle to body margin, pore band narrowing near margins. Ventral microducts scattered evenly throughout, each about 5 µm wide. Ventral tubular ducts present around vulvar region, each tubular duct with an inner filament ending in a small gland. Ventral setae slender, straight or slightly bent, each 15–28 µm long; with 3 pairs of long median setae, each 47–65 µm long on pregenital segments and 2 pairs of interantennal setae. Spiracles well developed, large, anterior spiracular peritremes each 175 µm wide, posterior peritremes each 195 µm wide. Legs greatly reduced, but most segments

**Fig. 1.** (A) *Toumeyella erythrinae* Kondo & Williams on *Erythrina collaroides* (Mexico City, Mexico). (B) *Toumeyella mirabilis* (Cockerell) on *Prosopis juliflora* (Arizona, USA). (C) *Toumeyella fontanai* Kondo & Pellizzari (see arrow) surrounded by *Coccus longulus* (Douglas) on twig of Acacia tree. (D) Side view of *T. fontanai* (see arrow) showing a large side depression. Notice grayish-pink submarginal band. (E-F) *Toumeyella parvicornis* (Cockerell) (Alabama, USA): (E) bark form, (F) leaf form. Photos 1A, E, F by T. Kondo, 1B by Alex Wild, and 1C & D by P. Fontana.
usually discernible, with trochanter and femur, and tibia and tarsus fused, all segments with few setae; metathoracic legs shortest; total length of all legs: each 150–335 µm long: coxa 78–128 µm long, trochanter + femur 88–110 µm long, tibia + tarsus 118–133 µm long, claw 17.5–22.5 µm long; claws with a small denticle, claw digitules, slender, knobbed; tarsal digitules knobbed or spiniform. Antennae short, each 260–265 µm long, 7 segmented, with fleshy setae present on last two antennal segments. Mouthparts missing on specimen.

Etymology. The species is named in homage to Paolo Fontana, entomologist, who collected the insect.

**DISCUSSION**

The status of the genus *Toumeyella* was summarized by Williams & Kondo (2008), who listed 16 species. Two of them (namely *T. cerifera* Ferris and *T. sonorensis* Cockerell & Parrott) were later transferred to the genus *Neotoumeyella*.
(Kondo & Williams 2009). With the description of *T. fontanai* sp. nov., the number of species in the genus *Toumeyella* increases to 15 species worldwide and to 5 in Mexico.

The genus *Toumeyella* has a wide distribution in the New World, with most species being described from the USA, suggesting that many more new species should be found in Mexico and other countries in the Nearctic and Neotropical Regions.

With regard to the host plants, *Toumeyella* species are mostly oligophagous, usually being recorded off members of one or very few families. The Mexican *Toumeyella* species have been collected off Fabaceae (*T. erythrinae*, *T. mirabilis* and *T. fontanai*), and Pinaceae (*T. parvicornis*); the host plant of *T. sallei* is unknown.

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**REFERENCES**


