

## Two new species of *Triplocania* from Veracruz, Mexico (Psocodea: 'Psocoptera': Ptiloneuridae)

### Dos nuevas especies de *Triplocania* de Veracruz, México (Psocodea: 'Psocoptera': Ptiloneuridae)

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#### ABSTRACT

Two species of *Triplocania*, known so far only from Córdoba, Veracruz, México, are here described and illustrated; they rise to five the number of species of *Triplocania* in Mexico. *T. delgadoi* n. sp., is close to two Central American species, but differs from them in the forewing pigmentation pattern and in the structure of the female ninth sternum. *T. halffterorum* is unique in the genus by presenting two striking autapomorphies: a hypandrium of one sclerite, with two anterior projections bent posteriorly, and two sausage-shaped projections in the female ninth sternum; it constitutes a distinct species group in the genus. The types are deposited in the National Insect Collection (CNIN), Instituto de Biología, Universidad Nacional Autónoma de México.

**Key words:** Taxonomy, neotropics, species groups, endemics.

#### RESUMEN

Dos especies de *Triplocania*, conocidas hasta ahora solo de Córdoba, Veracruz, México, son aquí descritas e ilustradas; con ellas se eleva a cinco el número de especies de *Triplocania* en México. *T. delgadoi* es cercana a dos especies centroamericanas, pero difiere de ellas en el patrón de pigmentación del ala anterior y en la estructura del noveno esternito de la hembra. *T. halffterorum* es única en el género, por presentar dos notables autapomorfías: hipandrio de un esclerito, con dos proyecciones anteriores dirigidas posteriormente, y dos proyecciones en forma de salchicha en el noveno esternito de la hembra; esta especie constituye un grupo de especies muy diferente en el género. Los tipos están depositados en la Colección Nacional de Insectos (CNIN), en el Instituto de Biología, Universidad Nacional Autónoma de México.

**Palabras clave:** Taxonomía, neotrópico, grupos de especies, endémicas.



#### INTRODUCTION

The genera presently included in the family Ptiloneuridae, can be separated by the key in García Aldrete (2006); the genus *Triplocania* is characterized by having hindwing M unbranched, forewing 2A joining wing margin, without crossveins between 1A and wing margin, with forewing areola postica high, of apex rounded, with labral sclerites incomplete, not reaching anterior margin of labrum, by having forewing M three-branched, occasionally dichotomously branched, resulting in four M veins, and by having the hypandrium of three sclerites: a large, central sclerite, which may bear a central or two lateral posterior projections, flanked anteriorly by small sclerites. In the females, the subgenital plate is simple, v1 is slender, acuminate, v2+3 is often proximally heeled, and v2 has a field of setae on its surface; the ninth sternum is distinctive for each species.

Access to the study of more species since 2006, allows for a widening of the above diagnosis, particularly concerning the structure of the hypandrium: In some species the side sclerites are fused proximally to the central sclerite, resulting

in a hypandrium of one piece; in other species, in addition to the anterior sclerites flanking the central one, there is one pair of strongly sclerotized sclerites, flanking posteriorly the central one resulting in a hypandrium of five pieces.

The genus was erected by Roesler (1940), the type species being *T. magnifica*, from Nova Teutonia, Santa Catarina, Brazil. The species of *Triplocania* range from southern Mexico (Zacatlan, Puebla), to southeastern Brazil (Nova Teutonia, Santa Catarina), with a distance between those extremes of some 7400 km. Presently, the genus includes 83 species, of which 25 have been described, from Brazil (11), Peru (5), Mexico (3), Belize (2), Nicaragua (2), and one species each from Bolivia, Colombia, Costa Rica and Guatemala. 48 undescribed species, are available for study in my collection, from Brazil (29), Ecuador (12), Colombia (3), Peru (2), and one each from Bolivia and Venezuela, in addition to ten species from Panama, treated by Broadhead in an unpublished manuscript. Of the 83 species known in the genus, 49 occur in the Amazonian Region, 16 are found elsewhere in South America, 16 are found in Central America,

and three species occur in Mexico (*T. brailovskyana* García Aldrete, *T. spinosa* Mockford and *T. vazquezae* García Aldrete); the purpose of this paper is to describe and illustrate two additional species recently discovered in the state of Veracruz, southern Mexico.

#### MATERIAL AND METHODS

Eight specimens were available for study; they were dissected in 80% ethyl alcohol and their parts (head, right legs and wings, and genitals), were mounted in Canada balsam. Before dissecting, whole specimens were placed in 80% alcohol and observed at 80X to record color. Standard measurements (in  $\mu\text{m}$ ), were taken with a filar micrometer (see García Aldrete 2011); abbreviations of parts measured are as follows: FW and HW: right fore- and hind- wings length, F, T, t1, t2 and t3: lengths of femur, tibia and tarsomeres 1, 2 and 3 of right hind leg, f 1-f n: lengths of flagellomeres 1-n, Mx4: length of fourth segment of right maxillary palpus, IO: minimum distance between compound eyes in dorsal view of head, D and d: antero-posterior diameter and transverse diameter, respectively, of right compound eye in dorsal view of head. The types are deposited in the National Insect Collection, Instituto de Biología, Universidad Nacional Autónoma de México, México City (CNIN).

#### RESULTS

##### *Triplocania delgadoi* García Aldrete (♀) (Figs. 1-6)

**Diagnosis.** Forewing pigmentation pattern as in Fig. 2. Anterior heel of v2+3 slender, acuminate (Fig. 5). Ninth sternum with a large, thick, opaque middle area, divided in the middle by a longitudinal line, forked anteriorly, each half bearing in the middle a small, strongly pigmented oval area (Fig. 5).

**Color** (in 80% ethyl alcohol). Body pale brown, with dark brown spots as indicated below. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Postclypeus with dark brown striae. Wings hyaline, veins brown, each ending in a dark brown spot at wing margin. Forewing pterostigma with a dark brown band proximally and distally; a brown submarginal band from R4+5 to M3 with hyaline marginal lunules, a brown spot between proximal end of R4+5 and M, a brown spot surrounding distal end of Cu1b, a brown spot in areola postica from Cu1a extending posteriorly, and a large brown area from Cu1 to distal end of Cu2. Legs pale brown, femur with pigmented pattern as illustrated (Fig. 3). Coxae with dark brown apices. Tergal lobes of meso- and metathorax with anterior borders dark brown. Subgenital plate with a large brown band on each side. Abdomen with dark brown, transverse subcuticular rings, faded ventrally.

**Morphology.** As in Diagnosis, plus the following: Outer cusp of lacinial tip broad, with four-five denticles. Forewing pterostigma long, wider in distal third, about six times as long as wide. Rs convex, M concave, R4+5 about 1.4 times as long as Rs, M1 straight, M2 and M3 strongly sinuous. Areola

postica tall, rounded at apex, slightly slanted posteriorly (Fig. 2). Subgenital plate broad, setose, almost straight posteriorly (Fig. 6).

Gonapophyses (Fig. 5): v1 long, slender, acuminate, v2+3 with slender, pointed proximal heel, posterior lobe with 7-9 setae; distal process slender, acuminate, with field of microsetae along inner edge. Ninth sternum (Fig. 5). Paraprocts (Fig. 4) almost triangular, setose, sensory fields with 26-28 trichobothria on basal rosettes. Epiproct broadly triangular, with a group of three macrosetae mesally, next to anterior border; setal field on posterior two thirds as illustrated (Fig. 4).

**Measurements.** FW: 5048, HW: 2898, F: 355, T: 2176, t1: 991, t2: 91, t3: 136, IO: 544, D: 451, d: 293, IO/d: 1.85, PO: 0.64.

**Type locality.** MEXICO. Veracruz. Cordoba. Cuauhtemoc Agricultural Colony, 800m., 18°52'56"N: 96°53'47"W, interception trap in median subdeciduous forest. 8-31.I.2011. Holotype ♀. Luis Leonardo Delgado Castillo.

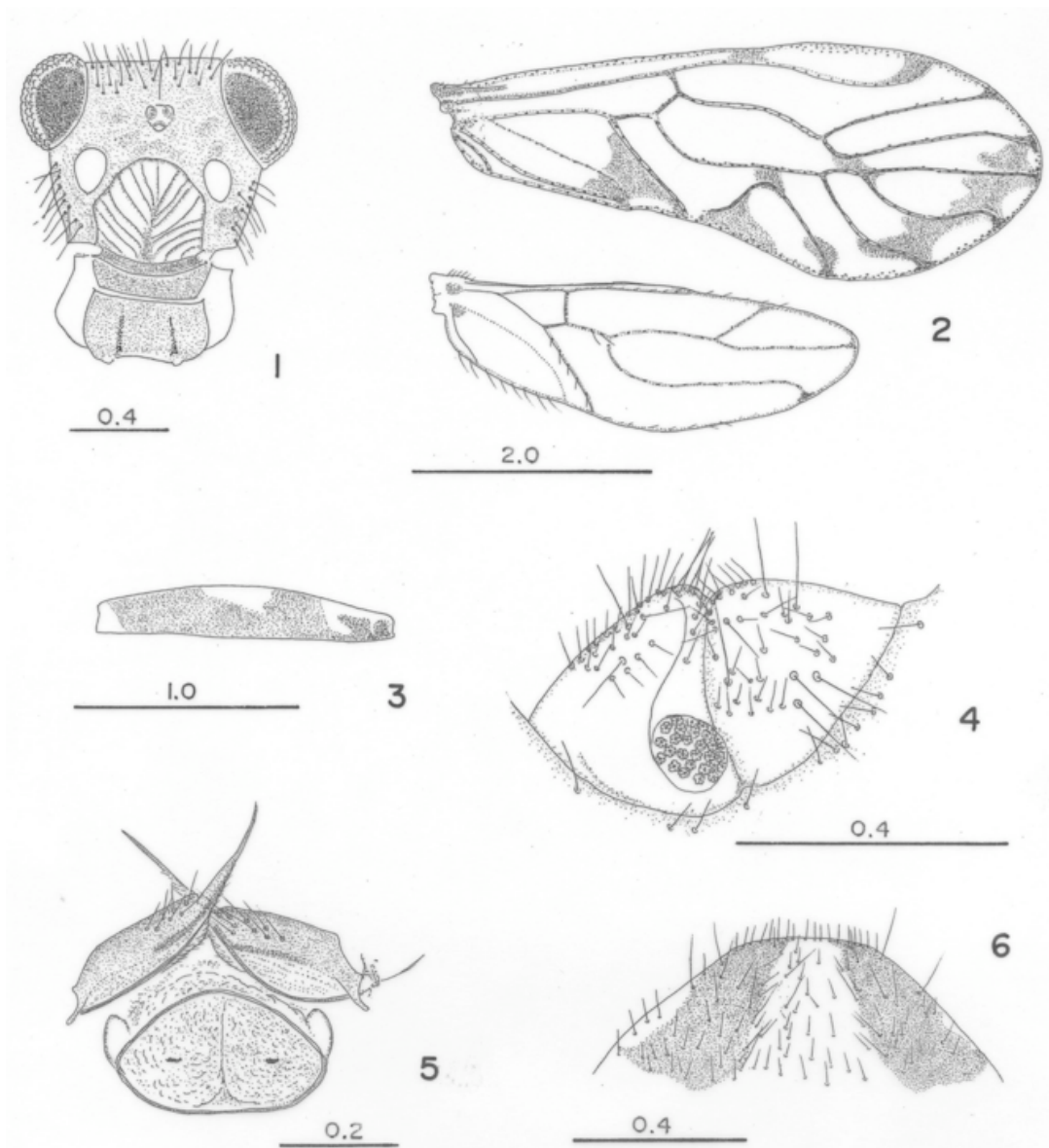
**Etymology.** This species is gratefully dedicated to its collector, Luis Leonardo Delgado Castillo, of the Instituto de Ecología, A. C. (Jalapa, Veracruz).

**Remarks.** *T. delgadoi* presents a forewing pigmentation pattern somewhat similar to *T. chiquibulensis* García Aldrete, from Belize, and to *T. saslayensis* García Aldrete, from Nicaragua, known only from the male. It clearly differs from the former in the ninth sternum, and the possibility of it being the female of the latter is ruled out, on account of substantial differences in the head pigmentation pattern, and on details of the forewing pattern, e.g., in *T. saslayensis*: areola postica unpigmented, other than in the apex, absence of a brown spot between the proximal end of R4+5 and M, and anterior pigmented band continuous, from distal end of A1 to near anterior end of pterostigma. The same pattern is shown by several undescribed South American species, but *T. delgadoi* differs from them in the structure and pigmentation of the ninth sternum.

##### *Triplocania halffterorum* García Aldrete (Figs. 7-14)

**Diagnosis.** Male hypandrium of one sclerite, consisting of a large, central setose lobe, with a slender anterior projection on each side, bent posteriorly, and distally dilated (Fig. 9). Female ninth sternum with a sausage-shaped projection, directed sideways, mesally on each half of the sclerite (Fig. 14).

**Female.** Color (in 80% ethyl alcohol). Body creamy white, with dark brown areas as indicated below. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Two slender ochre bands from each compound eye to ocellar group, the lower one joining a pale brown band between ocellar group and epistomal sulcus; postclypeus with brown diagonal striae. A brown band on each genae, from compound eye to subgenal sulcus, next to the epistomal sulcus. Antennae:



Figures 1-6. *Triplocania delgadoi* García Aldrete (♀). 1. Front view of head. 2. Fore- and hind- wings. 3. Pigmentation pattern of hind femur. 4. Right paraproct and epiproct. 5. Gonapophyses and ninth sternum. 6. Subgenital plate. Scales in mm.

scape and pedicel creamy white, flagellum pale brown, almost white; labrum reddish brown in the area between the longitudinal sclerites, and pale brown between each sclerite and side margin. Maxillary palps 1-3 dirty white, Mx4 pale brown. Tergal lobes of meso- and metathorax reddish brown; thoracic pleurae with irregular brown spots. Legs creamy white, apex of femur and t3 dark brown. Wings hyaline, veins pale brown, ending in a small brown spot at wing margin. Abdomen whitish, subgenital plate with a brown longitudinal band on each side, gonapophyses reddish brown.

**Morphology.** As in Diagnosis, plus the following: Outer cusp of lacinial tip broad, with four denticles. Forewing pterostigma long, rounded distally, wider in the middle;

R2+3 sinuous, about twice as long as Rs; areola postica tall, rounded apically, slanted distally (Fig. 8). Hindwing R4+5 about 1.5 times as long as Rs (Fig. 8). Subgenital plate (Fig. 12), broad, rounded posteriorly, with a dense field of setae on surface. Gonapophyses (Fig. 14): v1 long, slender, acuminate, v2+3 with short, pointed anterior heel; outer lobe with a row of four setae near border, and mesally two setae in line; distal process long, sinuous, acuminate, with a field of microsetae along inner border. Ninth sternum (Fig. 14) a thick membrane with irregular folds, slightly pigmented. Paraprocts (Fig. 13) broadly triangular, setose, sensory fields with 28-30 trichobothria on basal rosettes. Epiproct (Fig. 13) broad, triangular, with apex rounded, with a group of three

setae mesally, towards anterior border, and a field of setae on posterior two thirds, as illustrated.

**Measurements.** FW: 6548, HW: 4360, F: 1632, T: 2809, t1: 1088, t2: 95, t3: 144, ctt1: 33, f1: 1251, f2: 1322, f3: 1135, IO: 560, D: 442, d: 306, IO/d: 1.83, PO: 0.69.

**Male.** Color (in 80% ethyl alcohol). Same as the female.

**Morphology.** As in diagnosis, plus the following: Lacinial tip as in the female. Hypandrium (Fig. 9). Phallosome (Fig. 11) with side struts slender, dilated posteriorly, joining the proximal ends of the external parameres, these robust, rounded distally, bearing pores; two pairs of endophallic sclerites, inner pair curved, wide at base, distally acuminate; outer pair with broad, basal projections, directed posteriorly, mesally dilated, distally acuminate; underlying the endophallic sclerites a membrane with folds, anteriorly reticulate, and posteriorly with short, broad spines. Paraprocts (Fig. 10) broad, setose, sensory fields with 32-34 trichobothria on basal rosettes. Epiproct (Fig. 10) wide at base, broadly triangular, rounded posteriorly, with a group of three mesal setae near anterior border, a macroseta medially near each side, a field of small setae on each side of posterior half, and a row of three setae and a field of microsetae on posterior border.

**Measurements.** FW: 5929, HW: 4025, F: 1561, T: 2603, t1: 1098, t2: 95, t3: 136, ctt1: 25, f1: 1315, f2: 1259, f3: 1149, IO: 432, D: 544, d: 375, IO/d: 1.15, PO: 0.68.

**Typelocality.** MEXICO. Veracruz. Cordoba. Cuauhtemoc Agricultural Colony, 800m., 18°52'56"N: 96°53'47"W, interception trap in median subdeciduous forest. Holotype ♂, 1 paratype ♂, 8-31.I.2011. 12.XII.2010-8.I.2011, 1 paratype ♂, 1 paratype ♀. 6-31.III.2011, 1 paratype ♂. 1.II-6.III.2011, 2 paratypes ♀. All specimens collected by Luis Leonardo Delgado Castillo.

**Etymology.** This species is dedicated, with great pleasure, to Dr. Gonzalo Halffter Salas, a long recognized and distinguished leader of Mexican and world entomology and biological conservation, whose studies on the biogeography of the American entomofauna, and on the taxonomy and behavior of scarabaeid beetles are irreplaceable and whose

efforts in the conceptualization for the establishment of protected areas have become essential in the field; it is also dedicated, with equal pleasure, to Violeta Marcet Ocaña de Halffter, in recognition of the background support, silent and unobtrusive, in all aspects, to the work of Dr. Halffter Salas; clearly the proverbial great woman behind a great man.

**Remarks.** *T. halffterorum* is the largest species known in the genus. It presents two striking autapomorphies that set it apart from all the other species in the genus, namely, the remarkable hypandrium of one sclerite, and the sausage-shaped projections of the female ninth sternum; these two characters diagnose a distinct species group in *Triplocania*, where presently, and on the basis of the hypandrium structure, seven species groups can be recognized; these will be treated separately.

#### ACKNOWLEDGMENTS

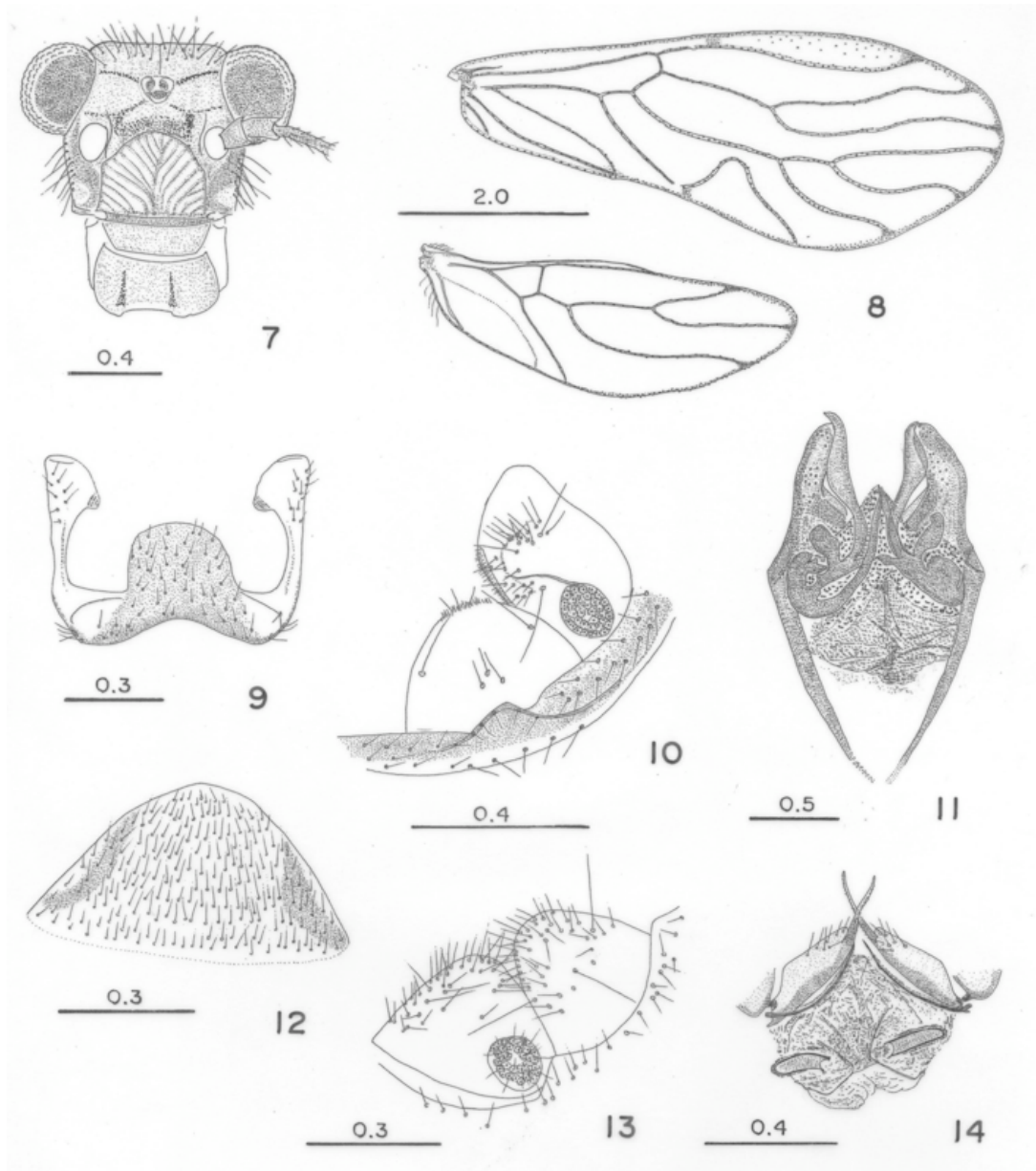
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Figures 7-14. *Triplocania halffterorum* García Aldrete. 7. Front view of head. ♀. 8. Fore- and hind- wings. ♀. 9. Hypandrium. ♂. 10. Epiproct and left paraproct. ♂. 11. Phallosome. ♂. 12. Subgnital plate. ♀. 13. Right paraproct and epiproct. ♀. 14. Gonapophyses and ninth sternum. ♀. Scales in mm.