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A NEW SPECIES OF *AGASTOSCHIZOMUS* (SCHIZOMIDA: PROTOSCHIZOMIDAE) FROM GUERRERO, MEXICO

Héctor Montaño Moreno and **Oscar F. Francke**

Colección Nacional de Arácnidos, Instituto de Biologia
Universidad Nacional Autónoma de México
Apto, Postal 70-153, México, D. F. 04510
Email: hmontano@ibiologia.unam.mx, offb@ibiologia.unam.mx

ABSTRACT

Agastoschizomus juxtlahuacensis is described from Grutas de Juxtlahuaca, Guerrero. It is a troglobite, as are the other four known species in the genus. This is the first species in this genus reported from the Sierra Madre Occidental.

RESUMEN

Se describe *Agastoschizomus juxtlahuacensis* de las Grutas de Juxtlahuaca, Guerrero. La nueva especie es troglobia, al igual que las cuatro conocidas anteriormente. Es la primera especie de dicho género reportada para la Sierra Madre Occidental.

INTRODUCTION

Mexico has one of the more diverse schizomid faunas of the World: two families (one of which is endemic), seven genera (five endemic), and 34 named species distributed throughout most of the country. The family Protoschizomidae has two troglobitic genera: *Protoschizomus* Rowland with seven species, and *Agastoschizomus* Rowland with four. The family Hubbardiidae is represented by five genera: *Pacal* Reddell and Cokendolpher with three species, *Mayazomus* Reddell and Cokendolpher with two species, *Schizomus* Cook with one, *Sotanostenochrus* Reddell and Cokendolpher with two, and *Stenochrus* Chamberlin with fifteen (Cokendolpher and Reddell, 1992).

The four named species of *Agastoschizomus* come from caves in the Sierra Madre Oriental, in the states of Hidalgo (one species), San Luis Potosí (two) and Tamaulipas (one). Recently, a juvenile specimen was reported from Guerrero (Armas and Palacios-Vargas, 2006). The objective of this contribution is to describe the first species from a cave in the Sierra Madre Occidental, representing the southernmost distribution record for the family. This is the smallest species in the genus, requiring slight revisions to the generic diagnosis.

METHODS

Eight specimens were collected during two visits to the cave, 700 m or more beyond the entrance. The specimens were immediately fixed in 80% ethanol. Dissections (chelicera and female genital plate) were done under a Nikon SMZ-800 stereoscope fitted with a camera lucida for the illustrations. Detailed observations were done with a Nikon Optiphot II microscope with differential phase interference. The male genital sclerites were not chemically treated for the illustration; the female genital sclerites and chelicera were cleared with lactophenol for two minutes. The description follows those by Cokendolpher and Reddell (1992).

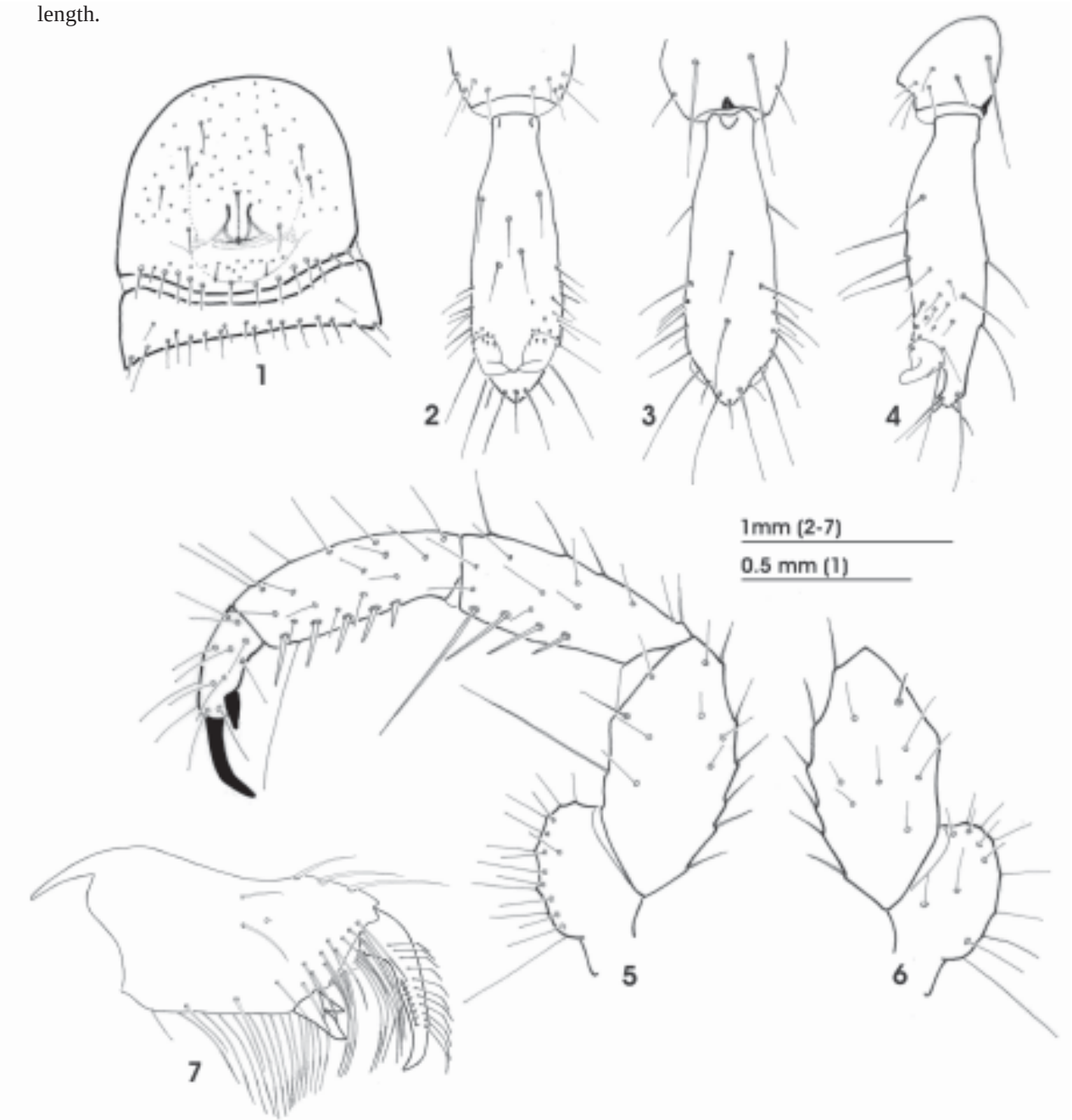
Genus *Agastoschizomus* Rowland

Diagnosis.—Cavernicolous. Relatively large, 6.57 to 12.40 mm in total length (excluding the flagellum). Propeltidium with one seta on anterior process. Anterior process downturned or not apically. Anterior sternum with one or two sternapophysial setae. Gap between mesopeltidial plates 0.1 to 0.3 times anterior width of the

plates. Sternites V-VIII of male with two distinct rows of setae. Sternite VI 2.0 to 3.0 times wider than long; width/length ratio versus body length 2.2 to 5.4. Female flagellum with or without segments and articles. Male flagellum not expanded distally, with or without retractable ventrolateral lobes. Female pedipalp in proportion to body length 0.9 to 1.2 times relative length of male pedipalp. Pedipalpal spur 0.33 to 0.7, claw about 0.88 to 1.3 dorsal length of basitarsus-tarsus. Femur IV 4.8 to 8.2 times longer than deep. Legs I and IV longer than body length.

Agastoschizomus juxtlahuacensis, new species
Figs. 1-10

Material examined.—MEXICO: *Guerrero*, Grutas de Juxtlahuaca, N 17° 26.324', W 99° 09.570' (938 m), Juxtlahuaca, Municipio de Quechultenango: holotype male (T-0245), one adult male paratype (T-0246), one juvenile female paratype (T-0249), and one unsexed juvenile paratype (T-0252) collected on 5 April 2007 (H. Montaño, O. F. Francke, A. Valdez, C. Santibáñez); one



Figs. 1-7.—Holotype male of *Agastoschizomus juxtlahuacensis.* 1. genital plate; 2. ventral view of flagellum; 3. dorsal view of flagellum; 4. lateral view of flagellum; 5. retrolateral view of left pedipalp; 6. prolateral view of basal segments of left pedipalp; 7. prolateral view of left chelicera.

adult male paratype (T-0247), one juvenile male paratype (T-0248), and two juvenile female paratypes (T-0250 and T-0251) collected on 14 June 2007 (H. Montaño, O. F. Francke, J. Ponce-Saavedra, A. Ballesteros, M. Córdova). All specimens deposited in the Colección Nacional de Arácnidos (CNAN), Instituto de Biología, UNAM.

Etymology.—The specific name refers to the cave where the species was found.

Diagnosis.—Relatively small, adult length 6.57 mm (excluding flagellum); metapeltidium divided as in *Agastoschizomus lucifer* Rowland, from which it differs in having four ventrolateral spinose setae on the pedipalp patellae; pedipalp claw shorter (0.88) than dorsal length of tarsus-basitarsus, whereas it is longer in the other four species in the genus; flagellum with ventrolateral lobes present; serrula on movable finger of the chelicera with eight teeth.

Description.—Male holotype (length from distal edge of propeltidium to base of flagellum) 6.57 mm. Color: Pedipalps and propeltidium light orange, opisthosoma brownish.

Cephalothorax: Propeltidium 2.05 mm long, 1 mm wide; anterior process slightly curved downward, with one apical seta and one pair of setae at base of process; with three pairs of medial setae with the second pair longer than the others, and a pair of shorter setae posteriorly; without ocular spots. Mesopeltidial plates 0.5 mm long; gap between the plates about 0.21 anterior width of one plate. Metapeltidium divided, each plate about 0.55 mm wide. Anterior sternum triangular, with 10 setae. Posterior sternum with four setae.

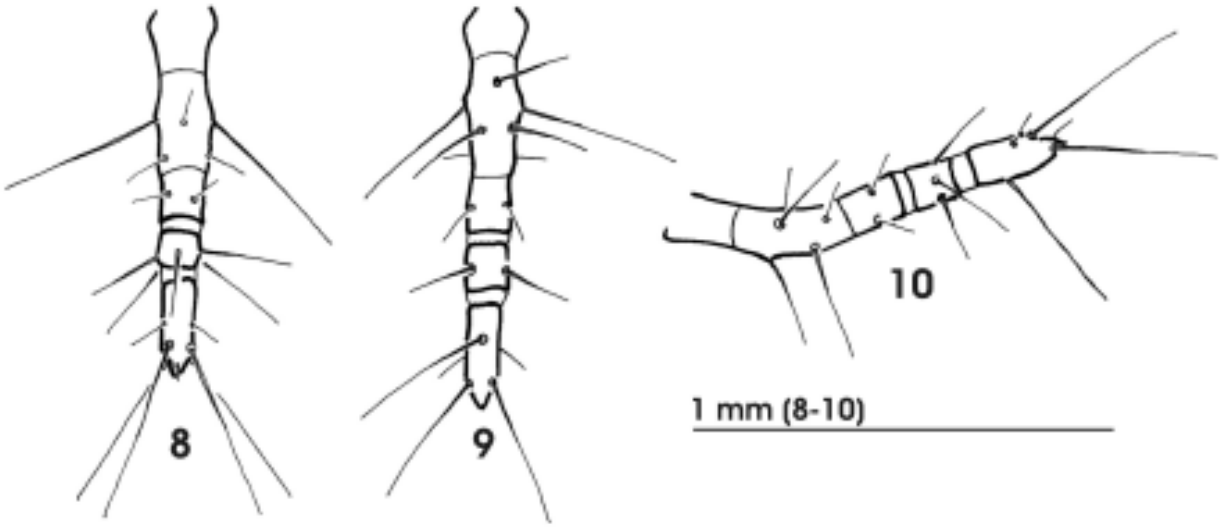
Abdomen: Tergite I with two pairs anterior microsetae (in row) and one pair large posterior setae; tergite II with three pairs anterior microsetae (in row) and one pair large posterior setae; tergites III and IV with one pair dorsal setae each; tergites V-VII with one pair dorsal and one pair smaller dorsolateral setae; tergite VIII with two pairs dorsal setae and one pair dorsolaterally; tergite IX with one pair dorsal, and one pair dorsolateral setae; Tergites X-XII semi-telescopic, XII being longest. Ventrally with a series of three pairs of branchial spots slightly more pigmented than the sclerites. Genital plate clearly sclerotized (Fig. 1), with four pairs longer setae. Sternite VI three times longer than wide; width/length ratio versus body length, 2.2. Sternites V-IX with two distinct submarginal rows of setae. Flagellum (Figs. 2-4) 1.33 mm long, 0.3 mm wide, tubular with one pair short non-sclerotized retractable ventrolateral lobes with 9-11 small setae distally under each lobe; two setae dorsally along midline, and five ventral setae.

Pedipalps (Figs. 5-6): Trochanter semi-ovate, without sharp distal margins, without mesal spur. Femur with two thickened setae on ventral margin, basal one longer (0.44 mm) and spiniform; with six spiniform setae dorsally. Patella with four ventrolateral spinose setae, basalmost shorter (0.11 mm) and distalmost longest (0.61 mm). Tarsus-basitarsus with two symmetrical spurs, 0.33 dorsal length of segment; claw 0.88 length of segment.

Chelicera (Fig. 7): Serrula with eight teeth. Seta: 1=3, 2=6, 3=11, 4=5, 5=0, 6=3.

Legs: Leg 1, including coxa, 10 mm long; basitarsal-tarsal proportions 43:9:11:9:9:8:34. Femur IV 5.15 times longer than deep.

Presumed juvenile female. Without apparent sexual dimorphism; 6.2 mm long. Genital plates not sclerotized,



Figs. 8-10.—Juvenile female of *Agastoschizomus juxtlahuacensis*. 8. dorsal view of flagellum; 9. ventral view of flagellum; 10. lateral view of flagellum.

so spermathecae could not be observed despite having cleared them with lactophenol and examined with phase contrast microscopy. Flagellum (Figs. 8-10) with five segments, distalmost two with articulated rings (=annuli); 15 thick and 10 thin setae.

Variation: Dorsal setae (type 6) on chelicera vary from two to three. The spines on the pedipalp femur vary from three to four. There can be three or four dorsal setae on segment V. One juvenile had an extra pair of dorsal median setae on the propeltidium. The number of teeth on the serrula of the chelicera varies between seven (3 specimens) and eight (4 specimens).

Measurements (mm).—Holotype male: Pedipalp: trochanter 0.63; femur 1.00; patella 0.93; tibia 0.87; basitarsus-tarsus 0.45; total 3.88. Leg I: coxa 0.65; trochanter 0.72; femur 2.33; patella 2.65; tibia 2.00; basitarsus 0.53; tarsus 1.12; total 10. Leg IV: trochanter 1.06; femur 2.29; patella 1.10; tibia 1.80; basitarsus 1.48; tarsus 0.90; total 8.63.

Comparisons.—*Agastoschizomus juxtlahuacensis* differs from the other four species in the genus in having the pedipalp claw shorter than the tarsus (longer in the others), and in having four tarsal spines on the pedipalp patella (the others have three or less). *Agastoschizomus juxtlahuacensis* shares with *A. lucifer* the split metapeltidium (in the other three species it is not divided), and on males of both species the flagellum is similar in size and shape, although in lateral view it is more bulbous in *A. lucifer.* The new species shares with *A. lucifer* and with *A. huitzmolotitlensis* Rowland the presence of ventrolateral lobes on the male flagellum (absent in the other three species).

Habitat.—The cave entrance is located at an elevation of 938 m, in tropical deciduous scrub forest. The main passage is approximately 1900 m long, with several side branches (Fig. 11). The specimens were found in Salón del Toro and beyond, at least 700 m from the entrance; and approximately 630 m from Salón del Infierno, which is where large bat colonies roost, and from where potential food is available. At that depth the temperature and relative humidity are quite stable throughout the year (Valdez, 2006). The cave is "exploited" for ecotourism by the local inhabitants, and the impact of human visitors is increasing inside the cave; therefore, we consider this population of schizomids to be threatened.

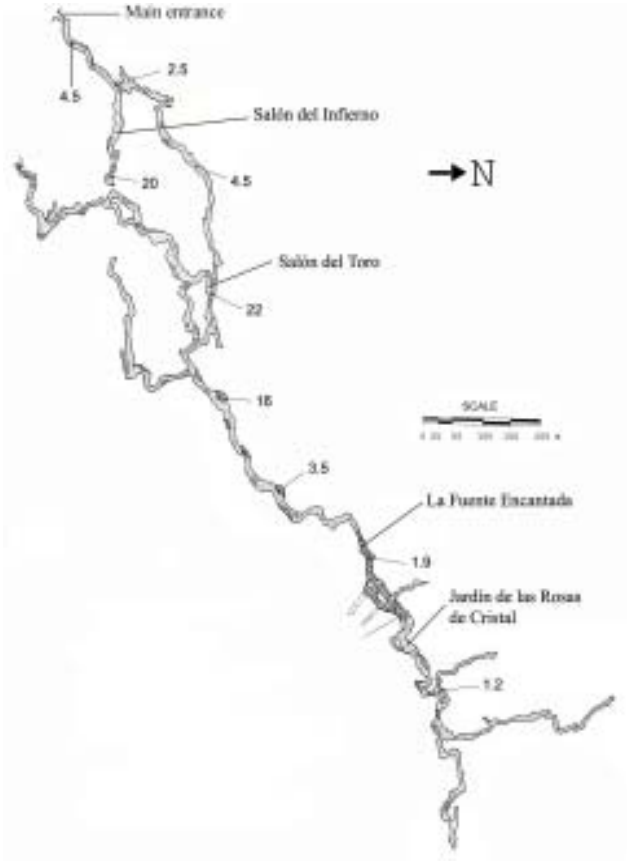


Fig. 11.—Map of Las Grutas de Juxtlahuaca, Guerrero, Mexico.

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