



Two new species of spiders of the genus *Selenops* Latreille, 1819 (Araneae: Selenopidae) and redescription of *Selenops scitus* Muma, 1953 from Mexico

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Abstract

Two new species of *Selenops* Latreille, 1819 from Mexico are described: *Selenops aztecus* **sp. nov.** from the state of Veracruz, known only from a single male, and *Selenops santibanezi* **sp. nov.** from the state of Oaxaca, known from both sexes. *Selenops scitus* Muma, 1953, originally described only from the female holotype from Guerrero, México is redescribed and the male of this species is described for the first time; new records of its distribution are given.

Key words: *Selenops*, Taxonomy, Veracruz, Oaxaca, Guerrero

Resumen

Dos especies nuevas de *Selenops* Latreille, 1819 de México son descritas: *Selenops aztecus* **sp. nov.** del estado de Veracruz, conocida solamente por el macho; y *Selenops santibanezi* **sp. nov.** del estado de Oaxaca, conocida por el macho y la hembra. *Selenops scitus* Muma, 1953, descrita originalmente solo del holotipo hembra de Guerrero, México es redescrita y el macho de esta especie es descrito por primera vez; nuevos registros de su distribución son proporcionados.

Palabras clave: *Selenops*, Taxonomía, Veracruz, Oaxaca, Guerrero

Introduction

The family Selenopidae Simon, 1897 contains five genera. The type genus *Selenops* Latreille, 1819, is a diverse group of spiders distributed in tropical, subtropical and temperate regions around the world, with 117 species described to date (Platnick 2009). *Selenops* is the only genus of the family found in the New World. The natural distribution of this genus covers all the tropical and subtropical regions of North America such as Florida, Texas, New Mexico, Arizona, southern California (including the Peninsula of Baja California) and reaches Northern Argentina and Paraguay in the south (Muma 1953; Crews 2005).

The spiders of *Selenops* can be found in diverse types of vegetation, from dry desert and chaparral to tropical forests (Crews 2005), from sea level to around 2000 meters elevation. These spiders are commonly found under bark, under or on stones, trunks, and debris on the ground, between the bases of the leaves of tropical plants, occasionally inside tree trunks, entrances of caves, and on flat surfaces and in narrow cracks and crevices (Muma 1953; Valdez-Mondragón 2007). They are common inside human buildings: Macleay (1839) reported *Selenops celer* Macleay, 1839 as common on walls of buildings in Cuba; Gertsch (1949) reported *Selenops* (probably *S. mexicanus* Keyserling, 1880) on houses in Panama. *Selenops mexicanus* is common and abundant in Mexican cities, like Oaxaca where it is found inside the houses and buildings, living with other spiders like the pholcid *Physocyclus dugesi* Simon, 1893, and they could be the pray of this one (*pers. observ.*). They are nocturnal and do not build webs (Crew 2005).

The taxonomic history begins with Walckenaer (1837) who proposed three groups based on the cheliceral morphology, the shape of the labium and the leg lengths. Simon (1880) did not corroborate those three groups, and separated the Old and New World species based the eye size. Pickard-Cambridge (1905) separated the species of the Western Hemisphere using the position and the size of the eyes in addition to the genitalic characters (Crews 2005). The most important work on this genus for North and Central America and the Caribbean was conducted by Muma (1953), who proposed six species groups, based on the leg lengths, the position and the size of the eyes and the genitalic characters.

In Mexico there are 16 species recorded, including the two new ones that are described below. These species belong to three groups: the *debilis*, *lindborgi*, and *mexicanus* groups (Muma 1953; Valdez-Mondragón 2007).

Material and methods

The epigynes of the females and the palps of the males were dissected in ethanol (80%) and cleared in potassium hydroxide (KOH-10%) for 10 to 15 minutes. Habitus, chelicerae, epyginae and palps were submerged in 96% gel alcohol and covered with a thin layer of liquid ethanol (80%) to minimize diffraction during photography and drawings. A dissecting microscope Nikon SMZ645 was used to observe and to take the photographs. The photographs were taken with a camera Nikon Coolpix S10 VR with adapter for the microscope. A dissecting microscope Zeiss Stemi SV11 with a camera lucida attached was used to make the drawings. The photographs, drawings and the map were edited using Adobe Photoshop CS2 Version 9.0. The map was made with Microsoft Encarta Encyclopedia Standard Edition (Microsoft Corporation 1993-2009). The specimens used in this study are deposited in ethanol (80%) in the Colección Nacional de Arácnidos (CNAN) of the Instituto de Biología, Universidad Nacional Autónoma de México (UNAM).

All measurements are in millimeters. Abbreviations of morphological terms as follow: ALE, anterior lateral eyes; ALS, anterior lateral spinnerets; AME, anterior median eyes; C, cymbium; CD, copulatory duct; E, embolus; MS, median septum; MA, median apophysis; P, promargin; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; R, retromargin; RTA, retrolateral tibial apophysis; S, spermatheca; T, tegulum; VTA, ventral tibial apophysis. Spines formula: v, ventral; d, dorsal.

Taxonomy

Family Selenopidae Simon, 1897

Genus *Selenops* Latreille, 1819

Selenops radiatus Latreille, 1819 (Type species)

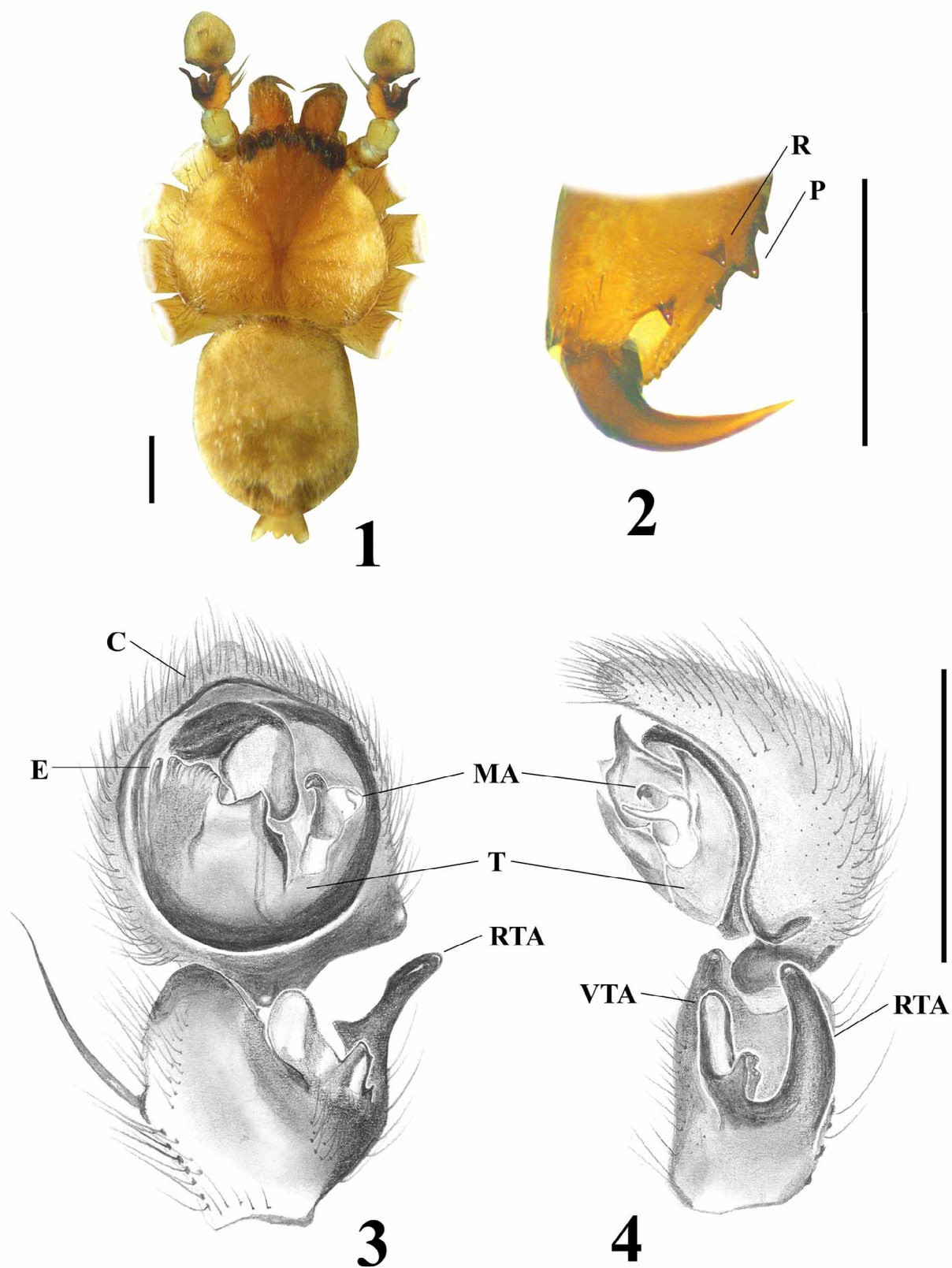
Selenops differs from other selenopid genera by the following characters: The anterior median eyes (AME), posterior median eyes (PME) and anterior lateral eyes (ALE) aligned or slightly recurved, with the PME equal or subequal in size to AME. Leg II > leg IV; tibiae and metatarsi I-II with spines formula v2-2-2 and v2-2, respectively. Male palp with a retrolateral tibial apophysis (RTA) and ventral tibial apophysis (VTA). Median apophysis (MA) small and simple with one or two projections. Epigynum of the female with central area well developed, with distinct lateral lobes and epigynal pockets bigger than genital openings (Corronca 2002).

Selenops aztecus new species

Figures 1–4

Type material: Holotype: male, 14 km from Coatzacoalcos-Villa Hermosa, Tabasco; on bromeliad *Aechmea*

bracteata (Sw.) Griseb. (Poales: Bromeliaceae) in the corolla, at 5 meters above the ground [Veracruz, Mexico], 1 February 1971, (CNAN-T0414).



FIGURES 1–4. *Selenops aztecus* new species. Male (Holotype). 1 Habitus, dorsal view; 2 Left chelicera, teeth of promargin and retromargin view; 3 Left palp, ventral view; 4 Left palp, retrolateral view. Scales= 1 mm.

Other material examined. One immature specimen, same data as holotype (CNAN 3229).

Etymology. The specific name is dedicated to the Aztecs, a Mesoamerican culture centered in Mexico from about 1428 to 1521.

Diagnosis. Male can be distinguished by the exclusive shape of the VTA, which is bifurcated, the inner lobe is longer and tongue-shaped and the external lobe is shorter and triangular (Fig. 3). The RTA is long and thin distally, it has an upside-down boot-shape (Fig. 3), and curved slightly in retrolateral view (Fig. 4).

Description. Male (Holotype): Carapace orange, circular, ocular region darker (Fig. 1). Carapace with numerous setae on the margin, and shallow longitudinal fovea. Clypeus slightly shorter than diameter of ALE. Chelicerae dark brown. Promargin of the chelicerae with only three teeth, separated by the same distance, the middle one bigger; retromargin with two teeth, widely separated (Fig. 2). Sternum round, yellow, orange in the margins. Labium dark orange, paler basally, wider than long, not merged with the sternum. Gnathocoxae orange, paler than labium, lighter distally, trapezoidal in shape. Opisthosoma pale gray dorsally, dark gray around the edges, ventrally pale orange. ALS and PLS gray in retrolateral part.

Palps. Curved RTA, as long as tibia (Figs 3, 4). Embolus short, near to prolateral part of cymbium (Fig. 3).

Legs. Coxae orange, longer than wide. Femora and tibiae orange, with faint dusky bands. Patellae basally dark orange. Spine formulae: Tibiae I: v2.2.2; [leg II missing on both sides]; III-IV: v1.1; metatarsi I: v2.2; [leg II missing]; III-IV: v2.1. Femora I: d1.1.1; II missing; III-IV: d1.1.1.

Measurements. Total length (prosoma + opisthosoma): 8.60, prosoma: 3.95 long, 4.40 wide. Diameter of eyes: AME 0.32, ALE 0.16, PME 0.30, PLE 0.42. Leg lengths: I: femur 4.85/ patella 2.10/ tibia 4.60/ metatarsus 4.25/ tarsus 1.90/ total 17.70; [leg II missing]; III: 6.00/ 2.08/ 5.15/ 4.60/ 1.80/ 19.63; IV: 5.30/ 2.00/ 5.25/ 4.58/ 1.75/ 18.88. Formula: 2341?

Female: Unknown.

Distribution. Only known from the type locality (Fig. 20).

Remarks. Following Muma (1953), *Selenops aztecus* **sp. nov.** belongs to the *mexicanus* group by having RTA long, slender, extending beyond the base of the cymbium; the median apophysis has two hook-shaped projections, located medially near to retrolateral margin; by having a thin, sheet-like, terminal apophysis extending beyond the embolus, near the distal part of the cymbium (Figs 3, 4), and maybe by the leg formula 2341 characteristic for this group. Four species belong to the *mexicanus* species group: *Selenops mexicanus* Kesarling, 1880; *S. galapagoensis* Banks, 1902; *S. gracilis* Muma, 1953 and *S. tehuacanus* Muma, 1953;

Selenops aztecus resembles *S. tehuacanus* in the shape of the median apophysis and in total size, but in this new species the RTA is shorter than in *S. tehuacanus*, where it extends distally almost to the position of MA. The VTA in the new species is bifurcated and wider than in *S. tehuacanus*. The new species has carapace and legs with light color, whereas *S. tehuacanus* has dusky color pattern.

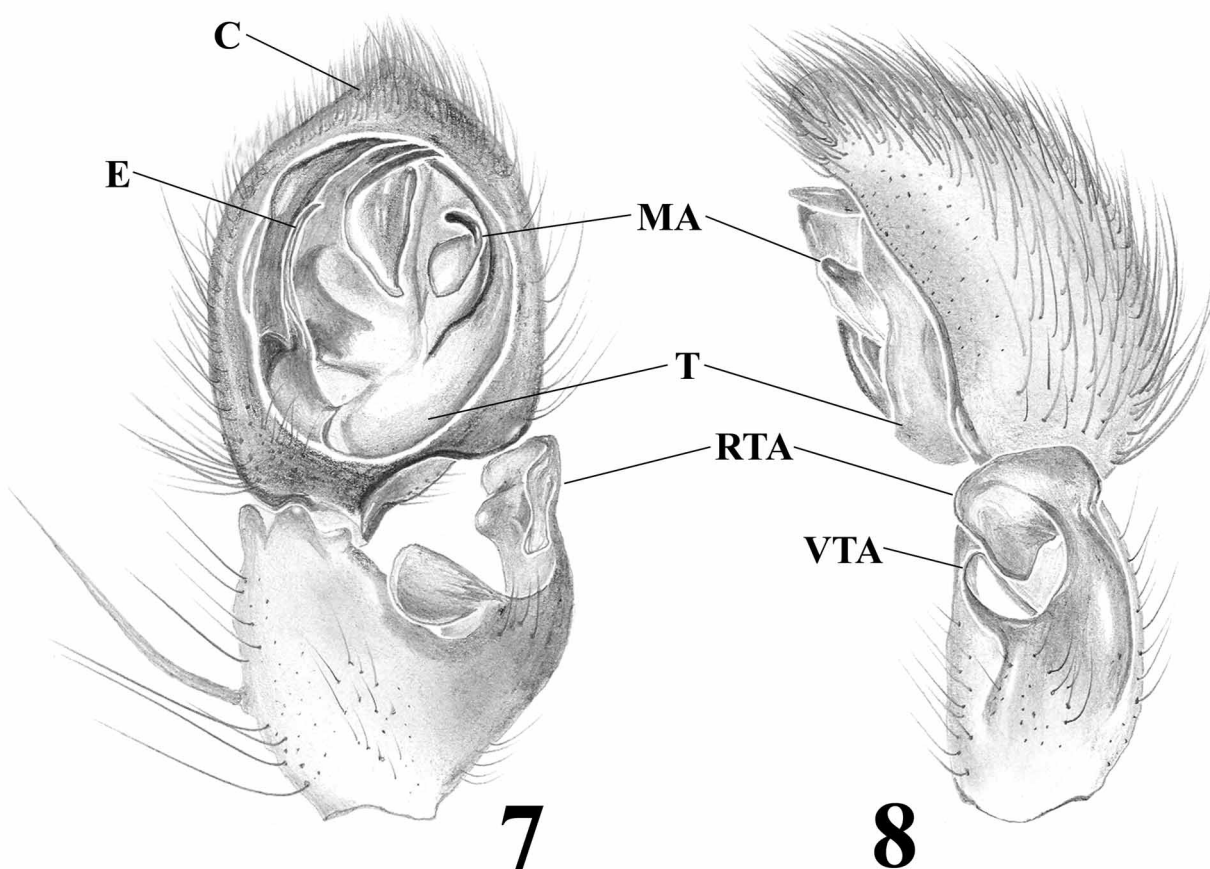
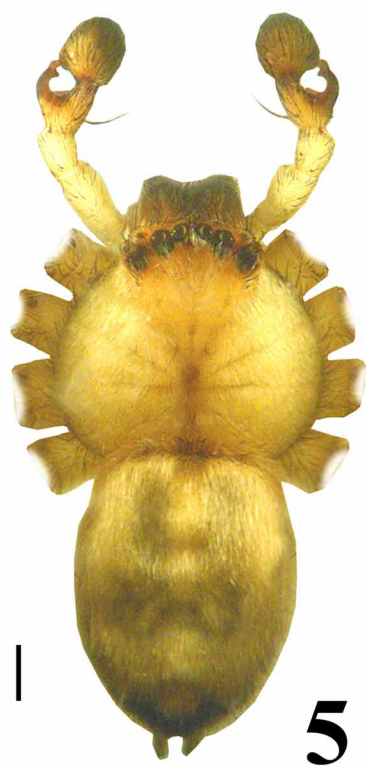
Note: Muma (1953) did not illustrate the male palp of *S. tehuacanus*. The holotype is deposited in the American Museum of Natural History (AMNH), New York; and was compared with *Selenops aztecus* by means of photographs amiably provided by Nadine Dupérré, assistant of the Dr. Norman I. Platnick (AMNH). These images corroborate the specific distinctiveness of *S. aztecus* **sp. nov.**

Selenops santibanezi new species

Figures 5–11

Type material: Holotype: male, from Santa Catarina Ixtepeji, [lat 17.28°, lon -96.54496667°, 2021 m; Municipio Santa Catarina Ixtepeji, Distrito Ixtlán, Oaxaca, México], 19 September 2009, A. Valdez, R. Paredes, C. Santibáñez Cols. (CNAN-T0415).

Other material examined: female paratype, from same locality as holotype, 17 March 2008, A. Valdez, H. Montaña, C. Santibáñez Cols. (CNAN-T0625). Two females paratypes, same data as holotype (CNAN-T0626). Five immatures, same locality as holotype (CNAN 3230). Three immatures from Road to Santa Catarina Ixtepeji [lat 17.2796333°, lon 96.5447666°, 1951 m; Municipio Santa Catarina Ixtepeji, Distrito Ixtlán, Oaxaca, Mexico], 17 June 2007, A. Valdez, C. Santibáñez Cols. (CNAN 3231). One immature (Ara-0007) for DNA, from same data as holotype.



FIGURES 5–8. *Selenops santibanezi* **new species**. Male (Holotype). 5 Habitus, dorsal view; 6 Left chelicera, teeth of promargin and retromargin view; 7 Left palp, ventral view; 8 Left palp, retrolateral view. Scales= 1 mm.

Etymology. This species is dedicated to the scorpionologist and friend Carlos Eduardo Santibáñez López, for his contribution to the knowledge of the arachnids from Oaxaca, Mexico, and his participation in the collecting of the type series.

Diagnosis. Males can be distinguished by the exclusive shape of the RTA and VTA; RTA is short and distally with axe-shape in retrolateral view (Figs 7, 8); VTA is wide and oval in ventral view (Fig. 7). Females can be distinguished by the wide vertical median septum of the epigynum, and by the thin vertical concavity near to epigastric furrow (Fig. 10).

Description. Male (Holotype). Carapace orange with ocular region dark orange (Fig. 5). Caparace with three thin gray lines, little visible, towards each side (Fig. 5). Fovea Y-shaped extending anteriorly and merging with the posterior part of ocular region (Fig. 5). Clypeus slightly shorter than diameter of AME. Chelicerae orange, with dark region in distal part. Promargin of the chelicerae with only three teeth, the middle one bigger, middle one closer to basal than to distal; retromargin with two teeth of same size (Fig. 6). Sternum round, pale orange, darker posteriorly. Labium dark orange, wider than long, not merged with the sternum. Gnathocoxae of the same color as sternum, trapezoid in shape. Opisthosoma orange, darker than carapace, dark around the edges and with a dark region near to spinnerets (Fig. 5). Opisthosoma ventrally dark orange. ALS and PLS orange, dark in retrolateral part.

Palps. RTA short, as long as a tibia; VTA wide, ventrally oval, straight in the base (Figs 7, 8). Embolus long and thin, near to prolateral part of cymbium (Fig. 7).

Legs. Coxae yellow, longer than wide. Femora-tarsus orange, femora paler, femora and tibia without dusky bands. Spine formulae: Tibiae I: v2.2.2; II: v2.2.2; III-IV: v2.2; metatarsi I-IV: v2.2. Femora I-IV: d1.1.1.

Measurements. Total length: 11.13, prosoma: 5.30 long, 5.60. Diameter of eyes: AME 0.36, ALE 0.20, PME 0.38, PLE 0.45. Leg lengths: I: femur 5.95/ patella 2.80/ tibia 5.40/ metatarsus 5.30/ tarsus 2.35/ total 21.80; II: 6.90/ 2.80/ 6.50/ 5.85/ 2.40/ 24.45. III: 6.95/ 2.50/ 6.25/ 5.75/ 2.25/ 23.70; IV: 6.70/ 2.30/ 5.60/ 5.60/ 2.23/ 22.43. Formula: 2341.

Female (Paratype): Coloration similar to the male (Fig. 9).

Epigynum. Wider than long, triangular (Fig. 10). Spermathecae oval, with a triangular transparent membrane that covers them (Fig. 11).

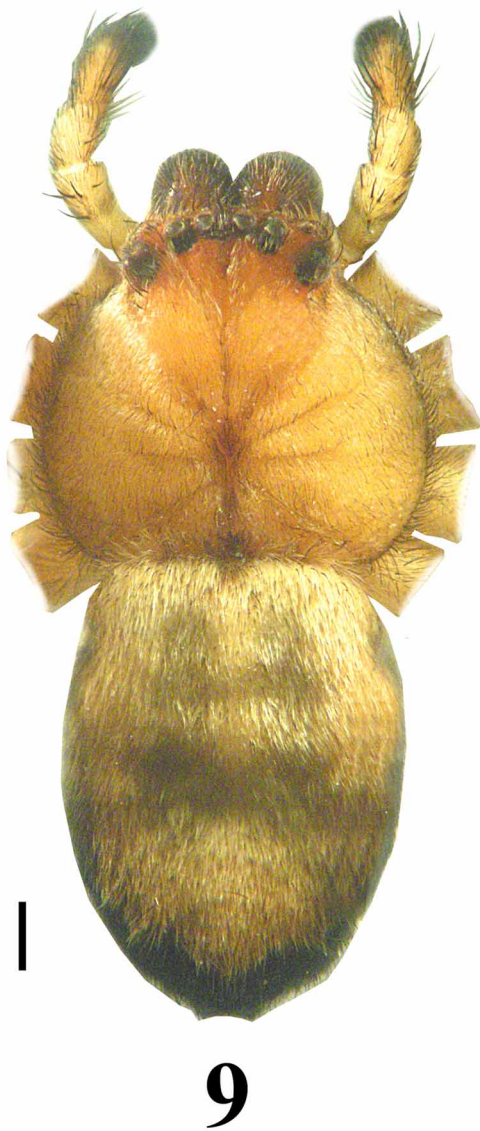
Measurements. Total length (prosoma + opisthosoma): 12.0, prosoma: 5.35 long, 5.5 wide. Diameter of eyes: AME 0.36, ALE 0.2, PME 0.38, PLE 0.44. Leg lengths: I: femur 4.85/ patella 2.45/ tibia 4.27/ metatarsus 3.57/ tarsus 1.83/ total 16.97; II: 5.65/ 2.62/ 4.85/ 4.05/ 1.8/ 18.97; III: 5.75/ 2.35/ 4.55/ 4.0/ 1.73/ 18.38; IV: 5.4/ 2.1/ 4.35/ 3.95/ 1.83/ 17.63.

Distribution. Only known from Santa Catarina Ixtepeji in Oaxaca state, Mexico. (Fig. 20).

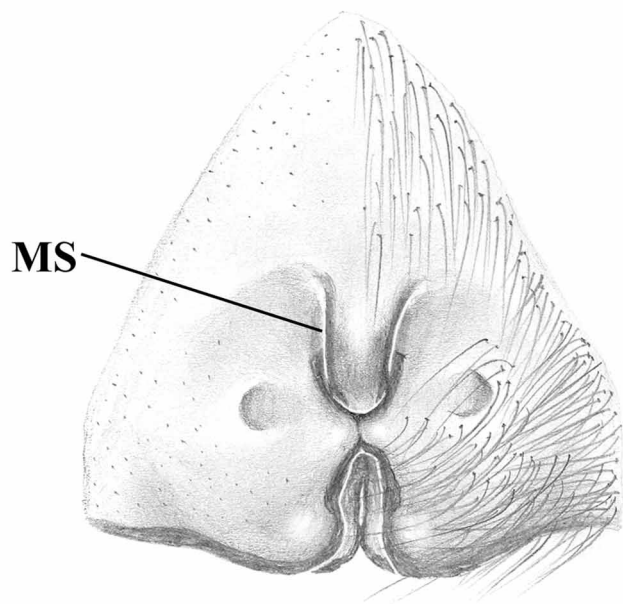
Natural history. The specimens were collected on bromeliads between the bracts, approximately 3 meters above the ground. These spiders have very fast movements, escaping between the bracts, rendering their capture quite difficult. The bromeliads were growing on oaks (*Quercus* sp.) (Fig. 19), in deciduous forest, near 2000 meters elevation, in the Northern Sierra Madre, Oaxaca State.

Remarks. Following Muma (1953), *Selenops santibanezi* belongs to the *lindborgi* group by having the leg formula 2341, by having RTA broad and distally twisted, female epigynum with auxiliary concavities and with spermathecal openings widely separated, and by having spine formulae: tibiae I-II: v2.2.2, metatarsi I-II: v2.2. Two species belong to *lindborgi* species group: *S. lindborgi* Petrunkevitch, 1926 and *S. formosus* Bryant, 1940. One South American species, *S. hebraicus* Mello-Leitão, 1945 also seems to belong here (Muma 1953).

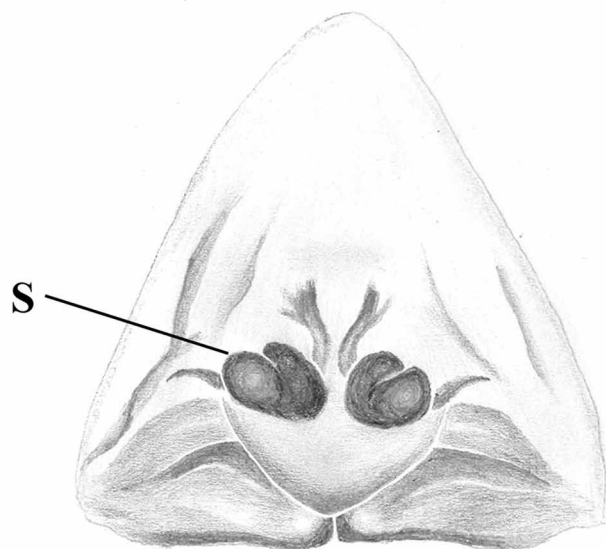
Selenops santibanezi new species resembles to *Selenops lindborgi* Petrunkevitch, 1926 by the shape of the RTA and VTA, but in the new species the RTA is wider distally than in *S. lindborgi*, and in retrolateral view the new species has axe-shaped RTA whereas *S. lindborgi* has triangular-shape; in addition the MA in *S. lindborgi* is more extended than in *S. santibanezi* and closer to basal than to distal part of cymbium compared to *S. santibanezi*. The female epigynum of the new species has a vertical median septum of the epigynum in contrast to *S. lindborgi*, which has epigynum divided into two oval, diagonal, elevated areas, with posterior margin with a deep, narrow, median notch.



9



10



11

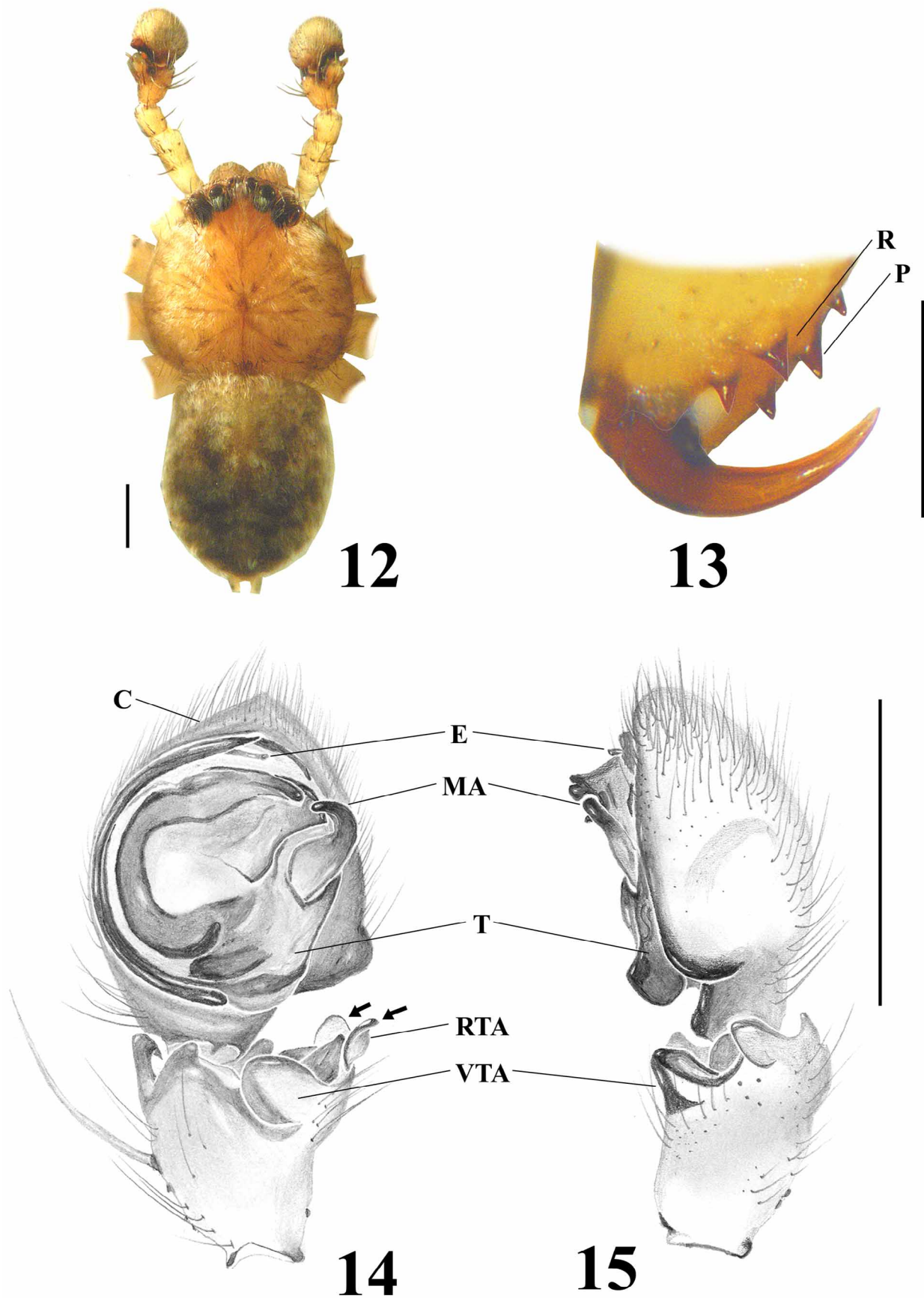
FIGURES 9–11. *Selenops santibanezi* **new species**. Female (Paratype). 9 Habitus, dorsal view; 10 Epigynum, ventral view; 11 dorsal view. Scales= 1 mm.

***Selenops scitus* Muma, 1953**

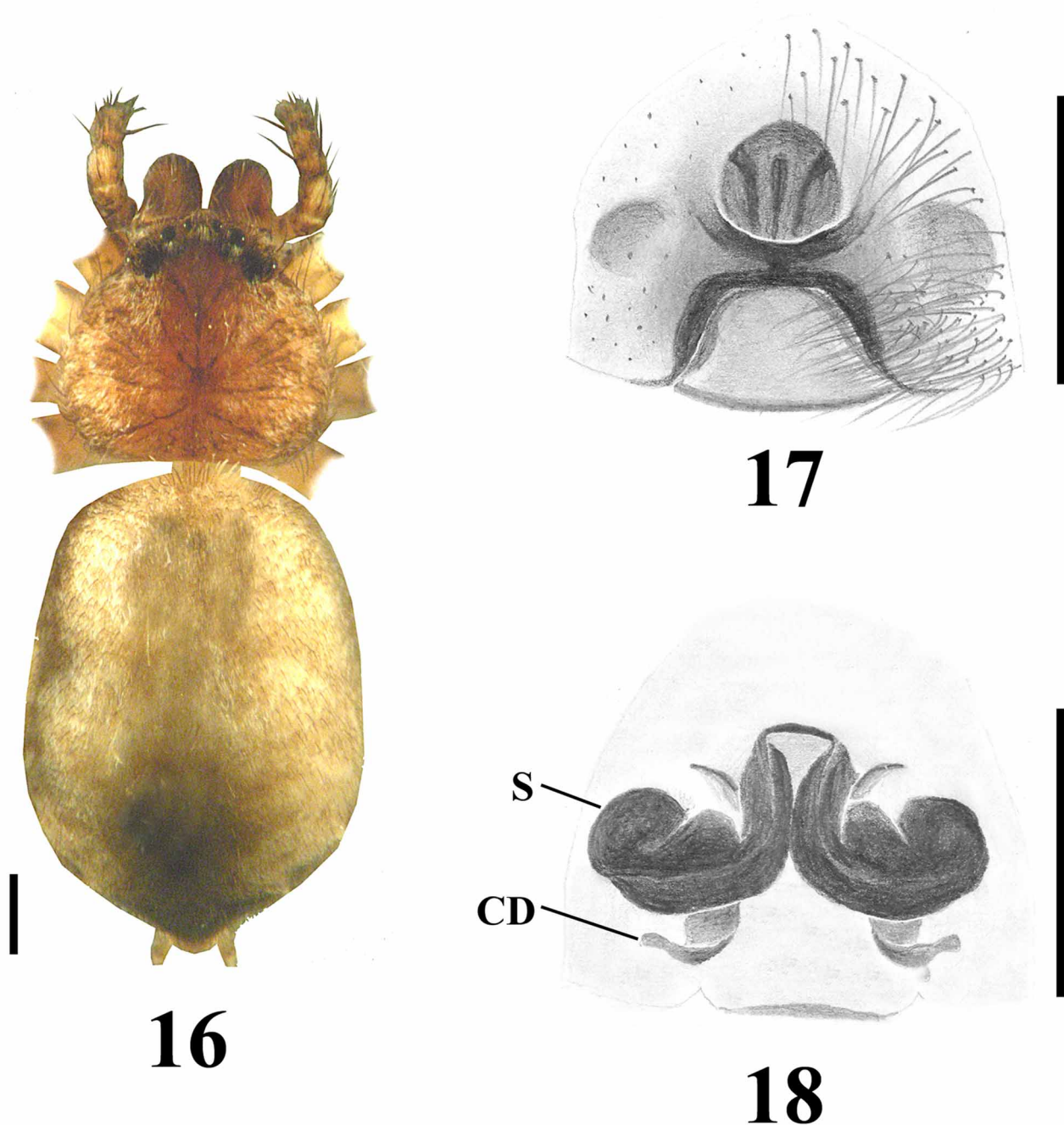
S. scitus Muma, 1953: 19, f. 32 (Description ♀).

Figures 12–18

Type material: Female holotype (not examined) from Mexcala [*sic*], [Guerrero, Mexico], August 1946, C. J. Goodnight, deposited in the American Museum of Natural History, New York.



FIGURES 12–15. *Selenops scitus* Muma, 1953. Male. 12 Habitus, dorsal view; 13 Left chelicera, teeth of promargin and retromargin; 14 Left male palp ventral view, 15 retrolateral view. Scales= 1 mm (Figs 12, 14, 15); 0.5 mm (Fig. 13).



FIGURES 16–18. *Selenops scitus* Muma, 1953. Female. 16 Habitus, dorsal view; 17 Epigynum, ventral view; 18 dorsal view. Scales= 1 mm (Fig. 16); 0.5 mm (Figs. 17, 18).

Other material examined. Male and female from Cerro “La Víbora”, in front of Santa Cruz (deciduous thorn scrub), [lat 18.18298333°, lon -99.1174°, 1011 m; Municipio Atenango del Río, Guerrero, México], 5 July 2000, F. Álvarez, E. González (CNAN 3223). Male and female from Atenango del Río (deciduous thorn scrub), [lat 18.1258°, lon -99.08988333°, 651 m; Municipio Atenango del Río, Guerrero, México], 14 June 2000, G. Montiel, F. Álvarez, E. González, O. Delgado, J. Castelo, E. Lira, C. Durán (CNAN 3224).

Diagnosis. Males can be distinguished by the oval shape of the VTA (Fig. 14). The RTA is short, bifurcated, the longer branch is claw-shaped, and the shorter one is oval (arrows in Fig. 14). The MA has only one hook-shaped projection (Figs 14, 15). Females can be distinguished by the shape of the epigynum, the median portion forming a subsquared concavity near the epigastric furrow; and by the circular portion in anterior part (Fig. 17).



FIGURE 19. Microhabitat of *Selenops santibanezi* new species, arrow show the area among the bracts where the specimens were collected. Probably it is the same microhabitat for *Selenops aztecus*.

Description. Male: Carapace brown, with dusky markings (Fig. 12). Ocular region with fine white setae. Clypeus shorter than AME, equivalent to $\frac{3}{4}$ of their diameter. Chelicerae pale orange, with a J-shaped dark gray central pattern and curving on prolateral portion. Promargin of the chelicerae with three teeth; middle tooth closer to basal than to distal tooth, the middle one is bigger; retromargin with two teeth, the basal is bigger (Fig. 13). Sternum round, and yellow. Labium brown, with two darker lateral notches basally; not fused to the sternum. Trapezoidal gnathocoxae pale brown, lighter distally. Opisthosoma gray dorsally, venter lighter. ALS and PLS gray retrolaterally.

Palps. RTA conical, bifurcated distally, shorter than tibia (Figs 14, 15).

Legs. Pale orange, with two marked dusky bands on each segment, except on patellae and tarsi. Spine formula: Tibiae I–II: v2.2.2, III–IV: v2.2; metatarsi I–II: v2.2, III–IV: v2.1. Femora I–IV: d1.1.1.

Measurements. Total length: 6.4, prosoma: 3.2 long, 3.3 wide. Diameter of eyes: AME 0.21, ALE 0.13, PME 0.28, PLE 0.35. Leg lengths: I: femur 3.52/ patella 1.45/ tibia 3.10/ metatarsus 3.00/ tarsus 1.78/ total 12.85; II: 3.95/ 1.45/ 3.37/ 3.17/ 1.86/ 13.80; III: 4.05/ 1.45/ 3.45/ 3.30/ 1.76/ 14.01; IV- 4.27/ 1.25/ 3.65/ 3.75/ 1.86/ 14.78. Formula: 4321.

Female: Coloration similar to the male (Fig. 16).

Epigynum. Wider than long, oval (Fig. 17). Spermathecae with two anterior oval protuberances; CD long and curved, oval distally (Fig. 18). Spine formula: Femora I–IV: d3.2.2. *Measurements:* Total length: 8.1, prosoma: 3.15 long, 3.2 wide. Diameter of eyes: AME 0.18, ALE 0.12, PME 0.28, PLE 0.34. Leg lengths: I: femur 3.05/ patella 1.43/ tibia 2.65/ metatarsus 2.25/ tarsus 1.36/ total 10.74; II: 3.52/ 1.46/ 2.87/ 2.5/ 1.4/ 11.75; III: 3.77/ 1.4/ 3.07/ 2.62/ 1.4/ 12.26; IV: 3.8/ 1.13/ 3.1/ 2.95/ 1.53/ 12.51.

Distribution. Known from several localities in the Mexican state Guerrero: Mezcala, Santa Cruz, Atenango del Río (Fig. 20).



FIGURE 20. Records of *Selenops aztecus* new species (▲); *Selenops santibanezi* new species (●); and *Selenops scitus* Muma, 1953 (◆).

Remarks. Following Muma (1953), *Selenops scitus* Muma, 1953 belongs to the *debilis* group by having the leg formula 4321; by having spine formulae: tibiae I and II: v2.2.2, metatarsi I and II: v2.2; palp of the male by having RTA bifurcated; MA of palp with only one hook-shaped projection, located at the middle or in the distal half near the retrolateral margin; by having the embolus long and slender, extending at least one-third of the distance around the cymbium; by the median subquadrate guide in the epigynum of the female; and by the spermathecal openings located near the epigastric furrow.

Selenops scitus resembles *Selenops debilis* Banks, 1898 in the shape of the palps and epigynum, but in *S. scitus* the RTA of the palp is shorter than in *S. debilis*, furthermore the RTA is bifurcated in *S. scitus* and in *S. debilis* it is simple. The VTA in *S. scitus* is oval and wide, in *S. debilis* is shorter. The MA in *S. scitus* is wider than in *S. debilis*, in *S. scitus* it is situated in the median part of cymbium, whereas in *S. debilis* it is near to distal part. The epigynum in *S. debilis* has a vertical and thin median septum that *S. scitus* does not have; and *S. scitus* has a subsquared concavity near to the epigastric furrow that is lacking in *S. debilis*.

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