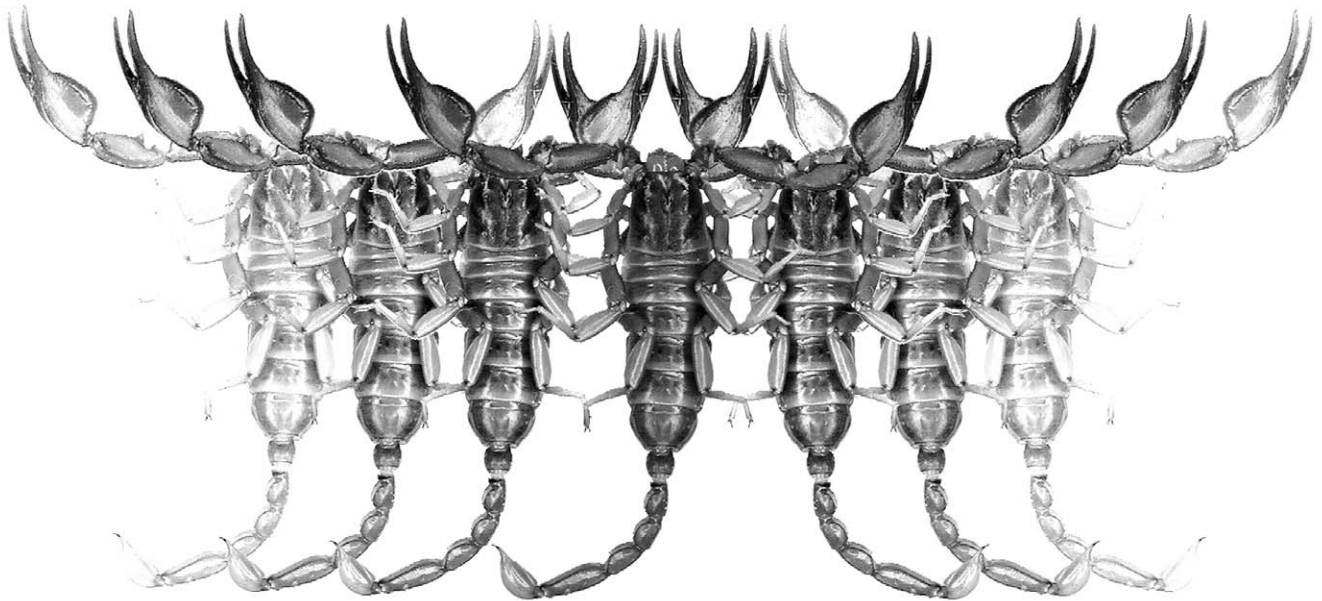


Euscorpium

Occasional Publications in Scorpiology



**A New Species of *Centruroides* (Scorpiones: Buthidae)
from Quiché, Northwestern Guatemala**

Rony E. Trujillo & Luis F. de Armas

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A new species of *Centruroides* (Scorpiones: Buthidae) from Quiché, northwestern Guatemala

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Summary

A new species of the genus *Centruroides* Marx, 1890 is described from Sotzil Village (15.61775°N, -91.09745°W, 1173 m a.s.l.), Chajul Municipality, Quiché Department, Guatemala, on basis of one female and one male. It closely resembles *Centruroides caral* Armas et Trujillo, 2013 from northeastern Guatemala (240 Km southeast of Chajul), but male differs by having a most globose pedipalp manus, as well as metasoma clearly more attenuate (length/width ratio: segments II–IV = 2.4, 2.7 and 1.4, respectively; 1.7, 2.2 and 2.5 in the holotype of *C. caral*, the only known specimen of this taxon). Data on its habitat and some biogeographical comments are also given.

Resumen

Se describe una especie nueva del género *Centruroides* Marx, 1890, sobre la base de una hembra y un macho adultos recolectados en la aldea Sotzil (15.61775 N, -91.09745 W; 1173 msnm), municipio Chajul, departamento de Quiché, noroeste de Guatemala. Se asemeja a *Centruroides caral* Armas et Trujillo, 2013, del nordeste de Guatemala (240 km al sudeste de Chajul), pero el macho del nuevo taxón presenta las manos de los pedipalpos más globosas, así como el metasoma claramente más atenuado (relación largo/ancho de los segmentos metasomales II-IV = 2,4, 2,7 y 1,4, respectivamente; 1,7, 2,2 y 2,5 en el holotipo de *C. caral*, único ejemplar conocido de esta especie). También se aportan datos sobre el hábitat de esta especie y se comentan algunos aspectos biogeográficos.

Introduction

The genus *Centruroides* Marx, 1890, ranges from southern USA to northern South America, including the Galapagos Islands and the West Indies; Mexico, with 42 species, is the most *Centruroides*-diverse country (Fet & Lowe, 2000; Teruel et al., 2015; Quijano-Ravel et al., 2016). It is represented in the Guatemalan fauna by seven species, most of them shared with other neighboring countries (Armas & Trujillo, 2013). At the present, the only Guatemalan endemic species is *Centruroides caral* Armas et Trujillo, 2015, but probably it is also present in Sierra del Merendón, north-western Honduras.

In this contribution, we describe a new species of the genus *Centruroides* from northwestern Guatemala, based on one female and one male recently collected.

Material and Methods

The examined specimens are deposited in the Museo de Historia Natural (MHN), Universidad de San Carlos, Guatemala City, Guatemala.

Nomenclature and measurements follow Stahnke (1971), except for trichobothriotaxy (Vachon, 1974), and metasomal carinae (Francke, 1977). For pedipalp chela carinae we follow Stahnke (1971) modified by Prendini (2000), but we recognize nine carinae instead of eight, as pointed out by Acosta et al. (2008: 492–493, fig. 14). Measurements are given in millimeters. Satellite photo of the type locality was taken from GoogleEarth. Photos of the specimens were taken with a Sony Cybershop camera manually coupled to an AmScope SM-2TZ-P dissecting microscope, and digital images were slightly processed with Adobe Photoshop® v. 8.0.1, only to optimize bright and contrast features.

The collecting label was originally written in Spanish, but has been translated here into English for text coherence.

Taxonomy

Centruroides ixil sp. n.

Fig. 1 A–C, 2 A–G, 3 A–G, 4, Table 1

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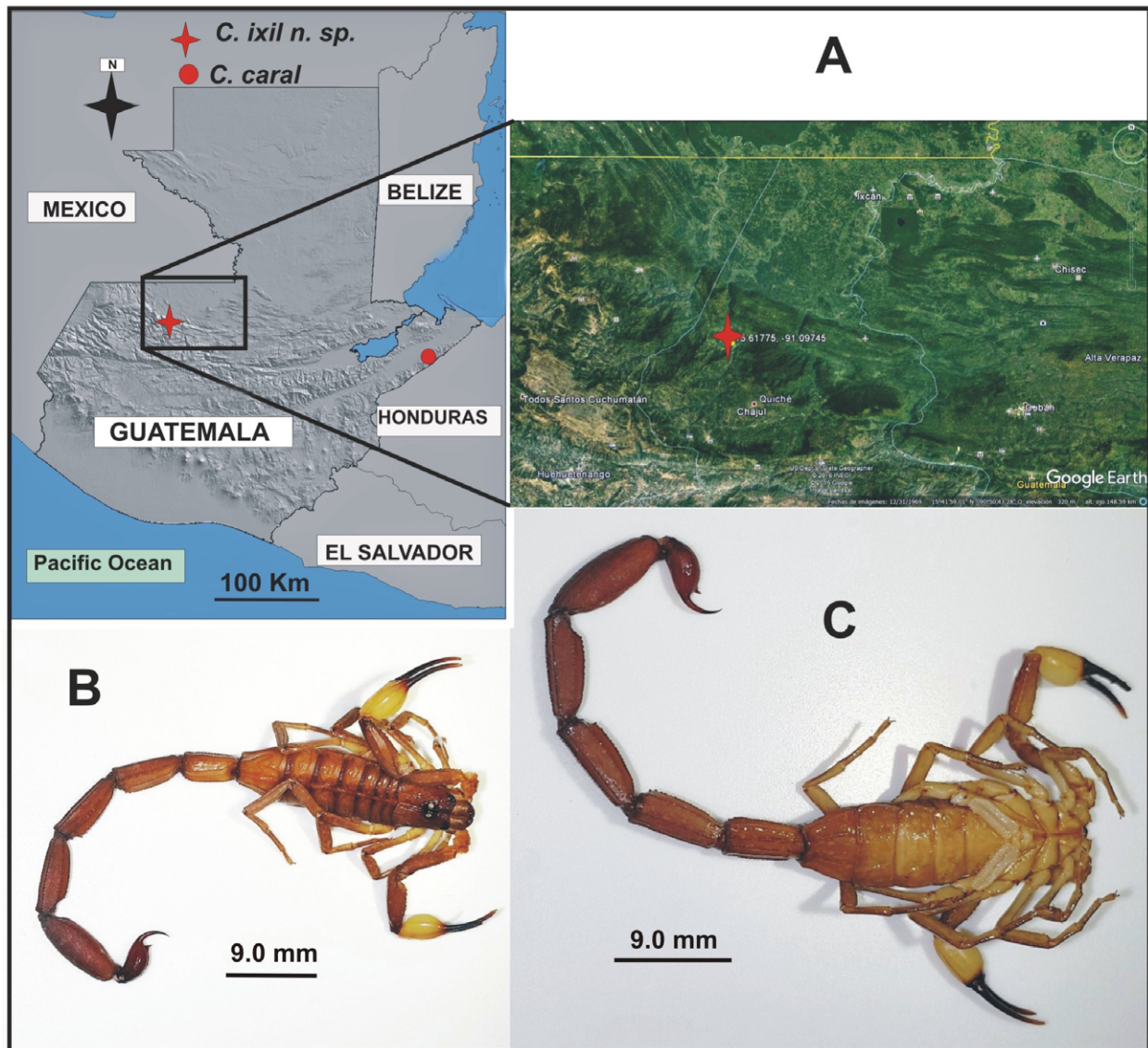


Figure 1: A, geographical distribution of *Centruroides ixil* sp. n. (red star) and *C. caral* (red circle). B–C, male holotype of *Centruroides ixil* sp. n. in dorsal (B) and ventral (C) aspect.

Type data. Male holotype, female paratype (MHN), Sotzil Village (15.61775 N, -91.09745 W; 1173 m a. s.l.), Chajul Municipality, Quiché Department, Guatemala, September 2, 2016, Luis A. Trujillo, at night, UV light.

Distribution. Only known from the type locality (Fig. 1 A).

Etymology. The specific name is a noun in apposition, designating the predominant Mayan ethnic group in the region where this new species lives.

Diagnosis. Male 68.5 mm in total length; female 56.6 mm. Base color light brownish; darker on last metasomal segments and posterior margin of tergites I–VI; cheliceral manus with dark brown reticulations all over; pedipalp chelae with light yellowish manus and blackish

fingers; sternites III–VI brown yellowish in the male (darker on the female). Carapace finely granular, with moderate granules on the interocular triangle; antero-medial notch V-shaped. Pedipalp manus slightly wider (♂, Fig. 2 B) or slender (♀, Fig. 3 D) than patella; movable finger with moderately developed basal lobe. Pectines with 19 (♀, Fig. 3 E) or 20 (♂, Fig. 2 E) teeth; basal plate rectangular, wider than long. Metasoma: segments I–IV with dorsolateral carinae, lateral supra-medial carinae, ventrolateral carinae and ventral sub-medial carinae moderately developed, granular to slightly serrate; segments II–IV with two pairs of ventrolateral macrochaetae; intercarinal spaces I–IV coriaceous; vesicle deeper than wide; subaculear tubercle strong, spine-like, with tip pointing towards the apex of

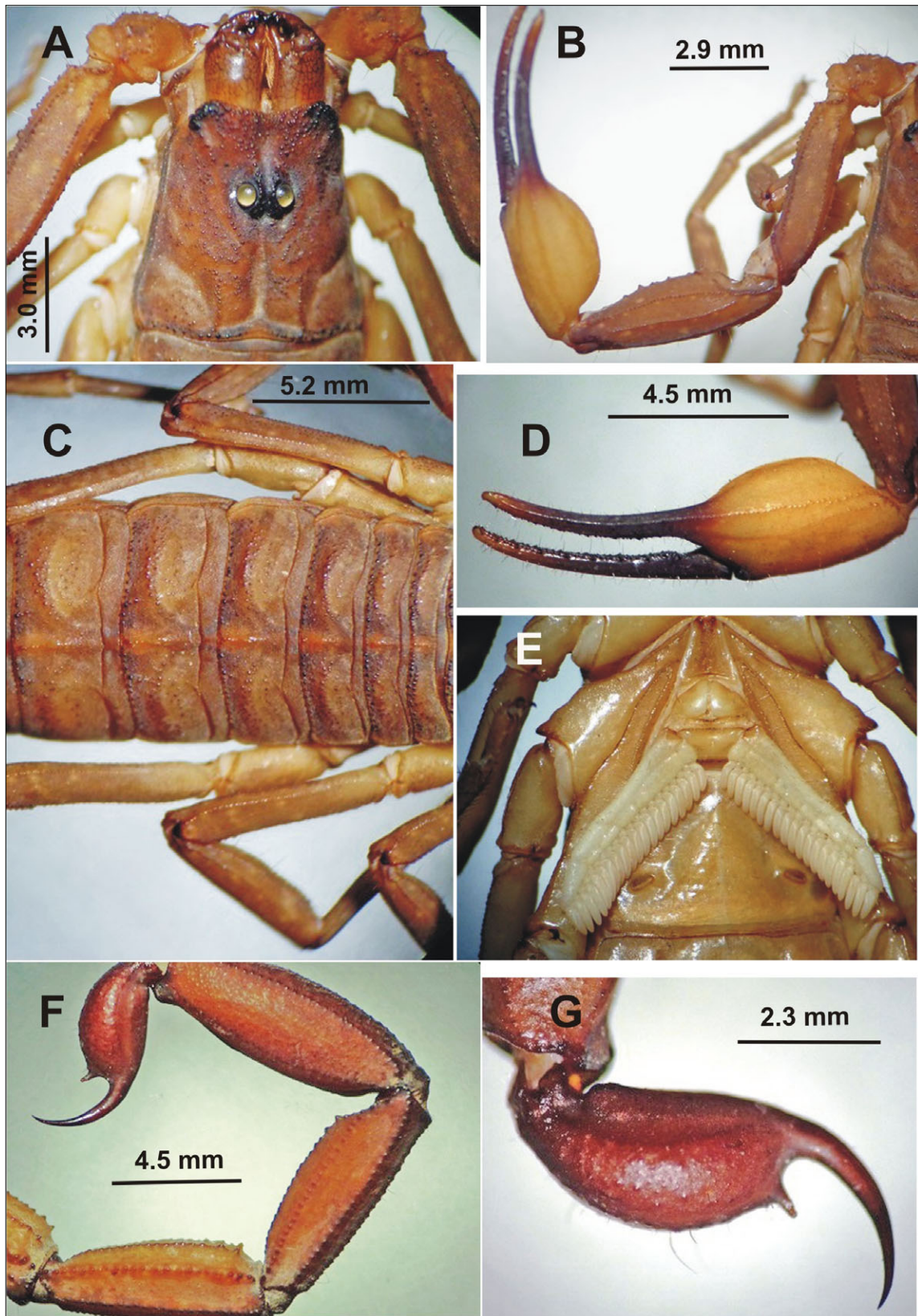


Figure 2: *Centruroides ixil* sp. n. Male holotype. A, carapace; B, left pedipalp, dorsal aspect; C, tergites I–VI; D, pedipalp chela, dorsal lateral aspect; E, pectines; F, metasomal segments III–V + telson, lateral aspect; G, telson, lateral aspect.

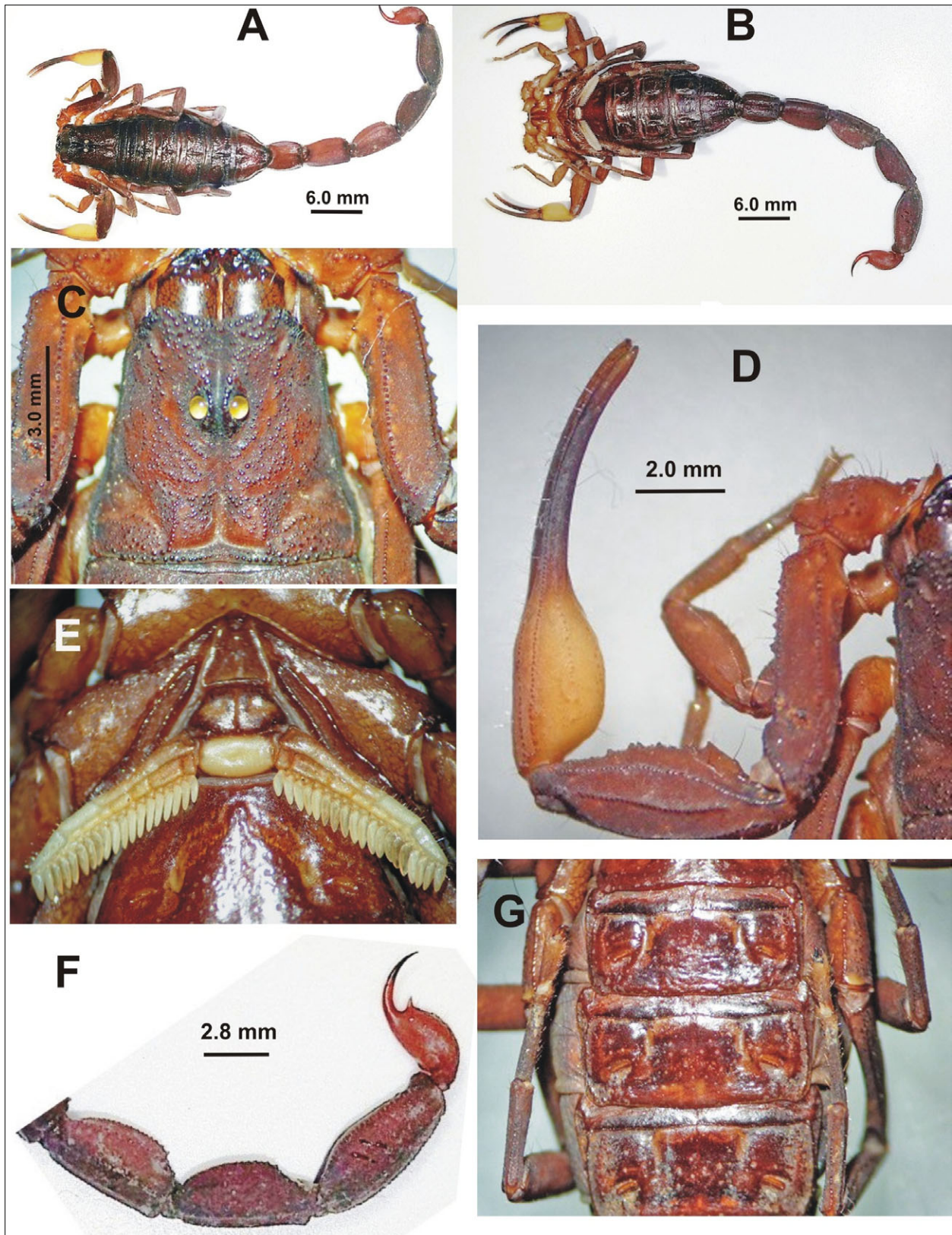


Figure 3: *Centruroides ixil* sp. n. A–G, female paratype: A–B, dorsal (A) and ventral (B) aspect. C, metasomal segments III–V + telson, lateral aspect. D, left pedipalp, dorsal aspect. E, pectines. F, metasomal segments III–V + telson, lateral aspect; G, sternites IV–VI.

Characters	♂ Holotype	♀ Paratype
Carapace, L/posterior W	6.1/5.9	6.0/6.0
Pedipalp, L	25.15	21.9
Femur, L/W	6.75/1.5	5.85/1.5
Patella, L/W	7.1/2.2	6.0/2.1
Chela, L/W/D	11.3/2.9/2.8	10.05/2.0/1.9
Underhand, L	4.5	3.5
Movable finger, L	6.8	6.55
Mesosoma, L	17.5	17.3
Tergite VII, L/W	5.0/5.9	4.5/6.4
Metasoma, L	44.9	33.3
I, L/W/D	5.8/3.1/2.8	4.3/3.4/2.8
II, L/W	7.2/3.0	5.2/3.2
III, L/W	8.0/2.9	5.6/3.0
IV, L/W	8.3/2.8	6.0/2.9
V, L/W/D	8.9/3.2/3.3	6.8/2.8/2.8
Telson, L	6.7	5.4
vesicle, L/W/D	4.4/2.5/2.3	3.3/2.1/2.0
Total L	68.5	56.6

Table 1: Measurements (mm) of *Centruroides ixil* sp. n. D, depth; L, length; W, width.

the aculeus. Metasomal segment III length/width ratio: ♀ = 1.86, ♂ = 2.76; metasomal segment V: length/width ratio: ♀ = 2.43, ♂ = 2.78; carapace length/metasomal segment V length ratio: ♀ = 0.88, ♂ = 0.68.

Description of the male holotype (Fig. 1 B–C, 2 A–F). Base color light brown. Carapace with posterior margins infuscate and distinct dusky marbling throughout (Fig. 2 A); interocular triangle darker. Tergites I–VI with dusky band along posterior margins (Fig. 1 B). Metasomal segments I–IV light brown; V and telson slightly darker. Cheliceral manus with dark brown reticulations all over (Fig. 2 B). Pedipalp femur and patella brownish, with small yellowish areas around the trichobothria; manus light yellowish, with blackish fingers. Legs yellowish with pale brown marks. Sternites III–VI brown yellowish; VII darker.

Carapace (Fig. 2 A) 1.03 times longer than wide; anteromedian notch V-shaped, reaching the posterior margin level of the second pair of lateral eyes; interocular triangle with moderate granules, the rest finely and sparsely granular. Anterior median carinae vestigial, with disperse moderate granules; superciliary carinae strong, subgranulose; posterior median carinae moderate, subgranulose, other carinae indistinct.

Pedipalps orthobothriotaxic Type A. Femur (Fig. 2 B): internal surface with large granules, all other surfaces finely granular; dorsointernal, dorsoexternal and ventrointernal carinae moderate, granular; ventroexternal carina strong, serrate. Patella (Fig. 2 B): internal surface with 5–6 large conical granules; dorsal, external and ventral surfaces finely granular; dorsointernal and dorsoexternal carinae moderate, granular; dorsomedian carina weak, granular; ventrointernal carina weak, granular. Manus (Fig. 2 B, D): globose, 1.32 times wider

than patella; intercarinal surfaces almost smooth, dorso-marginal, dorsal secondary and digital carinae weak to moderate, minutely granular to subgranular; ventro-external carina strong, smooth; other carinae vestigial. Fixed fingers with eight oblique rows of denticles; trichobothrium *et* basal to *db*. Movable fingers with eight principal oblique rows of denticles, plus a distal short one with four denticles.

Pectines (Fig. 2 E) with 20/20 teeth; basal plate rectangular in shape, 2.14 times wider than long.

Mesosoma. Tergites I–VII finely granular, with some larger granules on the posterior one-half of I–VI (Fig. 2 C); longitudinal median carina I–VII moderate, subgranular. Tergite VII lateral and submedian carinae moderate, granulose. Sternites III–VI mostly smooth, except on lateral submargins; VII mostly smooth, with lateral and submedian carinae moderate to feeble, subgranular.

Metasoma (Fig. 2 F). Intercarinal spaces I–IV coriaceous, with sparse minute granules. Segments II–IV with two pairs of ventrolateral macrochaetae. Segment I, ten carinae; II–IV, eight carinae; V with five carinae; on II, the lateral inframedian carina is only represented by 6–8 distal granules, being the distal ones the largest; I–IV with dorsolateral, lateral suprasedian, ventrolateral and ventrosubmedian carinae moderately developed, granular to slightly serrate; dorsolateral carinae with a larger terminal granule. Segment V: intercarinal spaces finely granulate; dorsolateral, ventrolateral and ventromedian carinae moderate, granular. Vesicle with ventral and lateral surfaces finely granular, 1.08 times as wide as deep; subaculear tubercle strong, spine-like, with tip pointing towards the apex of the aculeus (Fig. 2 F, G).



Figure 4: Habitat of *Centruroides ixil* sp. n. (photos by Andrea Martinez).

Legs with femora finely granular on the prolateral surface. Telotarsi moderately covered by fine setae on the ventral surface.

Female (Fig. 3 A–G). The only examined female differs from the male holotype by having a darker pattern, mainly on carapace and tergites (Fig. 3 A–B), small size (Table 1), carapace (Fig. 3 C) and tergites most strongly granulate, pedipalp chelae with slender manus (Fig. 3 A, D), pectines with 19/19 teeth (Fig. 3 E), metasoma not attenuate (segment III length/width ratio = 1.86 vs 2.76; segment V length/width ratio = 0.88 vs 0.68; carapace length/metasomal segment V length ratio = 2.43 vs 2.78).

Comparisons

The male holotype of this new species resembles that of *C. caral* Armas et Trujillo, 2013, from which it

differs by having a most globose pedipalp manus, telson wider than its height, and more attenuate metasoma (length/width ratio: segments II–IV = 2.4, 2.7 and 1.4, respectively; 1.7, 2.2 and 2.5 in the male holotype of *C. caral*, only known specimen of this taxon). Also, general pattern differs in both species: base color light brownish in *C. ixil*, but light yellow in *C. caral*; each tergite bearing a narrow yellow median longitudinal line in *C. caral*, but absent in *C. ixil*.

Although male scorpions of the same species that reach the adulthood from different stadia show significant morphometric differences, those observed between the respective males of *C. caral* and *C. ixil* seem to be not caused by that phenomenon. Unfortunately, the female of the former is unknown, but the differences between the males of these two species strongly suggest that *C. ixil* is not the large male of *C. caral*.

Natural History

The holotype male and paratype female were collected on a rocky wall partly covered by vegetation in a mountainous subtropical wet forest, 1173 m a.s.l., a few kilometers west from Visís Cabá Biosphere Reserve. The male and female were separate 30 cm to each other, about 3 m over the soil, in a place covered by leaf litter. The type locality is in the margin of a non-pavement road, approximately at 300 m from a small river cascade (Fig. 4).

In Guatemala, the mountainous subtropical wet forest is located in parts of Los Cuchumatanes, Chamá, Chuacús and Las Minas mountain systems. This forest is characterized by a complex vegetation structure over an irregular landscape, with high levels of humidity and precipitation and a great diversity of habitats, supporting high levels of endemism (Castañeda, 2008). This ecosystem is sometimes known as “mix forest” due to the association of conifers and broad-leaf species. Epiphytes, mosses and ferns are also abundant in this type of forest.

Biogeographic Comments

The type locality of *C. ixil* belongs to Sierra de los Cuchumatanes, a continuous of the Chiapas Range. According with several authors (for details see Morrone, 2001), this orographic area belongs to the Chiapas province, a biogeographic unity that shows a strong relationship with the neighboring province of Eastern Central America. To the later belongs the type locality of *C. caral*, a species geographically and ecologically disjointed from *C. ixil* by the valleys of Motagua and Chixoy, two areas with xeromorphic vegetation. A similar distribution is shown by the beetles *Crysina purulensis* (Monzón et Warner, 1993), *C. diversa* (Ohaus, 1912), *C. quiche* (Moran, 1990), and *C. rodriguezi* (Boucard, 1878), all them restricted to Cuchumatanes Range, whereas *C. strasseni* (Ohaus, 1924) and *C. ericsmithi* (Monzón et Cano, 1999) are endemic from Merendón Range (Monzón Sierra, 2006).

On this respect, *C. ixil* and *C. caral* seems to be closely related species, perhaps originated as result of a vicariance event during the Upper Pliocene, and pronounced during the last two millions of years, when the valleys of Motagua and Chixoy became xeric ecosystems.

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