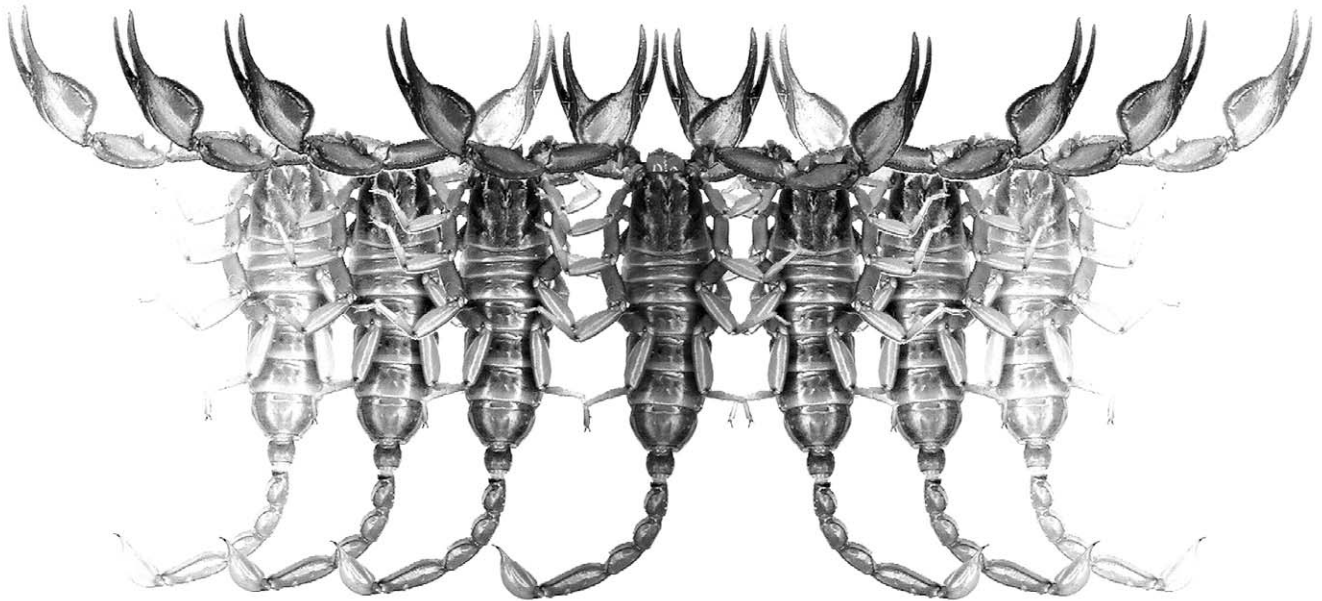


Euscorpium

Occasional Publications in Scorpiology



**A New Species of *Diplocentrus* (Scorpionidae:
Diplocentrinae) from Western Izabal, Guatemala**

Luis F. de Armas & Rony E. Trujillo

July 2016 — No. 225

Euscorpius

Occasional Publications in Scorpiology

EDITOR: Victor Fet, Marshall University, 'fet@marshall.edu'
ASSOCIATE EDITOR: Michael E. Soleglad, 'soleglad@znet.com'

Euscorpius is the first research publication completely devoted to scorpions (Arachnida: Scorpiones). *Euscorpius* takes advantage of the rapidly evolving medium of quick online publication, at the same time maintaining high research standards for the burgeoning field of scorpion science (scorpiology). *Euscorpius* is an expedient and viable medium for the publication of serious papers in scorpiology, including (but not limited to): systematics, evolution, ecology, biogeography, and general biology of scorpions. Review papers, descriptions of new taxa, faunistic surveys, lists of museum collections, and book reviews are welcome.

Derivatio Nominis

The name *Euscorpius* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

Euscorpius is located at: <http://www.science.marshall.edu/fet/Euscorpius>

(Marshall University, Huntington, West Virginia 25755-2510, USA)

ICZN COMPLIANCE OF ELECTRONIC PUBLICATIONS:

Electronic ("e-only") publications are fully compliant with ICZN (*International Code of Zoological Nomenclature*) (i.e. for the purposes of new names and new nomenclatural acts) when properly archived and registered. All *Euscorpius* issues starting from No. 156 (2013) are archived in two electronic archives:

- **Biotaxa**, <http://biotaxa.org/Euscorpius> (ICZN-approved and ZooBank-enabled)
- **Marshall Digital Scholar**, <http://mds.marshall.edu/euscorpius/>. (This website also archives all *Euscorpius* issues previously published on CD-ROMs.)

Between 2000 and 2013, ICZN did not accept online texts as "published work" (Article 9.8). At this time, *Euscorpius* was produced in two identical versions: online (*ISSN 1536-9307*) and CD-ROM (*ISSN 1536-9293*) (laser disk) in archive-quality, read-only format. Both versions had the identical date of publication, as well as identical page and figure numbers. Only copies distributed on a CD-ROM from *Euscorpius* in 2001-2012 represent published work in compliance with the ICZN, i.e. for the purposes of new names and new nomenclatural acts.

In September 2012, ICZN Article 8. *What constitutes published work*, has been amended and allowed for electronic publications, disallowing publication on optical discs. From January 2013, *Euscorpius* discontinued CD-ROM production; only online electronic version (*ISSN 1536-9307*) is published. For further details on the new ICZN amendment, see <http://www.pensoft.net/journals/zookeys/article/3944/>.

Publication date: 18 July 2016

<http://www.zoobank.org/urn:lsid:zoobank.org:pub:A2B10F67-6CE9-4D7C-83AE-136C5E390498>

A new species of *Diplocentrus* (Scorpionidae: Diplocentrinae) from western Izabal, Guatemala

Luis F. de Armas¹ & Rony E. Trujillo²

¹ P. O. Box 4327, San Antonio de los Baños, Artemisa 32500, Cuba.
Email: luisdearmas1945@gmail.com

² Museo de Historia Natural, Escuela de Biología, Universidad de San Carlos de Guatemala.
Email: ronytrujillo83@yahoo.es

<http://www.zoobank.org/urn:lsid:zoobank.org:pub:A2B10F67-6CE9-4D7C-83AE-136C5E390498>

Summary

Diplocentrus izabal sp. n. is herein described on basis to one male (holotype) and two females from El Estor municipality, Izabal department, eastern Guatemala. It seems to be a close relative of *Diplocentrus lachua* Armas, Trujillo & Agreda, 2012, from which it differs by having carapace almost smooth, with anteromedian notch V-shaped; pectines with 11 teeth in both sexes, and carapace clearly longer than pedipalp manus and metasomal segment V (*D. lachua* has carapace minutely granulate, with anteromedian notch U-shaped; pectines with 13 teeth in the males (female unknown), and carapace as long as both pedipalp manus and metasomal segment V).

Introduction

The genus *Diplocentrus* Peters, 1861 ranges from southeastern USA to northern Honduras and contains 60 species, most of them from Mexico (Santibáñez-Lopez et al., 2014; Sagastume-Espinoza et al., 2015). It is represented in the Guatemalan fauna by seven species, several described on the last decade (Armas & Trujillo, 2009; Armas et al., 2011; Trujillo & Armas, 2012, 2016), being together with *Centruroides* Marx, 1890 (Buthidae) the most diversified scorpion genera in this Central American country.

As other arachnids, the Guatemalan scorpions have been poorly studied. For that reason, it is not a surprise to find populations of undescribed taxa, although in the particular case of the diplocentrine to obtain adult specimens represents a hard task.

In the present contribution, adult specimens of both sexes belonging to a new species of *Diplocentrus* are described from El Estor municipality, Izabal department, eastern Guatemala.

Methods & Material

The specimens here described are deposited in the following scientific institutions:

IESC: Instituto de Ecología y Sistemática, La Habana, Cuba; MHN: Museo de Historia Natural, Escuela de

Biología, Universidad de San Carlos de Guatemala, Guatemala City, Guatemala.

Nomenclature and measurements follow Stahnke (1971), except for trichobothriotaxy (Vachon, 1974), metasomal carinae (Francke, 1977), and pedipalp chela carinae (Stahnke, 1970, modified by Prendini, 2000).

Systematics

Diplocentrus izabal Armas & Trujillo, sp. n.

(Figures 1–9, 12–23, Table 1)

<http://www.zoobank.org/urn:lsid:zoobank.org:act:3AF93098-C898-4C2E-9C97-841559F78304>

HOLOTYPE. ♂ (MHN), 7 km east of Taquincó (15.53100° N, -89.60481° W; 348 m a.s.l.), El Estor Municipality, Izabal Department, Guatemala, 19-12-2010, leg. C. Vásquez Almazán. Note: Left legs I-III are detached.

PARATYPES: 1♀ (IESC-3.3765), 1♀ (MHN), same data as the holotype.

DISTRIBUTION. Only known from the type locality (Fig. 1).

ETYMOLOGY. The specific name is a noun in apposition, taken from the department to which belongs the type locality.

DIAGNOSIS. The following combination of characters is diagnostic for *D. izabal*, n. sp. Total length 50–54 mm. Base coloration (adult), brown. Carapace antero-

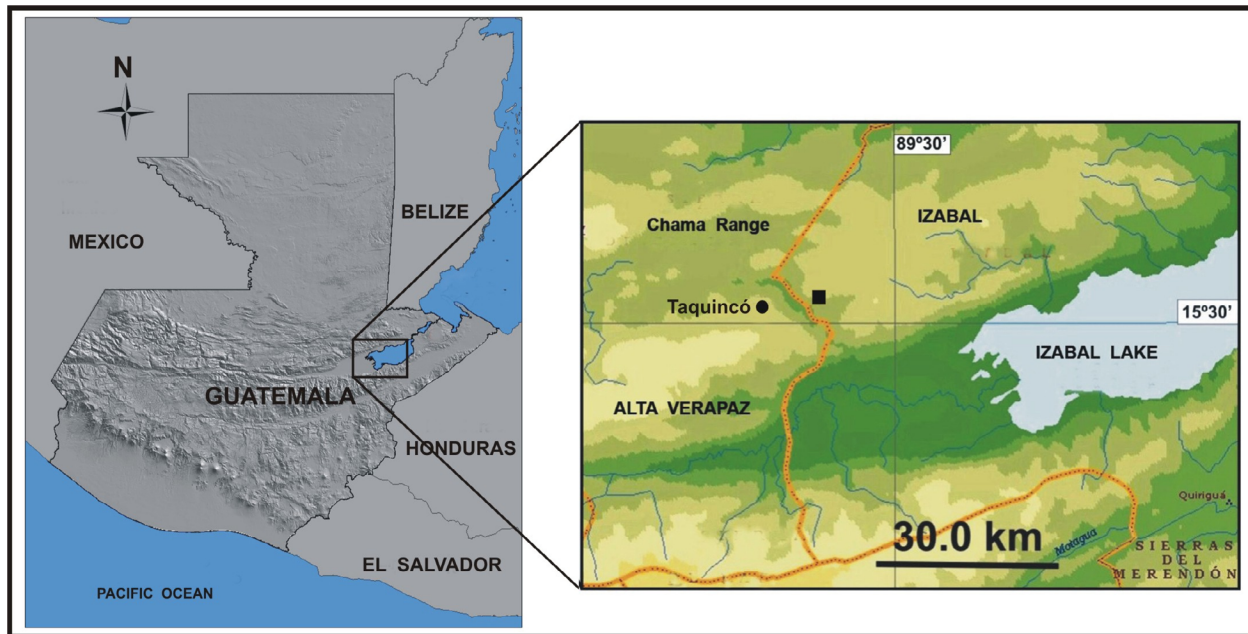


Figure 1: Distribution of *Diplocentrus izabal* n. sp. (black square).

median notch shallow, V-shaped (Figs. 2, 18). Pedipalp femur with dorsal surface finely and sparsely granular on the basal one-half (♂, Fig. 12) or medially (♀, Fig. 18). Pedipalp patella, with intercarinal surfaces faintly reticulate (♂, Fig. 13) or smooth (♀, Fig. 21); dorso-internal carina strong (♂; Fig. 13) or weak (♀), smooth; dorsoexternal carina moderately (♂, Fig. 13) or weakly (♀) developed, smooth. Pedipalp chela manus with dorsal surface markedly (♂; Fig. 14) or feebly (♀; Fig. 22) reticulate; digital carina strongly developed (♂, Fig. 14) or weakly developed (♀), smooth; ventral median carina strong, faintly crenulate (♂, Fig. 15) or weakly developed, smooth (♀). Legs I–IV tarsomere II, counts of spiniform macrosetae in pro- and retroventral rows: 4/4-5: 4-5/4-5: 5/5: 5/5. Pectinal tooth count, 11 (♀, ♂).

Diplocentrus izabal, n. sp., resembles *D. lachua* Armas, Trujillo & Agreda, 2011, and *Diplocentrus maya* Francke, 1977 in adult size and tarsomere II counts of ventral spiniform macrosetae, but they may be distinguished as follows. The carapace anteromedian notch is V-shaped in *D. izabal*, but U-shaped in *D. lachua* and *D. maya*. Males of *D. maya* have a more globose telson (Fig. 10), pectines with 12–15 teeth, metasoma without reticulations, carapace more granular, pedipalp manus more attenuate (ratio length/width = 2.4–2.5 vs 1.6 in *D. izabal*). Male of *D. lachua* also resembles that of *D. izabal* by having reticulate both metasoma segments and pedipalp patella, as well as attenuate telson (Fig. 11), but it has a darker coloration, carapace finely granular through, pectines with 13 teeth, and carapace as long as the pedipalp manus (in *D. izabal*, carapace is 1.2 times longer than pedipalp manus).

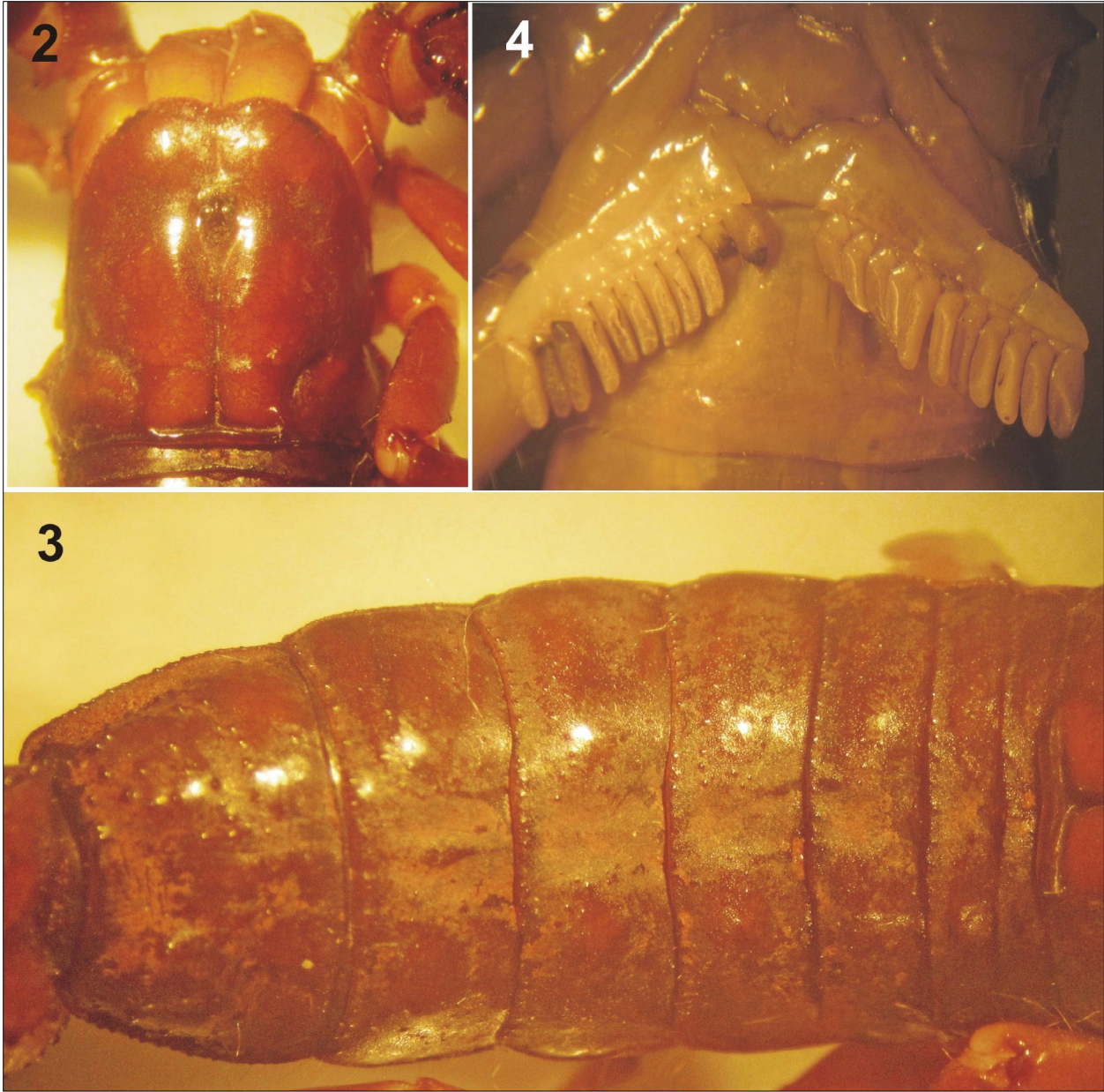
DESCRIPTION (adult male holotype; Figs. 2–8, 12–17). Carapace reddish-brown, uniformly variegated with dark fine reticulations. Coxosternal region pale brown. Pedipalps dark reddish-brown, carinae darker. Legs pale brown. Tergites brown, densely infuscate; sternites pale brown. Metasoma and telson reddish-brown; carinae moderately infuscate.

Carapace mostly smooth, with very fine granules on lateral areas and interocular triangle; anterior margin moderately setose, subgranulose; anteromedian notch shallow, V-shaped; anteromedian furrow wide, deep; three pairs of subequal lateral ocelli.

Pectines with 11/11 teeth.

Pretergites smooth. Tergites fine and faintly granular, shagreened; VII with dorsosubmedian and dorsolateral carinae weakly developed, granulose. Sternites smooth; VII with poorly developed lateral carinae, smooth.

Metasomal segments with dorsal intercarinal surfaces weakly reticulate on I–IV, smooth on V; lateral intercarinal surfaces reticulate; ventral intercarinal surfaces smooth. Segments I–IV with dorsal lateral and lateral supramedian carinae moderately developed, granular; lateral inframedian carinae weakly developed, slightly granular to crenulate on I, weakly developed to obsolete on II–IV, smooth; ventral lateral carinae weakly developed, smooth on I–II, weakly granular to crenate on III–IV; ventral submedian carinae obsolete on I–IV. Segment V length/pedipalp femur length ratio = 1.09; dorsal lateral carinae moderately developed, granular; lateral inframedian carinae weakly developed, smooth; ventral lateral carinae moderately developed,

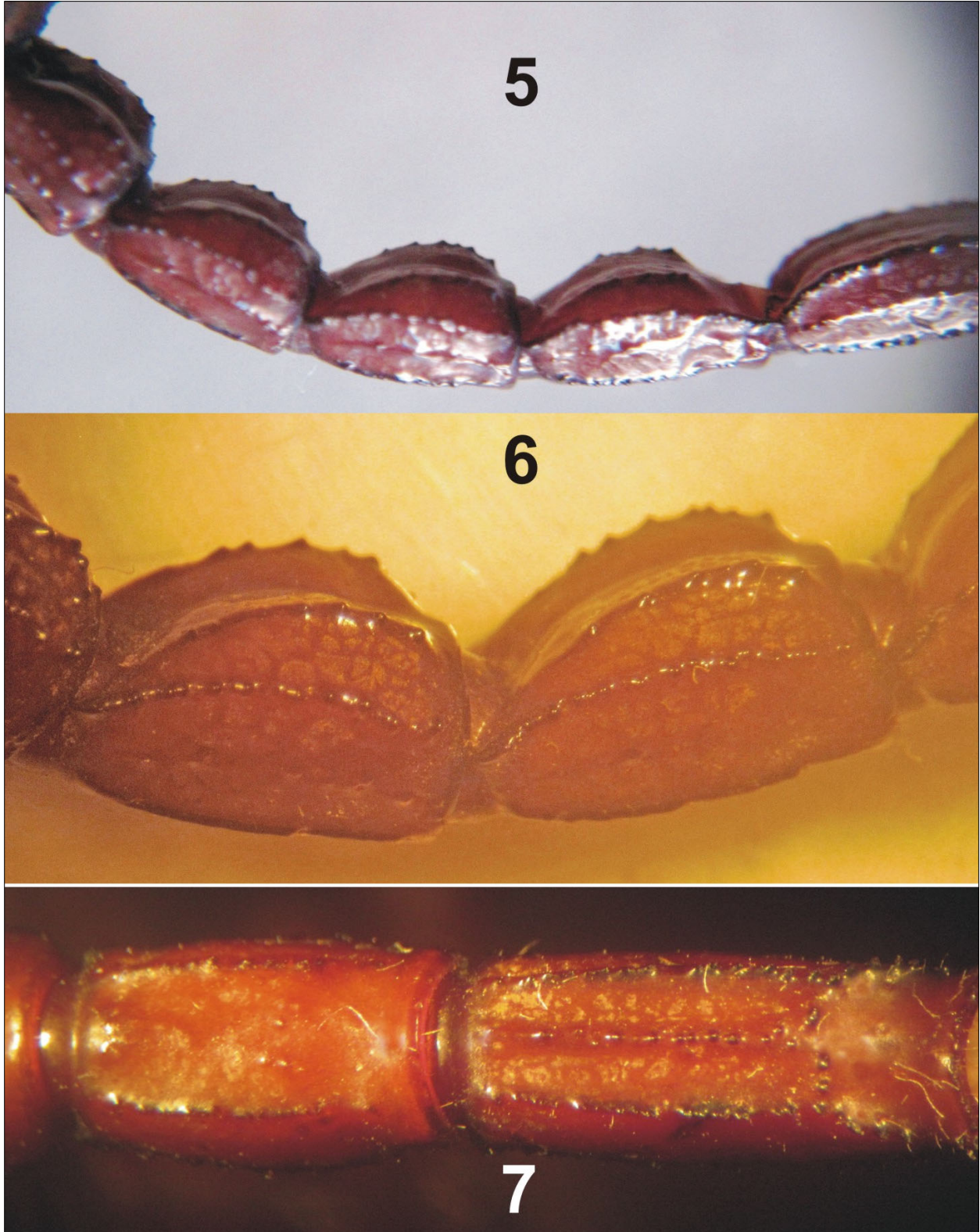


Figures 2–4: *Diplocentrus izabal* n. sp. Male holotype. 2, carapace, dorsal aspect. 3, mesosoma, dorsal aspect; 4, pectines.

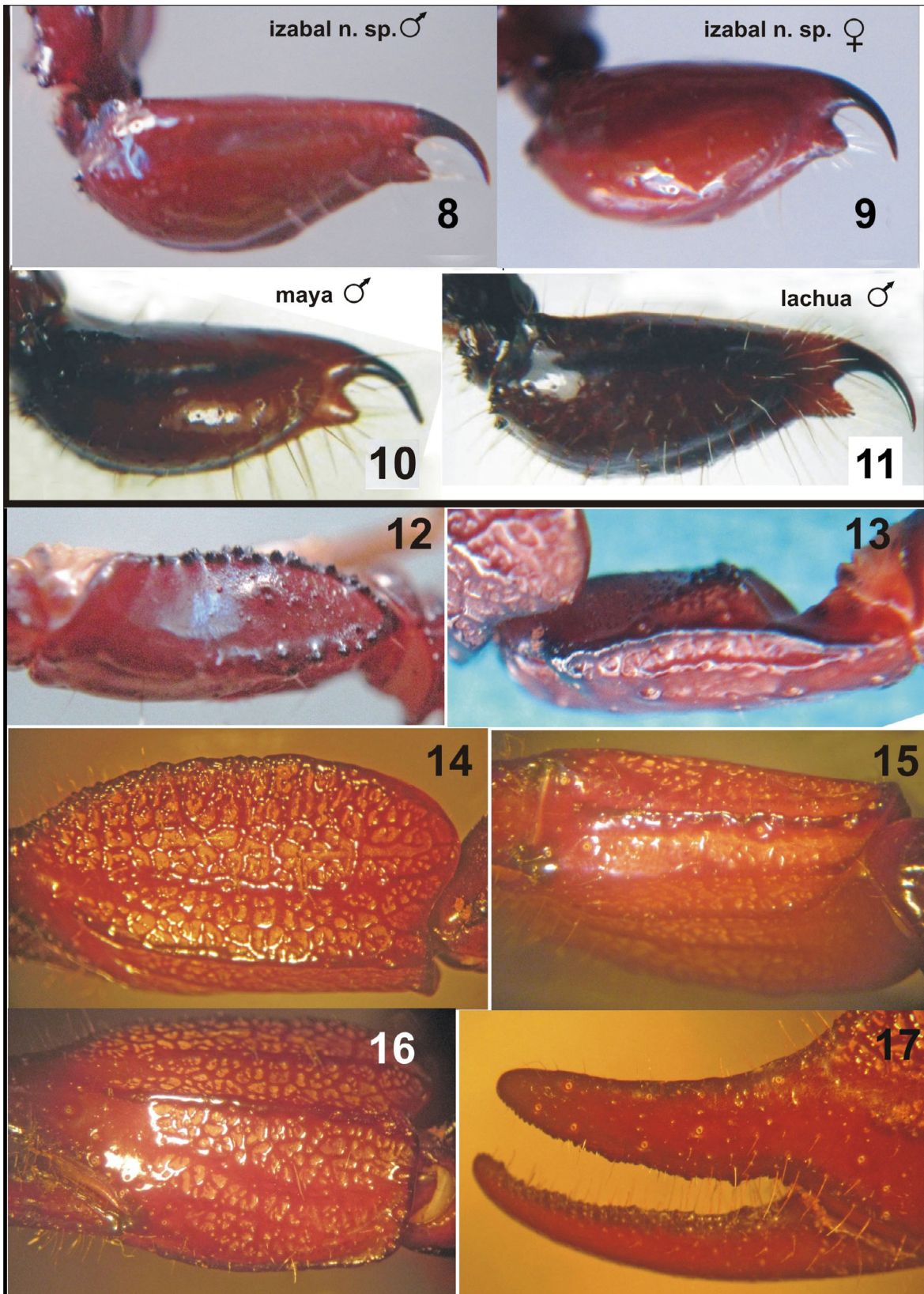
granular, with subspini-form granules; ventral median carina moderately developed, granular, with subspini-form granules posteriorly; ventral transverse carina moderately developed, comprising six subspini-form granules. Telson moderately attenuate (length/width ratio = 2.02); vesicle with lateral surfaces smooth and ventral surface granular anteriorly; subaculear tubercle stout, subconical. Measurements (Table 1).

Pedipalps orthobothriotaxic, type C. Femur (Fig. 12) 1.4 times wider than height; dorsal intercarinal surface shallowly convex, finely and sparsely granular in its proximal one-half; external intercarinal surface smooth;

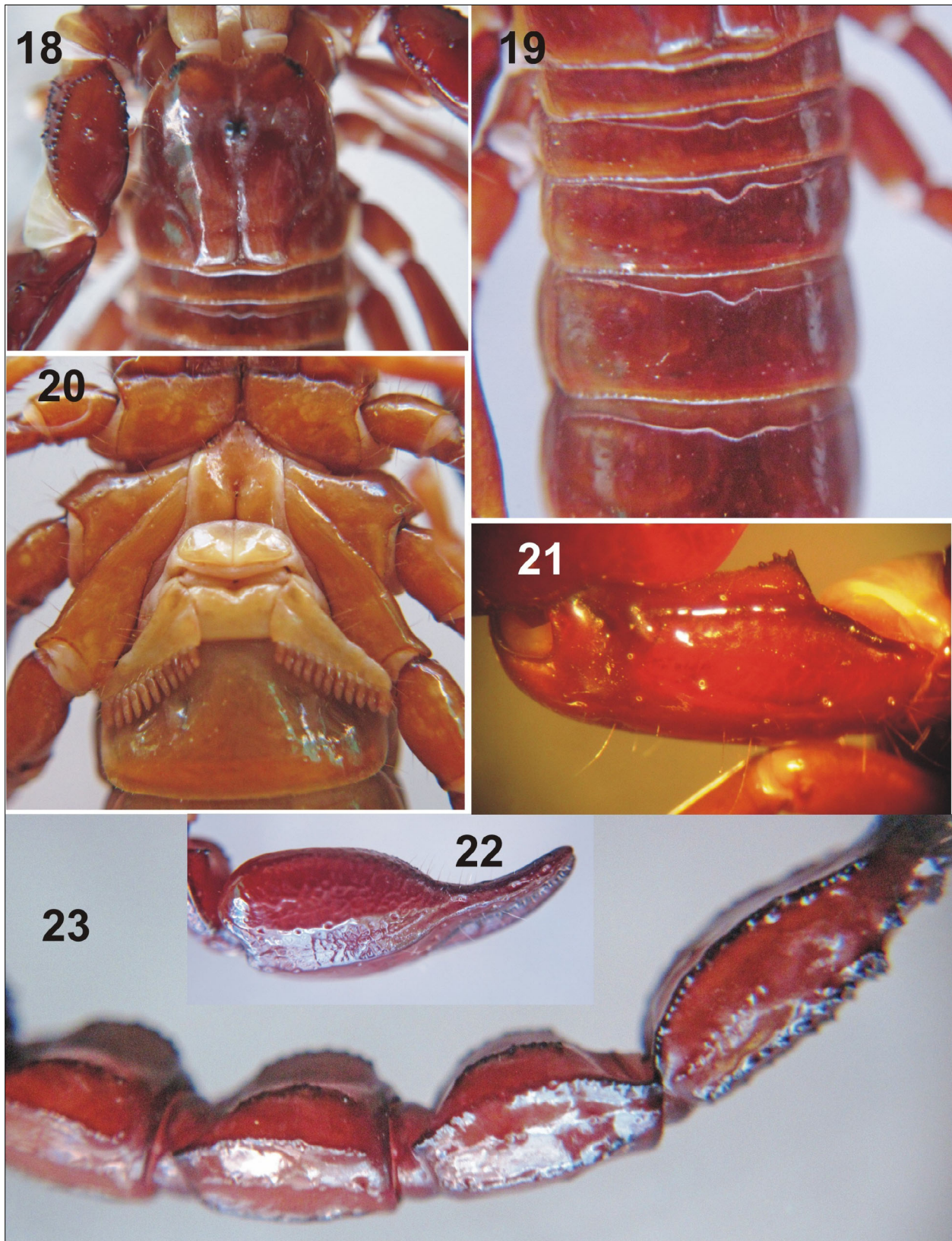
ventral intercarinal surface flat, smooth; internal intercarinal surface coarsely and densely granular; dorso-internal carina strongly developed, granular; dorso-external carina weakly developed, granular proximally and smooth distally; ventroexternal carina obsolete; ventrointernal carina moderately developed, granular proximally, becoming obsolete distally. Patella (Fig. 13) with dorsal, external and ventral intercarinal surfaces slightly reticulate; internal intercarinal surface finely granulose; proximal tubercle moderately developed; dorso-internal carina strongly developed, smooth; dorso-posterior carina weakly developed, smooth; externo-



Figures 5–7: *Diplocentrus izabal* n. sp. Male holotype, metasoma: 5, segments I–V, lateral aspect; 6, segments II–III, lateral aspect; 7, segments IV–V, ventral aspect.



Figures 8–17: Telson, lateral aspect (8–11), of three Guatemalan species of the genus *Diplocentrus*. *Diplocentrus izabal* n. sp. (12–17), Left pedipalp of the male holotype. 12, femur, dorsal aspect; 13, patella, dorsal aspect. 14–16, manus in dorsal (14), ventrointernal (15) and external aspects; 17, fingers, external aspect.



Figures 18–23: *Diplocentrus izabal* n. sp. Female paratype (IESC-3.3765). **18**, carapace, first tergites and pedipalp femur, dorsal aspect; **19**, tergites I–V; **20**, coxosternal region; **21**, pedipalp patella, dorsal aspect; **22**, pedipalp chela, dorsal aspect; **23**, metasomal segments II–V, lateral aspect.

| Characters | ♂ Holotype (MHN) | ♀ Paratype (IESC-3.3765) |
|-------------------|------------------|--------------------------|
| L total | 53.85 | 52.25 |
| Carapace, L/W | 6.75/6.50 | 7.50/7.30 |
| Pedipalp, L | 27.03 | 23.83 |
| Femur, L/W/H | 6.75/2.70/1.95 | 5.80/2.60/2.10 |
| Patella, L/W | 7.28/2.90 | 6.03/2.75 |
| Chela, L | 13.00 | 12.00 |
| Manus, L/W/H | 5.70/3.45/6.00 | 5.45/3.65/5.95 |
| Movable finger, L | 8.35 | 6.65 |
| Mesosoma, L | 14.20 | 17.45 |
| Tergite VII, L/W | 3.65/5.75 | 3.65/6.75 |
| Metasoma, L | 32.90 | 27.30 |
| I, L/W/H | 4.25/3.95/2.85 | 3.40/4.00/2.85 |
| II, L/W/H | 4.70/3.65/2.75 | 3.80/3.65/2.95 |
| III, L/W/H | 4.70/3.50/2.65 | 3.90/3.50/2.85 |
| IV, L/W/H | 5.45/3.25/2.60 | 4.10/3.25/2.65 |
| V, L/W/H | 7.35/2.75/2.60 | 5.95/2.85/2.65 |
| Telson, L | 6.45 | 6.15 |
| Vesicle, L/W/H | 5.20/3.20/2.40 | 5.00/3.40/2.70 |

Table 1: Measurements (mm) of *Diplocentrus izabal* sp. n. H, height; L, length; W, width.

median weakly developed, smooth; ventroexternal carina moderately developed in its proximal two-third, smooth, but obsolete in the distal one-third; ventro-internal carina moderately developed, comprising 5–6 conical granules in its proximal one-half. Chela (Figs. 14–17): manus slender, 1.7 as height as width, sparsely setose; dorsal and external intercarinal surfaces strongly reticulate; dorsal marginal carina moderately developed, coarsely granular; digital carina strongly developed, smooth; dorsal secondary and external secondary carinae moderately developed, smooth; ventroexternal carina weakly developed, smooth; ventromedian carina strongly developed, faintly crenulate, directed towards mid-point of movable finger articulation; internodorsal and internomedian carinae weakly developed, smooth, but having obsolete fine granules; internoventral carinae weakly developed, smooth.

Legs I–IV polished. Tarsomere II counts of spiniform macrosetae in pro- and retroventral rows: 4/4 4/4: -/- -/: 5/5 5/5: 5/5 5/5 (tarsomere II is lacking in legs II).

FEMALE (Figs. 9, 18–23). Adult females mainly differ from male holotype by having carapace and tergites smooth, shiny; pedipalps shorter, with patellae not reticulate, and chela faintly reticulate; pectinal teeth shorter; metasomal with intercarinal spaces not reticulated and segments stouter; telson most globose; genital operculum elliptical. Both paratype females have 11/11 pectinal teeth. Measurements (Table 1).

VARIATION. Female paratypes have the following tarsomere II counts of ventral spiniform macrosetae on legs I–II: 4/5 4/4: 4/5 4/5 (IESC), and 4/4 -/-: 5/4 4/4

(MHN). Total length of the smaller paratype was 50.0 mm.

NATURAL HISTORY. The type series of *D. izabal* was collected in a subtropical wet forest, 348 m a.s.l., about 3.5 km East from Cahabón river, near the border with Panzós, Alta Verapaz department. Some indicator species from this forest are *Attalea cohune*, *Terminalia amazonia*, *Brosimum alicastrum*, *Lonchocarpus* spp., *Virola* spp., *Cecropia peltata*, *Ceiba pentandra* and *Vochysia guatemalensis* (Cruz, 1982). According to Méndez (2008), the site is located at the Biogeographic Region II, corresponding to the northwest-northeast intermediate and highlands, which includes the mountain systems of Lacandón, Chamá, Santa Cruz and part of the Maya Mountains. This biogeographic unit supports high levels of endemism and stands out as the most diverse Guatemalan region for mammals, birds, reptiles and amphibians.

Acknowledgments

We thank Carlos Vazquez Almazán for collecting the examined specimens of this new species, and two anonymous reviewers for their comments.

References

- ARMAS, L. F. DE & R. E. TRUJILLO. 2009. Nueva especie de *Diplocentrus* Peters, 1861 (Scorpiones: Scorpionidae) de Guatemala. *Boletín de la Sociedad Entomológica Aragonesa*, 45: 67–72.

- ARMAS, L. F. DE, R. E. TRUJILLO & E. O. AGREDA. 2011. Nueva especie de *Diplocentrus* Peters, 1861 (Scorpionidae: Diplocentrinae) del noroeste de Alta Verapaz, Guatemala. *Boletín de la Sociedad Entomológica Aragonesa*, 49: 113–117.
- CRUZ, J. DE LA. 1982. *Clasificación de zonas de vida de Guatemala a nivel de reconocimiento*. Instituto Nacional Forestal. Guatemala, 42 pp.
- FRANCKE, O. F. 1977. Scorpions of the genus *Diplocentrus* from Oaxaca, Mexico (Scorpionida, Diplocentridae). *Journal of Arachnology*, 4: 145–200.
- MÉNDEZ, C. 2008. Diversidad faunística de Guatemala. In: CONAP (eds.), *Guatemala y su biodiversidad: Un enfoque histórico, cultural, biológico y económico*. Consejo Nacional de Áreas Protegidas, Oficina Técnica de Biodiversidad. Guatemala, 630 pp.
- PRENDINI, L. 2000. Phylogeny and classification of the superfamily Scorpionoidea Latreille 1802 (Chelicerata: Scorpiones): An exemplar approach. *Cladistics*, 16: 1–78.
- SAGASTUME-ESPINOZA, K. O., S. J. LONGHORN & C. E. SANTIBÁÑEZ-LÓPEZ. 2015. A new scorpion species of the genus *Diplocentrus* Peters, 1861 (Scorpiones: Diplocentridae) endemic to Islas de la Bahía, Honduras. *Comptes Rendus Biologies*, 338: 502–510.
- SANTIBÁÑEZ-LOPEZ, C. E., O. F. FRANCKE & L. PRENDINI. 2014. Phylogeny of the North American scorpion genus *Diplocentrus* Peters, 1861 (Scorpiones: Diplocentridae) based on morphology, nuclear and mitochondrial DNA. *Arthropod Systematics & Phylogeny*, 72(3): 257–279.
- STAHNKE, H. L. 1971. Scorpion nomenclature and mensuration. *Entomological News*, 81: 297–316.
- TRUJILLO, R. E. & L. F. DE ARMAS. 2011. Descripción del macho adulto de *Diplocentrus maya* Francke, 1977 (Scorpionidae: Diplocentrinae). *Boletín de la Sociedad Entomológica Aragonesa*, 48: 139–142.
- TRUJILLO, R. E. & L. F. DE ARMAS. 2012. Dos nuevas especies de *Diplocentrus* Peters, 1861 (Scorpionidae: Diplocentrinae) de Guatemala. *Revista Ibérica de Aracnología*, 21: 131–138.
- TRUJILLO, R. E. & L. F. DE ARMAS. 2016. Nueva especie de *Diplocentrus* Peters, 1861 (Scorpiones: Scorpionidae: Diplocentrinae) del occidente de Guatemala. *Revista Ibérica de Aracnología*, 27.
- VACHON, M. 1974. Étude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en Aracnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Museum National d'Histoire Naturelle*, Paris, 3e série, 140 (Zoologie, 104): 857–958.