

A NEW SPECIES OF *DIPLOCENTRUS* PETERS, 1861 (SCORPIONES: SCORPIONIDAE: DIPLOCENTRINAE) FROM QUINTANA ROO, MEXICO

Luis F. de Armas¹ & Eliézer Martín-Frías²

¹ Apartado Postal 4327, San Antonio de los Baños, La Habana 32500, Cuba.

² Laboratorio de Entomología, Departamento de Parasitología, Escuela Nacional de Ciencias Biológicas, I.P.N., México, D.F. 17. Mexico.

Abstract: A new scorpion species of the genus *Diplocentrus* Peters, 1861 is herein described from Quintana Roo state, Mexico. Its nearest relatives seem to be *D. taibeli* Caporiacco, 1938, from Peten, Guatemala, and *D. luisae* Guijosa, 1973 from Quintana Roo state.

Key words: Scorpiones, Scorpionidae, Diplocentrinae, *Diplocentrus*, Mexico, Yucatan peninsula, taxonomy.

Taxonomy: *Diplocentrus roo* sp. n.

Nueva especie de *Diplocentrus* Peters, 1861 (Scorpiones: Scorpionidae: Diplocentrinae) de Quintana Roo, México

Resumen: Se describe una especie nueva de *Diplocentrus* Peters, 1861, a partir de dos machos y una hembra procedentes del estado mexicano de Quintana Roo (península de Yucatán). Morfológicamente se parece a *D. taibeli* Caporiacco 1938, de Peten, Guatemala, y a *D. luisae* Guijosa 1973, de Felipe Carrillo Puerto, Quintana Roo.

Palabras claves: Scorpiones, Scorpionidae, Diplocentrinae, *Diplocentrus*, México, península de Yucatán, taxonomía.

Taxonomía: *Diplocentrus roo* sp. n.

The genus *Diplocentrus* Peters, 1861 is represented in the Mexican state of Quintana Roo by two described species (*D. luisae* Guijosa, 1973, and *D. cozumel* Beutelspacher and Armas, 2000), and two innominate ones (Armas, 2000). One of these is herein described as a new species.

The material examined is deposited at the Institute of Ecology and Systematic (IES), Havana. Measurements and nomenclature follow Stahnke (1970), except for trichobothriotaxy (Vachon, 1974) and carinae of the metasoma (Francke, 1977). For the suprageneric categories we follow to Sologlad & Fet (2003).

Diplocentrus roo sp. n.

(Fig. 1 A-E, 2 A-C, 3 A-D, 4, Table I)

Diplocentrus sp. 3: Armas, 2000:65.

TYPE DATA. Male holotype (IES), Chetumal, Quintana Roo, 1993 (this specimen is broken in two parts at level of tergite IV). **Paratypes:** One female (IES), Colonia Campestre, Chetumal, Quintana Roo, November 1993, P. Castellanos, in house. One male (IES), Rancho Las Palmas, Felipe Carrillo Puerto, Quintana Roo, Mexico, 3 October, 1993, M. Tuz, in house.

DISTRIBUTION. Only known from the municipalities of Otton P. Blanco and Felipe Carrillo Puerto, Quintana Roo State, southeastern Mexico (Fig. 4).

ETYMOLOGY. The proposed name is a noun in apposition, taken from the type locality.

DIAGNOSIS. A medium to rather large species (61–74 mm), yellow brown with dusky pattern on carapace and tergites. Pectinal tooth count, 15–16 in the female and 17 in the male. Caudal segments I–IV, decacarinatate; V, ninecarinate; the carinae are granulose all with intercarinae almost smooth.

Pedipalpal femur wider than deep, dorsally flat; patella vestigially reticulate on dorsal and external faces, dorsal median keel strong, smooth. Male with manus strongly reticulate on dorsal and external faces (in female it is vestigially reticulate only). Caudal segment V length/width ratio = 2.60–2.76 in male and 2.35 in female. Formula of tarsomere II ventral spines on legs I–II: 5–6/5–6: 5–6/5–6.

MALE HOLOTYPE. Carapace and tergites base color yellow brown with distinct dusky pattern. Pedipalps and metasoma red brown; telson yellow brown. Legs and chelicerae pale yellow brown; coxosternal region pale yellow brown, with vestigial dusky pattern on coxae II–III.

Prosoma. Carapace longer than wide, anterior margin granulose, median notch obtusely angular, approximately three times as wide as deep. Surface shagreened, anterior submargin moderately granulose. Anterior median furrow shallow, moderately wide; ocular median furrow vestigial; posterior median furrow moderately deep, narrow; posterior marginal furrow deep, narrow; posterior lateral furrows wide, shallow. Sternum pentagonal, longer than wide.

Mesosoma. Tergites shagreened, posterior submargins with sparse small and medium granules. Tergite VII moderately bilobed posterolaterally; submedian and lateral carinae obsolete. Genital operculi ellipsoidal, with five or six pairs of posterior submarginal setae. Pectinal tooth count 17/17. Sternites III–VI smooth, lustrous. Sternite VII tetracarinate: submedian keels present on distal one-third, moderate, smooth; lateral keels present on two thirds, moderate, subgranulose, intercarinae smooth.

Metasoma. Sparsely to moderately setate. Segments I–IV decacarinatate: dorsal lateral carinae and lateral suprmedian carinae strong, subserrate; lateral inframedian carinae moderately strong and subserrate on I–III, weak and subdentate on IV; ventral lateral carinae moderately strong and

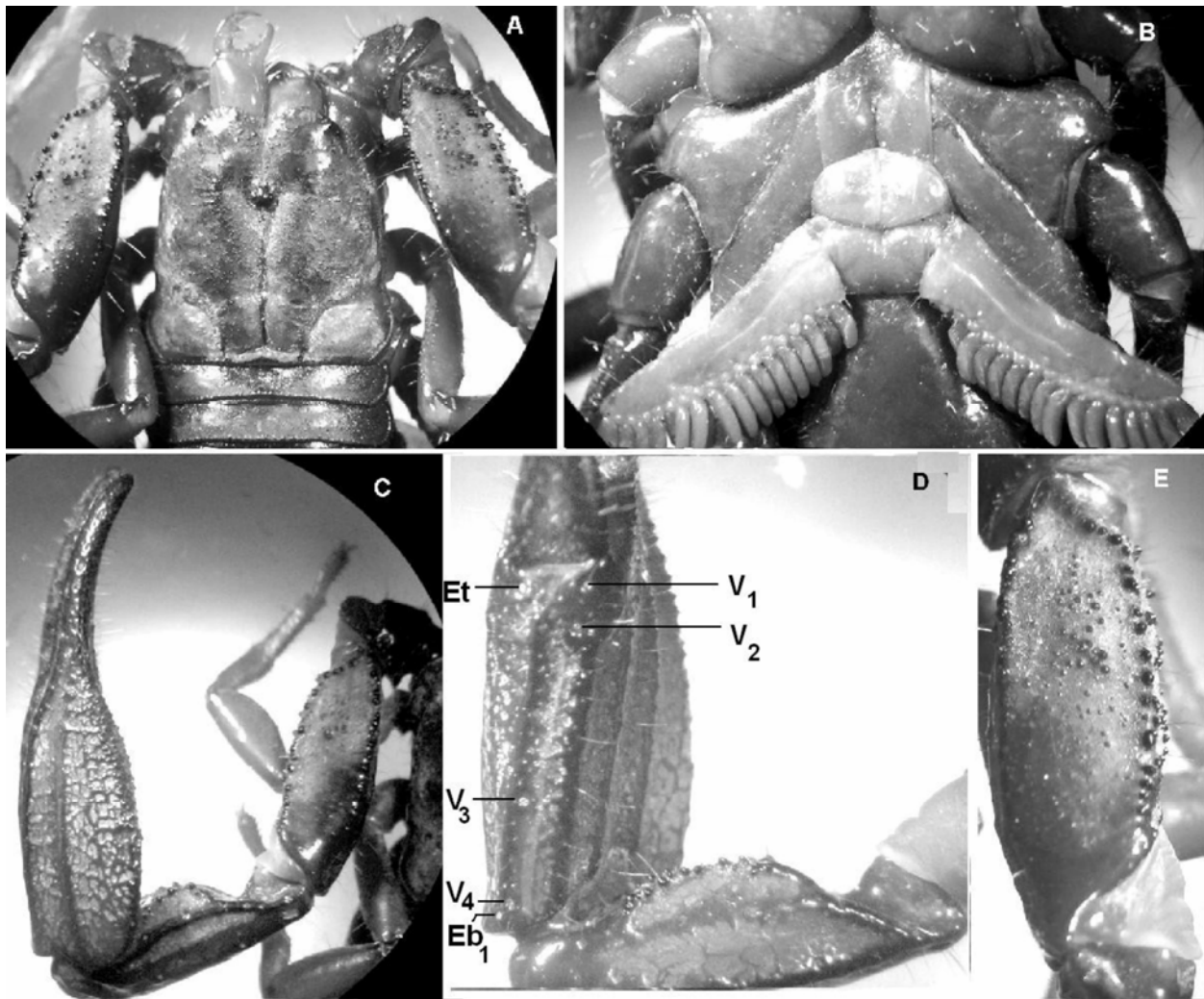


Fig. 1. *Diplocentrus roo* sp. n. Male holotype. **A.** carapace, pedipalpal femora and first tergites; **B.** sternum, genital operculum and pectines; **C.** left pedipalp, dorsal aspect; **D.** pedipalp patella and manus, ventral aspect; **E.** pedipalp femur, dorsal aspect.

subgranulose on I-III, sub serrate on IV; ventral submedian moderately strong, subgranulose, on I-III; weak, subgranulose on III-IV. Segment V: Intercarinae mostly smooth, with scarce minute granules; dorsal median carinae vestigial, present on proximal one-half, with sparse minute granules; lateral supramedian carinae [= dorsal lateral carinae of Francke, 1977]) moderate, with small and medium granules; lateral median carinae present on proximal three-fourth, weak, subgranulose; ventral lateral carinae strong, granulose; ventral median carina strong, with large subconical granules; ventral transverse carina strong, composed by four large granules. Telson smooth, with four obsolete ventral carinae, which have some proximal medium conical granules.

Pedipalp. Ortobothriotaxic type C. Femur: wider than deep; dorsal face flat, with moderate granules on proximal one-third and scarce small granules through; internal face moderately granulose; ventral face mostly smooth, with small granules on the internal submargin and proximal one-third; external face smooth; dorsal internal keel moderate, with large conical granules; dorsal external keel: proximal two-third moderate, granulose, distally weak to vestigial, subgranulose; ventral internal keel moderate, granulose;

ventral external keel vestigial, with minute granules on proximal one-third. Patela longer than caudal segment V; dorsal face smooth, vestigially reticulate; internal face densely and finely granulate; ventral and external faces smooth to vestigially reticulate; dorsal internal keel obsolete, with a group of three large, basal granules; dorsal median keel strong, smooth; dorsal external keel vestigial, smooth; external keel obsolete, smooth; ventral internal keel strong, with large conical granules; ventral median keel vestigial, smooth; ventral external keel: proximal two-third moderate, smooth, distally weak to obsolete, smooth. Chela: dorsal and external faces strongly reticulate; ventral and internal faces vestigially reticulate; dorsal margin of manus with medium and small conical granules, moderately setose; dorsal secondary keel moderate, smooth; digital keel strong, smooth; external secondary keel moderate, smooth; internal keels moderate, smooth to subgranulose; ventral external keel obsolete, present on distal one-fourth; ventral median keel very strong, smooth, directed to a middle point between the movable finger condyles; ventral internal keel strong, smooth; trichobothrium **Dt** on the fixed finger; fingers moderately setose; movable finger with seven subrows of granules, each separated by a large granule.

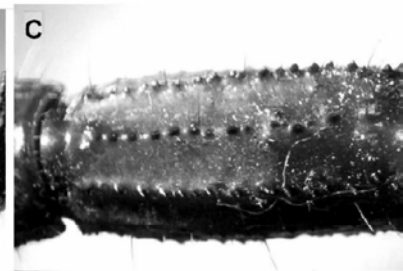
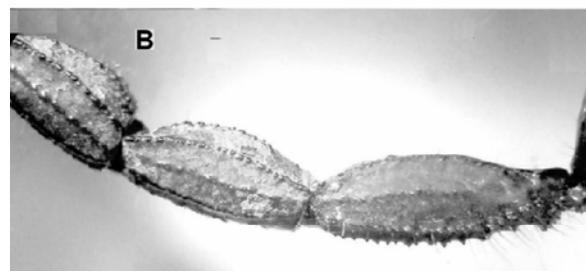
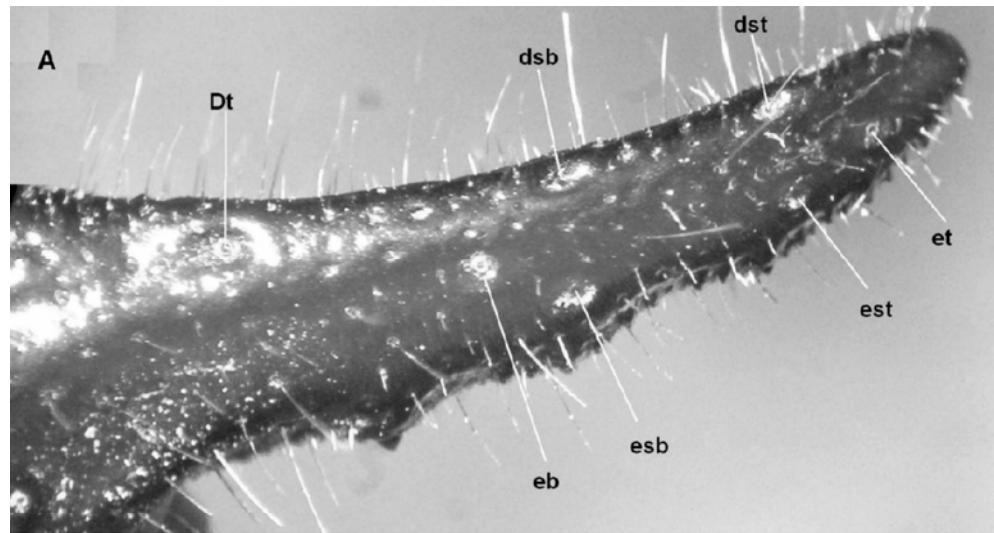


Fig. 2. *Diplocentrus roo* sp. n. Male holotype. **A.** pedipalp fixed finger, external aspect; **B.** caudal segments III-V, lateral aspect; **C.** caudal segment V, ventral aspect.

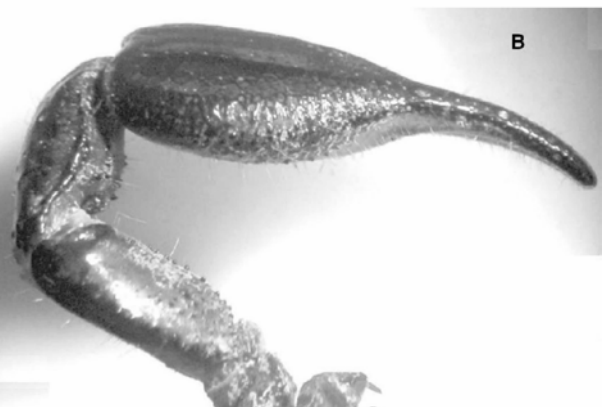
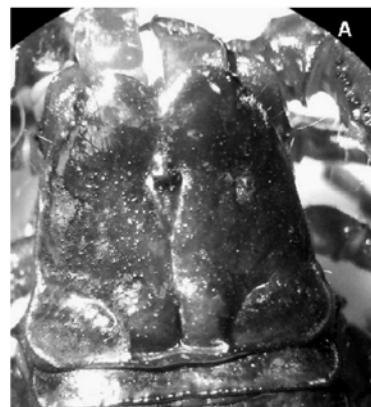


Fig. 3. *Diplocentrus roo* sp. n. Female. **A.** Carapace; **B.** left pedipalp, dorsal aspect; **C.** pedipalp manus, ventral aspect; **D.** caudal segments IV-V and telson, lateral aspect.

Legs. Mostly smooth, vestigially and finely granulose on femur and patella III-IV. Tarsomere II distal lateral lobes rounded; ventral spine formula: 5/5 5/5: 6/6 5/6: ?? 6/7: ??/??.

FEMALE. It differs from the male in the following characters: Carapace wider than long, with the surface moderately granulate, not shagreened; pedipalps shorter (patella length/width ratio = 2.33 versus 2.75-2.82 in the male), with manus most globose (length/height ratio = 1.09 versus 1.32-1.36 in the male), and vestigially reticulate; pectinal tooth

count 15/16. Caudal segment I almost as wide as long; V, shorter than pedipalpal patella; vesicle globose (length/width ratio = 1.55 versus 1.82-1.85 in the male). Tarsomere II spine formula: 5/5 5/5: 5/6 5/6: 6/6 6/6: 6/7 6/7.

VARIATION. The male paratype from Felipe Carrillo Puerto differs from the holotype in some morphometric characters as shown in Table I. Its tarsomere II spine formula is as follows: 5/6 5/6: 6/6 6/6: 7/7 6/8: 7/7 7/8. We consider those differences as intraspecific ones only.

Table I
Measurements (mm) of *Diplocentrus roo* sp. n. H, height; L, length; W, width.

Characters	Holotype ♂	Paratype ♂	Paratype ♀
Carapace, L/posterior W	8.79/8.42	8.84/8.37	8.16/8.32
Chelicera, L/W	2.70/1.87	2.86/1.92	2.44/1.77
Fixed finger, L	1.20	1.30	1.14
Movable finger, L	1.92	2.39	2.24
Pedipalp, L	35.31	37.23	28.80
Femur, L/W/H	9.20/3.12/1.92	9.46/3.17/2.18	7.02/2.86/1.98
Patella, L/W	9.31/3.38	9.67/3.43	7.28/3.12
Chela, L	16.80	18.10	14.50
Manus, L/W/H	8.11/4.06/5.98	8.84/4.78/6.66	6.97/3.64/6.40
Movable finger, L	8.89	10.00	7.80
Mesosoma, L	21.04	22.35	21.07
Metasoma, L	38.05	42.79	31.35
I, L/W/H	4.94/4.52/3.17	5.72/4.52/3.38	4.00/3.90/3.02
II, L/W	5.30/4.06	6.24/4.26	4.26/3.69
III, L/W	5.77/3.85	7.02/3.95	4.68/3.59
IV, L/W	6.60/3.48	7.12/3.69	5.46/3.17
V, L/W/H	8.11/3.12/2.81	8.89/3.22/3.12	6.71/2.86/2.44
Telson, L	7.33	7.80	6.24
Vesicle, L/W/H	6.08/3.28/2.76	6.24/3.43/2.76	5.10/3.28/2.60
Total L	67.88	73.98	60.58

NATURAL HISTORY. The male paratype was collected into a house, at night, in a low tropical forest. The female paratype was also collected into a house, at night, in a residential area of the city of Chetumal, which originally was covered by low tropical forest. In both places this species lives sympatrically with *Diplocentrus* sp. (a smaller species), and the large buthids *Centruroides gracilis* (Latreille, 1804) and *C. ochraceus* (Pocock, 1898).

COMPARISONS. The only known species of *Diplocentrus* from the Yucatan peninsula having more than 15 pectinal teeth, a large size, and tarsomere II with so high spine formula are *D. taibeli* Caporiaco, 1938 from Flores (240 km SW of Chetumal), Petén, Guatemala, and *D. luisae*. *Diplocentrus roo* sp. n. differs from them by its smaller size [males of *D. taibeli* and *D. luisae* reach more than 85 mm (Francke, 1977; Armas & Martín-Frías, 2001)]. According with the original description of *D. taibeli*, caudal segment I of the male is wider than long, a condition certainly infrequent in this genus and not shared with its congeners *D. luisae* and *D. roo* sp. n. On the other hand, male of *D. roo* sp. n. seems to be more elongated than that of *D. taibeli* [in the former the pedipalpal femur is longer than carapace, caudal segment V is 2.60-2.86 times as long as wide (2.3 in *D. taibeli*), and pedipalpal chelae is 2.7-2.8 times as long as deep (2.3 in *D. taibeli*).

In *Diplocentrus luisae* the male holotype (only known specimen) has pedipalpal patella with dorsal median keel that is weak at level of the trichobothrium d_2 (in *D. roo* sp. n. this keel is uniformly well developed through). On the other hand, *D. luisae* has a slender caudal segment V (length/width ratio = 3.23 versus 2.60-2.86 in *D. roo*).

Acknowledgment

Part of this research was supported by the Institute Bioclon, Mexico, D. F. The first author (L.F.A.) is also indebted to CIQROO (Centro de Investigaciones de Quintana Roo, Mexico) for assistance during the project "Arachnids of the Yucatan peninsula" (CONACYT No. 1140- N9208). We also thank to Rolando Teruel (Bioeco, Santiago de Cuba) for his valuable commentaries to our manuscript.

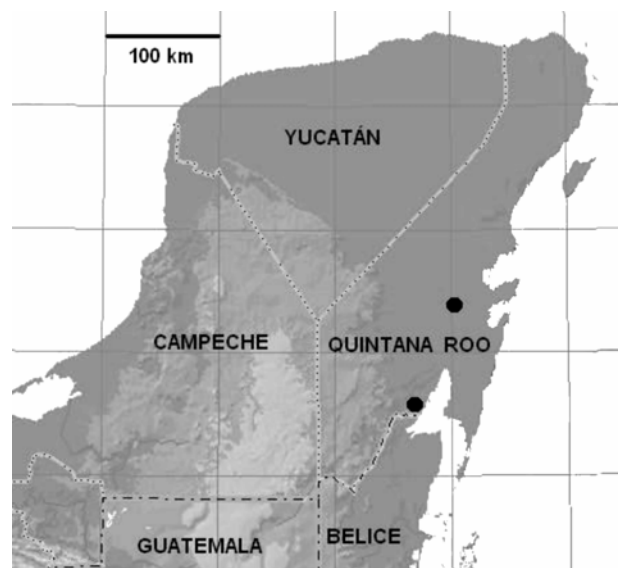


Fig. 4. Geographical distribution of *Diplocentrus roo* sp. n.

References

- ARMAS, L. F. DE 2000. Amblypygi, Schizomida, Scorpiones y Solpugida. Pp. 55-72 in *Fauna edáfica de las selvas tropicales de Quintana Roo* (M. M. Vázquez, ed.), Universidad de Quintana Roo, México.
- ARMAS, L. F. DE & E. MARTÍN-FRÍAS 2001 (2000). Redescrición de *Diplocentrus luisae* Guíjosa (Scorpiones: Diplocentridae). *An. Esc. Nac. Cien. Biol.*, **46**(3): 283-288.
- FRANCKE, O. F. 1977. Scorpions of the genus *Diplocentrus* from Oaxaca, Mexico (Scorpionida, Diplocentridae). *J. Arachnol.*, **4**: 145-200.
- SOLEGLAD, M. E. & V. FET 2003. High-level systematics and phylogeny of the extant scorpions (Scorpiones: Orthosterni). *Euscorpius*, **11**: 1-175.
- STAHNKE, H. L. 1970. Scorpion nomenclature and mensuration. *Ent. News*, **81**: 297-316.
- VACHON, M. 1974. Étude des caractères utilisés pour classer les familles et les genres de scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriax et types de trichobothriotaxie chez les Scorpions. *Bull. Mus. Natl. Hist. Nat.*, 3a ser., **140** (Zool. 104): 857-958.