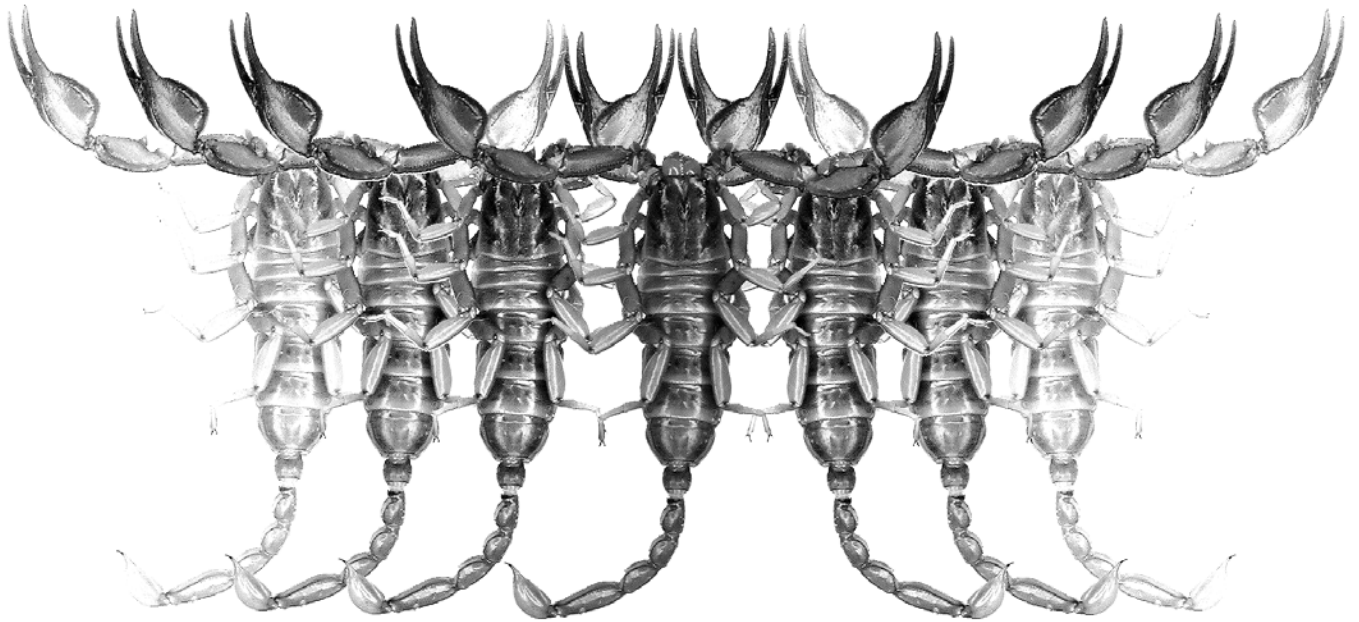


# *Euscorpium*

Occasional Publications in Scorpiology



**A New Species of *Tarsoporosus* Francke, 1978  
(Scorpiones: Scorpionidae: Diplocentrinae), from  
Northeastern Colombia**

**Rolando Teruel & César A. Roncallo**

**December 2007 – No. 62**

# *Euscorpilus*

## Occasional Publications in Scorpiology

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- **ZISP**, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

## A new species of *Tarsoporosus* Francke, 1978 (Scorpiones: Scorpionidae: Diplocentrinae) from northeastern Colombia

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### Summary

A new species of *Tarsoporosus* Francke, 1978 is described herein from two localities in La Guajira Peninsula, northeastern Colombia. This new taxon inhabits arid environments, and is morphologically close to *Tarsoporosus flavus* González-Sponga, 1984, from northwestern Venezuela. With this addition, the total number of described species in *Tarsoporosus* is raised to five, with at least two occurring in Colombia.

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### Introduction

The genus *Tarsoporosus* was described by Francke (1978) to accommodate *Diplocentrus kugleri* Schenkel, 1932, a very peculiar species described originally from a single locality in Falcón state (northern Venezuela). This species was then redescribed by Francke (1978) on the basis of the female holotype and several additional specimens collected in arid localities of northwestern Venezuela and northeastern Colombia. González-Sponga (1984a) did not make any mention of the genus *Tarsoporosus* in his first catalog of Venezuelan scorpions. In another paper that followed the same year, González-Sponga (1984b), without recognizing *Tarsoporosus* as valid, discovered that Francke's redescription had been based upon specimens belonging to at least three different taxa. He presented a second redescription of *Diplocentrus kugleri*, described two new species (*Diplocentrus flavus* and *D. yustizi*, from Falcón and Lara states, respectively), and mentioned the occurrence of “new zoological entities” in northern and eastern Zulia state.

On the other hand, Lourenço & Flórez (1990) recorded the unexpected finding of *Tarsoporosus* populations from the rain forests of Chocó (Colombian Pacific coast), which was described as a new subspecies under the name *Tarsoporosus klugeri* [sic] *anchicaya*. However, this subspecies was quickly raised to species level and redefined by these same authors (Lourenço & Flórez, 1995). Just one year later, González-Sponga (1996) again listed the three Venezuelan species under *Diplocentrus*, but in turn Sissom & Fet (2000) and Rojas-Runjaic & Sousa (2007) listed them in *Tarsoporosus*.

Currently, this genus contains four described species: the Colombian endemic *T. anchicaya*, and the three Venezuelan endemics *T. flavus*, *T. kugleri* and *T. yustizi*. Also, several populations of an uncertain specific identity have been recorded from both countries, some of them erroneously referred to as *T. kugleri* by different authors, i.e., Francke (1978) and Lourenço & Flórez (1990, 1995). This is particularly the case for those located in the arid northeastern Colombia, which have never been revised. During recent field work undertaken by one of us (CARS) as part of a joint research project on the systematics of Colombian scorpions, new specimens of *Tarsoporosus* were collected in La Guajira Peninsula. The study of these specimens clarified part of those problematic records, as they demonstrated to represent a new species which is described in the present contribution.

### Methods & Material

The specimens were studied, measured and photographed under a ZEISS Stemi 2000-C stereomicroscope, equipped with line scale and grid ocular micrometers, and a CANON PowerShot A620 digital camera, all calibrated to 20x. Digital images were slightly processed with Adobe Photoshop® 8.0, only to optimize bright and contrast features. Nomenclature and measurements follow Stahnke (1970), except for trichobothriotaxy (Vachon, 1974), metasomal carinae (Francke, 1977) and sternum (Soleglad & Fet, 2003). In the table, all measurements are given in millimeters as length/width/depth except for the carapace, where these correspond to length/posterior width. Holotype and paratype are deposited in the first author's personal collection (RTO), with collecting and identification

Dimensions		♂ holotype (Riohacha)	♂ paratype (Nazareth)
Carapace	L/Wp	5.3 / 5.0	5.6 / 5.1
Mesosoma	L	13.1	13.1
Tergite VII	L	3.3 / 4.9	3.2 / 4.9
Metasoma	L	22.0	21.9
Segment I	L/W	3.0 / 3.7	3.0 / 3.6
Segment II	L/W	3.1 / 3.4	3.1 / 3.6
Segment III	L/W	3.2 / 3.4	3.2 / 3.5
Segment IV	L/W	3.8 / 3.3	3.7 / 3.5
Segment V	L/W	4.5 / 3.2	4.5 / 3.2
Telson	L	4.4	4.4
Vesicle	L/W/H	3.2 / 3.0 / 1.9	3.2 / 3.0 / 1.7
Pedipalp	L	15.1	15.3
Femur	L/W	3.4 / 1.8	3.5 / 1.7
Patella	L/W	3.7 / 1.8	4.2 / 1.7
Chela	L	8.0	7.6
Hand	L/W/H	3.0 / 3.1 / 4.1	3.0 / 3.1 / 4.2
Movable finger	L	5.0	4.6
<b>Total</b>	<b>L</b>	<b>40.4</b>	<b>40.6</b>

**Table 1:** Measurements of the types of *Tarsoporosus macuira* sp. n. Abbreviations: length (L), width (W), posterior width (Wp), depth (H).

labels originally written in Spanish, but translated to English in the text only for coherence purposes.

## Systematics

*Tarsoporosus macuira* Teruel et Roncallo, **new species**  
Figures 1–4; Table 1

*Tarsoporosus kugleri*: Francke, 1978: 24–26 (misidentification?: specimens from La Guajira and Maracaibo).

*Tarsoporosus klugeri klugeri* [sic]: Lourenço & Flórez, 1990: 121–122, 131, fig. 17 (misidentification?: record from La Guajira); Lourenço & Flórez, 1995: 143–144, fig. 1 (misidentification?: record from La Guajira).

**DIAGNOSIS** (males only): species of medium size (40–41 mm) for the genus. Body light brown to yellow, with pedipalps and metasoma distally darker; chelicerae, carapace and tergites densely but diffusely patterned with dark brown reticulations; legs immaculate, conspicuously paler than the body; pedipalps and metasoma with carinae and fingers darkened. Carapace and tergites with smooth and granulose areas symmetrically interspersed. Metasoma with intercarinal tegument smooth and totally devoid of granulation on segments I–IV. Pedipalp chela robust, strongly carinated and covered by granulose reticulations on dorsoexternal surfaces. Pectinal tooth

count 12–14. Modal tarsal spine formula 4/5 : 5/5 : 6/6 : 6/6.

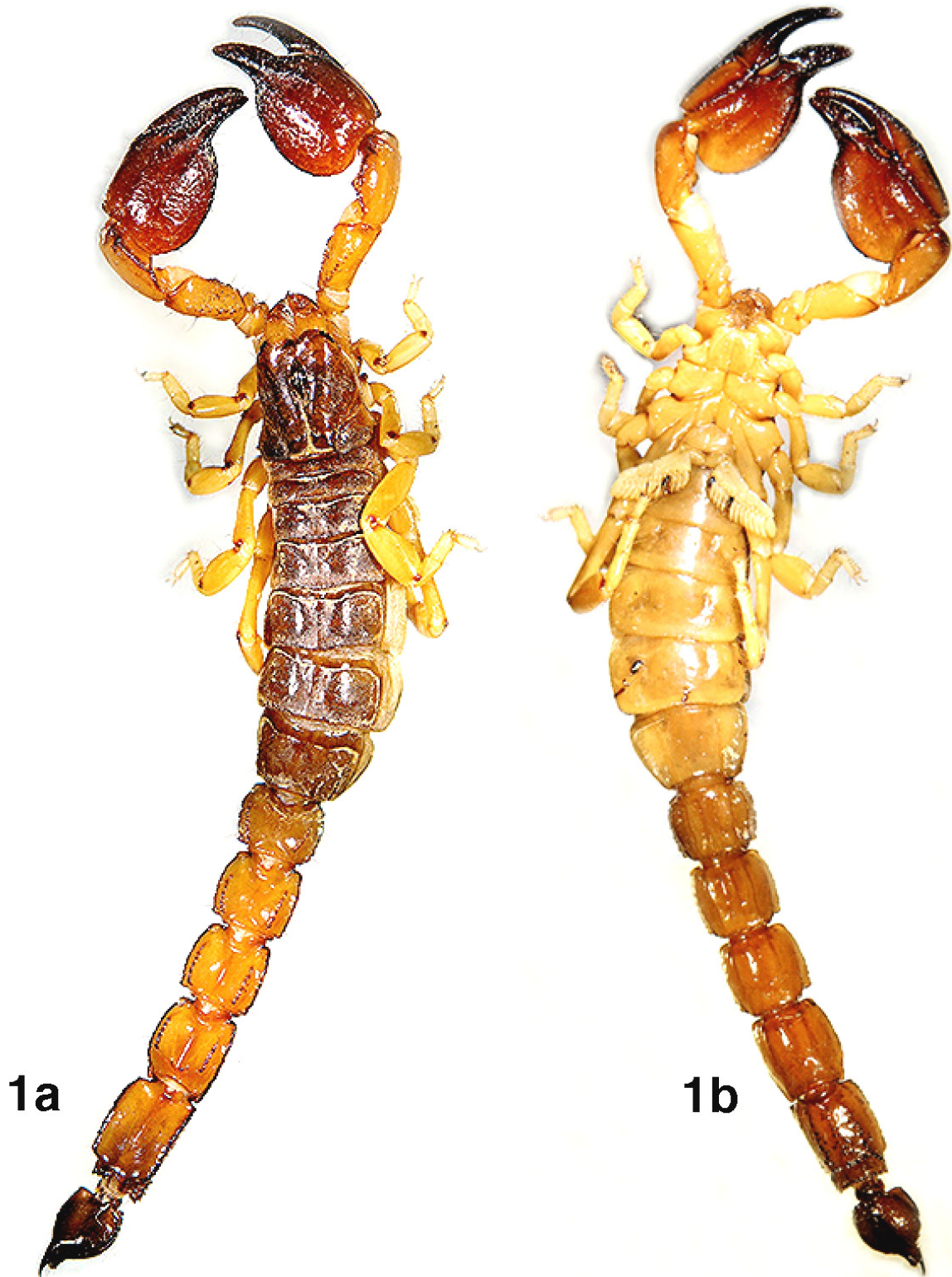
**HOLOTYPE**: adult ♂ (RTO: Sco.0368), Colombia, La Guajira, Riohacha, Barrio “Dividivi”, 23 April 2007, C. A. Roncallo.

**PARATYPE**: adult ♂ (RTO: Sco.0369), Colombia, La Guajira, Serranía de Macuira, 3 km west of Nazareth; 14 July 2007, J. Echavarría.

**ETYMOLOGY**: the specific name is a Latinized noun in apposition, derived from the mountain range where one of the populations of this species occurs.

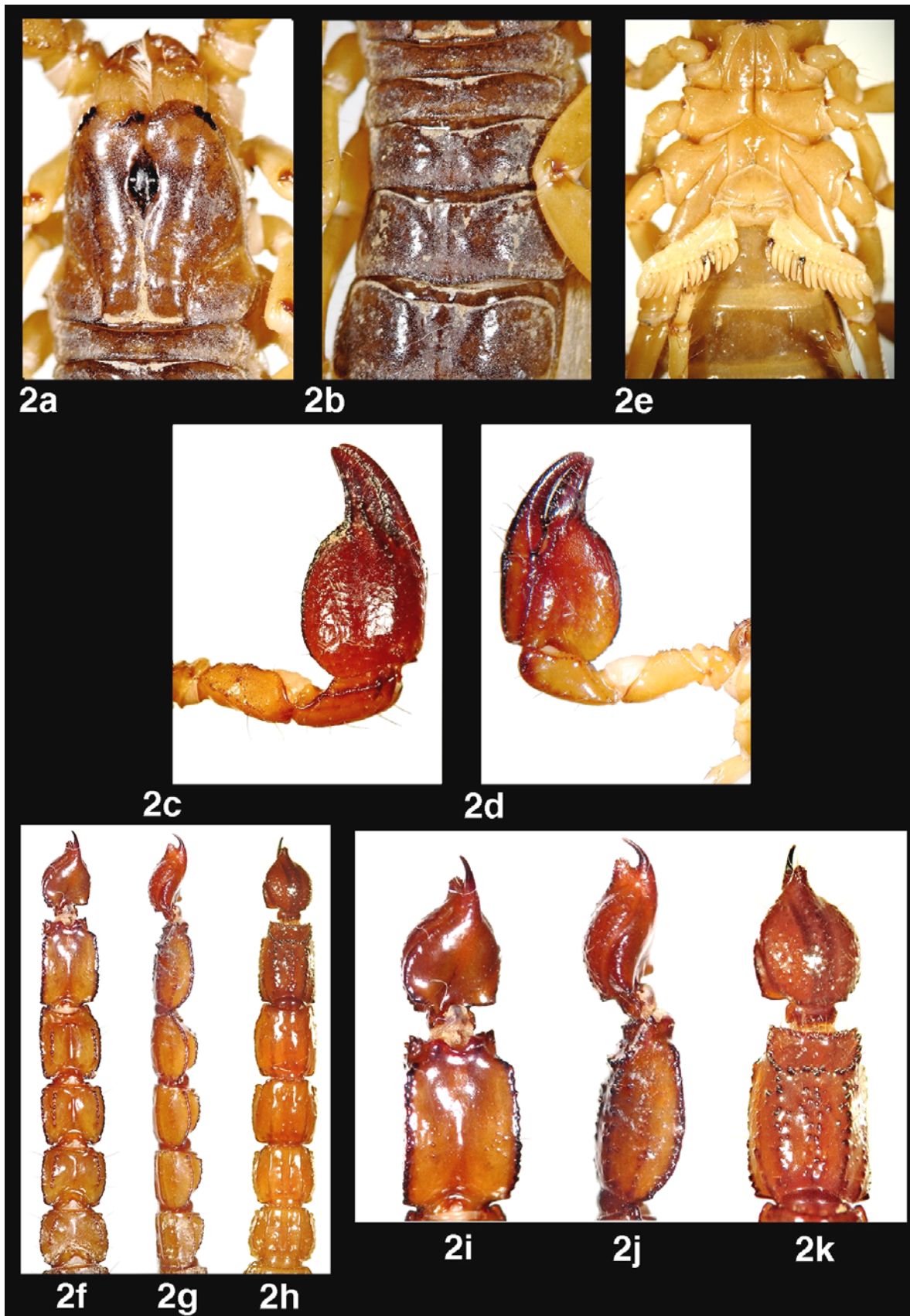
**DISTRIBUTION** (Fig. 3): arid coastal and sub-coastal areas of La Guajira Peninsula (including the Serranía de Macuira range), in extreme northeastern Colombia.

**DESCRIPTION** (adult male holotype): **coloration** (Fig. 1a–b) basically light brown, with pedipalps and metasoma distally darker, with carinae outlined in dark to blackish brown. Chelicerae, carapace and tergites densely patterned with diffuse dark brown reticulations. Legs immaculate yellowish, conspicuously paler than the body. Ocular tubercle and eyes blackish, pectines yellowish. **Carapace** (Fig. 2a) longer than wide, anterior margin with three pairs of macrosetae in the frontal lobes,



**Figure 1:** Adult male holotype of *Tarsoporosus macuira* sp. n.: **a)** entire dorsal view; **b)** entire ventral view.





**Figure 2:** Adult male holotype of *Tarsoporosus macuira* sp. n.: **a)** prosoma, dorsal view; **b)** tergites I-V, dorsal view; **c)** pedipalp, dorsal view; **d)** pedipalp, ventral view; **e)** sternospectinal region, ventral view; **f)** metasoma, dorsal view; **g)** metasoma, lateral view; **h)** metasoma, ventral view; **i)** metasomal segment V and telson, dorsal view; **j)** metasomal segment V and telson, lateral view; **k)** metasomal segment V and telson, ventral view.



**Figure 3:** Known geographical distribution of: (1) *Tarsoporosus anchicaya*, (2) *Tarsoporosus flavus*, (3) *Tarsoporosus kugleri*, (4) *Tarsoporosus macuira* sp. n., and (5) *Tarsoporosus yustizi*; black squares indicate undetermined populations of this genus.

which are moderately wide and rounded, frontal notch relatively wide and deep. Tegument polished, with fine and densely granulose areas symmetrically interspersed. Furrows: median ocular obsolete; anterior median very wide and moderately deep; lateral ocular, posterior median and posterior marginal fused, all relatively deep; posterior lateral narrow and deep. Median eyes small (similar to the lateral eyes) and separated by about one ocular diameter, median tubercle moderately raised; three pairs of lateral eyes. **Tergites** (Fig. 2b) with well defined median carina, basically extending over the whole length of each tergite, moderately raised and smooth to subgranulose, flanked by a large, divergent depression on each side. Tegument with the same basic sculpture as carapace. Tergite VII with moderately bilobed lateroposterior region, and with two pairs of strongly crenulate lateral carinae, the external pair longer than the submedian pair. **Chelicerae** (Fig. 2a) with dentition typical for the family, and tegument smooth and polished. **Pedipalps** (Figs. 1a–b, 2c–d) orthobothriotaxic C. Femur deeper than wide, with dorsal surface basically straight; dorsointernal and ventrointernal carinae poorly defined, irregularly granulose, ventroexternal carina absent; ven-

tral and external tegument smooth and polished, dorsal and internal tegument irregularly granulose, dorsal surface with some coarse granules clustered in the mid-portion. Patella with all carinae weak except for the dorsointernal (very strong, subgranulose and distally folded) and the ventrointernal (moderate, irregularly granulose); tegument smooth and polished except on the internal surface, which is very finely granulose. Chela robust, prismatic in cross-section and much deeper than wide; hand with dorsal secondary carina very weak, digital carina very strong, coarsely and irregularly granulose, external secondary carina strong, basically smooth and evenly convex, external and ventrointernal carinae strong, costate and directed towards their respective articulation condyle, dorsal marginal and dorsointernal carinae strong, granulose; dorsal and external tegument smooth, but covered with granulose reticulations which cross even over some of the carinae, internal surface smooth, with the distal third moderately concave just above movable finger articulation. Fingers short, strongly carinated and sparsely setose, without lobe/notch combination; opposable edges with irregular granulation not arranged in rows; fixed finger internally

with some coarse granules aligned close to the apex. **Legs** with tegument smooth and polished; tarsomere I enlarged and densely covered with pores on prolateral and ventral surfaces; tarsomere II without laterodistal lobes; tarsal spine formula 4/5 : 5/5 : 6/6 : 6/6. **Sternum** (Fig. 2e) type 2, strongly pentagonal, with slightly divergent sides. **Genital operculi** (Fig. 2e) shaped intermediately between rhomboidal and oval; genital papillae moderately developed and slightly exposed. **Pectines** (Fig. 2e) moderately setose, with 13/14 teeth; basal plate much wider than long; anterior margin notched, posterior margin straight. **Sternites** (Fig. 2e) smooth and polished, with some scattered setae; VII with two pairs of parallel and smooth carinae, the externals weak and long, the internals vestigial and short; spiracles narrow and elongate, almost slit-like. **Metasoma** (Figs. 1a–b, 2f–k) depressed and almost bare, with segments I–III each wider than long; intercarinal tegument smooth and polished, with some minute granules scattered on dorsal and lateral surfaces of V; segments I–IV with ten carinae, V with seven; dorsolateral carinae strong and granulose on I–IV, absent on V; lateral suprmedian carinae strong and crenulate to subserrate on all segments; lateral inframedian carinae complete, moderate and almost smooth on I–II, weak and almost smooth on III, vestigial and smooth on IV, weak and irregularly granulose on V; ventrolateral carinae strong and costate on I–II, moderate and smooth on III, very weak and smooth on IV, moderate and subdentate on V, where are fused to the ventral transverse carina, which is strongly dentate and evenly arched; ventral submedian carinae costate, moderate on I, weak on II, vestigial on III and absent on IV–V; ventromedian carinae on V strong and composed by a double row of irregularly arranged dentate granules; segment V slightly longer than telson, with anal arc denticulate, laterodistal lobes triangular and not projected. Telson rounded and depressed; vesicle polished and irregularly granulose, ventrobasal margin with some obsolete granules, subaculear tubercle large, laterally compressed and covered by coarse granules and some rigid setae; aculeus short, sharp and moderately curved.

**VARIATION:** the adult male paratype differs slightly from the holotype: its coloration is much lighter (basically yellow, with the dark reticulations similarly distributed but also paler), pedipalp femur and patella are less robust (Table 1), and pectinal tooth count is 13/12. As both specimens match exactly in all other diagnostic features and the two localities are about 200 km apart, we conclude that this discrepancy reflects only intraspecific variation among separate populations.

**ECOLOGICAL NOTES:** the holotype was found under a large rock on sandy/clay soil, in an uninhabited, isolated spot inside Riohacha city which is used as a rubbish dump

and has a cover of dense thicket, seasonally variable depending upon humidity (Fig. 4). The scorpion was found just after the rainy season finished and further searches during the dry season did not yield additional specimens (only two small and fragmented exuvia were found, also under stones). The paratype from Nazareth was collected under a medium size rock on sand/clay soil with some humus, in the subxerophytic premontane forest of the transitional zone between the coastal desert and the humid mountain forest of the Macuira range. This vegetation has three strata and the most characteristic plant families are the Amaranthaceae, Boraginaceae, Cactaceae, Caesalpinaceae, Capparaceae, Convulvulaceae, and Euphorbiaceae.

According to the available data, *T. macuira* **sp. n.** appears to be restricted to xeric coastal and sub-coastal areas, and in both known localities it lives syntopically with other two scorpion species also adapted to xeric environments: *Centruroides margaritatus* (Gervais, 1841) and *Rhopalurus laticauda* Thorell, 1876, both members of the family Buthidae.

**COMPARISONS:** on the basis of coloration, sculpture of the carapace and tergites, and the presence of granulose reticulations on the pedipalp chela, *T. macuira* **sp. n.** is closely related to *T. flavus*, another xerophilic species which is endemic from Paraguaná Peninsula in northwest Venezuela (González-Sponga, 1984b, 1996). However, the adult males of *T. flavus* can easily be separated by: (1) metasoma much more slender, with segments II–III each longer than wide; (2) metasomal carinae much less developed and more smooth, specially the lateral inframedian, lateral suprmedian and ventral submedian; (3) dorsal surface of all metasomal segments with scattered granulation; (4) carapace with some coarse granules scattered over the anterior margin; (5) sternite VII with carinae obsolete; (6) larger size (42–50 mm).

## General Comments

Francke (1978) assigned to *T. kugleri* several specimens collected from same localities in Colombia and Venezuela, but these turned out in fact to be at least four different species. Particularly, specimens from Merochón (La Guajira, Colombia) and Maracaibo (Zulia, Venezuela) possibly belong to *T. macuira* **sp. n.**, because both sites are located inside of or very near to the known distribution of this taxon, and also exhibit similar vegetation and soil. Presumably, these specimens are also conspecific with those from eastern and northern Zulia examined and regarded by González-Sponga (1984b: 68) as “possibly new zoological entities”, but a definite identification will only be made by studying additional samples from these localities.





Figure 4: Two views of the type locality of *Tarsoporosus macuira* sp. n.

Of the remaining Colombian populations identified as *T. kugleri* by Francke (1978), those from César department (Becerril and Valledupar) are of very special interest, because both localities are geographically isolated from all others of the genus by high mountain ranges (Cordillera Oriental, Sierra Nevada de Santa Marta, and Serranía de Perijá), and thus possibly represent an undescribed species.

All five described species of *Tarsoporosus* can be identified using the following key (modified from González-Sponga, 1996):

1.- Overall color very dark brown. Metasomal segments I–IV with granulose ventrolateral carinae. Modal tarsal spine formula 3/3 : 3/3 : 4/4 : 4/4. Distribution: rain forests of Chocó, in the Pacific lowlands of Colombia (Fig. 3) ----- *T. anchicaya*

- Overall color much lighter, yellow to reddish brown. Metasomal segments I–IV with smooth ventrolateral carinae. Modal tarsal spine formula different from above. Distribution: arid to semiarid Caribbean lowlands of Colombia and Venezuela (Fig. 3) ----- 2

2.- Pedipalp chela with dorsoexternal surface covered by granulose reticulations. Overall color yellow to light brown, with conspicuously darker carapace, tergites and distal segments of metasoma and pedipalps ----- 3

- Pedipalp chela with dorsoexternal surface smooth. Overall color uniform, reddish to dark brown ----- 4

3.- Larger size (42–50 mm). Adult males with metasoma much more slender (segments II–III each longer than wide), with carinae conspicuously weaker and with dorsal tegument on segments I–IV sparsely granulose. Modal tarsal spine formula 3–4/3–4 : 4–5/4–5 : 6–7/6–7 : 6–7/6–7. Distribution: Paraguaná Peninsula, northwestern Venezuela (Fig. 3) ----- *T. flavus*

- Smaller size (40–41 mm). Adult males with metasoma much more robust (segments II–III each wider than long), with carinae conspicuously stronger and with dorsal tegument on segments I–IV smooth. Modal tarsal spine formula 3–4/3–4 : 4–5/4–5 : 6–7/6–7 : 6–7/6–7. Distribution: La Guajira Peninsula, northeastern Colombia (Fig. 3) ----- *T. macuira* sp. n.

4.- Larger size (47–60 mm). Overall color lighter. Adult males with metasomal segment I longer than wide. Carapace and tergites with granulation less developed. Modal tarsal spine formula 3–4/3–4 : 4–5/4–5 : 6/6 : 6/6. Distribution: eastern Falcón state, Venezuela (Fig. 3) ----- *T. kugleri*

- Smaller size (43–46 mm). Overall color reddish darker. Adult males with metasomal segment I wider than long. Carapace and tergites with granulation more developed. Modal tarsal spine formula 4–5/4–5 : 6–7/6–7 : 7–8/7–8 : 7–8/7–8. Distribution: interior Lara state, Venezuela (Fig. 3) ----- *T. yustizi*

### Acknowledgments

We wish to thank all persons who made this contribution possible: Johnny Echavarría (Colegio Departamental de Bachillerato de Nazareth, La Guajira, Colombia) collected and donated scorpions there at our request (including the one here designated as paratype of *T. macuira* sp. n.), Juliana Cadena and Evelyn Gómez (Bogotá, Colombia) kindly carried those specimens to the first author, Wilson R. Lourenço (Museum National d’Histoire Naturelle, Paris, France), Luis F. de Armas (Instituto de Ecología y Sistemática, Havana, Cuba), Oscar F. Francke (Universidad Nacional Autónoma de México, Mexico) and Jan O. Rein (Trondheim, Norway), provided the pertinent literature, and Fernando J. M. Rojas-Runjaic (Mueso de Historia Natural “La Salle”, Caracas, Venezuela) who reviewed this manuscript.

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