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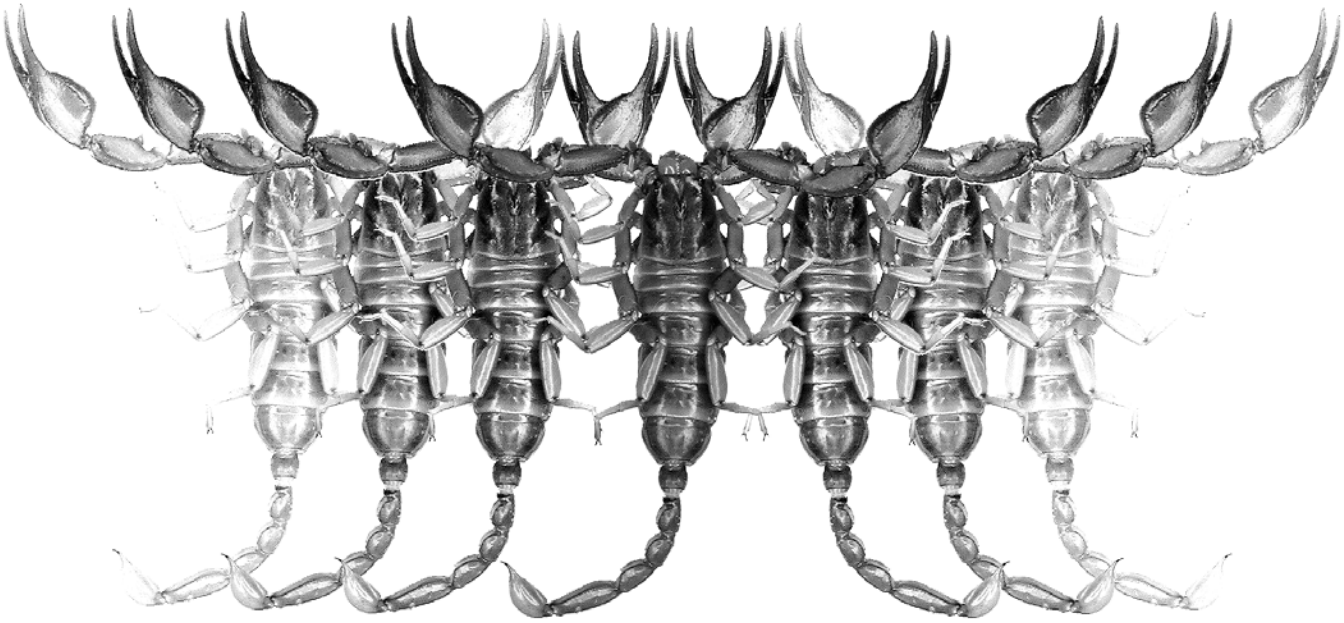

Description of *Tityus mraceki* sp. n. from Colombia and Synonymization of *T. meridanus* González-Sponga with *T. nematochirus* Mello-Leitão (Scorpiones: Buthidae)

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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

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Summary

Tityus (*Archaeotityus*) *mraceki* **sp. n.** from Colombia is described. It differs from other species of the subgenus *Archaeotityus* by unique sexual dimorphism expressed in the male having a longer metasoma and a narrower chela of the pedipalp. The synonymization of *T. meridanus* González-Sponga, 1981 with *T. nematochirus* Mello-Leitão, 1941 is based on morphological and color variation present in a single litter consisting of 33 individuals.

Tityus C. L. Koch, 1836

Tityus C. L. Koch, 1836: 33; Kraepelin, 1891: 229; Pocock, 1893: 376; Kraepelin, 1899: 69; Pocock, 1900: 469; Mello-Leitão, 1931: 119; González-Sponga, 1987: 217; Sissom, 1990: 102; Fet & Lowe, 2000: 228; Lourenço, 2006: 55.

Scorpio (*Atreus*) Gervais, 1843: 130 (TYPE SPECIES: *Scorpio* (*Atreus*) *forcipula* Gervais, 1843).

Tityus (*Tityus*): Werner, 1934: 274; Lourenço, 2006: 60.

= *Phassus* Thorell, 1877: 8 non *Phassus* Walker, 1856 (Lepidoptera) (TYPE SPECIES: *Phassus columbianus* Thorell, 1876).

= *Androcottus* Karsch, 1879: 11, 18 (TYPE SPECIES: *Androcottus discrepans* Karsch, 1879) (syn. by Kraepelin, 1899: 69).

= *Pucha* Francke, 1985: 4, *nomensubstitutum* [*pro Phassus* Thorell, 1877, *nomen praeoccupatum*]; *nomen nudum* (Acosta & Fet, 2005)

= *Caribetityus* Lourenço, 1999: 136 (TYPE SPECIES: *Tityus elii* Armas et Marcano Fondeur, 1992) (syn. by Armas & Abud Antun, 2004: 60).

Tityus (*Brazilotityus*) Lourenço, 2006: 58 (TYPE SPECIES: *Tityus rionegrensis* Lourenço, 2006: 58).

Tityus (*Archaeotityus*) Lourenço, 2006: 60 (TYPE SPECIES: *Tityus clathratus* C. L. Koch, 1844).

Tityus (*Atreus*): Lourenço, 2006: 61.

Tityus (*Caribetityus*): Lourenço, 2006: 61.

TYPE SPECIES. *Scorpio bahiensis* Perty, 1834

DIAGNOSIS: Trichobothrium d_3 of patella situated considerably external to dorsomedian carina. Dorsal trichobothria of femur arranged in *alpha*-configuration. Trichobothrium d_2 of pedipalp femur present on internal surface. Trichobothrium d_5 distinctly basal to e_1. Third and fourth legs without tibial spurs. Mesosomal tergites I–VI with a single carina. Cutting edge of the movable fingers of pedipalps with 10–17 cutting imbricated rows of granules, without accessory granules. Fifth metasomal segment with single ventral median carina. Telson with subaculear tooth. Total length 18–110 mm.

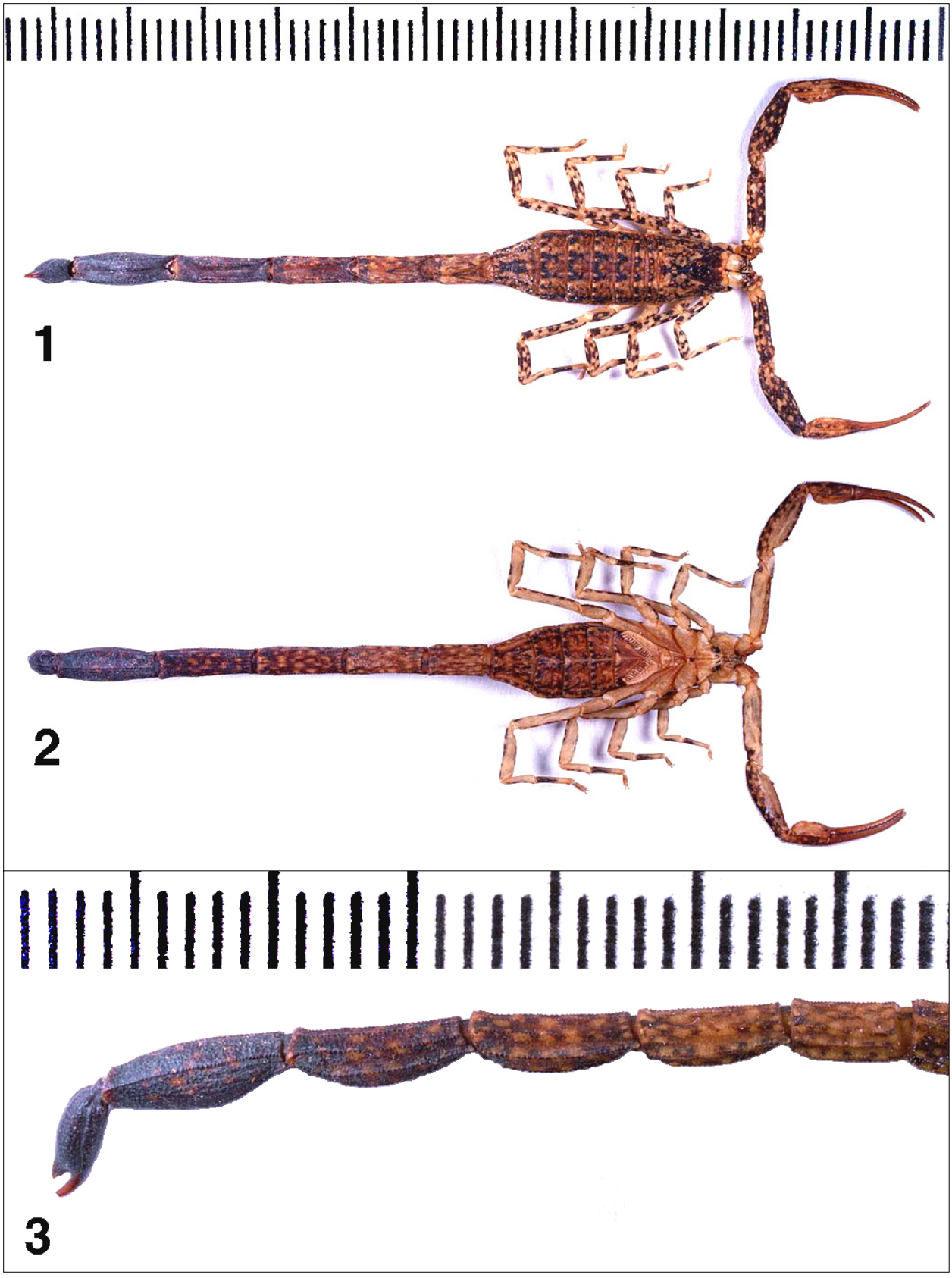
Tityus (*Archaeotityus*) *mraceki* sp. n.
(Figs. 1–4, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **Colombia**, Juanchaco near Buenaventura, mangrove swamp on the Pacific shore (Fig. 4); author´s collection (FKCP).

TYPE MATERIAL. **Colombia**, Juanchaco near Buenaventura, 15–20 September 1995, holotype ♂, leg. Z. Mráček.

ETYMOLOGY. Named after Zdeněk Mráček, who collected the type.

DIAGNOSIS: Adult male 50 mm long. Female unknown. Color blotched. For habitus see Figs. 1 and 2. Carapace, mesosoma and metasoma densely granulate. Pectines with 14 teeth. Stigmata are elongate. Rhomboidal subaculear tooth with four granules in two rows. Movable finger of pedipalp with 15 or 16 rows of granules, which include external and internal granules. First metasomal segment with 10 carinae, second to fourth metasomal segments with eight carinae, fifth metasomal segment with only three ventral carinae. All



Figures 1–3: *Tityus mraceki* **sp. n.**, male holotype. **1.** Dorsal view. **2.** Ventral view. **3.** Lateral view of metasoma.

***Tityus mraceki* sp. n.**	
	Male Holotype
Total length *	50.7
Carapace length	4.5
width	4.6
Metasoma and Telson length *	32.7
Segment I length	4.0
width	2.0
Segment II length	5.2
width	1.9
Segment III length	5.9
width	1.9
Segment IV length	6.4
width	1.9
Segment V length	6.3
width	2.3
Telson length	-
Pedipalp	
Femur length	5.2
width	1.2
Patella length	5.7
width	1.7
Chela length	8.9
width	1.5
Mov. Finger length	5.8
Pectinal teeth	14:14

Table 1: Measurements (in mm) of the male holotype of *Tityus mraceki* **sp. n.** * Includes intersegment membranes.

carinae parallel and composed of equally sized granules. Chela of pedipalp narrow. Male metasoma long.

DESCRIPTION: Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 2. Coloration is shown in Figs. 1 and 2. Most of the body is blotched, including the ventral surface of metasomal segments. Only the fifth metasomal segment and telson are black. The manus of pedipalp is yellow and spotted, fingers of pedipalps are brown. Although the female is not known, sexual dimorphism can be assumed because the male has elongated metasomal segments and, conversely, lacks widening of the pedipalp manus (Fig. 1).

MESOSOMA AND CARAPACE: The carapace bears only posterior median carinae but is densely granulate. The chelicerae are reticulate in anterior half, their fingers are dark. The mesosomal tergites I–VI with a single carina, which is indistinct due to dense granulation. The sternites are densely granulated and the seventh sternite bears four carinae. The third and fifth sternites bear glossy expanded zones in posterior parts. On the fourth sternite the glossy zone is reduced and on the sixth sternite it is absent. Stigmata are elongate. The pectinal tooth count is 14.

METASOMA AND TELSON: The first metasomal segment has 10 carinae, the second through fourth segments have eight carinae, and the fifth segment has only three ventral carinae. All the carinae run in parallel and are composed of equally sized granules (Fig. 3). The fifth segment is laterally convex and therefore wider than other segments. The telson has a strong rhomboidal subaculear tooth and bears four granules in two rows.

PEDIPALPS: The movable fingers have 15 and 16 rows of granules, which include external and internal granules. The entire pedipalps are densely granulated, namely on the dorsal surface. The chela is narrow, granulated and carinated. The patella bears a strong internal tubercle.

AFFINITIES. The described features distinguish *Tityus mraceki* sp. n. from all other species of the genus. Within the subgenus *Archaeotityus* its assumed sexual dimorphism is unique, as the male long metasoma and the narrow chela of pedipalp distinguish *T. mraceki* sp. n. from all other species. Other species of the subgenus *Archaeotityus* differ in sexual dimorphism, which may be divided into three groups: Male pedipalps broader and more bulky than those of females, male metasoma not markedly longer than that of female (e.g. *Tityus clathratus* C. L. Koch, 1843); male pedipalps broad and more bulky than those of females, male metasoma longer than that of female (e.g. *Tityus birabeni* Abalos, 1954); shape of pedipalp manus and length of metasomal segments similar in both sexes (e.g. *Tityus kaderkai* Kovařík, 2005). The adult male is not known in two species of this subgenus. *T. erikae* Lourenço, 1999 is known only from a single juvenile specimen, which shares with *T. mraceki* sp. n. glossy expanded zone on the posterior part of the fifth sternite (fig. 6 in Lourenço, 1999: 3); however, *T. mraceki* sp. n. has the sternites densely granulated, whereas *T. erikae* has them nearly smooth.

T. betschi Lourenço, 1992 is based on a female characterized as having a moderate and feebly rhomboidal subaculear tooth, which according to Lourenço (2000: 458) distinguishes it from *T. columbianus*. However, the relatively common *T. columbianus* also has a moderate and feebly rhomboidal subaculear tooth, thus the possibility cannot be excluded that *T. betschi* is a synonym of *T. columbianus*. Confusion between *T. columbianus* and *T. mraceki* sp. n. is not possible, the sexual dimorphism and proportions make these two species easy to separate. In addition, the telson of *T. mraceki* sp. n. has a strong rhomboidal subaculear tooth.

Tityus* (*Atreus*) *nematochirus Mello-Leitao, 1941

Tityus nemstachirus (sic) Mello-Leitao, 1941: 54.
Tityus nematochirus: Mello-Leitao, 1945: 425; González-Sponga, 1984: 79; González-Sponga, 1994:

Figure 4: Type locality of *Tityus mraceki* **sp. n.**, mangrove swamp on the Pacific shore, Colombia, Juanchaco near Buenaventura.

350; González-Sponga, 1996: 146; Fet & Lowe, 2000: 252.
Tityus (*Atreus*) *nematochirus*: Lourenço, 2006: 61.
= *Tityus meridanus* González-Sponga, 1981: 26 (TYPE LOCALITY AND TYPE REPOSITORY. "General José Antonio Páez" dam, 7 km NW of village of Santo Domingo, Sierra de Santo Domingo, Distrito Rangel, Estado Mérida, Venezuela; Museo de Ciencias Naturales de Caracas, Caracas, Venezuela); González-Sponga, 1984: 90; González-Sponga, 1994: 350; González-Sponga, 1996: 149; Fet & Lowe, 2000: 250. **Syn. n.**
Tityus (*Atreus*) *meridanus*: Lourenco, 2006: 61

TYPE LOCALITY AND TYPE REPOSITORY. **Colombia**, Villavicencio; Instituto de La Salle, Bogota, Colombia.

DIAGNOSIS: Adults 50–90 mm long. Adults uniformly reddish or reddish brown to black, young blotched. First to fourth metasomal segments with paired parallel ventral median carinae. For habitus see Figs. 5–7. Male pedipalps longer and more slender than those of females, length of metasomal segments similar in both sexes. Subaculear tooth pointed. Pectines with 17–20 teeth. Stigmata elongate. Movable finger of pedipalp with 14–17 rows of granules, which include external and internal granules. First metasomal segment with 10 carinae, second to fourth metasomal segments with eight carinae, fifth metasomal segment with fifth carinae.

COMMENTS. González-Sponga (1981: 26) distinguished *T. meridanus* from *T. nematochirus* primarily on coloration and size. The distributions of these species in Venezuela overlap (see González-Sponga, 1996: 146 and 149) and dead specimens are virtually impossible to separate. I was able to raise 33 individuals born to a female from Venezuela (Agua Dulce near San Cristóbal, 440 m), which allowed me to observe color variation in a single litter (Figs. 5–7). The size differences given by González-Sponga (1996: 144), with *T. nematochirus* measuring 73 mm (female) and 77 mm (male) whereas *T. meridanus* measuring 53 mm (female) and 67 mm (male), and the morphological differences linked to those in size (length vs. width of metasomal segments, length of pedipalp chela) correspond to the number of ecdyses needed to reach adulthood, with some males becoming adult after the fourth and others after the fifth ecdysis (Figs. 5 and 6). For this reason I am convinced that *T. meridanus* González–Sponga, 1981 is a synonym of *T. nematochirus* Mello-Leitão, 1941.

Figure 5: Black male of *Tityus nematochirus* Mello–Leitão, 1941 that matured after the fifth ecdysis.

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Figure 6: Red male of *Tityus nematochirus* Mello–Leitão, 1941 that matured after the fourth ecdysis, accompanied by a black female that matured after the fifth ecdysis.

Figure 7: Differently colored immatures of *Tityus nematochirus* Mello–Leitão, 1941 shortly before the fifth ecdysis, all from the same litter.

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