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Tityus antioquensis sp. n., a new species of scorpion from the Department Antioquia, Central Cordillera of Colombia (Scorpiones, Buthidae), with a checklist and key for the Colombian species of the genus

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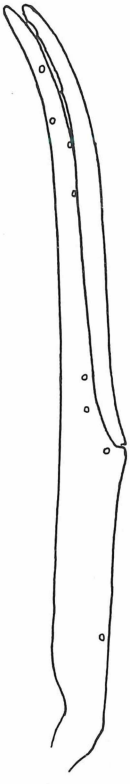
(With 13 figures)

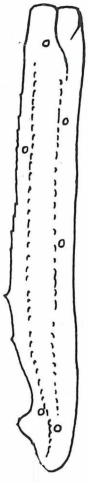
Abstract

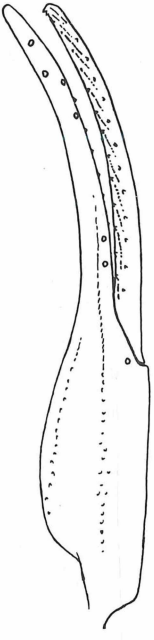
Tityus antioquensis sp. n. (Scorpiones, Buthidae) is described on the basis of 6 specimens (1 male, 3 females and 2 juveniles: male + female) collected in the region of Angelopolis, Department Antioquia, Colombia. With the description of *Tityus antioquensis* sp. n., the number of species of the genus *Tityus* known from Colombia is raised to 21. Some comments concerning the taxonomic position of the new species are added. A checklist of Colombian species of *Tityus* as well as keys for their identification are included.

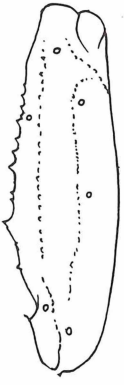
Introduction

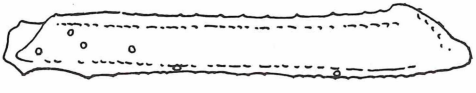
The Colombian scorpion fauna has attracted the attention of arachnologists (e.g. Gervais 1844; Thorell 1876; Pocock 1893; Kraepelin 1912a, b; Mello-Leitão 1945), since the middle of the 19th century. Only since the 1980s, however, and especially during the last ten years this fauna has been studied intensively and several new species have been added (Lourenço 1991, 1992, 1994, 1995; Lourenço & Florez 1989, 1990, 1995). A recent contribution by Lourenço (1997) represents the first attempt to produce a synthesis. In this it was admitted, however, that the results presented were probably only a part of the fauna actually found in Colombia. This was confirmed

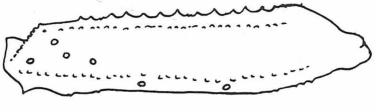












Figs 1-6. Trichobothrial pattern of *Tityus antioquensis* sp. n.: 1 - chela, external aspect, ♂; 2 - tibia, dorsal aspect, ♂; 3 - chela, external aspect, ♀; 4 - tibia, dorsal aspect, ♀; 5 - femur, dorsal aspect, ♂; 6 - femur, dorsal aspect, ♀. [Figs 1, 2, 5: holotype, Figs 3, 4, 6: paratype (allotype)].

shortly afterwards by the description of a new *Tityus* species from the region of Darien (Lourenço 1998).

A recent field trip to the Department Antioquia in the Colombian Central Cordillera resulted in finding of several scorpions belonging to the families Buthidae and Chactidae. A preliminary study of these specimens revealed presence of one more new species of *Tityus*, which is described here. Since several people have been stung by scorpions in that country during the last few years probably by species belonging to *Tityus*, it seemed useful to present a checklist and key to the species of this genus recorded from Colombia.

Description of the new species

Tityus antioquensis sp. n.
(Figs 1-10, 12)

TYPE MATERIAL. Holotype male: Colombia, Antioquia, La Clara, Angelopolis. In wet forest at high altitude, 1870 m, under a log; 16 February 1998; coll. R. Otero. Deposited in the Snake Laboratory "Serpentario" of the "Centro de Investigaciones Medicas", the University of Antioquia, Medellin, Colombia.

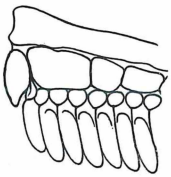
Paratypes. Allotype female: Colombia, Antioquia, EADE, Angelopolis, 1860 m. Under a log, 15 February 1998, C. Enrique Lopes coll. Deposited in the Snake Laboratory "Serpentario" of the "Centro de Investigaciones Medicas", University of Antioquia, Medellin, Colombia. One female, one female juvenile and one male juvenile: Antioquia, Las Camelias, 1560 m, under log; 18 October 1998, coll. Vasquez. Deposited in the Zoologisches Museum Hamburg, Germany (ZMH Reg. No. A56/98). One female: Antioquia, Caldas, 2100 m, under log, 2 February 1998, G. Parra coll. Deposited in the Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogota, Colombia.

ETYMOLOGY: Patronym refers to the Department Antioquia in Colombia, where Angelopolis is the type locality of the new species.

Description (based on male holotype). The measurements are given in Table I.

Coloration. Basically reddish. Prosoma: carapace reddish brown. Mesosoma: reddish with one longitudinal darker stripe. Metasoma: segments I to III reddish; IV dark reddish; V dark reddish with some blackish regions. Vesicle: reddish black. Venter reddish brown with some yellowish regions. Chelicerae yellowish brown with a very dark thread; fingers dark. Pedipalps: reddish; fingers blackish with the extremities yellowish. Legs reddish yellow with some diffuse fuscous spots.

Morphology. Carapace moderately granular; anterior margin with a moderate to strong concavity. Anterior median superciliary and posterior median keels moderate to strong. All furrows moderately deep. Median ocular tubercle distinctly anterior to centre of carapace. Eyes separated by one ocular diameter. Three pairs of lateral eyes. Sternum subtriangular. Mesosoma: tergites moderately granular. Median keel moderate to strong in all tergites. Tergite VII pentacarinate. Venter: genital operculum divided longitudinally. Pectines: pectinal tooth count 16-16; basal middle lamellae of the pectines not dilated. Sternites moderately granular with elongate stigmata; VII with four + one keels. Metasoma: segments I with 10 keels; II to IV with 8 keels, crenulate; V



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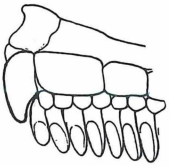

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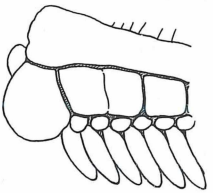

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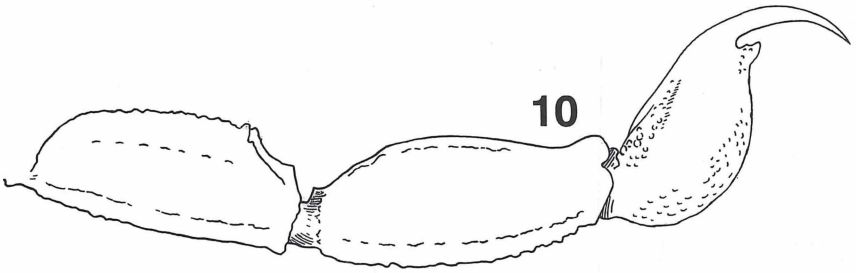

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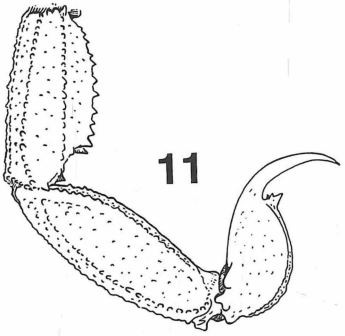

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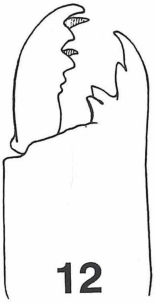

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Figs 7-12. Pectines (Figs 7-9), internal part, showing the size and degree of dilation of the basal middle lamella: 7 and 8 - *Tityus antioquensis* sp. n., holotype ♂ and allotype ♀; 9 - *Tityus oteroi* Lourenço, allotype ♀; 10 - *Tityus antioquensis* sp. n., allotype ♀: metasomal segments IV and V and telson, lateral aspect, showing the absence of spinoid dorsal granules; 11 - idem, *Tityus oteroi* Lourenço, showing the carinal structure and the spinoid dorsal granules; 12 - *Tityus antioquensis* sp. n., chelicera, holotype ♂.

with five + two keels on the ventral side. Dorsal keels on segments II to IV without strongly spinoid granules (this character is diagnostic for separating the new species from *Tityus oteroi* Lourenço, 1998). Lateral inframedian keels on segment I complete, strongly crenulate; on II represented by only 6 to 7 distal granules; absent from III and IV. Ventrolateral keels strong, crenulate. Ventral submedian keels strongly crenulate. Intercarinal spaces moderately granular. Segment V with dorsolateral and lateromedian keels vestigial; ventrolateral and ventromedian keels strong, crenulate. Lateral intercarinal spaces moderately granular. Telson, moderately granular, with a moderately long but strongly curved aculeus. Dorsal surface smooth; ventral surface feebly granular; subaculear tooth strong and spino-rhomboidal. Cheliceral dentition characteristic of the family Buthidae (Vachon 1963); ventral aspect of both fingers and manus with long dense setae. Pedipalps: femur pentacarinate; tibia with 6/7 keels; chelae with vestigial keels; all faces feebly granular, almost smooth. Movable fingers with 14/15 oblique rows of granules. Trichobothriotaxy: orthobothriotaxy *A-α* (Vachon 1973, 1975). Legs: tarsus ventrally with numerous short fine setae.

P a r a t y p e s. Females coloration similar to that of male holotype, only more reddish throughout. General morphology quite different from that of holotype as regards morphometric values (see Table I). Female pectines smaller with 16-16 (allotype), 14-14, 15-15 and 16-16 teeth (paratypes). Male paratype with 15-15 teeth. Basal middle lamella with only a vestigial dilatation. This character is diagnostic and can be used to differentiate the two associated species, *Tityus nematochirus* Mello-Leitão, 1940 and *Tityus oteroi* Lourenço, in which this lamella is strongly dilated.

T a x o n o m i c a l p o s i t i o n. The new species belongs to the *Tityus asthenes*-group. It is closely associated with *Tityus nematochirus* Mello-Leitão and *Tityus oteroi* Lourenço, but it can readily be distinguished from these by the following characters:

(1) A reddish coloration overall, whereas in *T. nematochirus* and *T. oteroi* the general coloration is blackish; (2) Absence of strongly spinoid granules on the dorsal keels of metasomal segments II to IV, which are characteristic of *T. oteroi*; (3) Basal middle lamella with only a vestigial dilatation whereas in *T. nematochirus* and *T. oteroi* this lamella is strongly dilated; (4) A lower number of pectinial teeth, ranging from 14 to 16. In *T. nematochirus* the number ranges from 20 to 22, and in *T. oteroi* from 18 to 20; (5) A subaculear tooth strong and spino-rhomboidal to rhomboidal, whereas in *T. nematochirus* and *T. oteroi* it is moderate and spinoid; (6) Movable fingers with 14/15 oblique rows of granules, whereas in *T. nematochirus* this number is 17 and in *T. oteroi* 16.

A checklist of *Tityus* species from Colombia

Family Buthidae Simon, 1880

Genus *Tityus* C. L. Koch, 1836

1. Species belonging to the *Tityus clathratus*-group

Tityus bastosi Lourenço, 1984
Tityus betschi Lourenço, 1992
Tityus columbianus (Thorell, 1876)
Tityus tayrona Lourenço, 1991

Table 1. Measurements (in mm) of *Tityus antioquensis* sp. n.

	holotype ♂	allotype ♀
Carapace:		
length	6.8	6.8
anterior width	5.6	5.0
posterior width	7.8	8.1
Metasoma, segment I		
length	5.2	4.1
width	3.6	3.8
Metasoma, segment V		
length	9.2	7.8
width	3.8	3.8
depth	3.4	3.3
Vesicle:		
width	3.2	3.0
depth	3.2	2.8
Femur:		
length	14.0	8.2
width	2.1	2.2
Tibia:		
length	15.1	8.8
width	2.3	2.8
Chelae:		
length	22.6	14.8
width	2.0	2.8
depth	1.9	2.6
Movable finger:		
length	12.0	9.3

2. Species belonging to the *Tityus bahiensis*-group

Tityus blanci Lourenço, 1994
Tityus charalaensis Mello-Leitão, 1940
Tityus engelkei Pocock, 1902
Tityus lourencoi Florez, 1995
Tityus rebierei Lourenço, 1997
Tityus sabineae Lourenço, 1994
Tityus sastrei Lourenço & Florez, 1990

3. Species belonging to the *Tityus asthenes*-group

***Tityus antioquensis* sp. n.**
Tityus asthenes Pocock, 1893
Tityus cuellari Lourenço, 1994

Tityus festae Borelli, 1899
Tityus forcipula (Gervais, 1844)
Tityus fuhrmanni Kraepelin, 1914
Tityus macrochirus Pocock, 1897
Tityus nematochirus Mello-Leitão, 1940
Tityus oteroi Lourenço, 1998
Tityus pachyurus Pocock, 1897

Total 21 species

Identification keys to the genus *Tityus* in Columbia

Key to three species-groups of *Tityus* proposed in the checklist

1. Small species ranging from 25 to 40 mm in total length with variegated pigmentation and a rhomboidal subaculear tooth ..... *Tityus clathratus*-group

- Species of medium or large size, ranging from 50 to 100 mm in total length; pigmentation varying from yellowish to brown and black; subaculear tooth spinoid 2

2. Species of medium size, ranging from 50 to 70 mm in total length; coloration rather pale varying from yellowish to reddish-brown or brownish, never black; often with conspicuous dark spots; basal middle lamellae of female pectines not dilated in almost all species ..... *Tityus bahiensis*-group

- Species of large size, ranging from 65 to 100 mm in total length; pigmentation blackish in the adult and yellowish/variegated in immature individuals; subaculear tooth always spinoid; basal middle lamellae of female pectines dilated in almost all species ..... *Tityus asthenes*-group

Key to the *Tityus clathratus*-group

1. Dorsolateral keels of metasomal segments I to IV without a spinoid posterior granule or with only a very feeble granule 2

- Dorsolateral keels of metasomal segments I to IV with a strong spinoid posterior granule; Amazonia ..... *T. bastosi*

2. Subaculear tooth strong and markedly rhomboidal 3

- Subaculear tooth moderate and feebly rhomboidal ..... *T. betschi*

3. Pectines with 10 to 14 teeth ..... *T. columbianus*

- Pectines with 14 to 17 teeth ..... *T. tayrona*

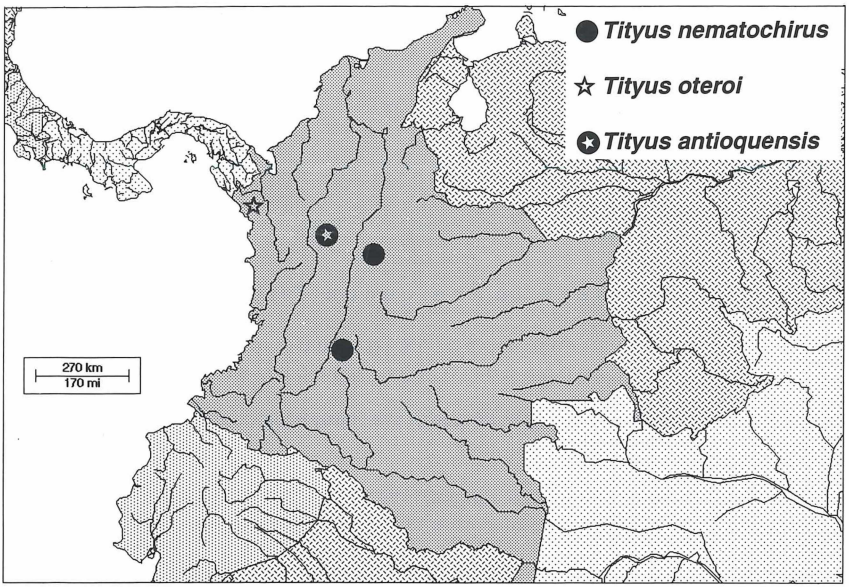

Fig. 13. Distribution of the *Tityus nematochirus* Mello-Leitão, *Tityus oteroi* Lourenço and *Tityus antioquensis* sp. n. in Colombia.

Key to the *Tityus bahiensis*-group

1. Ventral submedian keels of metasomal segments III and IV converging proximally to form a "Y" shape ..... *T. rebierei*

- Ventral submedian keels of metasomal segments III and IV parallel through entire length 2

2. General coloration from yellowish to reddish-yellow 3

- General coloration from dark reddish to blackish 5

3. Dorsolateral keels of metasomal segments II to IV with several granules modified as spines ..... *T. blanci*

- Dorsolateral keels of metasomal segments II to IV without granules modified as spines 4

4. Basal middle lamellae of female pectines strongly dilated; dentate margins of pedipalp-chela fingers composed of 13 to 14 oblique rows of denticles .. *T. engelkei*

- Basal middle lamellae of female pectines not dilated; dentate margins of pedipalp-chela fingers composed of 16 oblique rows of denticles ..... *T. sastrei*

5. Male pedipalps slightly longer and more slender than those of females 6

- Male pedipalps larger and more bulky than those of females ..... *T. sabineae*

6. Pectines with 16 to 17 teeth; dentate margins of pedipalp-chela fingers composed of 17 oblique rows of denticles ..... *T. lourencoi*

- Pectines with 14 teeth; dentate margins of pedipalp-chela fingers composed of 12 oblique rows of denticles v ..... *T. charalaensis*

Key to the *Tityus asthenes*-group

1. Male pedipalps longer and more slender than those of females 2

- Male pedipalps larger and more bulky than those of females 5

2. Values of (male) femur, tibia and chelae length respectively 6/8, 8/10 and 10/13 times longer than width 3

- Values of (male) femur, tibia and chelae length respectively 5, 3 and 5 times longer than width ..... *T. asthenes*

3. Dorsolateral keels of metasomal segments I to IV with several strong spinoid posterior granules ..... *T. oteroi*

- Dorsolateral keels of metasomal segments I to IV without spinoid posterior granules 4

4. Pectines with 14 to 16 teeth; overall coloration reddish ..... *T. antioquensis* sp. n.

- Pectines with 20 to 22 teeth; overall coloration blackish ..... *T. nematochirus*

5. Dorsolateral keels of metasomal segments I to IV with several strong spinoid posterior granules, or with one very strong spinoid posterior granule 6

- Dorsolateral keels of metasomal segments I to IV with moderate or feeble spinoid posterior granules 8

6. One very strong spinoid posterior granule on dorsolateral keels of metasomal segments II to IV ..... *T. fuhrmanni*

- Several strong spinoid posterior granules on dorsolateral keels of metasomal segments I to IV 7

7. Adult size around 60 mm; legs and pedipalps blackish ..... *T. forcipula*

- Adult size around 45 mm; legs and pedipalps yellowish to reddish-yellow ..... *T. cuellari*

8. Moderate spinoid posterior granules on dorsolateral keels of metasomal segments I to IV; male pedipalps larger and more bulky than those of females ..... *T. pachyurus*

- Feeble spinoid posterior granules on dorsolateral keels of metasomal segments I to IV; male pedipalps only slightly larger and more bulky than those of females 9

9. Pectines with 15 to 16 teeth; dentate margins of pedipalp-chela fingers composed of 15 oblique rows of denticles ..... *T. macrochirus*

- Pectines with 21 to 22 teeth; dentate margins of pedipalp-chela fingers composed of 16 oblique rows of denticles ..... *T. festae*

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