

Description of a new species of *Tityus*  
(Scorpiones, Buthidae) from the *Parque Estadual*  
*de Vila Velha* in the State of Paraná (Brazil)

Descrição de uma nova espécie  
de *Tityus* (Scorpiones, Buthidae) do Parque Estadual de  
Vila Velha no Estado do Paraná (Brasil)

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*Tityus* species which inhabit the forest and prairie formations of southern Brazil and belong to the *Tityus bahiensis* species group (as defined by LOURENÇO, 2002), have been the subject of relatively few taxonomic studies during the last 20 years. Noteworthy among these species are: *Tityus bahiensis* (Perty) (MAURY, 1969; LOURENÇO, 1982); *Tityus trivittatus* Kraepelin (MAURY, 1970; LOURENÇO, 1980); *Tityus serrulatus* Lutz & Mello (LOURENÇO, 1981); *Tityus costatus* (Karsch) (LOURENÇO & EICKESTEDT, 1988); *Tityus confluens* BORELLI (MAURY, 1974; LOURENÇO *et al.*, 2004) and *Tityus uruguayensis* Borelli (LOURENÇO & MAURY, 1985).

In more complete studies (LOURENÇO, 1986, 1994, 1996), precise patterns of their distribution and differentiation have been synthesised, and it was assumed that the *Tityus* species living in both forest and open vegetation formations of Brazil were largely

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known. These studies, however, dealt mainly with the tropical regions of Brazil while the southern regions, with a more temperate climate, remained poorly investigated. One exception is the study of the biogeographic pattern presented by *Tityus costatus* along the Atlantic forest, from the State of Espírito Santo to the State of Rio Grande do Sul (LOURENÇO & EICKESTEDT, 1988). Moreover, the recent discovery and description of new species of *Tityus* from Cerrado and Atlantic forest formations (LOURENÇO, 2001a; LOURENÇO & GIUPPONI, 2004) indicates, that inventory work is far from complete.

In the present paper a new species, *Tityus pintodarochai* sp. n., belonging to the *Tityus bahiensis* species group, is described from a female specimen collected in the 'Parque Estadual de Vila Velha', State of Paraná. The 'Parque Estadual de Vila Velha' is located in the Araucaria formations of southern Brazil (Eiten, 1974), a region also containing remnants of the cerrados (campos) now mostly present in the Central region of Brazil (EITEN, 1978, 1982). The taxonomic position of the new species, and the environmental characteristics of the type locality are discussed.

***Tityus pintodarochai* sp. n.**

(Figs 1-7)

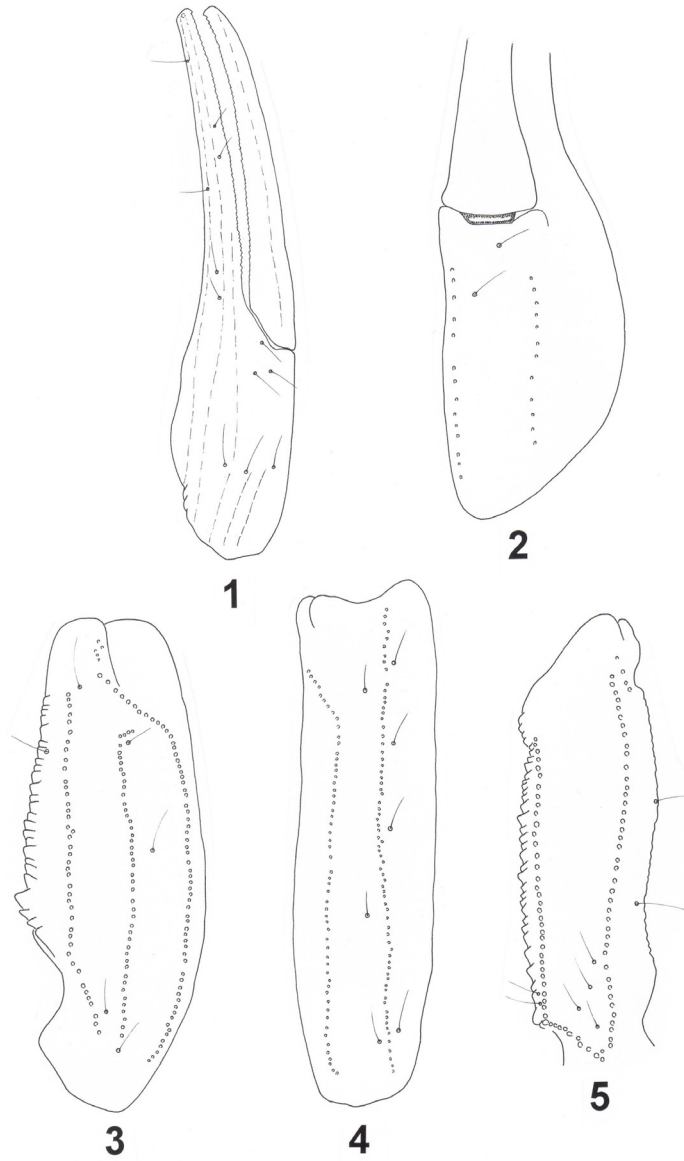
**MATERIAL** — Brazil, State of Paraná, 'Parque Estadual de Vila Velha' (campo formation), female holotype, 28/I/1973 (J. Garzoni leg.), deposited in the Muséum national d'Histoire naturelle, Paris (MNHN-RS-6567).

**ETYMOLOGY** — Patronym in honour of Dr. Ricardo Pinto da Rocha, from the University of São Paulo, Brazil, for his contribution to the study of arachnids.

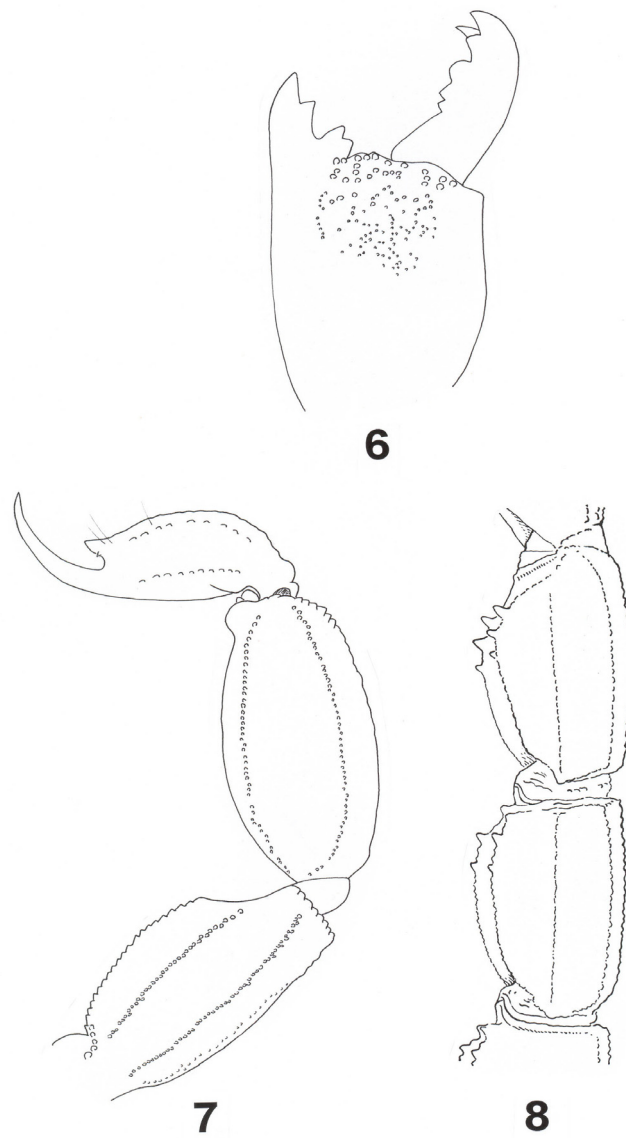
**DIAGNOSIS** — Scorpion of medium size, measuring 52.5 mm in total length. Coloration yellowish to pale yellow, with metasomal segments IV-V and telson slightly reddish-yellow without any spots or pigmentation. Granulation and carinae moderate to strongly marked; dorsal carinae of metasomal segments II to IV without any spinoid posterior granule. Fixed and movable fingers of pedipalps with 16-17 rows of granules. Pectinal teeth count 20.

**DESCRIPTION** — **Coloration.** Basically yellowish to pale yellow, without any spots or pigmentation. Prosoma: carapace yellowish with the anterior portion slightly reddish-yellow; eyes strongly marked with black pigment. Mesosoma: all tergites yellowish, with carinae of the same colour. Metasoma: segments I to III yellowish; IV and V reddish-yellow. Vesicle the same colour as segment V; extremity of aculeus darker than its base. Venter pale yellow. Chelicerae yellowish without any variegated pigmentation; fingers reddish-yellow; teeth reddish. Pedipalps yellowish; carinae and rows of granules on fingers of chela slightly reddish. Legs pale yellow.

**MORPHOLOGY** — Carapace intensely granular; anterior margin with a median concavity. Anterior median and posterior median carinae moderately to weakly developed. All furrows moderately deep. Median ocular tubercle slightly anterior to the centre of the carapace. Three pairs of lateral eyes. Sternum triangular. Mesosoma: tergites intensely granular. Median carina moderate on all tergites. Tergite VII pentacarinata. Venter: genital operculum wider than long. Pectines: pectinal teeth count 20-20; basal middle lamellae of the pectines not dilated. Sternites with thin granulation and elongate spiracles; VI with two carinae; VII with four well marked carinae. Metasoma: segments I-II with ten carinae; segments III-IV with eight carinae; dorsal carinae of segments II to IV without any spinoid posterior granule; segment V with five carinae. Intercarinal spaces with thin granulation. Telson with very few granulations on ventral and lateral faces and with a moderately long but strongly curved aculeus; subaculear tooth strong and more to spinoid, with two dorsal teeth. Cheliceral dentition characteristic of the family Buthidae; ventral teeth on movable finger reduced but distinct (Vachon, 1963); ventral aspect of both fingers and manus densely covered with long setae. Pedipalps: femur pentacarinata; patella with seven carinae; internal carina with spinoid granules; chela with nine carinae; all carinae moderately to strongly developed; entire surface weakly granular. Fixed and movable fingers with 16-17



Figs 1-5. *Tityus pintodarochai* sp. n., female holotype. Trichobothrial pattern of pedipalp. 1-2, chela, dorso-external and ventral aspects; 3-4, patella, dorsal and external aspects. 5, femur, dorsal aspect.



Figs 6-8. *Tityus pintodarochai* sp. n., female holotype. 6, chelicera dorsal aspect; 7, metasomal segments IV-V and telson, lateral aspect; 8, metasomal segments III and IV of *Tityus serrulatus*, lateral aspect, showing dorsal spinoid granules.

oblique rows of granules. Trichobothriotaxy; orthobothriotaxy A- $\alpha$ -alpha (Vachon, 1974, 1975). Legs: tarsus with numerous short fine setae ventrally.

#### RELATIONSHIPS

*Tityus pintodarochai* sp. n. belongs to the *Tityus bahiensis* species group. In its general pattern of coloration the new species shows affinities with *Tityus serrulatus* Lutz & Mello, a species originally described from Belo Horizonte in the State of Minas Gerais. It is now known to be an opportunistic species widespread in the States of Minas, Gerais, São Paulo, Goiás, Rio de Janeiro and including Paraná (see LOURENÇO & CLOUDSLEY-THOMPSON, 1996; Lourenço et al., 1996).

The following characters are distinctive:

— The pigmentation of carapace, tergites and metasomal segments is entirely yellowish in the new species, whereas *T. serrulatus* has confluent dark spots on the tergites, and some dark spots can be observed in the ventral aspect of metasomal segments II to V.

— Dorsal carinae on metasomal segments II to IV of the new species have no posterior spinoid granules whereas in *T. serrulatus* one to four/five spinoid granules are present on these carinae.

The new species can easily be distinguished from *Tityus bahiensis* (Perty) and *Tityus costatus* (Karsch), both found in the State of Paraná. All three species show different patterns of pigmentation, and the new species lacks any kind of spots or pigmentation (see LOURENÇO, 2002).

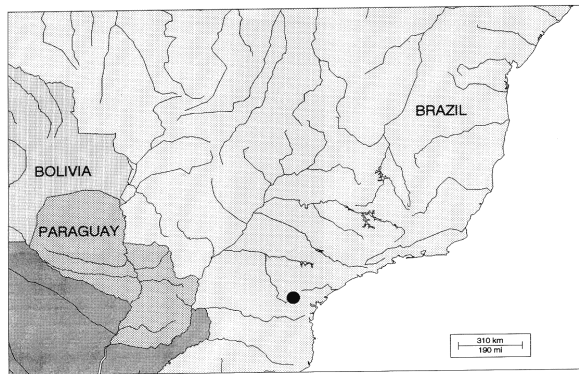


Fig. 9. Map showing the southern region of Brazil with the type locality of the new species (black circle).

## ENVIRONMENTAL CHARACTERISTICS OF THE TYPE LOCALITY

The main vegetation formation in the 'Parque Estadual de Vila Velha' is Brazilian Araucaria forest. According to EITEN (1974), this kind of forest is composed of tall *Araucaria angustifolia* trees, 20-40 m high, forming a one-species open upper layer several meters high, with a closed lower layer of small broadleaf trees and shrubs of many species. It is represented at an altitude 600-1000 m in the States from Rio Grande do Sul to Paraná and São Paulo

The forested formations are located in regions with deep soil and high humidity. Among the islands of Araucaria forest several areas of 'campos' can also be observed in the 'Parque Estadual de Vila Velha'. These 'campos' are mostly covered with grass. The new scorpion species was undoubtedly collected in one of these areas of 'campos'.

Table 1. Morphometric values (in mm) of female holotype of *Tityus pintodarochai* sp. n.

Total length	52.5
Carapace:	
— length	6.4
— anterior width	4.4
— posterior width	7.2
Metasomal segment I:	
— length	4.1
— width	3.5
Metasomal segment V:	
— length	7.5
— width	3.3
— depth	3.4
Vesicle:	
— width	2.4
— depth	2.2
Pedipalp:	
— Femur length	5.9
— Femur width	1.8
— Patella length	6.5
— Patella width	2.6
— Chela length	11.1
— Chela width	2.3
— Chela depth	2.2
Movable finger:	
— length	7.3

CHECK-LIST AND KEY — to the *Tityus* species of the ‘*Tityus bahiensis*’ group distributed in the southern range of Brazil, including parts of Argentina, Paraguay and Uruguay.

## CHECK-LIST:

*Tityus bahiensis* (Perty)  
*Tityus confluens* Borelli  
*Tityus costatus* (Karsch)  
*Tityus pintodarochai* sp. n.  
*Tityus serrulatus* Lutz & Mello  
*Tityus trivittatus* Kraepelin  
*Tityus uruguayensis* Borelli

## KEY

1. General coloration yellowish, with or without dark spots . . . . . 2
- (1). General coloration reddish-brown to dark brown; tergites with 3 longitudinal stripes, or with confluent spots . . . . . 3
2. Confluent spots on tergites; dorsal carinae of metasomal segments II to IV with 1 to 5 spinoid granules . . . . . *T. serrulatus*
- (2) Absence of any spots on tergites; dorsal carinae of metasomal segments II to IV without any spinoid granule . . . . .  
 . . . . . *T. pintodarochai* sp. n.
3. Coloration reddish-brown to dark brown; tergites with confluent pale brown to brownish spots . . . . . 4
- (3). Coloration generally brownish to dark brown with 3 dark longitudinal stripes on tergites . . . . . 6
4. Pedipalps and legs without spots . . . . . *T. confluens*
- (4) Pedipalps and legs heavily spotted . . . . . 5
5. Spots on pedipalps and legs strongly or moderately marked but always dense; metasomal segments without variegated spots . . . . .  
 . . . . . *T. bahiensis*
- (5). Spots on pedipalps strongly marked and variegated; metasomal segments with variegated spots . . . . . *T. costatus*
6. Small size, 30 to 40 mm in total length; subaculear tooth strong and stocky . . . . . *T. uruguayensis*
- (6). Moderate size, 50 to 55 mm in total length; subaculear tooth strong and spinoid . . . . . *T. trivittatus*

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## RESUMO

*Tityus pintodarochai* sp. n., pertencente ao grupo de espécies de *Tityus bahiensis* (Scorpiones, Buthidae) é descrito com base em um único exemplar coletado no ‘Parque Estadual de Vila Velha’, Estado do Paraná, Brazil. São comentadas a posição taxonômica da espécie nova e as características ambientais da localidade do tipo. É provida uma chave para as espécies pertencentes ao Grupo *Tityus bahiensis*, distribuídas no sul do Brasil, assim como em países vizinhos como Argentina, Paraguay and Uruguay.

PALAVRAS CHAVES: escorpião, Buthidae, *Tityus pintodarochai* sp. n., vegetação de campos, Parque Estadual de Vila Velha, Paraná, Brasil.

## SUMMARY

*Tityus pintodarochai* sp. n., belonging to the *Tityus bahiensis* species group (Scorpiones, Buthidae) is described on the basis of a single female specimen collected in the ‘Parque Estadual de Vila Velha’, State of Paraná, Brazil. Comments on the taxonomic position of the new species and on the environmental characteristics of the type locality are given. A key is provided to the species belonging to the *Tityus bahiensis* group, distributed in the southern range of Brazil as well as in nearby countries such as Argentina, Paraguay and Uruguay.

KEY-WORDS: Scorpiones, Buthidae, *Tityus pintodarochai* sp. n., Campos formations, Vila Velha State Park, Paraná State Brazil.

## RÉSUMÉ

*Tityus pintodarochai* sp. n., espèce appartenant au groupe d’espèces *Tityus bahiensis*, (Scorpiones, Buthidae) est décrit à partir d’un seul exemplaire femelle collecté dans le ‘Parque Estadual de Vila Velha’, dans l’Etat du Paraná, Brésil. Des commentaires sur la position taxonomique de la nouvelle espèce, ainsi que sur les caractéristiques écologiques de la localité typique sont apportés. Une clé est proposée pour les espèces appartenant au group *Tityus bahiensis*, distribuées dans la région Sud du Brésil, ainsi que dans les pays limitrophes tels l’Argentine, le Paraguay et l’Uruguay.

MOTS CLÉS: Scorpiones, Buthidae, *Tityus pintodarochai* sp. n., formations de *campos*, Parc d’Etat de Vila Velha, État Paraná Brésil.

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