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New scorpion records from the Gran Chaco of Paraguay (Chelicerata, Scorpiones)

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(with 5 figures)

Abstract

A small scorpion collection from the Gran Chaco in western Paraguay is reported. Most of the material was sampled during the rainy season in early 2001 in the Dry (= Upper) Chaco. It comprises eight specimens belonging to two families, three genera and four species. One species, *Timogenes dorbignyi* (Guérin Méneville, 1843), previously known only from Argentina and Bolivia, represents a new record for the fauna of Paraguay. The first data on the habitat and natural history of the species in the Dry Chaco are provided.

Introduction

Even if some early works on Neotropical scorpions referred also to Paraguay (e.g. Kraepelin 1895; Borelli 1899, 1901), the Paraguayan scorpion fauna remained poorly known until recently when compared to that of other South American countries. As supposed by Lourenço (1994), one of the possible reasons was the lack of early prospecting, since even during the 19th century very few expeditions have been done in Paraguay (see also Papavero 1973). Those pioneer papers, together with subsequent publications and other available data on Paraguayan scorpions were first summarised by Mello-Leitão (1945) in his South American monograph.

More recently two new syntheses have been proposed for the scorpion fauna of Paraguay: one by Maury (1984), and the second by Lourenço (1994). The last one provides a checklist and a key for two families, six genera and 12 species.

Herein we provide a further contribution to the scorpion fauna of the Gran Chaco of Paraguay, resulting from a small collection sampled in the framework of a zoological expedition to the Dry (= Upper) Chaco (Fig. 1) in the rainy season in 2001 by the senior author (for details see Ziegler *et al.*, 2002).

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Material and methods

Specimens were collected by T. Ziegler and J. Unger during the excursion in the Dry Chaco of Paraguay (12 Jan - 9 Feb 2001, see Fig. 1 for localities). The material is deposited in the collections of the Staatliche Naturhistorische Sammlungen Dresden (Museum für Tierkunde) and the Zoologisches Museum Hamburg.

Scorpions were collected at day by examining turned stones or logs on the ground. Moreover, they were sampled from sparsely vegetated sandy waysides and thorn forest ground, while foraging at night. Collected specimens were anesthetized, killed and, with the exception of a single previously formalin fixed specimen, preserved in 70 % alcohol. All photos were taken by T. Ziegler in the field.

List of recorded species

Family Bothriuridae Simon, 1880

Genus *Brachistosternus* Pocock, 1893

Brachistosternus (*Ministernus*) *ferrugineus* (Thorell, 1876)
(Fig. 2)

♀: West Paraguay, Dry Chaco, surroundings of Fortin Toledo, 22° 21' S, 60° 20' W,
14 Jan - 3 Feb, 2001.

Distribution: Argentina, Paraguay.

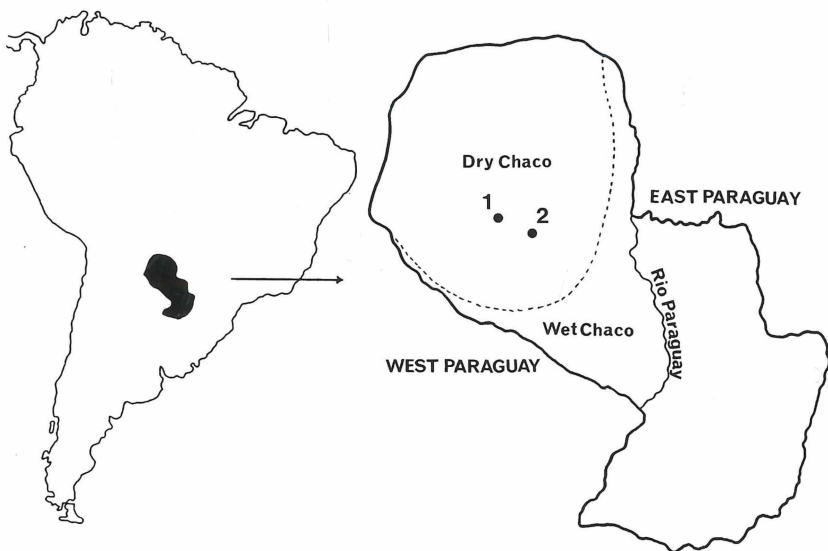


Fig. 1. Localities of collected scorpions in the Dry Chaco of western Paraguay (1: surroundings of Fortin Toledo; 2: surroundings of Laguna Capitan).

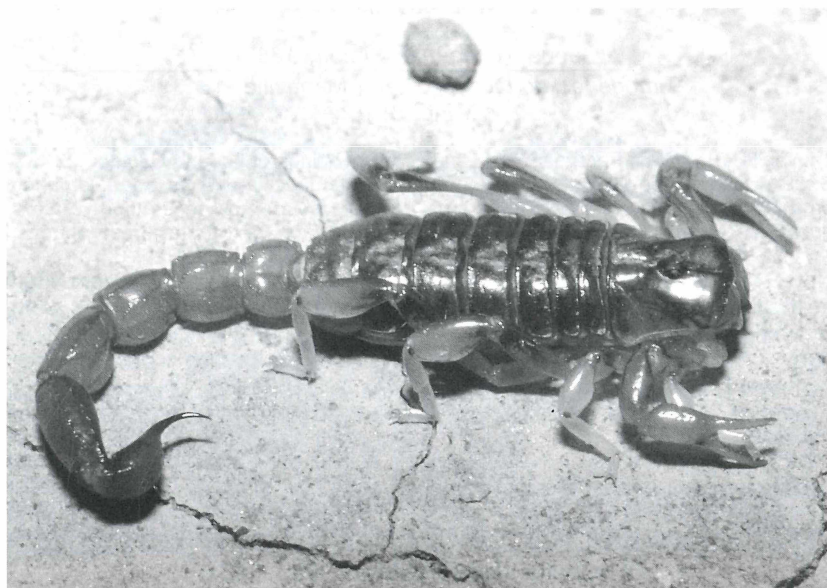


Fig. 2. *Brachistosternus* (*Ministernus*) *ferrugineus* (Thorell), ♀.



Fig. 3. *Timogenes dorbignyi* (Guérin Méneville), ♂.

Genus *Timogenes* Simon, 1880

Timogenes dorbignyi (Guérin Méneville, 1843)
(Fig. 3)

1 juvenile, 2 ♂: West Paraguay, Dry Chaco, surroundings of Laguna Capitan, 22° 32' S, 59° 40' W, 3 Feb 2001. Collected in the day time under a partly shaded, large log on the sandy ground of a camp site. The latter surrounded by dense thorny undergrowth and larger trees bordering with open grasslands and thorn forest lagoons.

Note: According to Maury (1982) the male holotype, presumably deposited in the Museum of Natural History in Paris but now lost, originates from Bolivia. Our material represents the first record of this species for Paraguay. Our specimens show some minor differences in colour pattern when compared to the description given by Maury (1982) for specimens from Argentina. We presume that those differences only reflect some regional variability.

Distribution: Argentina, Bolivia, Paraguay.

Timogenes elegans (Mello-Leitão, 1931)
(Fig. 4)

♂, 2 ♀: West Paraguay, Dry Chaco, surroundings of Fortin Toledo, 22° 21' S, 60° 20' W, 14 Jan - 3 Feb 2001. (One large, formalin fixed specimen was detected by local people but its detailed collecting data are not available).

Distribution: Argentina, Bolivia, Paraguay

Family Buthidae C. L. Koch, 1837

Genus *Tityus* C. L. Koch, 1836

Tityus confluens Borelli, 1899
(Fig. 5)

♀: West Paraguay, Dry Chaco, surroundings of Fortin Toledo, 22° 21' S, 60° 20' W, 14 January 2001.

Distribution: Argentina, Bolivia, Brazil (Mato Grosso do Sul), Paraguay.

Notes on natural history

Except for the large specimen of *T. elegans* without exact collecting data, the remaining scorpions were collected throughout the rainy season. According to Müller (1996: p. 298) the highest rainfalls for the Dry Chaco station Mariscal Estigarribia (NW of Fortin Toledo: 22° 1' S, 60° 36' W; 181 m a.s.l.) is between October and March. Mean annual precipitation for Mariscal Estigarribia is 758 mm, mean annual relative humidity is 56 % and the mean annual temperature 25.4 °C.

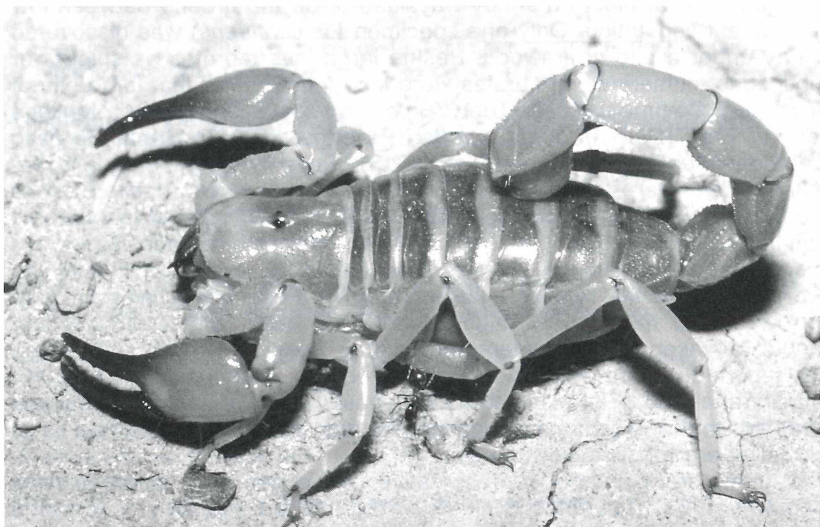


Fig. 4. *Timogenes elegans* (Mello-Leitão), ♀.



Fig. 5. *Tityus confluens* Borelli, ♀.

Scorpions from the surroundings of Fortín Toledo were mainly collected while foraging at night on sandy waysides or on the ground between low thorn forest vegetation. Only one specimen (*T. confluens*) was discovered at day under a pile of firewood. Beside large invertebrates as spiders or centipedes, numerous vertebrates were also found under that large pile of wood, e.g. Common Lesser Toad (*Bufo granulosus* Spix, 1824), Muller's Termite Frog [*Dermatonotus muelleri* (Boettger, 1885)], Santa Fe Frog (*Leptodactylus laticeps* Boulenger, 1918), Cei's Weeping Frog [*Physalaemus biligonigerus* (Cope, 1861 "1860")], South American Marked Gecko [*Homonota horrida* (Burmeister, 1861)], Spiny Lava Lizard [*Tropidurus spinulosus* (Cope, 1862)] and a large rat, "Pericote Común" [*Graomys griseoflavus* (Waterhouse, 1837)], (see Ziegler *et al.* 2002). It may be noteworthy, that the relatively large Santa Fe Frog, which lives in deep burrows under the ground, might syntopically occur with scorpions and should be taken into consideration as their possible predator. The frog was reported to feed even on smaller vertebrates (Norman 1994) and preliminary analyses of its stomach content based on material from Paraguay revealed, that poisonous arthropodes like ants or wasps as well as large tarantulas are readily eaten (Ziegler, in prep.). The preying on scorpions is also known from another representative of the genus, *L. pentadactylus* (Laurenti, 1768) (Loureño & Cuellar 1995; for an overview of scorpion feeding in frogs see also Lourenço *et al.* 1997).

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Zusammenfassung

Neue Skorpionsnachweise aus dem Gran Chaco Paraguays (Chelicerata, Skorpiones). Es wird eine kleine Sammlung an Skorpionen aus dem Gran Chaco von West-Paraguay vorgestellt. Das Material wurde größtenteils Anfang 2001 während der Regenzeit im Trockenem (= Oberen) Chaco gesammelt und umfaßt acht Skorpione, vertreten durch zwei Familien, drei Gattungen und vier Arten. Bei einer der nachgewiesenen Arten, *Timogenes dorbignyi* (Guérin Méneville, 1843) - zuvor nur aus Argentinien und Bolivien bekannt - handelt es sich um einen Neunachweis für die paraguayische Skorpionsfauna. Zusätzlich stellen wir erste Daten zu Lebensraum und Lebensweise der Arten im Trockenem Chaco bereit.

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