Entomol. Mitt. Zool. Mus. Hamburg	**15** (183): 183-189	Hamburg, 15. November 2010 ISSN 0044-5223

A new species of *Butheoloides* Hirst, 1925 from Morocco (Scorpiones, Buthidae)

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(with 8 Figures)

Abstract

A new species belonging to the genus *Butheoloides* Hirst, 1925 (subgenus *Butheoloides* Hirst, 1925) (Scorpiones, Buthidae) is described from the northern range of the Atlas Mountains in Morocco. With the description of *Butheoloides* (*Butheoloides*) *slimanii* sp. n., the total number of species known from Morocco is raised to four. *Butheoloides* (*Butheoloides*) *monodi* Vachon, 1950 is also recorded from Guinea Bissau for the first time.

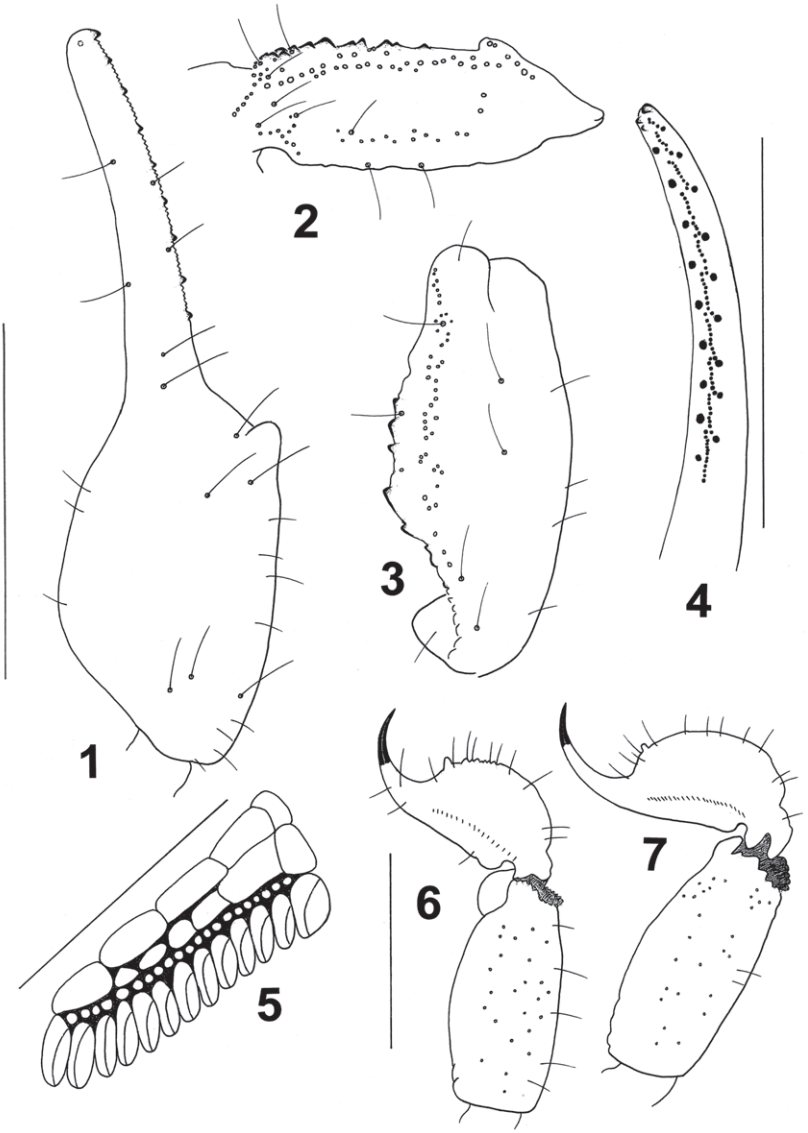
K e y w o r d s: Scorpiones, *Butheoloides*, Buthidae, new species, Atlas Mts., Morocco.

Introduction

The genus *Butheoloides* was proposed by Hirst (1925) for the species *Butheoloides maroccanus* distributed in the Atlas Mountains of the region of Amizmiz in the south of Marrakech in Morocco. The genus remained monospecific until the description of *Butheoloides milloti* by Vachon (1948) from the hills of Bandiagara in the south of Tombouctou in Mali. Subsequently Vachon (1950) described another new species, *Butheoloides monodi* from Fissel in the western region of Senegal.

More recently, several new species were described, including one in a new subgenus *Gigantoloides* Lourenço, 2002 (see Lourenço 2002; Lourenço *et al.* 2003). The description of the new species, confirmed a peri-Saharian pattern of distribution for the genus *Butheoloides*, with the zone of distribution almost forming a ring around the most arid core region of the Sahara. This region follows a circle from the North of Algeria and through the Atlas Mountains of Morocco, South via Senegal, and then East through Mali, Côte d'Ivoire, Nigeria, Sudan and Ethiopia (Lourenço 2002, Lourenço *et al.* 2003).

For Morocco, a second species, *Butheoloides* (*Gigantoloides*) *aymerichi* Lourenço, 2002 was described from the region of Tinerhir and included in a new subgenus *Gigantoloides* (Lourenço 2002). Shortly after, another new species, *Butheoloides* (*Butheoloides*) *occidentalis* Lourenço,



Figs 1-7. *Butheoloides* (*B.*) *slimanii* sp. n., female holotype. 1-3. Trichobothrial pattern. **1.** chela dorso-external aspect; **2.** femur, dorsal aspect; **3.** patella, dorsal aspect; **4.** disposition of the granulations on the dentate margin of the pedipalp chela movable finger; **5.** pecten, showing the enlarged most proximal tooth; **6.** metasomal segment V and telson, lateral aspect; **7.** idem for a female of *B.* (*B.*) *maroccanus* from Amizmiz (scale bars = 2 mm).

Slimani & Berahou, 2003, was described from the region of Tan-Tan, near the southern coastal region of this country (Lourenço *et al.* 2003).

At present, an additional new species is described from the region of Azilal in the North range of Atlas Mountains, raising the total number of species from Morocco to four. Nevertheless, the number of known species in genus *Butheoloides* remains moderate (i.e., thirteen) and most species appear to be rare. One exception is *Butheoloides* (*Butheoloides*) *annieae* Lourenço, 1986 from Côte d'Ivoire (Lourenço *et al.* 2005). Refer also to the taxonomic section for more information.

Methods

Illustrations and measurements were produced with the aid of a Wild M5 stereo-microscope with a drawing tube (camera lucida) and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology generally follows Vachon (1952) and Hjelle (1990).

Taxonomic account

Family Buthidae C. L. Koch, 1837
Genus *Butheoloides* Hirst, 1925
Subgenus *Butheoloides* Hirst, 1925

Butheoloides (*Butheoloides*) *slimanii* sp. n.

(Figs 1-6)

TYPE MATERIAL: Holotype ♀: Morocco. From Tanannt to Azilal (N 31° 53 191 – W 005° 55 447), 28. April 2004 (T. Slimani). The specimen is deposited in the Zoologisches Museum Hamburg (ZMH Acc. No. A25/10). No paratypes.

ETYMOLOGY: Patronym in honour of Dr. Tahar Slimani, of the University Cadi Ayyad, Marrakech, who collected the new species.

DIAGNOSIS: Scorpions of small size; female holotype 17.1 mm in total length. Coloration globally yellow to reddish-yellow with diffused brownish pigmentation on body and appendages; chelicerae with a blackish variegated pigmentation; femur and patella of pedipalps with the internal and external aspects infuscated. Carapace weakly emarginated. Dorsal carinae of metasomal segments weakly marked; telson with some spinoid granulations on the ventral aspect; aculeus weakly curved and shorter than vesicle; subaculear tooth strongly marked. Pectinal tooth count 13-13; most proximal tooth enlarged; fulcra present. Fixed and movable fingers of pedipalp with 9-10 rows of granules; internal accessory granules present, conspicuous; distal extremity of movable finger with three teeth. Trichobothrial pattern *A*-α (*alpha*), orthobothriotaxy.

DESCRIPTION: Based on female holotype. Measurements in Table 1.

Table 1. Morphometric values (in mm) of the female holotype of *Butheoloides* (*B.*) *slimanii* sp. n. and of a female of *B.* (*B.*) *maroccanus* from it's type locality.

	***B.* (*B.*). *slimanii* sp. n**	*B.* (*B.*) *maroccanus*
	♀	♀
Total length	17.1	22.3
Carapace:		
- length	2.1	2.6
- anterior width	1.5	2.0
- posterior width	2.2	2.7
Metasomal segment I:		
- length	1.4	2.0
- width	1.2	1.6
Metasomal segment V:		
- length	2.3	3.0
- width	1.0	1.5
- depth	0.9	1.3
Vesicle		
- width	1.0	1.2
- depth	0.9	1.1
Pedipalp:		
- femur lenght	1.9	2.4
- femur width	0.8	0.9
- patella length	2.3	2.8
- patella width	1.0	1.2
- chela length	4.1	4.7
- chela width	1.1	1.3
- chela depth	0.9	1.1
Movable finger:		
- length	2.3	3.0

Co l o r a t i o n. Basically yellow to reddish-yellow with diffused brownish pigmentation on body and appendages. Prosoma: carapace yellow with diffused brownish spots; median and lateral eyes surrounded with black pigment. Mesosoma yellow with confluent brownish spots. Metasomal segments I to III yellow, without spots; segments IV-V reddish and infuscated; telson yellow with the aculeus dark-reddish. Venter yellow; pectines and genital operculum light yellow. Chelicerae yellow with variegated blackish spots; fingers yellow with reddish-yellow teeth. Femur and patella of pedipalps with the internal and external aspects infuscated; legs pale yellow slightly infuscated.

MORPHOLOGY. P r o s o m a: Carapace very weakly granular, smooth and punctuated; anterior margin weakly emarginated. Carinae and furrows vestigial or absent. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by one ocular diameter. Three pairs of lateral eyes. Sternum pentagonal, wider than long. M e s o s o m a: Tergites smooth and punctuated; median carina very weakly marked in all tergites; tergite VII pentacarinate, with carinae weakly marked. Venter: genital operculum divided longitudinally, and formed by two almost semi-

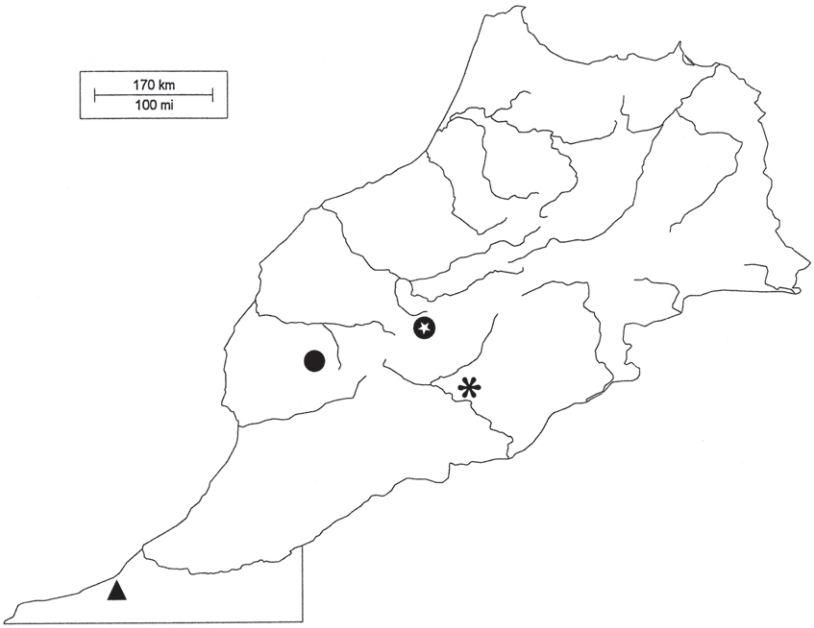


Fig. 8. Type localities of *Butheoloides* (*B.*) *maroccanus* (black circle). *B.* (*B.*) *occidentalis* (black triangle). *B.* (*B.*) *slimanii* sp. n. (black circle with white star) and *B.* (*G.*) *aymerichi* (black flower) in Morocco.

triangular plates. Pectinal tooth count 13-13; the proximal most tooth enlarged; fulcra conspicuous. Sternites smooth with small slit-like spiracles; VII smooth without carinae. M e t a s o m a: Segments I to V rounded; dorsal and dorso-lateral carinae present only on segments I-III; segments IV-V lustrous and punctuated; intercarinal spaces smooth. Telson moderately granular with spinoid granules on ventral aspect; aculeus shorter than the vesicle, moderately curved; subaculear tooth conical to spinoid, strongly marked. C h e l i c e r a l dentition characteristic of the family Buthidae (Vachon 1963); movable fingers with two basal teeth, small but well distinct; ventral aspect of both finger and manus with setae. P e d i p a l p s: Femur pentacarinate; patella with dorsal and dorso-internal carinae moderately marked; chela without carinae, smooth; all faces weakly granular to smooth. Fixed and movable fingers of pedipalps with 9-10 oblique rows of granules, and accessory granules; three granules on the extremity of the movable finger. Trichobothriotaxy; *A-ά-alpha* orthobothriotaxy (Vachon 1974, 1975). L e g s: tarsus with setae ventrally. Tibial and pedal spurs present on legs III-IV, moderately marked.

REMARKS: The new species shows affinities with *Butheoloides* (*B.*) *maroccanus*, but can be distinguished, by a combination of distinct characters: (i) a paler pigmentation overall with, however, a blackish variegated pigmentation on chelicerae, (ii) telson with a better marked subaculear tooth and with some spinoid granulations on the ventral aspect, (iii) pectines with 13-13 teeth, against 15-17 for the female of *B.* (*B.*) *maroccanus* (Vachon 1952) and, with the most proximal tooth enlarged.

Other species of *Butheoloides* recently deposited in the ZMH

Butheoloides maroccanus Hirst, 1925
Morocco, North of Amizmiz, 30. March 2004 (T. Slimani), 1 juvenile male.

Butheoloides monodi Vachon, 1950
Species originally described from Fissel in the western region of Senegal. Until now this species was known exclusively from Senegal (Fet & Lowe 2000). One new record for Guinea Bissau is reported at present.
Guinea Bissau, Cumbija Tombali, 29 June 2006 (A. Bivar Sousa), 1 female.

Butheoloides annieae Lourenço, 1986
Côte d'Ivoire, LAMTO Ecological Station, 50 km S of Toumodi, Savannah formation, September 1981 (W. Lourenço). 13 males, 12 females, 18 juveniles. Note: Material collected during a one week survey, using pitfall traps. This attests to the abundance of the species (Lourenço *et al.* 2005).

Acknowledgments

I am most grateful to Michael Soleglad, Borrego Springs (California, USA) for his useful comments on the manuscript.

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