

Description of a new scorpion species of the genus *Buthus* Leach, 1815 (Scorpiones, Buthidae) from Guinea and Senegal in Western Africa

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(With 13 figures)

Abstract

A new species belonging to the genus *Buthus* Leach, 1815 (Scorpiones, Buthidae) is described from Guinea in Western Africa. The new species does not belong to the "*Buthus occitanus* complex of species", as suggested by Vachon (1949, 1952), but is rather associated with *Buthus atlantis* Pocock, 1889, the taxon known only from southern Morocco. With the description of *Buthus elizabethae* sp. n., the status of the population from Western Africa is partly clarified.

Key words: Scorpiones, taxonomy, *Buthus*, new species, Western Africa, Guinea, Senegal.

Introduction

As already explained in previous papers (Lourenço 2002, 2003, Lourenço & Slimani 2004) the taxonomy of the genus *Buthus* Leach has remained complex and confused for a long while. In a series of publications, summarized in a monograph about North African scorpions, Vachon (1952) attempted to establish a better definition of the genus and transferred several species, which previously belonged to it, to other genera (see Lourenço 2003 for details). The classification proposed by Vachon (1952) for the species of *Buthus*, and in particular for *Buthus occitanus*-complex, remained unsatisfactory, mainly because of the existence of several poorly defined subspecies and even varieties (the latter category is not accepted by the International Code of Zoological Nomenclature: see Article 45).

Only recently, a more precise definition of the *Buthus* species has been attempted by Lourenço (2002, 2003) and Lourenço & Slimani (2004), with the description of several new species and the elevation of some subspecies to species rank. Even if these contributions clarified the status of some taxa, particularly these from Morocco, the status of other species remains confuse. This is the case of some *Buthus* population from the Western Africa, distributed mainly from Senegal to Niger. Vachon (1949,

1952) refers to these populations as *Buthus occitanus* (Amoreux, 1789) but without any reference to a certain subspecies. The material from these populations, still available in the Natural History Museum in Paris, is very limited and poorly preserved. For this reason, I did not take any decision in my recent revision (Lourenço 2003). Very recently, I was able to locate two well preserved specimens of *Buthus* from Guinea, and two others from Senegal. These individuals are described in this paper as a new species. The new taxon is not associated with *Buthus occitanus* as suggested by Vachon (1949, 1952), but rather with *Buthus atlantis* Pocock, 1889, a species known only from southern Morocco. With the description of *Buthus elizabethae* sp. n., the status of at least one population from Western Africa is clarified. This population is distributed in the savannas of Guinea and Senegal. Further studies are necessary to clarify the taxonomic position of the *Buthus* populations distributed more to the East, mainly in Niger and Côte d'Ivoire.

Description

Buthus elizabethae sp. n. (Figs 1-13)

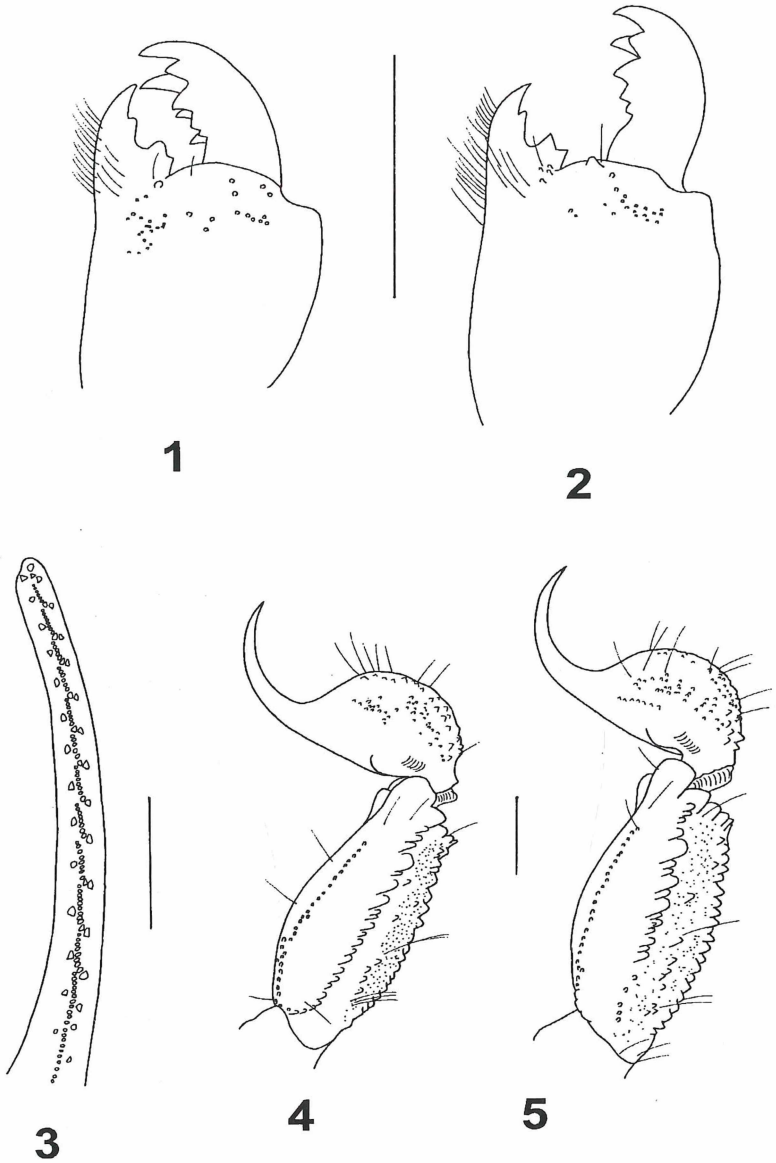
TYPE MATERIAL: H o l o t y p e (♂) and p a r a t y p e (♀). Guinea, SW of Gaoual, (savannah formations), November 1991, coll. J. Etienne. Deposited in the Zoologisches Museum Hamburg, Germany [ZMH Acc. No. A36/05 (holotype), A37/05 (paratype)]. Two p a r a t y p e s (♂+♀): Senegal, Parc National du Niokolo-Kola, 6 September 1950 (mission IFAN). Deposited in the Muséum National d'Histoire Naturelle, Paris, France.

ETYMOLOGY: patronym in honour of Miss Elizabeth Victoria Fet, Huntington, West Virginia (U.S.A.), for her enthusiastic interest in the study of scorpions.

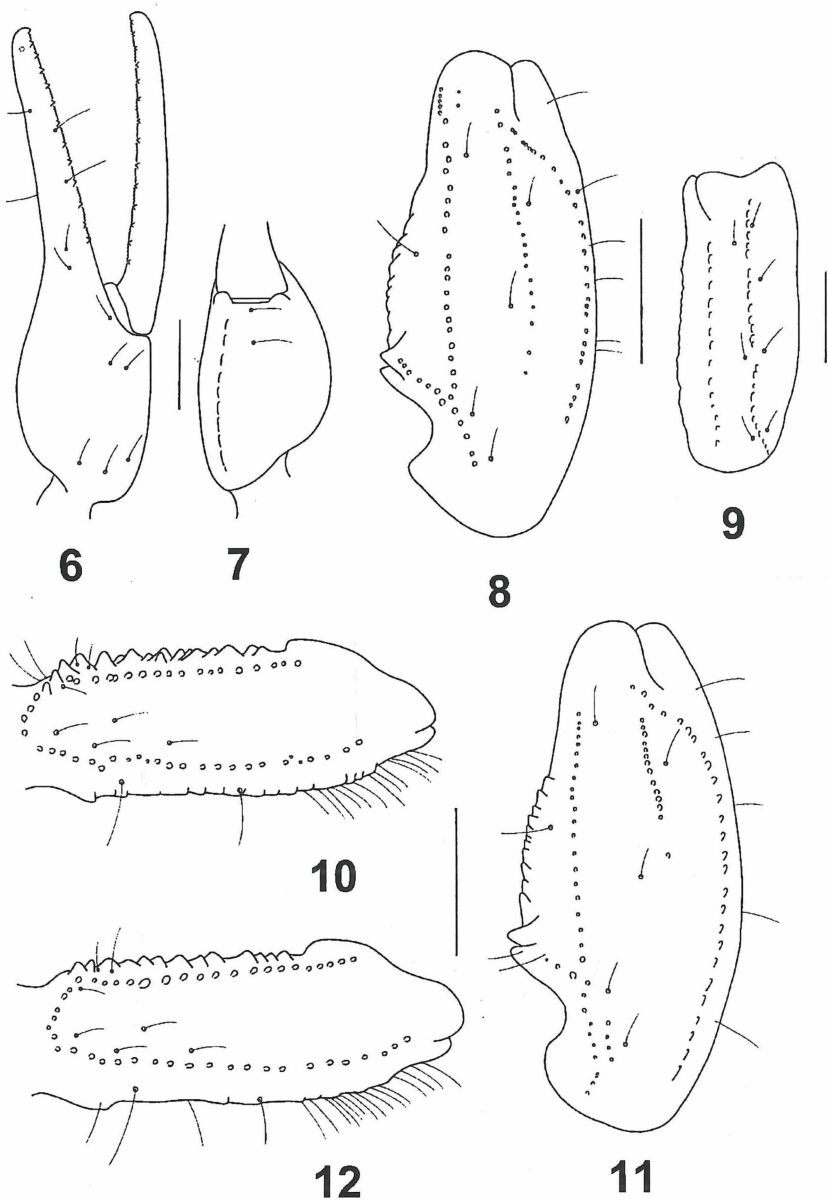
DIAGNOSIS: Scorpions of medium to large size, reaching a total length of 55 to 61 mm. General coloration pale yellow, with only some slightly reddish zones over the carapace and metasomal carinae, chelicera finger denticles, oblique rows of granules on pedipalp fingers and extremity of aculeus. Venter, pedipalps and legs pale yellow. Carinae and granulations moderate to weak. Fixed and movable fingers with 12-12 rows of granules in both sexes. Pectines with 28/31 teeth in males and 26/27 in females. Male pectines small and not overlapping in their proximal region.

Description [based on holotype (♂) and paratype (♀). Measurements in Table 1].

C o l o r a t i o n. Basically pale yellow, with only some slightly reddish zones over the carapace and metasomal carinae, chelicera finger denticles, oblique rows of granules on pedipalp fingers and extremity of aculeus. Prosoma: carapace yellowish, with carinae slightly reddish; eyes surrounded by black pigment. Mesosoma: tergites yellowish slightly darker in males. Metasoma: all segments and vesicle yellowish; aculeus yellowish at its base and dark reddish at its extremity. Venter yellowish in males; pale yellow females. Chelicerae yellowish without any variegated



Figs 1-5. *Buthus elizabethae* sp. n.: 1+2 - chelicera, dorsal aspect (1 - ♂, 2 - ♀); 3 - granulation on the dentate margins of the pedipalp chela movable finger (♂); 4+5 - metasomal segment V and telson, lateral aspect (4 - ♂, 5 - ♀) (Scale bar = 2 mm).



Figs 6-12. *Buthus elizabethae* sp. n.: trichobothrial pattern of male holotype (Figs 6-10): **6+7** - chela, dorso-external and ventral aspects; **8+9** - patella, dorsal and external aspects; **10** - femur, dorsal aspect; **11+12** - as above, female paratype: patella and femur, dorsal aspect, respectively (Scale bar = 2 mm).

spots; fingers yellowish with reddish teeth. Pedipalps: yellowish; fingers with the oblique rows of granules dark reddish. Legs yellowish without any spots.

MORPHOLOGY. *P r o s o m a*: Carapace moderately to weakly granular; anterior margin almost straight. Carinae moderate; anterior median, central median and posterior median carinae moderately granular; 'lyre' configuration can, however, be well observed. All furrows moderate to weak. Median ocular tubercle at the centre of carapace. Eyes separated by three ocular diameters. Four pairs of lateral eyes: the first three of moderate size, the last one only vestigial. Sternum triangular, wider than long. *M e s o s o m a*: tergites with a thin but intense granulation, better marked in males. Three longitudinal carinae moderately crenulate in all tergites; lateral carinae reduced in tergites I and II. Tergite VII pentacarinat. Venter: genital operculum divided longitudinally, and formed by two semi triangular plates. Pectines: pectinal tooth count 28-28 in male holotype, and 27-27 in female paratype; middle basal lamella of the pectines not dilated. Sternites smooth, with elongated spiracles; four carinae on sternite VII; other sternites without carinae and with two weak furrows. *M e t a s o m a*: segments I to III with 10 crenulated carinae, ventral more strongly marked on segments II and III; segment IV with 8 carinae, crenulated; segment V with five carinae; the ventrolateral carinae crenulate with 2/3 lobate denticles posteriorly; ventral median carina only slightly divided posteriorly; anal arc composed of 7/8 ventral teeth, and two lateral lobes. All segments with a smooth dorsal depression; intercarinal spaces weakly granular, except for the ventral aspect of segment V which presents an thin but intense granulation. Telson with some granulations on the lateral and ventral surfaces; aculeus strongly curved, and as long as the vesicle; subaculear tooth absent. *C h e l i c e r a l* dentition as defined by Vachon (1963) for the family Buthidae; external distal and internal distal denticles of approximately the same length; basal denticles of movable finger small but not fused; ventral aspect of both fingers and manus covered with long dense setae. *P e d i p a l p s*: femur pentacarinat; patella with eight carinae; chela smooth with only vestigial carinae; all faces weakly granular to smooth. Fixed and movable fingers with 12/12 oblique rows of granules. Internal and external accessory granules present but moderate to weak; three accessory granules on the distal end of movable finger next to the terminal denticle. *L e g s*: tarsus with two longitudinal rows of 7/8 long setae ventrally; tibial spur strong on legs III and IV; prolateral spurs moderate to strong on legs I to IV. *T r i c h o b o t h r i o - t a x y*: trichobothrial pattern of Type A, orthobothriotaxic as defined by Vachon (1974). Dorsal trichobothria of femur arranged in \hat{a} -configuration (Vachon 1975).

REMARKS: *Buthus elizabethae* sp. n. does not belong to the "*Buthus occitanus* complex of species", but is rather associated with *B. atlantis*. It can, however, be distinguished from the other species of *Buthus*, in particular from *B. atlantis*, by the following characters:

(i) in *B. elizabethae* sp. n. male pectines do not overlap in their proximal region, whereas they overlap in all the other species of *Buthus*;

(ii) pectinal tooth count in males of the new species vary from 28 to 29, whereas in *B. atlantis* these vary from 31 to 35; (iii) aculeus in *B. elizabethae* sp. n. is as long as the vesicle and strongly curved, whereas in *B. atlantis* it is longer than the vesicle and weakly curved (see Lourenço 2003, figures 20 and 24); (iv) anal arc in the new species shows 2 lobes, whereas in *B. atlantis* 3 lobes are frequently observed.

Several characters defined by Vachon (1949, 1952) for his *Buthus* population from Western Africa, can be confirmed in the new species described here. One can note in particular a rather weak carination, the character which partially associates *B. elizabethae* sp. n. with *B. occitanus* from Europe. This characteristic is strongly in contrast with the *Buthus* species from Morocco which show very strong carination. The new species shows long setation in the tarsi of legs, and ventral carinae of metasomal segments are very weak. Finally, Vachon (1949, 1952) stated that female pectinal tooth counts are very high when compared with the European *Buthus*, also in relation to males. This was clearly observed in the new species which, in fact, shows a very weak sexual dimorphism. A usual character in the distinction of sexes in *Buthus* species is the size of male pectines that overlap in their proximal region. This character is not observed in *B. elizabethae* sp. n., and I had to dissect the male holotype to confirm the presence of a paraxial organ. (not removed from the specimen).

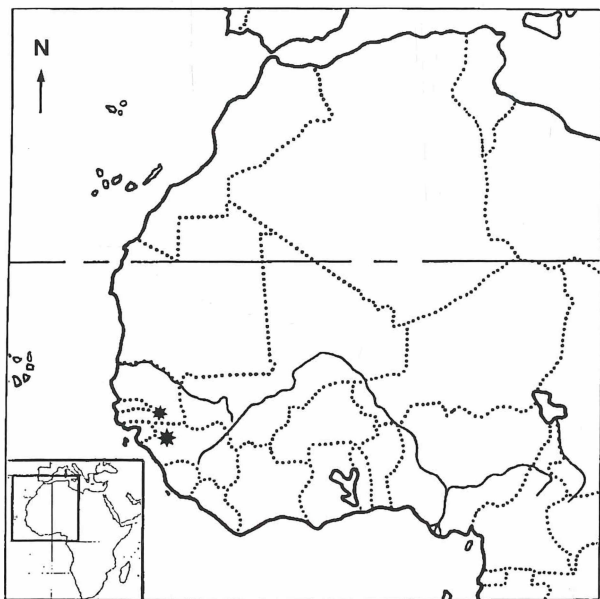


Fig. 13. The collection sites of *Buthus elizabethae* sp. n. in Western Africa (the larger black star indicates type locality).

Table 1. Morphometric values (in mm) of *Buthus elizabethae* sp. n.

	Holotype (♂)	Paratype (♀)
Total length	56.2	60.4
Carapace:		
- length	7.6	7.6
- anterior width	5.3	5.7
- posterior width	8.6	9.1
Metasomal segment I:		
- length	5.2	5.2
- width	5.2	5.4
Metasomal segment V:		
- length	8.2	8.4
- width	4.3	4.6
- depth	3.7	3.8
Vesicle:		
- width	3.2	3.3
- depth	2.8	3.1
Pedipalp:		
- Femur length	5.8	6.1
- Femur width	2.1	2.2
- Patella length	6.9	7.2
- Patella width	2.9	3.1
- Chela length	11.8	11.9
- Chela width	3.2	3.1
- Chela depth	3.2	3.2
Movable finger: length	8.2	8.2

Acknowledgements

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