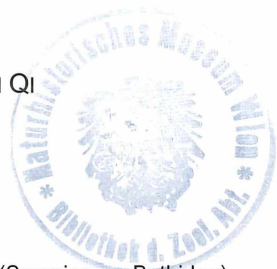


## A new species of *Buthus* Leach, 1815 from Morocco (Scorpiones, Buthidae)

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(with 12 figures)



### Abstract

A new species belonging to the genus *Buthus* Leach (Scorpiones, Buthidae) and to the "*Buthus occitanus*" complex of species is described. *Buthus elmoutaouakili* sp. n. raises the total number of *Buthus* species known to be present in Morocco to eleven. The Moroccan species of *Buthus*, which belong to the "*Buthus occitanus*" complex, are confirmed as composing an isolated group of species, i.e., "the Atlas group".

**Key words:** Scorpiones, taxonomy, *Buthus elmoutaouakili* sp.n., Morocco.

### Introduction

As discussed in previous papers (Lourenço 2002, 2003, 2005a, Lourenço & Slimani 2004) the taxonomy of the genus *Buthus* Leach has long remained complex and confused. In his monograph about North African scorpions, Vachon (1952) attempted to establish a better definition of the genus and transferred to other genera several species previously included in it (see Lourenço 2003 for details). The classification proposed by Vachon (1952) for the species of *Buthus*, and in particular for those belonging to the "*Buthus occitanus*" complex, remained unsatisfactory, however, mainly because of the existence of several poorly defined subspecies and even varieties.

Only recently a more precise definition of the *Buthus* species which belong to the "*Buthus occitanus*" complex has been attempted (Lourenço 2002, 2003, 2005a, Lourenço & Slimani 2004), accompanied by the description of several new species and the promotion of some subspecies to species rank. Other contributions by Lourenço (2005b,c, Lourenço & Geniez 2005) have also attempted to clarify the taxonomic status of some of the species of *Buthus* associated with *Buthus atlantis* Pocock, 1889, or belonging to the "*Buthus occitanus*" complex, and distributed in the southern region of the Sahara, from Guinea to Niger. These contributions, however, still remain incomplete, and further studies on the species of these regions are yet necessary.

Another new species, also belonging to the "*Buthus occitanus*" complex was recently collected in the South of Morocco, from Ait-Baha, a location between Agadir and Tiznit. The species of the population of which it is a

member was previously identified by Vachon (1952) as *Buthus occitanus mardochei* var. *alluaudi* Vachon, 1949. Since a variety is a category no longer accepted by the International Code of Zoological Nomenclature - Article 45 (see Lourenço 2003), it is described here as a new species.

The Moroccan species of *Buthus*, which belong to the "*B. occitanus*" complex, are confirmed as composing an isolated group of species, "the Atlas group", as defined by Gantenbein & Largiadèr (2003).

### Description of species

*Buthus elmoutaouakili* sp. n.

(Figs 1-11)

**TYPE MATERIAL:** holotype (♂). Morocco, Ait-Baha, south of Agadir and between Agadir and Tiznit, 15 May 2005, coll. M. Aymerich. Deposited in the Zoologischen Museum Hamburg, Germany (ZMH Acc. No. A18/06).

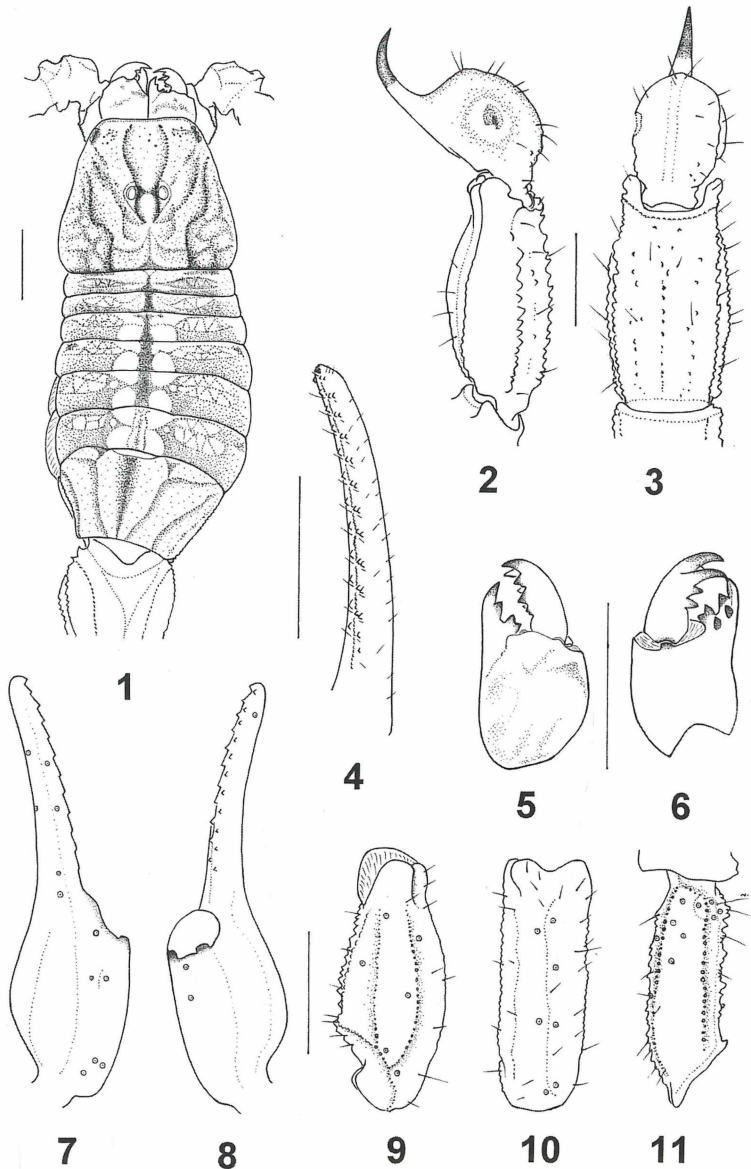
**ETYMOLOGY:** In honour of Mr. Bouchaib Elmoutaouakil, former governor of the Morocco Province of Assa-Zag, now in Rabat, for his continuous interest in and support of the study of Moroccan fauna.

**DIAGNOSIS:** Scorpion of medium size, reaching a total length of 51-52 mm. General coloration yellow to pale yellow, with one narrow central and two large lateral longitudinal brownish stripes over the tergites; lateral stripes absent from tergite VII; metasomal segments yellow; telson yellowish with the tip of the aculeus dark. Venter yellowish. Pedipalps yellowish; legs pale yellow. Carinae and granulations moderately to strongly marked. Fixed and movable fingers with 11 rows of granules. Pectines with 30-30 teeth in male.

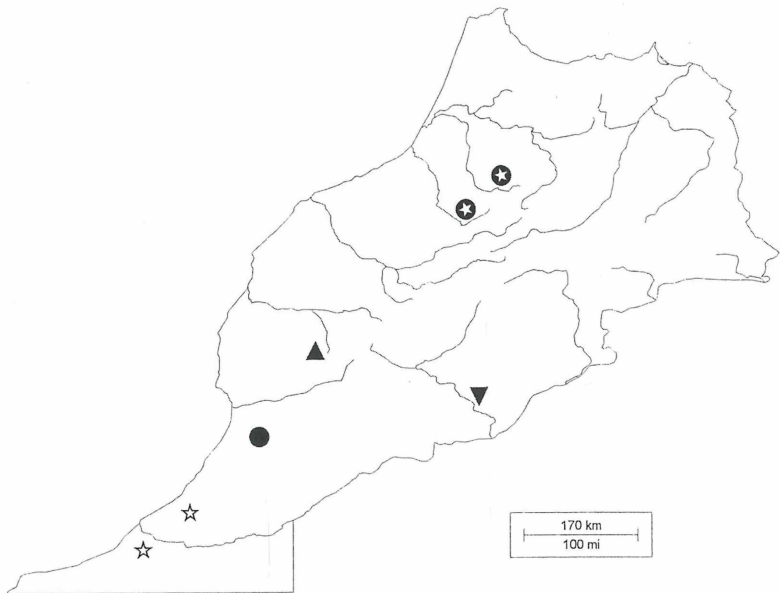
**DESCRIPTION** based on male holotype. Measurements below.

**C o l o r a t i o n.** Mainly yellowish. Prosoma: carapace yellowish; carinae and eyes marked by dark pigment. Mesosoma: yellowish with one central and two lateral longitudinal brownish stripes over the tergites; lateral stripes absent from tergite VII. Metasoma: segments I to V yellowish; vesicle yellowish; aculeus yellowish at its base and dark at its extremity. Venter yellowish; pectines pale yellow. Chelicerae yellowish with vestigial variegated spots; fingers yellowish with blackish teeth. Pedipalps: yellowish; fingers with the oblique rows of granules dark. Legs pale yellow without any diffuse fuscous spots.

**MORPHOLOGY.** **P r o s o m a:** Carapace strongly granular; anterior margin almost straight and without a median concavity. Carinae strong; anterior median, central median and posterior median carinae strongly granular, with 'lyre' configuration. All furrows moderate to strong. Median ocular tubercle at the centre of carapace. Eyes separated by almost three ocular diameters. Four pairs of lateral eyes: the first three of moderate size, the last only vestigial. Sternum triangular and narrow; wider than long. **M e s o s o m a:** tergites moderately granular. Three longitudinal



**Figs. 1-11.** *Buthus elmoutaouakili* sp. n., holotype ( $\sigma$ ): 1 – carapace and tergites with typical pigmentation pattern; 2-3 – metasomal segment five and telson, lateral and ventral aspects; 4 – movable finger of pedipalp chela with rows of granules; 5-6 – chelicera, dorsal and ventral aspects; 7-8 – chela, dorso-external and ventro-internal aspects; 9-10 – patella, dorsal and external aspects; 11 – femur, dorsal aspect (scale bars = 3 mm).



**Fig. 12.** Localities of the new and related species in Morocco: *Buthus elmoutaouakili* sp. n. (black circle); *B. mariefranceae* Lourenço (white star), *B. rochati* Lourenço (inverted black triangle), *B. lienhardi* Lourenço (black triangle). *B. albengai* Lourenço (black circle with white star) (modified from Lourenço 2003).

carinae strongly crenulate in all tergites; lateral carinae reduced in tergites I and II. Tergite VII pentacarinat. Venter: genital operculum divided longitudinally. Pectines: pectinal tooth count 30-30 in male holotype; middle basal lamella of the pectines not dilated. Sternites without granules, smooth with elongated spiracles; four carinae on sternite VII; other sternites acarinated and with two vestigial furrows. *Metasoma*: segments I to III with 10 crenulated carinae, ventral moderately marked; segment IV with 8 carinae, crenulated; the first four segments with a smooth dorsal depression; segment V with five carinae; the latero-ventral carinae crenulate with two lobate denticles posteriorly; ventral median carina slightly divided posteriorly; anal arc composed of 10 ventral teeth, and two lateral lobes, with one small granule between the lobes. Intercarinal spaces weakly granular. Telson with some granulations on the lateral and ventral surfaces; aculeus curved and shorter than the vesicle, without a subaculear tooth. *Chelicer al* dentition as defined by Vachon (1963) for the Buthidae; external distal and internal distal teeth approximately the same length; basal teeth on movable finger small and almost fused; ventral aspect of both fingers and manus covered with long dense setae. *Pedipalps*: femur

pentacarinata; patella with eight carinae; chela with only a few vestigial carinae; all faces weakly granular. Fixed and movable fingers with 11 oblique rows of granules. Internal and external accessory granules present, strong; three accessory granules on the distal end of the movable finger next to the terminal denticle. **Legs:** tarsus with two longitudinal rows of 6/7 spinoid setae ventrally; tibial spur strong on legs III and IV; pedal spurs moderate to strong on legs I to IV. **Trichobothriotaxy:** trichobothrial pattern of Type A, orthobothriotaxic as defined by Vachon (1974). Dorsal trichobothria of femur arranged in *Beta-â* configuration (Vachon 1975).

**Measurements:** (in mm: holotype ♂): Total length 51.6. Carapace: length 6.6, anterior width 4.7, posterior width 7.6. Metasomal segment I: length 4.8, width 4.9. Metasomal segment V: length 7.8, width 3.8, depth 3.4. Vesicle: width 3.1, depth 3.2. Pedipalp: Femur length 5.5, Femur width 1.9, Patella length 6.2, Patella width 2.5, Chela length 10.3, Chela width 2.3, Chela depth 2.3. Movable finger: length 6.8.

**REMARKS:** *Buthus elmoutaouakili* sp. n. belongs to the "*B. occitanus*" complex of species. It can be distinguished from the other species of *Buthus* and in particular from *B. mariefranceae* Lourenço, 2003 (also distributed in the same region of Morocco) by the following characters: (i) *B. mariefranceae* is smaller, measuring only 45 to 48 mm in total length, (ii) the new species lacks the dark pigmentation on metasomal segment V and carapace, typical of *B. mariefranceae*, (iii) the new species has 11 rows of granules on the fixed and movable fingers of the pedipalps, whereas *B. mariefranceae* has only 8/9 rows, (iv) the anal arc shows 2 lobes in the new species, whereas in *B. mariefranceae* 3 lobes are frequently observed.

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