

## A NEW SPECIES OF THE GENUS *BUTHACUS* BIRULA, 1908 (SCORPIONES, BUTHIDAE), FROM PAKISTAN

Wilson R. Lourenço<sup>1</sup> & Jian-Xin Qi<sup>2</sup>

<sup>1</sup>Département de Systématique et Evolution, USM 0602, Section Arthropodes (Arachnologie), CP 053, Muséum National d'Histoire Naturelle, 61 rue Buffon 75005 Paris, France – arachne@mnhn.fr

<sup>2</sup>Department of Biological Sciences, National University of Singapore, 14 Science Drive 4, Singapore 117543, Singapore. free8wind@yahoo.com.cn

**Abstract:** Subsequent to the recent revision of the genus *Buthacus* Birula proposed by Lourenço (2006), a new species has been recorded from north-east of Sukkur, in Pakistan. This new species, collected in the most arid region of the Thar desert, has the easternmost distribution of all known species of *Buthacus*.

**Key words:** Scorpiones, Buthidae, *Buthacus*, new species, Pakistan.

### Una nueva especie del género *Buthacus* Birula, 1908 (Scorpiones, Buthidae), de Pakistán

**Resumen:** Con posterioridad a la reciente revisión del género *Buthacus* Birula presentada por Lourenço (2006) se ha registrado una nueva especie recogida al noreste de Sukkur, en Pakistán. Esta nueva especie, colectada en la región más árida del desierto de Thar, tiene la distribución más oriental de todas las especies conocidas de *Buthacus*.

**Palabras clave:** Scorpiones, Buthidae, *Buthacus*, nueva especie, Pakistán.

**Taxonomy:** Taxonomía: *Buthacus pakistanensis* sp. n.

### Introduction

As previously explained, and particularly in the recent revision by Lourenço (2006), the taxonomy of the genus *Buthacus* Birula (1908) has been the subject of controversy for over 50 years. In attempting to clarify the status of the species of the genus, attention was focused mainly on the North African species (Lourenço, 2006). Those distributed in most of the countries of the Middle East were intentionally disregarded. However, the chaotic situation that still exists in the taxonomy of some species, necessitates consideration of other species in the genus. One of these, from Pakistan, is described here as new. It is clearly associated with *Buthacus tadmorensis* (Simon, 1892), described from Palmyra in Syria and recently revalidated (Lourenço, 2006).

### Additional comments on the taxonomy of *Buthacus tadmorensis*

As already pointed out (Lourenço, 2006), *Buthacus tadmorensis* (Simon) (= *Buthus tadmorensis* Simon, 1892) was described by Simon (1892) from 'Palmyre' in Syria. In his publication, Simon (1892) also made reference to *Buthacus leptochelys* and *Buthacus arenicola*. Shortly after its original description *B. tadmorensis* was placed in synonymy with *B. leptochelys* by Kraepelin (1895), an opinion supported by subsequent authors. This position was further confirmed by Levy *et al.* (1973), who expressed their opinion as follows: "Having carefully examined Simon's collection from the whole Syrian region of that period, it should be noted that specimens belonging to *B. leptochelys* only have been found. Consequently, and basing also on its description, it seems that *tadmorensis* should be considered synonymous to *leptochelys*." Examination of two specimens of *B. tadmorensis* from Palmyra in the collections of the Museum in Paris (and possibly part of the type material of

Simon), shows clear morphological differences from *B. leptochelys*. In particular, the ventral carinae of metasomal segments II and III are very developed. This feature was previously commented on by Simon (1892) who associated *B. tadmorensis* with *Odontobuthus doriae* (Thorell) as follows: "segmentis caudae 2° et 3° carinis inferioribus apicem versus sensim validioribus et dente apicali reliquis majoribus (minus quam in *B. Doriae* Thorell)". In conclusion, *B. tadmorensis* is a valid species, not related to *B. macrocentrus* as affirmed by Kovařík (2005). Furthermore, analysis of the morphological characteristics of the species of *Buthacus* distributed in Sinai, Israel and Syria, indicates only that *Buthacus leptochelys nitzani* Levy, Amitai & Shulov, 1973 may well be a junior synonym of *B. tadmorensis*.

Hendrixson (2006), has recently described a new species, *Buthacus buettikeri* from Saudi Arabia. The characters used to diagnose this species are exactly those presented by *B. tadmorensis*. This last species, however, was not considered by Hendrixson (2006) who, as he himself stated, followed the taxonomy of *Buthacus* presented by Levy *et al.* (1973), without attempting any revision of the genus. Since the latest revision by Lourenço (2006) was published about the same time as Hendrixson's (2006) paper, the later could not have been aware of the revision. Nevertheless, taking into account the fact that both *B. leptochelys* and *B. tadmorensis* are distinct and valid species, and also that the areas of distribution of *B. tadmorensis* and *Buthacus buettikeri* are not very much distinct, it is quite possible that these two closely associated species may be regional morphs, or even synonyms. We were not able to examine the type material of *B. buettikeri*, therefore we prefer to postpone a definite taxonomic decision until on the matter until a more precise study becomes possible.

***Buthacus pakistanensis* sp. n.**

Fig. 1-15.

**TYPE MATERIAL:** Pakistan, NE of Sukkur (Thar desert), IX/1956 (R. Furon), 1 male holotype, 1 female paratype. Deposited in the Muséum national d'Histoire naturelle, Paris.

**ETYMOLOGY:** specific name refers to the country in which the new species occurs.

**DIAGNOSIS:** Scorpions of moderate to large size in relation to other species of the genus, with a total length of 58 mm in the male and 53 mm in the female. General coloration yellowish to pale yellow without any spots; but the tip of the aculeus, the granulations on the pedipalp fingers and the teeth of the chelicerae are slightly reddish. Pedipalps with 8-9 rows of granules on the fixed and movable fingers; external accessory granules moderate. Trichobothriotaxy A-β (beta) orthobothriotaxic. Ventro-median carinae on metasomal segments II-III with strong spiniform granules with lobe-shape in female; anal arc with one lobe in male and two lobes in female. Tibial spurs moderate on legs III and IV. Pectinal tooth count 32-34 in male and 26-26 in female.

**RELATIONSHIPS:** In its general morphology the new species displays associations with *Buthacus tadmorensis* (Simon) from Syria. The new species can, however, be distinguished from this by the following characters:

(i) larger overall size, 60 to 65 mm in total length, against 49 mm for *B. tadmorensis*, (ii) a greater number of pectinal teeth, 26 to 34, (iii) the anal arc with one lobe in the male and two in the female, (iv) the ventro-median carinae of metasomal segments II-III with lobate granules only in females.

**DESCRIPTION BASED ON MALE HOLOTYPE AND FEMALE PARATYPE.**

**Morphometric** measurements in Table I.

**Coloration.** Generally yellowish to pale yellow without any spots or pigmented zones on the body and appendages; the tip of aculeus, the granulations on the pedipalp fingers and the teeth of the chelicerae are slightly reddish; the eyes surrounded by black pigment.

**Morphology.** Prosoma: Anterior margin of carapace not emarginate, straight. Carapace carinae weak; anterior median carinae obsolete; central median, posterior median and central lateral carinae weak to obsolete. All furrows weak to obsolete. Intercarinal spaces slightly granular. Median ocular tubercle slightly anterior to the centre of the carapace; median eyes separated by one and a half ocular diameters. Five pairs of lateral eyes; the first three disposed in one line, the fourth and fifth situated behind eye three. Mesosoma: Tergites I-VI tricarinate; all carinae weak; lateral carinae vestigial on segments I-II; tergite VII pentacarinate, with lateral pairs of carinae strong; median carinae present on proximal half, moderately marked. Intercarinal spaces weakly granular. Sternites: all carinae absent from sternites III-VI; weak on VII. Pectines long; pectinal tooth count 32-34 in male holotype and 26-26 in female paratype. Metasoma: Segments I-II with ten carinae; III-IV with eight carinae. Ventral carinae moderately marked on segment I; with spinoid granules on segments II-III, lobe-shaped on female; dorsal and dorsolateral carinae with granules slightly spinoid on segments I and II. Segment V with five

**Table I. Morphometric values (in mm) of the male holotype and female paratype of *Buthacus pakistanensis* sp. n.**

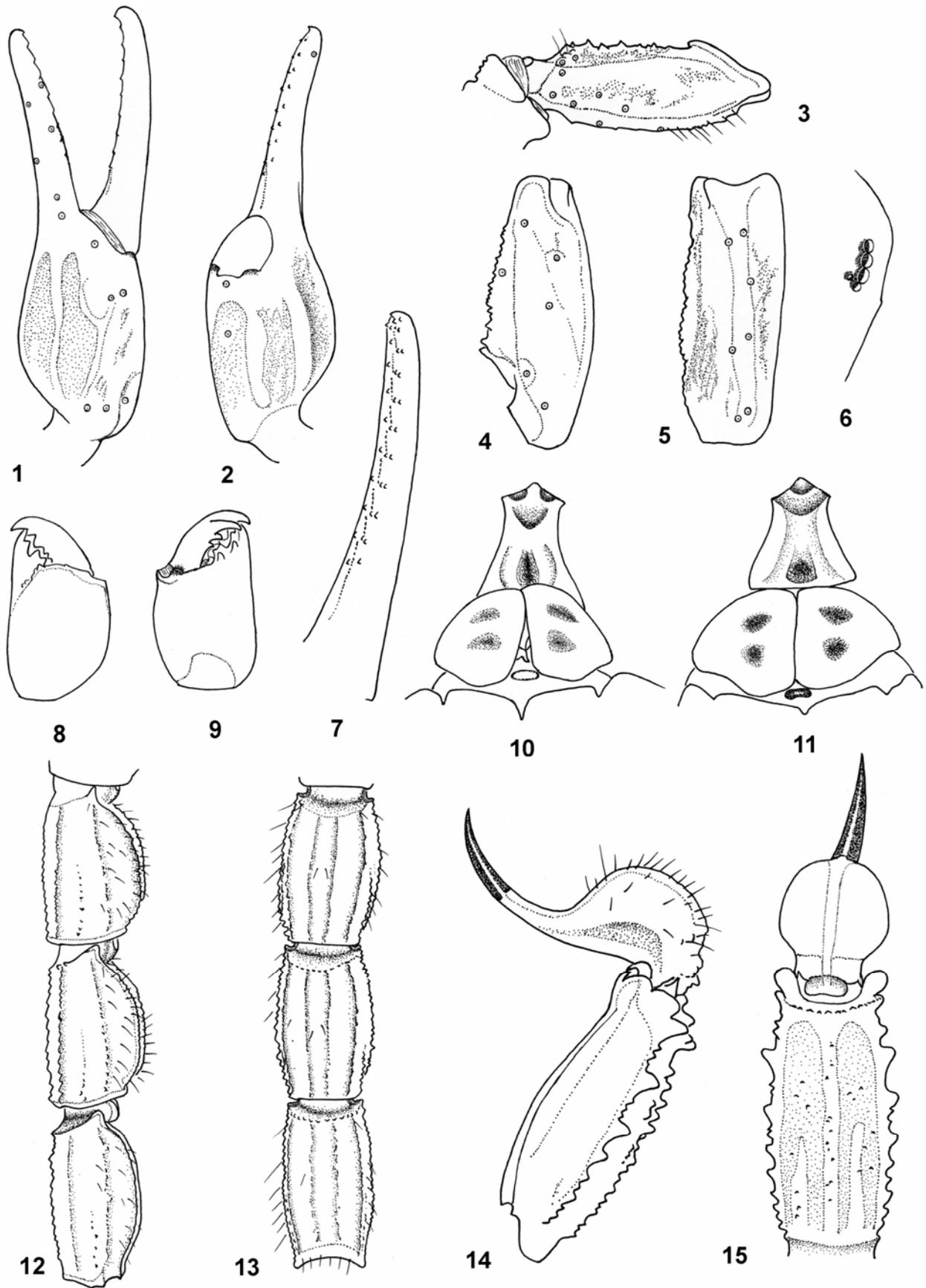
	♂ holotype	♀ paratype
Total length:	57.5 (65.7)*	52.4 (60.4)*
Carapace:		
- length	6.6	7.1
- anterior width	4.4	4.8
- posterior width	7.6	8.2
Metasomal segment I:		
- length	5.7	5.5
- width	4.6	4.5
Metasomal segment V:		
- length	8.2	8.1
- width	3.5	4.0
- depth	3.3	3.4
Vesicle:		
- length	8.2	8.0
- width	2.7	3.0
- depth	2.7	2.8
Pedipalp:		
- Femur length	5.5	5.2
- Femur width	2.0	2.2
- Patella length	6.5	6.3
- Patella width	2.5	2.5
- Chela length	10.1	9.3
- Chela width	2.5	2.0
- Chela depth	2.7	2.2
Movable finger:		
- length	6.2	5.9

\* Total length including also telson length.

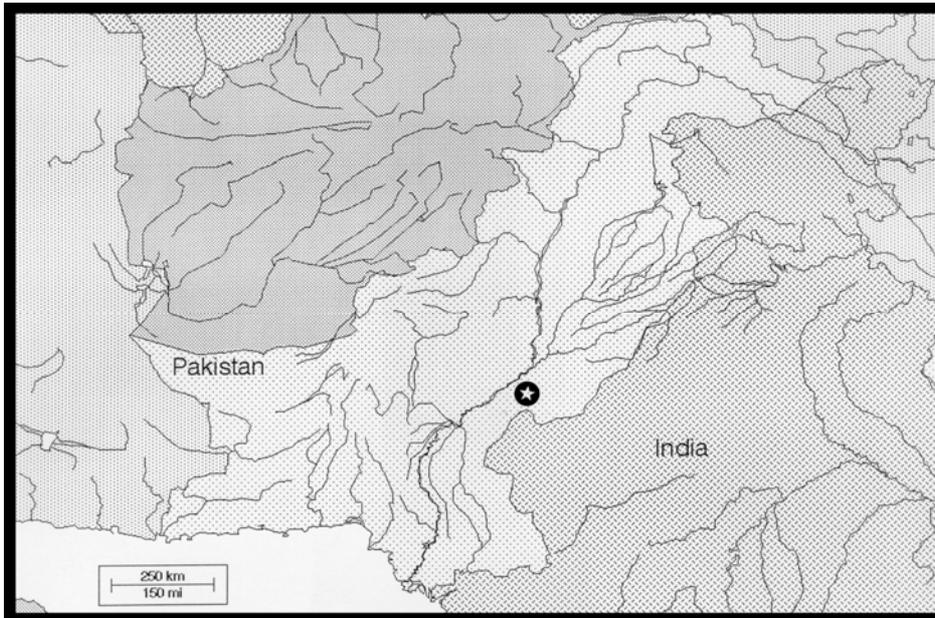
carinae; ventrolateral armed with spinoid granules and three to six lobe-shaped granules; anal arc with one lobe in male and two lobes in female. Dorsal furrows of all segments weakly developed, smooth; intercarinal spaces slightly granular to almost smooth. Telson with a few ventral granules; other spaces smooth. Aculeus long but not strongly curved; subaculear tubercle absent. Chelicerae with two reduced but not fused denticles at the base of the movable finger (Vachon, 1963). Pedipalps: Trichobothrial pattern orthobothriotaxic, type A (Vachon, 1974); dorsal trichobothria of femur in β-beta configuration (Vachon, 1975). Femur pentacarinate; all carinae moderately crenulate. Patella with seven moderately to weakly marked carinae; chela rounded and smooth. Dentate margins on fixed and movable fingers composed of 8-9 almost linear rows of granules; external accessory granules moderate. Legs: Ventral aspect of tarsi with numerous long thin setae. Tibial spurs moderate on legs III and IV, reduced on leg III. Pedal spurs moderate on all legs.

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**Figs. 1-15.** *Buthacus pakistanensis* sp. n. **1-10.** Male holotype. **11.** Female paratype. **1-5.** Trichobothrial pattern. **1-2.** Chela, dorso-external and ventro-internal aspects. **3.** Femur, dorsal aspect. **4-5.** Patella, dorsal and external aspects. **6.** Detail of the lateral eyes. **7.** Disposition of granulations on the dentate margins of the pedipalp chela movable finger. **8-9.** Chelicera, dorsal and ventral aspects. **10-11.** Sternum and genital operculum, male and female. **12-13.** Metasomal segments II-IV, lateral and ventral aspects (male holotype). **14-15.** Metasomal segment V and telson, lateral and ventral aspects (female paratype).



**Fig. 16.** Map of Pakistan showing the type locality of the new species.

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