

The genus *Microbuthus* Kraepelin, 1898 in North Africa and redescription of *Microbuthus litoralis* (Pavesi, 1885) (Scorpiones: Buthidae)

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(with 8 figures)

Abstract

The taxonomic status of *Microbuthus litoralis* (Pavesi) and *Microbuthus pusillus* Kraepelin are reconsidered. Based on the study of new material from both type localities, *M. pusillus* is considered as a synonym of *M. litoralis*. A neotype is proposed for *M. litoralis*, and the species is redescribed.

Key words: Scorpiones, Buthidae, *Microbuthus litoralis*, neotype.

Introduction

The genus *Microbuthus* was described by Kraepelin (1898), with type species, *Microbuthus pusillus* Kraepelin, 1898 collected in the region of Tadjura Bay (=Tadscharabay) in the Gulf of Aden, Djibouti. Another species, *Microbuthus litoralis* was described by Pavesi (1885) as *Butheolus litoralis* from Assab, on the Red Sea coast of Eritrea. This species was subsequently transferred to the genus *Microbuthus* by Birula (1905). The genus *Microbuthus* was represented only by these two species until the description of *Microbuthus fagei* by Vachon (1949) collected at Nouakchott in the coastal region of the Atlantic Ocean in the south of Mauritania. Lourenço (2002) proposed a subspecies of *Microbuthus fagei* for the population distributed in South of Morocco, as *Microbuthus fagei maroccanus* which was subsequently raised to species (Lourenço & Duhem, 2006). More recently, three other new species have been described for the genus: *Microbuthus flavorus* from Egypt by Lourenço & Duhem (2006), and *Microbuthus gardneri* and *Microbuthus kristensenorum* by Lowe (2010) from Oman.

Although seven species have been described up to now, the identity of at least two species remained questionable. This is due to the scarcity of known material, but also to the fact that some of the type specimens have been mislaid. *Microbuthus pusillus* is known only from its type specimen, most certainly a juvenile of uncertain sex (Vachon 1952), and the type material of *Butheolus litoralis*, presumably an adult female, cannot be found in any of the Italian museums. Since these two species are morphologically

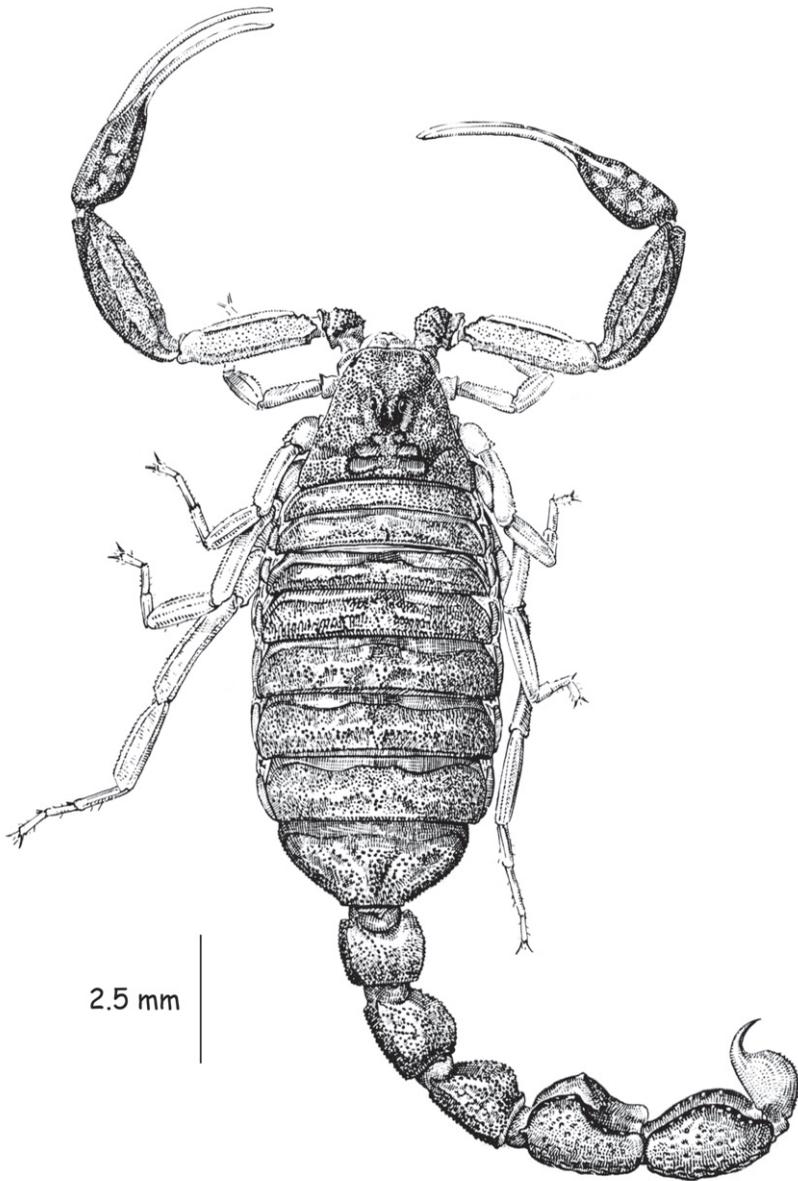


Fig. 1. *Microbuthus litoralis* (Pavesi). Neotype ♀. Habitus.

very similar, and have been described from geographically close localities, questions remain about their taxonomic validity. A few years ago, I received from my colleague P. M. Brignoli some scorpions from Eritrea, including one adult female of *Microbuthus* from Assab, type locality of *M. litoralis*. The comparative study with the only existing type of *M. pusillus* has not led to any final results since the latter one was a juvenile (probably a female). More recently, I received two females, including one with an offspring, from Djibouti, type locality of *M. pusillus*. A new comparative study led to the conclusion that both species represent a single population, and *M. pusillus* should be considered at present as a junior synonym of *M. litoralis*. The possibility was already suggested by Kovařík (2003); however, he chose to consider *M. litoralis* a *nomen dubium*. *M. litoralis* is redescribed and the female from Assab is designated as a neotype. The designation of neotypes is only recommended by the International Code of Zoological Nomenclature (ICZN, Article 75) when there is an exceptional need. This appears to be the case in the present situation, in order to bring a final stability to the nomenclature.

Methods

Illustrations and measurements were produced with the aid of a Wild M5 stereomicroscope 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 mostly follows Hjelle (1990).

Taxonomic account

Family Buthidae, C. L. Koch, 1837
Genus *Microbuthus* Kraepelin, 1898

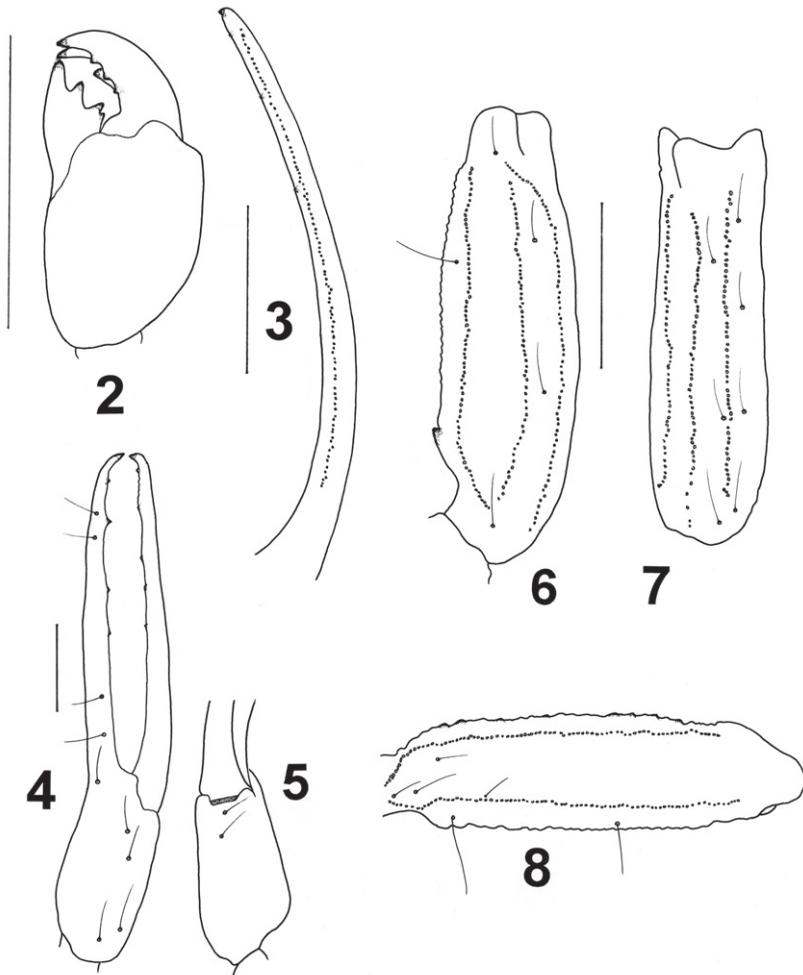
Microbuthus litoralis (Pavesi, 1885)
(Figs 1-8)

(= *Microbuthus pusillus* Kraepelin, 1898: syn. n.)

TYPE MATERIAL: Neotype ♀, here designated (holotype presumed lost). Eritrea, S of Assab, April 1982 (coll. P. M. Brignoli). Deposited in the Zoologisches Museum Hamburg (ZMH), Acc. No. A22/11.

Other material examined: NE Djibouti, 8 Mai 2009, coll. T. Anthony, ♀ with 4 offspring (= 3 ♀, ♂). Material in ZMH, Acc. No. A23/11).

DIAGNOSIS. A small scorpion only 17.4 mm in total length. Coloration dark as in some of the other species, ranging from reddish-yellow to reddish-brown. Pectinal tooth counts 10-11 in females, 12-13 in male. Metasomal segment I wider than long; segments II and III longer than wide; segment IV with similar values for length and width; segment V longer than wide. Tibial spurs on leg III absent; extremely reduced, almost obsolete on leg IV. Trichobothrial pattern: minorante neobothriotaxy; chela (hand + fixed finger) with the absence of trichobothria *est*, *Esb*, *Eb*₃; patella with trichobothrium *d*₂ extremely reduced or absent and seven external trichobothria; femur with the absence of trichobothrium *d*₂, and an extremely reduced *d*₅.



Figs 2-8. *Microbutthus littoralis* Pavesi. Neotype ♀. **2.** chelicera, dorsal aspect. **3.** cutting edge of movable finger with rows of granules. **4-5.** chela, dorso-external and ventral aspects. **6-7.** patella, dorsal and external aspects. **8.** femur, dorsal aspect (scale bars = 1 mm).

DESCRIPTION: Based on female neotype and on specimens from Djibouti (measurements following the description).

C o l o r a t i o n. Basically reddish-yellow to reddish-brown. Prosoma: carapace dark brown, spotted with blackish pigment particularly in the central zone; eyes surrounded by black pigment. Mesosoma: reddish-brown with some paler confluent zones; tergite VII darker, almost blackish. Metasoma:

segment I to III dark brown to blackish; segments IV and V reddish, with dark zones over carinae. Vesicle reddish-yellow; aculeus yellowish at the base and reddish at the tip. Venter dark yellow except in sternite VII where it is dark brown. Pectines and genital operculum pale yellow. Chelicerae yellow with dark reticulated spots on the anterior half; fingers brownish-yellow with reddish teeth. Pedipalps reddish-brown with chela fingers yellow; granulations on cutting edge of fingers slightly reddish. Legs brownish-yellow.

MORPHOLOGY. P r o s o m a: Carapace strongly narrowed anteriorly, almost triangular; anterior margin almost without a median concavity, straight. Carinae weakly marked; granulations strongly marked by pearl-like granules. Furrows weak. Median ocular tubercle only slightly anterior to the centre of the carapace; median eyes separated by one and half ocular diameters. Three pairs of lateral eyes. Sternum triangular, wider than long. M e s o - s o m a I tergites moderately to strongly granular. Median carina moderate and present in all tergites; the two lateral carinae vestigial. Tergite VII pentacarinata but weakly crenulate. Venter: genital operculum of large size divided longitudinally and longer than the sternum. Pectines: pectinal tooth count (see diagnosis); 10-10 in female neotype; basal middle lamellae of the pectines not dilated; fulcra reduced. Sternites III-VI with thin granulation; granules on VII much stronger with two vestigial carinae; two lateral furrows present on sternites III-VI. Short semi-slit-like spiracles. M e t a s o - m a I segments rounded with ten carinae moderately to strongly marked on segments I to III; carinae on segment III partially fused with the granulations; segments IV and V with only vestigial dorsal carinae and with numerous punctuations. Intercarinal spaces strongly granular on segments I to III. Telson slightly punctuated, with two small lateral furrows and one ventral carina with a serrula shape; aculeus very short and strongly curved; subaculear tooth absent. C h e l i c e r a I dentition characteristic of the family Buthidae: the basal teeth in the movable finger are almost fused (Vachon 1963). P e d i p a l p s: femur pentacarinata; patella with seven carinae and the internal face without any spinoid granule; chela with vestigial carinae; all faces with thin but intense granulation. Fixed and movable fingers with one linear row of granules divided by some stronger spinoid accessory granules; extremity of the fingers with one strong accessory granule giving the shape of forceps to the fingers. Trichobothriotaxy; minorante neobothriotaxy; $A-\beta$ (*beta*) for the disposition of the dorsal trichobothria of the femur (Vachon 1974, 1975); trichobothrium d_2 is absent from the femur, and d_5 is extremely reduced; patella with seven external trichobothria, and with d_2 extremely reduced or absent; chela (hand + fixed finger) with the trichobothria *est*, *Esb*, *Eb₃* absent. L e g s: tarsus with a few median fine setae ventrally; pedal spurs moderate on legs III and IV; tibial spurs absent on leg III and reduced on leg IV.

Morphometric values (in mm) of female neotype. Total length, 17.4, without the telson. Carapace: length, 2.4; anterior width, 1.5; posterior width, 3.4. Metasomal segments. I: length, 1.3; width, 1.5; II: length, 1.5; width, 1.4; III: length, 1.7; width, 1.5; IV: length, 2.1; width, 2.1; V: length, 2.4; width, 2.1; depth, 1.5. Vesicle: width, 0.8; depth, 0.9. Pedipalp: femur length, 2.4, width, 0.7; patella length, 2.8, width, 0.9; chela length, 4.9, width, 0.8, depth, 0.7; movable finger length, 3.3.

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References

- Birula A. A. 1905: Skorpiologische Beiträge, 1-3. *Microbuthus littoralis* (Pav.), *Anomalobuthus rickmersi* Krpl. und *Buthus zarudnianus* n. nom. – Zool. Anzeiger, **29**: 445-450. Jena.
- Hjelle, J. T. 1990: Anatomy and morphology. – Pp. 9-63, In: Polis, G.A. (ed.). The Biology of Scorpions. Stanford Univ. Press, 587 pp. Stanford.
- International Code of Zoological Nomenclature (ICZN), 1999: Fourth Edition, 306 pp. London.
- Kovařík, F. 2003: Scorpions of Djibouti, Eritrea, Ethiopia, and Somalia (Arachnida: Scorpiones), with a key and descriptions of three new species. – Acta Soc. Zool. Bohem., **67**: 133-159. Praha.
- Kraepelin K. 1898: Neue Pedipalpen und Skorpionen des Hamburger Museums. – Mitt. Natur. Museum (2. Beiheft zum Jahrb Hamburg. wissenschaft. Anstalt, 1897), **15**: 39-44. Hamburg.
- Lourenço W. R. 2002: Nouvelles considérations sur la classification et la biogéographie du genre *Microbuthus* Kraepelin (Scorpiones, Buthidae); caractérisation d'une nouvelle sous-espèce pour le Maroc. – Biogeographica, **78**: 165-176. Paris
- Lourenço, W. R. Duhem, B. 2006: Observations on the remarkable disrupted geographical distribution of the genus *Microbuthus* Kraepelin, 1898 in North Africa, with the description of a new species from Egypt (Scorpiones, Buthidae). – C. R. Biologies, **330**: 439-445. Paris.
- Lowe, G., 2010: New picobuthoid scorpions (Scorpiones: Buthidae) from Oman. – Euscorpius, **93**: 1-53. Hutington, West Virginia (online publication).
- Pavesi, P. 1885: Aracnidi raccolti dal conte Bouturlin ad Assab e Massaua. – Boll. Soc. Entomol. italiana, **17**: 197-200. Genova.
- Stahnke, H. L. 1970: Scorpion nomenclature and mensuration. – Entomol. News, **81**: 297-316. Philadelphia.
- Vachon M. 1949: Etudes sur les Scorpions. III (suite). Description des Scorpions du Nord de l'Afrique. – Arch. Inst. Pasteur d'Algérie, **27**: 334-396. Alger.
- Vachon M. 1952: Etude sur les Scorpions. – Institut Pasteur d'Algérie, 482 p. Alger.
- Vachon M. 1963: De l'utilité, en systématique, d'une nomenclature des dents des chélicères chez les scorpions. – Bull. Mus. natn Hist. nat., 2e sér., **35**: 161-166. Paris.

Vachon M. 1974: Etude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. – Bull. Mus. natn Hist. nat., 3e sér., n° **140**, Zool. 104: 857-958. Paris.

Vachon M. 1975: Sur l'utilisation de la trichobothriotaxie du bras des pédipalpes des Scorpions (Arachnides) dans le classement des genres de la famille des Buthidae Simon. – C. R. S. Acad. Sc., **281**: 1597-1599. Paris.

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