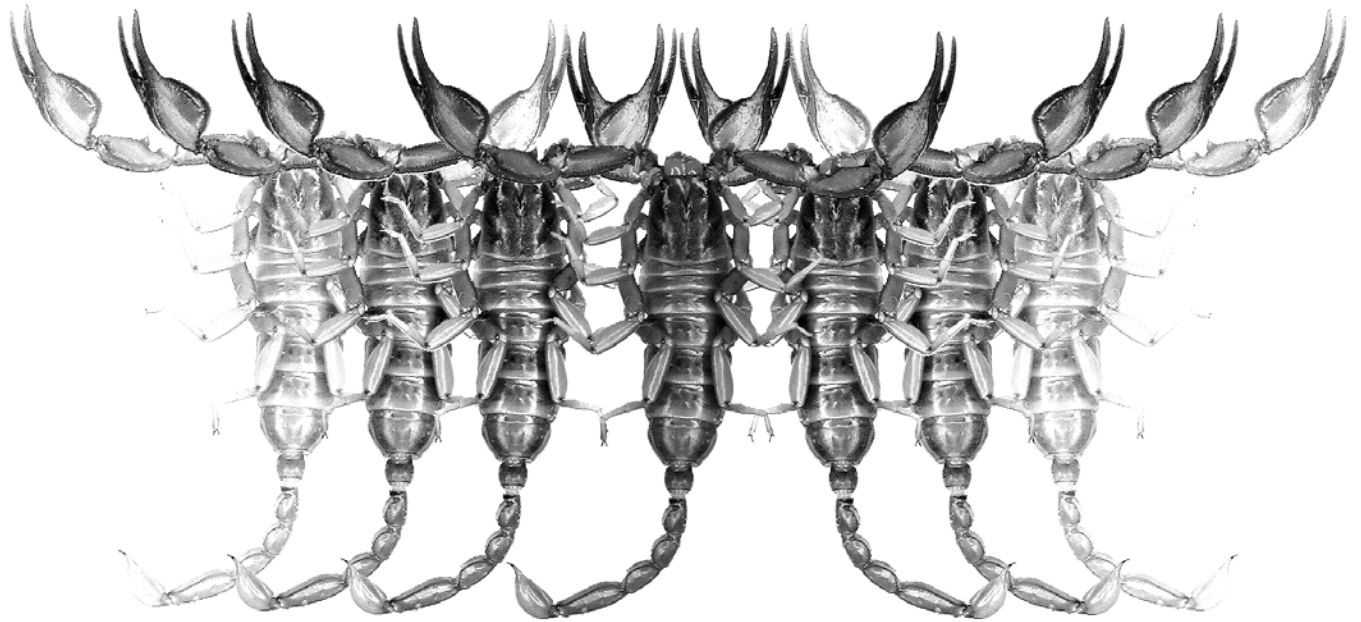


# *Euscorpilus*

Occasional Publications in Scorpiology



**Review of Tunisian Species of the Genus *Buthus* with Descriptions  
of Two New Species and a Discussion of Ehrenberg's Types  
(Scorpiones: Buthidae)**

**František Kovařík**

**February 2006 — No. 34**

# *Euscorpilus*

## Occasional Publications in Scorpiology

*EDITOR:* Victor Fet, Marshall University, 'fet@marshall.edu'

*ASSOCIATE EDITOR:* Michael E. Soleglad, 'soleglad@la.znet.com'

*Euscorpilus* is the first research publication completely devoted to scorpions (Arachnida: Scorpiones). *Euscorpilus* takes advantage of the rapidly evolving medium of quick online publication, at the same time maintaining high research standards for the burgeoning field of scorpion science (scorpiology). *Euscorpilus* is an expedient and viable medium for the publication of serious papers in scorpiology, including (but not limited to): systematics, evolution, ecology, biogeography, and general biology of scorpions. Review papers, descriptions of new taxa, faunistic surveys, lists of museum collections, and book reviews are welcome.

### Derivatio Nominis

The name *Euscorpilus* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpilidae).

*Euscorpilus* is located on Website '<http://www.science.marshall.edu/fet/euscorpilus/>' at Marshall University, Huntington, WV 25755-2510, USA.

---

The International Code of Zoological Nomenclature (ICZN, 4th Edition, 1999) does not accept online texts as published work (Article 9.8); however, it accepts CD-ROM publications (Article 8). *Euscorpilus* is produced in two *identical* versions: online (ISSN 1536-9307) and CD-ROM (ISSN 1536-9293). Only copies distributed on a CD-ROM from *Euscorpilus* are considered published work in compliance with the ICZN, i.e. for the purposes of new names and new nomenclatural acts. All *Euscorpilus* publications are distributed on a CD-ROM medium to the following museums/libraries:

- **ZR**, Zoological Record, York, UK
- **LC**, Library of Congress, Washington, DC, USA
- **USNM**, United States National Museum of Natural History (Smithsonian Institution), Washington, DC, USA
- **AMNH**, American Museum of Natural History, New York, USA
- **CAS**, California Academy of Sciences, San Francisco, USA
- **FMNH**, Field Museum of Natural History, Chicago, USA
- **MCZ**, Museum of Comparative Zoology, Cambridge, Massachusetts, USA
- **MNHN**, Museum National d'Histoire Naturelle, Paris, France
- **NMW**, Naturhistorisches Museum Wien, Vienna, Austria
- **BMNH**, British Museum of Natural History, London, England, UK
- **MZUC**, Museo Zoologico "La Specola" dell'Universita de Firenze, Florence, Italy
- **ZISP**, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

# Review of Tunisian species of the genus *Buthus* with descriptions of two new species and a discussion of Ehrenberg's types (Scorpiones: Buthidae)

František Kovařík

P.O. Box 27, CZ-145 01 Praha 45, Czech Republic

---

## Summary

*Buthus chambiensis*, **sp. n.** and *Buthus dunlopi*, **sp. n.** from Tunisia are described. Presented is also a key to four Tunisian species of the genus *Buthus*. The males of *B. chambiensis*, **sp. n.** and *B. paris* (C. L. Koch, 1839) have narrower chela than the females, which distinguishes them from *B. tunetanus* (Herbst, 1800) and *B. dunlopi*, **sp. n.** Uniformly yellowish mesosoma and very narrow chela of pedipalps distinguish *B. chambiensis*, **sp. n.** from *Buthus paris* (C. L. Koch, 1839). Morphologically closest to *B. chambiensis* **sp. n.** is *Buthus barcaeus* Birula, 1909, **comb. n.** from Libya, which has a different color pattern on mesosomal segments, more bulbous telson, and more densely pubescent legs. *B. dunlopi*, **sp. n.** has sexual dimorphism similar to *B. tunetanus* (Herbst, 1800), but is smaller and has narrower chela of pedipalps. Examination of the holotype results in revalidation of *Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), **comb. n.** with the synonyms *Androctonus (Leirus) tunetanus intermedius* Ehrenberg in Hemprich & Ehrenberg, 1829, **syn. n.** and *Buthus occitanus mardochei* var. *israelis* Shulov & Amitai, 1959, **syn. n.**

---

## Introduction

In 2004 and 2005, I conducted two collecting trips to Tunisia (Kovařík et al., 2005), where in the company of my friends Petr Kabátek and Stanislav Kadlec I visited several localities in the northern and central parts of the country and was able to observe scorpions of the genus *Buthus* Leach, 1815 in their natural environment. Hitherto, there have been only two species, namely *Buthus paris* (C. L. Koch, 1839) and *Buthus tunetanus* (Herbst, 1800), of the *Buthus occitanus* complex recorded from Tunisia. However, already during the field work it became apparent that there are three species involved; in addition to that I found yet another species among previously acquired specimens collected in southern Tunisia. In order to verify that two of the species are really new, I examined Ehrenberg's types pertaining to the *Buthus occitanus* complex with special attention to those whose taxonomic status appeared questionable to me. It turned out that none of Ehrenberg's types can be matched to the species described here as new, although one of his taxa proved to be valid; it is *Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), **comb. n.** All listed specimens are in the author's collection (FKCP) unless noted otherwise.

## Abbreviations

*List of depositories:* FKCP, Personal collection of František Kovařík, Prague, Czech Republic; ZMBH, Museum für Naturkunde der Humboldt-Universität Berlin, Berlin, Germany.

## Systematics

### *Buthus chambiensis*, **sp. n.** (Figs. 1–5, Table 1)

*Type locality and type repository.* **Tunisia**, Kasserine Province, Jebel Chambi Mts., 24 km W Kasserine (Fig. 1); author's collection (FKCP).

*Type material.* **Tunisia**, Kasserine Province, Jebel Chambi Mts., 24 km W Kasserine, 23–24 May 1999, 1♂ imm. (paratype), leg. M. Kafka, 29–30 May 2005, 1♂ (holotype), 2♀ 1 imm. (allotype and paratypes), leg. F. Kovařík.

*Etymology:* Named after the type locality.

*Diagnosis:* Total adult length 60–70 mm. Legs, metasoma, and pedipalps uniformly yellowish brown, mesosoma and carapace darker but without noticeable bands, mesosomal sagittal carina black. Movable fingers

		<i>B. chambiensis</i> sp. n.		<i>B. dunlopi</i> sp. n.		<i>B. paris</i>		<i>B. tunetanus</i>	
		♂	♀	♂	♀	♂	♀	♂	♀
		HT	AT	HT	AT	(Le Kef)		(Balta)	
<b>Total</b>	<b>length</b>	62.3	67.3	58.3	54.2	58.9	71.4	66.2	72.1
<b>Carapace</b>	<b>length</b>	6.1	7.0	6.8	6.0	6.1	7.2	7.3	7.5
	<b>width</b>	6.6	7.6	7.1	6.5	6.4	8.2	7.5	8.2
<b>Metasoma and telson</b>									
	<b>length</b>	36.5	35.8	38.3	31.4	35.8	37.9	40.0	38.1
<b>segment I</b>	<b>length</b>	4.9	4.6	5.0	3.9	4.6	4.8	4.8	4.8
	<b>width</b>	4.8	4.6	4.9	3.9	4.5	5.1	5.0	5.2
<b>segment II</b>	<b>length</b>	5.4	5.4	5.6	4.5	5.5	5.6	5.9	5.5
	<b>width</b>	4.3	4.3	4.7	3.8	4.3	4.7	4.9	4.9
<b>segment III</b>	<b>length</b>	5.5	5.6	5.9	4.8	5.6	5.6	6.1	5.8
	<b>width</b>	4.2	4.3	4.2	3.7	4.1	4.6	4.9	4.8
<b>segment IV</b>	<b>length</b>	6.6	6.3	7.1	5.5	6.5	6.5	7.3	6.8
	<b>width</b>	4.0	4.1	4.2	3.5	3.9	4.5	4.7	4.7
<b>segment V</b>	<b>length</b>	7.2	7.3	7.8	6.7	7.1	7.8	8.5	7.5
	<b>width</b>	3.4	3.9	3.9	3.6	3.6	4.1	4.2	4.5
<b>telson</b>	<b>length</b>	6.7	6.6	6.9	6.0	6.5	7.6	7.3	7.7
<b>Pedipalp</b>									
<b>femur</b>	<b>length</b>	5.4	5.3	5.6	5.0	5.1	5.7	6.0	6.4
	<b>width</b>	1.6	1.7	1.8	1.6	1.5	2.2	2.0	2.2
<b>patella</b>	<b>length</b>	6.1	6.4	6.5	5.8	6.1	6.9	7.9	7.4
	<b>width</b>	2.3	2.7	2.6	2.2	2.4	2.9	3.1	3.2
<b>chela</b>	<b>length</b>	10.5	10.8	10.6	9.8	10.6	11.7	12.6	12.9
	<b>width</b>	2.0	3.2	2.4	2.1	2.4	3.2	4.1	3.9
<b>finger mov.</b>	<b>length</b>	7.2	7.5	7.5	6.7	8.2	7.7	7.9	8.4
<b>Pectinal teeth</b>		29:31	27:28	31:31	27:28	33:34	26:27	29:30	25:26

**Table 1:** Morphometrics (mm) of *Buthus* species. HT = holotype, AT = allotype.

of pedipalps bear 11 or 12 rows of granules with one internal and one external granule and three distal granules. In female, the segments of pedipalps, namely chela, are wider than in male; chela length to width ratio 5.2 in males, 3.4 in females. Pectines with 26–28 teeth in females, 29–33 in males.

**Description:** The adult male holotype is 62.3 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Legs, metasoma, and pedipalps are uniformly yellowish brown, mesosoma and carapace are darker but without noticeable bands, and the sagittal carina on the mesosoma is black. For habitus see Figs. 2–5.

**Mesosoma and carapace:** The mesosoma is granulated, with three median carinae, and the seventh segment ventrally bears four inconspicuous carinae. The carapace is sparsely granulated, with carinae typical for the genus *Buthus* (Fig. 2). Pectinal teeth number 26–28 in females and 29–33 in males.

**Metasoma and telson:** The first segment bears 10 carinae, the second through fourth segments bear eight carinae (the lateral surface of the second and third segments bears a row of granules that exceeds one-half of the segment length but does not form a complete carina). The fifth metasomal segment has five carinae.

The ventrolateral carinae of the fifth segment terminate in two lobes. The ventral carinae on the second and third segments of females posteriorly bear two or three large granules. The surface between carinae is finely granulated, especially in males, may be smooth in females. The telson is bulbous, with the aculeus as long as or shorter than the vesicle.

**Legs:** Tarsomeres of the legs I to III have very dense bristlecombs. The legs IV are only hirsute. All legs have tarsomeres, tibia, and patella hirsute also on the ventral surfaces. Tibial spurs of legs III and IV are moderately developed.

**Pedipalps:** The movable fingers bear 11 or 12 rows of granules that have one internal and one external granule and three distal granules. The chela is smooth, males (including immature) may have smooth carinae and on the femur and patella, granulate carinae. Females have wider segments of pedipalps, especially the chela, than males. The chela length to width ratio is 5.2 in males and 3.4 in females.

**Affinities.** The described features distinguish *Buthus chambiensis*, sp. n. from all other species of the genus. A key to the Tunisian species of the genus is presented below.

*B. chambiensis*, sp. n. is easily distinguished from *B. tunetanus* and *B. dunlopi*, sp. n. by coloration and



**Figure 1:** Type locality of *Buthus chambiensis* sp. n. (Tunisia, Kasserine Province, Jebel Chambi Mts., 24 km W Kasserine).

sexual dimorphism. Whereas the males of *B. tunetanus* and *B. dunlopi*, sp. n. have the chela as wide as or wider than females (Figs 16 and 18), in *B. chambiensis*, sp. n. the chela is markedly narrower in the male than in the female (Figs. 2 and 4, Table 1). Recognition of species within the *Buthus occitanus* complex (Lourenço, 2002, 2003, 2005) should employ sexual dimorphism as a criterion that allows to divide the complex into groups.

Another Tunisian species is *B. paris*, whose presence in the steppes around Le Kef I was able to verify during the 2004 and 2005 trips. This species has sexual dimorphism similar to *B. chambiensis*, sp. n., in which, however, the chela of both sexes is markedly narrower than in *B. paris* (Figs. 2–5). Other differences are given in the key below.

In the neighboring Algeria there occurs *B. tassili* Lourenço, 2002, which differs from all Tunisian species in having the telson and the fifth metasomal segment dark.

The species in all respects closest to *B. chambiensis*, sp. n. is *Buthus barcaeus* Birula, 1909, **comb. n.** from Libya (Fig. 6), which, however, is larger and has differently colored mesosoma, more bulbous telson, and more densely hirsute legs. This latter species is here elevated to the species status according to the current recognition of former *Buthus occitanus* as a species complex.

### ***Buthus dunlopi*, sp. n.**

(Figs. 7–8, Table 1)

*Type locality and type repository.* **Tunisia**, near Remada; author's collection (FKCP).

*Type material.* **Tunisia**, near Remada, 2♂ (holotype and paratype), 3♀ (allotype and paratypes), 20 September 1989, anonymous collector.

*Etymology:* Named after Jason Dunlop of the Museum für Naturkunde, Zentralinstitut der Humboldt-Universität zu Berlin, in appreciation of his kind help.

*Diagnosis:* Total adult length 50–60 mm. Legs, metasoma and pedipalps uniformly yellowish brown; mesosomal sagittal carina black, with adjacent dark band on each side. Movable fingers of pedipalps bear 12 rows of granules with one internal and one external granule and 3 distal granules. Chela of pedipalp narrow in both sexes, its length to width ratio 4.4–4.7. Pectinal teeth number 26–28 in females and 31–33 in males.

*Description:* The adult male holotype is 58.3 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Legs, metasoma and pedipalps are uniformly yellowish brown, ventral carinae on the metasoma may be black. The metasomal sagittal carina is black, with adjacent median dark band



**Figure 2:** *Buthus chambiensis* sp. n., ♂ holotype, dorsal aspect.



**Figure 3:** *Buthus chambiensis* sp. n., ♂ holotype, ventral aspect.



Figure 4: *Buthus chambiensis* sp. n., ♀ allotype, dorsal aspect.



Figure 5: *Buthus chambiensis* sp. n., ♀ allotype, ventral aspect.



**Figure 6:** *Buthus barcaeus* Birula, 1909, comb. n., immature ♀ from Libya (Tarabulus Province, Abu Qurayn, 31°26'N, 15°14'E, ca. 52 m a. s. l., 14 April 2003, leg. M. Kaftan).

on each side. Colors tend to be more contrasting in females. For habitus see Figs. 7 and 8.

*Mesosoma and carapace:* The mesosoma is granulated, with three median carinae, and the seventh segment ventrally bears four inconspicuous carinae. The carapace is sparsely granulated, with carinae typical for the genus. Pectinal teeth number 26–28 in females and 31–33 in males.

*Metasoma and telson:* The first segment bears 10 carinae, the second through fourth segments bear eight carinae (the lateral surface of the second and third segments bears a row of granules that exceeds one-half of the segment's length but does not form a complete carina). The fifth metasomal segment has five carinae. The ventrolateral carinae on the fifth segment terminates in two lobes. The ventral carinae on the second and third segments, namely in females, posteriorly bear two or three large granules. The surface between carinae is finely granulated, namely in males, in females it may be smooth. The telson is bulbous, with the aculeus as long as or shorter than the vesicle.

*Legs:* Tarsomeres of legs I to III have very dense bristlecombs. The legs IV are only hirsute. All legs have

tarsomeres, tibia, and patella hirsute also on the ventral surfaces. Tibial spurs of legs III and IV are moderate.

*Pedipalps:* The movable fingers bear 12 rows of granules that have one internal and one external granule and three distal granules. The chela is smooth, in some males with weakly indicated smooth carinae; the femur and patella bear granulate carinae. The chela is almost equally narrow in both sexes, its length to width ratio is 4.4–4.7.

*Affinities.* The described features distinguish *Buthus dunlopi* sp. n. from all other species of the genus. A key to the Tunisian species is presented below. *B. dunlopi* sp. n. has the same sexual dimorphism as *B. tunetanus*, but is larger, has a differently colored metasoma and its chela of pedipalp is markedly more robust. The chela length to width ratio in *B. tunetanus* is always lower than 3.5, whereas in *Buthus dunlopi*, sp. n. it is 4.4–4.7.

***Buthus paris*** (C. L. Koch, 1839)  
(Figs. 9–11, Table 1)

*Androctonus paris* C. L. Koch, 1838: 25, fig. 352; C. L. Koch, 1850: 90.





Figure 7: *Buthus dunlopi* sp. n., ♂ holotype, dorsal aspect.



Figure 8: *Buthus dunlopi* sp. n., ♀ allotype, dorsal aspect.



**Figure 9:** Locality of *Buthus paris* (C. L. Koch, 1839) (Tunisia, Le Kef Province, 6 km N Le Kef, 1 June 2005).

*Buthus occitanus paris*: Birula, 1903: 107; Birula, 1914: 644; Vachon, 1949: 380; Vachon, 1952: 308; Kovařík, 1998: 106; Fet & Lowe, 2000: 96.

*Buthus paris*: Lourenço, 2003: 896.

= *Androctonus clytoneus* C. L. Koch, 1838: 70, fig. 384; C. L. Koch, 1850: 90 (syn. by Kraepelin, 1891: 196).

**Material examined:** **Tunisia**, Kairovan, 1♂, May 1930 (collector unknown); Le Kef, 1 juv. 1970 (collector unknown); Le Kef Province, 6 km N Le Kef (Fig. 9), 1 June 2005, 1♂ (Fig. 10) 1♀, leg. F. Kovařík.

**Diagnosis:** Total adult length 55–75 mm. Legs, metasoma and pedipalps uniformly reddish brown, carapace and mesosoma dark with conspicuous orangish-brown sagittal band or at least spots. Movable fingers of pedipalps bear 12 to 14 rows of granules with one internal and one external granule and three distal granules. In female, chela of pedipalp wider than in male. Pectines with 23–28 teeth in females and 29–34 in males. First metasomal segment with 10 carinae, second to fourth segments with eight carinae (lateral surface of second and third segments with row of granules that may exceed one-half of segment length but does not form a complete carina). Fifth metasomal segment with five carinae. Ventrolateral carinae on metasomal segment terminates in two lobates. Telson bulbous, aculeus shorter than vesicle.

***Buthus tunetanus*** (Herbst, 1800)  
(Figs. 12–19, Table 1)

*Scorpio tunetanus* Herbst, 1800: 68.

*Androctonus (Leiurus) tunetanus*: Hemprich & Ehrenberg, 1828: 4; Hemprich & Ehrenberg, 1829: 354.

*Androctonus (Leiurus) tunetanus genuinus*: Hemprich & Ehrenberg, 1831 (pages unnumbered).

*Androctonus tunetanus*: C. L. Koch, 1845: 15, fig. 968; C. L. Koch, 1850: 90; C. Koch, 1873: 106.

*Buthus occitanus tunetanus*: Birula, 1903: 107; Vachon, 1949: 344; Vachon, 1952: 272; Levy & Amitai, 1980: 21; Kovařík, 1998: 106; Fet & Lowe, 2000: 97; Lourenço, 2002: 110; Babay & Nouira, 2003: 54.

*Buthus tunetanus*: Lourenço, 2003: 897.

**Material examined:** **Tunisia**, Gafsa Province, near Gafsa, 1964, 1♀ (collector unknown); Gafsa Province, 25 km SW Mezzouna, near Bou Hedma National Park, 23 April 2004 (Fig. 12), 2 juvs., leg. F. Kovařík; Beja Province, Jebel Sabbah Mts., Bou Salem, 10 km NW Balta, 27 May 2005 and 2 June 2005 (Figs. 13 to 15), 4♂, 8♀, 3 immatures, 2 juvs. (Figs. 16–19), leg. F. Kovařík.

**Diagnosis:** Total adult length 60–80 mm. Legs, metasoma, and pedipalps uniformly yellowish or reddish brown; mesosoma and carapace darker, with median and



Figure 10: *Buthus paris*, ♂ at the locality pictured in Figure 9.



Figure 11: *Buthus paris*, ♀ from Morocco (Meknes prov., 17 km NW of Azrou, 33°34.23'N, 05°19.69'W, 16 February 2005, leg. R. Fouquè, H. Fouquè & S. Bečvār).



**Figure 12:** Locality of *Buthus tunetanus* (Herbst, 1800) (Tunisia, Gafsa Province, 25 km SW Mezzouna, near Bou Hedma National Park, 23 April 2004).

lateral yellowish-brown spots. Movable fingers of pedipalps bear 10 or 11 rows of granules with one internal and one external granule and three distal granules. Chela of pedipalp wide in both sexes, in males wider than in females. Pectines with 24–29 teeth in females and 29–35 in males. First metasomal segment with 10 carinae, second to fourth segments with eight carinae (lateral surface of second and third segments with row of granules that reaches midlength of segment but does not form a complete carina). Fifth metasomal segment bears five carinae. Ventrolateral carinae terminates in two lobes. Telson bulbous, aculeus shorter than vesicle.

*Comments.* The type of *Buthus tunetanus* (Herbst, 1800) is considered lost (Fet & Lowe, 2000: 97), but this species can be recognized by its size and chela wider in males than in females, a feature that has long been accepted as diagnostic (see fig. 381 in Vachon, 1952: 273).

*Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), **comb. n.**  
(Fig. 20)

*Androctonus (Leiurus) tunetanus intumescens* Ehrenberg in Hemprich & Ehrenberg, 1829: 354.

*Androctonus (Liurus) tunetanus intumescens*: Hemprich & Ehrenberg, 1831 (pages unnumbered).

*Androctonus (Leiurus) tunetanus intermedius* Ehrenberg in Hemprich & Ehrenberg, 1829: 355, **syn. n.**

*Androctonus (Liurus) tunetanus intermedius*: Hemprich & Ehrenberg, 1831 (pages unnumbered).

*Buthus occitanus mardochei* var. *israelis* Shulov & Amitai, 1959: 219, **syn. n.**

*Buthus occitanus israelis*: Levy & Amitai, 1980: 16, figs. 25–29; Fet & Lowe, 2000: 95.

*Material examined:* **Egypt**, 1♀, leg. F. W. Hemprich & C. G. Ehrenberg (ZMHB No. 145, holotype of *A. t. intumescens*). **?Yemen**, Lohaie, now Al Luhayyah, probably incorrect locality, 1♀, leg. F. W. Hemprich & C. G. Ehrenberg (ZMHB No. 146, holotype of *A. t. intermedius*). **Israel**, south part of Negev, Vadi Hazaz near Sede Boqer (Haluqim Ridge), November–December 2004, 1♂ 3♀, 5 juvs., leg. J. Král (FKCP).

*Comments.* It was important to examine the type of *Androctonus (Leiurus) tunetanus intumescens* Ehrenberg in Hemprich & Ehrenberg, 1829, hitherto considered a syn-



**Figure 13:** Locality of *Buthus tunetanus* (Tunisia, Beja Province, Jebel Sabbah Mts., Bou Salem, 10 km NW Balta, 27 May 2005 and 2 June 2005).

onym of *Buthus tunetanus* (see Fet & Lowe, 2000: 97), to verify that it is not one of the species proposed in this study as new. The holotype in question is a female (Fig. 20) from Egypt (ZMHB No. 145) and has the chela markedly narrower than *B. tunetanus*; its movable fingers bear 11 rows of granules.

I have not been able to find any differences between this type, the holotype of *Androctonus (Leiurus) tunetanus intermedius*, and *Buthus* specimens from Israel identified as *Buthus occitanus israelis*. The inevitable conclusion is that *Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), comb. n. is a valid species occurring in Egypt (Sinai) and Israel, and its synonyms are *Buthus occitanus mardochei* var. *israelis* Shulov & Amitai, 1959, syn. n. and *Androctonus (Leiurus) tunetanus intermedius* Ehrenberg in Hemprich & Ehrenberg, 1829, syn. n. The holotype of the latter taxon is a female labeled as from Lohaie (ZMHB No. 146). Lohaie, now Al Luhayyah, Yemen, probably is an incorrect locality, because no specimen of *Buthus* from the Arabian Peninsula has ever been confirmed (Braunwalder & Fet, 1998: 34; Fet & Lowe, 2000: 94). Although *Androctonus (Leiurus) tunetanus intumescens* and *A. (L.) tunetanus intermedius* are described in the same work, the description of *A. t. intumescens* (p. 354) precedes that of *A. t.*

*intermedius* (p. 355), thus the first name must have priority.

In case of *Buthus occitanus mardochei* var. *israelis* Shulov & Amitai, 1959, I have not studied types and base my conclusions on nine studied specimens from Negev. As noted above, the primary criterion for assessing species of the *Buthus occitanus* complex, i.e. all taxa formerly considered subspecies of *Buthus occitanus* (Amoreux, 1789) or of *Buthus tunetanus* (Herbst, 1800), is the width of pedipalp chela and its relation to sexual dimorphism. In the case of *Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), comb. n. the different width of chela shows this taxon to have the status of a species rather than a subspecies (Fig. 20), as the chela is narrower than in *Buthus occitanus* (Amoreux, 1789) and *Buthus tunetanus* (Herbst, 1800) (Figs. 16 and 18).

#### Key to Tunisian species of the genus *Buthus*

1. Chela of same width in both sexes, or male chela slightly wider (Figs. 18 and 16) ..... **2**  
– Chela much wider in female than in male (Figs. 4 and 2) ..... **3**



**Figure 14:** Burrow of *Buthus tunetanus* at the locality pictured in Figure 13.



**Figure 15:** Female *Buthus tunetanus* at the locality pictured in Figure 13.



Figure 16: *Buthus tunetanus*, ♂, dorsal aspect.



Figure 17: *Buthus tunetanus*, ♂, ventral aspect.



**Figure 18:** *Buthus tunetanus*, ♀, dorsal aspect.



**Figure 19:** *Buthus tunetanus*, ♀, ventral aspect.





**Figure 20:** *Buthus intumescens* (Ehrenberg in Hemprich & Ehrenberg, 1829), comb. n., ♀, holotype, dorsal aspect.

2. Adults 60–80 mm long, with robust chela. Chela length to width ratio always lower than 3.5

..... *Buthus tunetanus*

– Adults under 60 mm long. Chela length to width ratio always higher than 4.3 ..... *Buthus dunlopi*, **sp. n.**

3. Base color reddish brown, with conspicuous dark grayish-brown to ochre pattern on mesosoma. Movable fingers of pedipalps bear 12 to 14 rows of granules. Male chela length to width ratio lower than 4.8

..... *Buthus paris*

– Base color yellowish brown, mesosoma darker and without noticeable color pattern. Movable fingers of pedipalps bear 11 or 12 rows of granules. Male chela very narrow (the narrowest of all Tunisian species of *Buthus*). Chela length to width ratio 5.25 in males, 3.4 in females ..... *Buthus chambiensis*, **sp. n.**

### Acknowledgments

I am grateful to Shahin Navai and Jason Dunlop (ZMHB) for loans of Ehrenberg's types pertinent to the *Buthus occitanus* complex from the collections in their care. Special thanks are due to Jiří Zidek for translating the text and my friends Petr Kabátek and Stanislav Kadlec for their company and support throughout collecting in Tunisia.

### References

- BABAY, J. & S. NOUIRA. 2003. Structure et diversité du peuplement des scorpions de la région de Sidi-Bouزيد en Tunisie. *Biogeographica*, 79(2): 49–58.
- BIRULA, A. A. 1903. Bemerkungen über einige neue oder wenig bekannte Skorpionenformen Nord-Afrikas. *Bulletin de l'Académie Impériale des Sciences de St.-Petersbourg*, 19: 105–113.
- BIRULA, A. A. 1914. Ergebnisse einer von Prof. Franz Werner im Sommer 1910 mit Unterstützung aus dem Legate Wedl ausgeführten zoologischen Forschungsreise nach Algerien. VI. Skorpione und Solifugen. *Sitzungsberichte der Kaiserlich-Königlichen Akademie der Wissenschaften, Wien*, 123(1): 633–668.
- BRAUNWALDER, M. E. & V. FET. 1998. On publications about scorpions (Arachnida, Scorpiones) by Hemprich and Ehrenberg (1828–1831). *Bulletin of the British Arachnological Society*, 11(1): 29–35.
- FET, V. & G. LOWE. 2000. Family Buthidae C. L. Koch, 1837. Pp. 54–286 in: Fet, V., Sissom, W. D., G. Lowe & M. E. Braunwalder. 2000. *Catalog of the Scorpions of the World (1758-1998)*. The New York Entomological Society, New York, 689 pp.

- HEMPRICH, F. W. & C. G. EHRENBERG. 1828. Zoologica II. Arachnoidea. Plate I: *Buthus*; plate II: *Androctonus*. In *Symbolae physicae seu icones et descriptiones animalium evertibratorum sepositis insectis quae ex itinere per Africam borealem et Asiam occidentalem. Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg, medicinae et chirurgiae doctorum, studio novae aut illustratae redierunt. Percensuit et regis iussu et impensis edidit Dr. C. G. Ehrenberg*. Decas prima. Berolini ex Officina Academica, Venditur a Mittlero (plates only).
- HEMPRICH (F. W.) & (C. G.) EHRENBERG. 1829. Vorläufige Uebersicht der in Nord-Afrika und West-Asien einheimischen Skorpione und deren geographischen Verbreitung, nach den eigenen Beobachtungen. *Verhandlungen der Gesellschaft Naturforschende Freunde in Berlin*, 1(6): 348–362.
- HEMPRICH, F. W. & C. G. EHRENBERG. 1831. *Animalia articulata, Arachnoidea. Scorpiones africani et asiatici*. In *Symbolae Physicae. Animalia evertibrata exclusis insectis percensuit Dr. C. G. Ehrenberg. Series prima cum tabularum decade prima. Continet animalia africana et asiatica 162*. Berolini ex Officina Academica, Venditur a Mittlero, 12 pp. (unnumbered) (a separate text which was intended to be a part of the 1828 issue of "Symbolae physicae").
- HERBST, J. F. W. 1800. Naturgeschichte der Skorpionen. *Natursystem der Ungeflügelten Insekten*. Berlin: Bei Gottlieb August Lange, 86 pp.
- KOCH, C. L. 1838. *Die Arachniden*. 5(1). Nürnberg: C. H. Zeh'sche Buchhandlung, 25-30, Figs. 352-353.
- KOCH, C. L. 1845. *Die Arachniden* 12(1). Nürnberg: C. H. Zeh'sche Buchhandlung, 166 pp, Figs. 960-968.
- KOCH, C. L. 1850. *Übersicht des Arachnidensystems*. 5. Nürnberg: C. H. Zeh'sche Buchhandlung, 104 pp.
- KOCH, C. 1873. Beiträge zur Kenntnis der Arachniden Nord-Afrikas, insbesondere einiger in dieser Richtung bisher noch unbekannt gebliebenen Gebiete des Atlas und der Küstenländer von Marocco. *Bericht über die Senckenbergische Naturforschende Gesellschaft in Frankfurt am Main*, 1873: 104–118.
- KOVAŘÍK, F. 1998. *Štíři [Scorpiones]*. Jihlava (Czech Republic): Publishing House "Madagaskar", 176 pp. (in Czech).
- KOVAŘÍK, F. 2001. Catalog of the Scorpions of the World (1758-1998) by V. Fet, W. D. Sissom, G. Lowe, and M. Braunwalder (New York Entomological Society, 2000: pp. 690). Discussion and supplement for 1999 and part of 2000. *Serket*, 7(3): 78–93.
- KOVAŘÍK, F., P. KABÁTEK & T. MAZUCH. 2005: Do Tuniska nejen za štíry (To Tunisia not only for scorpions). *Akva Tera Fórum* 1(1): 76–80. (in Czech, with English summary)
- KRAEPELIN, K. 1891. Revision der Skorpione. I. Die Familie des Androctonidae. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, 8(1890): 144–286 (1–144).
- LEVY, G. & P. AMITAI. 1980. *Fauna Palaestina, Arachnida I. Scorpiones*. The Israel Academy of Sciences and Humanities, 132 pp.
- LOURENÇO, W. R. 2002. Considérations sur les modes de distribution et differentiation du genre *Buthus* Leach, 1815, avec la description d'une nouvelle espèce des montagnes du Tassili des Ajjer, Algerie (Scorpiones, Buthidae). *Biogeographica* 78(3): 109–127.
- LOURENÇO, W. R. 2003. Compléments à la faune de scorpions (Arachnida) de l'Afrique du Nord, avec des considérations sur le genre *Buthus* Leach, 1815. *Revue suisse de Zoologie*, 110(4): 875–912.
- LOURENÇO, W. R. 2005. A new scorpion species of the genus *Buthus* Leach, 1815 (Scorpiones, Buthidae) from Morocco. *Euscorpius*, 19: 1–6.
- LOURENÇO, W. R. & T. SLIMANI. 2004. Description of a new scorpion species of the genus *Buthus* Leach, 1815 (Scorpiones: Buthidae) from Morocco. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 14(169): 165–170.
- LOURENÇO, W. R. & M. VACHON. 2004. Considérations sur le genre *Buthus* Leach, 1815 en Espagne, et description de deux nouvelles espèces (Scorpiones: Buthidae). *Revista Ibérica de Aracnología*, 9: 81–94.
- SHULOV, A. & P. AMITAI. 1959. Observations sur les scorpions, *Buthus occitanus* ssp. *mardochei* var. *israelis* var. nov. *Archives de l'Institut Pasteur d'Algérie*, 37: 218v225.
- VACHON, M. 1952. *Études sur les scorpions*. Institut Pasteur d'Algérie, Alger, 482 pp. (published 1948–1951 in *Archives de l'Institut Pasteur d'Algérie*, 1948, 26: 25–90, 162–208, 288–316, 441–481; 1949, 27: 66–100, 134–169, 281–288, 334–396; 1950, 28: 152–216, 383–413; 1951, 29: 46–104).