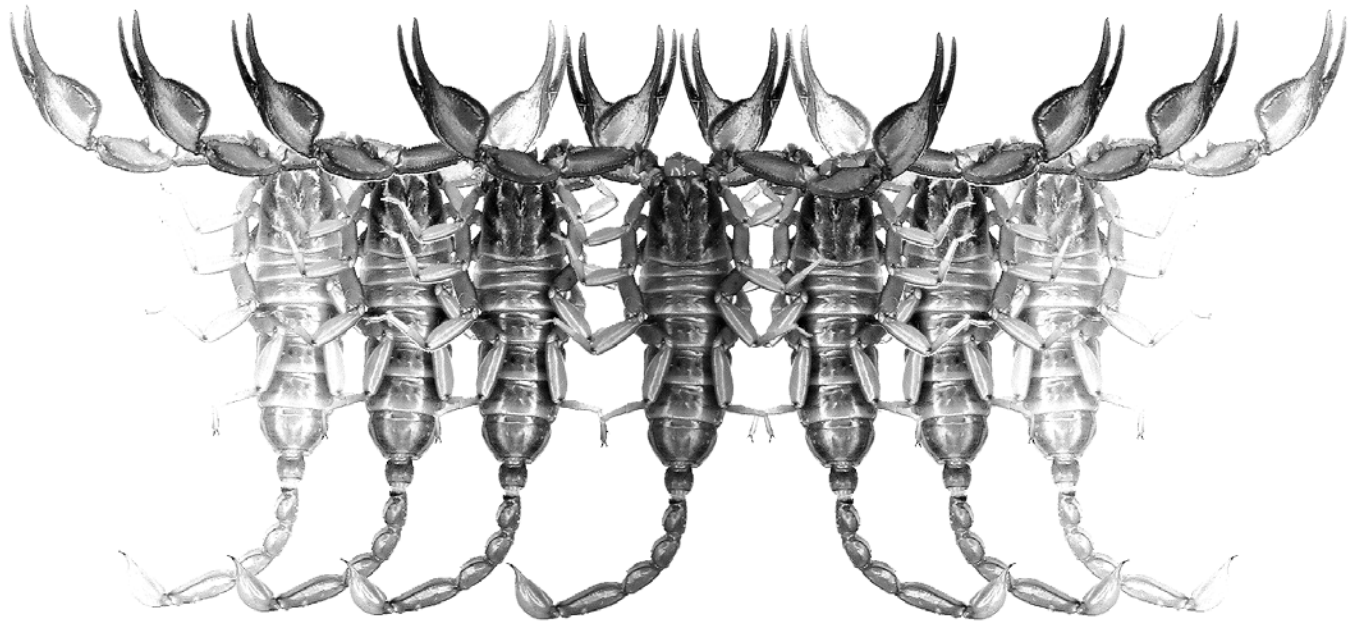


Euscorpius

Occasional Publications in Scorpiology



**On Two Subspecies of *Mesobuthus eupeus* (C. L. Koch, 1839)
in Turkey (Scorpiones: Buthidae)**

František Kovařík, Ersen Aydın Yağmur, Victor Fet & Shahrokh Navidpour

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Euscorpius

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EDITOR: Victor Fet, Marshall University, ‘fet@marshall.edu’

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On two subspecies of *Mesobuthus eupeus* (C. L. Koch, 1839) in Turkey (Scorpiones: Buthidae)

František Kovařík¹, Ersen Aydın Yağmur², Victor Fet³ & Shahrokh Navidpour⁴

¹ P.O. Box 27, CZ-145 01 Praha 45, Czech Republic; email: www.kovarex.com/scorpio

² Zoology Section, Biology Department, Science Faculty, Ege University, Izmir, Turkey; email: ersen.yagmur@gmail.com

³ Department of Biological Sciences, Marshall University, Huntington, WV 25755, USA; email: fet@marshall.edu

⁴ Razi Reference Laboratory of Scorpion Research, Razi Vaccine and Serum Research Institute, P.O.Box 31975/148, Department of Venomous Animals & Toxins, Hesarak, Karaj, Iran

Summary

Examination of 268 specimens of *Mesobuthus eupeus eupeus* (C. L. Koch, 1839) and 1765 specimens of *M. eupeus phillipsii* (Pocock, 1889) from 163 localities, 92 of them in Turkey, has enabled us to establish distribution of the two subspecies and limits of their ranges in southeastern Turkey. A map of distribution of these subspecies in Turkey and a key to Turkish *Mesobuthus* species and subspecies are provided. *Buthus eupeus philippovitschi* Birula, 1905 is synonymized with *Mesobuthus eupeus eupeus*, and *Buthus eupaeus mesopotamicus* Penther, 1912 is synonymized with *Mesobuthus eupeus phillipsii*.

Introduction

There are currently four confirmed scorpion species of the genus *Mesobuthus* Vachon, 1949 in Turkey. Presence of *Mesobuthus eupeus* (C. L. Koch, 1839), *M. caucasicus* (Nordmann, 1840), and *M. gibbosus* (Brullé, 1832) has been known for many decades (Fet & Lowe, 2000; Karataş, 2005). The fourth distinct species, *Mesobuthus nigrocinctus* (Ehrenberg, 1828), has been recently restored from synonymy (Fet et al., 2000) and first recorded for Turkey only by Crucitti & Vignoli (2002); its distribution was documented in detail by Karataş (2007). Note that in many areas, in Turkey and elsewhere, congeneric members of this genus are found in sympatry.

The highly polymorphic *Mesobuthus eupeus* (C. L. Koch, 1839) is probably the most wide-ranging scorpion species in the Palearctic (Vachon, 1958), found from Turkey to China, with the northernmost record in Russia at 51°13'N (Fet, 2010). This species (or, most likely, species complex) has been recently studied in other parts of its range (Gantenbein, Fet & Gromov, 2003; Mirshamsi et al., 2010). In Turkey, *Mesobuthus eupeus* has been reported only at species level (Fet & Lowe, 2000; Karataş & Karataş, 2001; Teruel, 2002). Here, we document for the first time the existence of two different, allopatric subspecies in Turkey.

Abbreviations. The institutional abbreviations listed below and used throughout are mostly after Arnett et al. (1993).

BMNH, The Natural History Museum, London, United Kingdom.

FKCP, František Kovařík Collection, Praha, Czech Republic.

MTAS, Museum of Turkish Arachnology Society, Ankara, Turkey.

NMPC, National Museum (Natural History), Praha, Czech Republic.

RRLS, Razi Reference Laboratory of Scorpion Research, Razi Vaccine and Serum Research Institute, Sepah St., Hejrat Sq., Ahvaz, Khoozestan, Iran.

SMFD, Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany.

Systematics

Mesobuthus eupeus eupeus (C. L. Koch, 1839)
Figures 1–11, 16, 19–20, 23.

Androctonus eupeus C. L. Koch, 1839: 127, fig. 419.

Buthus eupeus forma α : Birula, 1896: 239.

Buthus eupeus forma β : Birula, 1896: 240 (part).

Buthus eupeus eupeus: Birula, 1904: 37.

Buthus eupeus eupeus natio eupeus: Birula, 1917: 34.

Buthus eupeus eupeus natio armeniaca Birula, 1917: 34.

Buthus eupeus eupeus natio talyshensis: Birula, 1917: 34.

Mesobuthus eupeus eupeus: Vachon, 1950: 152; Vachon, 1952: 324; Vachon, 1958: 154; Vachon,



Figure 1: Armenia, Gorovan sands, 39°53'N 44°44'E, 970 m a.s.l. Recorded occurrence of *Mesobuthus eupeus eupeus* (C. L. Koch, 1839).

- 1966: 212; Habibi, 1971: 43; Farzanpay, 1988: 38; Fet, 1989: 86; Fet, 1994: 527; Kovařík, 1997: 49; Fet & Lowe, 2000: 171; Kovařík, 2002: 9; Gantenbein, Fet & Gromov, 2003: 413.
- = *Androctonus ornatus* Nordmann, 1840: 732 (syn. by Birula, 1896: 238)
- Androctonus ornatus*: Gervais, 1844b: 43
- Buthus ornatus*: Pocock, 1889b: 116
- = *Buthus cognatus* L. Koch, 1878: 58 (syn. by Birula, 1896: 238)
- Buthus eupeus cognatus*: Kraepelin, 1899: 24 (part).
- = *Buthus eupeus philippovitschi* Birula, 1905: 127. **Syn. n.**
- Buthus eupeus philippowitschi* (incorrect subsequent spelling): Birula, 1911: 165.
- Mesobuthus eupeus philippovitschi* (incorrect subsequent spelling): Vachon, 1958: 154; Vachon, 1966: 213; Habibi, 1971: 44; Farzanpay, 1988: 38
- Mesobuthus eupeus philippovitschi*: Fet, 1989: 100; Fet, 1994: 527; Fet & Lowe, 2000: 174.
- Mesobuthus eupeus philippovitschi* (incorrect subsequent spelling): Kovařík, 1997: 49; Kovařík, 1998: 114.
- Type locality and type repository.* Type(s) lost; “Caucasus”; type locality designated by Birula (1917: 35) as Tiflis (now Tbilisi), Georgia.
- Material examined:* **Armenia**, Solak-Sevan, 17 June 1981, 3♀, FKCP, leg. Soukup; Little Caucasus, Gocht near Gechard, 35 km SE of Yerevan, Azat River valley, 12 June 1988, 2♂2♀1juv., FKCP, leg. Z. Jindra; Lusashog, 1850 m a.s.l., 21 May 2005, 1♀im., FKCP, leg. S. Snäll; Gorovan sands, 39°53'N 44°44'E, 970 m a.s.l., 23 May 2007, 1♂2♀4juvs., FKCP, leg. S. Snäll.
- Azerbaijan (Nagorni Karabakh Region)**, “Kaukasus”, 1890, 2♂7♀im., SMFD No. 5253 and 5256, leg. Valentin. **Georgia**, Džvari, 15 km near Tbilisi, 1juv., FKCP, 7 August 1988, leg. T. Peš; Tbilisi, 7 June 1959, 1♂, FKCP, leg. J. Niedl; 2005, 1♂1♀im., FKCP.
- Iran, Ardabil Province**, 3 km E of Sorkheh Dizaj (Zanján), 38°49'N 48°58'E, 580 m a.s.l., 17 May 1997, 1♂1juv., FKCP, leg. M. Kaftan; **Khorāsān Province**, Chalus-Karaj, Marzan Abad, 1 June 1997, 3♀, FKCP, leg. M. Kafka; Golestan Forest, 55 km NE Minudast, 37°20'N 56°00'E, 840 m a.s.l., 19 June 2000, 1♂, FKCP, leg. P. Kabátek; 37°28'N 56°47'E, 909 m a.s.l., 17–18

- May 2003, 1♂2♀4ims.1juv., FKCP, leg. P. Kabátek; 10 km E of Teng Ráh, 37°23'N 55°50'E, 13 May 1997, 400–660 m a.s.l., 1♀, FKCP, leg. M. Kaftan; 36°34'N 59°10'E, 1237 m a.s.l., 15 May 2003, 1♂2juvs., FKCP, leg. P. Kabátek; **Mazandran Province**, Damavand Polur, 1♀im., FKCP, 7 April 1995, leg. M. Kafka; N slopes of Alborz Mtns., Vali Abad Village env., ca. 1800–2500 m a.s.l., 8–10 May 1996, 3♂6♀5juvs., FKCP, leg. D. Král, 4♀1juv., FKCP, leg. V. Šejna. **Turkey, Adana Province** (Antakya?), Locality **No. 1** in Fig. 27, May 1991, 1♀1juv., FKCP, leg. Nosek; **Ağrı Province**, Central District, 8 km W of Ağrı Town, 39°44'25"N, 42°56'11"E, 1640 m a.s.l., **No. 2**, 23 April 1996, 1♂, FKCP, leg. D. Král; Doğubeyazıt District, Suluçam Village (Sujucam env.), Zor Mountain, 39°42'05"N 43°51'00"E, 1860 m a.s.l., **No. 3**, 25 June 1993, 1♂1♀, FKCP, leg. V. Malý; **Aksaray Province**, Güzelyurt District, Ihlara Town, 38°16'N 34°22'E, 1500 m a.s.l., **No. 4**, 23 August 1990, 1♀, FKCP, leg. M. Kaftan, 23 June 1993, 1♀, FKCP, leg. P. Bílek; **Artvin Province**, Central District, Taşlıca Village, 41°13'40"N 41°45'29"E, 912 m a.s.l., **No. 5**, 7 June 2008, 2♂1♀, MTAS, leg. A. Avcı; Yusufeli District, Alanbaşı Village, 40°41'26"N 41°24'38"E, 1206 m a.s.l., **No. 6**, 1 July 2008, 1♂1♀, FKCP 1♂1♀, MTAS, leg. A. Avcı; Yusufeli District, Kömürlü Village, 40°54.036'N 41°39.645'E, 1381 m a.s.l., **No. 7**, 3 June 2008, 1♀, MTAS, leg. A. Avcı; Yusufeli District, Mutlugün Village, 40°52.521'N 41°35.780'E, 1508 m a.s.l., **No. 8**, 5 June 2008, 1♂im.3♀3juvs., MTAS, leg. A. Avcı; Yusufeli District, Öğdem Village, 40°55.366'N 41°38.523'E, 1685 m a.s.l., **No. 9**, 3 June 2008, 1♂2♀ims., MTAS, leg. A. Avcı; Yusufeli District, Yaylalar Village, 40°52'11"N 41°16'04"E, 1939 m a.s.l., **No. 10**, 3 July 2008, 1♀, MTAS, leg. A. Avcı; **Bayburt Province**, Central District, 5 km N of Bayburt Town, 40°18.023'N 40°13.946'E, 1527 m a.s.l., **No. 11**, 24 June 2007, 1♀, MTAS, leg. A. Avcı; **Bingöl Province**, Tatvan District, 38°31'54"N 42°16'19"E, 1765 m a.s.l., **No. 12**, 20 June 2007, 1♂1♀3juvs., MTAS, leg. H. Koç; **Erzincan Province**, Kemaliye District, Kemaliye Town, Zincirli Kaya area, 39°15'37"N 38°29'41"E, 1000 m a.s.l., **No. 13**, 11 July 2008, 1♂, MTAS, leg. E. A. Yağmur; **Erzurum Province**, Central District, Erzurum, forest nursery, 39°54'N 41°16'E, 1867 m a.s.l., **No. 14**, 1 June 2006, 1♂, MTAS, leg. M. Kesdek; Horasan District, Saç Pass, 39°52'42"N 42°23'01"E, 2130 m a.s.l., **No. 15**, 9 May 2002, 1♀lim., FKCP, leg. P. Kabátek; Oltu District, Başbağlar Village, Yayla Geçidi, 40°27'41"N 41°40'47"E, 1905 m a.s.l., **No. 16**, 17 May 2004, 1♀, MTAS, leg. M. Kesdek; **Iğdır Province**, Aralık District, Yenidoğan Village, 39°47'12"N 44°23'36"E, 1563 m a.s.l., **No. 17**, 16 June 2007, 1♂1♀, FKCP, 1♂1♀ MTAS, leg. H. Koç, 1717 m a.s.l., 17 June 2007, 23♂34♀15juvs., MTAS, leg. H. Koç & A. V. Gromov; Central District, Suveren Village, 5 km SE, 39°47'29"N 44°07'21"E, 1274 m a.s.l., **No. 18**, 4 June 2004, 2♀2juvs., MTAS, leg. M. Kesdek; Karakoyunlu District, Gürgen Village, 39°53'59"N 44°18'12"E, 880 m a.s.l., **No. 19**, 15 June 2007, 6♂6♀12juvs., MTAS, leg. H. Koç; Tuzluca District, Çalpala Village, 40°09'50"E 42°58'21"N, 894 m a.s.l., **No. 20**, 18 June 2007, 1♂ MTAS, leg. H. Koç; Tuzluca District, Yukarı Katırcı Village, 39°52'26"N 43°42'03"E, 1807 m a.s.l., **No. 21**, 5 October 2005, 1♂im.1♀1♀im.1 juv., MTAS, leg. A. E. Baltacıoğlu; 5 km SE Tuzluca Town (near border with Armenia), 39°59'44"N 43°42'42"E, 1200 m a.s.l., **No. 22**, 28 May 2005, 1♂4♀lim., FKCP, leg. V. Gvoždík; **Kahramanmaraş Province**, Elbistan District, Evcihöyük Village, 2 km SW, 38°19'59"N 37°11'36"E, 1207 m a.s.l., **No. 23**, 4 July 2007, 1♀, MTAS, leg. A. Avcı; Göksun District, Büyük Kızılık Village, 38°12'39"N 36°42'25"E, 1718 m a.s.l., **No. 24**, 15 June 2007, 1♂3juvs., MTAS, leg. E. A. Yağmur & M. S. Kılıç; **Kars Province**, Digor District, Yeniköy Village, 40°18'15"N 43°34'30"E, 1422 m a.s.l., **No. 25**, 4 June 2004, 1♀, MTAS, leg. M. Kesdek; Kağızman District, Ani Ruins, 40°30'42"N 43°33'58"E, 1440 m a.s.l., **No. 26**, 20 May 1997, 2♂1♀, FKCP, leg. M. Kaftan; Kağızman District, Aydınkavak Village, 40°11'05"N 43°19'28"E, 1405 m a.s.l., **No. 27**, 3 June 2004, 1♀, MTAS, leg. M. Kesdek; Sarıkamış District, 20 km West of Karakurt Village, 40°07'35"N 42°25'21"E, 1610 m a.s.l., **No. 28**, 14 May 1996, 1juv., FKCP, leg. D. Král, 1♀1juv., FKCP, leg. J. Pitulová; **Kayseri Province**, Develi District, Develi Plain, 38°20'N 35°20'E, 1070 m a.s.l., **No. 29**, 20 September 1998, 1♀lim., FKCP, leg. A. Bezdék; **Konya Province**, Karapınar District, Meke Tuzlası (Meketuzlag), 37°41'36"N 33°38'21"E, 1032 m a.s.l., **No. 30**, 10 April 1992, 2juvs., FKCP; June 1992, 2♂3♀, FKCP, leg. M. Kaftan; **Malatya Province**, Hekiman District, Koşar Village, 38°42'05.9"N 38°10'33.64"E, 921 m a.s.l., **No. 31**, 15 September 2007, 3♀, MTAS, leg. E. A. Yağmur & S. Anlaş; Hekimhan District, Near Botanic Garden, 38°49.250'N 37°57.343'E, 1231 m a.s.l., **No. 32**, 5 June 2007, 1♀, MTAS, leg. A. Avcı; **Muş Province**, 1500 m a.s.l., **No. 33**, 1♀, FKCP, 18 June 1991, leg. M. Janata; **Niğde Province**, Central District, Gümüşler Village, 38°01'55.0"N 34°50'35.4"E, 1485 m a.s.l., **No. 34**, 4.07.2007, 1♂1juv. MTAS, E. A. Yağmur & A. V. Gromov; **Sanlıurfa Province**, Siverek District, Karacadağ Mountain, road of skiing center, 37°44'45"N 39°49'50"E, 1752 m a.s.l., **No. 35**, 5 August 2006, 1♂1♀, FKCP, 2♂1♀, MTAS, leg. E. A. Yağmur & M. Yalçın; **Tunceli Province**, Pertek District, 1 km SW of Mercimek Village, 38°51'15.0"N 39°23'46.8"E, 1330 m a.s.l., **No. 36**, 2♂1♀, FKCP, 12 September 2007, leg. E. A. Yağmur & S. Anlaş; Pertek District, Geçityaka Village, 38°53'29"N 39°12'33"E, 940 m a.s.l., **No. 37**, 23 July 2007, 6♂2♀ims., MTAS, leg. B. Koç & H. Koç; **Van Province**, Başkale District, Çamlık Village, 37°57'10"N 44°05'38"E, 1889 m a.s.l., **No. 38**, 22 June 2007, 2♂ims. 3♀ims., MTAS,



Figures 2–3: *Mesobuthus eupeus eupeus* (C. L. Koch, 1839) from Armenia, Gorovan sands, 39°53'N 44°44'E, 970 m a.s.l.
Figure 2. Female. Figure 3. Male.

leg. H. Koç & A. V. Gromov; Başkale District, next to Gedikbaşı Village, 38°10'52"N 43°56'12"E, 2553 m a.s.l., No. 39, 22 June 2007, 1♀2 juvs. MTAS, leg. H. Koç; Erciş District, 11 km SW of Erciş Town, 38°56'49"E 43°09'59"N, 1706 m a.s.l., No. 40, 20 June 2007, 1 juv., MTAS, leg. H. Koç & A. V. Gromov; Gevaş District, Uysal Village, 38°19'41"N 42°57'19"E, 1689 m a.s.l., No. 41, 22 June 2007, 1♀im., MTAS, leg. H. Koç; Muradiye District, 38°39'26"E 43°44'33"N, 1680 m a.s.l., No. 42, 20 June 2007, 1♀1juv., MTAS, leg. H. Koç.

Diagnosis. Total length 35 to 55 (rarely 60) mm. Dorsal trichobothria of femur arranged in *beta*-configuration. Trichobothrium *eb* located on fixed finger of chela. Trichobothrium *db* on pedipalp fixed finger always located between *est* and *esb* (plate E, fig. 1 in Kovařík, 2009: 22). Color pattern usually dark, especially in forest populations. Pectines with fulcra. Legs III and IV with tibial spurs. Tarsomeres of legs I and II with paired ventral spines. Cheliceral fixed finger with two ventral denticles. Movable fingers of pedipalps with 10 to 12 (very rarely 13) diagonal rows of denticles. Rows of denticles with one internal and two posterior external denticles. Dentate margin of pedipalp chela movable finger with 5 terminal denticles (4 terminal and one basal terminal). Metasomal segment I with ten, and metasomal segment IV, with eight carinae. Carapace in lateral view with entire dorsal surface horizontal or nearly so (possibly with a slight anterior decline). Central lateral and posterior lateral carinae of carapace not joined to form a continuous linear series of granules to posterior margin. Carinae of carapace forming a lyre-shaped configuration. Mesosomal tergites I–VI with 3 carinae. Carinae of tergites do not project beyond posterior margin as distinct spiniform processes. Mesosomal tergites VI and VII granulated, usually densely. All metasomal segments similar in width. Ventral carinae of metasomal segments without very strong teeth. Metasomal segment V with a single ventral carina. Ventrolateral carinae on the metasomal segment V with irregular granules. Telson elongate in both sexes.

Distribution: Armenia; Azerbaijan (including Nagorny Karabakh Region); Georgia; Turkey (Birula, 1896: 239; Birula, 1917: 34-35; Fet & Lowe, 2000: 171); Iran: Ardabil Province (first report), Golestan Province (Birula, 1905: 127, as *Buthus eupeus philippovitschi*), Khorāsān Province (first report), Mazandran Province (first report); Turkmenistan (west; Birula, 1911: 165, as *B. e. philippowitschi*, incorrect subsequent spelling).

Comments: *Buthus eupeus philippovitschi* Birula, 1905 was described from the southeast side of the Caspian Sea (Golestan Province in Iran), its geographic range allegedly being separate from that of *M. e. eupeus* on the

western side of the sea (Vachon, 1958). However, we could find no consistent morphological differences between these two taxa, and a study by the first author has revealed no differences also in populations on the southern side of the sea in the Iranian provinces of Khorāsān (37°20'N 56°00'E, 37°28'N 56°47'E, 37°23'N 55°50'E, 36°34'N 59°10'E), Mazandran (N slopes of Alborz Mountains, Vali Abad Village env., ca. 1800–2500 m a.s.l.), and Ardabil (38°49'N 48°58'E). It is therefore clear that *Buthus eupeus philippovitschi* Birula, 1905 is a synonym of *M. eupeus eupeus* (C. L. Koch, 1839), which occurs around the southern shores of the Caspian Sea on all three sides. The western boundary of this subspecies in Turkmenistan remains to be determined.

***Mesobuthus eupeus philipsii* (Pocock, 1889)**

Figures 12–15, 17–18, 21–22, 24–26.

Buthus philipsii Pocock, 1889a: 341; Weidner, 1959: 99.

Buthus philipsii: Kraepelin, 1899: 24; Birula, 1905: 131; Borelli, 1915: 460; Werner, 1916: 80; Lampe, 1918: 191.

Mesobuthus philipsii: Vachon, 1950: 153 (1952: 325); Pérez Minocci, 1974: 25.

Mesobuthus eupeus philipsii: Vachon, 1958: 148; Vachon, 1966: 213; Habibi, 1971: 44; Farzanpay, 1986: 334; Fet, 1994: 527; Kovařík, 1997: 49; Kovařík, 1998: 114; Fet & Lowe, 2000: 175.

Mesobuthus eupeus philipsii: Farzanpay, 1987: 150; Farzanpay, 1988: 38; Navidpour et al., 2008a: 11; Navidpour et al., 2008b: 13; Navidpour et al., 2008c: 11; Navidpour et al., 2008d: 5; Pirali-Kheirabadi et al., 2009: 6.

Mesobuthus eupeus: Akbari, 2007: 76.

Buthus hottentotta: Kraepelin, 1891: 185 (part?).

= *Buthus eupaeus mesopotamicus* Penther, 1912: 111.

Syn. n.

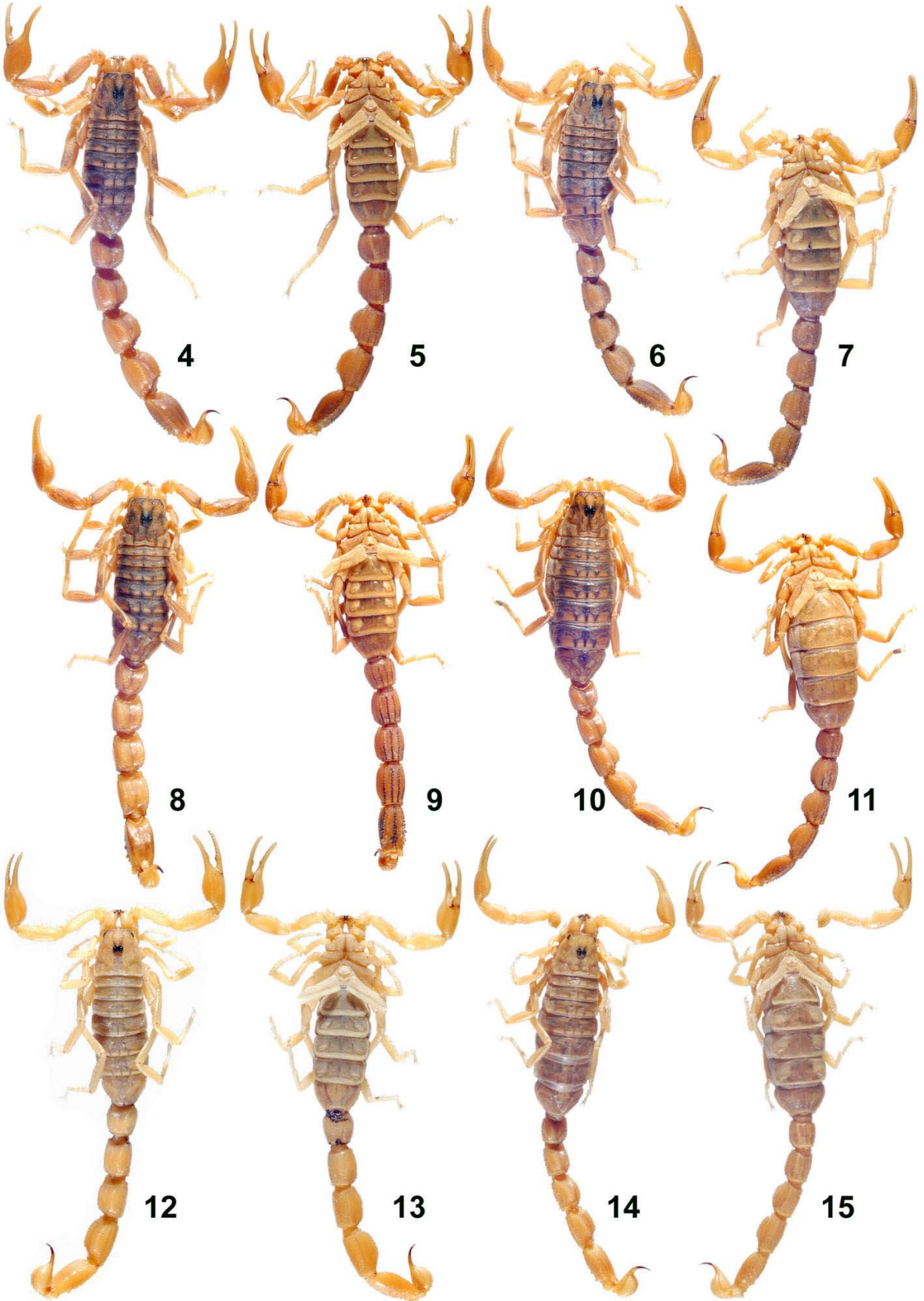
Buthus eupeus mesopotamicus: Birula, 1917: 39; Birula, 1918: 15.

Mesobuthus eupeus mesopotamicus: Vachon, 1958: 154; Vachon, 1966: 212; Farzanpay, 1986: 333; Fet, 1994: 527; Kovařík, 1998: 114; Fet & Lowe, 2000: 173.

Type locality and type repository. Iran, Bushir (now Bushehr) Province, BMNH.

Material examined: IRAN, **Bushehr Province**, 15 km NW Bandar-e Gonaveh, 50 m a.s.l., Chahak Village env., 3–5 May 1996, 4♂1juv., FKCP, leg. M. Kaftan & V. Šejna; Dayer road, Village, 26°28'12"N 51°07'40"E, 405 m a.s.l. (Locality No. Bu-21), November 2007, 1♂3♀, RRLS, 1im., FKCP, leg. Masihpour, Bahrani & Hayader; Dayer, 27°49'35"N 52°04'44"E, 4 m a.s.l. (Locality No. Bu-25), November 2007, 1♀, RRLS, leg.

Masihipour & Habibzadeh; Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (Locality No. Bu-31), November 2007, 1♂1♀, FKCP, leg. Masihipour & Habibzadeh; Tangestan, 28°52'53"N 51°18'43", 95 m a.s.l. (Locality No. Bu-35), November 2007, 2♂2♀3juvs., RRLS, leg. Masihipour, Bahrani & Habibzadeh; Tangestan, Ahram, 28°51'45"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), November 2007, 1juv., RRLS, leg. Masihipour, Bahrani & Habibzadeh; Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19), November 2007, 3♂2♀1juv., RRLS, leg. Masihipour & Bahrani; Deylam road, 30°26'31"N 49°55'26"E, 85 m a.s.l. (Locality No. OM-D 804), June 2007, 2♀, FKCP, 6♂8♀10ims., RRLS, leg. Navidpour, Masihipour & Tofigh; Omidiyeh to Genaveh road, 30°13'42"N 50°12'01"E, 128 m a.s.l. (Locality No. B-Bi805), June 2007, 8♂1♀11juvs., RRLS, leg. Navidpour & Masihipour; Borazjan, 29°16'56"N 51°15'26"E, 200 m a.s.l. (Locality No. Bu-18), February 2007, 9♂12♀, RRLS, leg. Masihipour, Bahrani & Habibzadeh; Borazjan, 29°16'56"N 51°15'26"E, 200 m a.s.l. (Locality No. Bu-18.2), February 2007, 4juvs., FKCP, 8♂10♀11juvs., RRLS, leg. Masihipour, Bahrani & Habibzadeh; Genaveh, 29°13'42"N 50°14'22"E, 227 m a.s.l. (Locality No. Bu-G1), January 2005, 2♀, FKCP, 8♂2♀, RRLS, leg. Hayader & Tofigh; Bushehr (Locality No. Bu-319.1) February 2007, 1♀2ims., FKCP, 6♂11♀, RRLS, leg. Bahrani & Hayader; Behbahan–Genaveh road, 29°40.71' N 51°24.04'E, 16 m a.s.l. (Locality No. B6), July 2007, 14 specimens, RRLS, 2♂1♀, FKCP, leg. Navidpour & Masihipour. **Chahar Mahal & Bakhtiyari Province**, Shahrekord (hills of Shahrekord University), 32°21'18"N 50°50'10"E, 2148 m a.s.l. (Locality No. SH-4), May 2007, 7♂5♀11♀im.3juvs., RRLS, 6♂1juv., FKCP, leg. Pirali & Navidpour; Shahrekord, Sarteshniz Village, 32°08'51"N 50°54'11"E, 2116 m a.s.l. (Locality No. SH-7), May 2008, 3♂2♀1♀im.5juvs., RRLS, 2♀1juv., FKCP, leg. Pirali; Saman, 32°27'17"N 50°52'36"E, 2134 m a.s.l. (Locality No. SH-9), May 2008, 2♂4♀, RRLS, leg. Pirali; Lordegan, Milas Village, 31°30'02"N 52°02'38"E, 1840 m, October 2007, 4♂2♀, RRLS, leg. Pirali; Lordegan, Marvan Village, 31°33'14"N 52°06'08"E, 1892 m a.s.l., October 2007, 4♂2♀, RRLS, leg. Pirali & Khosravi. **Esfahan Province**, Zagros Mts., Qamishlu Village env., 2000–2200 m a.s.l., 27–28 April 1996, 1♂5♀2juvs., FKCP, leg. M. Kaftan, D. Král and J. Pitulová. **Fars Province**, Zagros Mts., Abshar Village env., ca 1000 m a.s.l., 2–3 May 1996, 1♀, FKCP, leg. J. Pitulová; Rustai Kanj, 28°10'N 55°43'E, 760 m a.s.l., 19 April 2000, 1♀, FKCP, leg. M. Kaftan; 10 km S of Firuz Abad, 28°55'N 52°31'E, 1412 m a.s.l., 20–21 April 2000, 1♀, FKCP, leg. J. Šobotník; pass 140 km NE Siraáz, 20–21 April 2002, 1♀1im., FKCP, leg. P. Kabátek. **Ilam Province**, Ilam to Mehran road, Saleh Abad Village, 33°32.40'N 46°08.74'E, 683 m a.s.l. (Locality No. IL-821), X.2007, 3♂1♀im., RRLS, leg. Masihipour & Hayader; Mehran to Dehloran road, 32°55.42'N 46°41.32'E, 375 m a.s.l. (Locality No. IL-822), X.2007, 2♀1juv., FKCP, 4♂1♀1juv., RRLS, leg. Hayader, Masihipour & Bahrani; Dehloran road, 33°02.33'N 46°34.94'E, 280 m a.s.l. (Locality No. IL-823), X.2007, 1♀, RRLS, leg. Masihipour, Habibzadeh & Bahrani; Dehloran, 32°36.36'N 47°20.26'E, 146 m a.s.l. (Locality No. IL-825), X.2007, 1♀im., RRLS, leg. Masihipour, Hayader, Habibzadeh & Bahrani; Murmury to Dehloran road, 32°25.72'N 47°48.32'E, 171 m a.s.l. (Locality No. IL-827), X.2007, 1♀, RRLS, leg. Mashipour, Habibzadeh & Hayader; Dashte Abbas, Seyed Falhi village, 32°24.105'N 47°36.922'E, 115 m a.s.l. (Locality No. IL-829), 2008, 1♂, RRLS, leg. Navidpour, Hayader & Bahrani; Ein Saleh Village, 32°25.24'N 47°43.68'E, 182 m a.s.l. (Locality No. IL-828), X.2007, 1♂2♀, RRLS, leg. Masihipour, Bahrani & Hayader. **Khozestan Province**, Chogha Zanbil (zikkurat) env., ca 100 m a.s.l., 5–6 May 1996, 1♀, FKCP, leg. M. Kaftan, 3♂1♀1juv., FKCP, leg. D. Král; Baghmalek district, Hore Village, 31°55'30"N 49°31'47"E, 185 m a.s.l. (Locality No. B1 and B2), I. 2007, 250 specimens, RRLS, 3♂1♀ (Locality No. B3), FKCP, February 2007, 128 specimens, RRLS, 2♀, FKCP, leg. Kazemi; 28°40'71"N 51°24'04"E, 16 m a.s.l. (Locality No. B6), July 2007, 14 specimens, RRLS, 2♂1♀, FKCP, leg. Navidpour and Masihipour; Shahyoon (Dezful), 32°10'92"N 48°15'64"E, 75 m a.s.l. (Locality No. SHO-814), October 2007, 1♀, RRLS, leg. Hayader & Habibzadeh; Ahvaz–Masjedsoleyman road, 31°48'13"N 48°58'11"E, 38 m a.s.l. (Locality No. A-Ma-808), September 2007, 125 specimens, RRLS, leg. Bahrani & Masihipour; Chogha Zanbil (zikkurat), 32°00'92"N 48°31'10"E, 68 m a.s.l. (Locality No. Ch-100), June 2007, 29 specimens, RRLS, 4♂, FKCP, leg. Navidpour & Masihipour; Chogha Zanbil (zikkurat), 32°00'92"N 48°31'10"E, 68.5 m a.s.l. (Locality No. Ch-103), June 2007, 2♂1♀, FKCP, leg. Navidpour & Masihipour; Ahvaz–Masjedsoleyman road, 31°46'51"N 49°06'01"E, 48 m a.s.l. (Locality No. A-Ma-811), September 2007, 61 specimens, RRLS, leg. Navidpour & Masihipour; Ahvaz–Masjedsoleyman road, 31°49'57"N 49°04'82"E, 53 m a.s.l. (Locality No. A-Ma-816-1), October 2007, 1♂1♀6juvs., RRLS, leg. Masihipour & Hayader; 45 km NW of Masjedsoleyman, Lali, 32°18'56"N 49°03'64"E, 329 m a.s.l. (Locality No. La-815-4 and 5), October 2007, 197♂201♀2juvs., RRLS, 2♀1im., FKCP, leg. Masihipour & Hayader. **Kohgiluyeh & Boyer Ahmad Province**, Zagros Mts., Kuh-e-Dinar ridge, 10 km NE of Yasuj, by road (Baba Hasan Village env.), 1800–2500 m a.s.l., 1–2 May 1996, 1♀1juv., FKCP, leg. J. Pitulová; Behbahan to Gachsaran (Dogonbadan) road, 30°28'36"N 50°30'05", 498 m a.s.l. (Locality No. Y-1), March 2008, 6♂1♀, RRLS, 2ims., FKCP, leg. Ghafarnia & Habibzadeh; Yasuj, Deelaroo Village, 30°33'44"N 50°44'44"E, 820 m a.s.l. (Locality No. Y-2), March 2008, 6♂12♀, RRLS, 1♂1♀2ims.



(♂♀), FKCP, leg. Navidpour, Ghafarnia & Bahrani; Dena, Yasuj to Sisakht road, 30°48'15"N 51°28'54"E, 2000 m a.s.l. (Locality No. Y-3), March 2008, 3♀, RRLS, 1♂2ims., FKCP, leg. Ghafarnia, Habibzadeh & Bahrani; Yasuj to Mourgah road, Jahanno Village, 30°29'20"N 51°31'38"E, 2153 m a.s.l. (Locality No. Y-4), March 2008, 3♂2♀, RRLS, leg. Navidpour, Ghafarnia & Bahrani; Basht road, Dehno Village, 30°17'41"N 51°25'08"E, 826 m a.s.l. (Locality No. Y-5), March 2008, 1♂, RRLS, leg. Navidpour, Ghafarnia & Bahrani; Basht to Dehdasht road, Shah Baharan Village, 30°36'51"N 50°50'46"E, 886 m a.s.l. (Locality No. Y-7) X.2007, 4♂1♀, RRLS, leg. Ghafarnia, Hayder & Habibzadeh; Cheram, 30°44'23"N 50°44'35"E, 747 m a.s.l. (Locality No. Y-8), March 2008, 1♂2♀, RRLS, leg. Ghafarnia, Bahrani & Habibzadeh; Dehdasht to Behbahan road, Filegah Village, 30°31'21"N 50°24'51"E, 770 m a.s.l. (Locality No. Y-9), March 2008, 3♀, RRLS, leg. Ghafarnia, Hayader & Bahrani. **Iraq**, Baghdad env., 1929–1932, 17♂44♀88juvs., NMPC, 3♂2♀5juvs., FKCP, leg. Vlasta Kálalová. **Syria**, Damascus, 3♀, FKCP, June 1963, leg. Havlín. **TURKEY**, **Adiyaman**



Figures 4–15: 4–11. *Mesobuthus eupeus eupeus* (C. L. Koch, 1839). 4–5. Dorsal and ventral views, ♂ (50 mm), Turkey, Tunceli Province, Pertek District, 1 km SW of Mercimek Village, 38°51'15.0"N 39°23'46.8"E, 1330 m a.s.l. (locality No. 36), FKCP. 6–7. Dorsal and ventral views, ♀ (46 mm), Turkey, Tunceli Province, Pertek District, 1 km SW of Mercimek Village, 38°51'15.0"N 39°23'46.8"E, 1330 m a.s.l. (locality No. 36), FKCP. 8–9. Dorsal and ventral views, ♂ (51 mm), Turkey, Iğdır Province, Aralık District, Yenidoğan Village, 39°47'12"N 44°23'36"E, 1563 m a.s.l. (locality No. 17), FKCP. 10–11. Dorsal and ventral views, ♀ (55 mm), Turkey, Iğdır Province, Aralık District, Yenidoğan Village, 39°47'12"N 44°23'36"E, 1563 m a.s.l. (locality No. 17), FKCP. 12–15. *Mesobuthus eupeus phillipsii* (Pocock, 1889). 12–13. Dorsal and ventral views, ♂ (45 mm), Turkey, Şanlıurfa Province, Birecik District, Çiçekalan Village, 36°56.74'N 38°01.37'E, 410 m a.s.l. (locality No. 34), FKCP. 14–15. Dorsal and ventral views, ♀ (50 mm), Turkey, Şanlıurfa Province, Birecik District, Çiçekalan Village, 36°56.74'N 38°01.37'E, 410 m a.s.l. (locality No. 34), FKCP.

Province, Besni District, 1 km S of Çakırhöyük Village fork in road, 37°33'09"N 37°45'12"E, 724 m a.s.l., **No. 1**, 7 July 2006, 3♂, MTAS, leg. E. A. Yağmur & S. Anlaş; Besni District, from Adiyaman to Kahramanmaraş 25th km, 37°42'28"N 38°00'06"E, 730 m a.s.l., **No. 2**, 15 May 2004, 2♂4♀2juvs., MTAS, leg. E. A. Yağmur & A. Akkaya; Besni District, Üçgöz Village, 3 km NW, 37°39'38"N 37°56'28"E, 763 m a.s.l., **No. 3**, 8.VII.2006, 3♂, MTAS, leg. E. A. Yağmur & S. Anlaş; Central District, 1 km W of Aydınoluk Village fork in road, 37°46'08"E 38°20'54"N, **No. 4**, 4 May 2004, 3♂1♀, MTAS, leg. A. Avcı; Gerger District, Açma

Village, 2 km NE, 37°59'35"N 38°57'51"E, 595 m a.s.l., **No. 5**, 19 April 2008, 1♂1juv., MTAS, leg. E. A. Yağmur & E. Tezcan; Samsat District, 37°41.670'N 38°32.581'E, 600 m a.s.l., **No. 6**, 27 May 2006, 1juv., MTAS, leg. A. Avcı; **Diyarbakır Province**, Çmar District, Aşağı Konak Village, Ayşebacı Hill, 37°37'35"N 40°29'35"E, 760 m a.s.l., **No. 7**, 16 August 2007, 1♂, MTAS, leg. E. A. Yağmur; Ergani District, Salihli Village Fork In Road, 1 km NE, 38°13'38"N 39°40'07"E, 902 m a.s.l., **No. 8**, 12 April 2008, 1juv., MTAS, leg. E. A. Yağmur, G. Çalşır & M. Özkörük; Ergani District, Tevekli Village, 38°11'54"N 39°51'37"E, 823 m a.s.l., **No. 9**, 16 June 2007, 1♂1♂im.1♀1♀im., MTAS, leg. E. A. Yağmur & M. Yalçın; Çermik District, Petekkaya Village, 6 km SW, 38°03'06"N 39°24'17"E, 722 m a.s.l., **No. 10**, 11 April 2008, 2♀1juv., MTAS, leg. E. A. Yağmur, G. Çalşır & M. Özkörük; Çermik District, Başarı Village, 1 km NW, 38°06'36"N 39°31'05"E, 966 m a.s.l., **No. 11**, 12 April 2008, 1♀1juv., MTAS, leg. E. A. Yağmur, G. Çalşır & M. Özkörük; **Gaziantep Province**, Araban District, Başpınar Village, 2 km NE, 37°27'59"N 37°52'33"E, 675 m a.s.l., **No. 12**, 30 April 2005, 1♂, MTAS, leg. E. A. Yağmur & M. Özkörük; Araban District, Gümüşpınar Village, 1 km S, 37°25'58"N 37°53'28"E, **No. 13**, 30 April 2005, 1♂4♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Nizip District, Altındağ Village, 37°05'14"N 37°42'07"E, 667 m a.s.l., **No. 14**, 19 October 2002, 2♂5♀5juvs., MTAS, leg. C. Toprak & S. Kesmezoğlu; Nizip District, Keklik Village, 2 km SW, 37°04'21"N 37°48'07"E, 579 m a.s.l., **No. 15**, 30 May 2003, 1♀, MTAS, leg. E. A. Yağmur & C. Toprak; Nizip District, Kıratlı Village, 2 km NE, 37°05'34"N 37°45'10"E, 656 m a.s.l., **No. 16**, 10 October 2004, 2juvs., MTAS, leg. E. A. Yağmur & M. Özkörük; Şahinbey District, Belenköy Village, 1 km E, 37°03'15"N 37°05'31"E, 954 m a.s.l., **No. 17**, 5 May 2006, 3♂4♀, MTAS, leg. M. Yalçın; Şehitkamil District, Akçaburç Village, 2 km SW, 37°14'09"N 37°18'47"E, 834 m a.s.l., **No. 18**, 7 May 2005, 3♂1♀1juv., MTAS, leg. E. A. Yağmur & M. Yalçın; Şehitkamil District, 11th km from Gaziantep to Yavuzeli, 37°11'43"N 37°27'27"E, 865 m a.s.l., **No. 19**, 9 October 2004, 2♀, MTAS, leg. E. A. Yağmur & C. Toprak; Şehitkamil District, Güngürge Village, 1 km N, 37°13'35"N 37°28'57"E, 803 m a.s.l., **No. 20**, 9 October 2004, 1♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Şehitkamil District, İncesu Village, 1 km E, 37°13'16"N 37°18'05"E, 942 m a.s.l., **No. 21**, 7 May 2005, 2♂2♀, MTAS, leg. E. A. Yağmur & M. Yalçın; Şehitkamil District, Övündük Village, 2 km West, 37°12'53"N 37°24'57"E, 778 m a.s.l., **No. 22**, 8 June 2002, 1♂, MTAS, leg. C. Toprak & S. Kesmezoğlu; Şehitkamil District, Yeşilce Village, 37°10'12"N 37°12'50"E, 982 m a.s.l., **No. 23**, 10 May 2004, 1♀, MTAS, leg. A. Akkaya; Yavuzeli District, Örenli Village, 1 km E, 37°15'11"N 37°30'45"E, 726 m a.s.l., **No. 24**, 9 October 2004, 1♂1♀



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3 juvs., MTAS, leg. E. A. Yağmur & C. Toprak; Yavuzeli District, Süleymanobası Village, 37°14'56"N 37°33'14"E, 837 m a.s.l., **No. 25**, 9 October 2004, 1 juv., MTAS, leg. E. A. Yağmur & C. Toprak; **Kahramanmaraş Province**, Pazarcık District, 0.5 km N of Hörük Village fork in road, 37°30'10"N 37°33'46"E, 795 m a.s.l., **No. 26**, 24 June 2007, 2♂1♀, MTAS, leg. E. A. Yağmur & M. Yalçın; Pazarcık District, 10 km NE of Pazarcık Town, 37°32'47"N 37°27'16"E, 942 m a.s.l., **No. 27**, 9 July 2006, 2♂, MTAS, leg. E. A. Yağmur & S. Anlaş; Pazarcık District, Karabıyıklı Village, 4 km N, 37°19'33"N 37°09'40"E, 743 m a.s.l., **No. 28**, 18 June 2006, 1♂1♀, MTAS, leg. E. A. Yağmur & M. Yalçın; **Kilis Province**, Elbeyli District, Çangallı Village, 36°42'52"N 37°33'14"E, 615 m a.s.l., **No. 29**, 20 April 2006, 3♂1♀, MTAS, leg. E. A. Yağmur & M. Özkörük; **Mardin Province**, Central District, Eskikale Village, 2 km E, 37°18'23"N 40°46'28"E, 944 m a.s.l., **No. 3**, 4 August 2006, 2♂2♀3juvs., MTAS, leg. E. A. Yağmur & M. Yalçın; Central District, Yolbaşı Village,



Figures 16–26: 16–18. Carapace and mesosomal tergite I. 19–22. Mesosomal tergites VI and VII. 23–26. Metasomal segment V and telson. **16 and 19. Mesobuthus eupeus eupeus** (C. L. Koch, 1839), ♂ (50 mm), Georgia, Tbilisi, FKCP. **17 and 21. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♂ (45 mm), Turkey, Şanlıurfa Province, Birecik District, Çiçekalan Village, 36°56.74'N 38°01.37'E, 410 m a.s.l. (locality No. 34), FKCP. **18. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♂ (50 mm), Iran, Bushehr Province, Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (locality No. Bu-31), FKCP. **20. Mesobuthus eupeus eupeus** (C. L. Koch, 1839), ♀ (48 mm), Turkey, Şanlıurfa Province, Siverek District, Karacadağ Mountain, the road of skiing center, 37°44' 45"N 39°49'50"E, 1752 m a.s.l. (locality No. 35), FKCP. **22. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♀ (46 mm), Turkey, Şanlıurfa Province, Birecik District, Çiçekalan Village, 36°56.74'N 38°01.37'E, 410 m a.s.l. (locality No. 34), FKCP. **23. Mesobuthus eupeus eupeus** (C. L. Koch, 1839), ♀ (55 mm), Turkey, Iğdır Province, Aralık District, Yenidoğan Village, 39°47'12"N 44°23'36"E, 1563 m a.s.l., (locality No. 17), FKCP. **24. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♀ (55 mm), Iran, Bushehr Province, Genaveh, 29°13'42"N 50°14'22"E, 227 m a.s.l. FKCP. **25. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♀ (50 mm), Turkey, Şehitkamil District, Güngürge Village, 1 km N, 37°13'35"N 37°28'57"E, 803 m a.s.l. (locality No. 20), MTAS. **26. Mesobuthus eupeus phillipsii** (Pocock, 1889), ♀ (50 mm), Turkey, Şehitkamil District, 11th km from Gaziantep to Yavuzeli, 37°11'43"N 37°27'27"E, 865 m a.s.l. (locality No. 19), MTAS.

37°16'00"N 40°48'00"E, 658 m a.s.l., **No. 31**, 27 June 2007, 4♂3♀1juv., MTAS, leg. H. Koç & A. V. Gromov; Yeşilli District, 2 km N of Yeşilli Town, 37°20'49"N 40°49'35"E, 946 m a.s.l., **No. 32**, 13 May 2004, 1♂1♀, MTAS, leg. E. A. Yağmur & A. Akkaya; **Şanlıurfa Province**, Akçakale District, Edebey Village, 36°50' 40"N 38°40'57"E, 532 m a.s.l., **No. 33**, 22 May 2007,

5♂4♀2juvs., MTAS, leg. E. A. Yağmur, H. Koç & A. V. Gromov; Birecik District, Çiçekalan Village, 36°56.74'N 38°01.37'E, 410 m a.s.l., **No. 34**, 1 April 2008, 1♂1♂im.3♀ FKCP, leg. M. Z. Yıldız; Birecik District, Kelaynak Valley, 2 km N of Birecik Town, 37°02'59"N 37°59'07"E, 388 m a.s.l., **No. 35**, 1 April 2006, 1♀, FKCP, 2♀1im.m MTAS, leg. E. A. Yağmur & M. Özkörük; Birecik District, Mezra Village, 2 km S, 36°56'49"N 38°01'21"E, 375 m a.s.l., **No. 36**, 2 April 2006, 2juvs., MTAS, leg. E. A. Yağmur & M. Yalçın; Birecik District, Yukarı Habib Village, 2 km N, 37°08'51"N 37°59'57"E, 660 m a.s.l., **No. 37**, 1 April 2006, 1♀2juvs., MTAS, leg. E. A. Yağmur & M. Özkörük; Central District, 10 km W of Şanlıurfa Town, 37°07'21"N 38°40'41"E, 724 m a.s.l., **No. 38**, 11 May 2004, 1♀, MTAS, leg. E. A. Yağmur & A. Akkaya; Central District, Asri Village, 2 km SE, 37°04'36"N 39°13'30"E, 561 m a.s.l., **No. 39**, 9 May 2006, 1♂1♀, MTAS, leg. E. A. Yağmur & M. Z. Yıldız; Central District, 50th km from Şanlıurfa to Viranşehir, 37°13'27"N 39°24'06"E, 653 m a.s.l., **No. 40**, 12 May 2004, 1♂1♀, MTAS, leg. E. A. Yağmur & T. Akkaya; Ceylanpınar District, Evren Paşa Village, 36°52'15"N 40°02'30"E, 391 m a.s.l., **No. 41**, 5 March 2006, 2♂5♀1juv., MTAS, leg. E. A. Yağmur, M. Özkörük; Ceylanpınar District, Evren Paşa Village, Emintaş Area, 36°52'15"N 40°02'30"E, 391 m a.s.l., **No. 42**, 1 April 2006, 1♂3♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Halfeti District, Kalkan Village, 36°50'40"N 38°40' 57"E, 532 m a.s.l., **No. 43**, 10 April 2006, 1♂3♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Halfeti District, Yeşilözen Village, 2 km S, 37°11'05"N 37°58' 32"E, 669 m a.s.l., **No. 44**, 1 April 2006, 1♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Harran District, Şuayipşehir Village, 2 km N, 36°52'36"N 39°22'18"E, 506 m a.s.l., **No. 45**, 6 May 2006, 1♀, MTAS, leg. E. A. Yağmur & M. Z. Yıldız; Hilvan District, Kırbaşı Village, 37°30'03"N 38°53'17"E, 678 m a.s.l., **No. 46**, 10 May 2006, 1♀, MTAS, leg. E. A. Yağmur & M. Z. Yıldız; Suruç District, Yağışlı Village, 2 km S, 37°00'35"N 38°16'27"E, 606 m a.s.l., **No. 47**, 11 April 2006, 1♀, MTAS, leg. E. A. Yağmur & M. Özkörük; Viranşehir District, Kocanizam Village, 37°11'48"N 39° 29'29"E, 619 m a.s.l., **No. 48**, 8 May 2007, 1♀1juv., MTAS, leg. E. A. Yağmur & M. Z. Yıldız; **Şırnak Province**, Dicle District, Yalın-tepe Village, 37°17'16"N 42°03'15"E, 599 m a.s.l., **No. 49**, 12 May 2007, 19♂11♀33juvs., MTAS, leg. E. A. Yağmur & M. Yalçın, H. Koç & E. Ulupınar; İdil District, Yörük Village, 37°16'57"N 42°01'07"E, 669 m a.s.l., **No. 50**, 21 September 2006, 2♀, MTAS, 21 May 2009, 1♂1♀, FKCP, 2♂4♀ MTAS, leg. E. A. Yağmur.

Diagnosis. Total length 35 to 55 (rarely 60) mm. Dorsal trichobothria of femur arranged in *beta*-configuration. Trichobothrium *eb* located on fixed finger

of chela. Trichobothrium *db* on pedipalp fixed finger always located between *est* and *esb*. Color pattern usually lighter-colored. Pectines with fulcra. Legs III and IV with tibial spurs. Tarsomeres of legs I and II with paired ventral spines. Cheliceral fixed finger with two ventral denticles. Movable fingers of pedipalps with 10 to 12 (very rarely 13) diagonal rows of denticles. Rows of denticles with one internal and two posterior external granules. Dentate margin of pedipalp chela movable finger with 5 terminal denticles (4 terminal and one basal terminal). Metasomal segment I with ten, and metasomal segment IV, with eight carinae. Carapace in lateral view with entire dorsal surface horizontal or nearly so (possibly with a slight anterior decline). Central lateral and posterior lateral carinae of carapace not joined to form a continuous linear series of granules to posterior margin. Carinae of carapace forming a lyre-shaped configuration. Mesosomal tergites I–VI with three carinae. Carinae of tergites do not project beyond posterior margin as distinct spiniform processes. Mesosomal tergites VI and VII smooth or weakly granulated. All metasomal segment similar in width. Ventral carinae of metasomal segments without very strong teeth. Metasomal segment V with a single ventral carina. Ventrolateral carinae on the metasomal segment V with irregular granules. Telson bulbous, especially in female.

Distribution: **Iran:** Bushehr Province (Pocock, 1889a: 341), Ilam Province (Akbari, 2007: 76), Khoozestan Province (Navidpour et al., 2008a: 9), Kohgilouyeh & Boyer Ahmad (Kovařík, 1997), and Chahar Machal & Bakhtiyari Province (Pirali-Kheirabadi et al., 2009: 6); Iraq (Penther, 1912: 111); **Syria** (first report); **Turkey** (first report).

Comments: Penther (1912: 111), describing *Buthus eupaeus mesopotamicus*, had meager material and thus could not see the amount of variation present in different populations. He counted 24–27 pectinal teeth in males and 17–20 in females, whereas in *M. eupeus phillipsii* (as *Buthus phillipsii*) he found 27–30 pectinal teeth in males and 23–26 in females. In reality, males of *M. eupeus phillipsii* from Iran (Bushehr Province) have 21–29 pectinal teeth and females have 18–27. We were able to compare numerous specimens of *M. eupeus phillipsii* collected in Iran by the team under Shahrokh Navidpour with 159 specimens of *M. eupeus mesopotamicus* collected by Vlasta Kálalová, and can unequivocally state that *Buthus eupaeus mesopotamicus* Penther, 1912 is a synonym of *M. phillipsii* (Pocock, 1889). Similarity of these two taxa was indicated also by Birula (1917: 51). Later, Birula (1918) provided a detailed comparison of *M. eupeus mesopotamicus* with the nominotypical subspecies, and, in addition to telson shape, discussed minor variation of carination and sculpture on metasoma and pedipalps; however, our analysis did not reveal

consistent pattern in these characters. On the other hand, Birula (1918), in his last paper involving *Mesobuthus* of Middle East, distinguished *M. eupeus mesopotamicus* from *M. eupeus phillipsii* only by minor differences in carapace and mesosomal tergite carination and sculpture, and did not study any material from Turkey that was available to us.

Variation

Two subspecies, *M. eupeus eupeus* and *M. eupeus phillipsii*, form numerous populations living in variable local conditions (temperature, humidity, elevation), which exhibit substantial phenotypic variation specifically in adult specimen size, coloration, and the degree of development of sexual dimorphism.

Size. In the Turkish population of *M. eupeus eupeus* from Yörük Village (37°16'57"N 42°01'07"E) males are 35–40 mm long, whereas at the Karacadağ Mountain (37°44' 45"N 39°49'50"E) males are 48–60 mm long. Examined females from both populations are 52–55 mm long.

Coloration. Especially forest populations of *M. eupeus eupeus* have much darker color patterns. This can be seen in all Georgian and Armenian populations studied, and it is often regarded as characteristic for the nominotypical subspecies. However, some Turkish populations are much lighter-colored, including those within the postulated distributional limits of *M. eupeus eupeus*.

Sexual dimorphism. The degree of its development concerns primarily the shape of the chela and fingers in males and of the telson in females. Surprisingly, it does not show a correlation to specimen size; for instance, small males of both subspecies may have abnormally wide chela and a conspicuous internal lobe on the fingers. Equally complex is this relationship in females of *M. eupeus phillipsii*, where some 55 mm long specimens from Iran (Bushehr Province) have the telson extremely inflated whereas others of the same size have the telson relatively slender and therefore can be confused with *M. eupeus eupeus*.

Biogeography and Systematics

Our map (Figure 27) shows the allopatric geographic distribution of two subspecies in Turkey. We see that their ranges come close to each other in southeastern Turkey. The northern subspecies *Mesobuthus eupeus eupeus* is most common in the northeastern mountainous areas of the Caucasus; it also penetrates west into Anatolia as far as Konya Province, to the longitude 33°38'E. At the same time, the southern subspecies *M. eupeus phillipsii* occupies in Turkey a compact range in the arid regions of the southeast (Adıyaman, Diyarbakır, Gaziantep, Kahramanmaraş, Mardin, Şanlıurfa Prov-

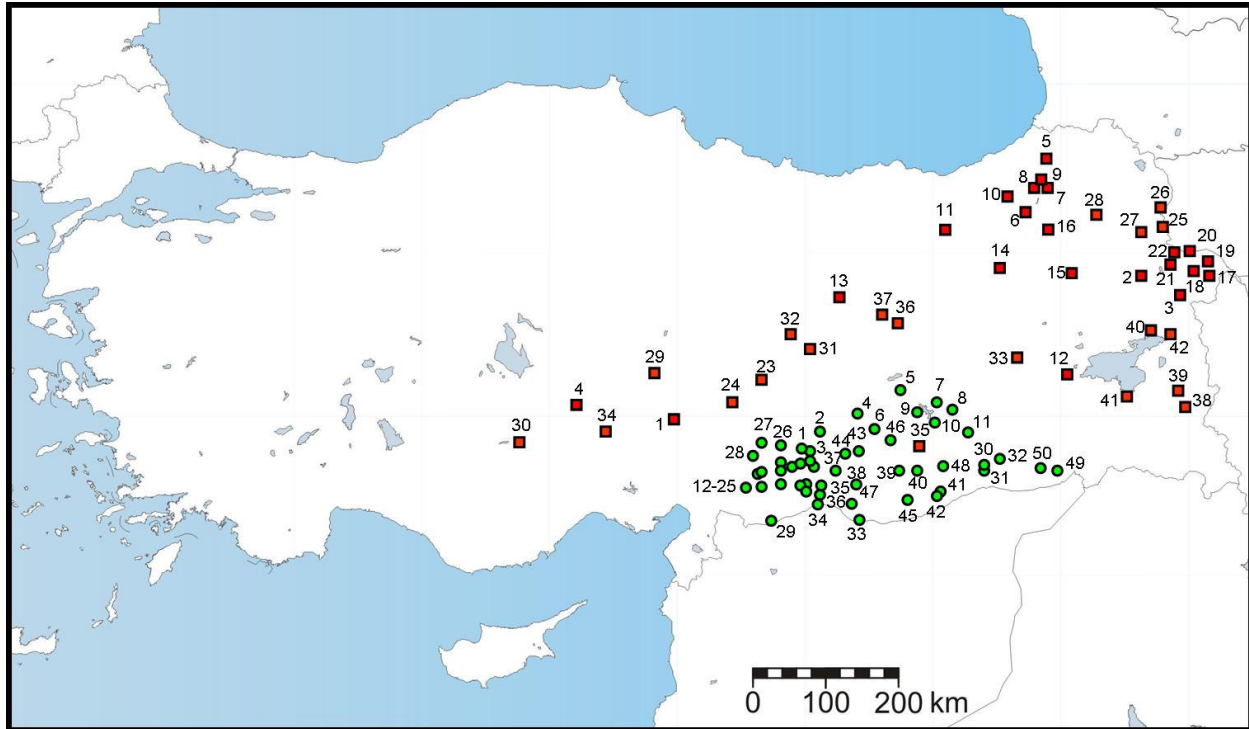


Figure 27: Distribution of *Mesobuthus eupeus eupeus* (C. L. Koch, 1839) and *M. eupeus phillipsii* (Pocock, 1889) in Turkey. Red squares, localities of *M. e. eupeus*; green circles, localities of *M. e. phillipsii*. See Material Examined for numbers of localities.

inces), reaching north over 37°N (in Adıyaman Province). This area is within the East Anatolian Region as defined by Crucitti & Cicuzza (2001). The allopatry follows the same biogeographic boundaries that have been recently outlined for another scorpion genus, *Calchas* Birula, 1899 (Fet et al. 2009).

The Southeast Anatolia Region is separated by Eastern Taurus mountains from the rest of Turkey. Certain scorpion species are found only in this area, e.g. *Calchas birulai* and *Leiurus abdullahbayrami*. Other, xerophilic scorpions are limited in their distribution by this area, e.g. *Androctonus crassicauda*, *Compsobuthus matthiesseni* (see Yağmur et al., 2008a, 2008b), and also *Mesobuthus eupeus phillipsii*, and do not penetrate further to the Mediterranean Region. On the other hand, *Mesobuthus eupeus eupeus* is limited from the north by the Black Sea Region and the eastern Black Sea mountains. This region is very humid and rainy, and its scorpionfauna includes only *Euscorpium* species.

We use the term "subspecies" here with a reservation; it is highly possible that two discussed taxa represent separate "sibling" species. The taxonomic status of many *M. eupeus* subspecies is currently under investigation. This overly polymorphic species (which is, likely, a species complex) possibly will be separated into a number of species. First such indication has been provided by Gantenbein, Fet & Gromov (2003) who

used 16S rRNA mitochondrial DNA markers to compare several populations of *M. eupeus* from Turkey to China.

In their most recent, detailed study of *M. eupeus* from Iran, using standard "barcoding" DNA markers (COI), Mirshamsi et al. (2010) detected two lineages: a northern clade, which included four subspecies identifies in their analysis (*M. e. eupeus*, *M. e. philippovitschi*, *M. e. afghanus* and *M. e. thersites*), and the southern clade with two subspecies (*M. e. phillipsii* and *M. e. kirmanensis*). Our current finding of two subspecies of *M. eupeus* in Turkey complements this comprehensive analysis. Further detailed analysis of both DNA and morphology, with intensive search of new characters, is needed across the range of the entire species (or species complex) *Mesobuthus eupeus*.

Key to Turkish *Mesobuthus*

1. Fourth metasomal segment with 10 carinae 2
- Fourth metasomal segment with 8 carinae 3

2. Rows of denticles on movable finger with 13 (more rarely 12) internal (outer accessory) denticles. Centromedian and posteriomedian carinae separated
 *Mesobuthus nigrocinctus* (Ehrenberg, 1828)
- Rows of denticles on movable finger with with 12 (more rarely 13) internal (outer accessory) denticles.

Centromedian and posteriomedian carinae fused.....
..... *Mesobuthus gibbosus* (Brullé, 1832)

3. Movable fingers of pedipalps with 11–12 cutting rows of denticles. Total adult length less than 60 mm 4
- Movable fingers of pedipalps with 13–14 cutting rows of denticles. Total adult length more than 60 mm
..... *Mesobuthus caucasicus* (Nordmann, 1840)

4. Telson bulbous, especially in female (Figs. 24–26). Specimens in which this character is not well defined are usually smaller, lighter-colored, and have smooth or weakly granulated mesosomal tergites VI and VII (Figs. 21–22). ... *Mesobuthus eupeus phillipsii* (Pocock, 1889)
- Telson elongate in both sexes (Fig. 23). Mesosomal tergites VI and VII granulated, usually densely (Figs. 19–20). Color pattern usually dark, especially in forest populations.
..... *Mesobuthus eupeus eupeus* (C. L. Koch, 1839)

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