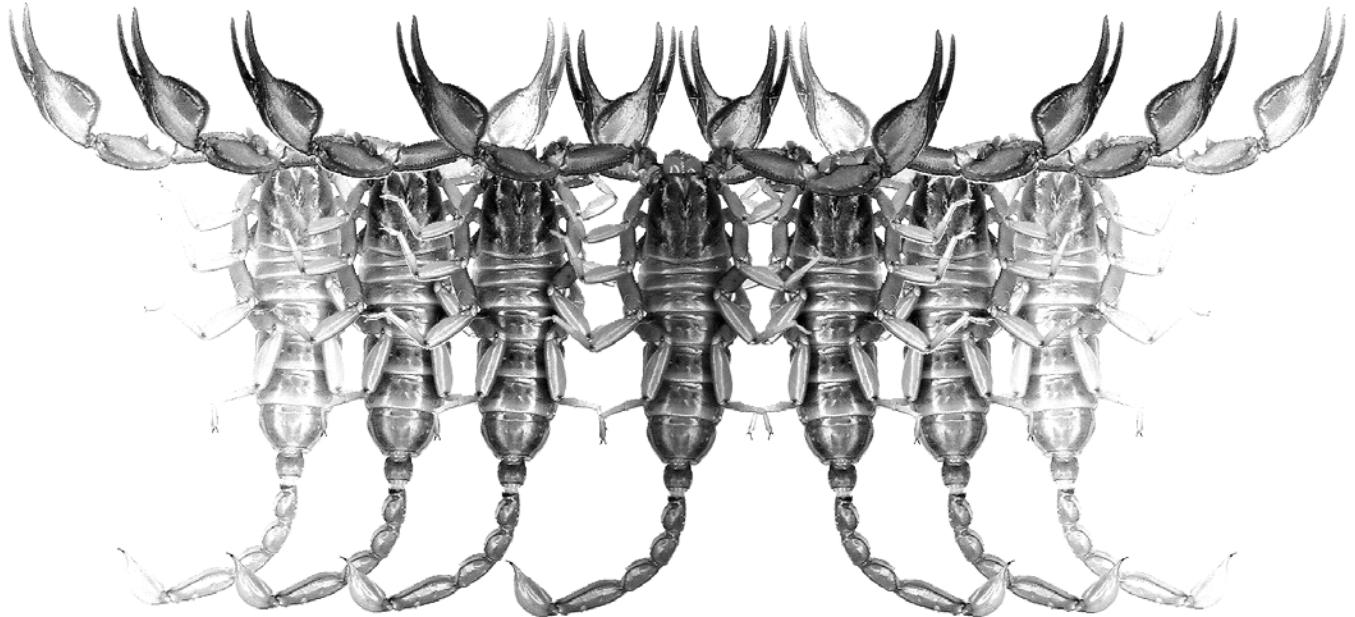


Euscorpius

Occasional Publications in Scorpiology



**Scorpions of Iran (Arachnida, Scorpiones).
Part II. Bushehr Province**

Shahrokh Navidpour, Michael E. Soleglad, Victor Fet & František Kovařík

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Occasional Publications in Scorpiology

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

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- **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

Scorpions of Iran (Arachnida, Scorpiones). Part II. Bushehr Province

Shahrokh Navidpour ¹, Michael E. Soleglad ², Victor Fet ³ & František Kovařík ⁴

¹ Razi Reference Laboratory of Scorpion Research (RRLS), Razi Vaccine and Serum Research Institute, Sepah St., Hejrat Sq., Ahvaz, Khoozestan, Iran

² P.O. Box 250, Borrego Springs, CA 92004, USA

³ Department of Biological Sciences, Marshall University, Huntington, WV 25755, USA

⁴ P.O. Box 27, CZ-145 01 Praha 45, Czech Republic

Summary

The Bushehr Province of Iran contains the type localities of three scorpion taxa, *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Orthochirus iranus* Kovařík, 2004, and *Scorpio maurus townsendi* (Pocock, 1900). Apart from them, *Androctonus crassicauda* (Olivier, 1807), *Compsobuthus matthiesseni* (Birula, 1905), *Hottentotta saulcyi* (Simon, 1880), *Odontobuthus bidentatus* Lourenço & Pézier, 2002, *Razianus zarudnyi* (Birula, 1903), and *Hemiscorpius lepturus* Peters, 1862 have also been known to occur in the province. Collections made by a team under Shahrokh Navidpour (Razi Reference Laboratory of Scorpion Research, Razi Vaccine and Serum Research Institute, Ahvaz, Khoozestan, Iran) reveal four additional species recorded from the province for the first time: *Buthacus macrocentrus* (Ehrenberg, 1828), *Compsobuthus jakesi* Kovařík, 2003, *Orthochirus farzanpayi* (Vachon & Farzanpay, 1987), and *Orthochirus stockwelli* (Lourenço et Vachon, 1995). In addition, *Compsobuthus persicus* sp. n. is described as a species new to science, bringing the total species count to 14. A key to all species of scorpions found in Bushehr Province is presented.

Introduction

A number of papers deal with the scorpions of Iran to some extent, but a comprehensive study of the scorpion fauna has been lacking. We therefore decided to survey the scorpions of Iran thoroughly, province by province. The fieldwork was conducted by the Razi Reference Laboratory of Scorpion Research (RRLS) team under Shahrokh Navidpour and included documentation of habitat diversity, revisititation of previously known sites, some of them type localities, and sampling of all the encountered scorpion species. All specimens are collected by UV light at night.

The first faunistic contribution of our scorpion survey of Iran has been published, and covers Khoozestan Province (Navidpour et al., 2008). The second region surveyed, the Bushehr Province, is an area for which very little is known about scorpions. The type localities of three species, *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Orthochirus iranus* Kovařík, 2004, and *Scorpio maurus townsendi* (Pocock, 1900), lie within Bushehr Province, and six additional species have been documented there in the past. New collections revealed the presence of five more species of scorpions within the Bushehr Province, one of which is new to science and is described below. Apart from the new species, all others

now known from Bushehr Province also occur in the neighboring Khoozestan Province (Navidpour et al., 2008).

The Bushehr Province is located in the southwest of Iran and is bordered by four other provinces: Khoozestan and Kohkiloye & Boyer Ahmad in the north, Fars in the east, and Hormozgan in the southwest; it is limited by the Persian Gulf in the west (see map in Fig. 1). Habitats in this province are diverse (see Figs. 2–3, 5–8, 20–21). Areas such as Dailam, Genaveh, Bushehr, and Delvar contain sandy deserts with clay hills covered by deep soils. Other areas such as Khormuj, Ahram, and Farashband are mountainous with rocky substrates. Elevations in this part of Iran change from 3–5 meters at the shores of the Persian Gulf to 220 meters in the northern parts of the province. Climate in this part of Iran is hot and humid for most of the year with temperatures ranging from 5°C in winter to 48°C in summer.

The team surveyed and collected scorpion species belonging to the families Buthidae, Scorpionidae, and Hemiscorpiidae, and recorded ecological and distribution data of the scorpion fauna. *Mesobuthus eupeus*, *Buthacus macrocentrus*, and *Odontobuthus bidentatus* were found everywhere within 15–80 m altitude, especially in soft soils of hills in the areas of Dailam,

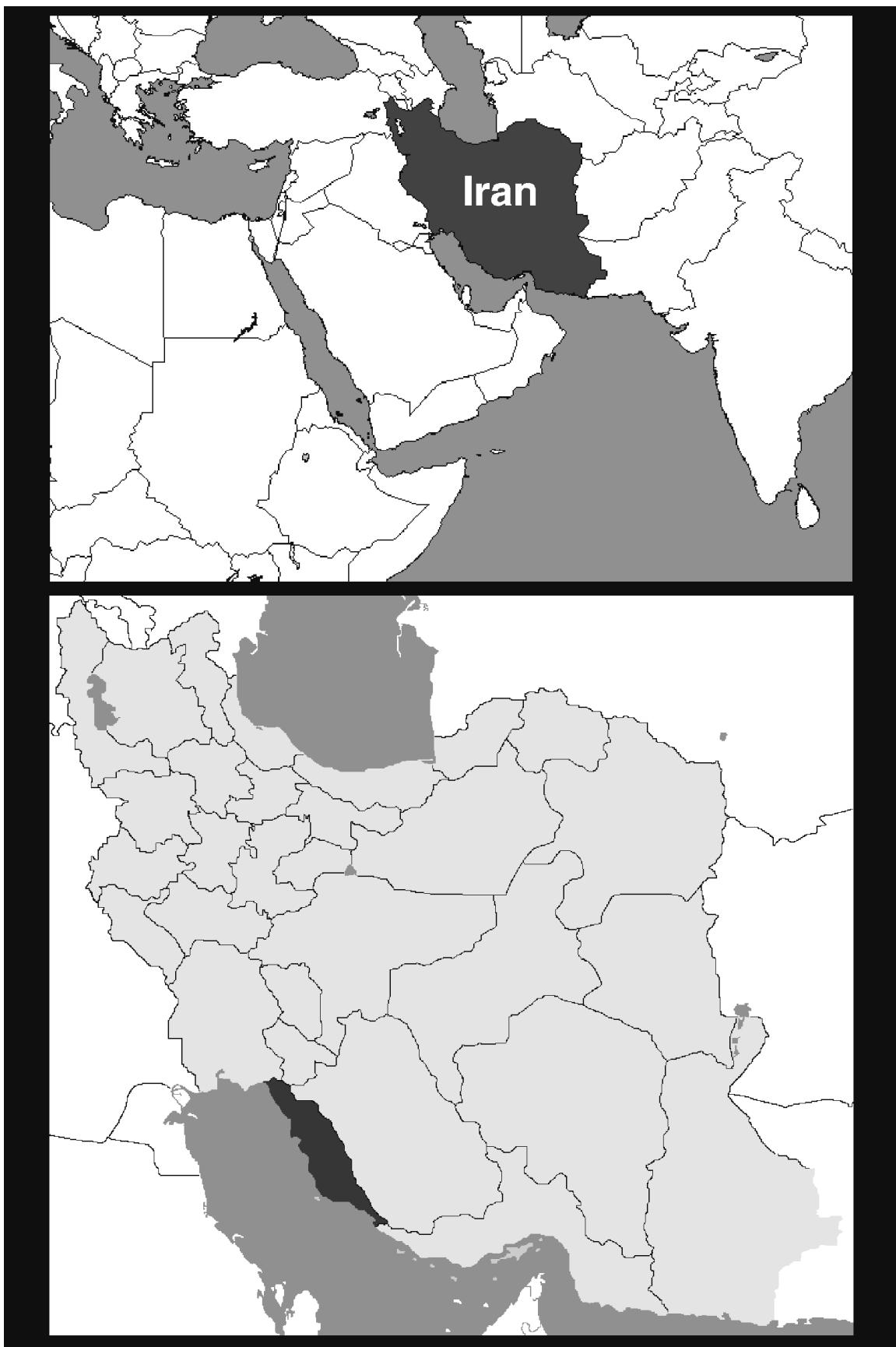


Figure 1: Map of southwestern Asia highlighting Iran (top) and closeup of Iran showing provinces, the Bushehr province depicted in black (bottom).

Genaveh, Delvar, Dayer, and Borazjan. *Hemiscorpius lepturus* was found only in the montane areas of the northern and northeastern parts of the province. Our study shows high densities and frequencies of *Odontobuthus bidentatus* and *Mesobuthus eupeus phillipsii* in the Bushehr Province, while those of *Androctonus crassicauda* and *Hottentotta saulcyi* were low. We found three species of *Compsobuthus* in the province, especially in northern and central areas, including one new species. All three species inhabit mountains with rocky substrates.

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;
 MHNG – Museum d'Histoire naturelle, Geneva, Switzerland;
 MNHN – Muséum National d'Histoire Naturelle, Paris, France;
 NHMW – Naturhistorisches Museum Wien, Vienna, Austria;
 RRLS – Razi Reference Laboratory of Scorpion Research, Razi Vaccine and Serum Research Institute, Sepah St., Hejrat Sq., Ahvaz, Khoozestan, Iran;
 ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;
 ZMHB – Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany;
 ZMUH – Zoologisches Institut und Zoologisches Museum, Universität Hamburg, Germany.

List of scorpions of Bushehr Province

Family **Buthidae** C. L. Koch, 1837

Androctonus crassicauda (Olivier, 1807)

Buthacus macrocentrus (Ehrenberg, 1828) (first report for Bushehr Province)

Compsobuthus jakesi Kovařík, 2003 (first report for Bushehr Province)

Compsobuthus matthiesseni (Birula, 1905)

Compsobuthus persicus sp. n.

Hottentotta saulcyi (Simon, 1880)

Mesobuthus eupeus phillipsii (Pocock, 1889)

Odontobuthus bidentatus Lourenço et Pézier, 2002

Orthochirus farzanpayi (Vachon et Farzanpay, 1987) (first report for Bushehr Province)

Orthochirus iranus Kovařík, 2004

Orthochirus stockwelli (Lourenço et Vachon, 1995) (first report for Bushehr Province)

Razianus zarudnyi (Birula, 1903)

Family **Scorpionidae** Latreille, 1802

Scorpio maurus townsendi (Pocock, 1900)

Family **Hemiscorpiidae** Pocock, 1893

Hemiscorpius lepturus Peters, 1861

Systematics

Family **Buthidae** C. L. Koch, 1837

Androctonus crassicauda (Olivier, 1807)

Figures 4, 20, 25–28

Scorpio crassicauda Olivier, 1807: 97.

Buthus crassicauda: Simon, 1872: 247 (in part); Simon, 1879: 99; Kraepelin, 1899: 16; Pocock, 1902: 373; Kraepelin, 1913: 124; Lampe, 1918: 190.

Androctonus crassicauda: Kraepelin, 1891: 175 (in part); Vachon, 1951: 343; Khalaf, 1962: 1; Khalaf, 1963: 60; Habibi, 1971: 42; Farzanpay & Pretzmann, 1974: 215; Pérez Minoccia, 1974: 17; Vachon, 1974: 909; Vachon, 1979: 31; Farzanpay, 1987: 141; Farzanpay, 1988: 36; Fet, 1989: 78; Sissom, 1994: 36; Al-Safadi, 1992: 96; Amr & El-Oran, 1994: 187; Dupré et al., 1998: 59; Kovařík, 1998: 104; Crucitti, 1999: 83; Kabakibi et al., 1999: 80; Fet & Lowe, 2000: 72; Stathi & Mylonas, 2001: 288; Kovařík, 2002: 5; Crucitti & Vignoli, 2002: 439; Vignoli et al., 2003: 2; Fet & Kovařík, 2003: 180; Kovařík & Whitman, 2005: 105; Hendrixson, 2006: 38; Akbari, 2007: 76; Navidpour et al., 2008: 5.

Prionurus crassicauda: Pocock, 1895: 292; Tullgren, 1909: 2; Birula, 1904: 29; Birula, 1905a: 120; Masi, 1912: 91; Penther, 1912: 110.

Androctonus crassicauda crassicauda: Vachon, 1959: 124; Vachon, 1966: 210; Habibi, 1971: 42; Vachon, 1979: 34; Levy & Amitai, 1980: 24; Kovařík, 1997a: 49.

= *Prionurus crassicauda orientalis* Birula, 1900: 355; Birula, 1903: 67 (syn. by Fet, 1989: 79)

Buthus (Prionurus) crassicauda orientalis: Birula, 1917: 93, 240.

Buthus crassicauda orientalis: Kraepelin, 1913: 124.

Androctonus crassicauda orientalis: Vachon, 1959: 124; Vachon, 1966: 210; Habibi, 1971: 42; Pérez Minoccia, 1974: 18.

Androctonus amoreuxi baluchicus: Kovařík, 1997a: 39 (see Vignoli et al., 2003: 4).

TYPE LOCALITY AND TYPE REPOSITORY. Kashan, Persia, now Iran, Esfahan Province; MNHN.

BUSHEHR PROVINCE MATERIAL EXAMINED. Iran, Bushehr Prov., cca 17 km NW Bandar-e Genaveh, 10 m



2



3

Figures 2–3: Iran, Bushehr Province. 2. Tangestan, Ahram, $28^{\circ}51'45''N$ $51^{\circ}20'50''E$, 123 m a.s.l. (Locality No. Bu-36). Recorded occurrence of *Compsobuthus persicus* sp. n., *Hottentotta saulcyi* (Simon, 1880), *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Orthochirus farzanpayi* (Vachon et Farzanpay, 1987), *Razianus zarudnyi* (Birula, 1903), and *Hemiscorpius lepturus* Peters, 1861. 3. Dayer road, village, $26^{\circ}28'12''N$ $51^{\circ}07'40''E$, 405 m a.s.l. (Locality No. Bu-21). Recorded occurrence of *Mesobuthus eupeus phillipsii* (Pocock, 1889).

a.s.l., 29°38'32"N 50°26'56"E, 1♂2juvs. FKCP, 13–14.X.1998, leg. P. Kabátek; Delvar, 28°42'59"N 51°04'52"E, 4 m a.s.l. (Locality No. Bu-20), XI.2007, 1♀ RRLS, leg. Masihipour & Hayader; Bushehr to Dayer road, Dero Ahmad village, 27°53'47"N 51°35'51"E, 4 m a.s.l. (Locality No. Bu-27), XI.2007, 2♂ RRLS 1im. FKCP, leg. Masihipour, Hayader & Habibzadeh.

DISTRIBUTION: Widespread in Iran, found in most provinces. Recorded also from Armenia (Kraepelin, 1899: 17), Azerbaijan (Fet, 1989: 79), Bahrain (Crucitti & Vignoli, 2002: 439), Egypt (Fet & Lowe, 2000: 72), Iraq (Kennedy, 1937: 745), Israel (Simon, 1892: 83), Jordan (Amr & El-Oran, 1994: 187), Kuwait (Kettel, 1982: 6), Lebanon (El-Hennawy, 1992: 100), Oman (Birula, 1917: 229; Hendrixson, 2006: 39), Qatar (El-Hennawy, 1992: 100), Saudi Arabia (Pocock, 1895: 292; Hendrixson, 2006: 39), Syria (Simon, 1872: 247), Tunisia (Kraepelin, 1901: 266), Turkey (Pocock, 1902: 373), United Arab Emirates (Hendrixson, 2006: 40), Yemen (Birula, 1937: 101).

***Buthacus macrocentrus* (Ehrenberg, 1828)**

Figures 4, 20, 53–56

Androctonus (Leiurus) macrocentrus Ehrenberg in Hemprich & Ehrenberg, 1828: pl. 1, fig. 6; Ehrenberg in Hemprich & Ehrenberg, 1829: 355 (in part); Hemprich & Ehrenberg, 1831: 5 (in part); Moritz & Fischer, 1980: 317 (in part); Braunwalder & Fet, 1998: 32 (in part).

Buthacus macrocentrus: Kovařík, 2005: 7; Navidpour et al., 2008: 7.

= *Buthus tadmorensis* Simon, 1892: 84; Kraepelin, 1895: 83; Birula, 1905a: 136; Habibi, 1971: 43 (syn. by Kovařík, 2005: 8).

Buthus (Buthacus) tadmorensis: Birula, 1910: 172; Birula, 1917: 229.

Buthacus tadmorensis: Simon, 1910: 76; Vachon, 1966: 210; Farzanpay, 1987: 144; Farzanpay, 1988: 36; Kovařík, 1997a: 49; Kovařík, 1998: 105; Kovařík, 2001: 80; Fet & Kovařík, 2003: 180.

= *Buthus pietschmanni* Penther, 1912: 112 (syn. by Birula, 1917: 229).

= *Buthacus yotvatensis* Levy, Amitai & Shulov, 1973: 130; Levy & Amitai, 1980: 90; Kinzelbach, 1984: 99; Vachon & Kinzelbach, 1987: 100; Fet & Lowe, 2000: 85; Crucitti & Vignoli, 2002: 439 (syn. by Kovařík, 2001: 80).

Buthacus yotvatensis yotvatensis: Vachon, 1979: 36; Fet & Lowe, 2000: 85.

Buthacus tadmorensis tadmorensis: Vachon & Kinzelbach, 1987: 101; Kovařík, 2002: 5;

Buthacus tadmorensis yotvatensis: Vachon & Kinzelbach, 1987: 101; Amr et al., 1988: 374; El-Hennawy, 1992: 114; Kabakibi et al., 1999: 82.

Mesobuthus pietschmanni: El-Hennawy, 1992: 128.

TYPE LOCALITY AND TYPE REPOSITORY. Sinai; ZMHB. Type locality "Sinai" (Ehrenberg in Hemprich & Ehrenberg, 1829: 355 and label) must be regarded as erroneous.

TYPE MATERIAL EXAMINED. Sinai (labeled as *Androctonus macrocentrus*, Sinai, No. 153), 1♀, lectotype of *Androctonus (Leiurus) macrocentrus* Ehrenberg in Hemprich & Ehrenberg, 1828, ZMHB.

BUSHEHR PROVINCE MATERIAL EXAMINED. Iran, Bushehr Prov., cca 17 km NW. Bandar-e Genaveh, 10 m a.s.l., 29°38'32"N 50°26'56"E, 1♂ FKCP, 13–14.X.1998, leg. P. Kabátek; Bandar-e Genaveh env., X.2000, 2♂ FKCP, leg. R. Perlík; Delvar, 28°42'59"N 51°04'52"E, 4 m a.s.l. (Locality No. Bu-20), XI.2007, 18♂22♀10juvs. RRLS 4juvs. FKCP, leg. Masihipour & Hayader; Dayer, 27°49'35"N 52°04'44"E, 4 m a.s.l. (Locality No. Bu-25), XI.2007, 1juv. RRLS, leg. Masihipour, Bahrami & Habibzadeh; Bushehr to Dayer road, Dero Ahmad village, 27°53'47"N 51°35'51"E, 4 m a.s.l. (Locality No. Bu-27), XI.2007, 3♂1♀1juv. RRLS, leg. Masihipour, Hayader & Habibzadeh; Bushehr to Dayer road, Golestan, 29°13'46"N 51°19'33"E, 3 m a.s.l. (Locality No. Bu-28), XI.2007, 15♂3♀8juvs. RRLS, 1♂2♀ FKCP, leg. Masihipour, Hayader & Bahrami; Omidiyeh to Genaveh road, 30°13'42"N 50°12'01"E, 128 m a.s.l. (Locality No. Bi 805), VI.2007, 11♂18♀22juvs. RRLS, leg. Navidpour & Masihipour; Dailam road, Khite Amareh village, 30°42'52"N 49°44'59"E, 41 m a.s.l. (Locality No. OM-801), VII.2007, 1♂2♀ RRLS, leg. Navidpour, Masihipour & Habibzadeh.

DISTRIBUTION: Iran, known from Bushehr Province (Kovařík, 2005: 8, as "Chamak Province") and Khoozestan Province (Navidpour et al., 2008: 7); Iraq (Penner, 1912: 112), Israel (Vachon, 1966: 210), Jordan (Pérez Minocci, 1974: 19), Syria (Simon, 1892: 84), Turkey (Crucitti & Vignoli, 2002: 439).

***Compsobuthus jakesi* Kovařík, 2003**

Figures 19, 41–44

Compsobuthus acutecarinatus: Kovařík, 1998: 109 (in part); Kovařík, 2001: 79 (in part).

Compsobuthus jakesi Kovařík, 2003: 91; Kovařík & Ahmed, 2007: 5; Navidpour et al., 2008: 9.

Compsobuthus sp.: Fet & Kovařík, 2003: 180.

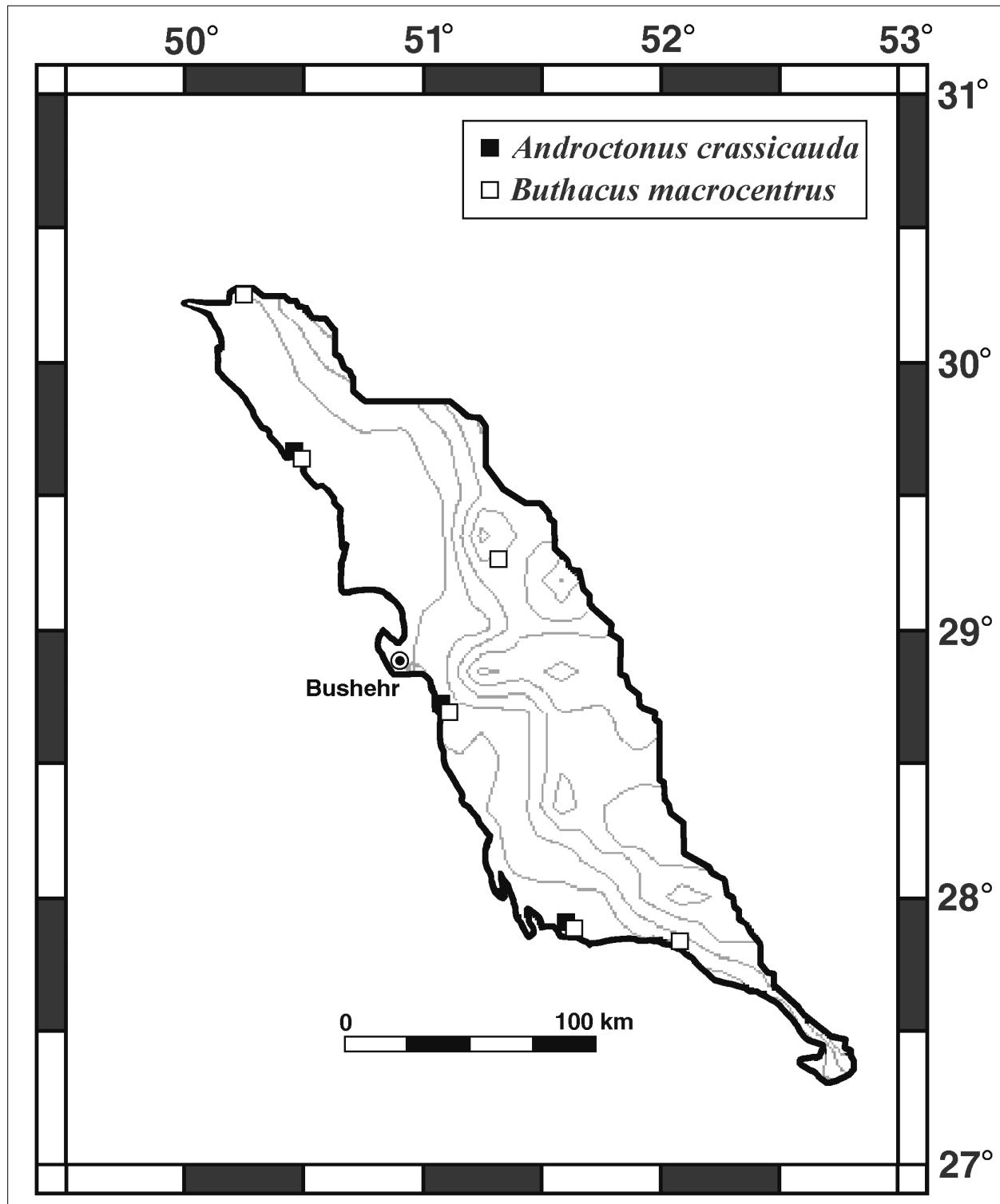
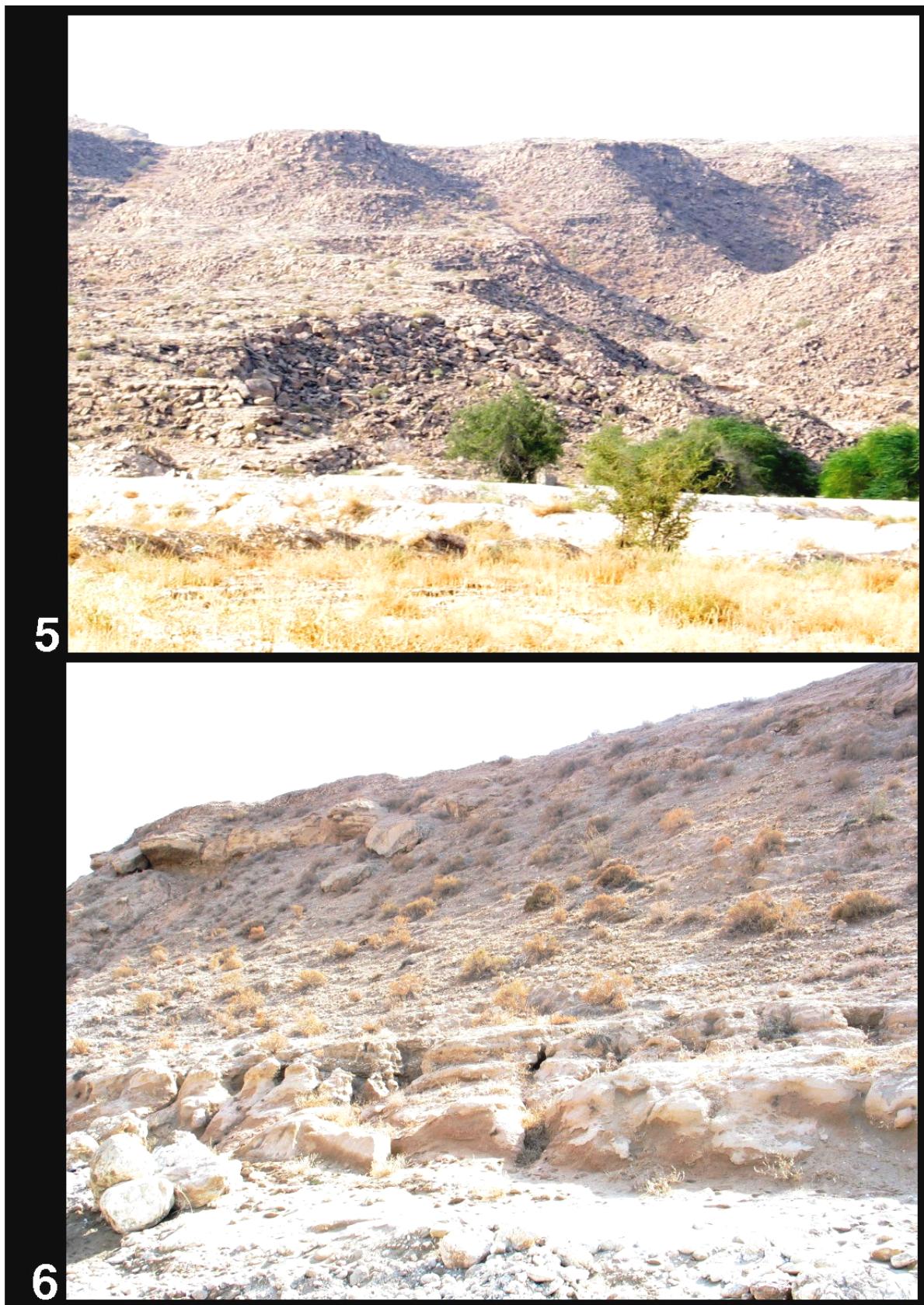


Figure 4: Map of Bushehr province showing distribution of *Androctonus crassicauda* and *Buthacus macrocentrus* collected in this study.

TYPE LOCALITY AND TYPE REPOSITORY. Iraq, Najaf Province, Ash-Shabakah (Shabachah, Shabicha), Geophysics Brno base camp, 150 km SW of An-Najaf (Najaf), 262 m a.s.l., 31°06'N 43°95'E; FKCP.



Figures 5–6: Iran, Bushehr Province. 5. Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19). Type locality of *Compsobuthus persicus* sp. n. Also found *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Razianus zarudnyi* (Birula, 1903), and *Hemiscorpius lepturus* Peters, 1861. 6. Dailam to Geneveh road, Payshur village, 29°41'56"N 50°26'04"E, 18 m a.s.l. (Locality No. Bu-803). Recorded occurrence of *Orthochirus stockwelli* (Lourenço et Vachon, 1995).



7



8

Figures 7–8: Iran, Bushehr Province. **7.** Tangestan to Farashband, 29°52'49"N 51°22'31"E, 227 m a.s.l. (Locality No. Bu-37). Recorded occurrence of *Compsobuthus persicus* sp. n. and *Hemiscorpius lepturus* Peters, 1861. **8.** Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (Locality No. Bu-31). Recorded occurrence of *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Odontobuthus bidentatus* Lourenço et Pézier, 2002, and *Orthochirus iranus* Kovařík, 2004.

<i>Compsobuthus persicus</i> sp. n.			
		Female PT	Male HT
Total Carapace	length	37	28
	length	4.0	3.1
	width	4.0	3.0
Metasoma and telson segment I	length	21	18
	length	2.7	2.3
	width	2.2	1.7
	length	3.2	2.8
	width	1.9	1.6
	length	3.4	2.9
	width	1.9	1.5
	length	3.9	3.3
	width	1.8	1.5
	length	4.3	3.6
segment V	width	1.7	1.5
	length	3.5	3.1
Pedipalp femur	length	3.8	3.2
	width	1.0	0.8
	length	4.7	3.9
	width	1.5	1.1
	length	7.3	5.9
tibia	width	1.2	0.9
	length	5.3	4.2
Pectinal teeth		22:21	23:24

Table 1: (in millimeters) of type specimens of *Compsobuthus persicus* new species.

TYPE MATERIAL EXAMINED. **Iraq**, Najaf Province, Ash-Shabakah (Shabachah, Shabicha), Geophysics Brno base camp, 150 km SW of An-Najaf (Najaf), 262 m a.s.l., 31°06'N 43°95'E, X.-XII.1978, 2♂3♀2juvs. (holotype, allotype, and paratypes), leg. O. Jakeš, FKCP.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Bushehr to Dayer road, Dero Ahmad village, 27°53'47"N 51°35'51"E, 4 m a.s.l. (Locality No. Bu-27), XI.2007, 1juv. RRLS, 1♀im. FKCP, leg. Masihipour, Hayader & Habibzadeh.

DISTRIBUTION: Iran, Khoozestan Province (Navidpour et al., 2008: 9), Bushehr Province (first report); Iraq (Kovařík, 2003: 91).

Compsobuthus matthiesseni (Birula, 1905)

Figures 19, 45–48

Buthus acutecarinatus matthiesseni Birula, 1905a: 142; Birula, 1937: 107.

Buthus (Buthus) acutecarinatus matthiesseni: Birula, 1917: 229, 240; Birula, 1918: 25.

Buthus (Hottentotta) acutecarinatus matthiesseni: Vachon, 1940b: 173.

Compsobuthus matthiesseni: Pringle, 1960: 77; Habibi, 1971: 43; Levy et al., 1973: 114; Levy & Amitai, 1980: 60; Farzanpay, 1987: 149; Farzanpay, 1988: 37; Kovařík, 1992: 183; Kovařík, 1996: 53; Kovařík, 1997a: 40, 49; Kovařík, 1997b: 179; Kovařík, 1998: 109; Sissom & Fet, 1998: 1; Crucitti, 1999: 84; Fet & Lowe, 2000: 127; Lourenço & Vachon, 2001: 180; Kovařík, 2002: 7; Crucitti & Vignoli, 2002; Kovařík, 2003: 97; Vignoli et al., 2003: 2; Vignoli, 2005: 85; Akbari, 2007: 76; Kovařík & Ahmed, 2007: 6; Navidpour et al., 2008: 9.

Compsobuthus acutecarinatus matthiesseni: Vachon & Kinzelbach, 1987: 101; El-Hennawy, 1992: 123.

TYPE LOCALITY AND TYPE REPOSITORY. Iran, "Kum, Province Irak-Adschemi" now Qum (Qom); ZISP.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Genaveh, 29°48'42"N 50°14'22"E, 227 m a.s.l. (Locality No. Bu-G), VI.2005, 8♂11♀ RRLS, 1♂3♀ FKCP, leg. Hayader & Tofigh; Omidiyeh to Genaveh road, 30°13'42"N 50°12'01"E, 128 m a.s.l. (Locality No. B-Bi805), VI.2007, 3♂2♀ RRLS, leg. Navidpour & Masihipour.

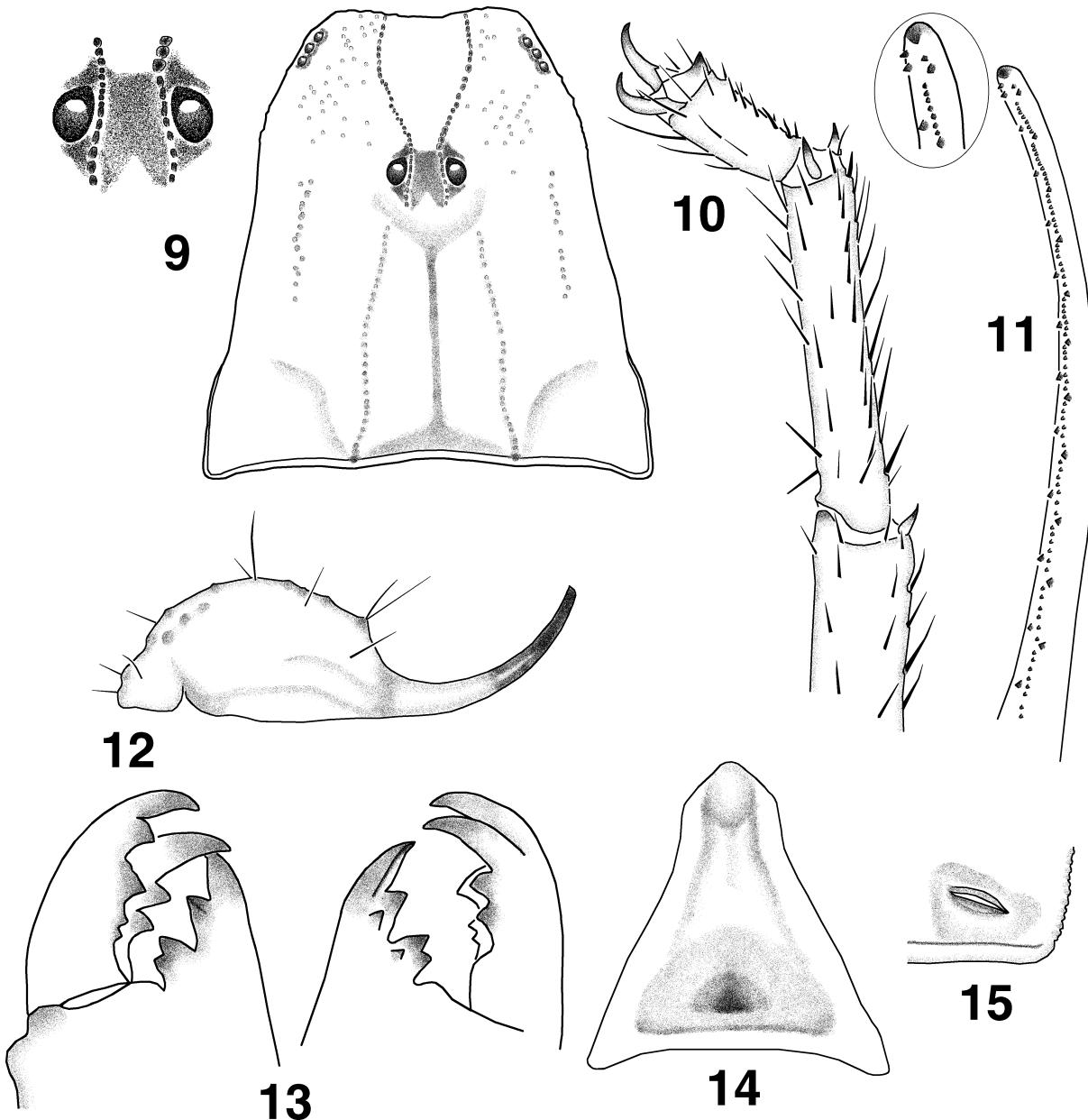
DISTRIBUTION: Iran, known from provinces Kermanshah (formerly Bachtaran), Bushehr, Fars, Hamadan, Khoozestan, Kerman, Kordestan, Lorestan, Markazi, and Qom (Sissom & Fet, 1998; Kovařík, 2003: 100; Akbari, 2007: 76; Navidpour et al., 2008: 9); Iraq (Birula, 1917: 240; Pringle, 1960: 77), Syria (Kovařík, 2002: 7), Turkey (Kovařík, 1996: 53).

Compsobuthus persicus Navidpour, Soleglad, Fet et Kovařík, sp. n.

Figures 2, 5, 7, 9–15, 16–18, 19, 37–40; Table 1

TYPE LOCALITY AND TYPE REPOSITORY. **Iran**, Bushehr Prov., Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l.; RRLS and FKCP.

TYPE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19), XI.2007, 1♂2♀(holotype and paratypes) RRLS, 1♂(paratype) FKCP, leg. Masihipour & Bahrani; Borazjan, 29°16'56"N 51°15'26"E, 200 m a.s.l. (Locality No. Bu-18), II.2007, 2♀(paratypes) FKCP, leg. Masihipour, Bahrani & Habibzadeh; Dayer, 27°49'35"N 52°04'44"E, 4 m a.s.l. (Locality No. Bu-25), XI.2007, 1♀(paratype) RRLS, leg. Masihipour, Bahrani & Habibzadeh; Tangestan, Ahram, 28°51'45"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), XI.2007, 1♂2♀(paratypes) RRLS, 1im. (paratype) FKCP, leg. Masihipour, Bahrani & Habibzadeh; Tangestan to Farashband, 227 m a.s.l. (Locality No. Bu-37), XI.2007,

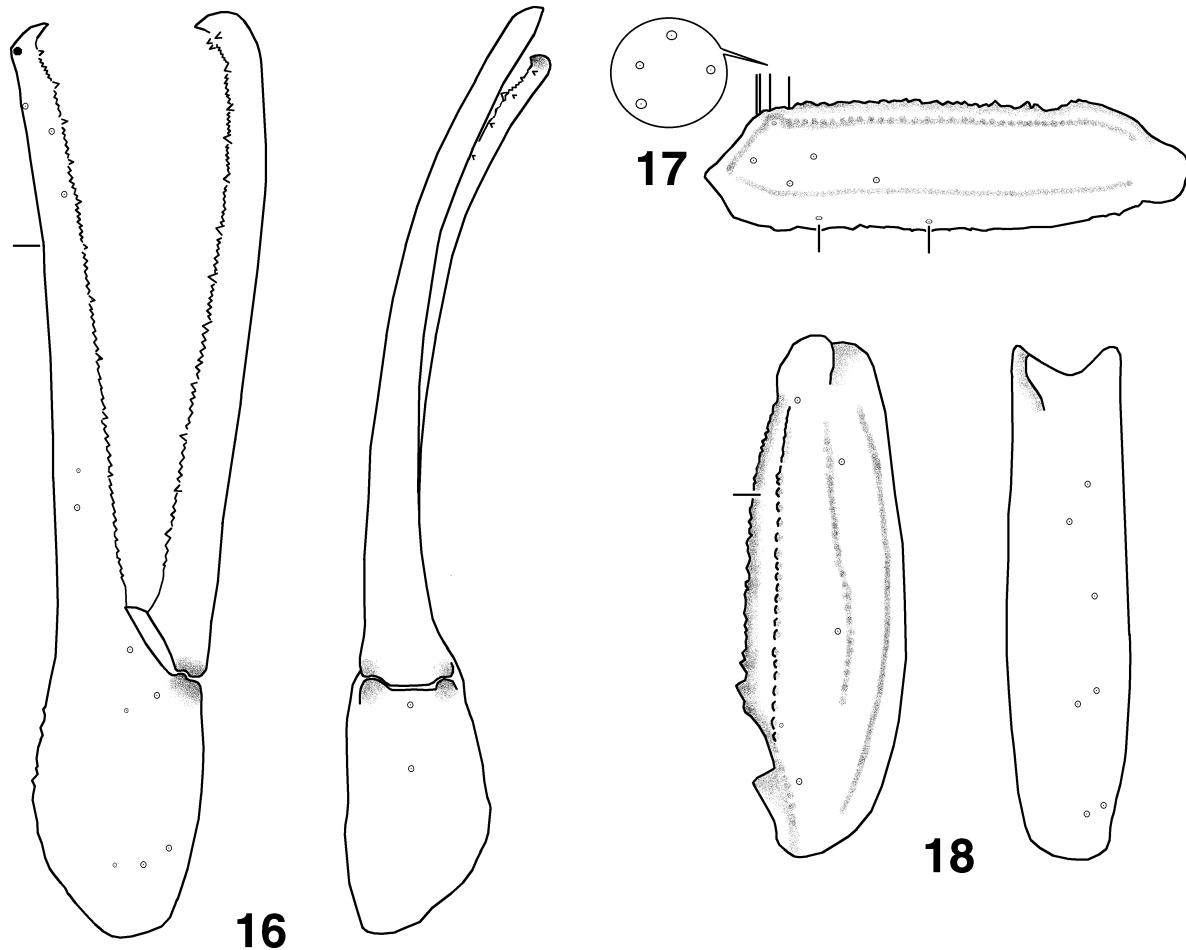


Figures 9–15: *Compsobuthus persicus*, sp. nov., female paratype (BU-18). **9.** Carapace and closeup of median eyes showing well developed median ocular carinae. **10.** Right leg III showing basitarsus and tarsus. Note small tibial spur. **11.** Right chelal movable finger showing dentition, closeup of distal tip in ellipse. **12.** Telson, lateral view. **13.** Left chelicera, dorsal and ventral views. **14.** Sternum. **15.** Left stigmata 3.

2♂4♀(paratypes) RRLS 2♀(paratypes) FKCP, leg. Masihipour, Bahrani & Habibzadeh; Dailam road, Khite Amareh village, 30°42'52"N 49°44'59"E, 41 m a.s.l. (Locality No. OM-801), VII.2007, 1♂(paratype) RRLS, leg. Navidpour, Masihipour & Habibzadeh.

ETYMOLOGY. Named after the country of type locality.

DIAGNOSIS. Total length 28–37 mm. Movable finger of pedipalp bears 10 or 11 rows of granules, without external and with internal granules (the *acutecarinatus* group). Intermediate carinae of second metasomal segment may reach three-quarters of segment length or be confined to only its posterior half; third segment bears only 3–10 posteriorly situated granules in place of



Figures 16–18: *Compsothelus persicus*, sp. nov., female paratype (BU-18), showing trichobothrial pattern. **16.** Chela external and ventral views. Closed circle on chelal fixed finger external view indicates trichobothrium *i*. **17.** Femur, dorsal view. Circled area shows internal trichobothria from an internal perspective. **18.** Patella, dorsal and external views.

intermediate carinae. All segments of pedipalps long and narrow in both sexes. Telson elongate. Pectinal teeth number 21–24.

DESCRIPTION: The adults are 28 mm (male) to 37 mm (female) 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. Sexual dimorphism is minor, but adult males do not have fingers of pedipalps proximally curved; there is no difference in length and width of pedipalps and metasomal segments.

COLORATION: The base color is uniformly yellow to yellowish brown.

MESOSOMA: Carapace (Fig. 9) surface rough with minute granules visible at 10x, larger granules occurring near lateral eyes; median ocular carinae well developed and conspicuous on median eye tubercle; central lateral and joined central-posterior median carinae of medium

development. Tergites I–VI bear very strong, denticulate lateral carinae. Each carina terminates in a spiniform process that extends well past the posterior margin of the tergite. Tergite VII is pentacarinate, with lateral pairs strong, serratocrenulate and the median carina moderate, crenulate and present only in the proximal half. The pectinal tooth count is 21–24 in the females and 23–24 in the males. The seventh segment bears four ventral crenulate carinae. The other sternites are smooth or shagreened and bear two or four smooth carinae. Stigma (Fig. 15) medium to long in length and slit-like in shape. Sternum (Fig. 14) Type 1, exhibiting considerable horizontal compression; concave region much larger than posterior depression, extending towards the apex; outer ridge narrow posteriorly, widening laterally towards the apex; apical “button” weakly developed. Sternum as long as wide, apex lateral edge quite short, approximately one quarter the sternum’s length.

CHELICERAE (Fig. 13): Movable finger dorsal edge with one large subdistal (*sd*) denticle; two small but well

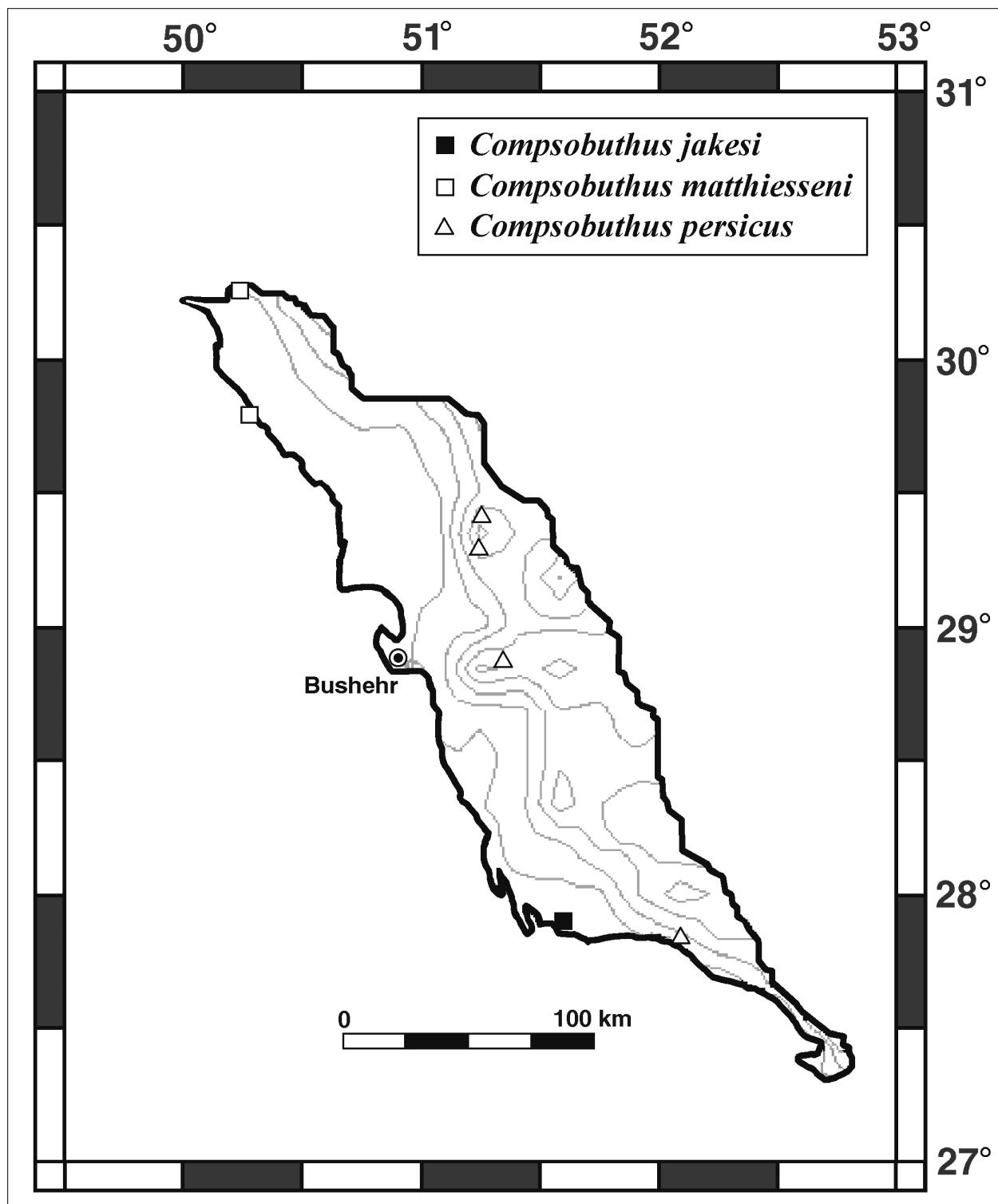


Figure 19: Map of Bushehr province showing distribution of *Compsobuthus jakesi*, *C. matthiesseni* and *C. persicus* sp. nov. collected in this study.

developed subbasal (*sb*) denticles; ventral edge with two well developed ventral accessory (*va*) denticles. Ventral distal denticle (*vd*) shorter in length than dorsal (*dd*)

counterpart. Ventral surface of fixed finger base with two pigmented *va* denticles.

METASOMA AND TELSON: The first segment has a total of 10 carinae, the second through fourth segments have eight complete carinae, and the fifth segment has five carinae. The lateral carinae of the second segment, a partial tenth carinal pair, may reach three-quarters of the segment length or be confined to only its posterior half; all segments are sparsely setose and granulated; larger granules are usually on the ventral surface of segment V, parallel to the ventromedian carina. The telson (Fig. 12) is elongate, with the aculeus approximately as long as the vesicle. The ventral surface of the telson is smooth and a very small, with a smooth subaculear tubercle and a median row composed of several minute granules.

PEDIPALPS (Figs. 11, 16–18): The femur has four granulose to crenulate carinae and the patella has seven only partly crenulate carinae. The chela is smooth, without discernible carinae. All segments are long and narrow, especially the femur and fingers. The movable finger (Fig. 11) bears 10 or 11 rows of granules, without external and with internal granules. The eleventh row may have one external granule. Trichobothrial pattern (Figs. 16–18) orthobothriotaxic, Type A, femoral dorsal trichobothria in *beta* pattern, d_2 located on dorsal surface; patellar trichobothrium d_3 positioned dorsal of dorso-median carina (DM_c) (i.e., member of “*buthus*” group).

LEGS (Fig. 10): Both pedal spurs present, tibial spur present on legs III–IV, spur on leg III smaller. Tarsus with delicate setae on ventral surface.

AFFINITIES. The described features distinguish *C. persicus* sp. n. from all other species of the genus (see the key to species known to occur in Bushehr province). *C. persicus* sp. n. is closest to *C. sobotnicki* Kovařík, 2003 from Hormozgan Province, from which it differs in proportions. *C. persicus* sp. n. has more elongate telson and longer and narrower segments of pedipalps. The femur length to width ratio is 3.1 in *C. sobotnicki* and 3.8–4.0 in *C. persicus* sp. n. The chela length to width ratio is 5.6 in *C. sobotnicki* and 6.0–6.6 in *C. persicus* sp. n. The chela to movable finger length ratio is 1.54 in *C. sobotnicki* and 1.37–1.40 in *C. persicus* sp. n. *C. sobotnicki* has all metasomal segments smooth, whereas they are usually granulated in *C. persicus* sp. n.

Hottentotta saulcyi (Simon, 1880)
Figures 2, 22, 29–32

Buthus saulcyi Simon, 1880a: 378; Simon, 1880b: 29; Kraepelin, 1899: 18; Kraepelin, 1901: 267; Weidner, 1959: 99.

Buthus (Hottentotta) saulcyi: Birula, 1905a: 136; Birula, 1917: 214; Birula, 1918: 30; Vachon, 1940b: 255.

Buthotus saulcyi: Vachon, 1949: 147 (1952: 233); Vachon, 1959: 134; Pringle, 1960: 79; Khalaf,

1962: 2; Khalaf, 1963: 64; Vachon, 1966: 210; Vachon & Stockmann, 1968: 91; Habibi, 1971: 43; Pérez Minocci, 1974: 21; Farzanpay, 1987: 148; Farzanpay, 1988: 37; El-Hennawy, 1992: 118; Kovařík, 1992: 90; Kovařík, 1992: 183; Akbari, 2007: 76; Akbari et al., 1997: 112; Dupré, Lambert & Gérard, 1998: 70.

Hottentotta saulcyi: Kovařík, 1997a: 40; Crucitti & Vignoli, 2002: 446; Vignoli et al., 2003: 4; Karatas, 2003: 315; Kovařík, 2007: 61; Navidpour et al., 2008: 10.

Hottentotta (Hottentotta) saulcyi: Kovařík, 1998: 110; Fet & Lowe, 2000: 143.

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

TYPE LOCALITY AND TYPE REPOSITORY. Iraq, Mosul; MNHN, ZMUH.

BUSHEHR PROVINCE MATERIAL EXAMINED. Iran, Bushehr Prov., Tangestan, Ahram, 28°51'45"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), XI.2007, 2♂ RRLS, 1im. FKCP, leg. Masihipour, Bahrani & Habibzadeh.

DISTRIBUTION: Iran, known from Kermanshah (formerly Bachtaran), Fars, Hamadan, Hormozgan, Ilam, and Lorestan Provinces (Kovařík, 2007: 65), Bushehr and Khoozestan Provinces (Akbari et al., 1997: 112; Akbari, 2007: 76; Navidpour et al., 2008: 9); Afghanistan (Kovařík, 1997a: 40), Iraq (Simon, 1880a: 379), Turkey (Crucitti & Vignoli, 2002: 446). Record for Syria (Kinzelbach, 1985; El-Hennawy, 1992: 118) must be considered dubious.

Mesobuthus eupeus phillipsii (Pocock, 1889)
Figures 2–3, 5, 21, 22, 49–52

Buthus phillipsii Pocock, 1889: 341; Weidner, 1959: 99.

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

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

Buthus (Buthus) eupeus phillipsi: Birula, 1917: 228.

Mesobuthus eupeus phillipsi: Vachon, 1959: 148; Vachon, 1966: 213; Habibi, 1971: 44; Farzanpay, 1986: 334; Fet, 1994: 527; Kovařík, 1997a: 49; Kovařík, 1998: 114; Fet & Lowe, 2000: 175.

Mesobuthus eupeus phillipsii: Farzanpay, 1987: 150; Farzanpay, 1988: 38; Navidpour et al., 2008: 11.

Mesobuthus eupeus: Akbari, 2007: 76.

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

TYPE LOCALITY AND TYPE REPOSITORY. Iran, Bushir (now Bushehr) Province; BMNH.



Figures 20–21: Iran, Bushehr Province. **20.** Delvar, $28^{\circ}42'59"N$ $51^{\circ}04'52"E$, 4 m a.s.l. (Locality No. Bu-20). Recorded occurrence of *Androctonus crassicauda* (Olivier, 1807), *Buthacus macrocentrus* (Ehrenberg, 1828), *Orthochirus iranus* Kovařík, 2004, and *Scorpio maurus townsendi* (Pocock, 1900). **21.** Tangestan, $28^{\circ}52'53"N$ $51^{\circ}18'43"E$, 95 m a.s.l. (Locality No. Bu-35). Recorded occurrence of *Mesobuthus eupeus phillipsii* (Pocock, 1889), *Odontobuthus bidentatus* Lourenço et Pézier, 2002, and *Scorpio maurus townsendi* (Pocock, 1900).

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., 15 km NW Bandar-e Genaveh, 50 m a.s.l., Chahak village env., 3–5.V.1996, 4♂1juv. FKCP, leg. M. Kaftan & V. Šejna; Dayer road, Menjoo village, 28°28'12"N 51°07'40"E, 405 m a.s.l. (Locality No. Bu-21), XI.2007, 1♂3♀ RRLS 1im. FKCP, leg. Masihipour, Bahrani & Hayader; Dayer, 27°49'35"N 52°04'44"E, 4 m a.s.l. (Locality No. Bu-25), XI.2007, 1♀ RRLS, leg. Masihipour & Habibzadeh; Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (Locality No. Bu-31), XI.2007, 1♂1♀ FKCP, leg. Masihipour & Habibzadeh; Tangestan, 28°52'53"N 51°18'43", 95 m a.s.l. (Locality No. Bu-35), XI.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), XI.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), XI.2007, 3♂2♀1juv., RRLS, leg. Masihipour & Bahrani; Dailam road, 85 m a.s.l. (Locality No. OM-D 804), VI.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), VI.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), II.2007, 12♀9♂ RRLS, leg. Masihipour, Bahrani & Habibzadeh; Borazjan, 29°16'56"N 51°15'26"E, 200 m a.s.l. (Locality No. Bu-18.2), II.2007, 4juvs. FKCP, 8♂10♀11juvs. RRLS, leg. Masihipour, Bahrani & Habibzadeh; Genaveh, 29°48'42"N 50°14'22"E, 227 m a.s.l. (Locality No. Bu-G1), I.2005, 2♀ FKCP, 8♂2♀ RRLS, leg. Hayader & Tofigh; Bushehr (Locality No. Bu-319.1) II.2007, 1♀2ims. FKCP, 11♀6♂ RRLS, leg. Bahrani & Hayader; Behbahan–Genaveh road, 29°40.71'N 51°24.04"E, 16 m a.s.l. (Locality No. B-G803), VII.2007, 14 specimens RRLS, 1♀2♂ FKCP, leg. Navidpour & Masihipour.

DISTRIBUTION: Iran (Bushehr and Khoozestan Provinces), Iraq (Vachon, 1966: 213; Habibi, 1971: 44; Fet & Lowe, 2000: 175; Navidpour et al., 2008: 11).

Odontobuthus bidentatus Lourenço et Pézier, 2002
Figures 8, 21, 22, 33–36

Odontobuthus odonturus: Habibi, 1971: 44 (in part); Farzanpay, 1987: 155; Farzanpay, 1988: 39; Kovařík, 1997a: 47; Kovařík, 1998: 115 (in part); Fet & Lowe, 2000: 188 (in part); Akbari, 2007: 76.
Odontobuthus bidentatus Lourenço & Pézier, 2002: 118; Navidpour et al., 2008: 13.

TYPE LOCALITY AND TYPE REPOSITORY. Iraq, 180 km north of Baghdad, Khanagin–Dyala; MHNG.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., 15 km NW of Bandar-e Genaveh, Chahak vill. env., 50 m a.s.l., 3–5.V.1996, 1♂2♀ FKCP, leg. M. Kaftan & D. Král; cca 17 km NW. Bandar-e Genaveh, 29°38'32"N 50°26'56"E, 10 m a.s.l., 2♀ FKCP, 13–14.X.1998, leg. P. Kabátek; Bushehr to Dayer road, Jeirani village, 27°50'47"N 51°45'33"E (Locality No. Bu-22), XI.2007, 19♂15♀6juvs. RRLS, 1♀ FKCP, leg. Masihipour, Bahrani & Habibzadeh; Kangan, 27°42'00"N 52°04'44"E, 4 m a.s.l. (Locality No. Bu-25), XI.2007, 1juv. RRLS, leg. Masihipour, Bahrani & Habibzadeh; Bushehr to Dayer road, Dero Ahmad village, 27°53'47"N 51°35'51"E, 4 m a.s.l. (Locality No. Bu-27), XI.2007, 2♂3♀2juvs., RRLS, leg. Masihipour, Hayader & Habibzadeh; Ahram, Khormuj road, 28°45'43"N 51°17'51"E, 43 m a.s.l. (Locality No. Bu-30), XI.2007, 5♂2♀ RRLS, 1♀ FKCP, leg. Masihipour, Bahrani & Hayader; Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (Locality No. Bu-31), XI.2007, 3♀ RRLS, leg. Masihipour & Habibzadeh; Tangestan, Farshanbeh, 28°52'53"N 51°18'43"E, 95 m a.s.l. (Locality No. Bu-35), XI.2007, 2♂3♀2juvs. RRLS, 1♂2juvs. FKCP, leg. Masihipour, Bahrani & Habibzadeh; Omidiyeh to Genaveh road, 30°13'42"N 50°12'01"E, 128 m a.s.l. (Locality No. B-Bi805), VI.2007, 1♀1juv. FKCP, leg. Navidpour & Masihipour; Dailam road, 85 m a.s.l. (Locality No. OM-D 804), VI.2007, 6♂8♀10ims. RRLS, leg. Navidpour, Masihipour & Tofigh; Genaveh, 29°48'42"N 50°14'22"E, 227 m a.s.l. (Locality No. Bu-G), I.2005, 8♂2♀, RRLS, leg. Hayader & Tofigh.

DISTRIBUTION: Iran, Bushehr Province (Lourenço & Pézier, 2002: 118), Khoozestan Province (Navidpour et al., 2008: 13); Iraq (Lourenço & Pézier, 2002: 118).

Orthochirus farzanpayi (Vachon et Farzanpay, 1987)
Figures 2, 23, 61–64

Simonoides farzanpayi Vachon & Farzanpay in Farzanpay, 1987: 162; Farzanpay, 1988: 41; Fet & Lowe, 2000: 223.

Orthochirus farzanpayi Kovařík & Fet, 2006: 1; Navidpour et al., 2008: 14.

= *Orthochirus sobotniki* Kovařík, 2004: 20 (syn. by Kovařík & Fet, 2006: 1).

TYPE LOCALITY AND TYPE REPOSITORY. Iran, 215 km N of Bandar-e-Abbas; NHMW.

TYPE MATERIAL EXAMINED. **Iran**, 215 km N of Bandar-e-Abbas, 22.III.1972, 1♀ (lectotype) 1♂1♀ (paralectotypes), NHMW Nos. 68–70, rev. Max Vachon in 1977, No. VA 1910; 5 km SE of Posht Chenar, 19–20 April 2000, 29°12.941'N 53°20.014"E, 1692 m a.s.l.,

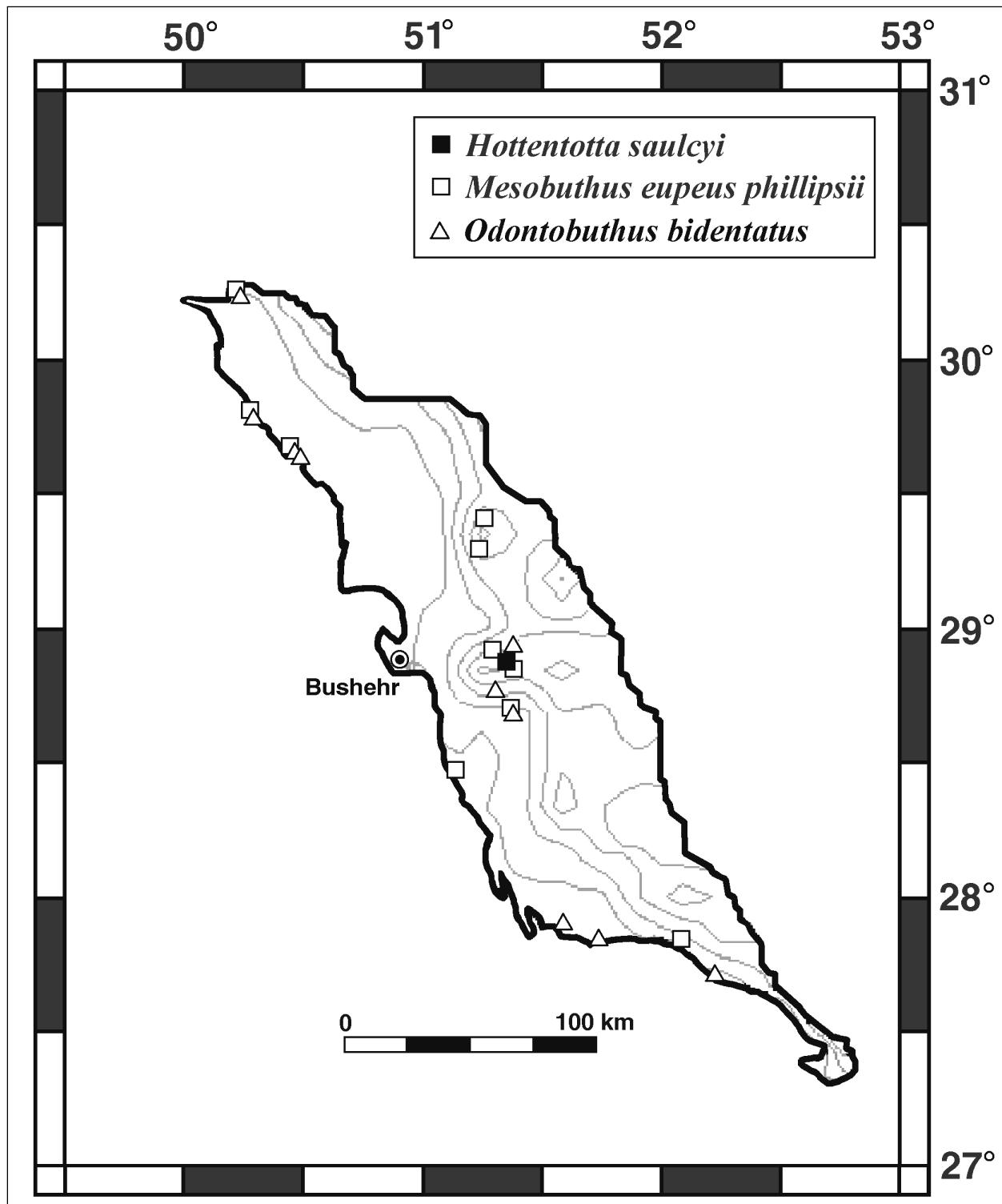


Figure 22: Map of Bushehr province showing distribution of *Hottentotta saulcyi*, *Mesobuthus eupeus phillipsii* and *Odontobuthus bidentatus* collected in this study.

1♂ 1♀ 1im. ♂ (holotype, allotype, and paratype of *Orthochirus sobotnikii*), leg. J. Šobotník, FKCP.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Borazjan, 29°16'56"N 51°15'26"E, 200

m a.s.l. (Locality No. Bu-18), II.2007, 1♀ RRLS, leg. Masihipour, Bahrani & Habibzadeh; Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19), XI.2007, 1♀ RRLS, leg. Masihipour & Bahrani; Dayer, 27°49'35"N 52°04'44"E, 4 m a.s.l. (Locality No.

Bu-25), XI.2007, 1♂ RRLS, leg. Masihipour, Bahrani & Habibzadeh; Dayer road, 27°55'44"N 51°49'56"E, 8 m a.s.l. (Locality No. Bu-26), XI.2007, 1♂ FKCP, 1♀ RRLS, leg. Masihiour, Bahrani & Habibzadeh; Tangestan, Ahram, 28°51'45"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), XI.2007, 2♀ FKCP, 1♂ RRLS, leg. Masihipour, Bahrani & Habibzadeh.

COMMENTS: All types and examined specimens of *Orthochirus farzanpayi* from Khoozestan Province (Shushtar district, Arab Hasan village) lack trichobothrium d_2 on the dorsal surface of pedipalp femur. Most of specimens from the Bushehr Province have this trichobothrium present, only one male from locality No. 36 lacks it.

DISTRIBUTION: Iran: Hormozgan and Fars Provinces (Kovařík & Fet, 2006: 1–3), Khoozestan Province (Navidpour et al., 2008: 15), Bushehr Province (first report).

Orthochirus iranus Kovařík, 2004
Figures 8, 23, 65–68

Orthochirus sp. n.? Kovařík, 1997a: 47 (in part).
Orthochirus iranus Kovařík, 2004: 13; Kovařík & Fet, 2006: 8; Navidpour et al., 2008: 15.

TYPE LOCALITY AND TYPE REPOSITORY. **Iran**, Bushehr Province, cca 17 km NW Bandar-e Gonárer, 29°38'32"N 50°26'56"E, 10 m a.s.l.; FKCP.

TYPE MATERIAL EXAMINED. **Iran**, Bushehr Province, cca 17 km NW Bandar-e Gonarer (correct: Bandar-e Genaveh), 29°38'32"N 50°26'56"E, 10 m a.s.l., 3♂ 2♀ (holotype and paratypes), 13–14.X.1998, leg. P. Kabátek; Chahak, 15 km NW Bandar-e Genaveh by road, 29°40'N, 50°25'E, 20 m a.s.l., 3–5.V.1996 (Locality No. 19 in Frynta et al., 1997: 4), 1♀ (allotype), leg. D. Král, 1♂ 1♀ (paratypes), leg. M. Kaftan; Khoozestan Province, Chogha Zanbil (zikkurat), 32°00'N, 48°31'E, 100 m a.s.l., 5–6.V.1996 (Locality No. 20 in Frynta et al., 1997: 4), 1im.♂ (paratype), leg. M. Kaftan. All types are in FKCP.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Delvar, 28°42'59"N 51°04'52"E, 4 m a.s.l. (Locality No. Bu-20), XI.2007, 2♂ FKCP, 3♂ 1♀ RRLS, leg. Masihipour & Hayader; Khormuj, 28°41'46"N 51°21'49"E, 83 m a.s.l. (Locality No. Bu-31), XI.2007, 1♂ 1juv., RRLS, leg. Masihipour & Habibzadeh; Omidiyeh–Dailam road (border line of Khoozestan and Bushehr), 30°18'48"N 50°12'01"E, 130 m a.s.l. (Locality No. B805), VI.2007, 1♂ RRLS, leg. Masihipour & Hayader.

COMMENTS: All type specimens of *Orthochirus iranus* from Bushehr Province lack trichobothrium d_2 on the dorsal surface of pedipalp femur. Some specimens from Khoozestan Province have this trichobothrium fully developed, some have it reduced, and some lack it. The variability of trichobothrium d_2 was first discussed by Navidpour et al. (2008: 17–20). In the past, all known specimens from Bushehr Province were found to lack this trichobothrium; however, some of the most recently examined specimens (from localities Nos. Bu-31 and B805) have trichobothrium d_2 fully developed.

DISTRIBUTION: Iran, Bushehr and Khoozestan Provinces (Kovařík, 2004: 13), Lorestan and Hamadan Provinces (Navidpour et al., 2008: 20).

Orthochirus stockwelli (Lourenço et Vachon, 1995)
Figures 6, 23, 69–72

Paraorthochirus stockwelli Lourenço & Vachon, 1995: 299; Lourenço & Vachon, 1997: 329; Kovařík, 1997a: 50; Kovařík, 1998: 117; Fet & Lowe, 2000: 212; ?Kovařík & Fet, 2006: 9.

Orthochirus stockwelli: Navidpour et al., 2008: 20.

TYPE LOCALITY AND TYPE REPOSITORY. Iran, Hormozgan Province, Bandar-Abbas; MNHN.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Dailam to Genaveh road, Payshur village, 29°41'56"N 50°26'04"E, 18 m a.s.l. (Locality No. Bu-803), VII.2007, 1♂ RRLS, leg. Masihipour, Hayader & Habibzadeh; Behbahan–Genaveh road, 29°40'43"N 50°24'24"E, 17 m a.s.l. (Locality No. B-G803), VII.2007, 1♀ FKCP, leg. Navidpour & Masihipour.

DISTRIBUTION: Iran, Hormozgan Province (Lourenço & Vachon, 1995: 299), Khoozestan Province (Navidpour et al., 2008: 20), and Bushehr Province (first report).

Razianus zarudnyi (Birula, 1903)
Figures 2, 5, 23, 57–60

Hemibuthus zarudnyi Birula, 1903: 75; Roewer, 1943: 216; Vachon, 1966: 211.

Razianus zarudnyi: Farzanpay, 1987: 159; Farzanpay, 1988: 41; Fet & Lowe, 2000: 216; Akbari, 2007: 76; Navidpour et al., 2008: 20.

= *Buthus zarudnianus* Birula, 1905a: 144; Birula, 1905b: 450; Kraepelin, 1913: 127; Vachon, 1966: 211; Habibi, 1971: 43 (syn. by Fet, 1997: 66).

= *Neohemibuthus kinzelbachi* Lourenço, 1996: 94; Kovařík, 1997a: 49 (syn. by Fet, 1997: 66).

Neohemibuthus zarudnyi: Fet, 1997: 65; Kovařík, 1998: 115.

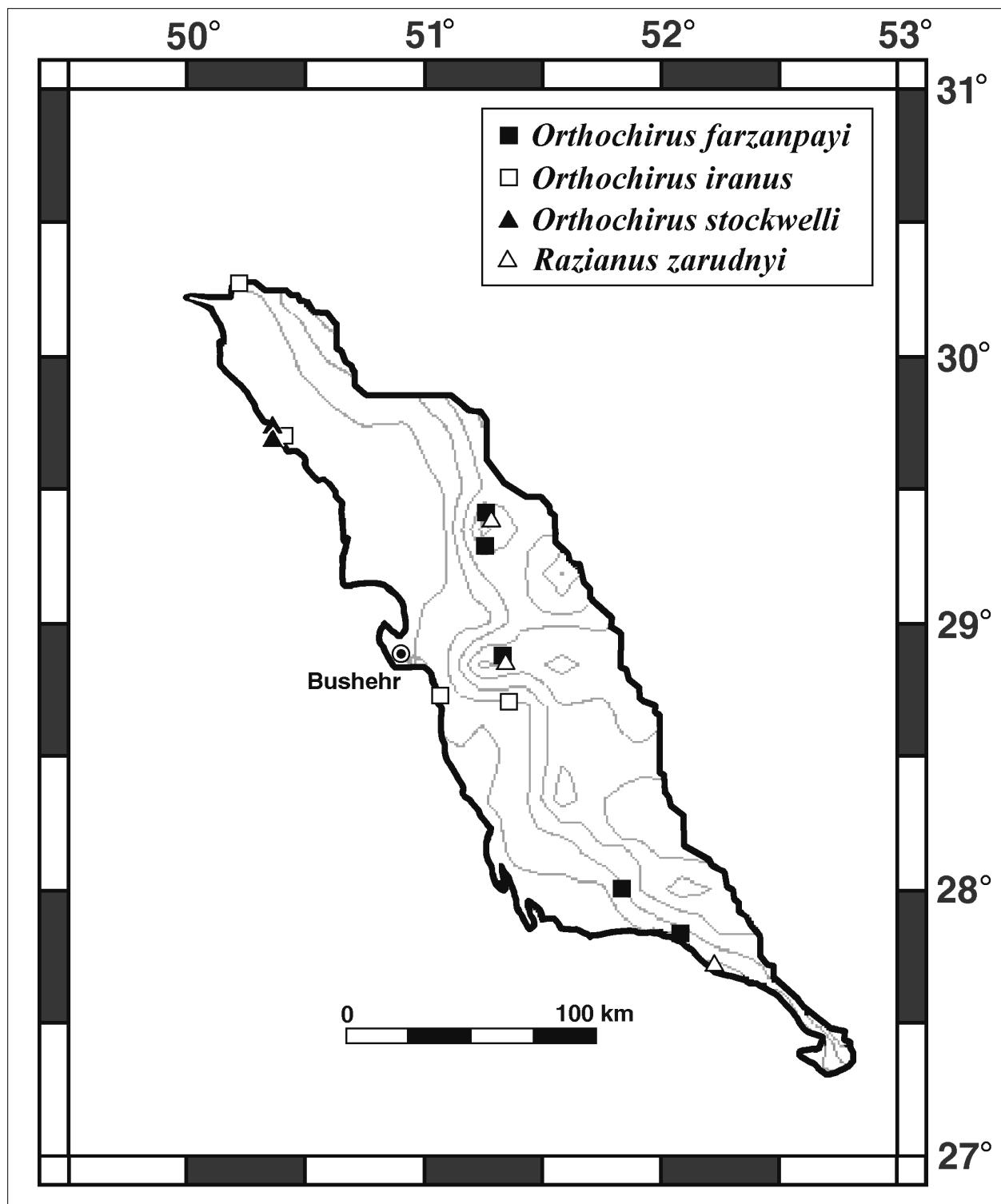


Figure 23: Map of Bushehr province showing distribution of *Orthochirus farzanpayi*, *O. iranus*, *O. stockwelli* and *Razianus zarudnyi* collected in this study.

TYPE LOCALITY AND TYPE REPOSITORY. “Persia, Kalagan Prov., Beludjistan, and Geh Prov., Makran”, now Sistan & Baluchistan Prov., Iran (Fet, 1997); ZISP.

BUSHEHR PROVINCE MATERIAL EXAMINED. Iran, Bushehr Prov., Kangan, 27°42'00"N 52°13'44"E, 5 m a.s.l. (Locality No. Bu-25), XI.2007, 1♂2♀ RRLS, leg.

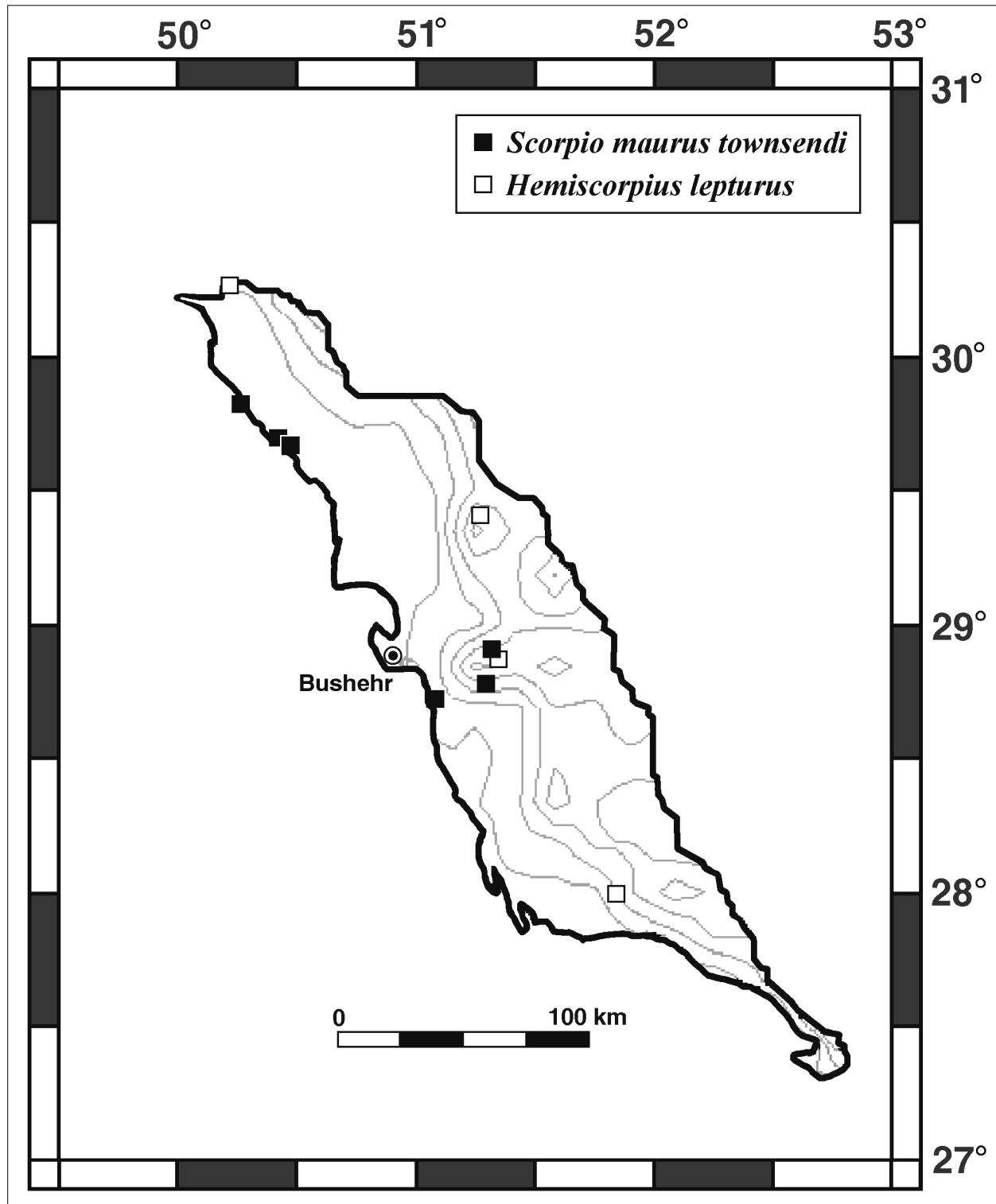


Figure 24: Map of Bushehr province showing distribution of *Scorpio maurus townsendi* and *Hemiscorpius lepturus* collected in this study.

Masihipour & Bahrani; Tangestan, Ahram, 28°51'45"N 1♀ RRLS 2♀ FKCP, leg. Masihipour, Bahrani & 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), XI.2007, Habibzadeh; Borazjan, Dalaki, 29°23'27"N 51°16'00"E,

100 m a.s.l. (Locality No. Bu-19), XI.2007, 1♀ RRLS, leg. Masihipour & Bahrani.

DISTRIBUTION: Iran, Bushehr Province (Akbari, 2007: 76), Chahar Mahal & Bakhtiyari Province (Fet, 1997: 67), Fars Province (Fet, 1997: 68), Khoozestan Province (Lourenço, 1996: 94; Fet, 1997: 67–68; Navidpour et al., 2008: 20), and Sistan & Baluchistan Province (Fet, 1997: 66).

Family Scorpionidae Latreille, 1802

Scorpio maurus townsendi (Pocock, 1900)

Figures 20–21, 24, 73–77

Heterometrus townsendi Pocock, 1900: 364.

? *Scorpio townsendi*: Birula, 1905a: 147 (Birula, 1910: 184).

Scorpio maurus townsendi: Birula, 1910: 184; Birula, 1917: 231; Vachon, 1950: 164 (1952: 336); Vachon, 1966: 215; Habibi, 1971: 44; Pérez Minocci, 1974: 40; Kovařík, 1997a: 50; Kovařík, 1998: 141; Fet, 2000: 479; Navidpour et al., 2008: 26.

Scorpio maurus: Farzanpay, 1987: 165; Farzanpay, 1988: 42; Akbari, 2007: 76.

TYPE LOCALITY AND TYPE REPOSITORY. Iran, Bushehr Province, Fort Reshire near Bushire, Persian Gulf, Iran; BMNH.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., cca 17 km NW. Bandar-e Genaveh, 10 m a.s.l., 29°38'32"N 50°26'56"E, 2♀10juvs. FKCP, 13–14.X.1998, leg. P. Kabátek; Bushehr env. (Locality No. Bu-1), I.2005, 1♀ FKCP, 1♀ RRLS, leg. Jahanifard; Genaveh env. (Locality No. Bu-2), 2005, 1♀ FKCP, 2♂8♀ RRLS, leg. Bahrani & Tofigh; Delvar, 28°42'59"N 51°04'52"E, 4 m a.s.l. (Locality No. Bu-20), XI.2007, 10 juvs. RRLS, 1♀2juvs. FKCP, leg. Masihipour & Hayader; Ahram, Khormuj road, 28°45'43"N 51°17'51"E, 43 m a.s.l. (Locality No. Bu-30), XI.2007, 1♂ RRLS, leg. Masihipour, Bharani & Hayader; Tangestan, Farshanbeh, 28°52'53"N 51°18'43"E, 95 m a.s.l. (Locality No. Bu-35), XI.2007, 2♀22juvs. RRLS, 7juvs. FKCP, leg. Masihipour, Bahrani & Habibzadeh.

DISTRIBUTION: Iran, Bushehr Province (Pocock, 1900: 364), Khoozestan Province (Navidpour et al., 2008: 26).

Family Hemiscorpiidae Pocock, 1893

Hemiscorpius lepturus Peters, 1861

Figures 2, 5, 7, 24, 78–81

Hemiscorpius lepturus Peters, 1861a: 426; Karsch, 1879: 15, 21; Birula, 1905a: 146; Birula, 1917: 215; Birula, 1918: 42; Weidner, 1959: 100; Pringle, 1960: 84; Khalaf, 1962: 2; Khalaf, 1963: 68; Vachon, 1966: 214; Habibi, 1971: 44; Farzanpay & Pretzmann, 1974: 217; Pérez Minocci, 1974: 36; Vachon, 1977: 213; Vachon, 1979: 59; Farzanpay, 1987: 141, 168; Farzanpay, 1988: 42; Simard & Watt, 1990: 441; Sissom, 1990: 75; El-Hennawy, 1992: 135; Kovařík, 1997a: 48; Kovařík, 1998: 136; Fet, 2000: 429; Prendini, 2000: 44; Capes & Fet, 2001: 303; Monod & Lourenço, 2005: 902; Akbari, 2007: 76; Navidpour et al., 2008: 26.

Hemiscorpius lepturus: Peters, 1861b: 511; Ausserer, 1880: 466; Kraepelin, 1899: 142; Werner, 1934: 276; Moritz & Fischer, 1980: 317; Kovařík, 2002: 14.

Hemiscorpius lepturus: Simon, 1880b: 29.

TYPE LOCALITY AND TYPE REPOSITORY. Iraq, "Mendeli bei Baghdad" (Mendeli near Baghdad); ZMHB.

TYPE MATERIAL EXAMINED. Iraq, Mendeli bei Baghdad, 2♂2♀ (syntypes), leg. Petermann, ZMHB 43a–d.

BUSHEHR PROVINCE MATERIAL EXAMINED. **Iran**, Bushehr Prov., Dayer road, 27°59'44"N 51°49'56"E, 8 m a.s.l. (Locality No. Bu-26), XI.2007, 1♀ RRLS, leg. Masihipour, Bahrani & Habibzadeh; Tangestan, Ahram, 28°51'54"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), XI.2007, 1♂ RRLS, leg. Masihipour, Bahrani & Habibzadeh; Tangestan to Farashband, 227 m a.s.l. (Locality No. Bu-37), XI.2007, 1♂ RRLS, 1♂2♀ FKCP, leg. Masihipour, Bahrani & Hayder; Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19), XI.2007, 2♀ RRLS, leg. Masihipour & Bahrani; Omidiyeh to Genaveh road, 30°13'42"N 50°12'01"E, 128 m a.s.l. (Locality No. B-Bi805), VI.2007, 3♂4♀ RRLS, leg. Navidpour & Masihipour.

DISTRIBUTION: Iran, Kohkiloyeh & Boyerahmad, Fars, Hormozgan, and Lorestan Provinces (Kovařík, 1997a: 48), Bushehr and Khoozestan Provinces (Farzanpay, 1987: 141, Monod & Lourenço, 2005: 902; Akbari, 2007: 76; Navidpour et al., 2008: 26); Iraq (Peters, 1861a: 426).

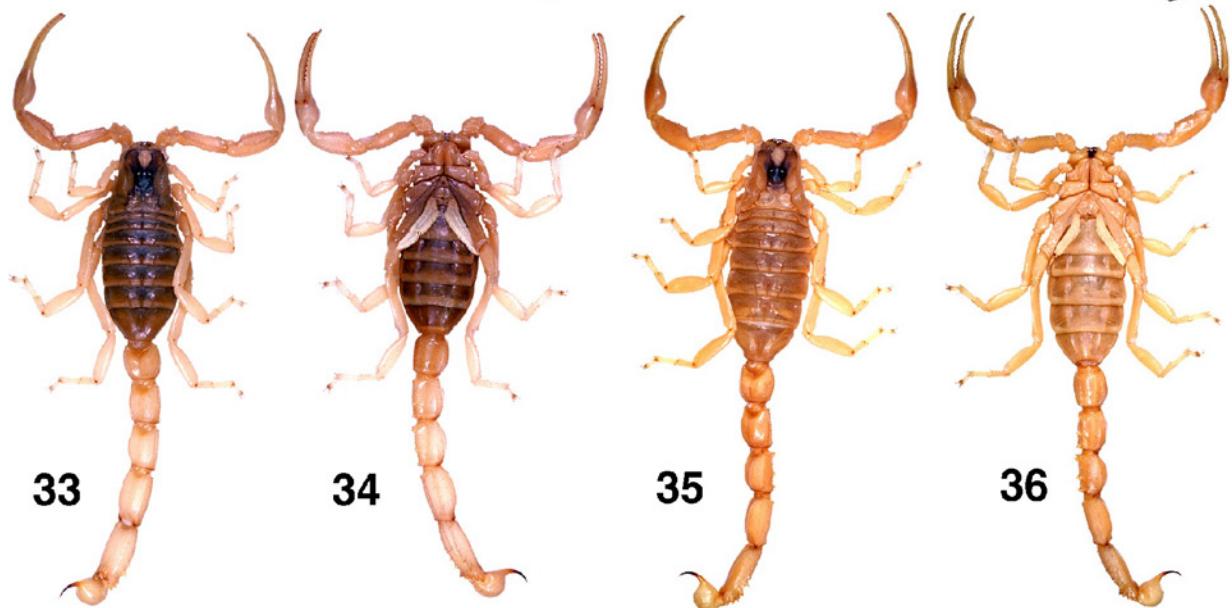
Key of Scorpions of Bushehr Province

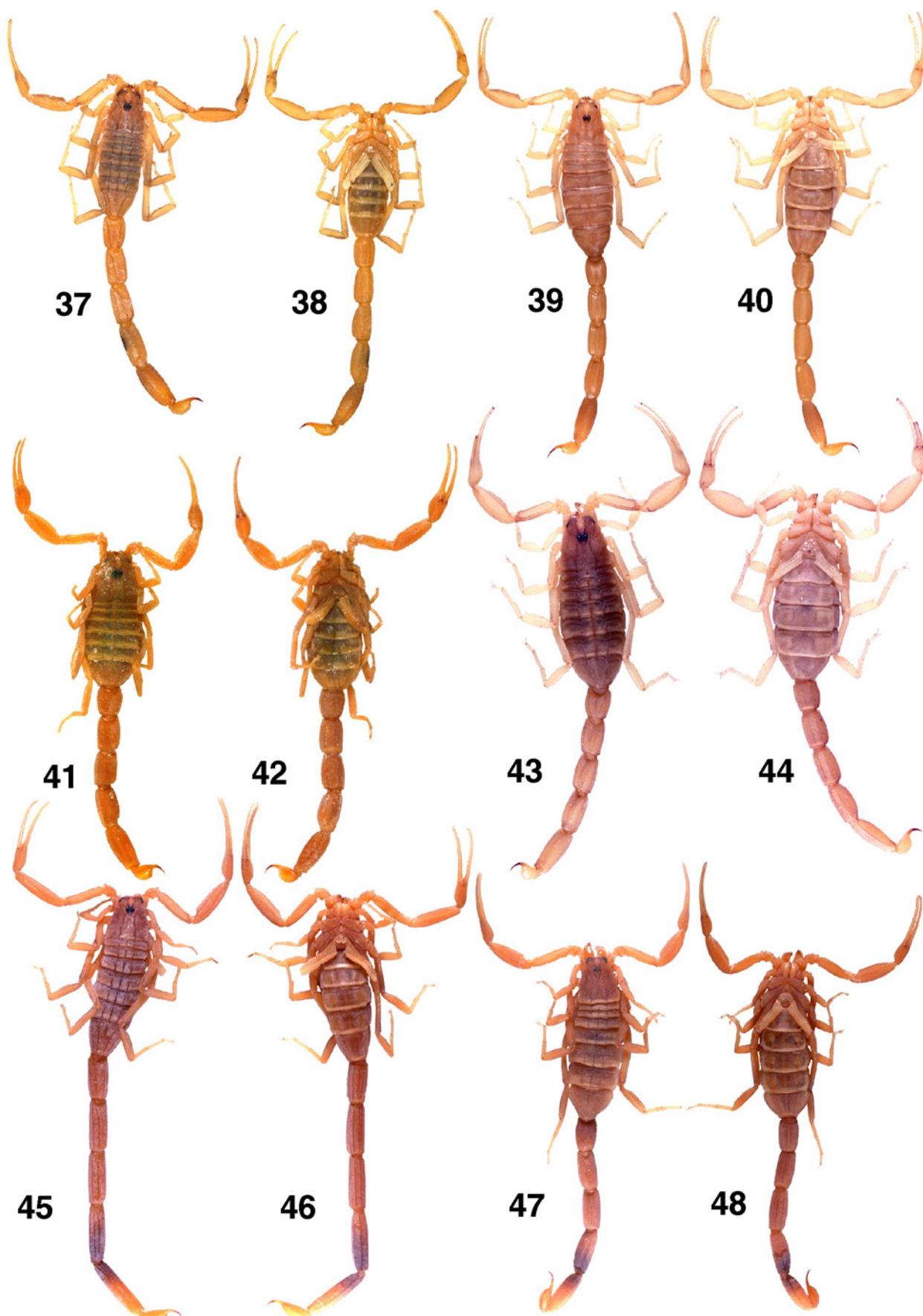
- | | |
|---|---|
| 1. Pedipalp patella without ventral trichobothria | |
| Buthidae | 3 |
| - Pedipalp patella with ventral trichobothria | 2 |

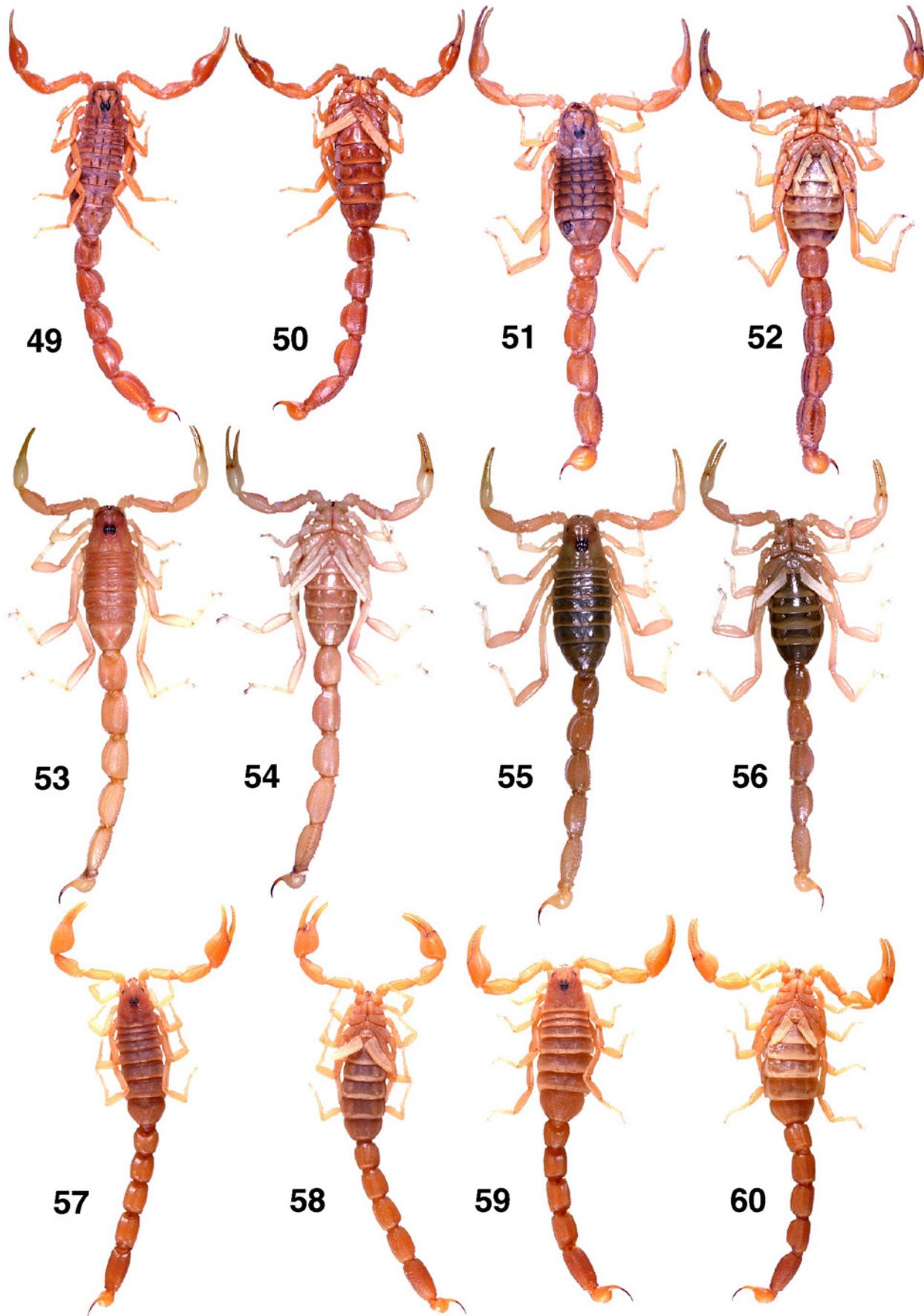
2. Lateroapical margins of leg tarsi shaped into rounded lobes. *Scorpio maurus townsendi* (Pocock, 1900)
 - Lateroapical margins of leg tarsi straight.
 *Hemiscorpius lepturus* Peters, 1861
3. Carapace in lateral view distinctly inclined downward from median eyes to anterior margin. Total length less than 50 mm. *Orthochirus*..... 4
 - Carapace in lateral view with entire dorsal surface horizontal or nearly so (possibly with a slight anterior slope) 6
4. Metasoma densely hirsute.
 *Orthochirus stockwelli* (Lourenço & Vachon, 1995)
 - Entire metasoma glabrous (short, thin setae may issue from some punctae) 5
5. Dorsal surface of fifth metasomal segment mesially densely granulated..... *Orthochirus iranus* Kovařík, 2004
 - Dorsal surface of fifth metasomal segment mesially smooth. *Orthochirus farzanpayi* (Vachon & Farzanpay, 1987)
6. Cheliceral fixed finger with a single ventral denticle *Razianus zarudnyi* (Birula, 1903)
 - Cheliceral fixed finger with two ventral denticles 7
7. Carapace granulated but without carinae
 *Buthacus macrocentrus* (Ehrenberg, 1828)
 - Carapace with carinae 8
8. Ventral carinae of second and third metasomal segments and ventral transverse carina of fourth segment armed with very strong denticles. *Odontobuthus bidentatus* Lourenço et Pézier, 2002
 - Ventral carinae of metasomal segments without very strong denticles..... 9
9. Dentate margin of pedipalp chela movable finger with 4 terminal granules (3 terminal and one basal terminal). *Androctonus crassicauda* (Olivier, 1807)
 - Dentate margin of pedipalp chela movable finger with 5–7 terminal granules (4–6 terminal and one basal terminal)..... 10
10. Central median and posterior median carinae of carapace joined to form a continuous linear series of granules to posterior margin ... *Compsobuthus* 11
 - Central median and posterior median carinae of carapace not joined to form a continuous linear series of granules to posterior margin 13
11. Male has longer metasoma than female.
 *C. matthiesseni* (Birula, 1905)
 - Length of metasoma the same in both sexes. 12
12. Pectinal teeth number 15–19. Male has much wider and shorter pedipalp chela *C. jakesi* Kovařík, 2003
 - Pectinal teeth number 21–24. Width of pedipalp manus the same in both sexes *C. persicus* sp. n.
13. Trichobothrium *db* on patella of pedipalp located usually between *est* and *dt*. Trichobothrium *db* may be on level with trichobothrium *est* or rarely between *est* and *esb*. Carinae of carapace not forming a lyre-shaped configuration. Ventrolateral carinae on the fifth metasomal segment with all granules more or less equal in size. *Hottentotta saulcyi* (Simon, 1880)
 - Trichobothrium *db* on patella of pedipalp always located between *est* and *esb*. Carinae of carapace forming a lyre-shaped configuration. Ventrolateral carinae on the fifth metasomal segment with irregular granules. *Mesobuthus eupeus phillipsii* (Pocock, 1889)

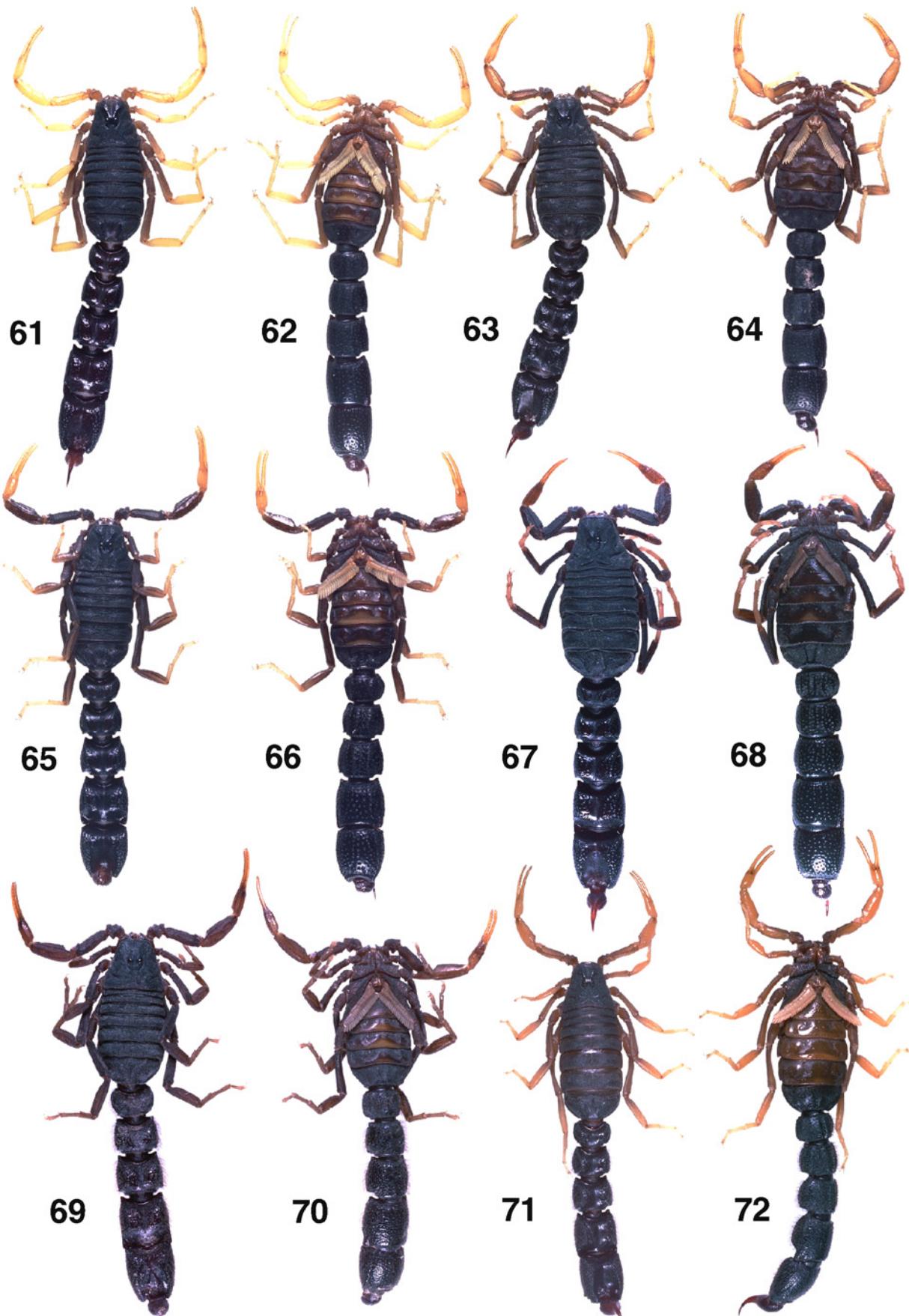
Acknowledgments

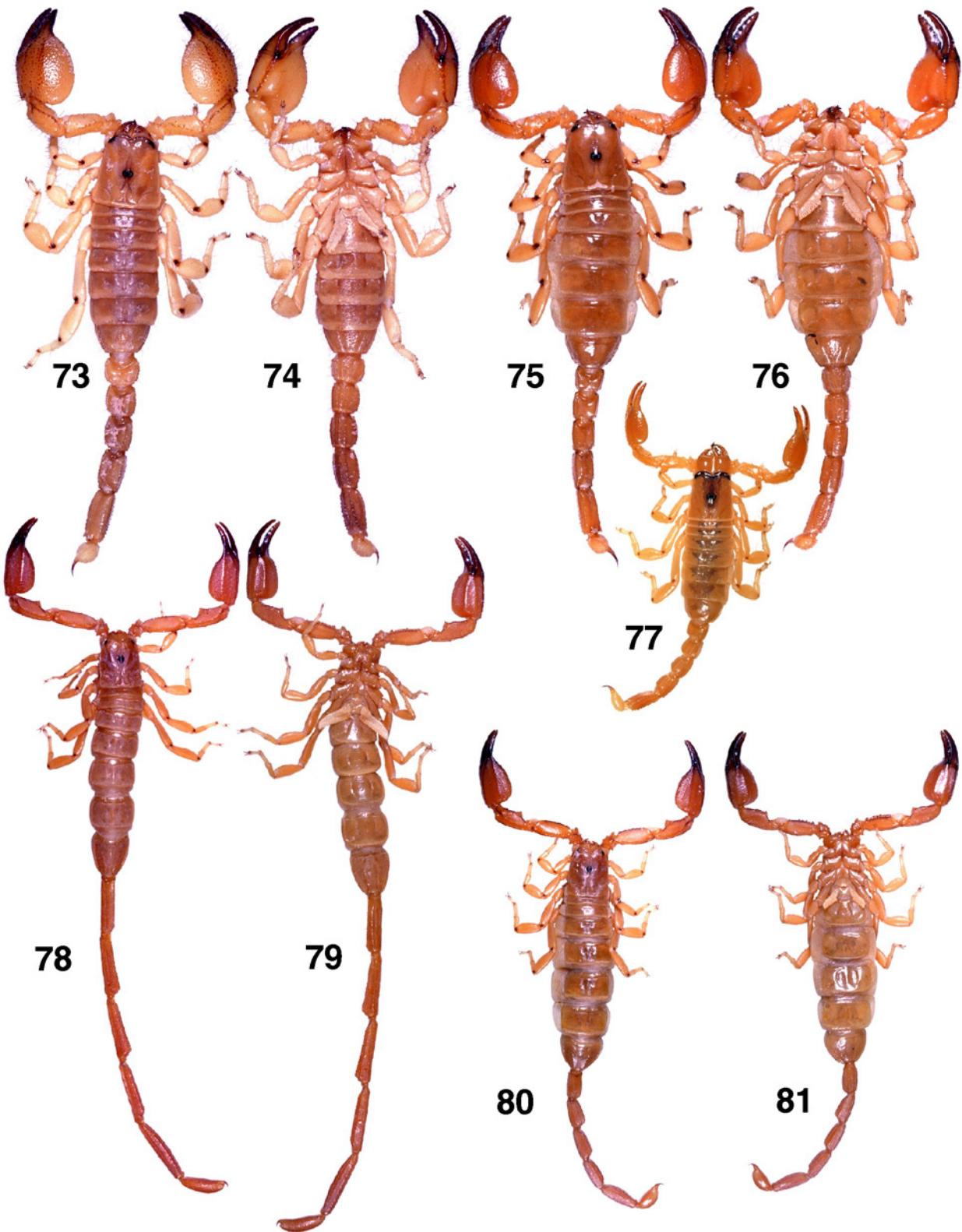
We are grateful to Dr. Taheri, Mrs. Jahanifard, Mr. Masihipour, Mr. Hadiyan, Mr. Hayader, Mr. Habibzadeh, Mr. Bahrani, and Mr. Tofigh (Iran) for their kind support. The species distribution maps were created using OMC (Online Map Creation) software (<http://www.aquarius.geomar.de>). We thank two anonymous reviewers for their comments.











◀ **Figures 25–36:** 25–26. *Androctonus crassicauda* (Olivier, 1807), dorsal and ventral views, ♂ (73 mm), Iran, Bushehr Province, Chahak district, 29°38'32"N 50°26'56"E, FKCP. 27–28. *Androctonus crassicauda* (Olivier, 1807), dorsal and ventral views, ♀ (85 mm), Egypt, FKCP. 29–30. *Hottentotta saulcyi* (Simon, 1880), dorsal and ventral views, ♂ (82 mm), Iran, Kermanshah Province (formerly Bachtaran), Hasrouabad, 34°10'09"N 46°21'56"E, 1300 m a.s.l., FKCP. 31–32. *Hottentotta saulcyi* (Simon, 1880), dorsal and ventral views, ♀ (94 mm), Iran, Ilam Province, 30 km NW Ilam, 33°43'N 46°41'E, FKCP. 33–34. *Odontobuthus bidentatus* Lourenço et Pézier, 2002, dorsal and ventral views, ♂ (63 mm), Iran, Khoozestan Province, 45 km NW of Masjedsoleyman, Lali, 31°18'33"N 49°03'39"E, 329 m a.s.l. (Locality No. La-815-2), FKCP. 35–36. *Odontobuthus bidentatus* Lourenço et Pézier, 2002, dorsal and ventral views, ♀ (68 mm), Iran, Bushehr Province, Bushehr to Dayer road, Jeirani village, 27°50'47"N 51°45'33"E (Locality No. Bu-22), FKCP.

◀ **Figures 37–48:** 37–38. *Compsobuthus persicus* sp. n., dorsal and ventral views, ♂ (28 mm) holotype, Iran, Bushehr Prov., Borazjan, Dalaki, 29°23'27"N 51°16'00"E, 100 m a.s.l. (Locality No. Bu-19), RRLS. 39–40. *Compsobuthus persicus* sp. n., dorsal and ventral views, ♀ (37 mm) allotype, Iran, Bushehr Prov., Borazjan, 29°16'56"N 51°15'26"E, 200 m a.s.l. (Locality No. Bu-18), FKCP. 41–42. *Compsobuthus jakesi* Kovářík, 2003, dorsal and ventral views, ♂ (28 mm) paratype, Iraq, Najaf Province, Ash-Shabakah (Shabachah, Shabicha), 262 m a.s.l., 31°06'N 43°95"E, FKCP. 43–44. *Compsobuthus jakesi* Kovářík, 2003, dorsal and ventral views, ♀ (27 mm), Iran, Khoozestan Province, FKCP. 45–46. *Compsobuthus matthieseni* (Birula, 1905), dorsal and ventral views, ♂ (38 mm), Iran, Lorestan Province, 10 km SE Bavineh, 1100 m a.s.l., 33°36'08"N 47°11'59"E, FKCP. 47–48. *Compsobuthus matthieseni* (Birula, 1905), dorsal and ventral views, ♀ (38 mm), Iran, Lorestan Province, same locality as in Figs. 45–46, FKCP.

◀ **Figures 49–60:** 49–50. *Mesobuthus eupeus phillipsii* (Pocock, 1889), dorsal and ventral views, ♂ (52 mm), Iran, Khoozestan Province, near Chogha Zanbil (zikkurat) ca. 100 m a.s.l., FKCP. 51–52. *Mesobuthus eupeus phillipsii* (Pocock, 1889), dorsal and ventral views, ♀ (53 mm), Iran, Khoozestan Province, Baghmalek district, Hore village, 31°55'30"N 49°31'47"E, 185 m a.s.l., FKCP. 53–54. *Buthacus macrocentrus* (Ehrenberg, 1828), dorsal and ventral views, ♂ (69 mm), Iran, Khoozestan Province, Hamidiyah, 31°27'57"N 48°29'18"E, 13 m a.s.l. (Locality No. A-Ham-812-2), FKCP. 55–56. *Buthacus macrocentrus* (Ehrenberg, 1828), dorsal and ventral views, ♀ (58 mm), Iran, Khoozestan Province, Hamidiyah, same locality as in Figs. 53–54, FKCP. 57–58. *Razianus zarudnyi* (Birula, 1903), dorsal and ventral views, ♂ (22 mm), Iran, Khoozestan Province, near Chogha Zanbil (zikkurat), 32°00'55"N 48°31'04"E, 68.5 m a.s.l. (Locality No. Ch-101), FKCP. 59–60. *Razianus zarudnyi* (Birula, 1903), dorsal and ventral views, ♀ (24 mm), Iran, Khoozestan Province, same locality as in Figs. 57–58, FKCP.

◀ **Figures 61–72:** 61–62. *Orthochirus farzanpayi* (Vachon et Farzanpay, 1987), dorsal and ventral views, ♂ (33 mm), Iran, Bushehr Province, Dayer road, 27°55'44"N 51°49'56"E, 8 m a.s.l. (Locality No. Bu-26), FKCP. 63–64. *Orthochirus farzanpayi* (Vachon et Farzanpay, 1987), dorsal and ventral views, ♀ (30 mm) Iran, Bushehr Province, Tangestan, Ahram, 28°51'45"N 51°20'50"E, 123 m a.s.l. (Locality No. Bu-36), FKCP. 65–66. *Orthochirus iranus* Kovářík, 2004, dorsal and ventral views, ♂ (29 mm), Iran, Bushehr Province, Delvar, 28°42'59"N 51°04'52"E, 4 m a.s.l. (Locality No. Bu-20), FKCP. 67–68. *Orthochirus iranus* Kovářík, 2004, dorsal and ventral views, ♀ (38 mm), Iran, Khoozestan Province, Shadegan district, Toopjieh village, 30°39'33"N 48°36'44"E, 33 m a.s.l., FKCP. 69–70. *Orthochirus stockwelli* (Lourenço et Vachon, 1995), dorsal and ventral views, ♂ (28 mm), Iran, Khoozestan Province, Dezful district, Shahyoon village, 32°36'41"N 48°33'36"E, 527 m a.s.l., FKCP. 71–72. *Orthochirus stockwelli* (Lourenço et Vachon, 1995), dorsal and ventral views, ♀ (41 mm), Iran, Bushehr Province, Behbahan-Genaveh road 29°40.71'N 50°24.04'E, 17 m a.s.l. (Locality Ni. B-G803), FKCP.

◀ **Figures 73–81:** 73–74. *Scorpio maurus townsendi* (Pocock, 1900), dorsal and ventral views, ♂ (55 mm), Iran, Khoozestan Province, Ahvaz–Omidiyeh road, Chombeh village, 31°11'54"N 49°11'41"E, 44 m a.s.l., FKCP. 75–76. *Scorpio maurus townsendi* (Pocock, 1900), dorsal and ventral views, ♀ (54 mm), Iran, Khoozestan Province, Hayader and Bahrani; Ramhormoz, 31°11'54"N 49°11'41"E, 44 m a.s.l. (Locality No. A-Ra 807), FKCP. 77. *Scorpio maurus townsendi* (Pocock, 1900), dorsal view, juv. (25 mm), Iran, Bushehr Province, Tangestan, Farshanbeh, 28°52'53"N 51°18'43"E, 95 m a.s.l. (Locality No. Bu-35), FKCP. 78–79. *Hemiscorpius lepturus* Peters, 1861, dorsal and ventral views, ♂ (72 mm), Iran, Khoozestan Province, Chogha Zanbil (zikkurat), 32°00'55"N 48°31'04"E, 68.5 m a.s.l. (Locality No. Ch-102), FKCP. 80–81. *Hemiscorpius lepturus* Peters, 1861, dorsal and ventral views, ♀ (58 mm), Iran, Khoozestan Province, same locality as in Figs. 78–79, FKCP.

References

- AKBARI, A. 2007(1836). [Study of scorpion fauna of Iran]. *Project report publication of Razi Vaccine & Serum Research Institute*, 2007, 96 (in Farsi).
- AKBARI, A., M. TABATABAI, A. HEDAYAT, H. MODIRROOSTA, M. H. ALIZADEH & M. KAMAL ZARE. 1997(1826). [Study of the geographical distribution of scorpions in the south of Iran]. *Pajooresh and Sazandegi*, 34: 112–115 (in Farsi).
- AL-SAFADI, M. M. 1992. Additions to the scorpion fauna of Yemen. *Zoology in the Middle East*, 6: 95–99.
- AMR, Z. S. & R. EL-ORAN. 1994. Systematics and distribution of scorpions (Arachnida, Scorpionida) in Jordan. *Bulletino di Zoologia*, 61(2): 185–190.
- AMR, Z. S., K. E. HYLAND, R. KINZELBACH, S. S. AMR & D. DEFOSSE. 1988. Scorpions et piqûres de scorpions en Jordanie. *Bulletin de la Société de Pathologie Exotique*, 81(3): 369–379.
- ARNETT, H. R. JR., G. A. SAMUELSON & G. M. NISHIDA. 1993. *The Insect and Spider Collections of the World. Flora & Fauna Handbook No. 11, Second edition*. Gainesville: Sandhill Crane Press, 308 pp.
- AUSSERER, A. 1880. Arachnida. *Zoologischer Jahresbericht*, 1879: 430–470.
- BIRULA, A. A. 1900. Beiträge zur Kenntniss der Scorpionenfauna Ost-Persiens. *Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg*, 12(1): 355–375.
- BIRULA, A. A. 1903. Beiträge zur Kenntniss der Scorpionenfauna Persiens (Zweiter Beitrag). *Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg*, 19: 67–80.
- BIRULA, A. A. 1904. Miscellanea scorpilogica. VII. Synopsis der russischen Skorpione. *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St.-Pétersbourg*, 9: 28–38.
- BIRULA, A. A. 1905a. Beiträge zur Kenntniss der Scorpionenfauna Persiens (Dritter Beitrag). *Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg*, 23: 119–148.
- BIRULA, A. A. 1905b. 4. Skorpilogische Beiträge, 1.–3. *Microbuthus littoralis* (Pavesi), *Anomalobuthus rickmersi* Kraepelin und *Buthus zarudnianus* n. nom. *Zoologisher Anzeiger*, 29(14): 445–450.
- BIRULA, A. A. 1910. Ueber *Scorpio maurus* Linné und seine Unterarten. *Horae Societatis Entomologicae Rossicae*, 39: 115–192.
- 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.
- (BIRULA, A. A.) BYALYNITSKII-BIRULYA, A. A. 1917. Arachnoidea Arthrogaster Caucasicæ. Pars I. Scorpiones. *Zapiski Kavkazskogo Muzeya (Mémoires du Musée du Caucase)*, Tiflis: Imprimerie de la Chancellerie du Comité pour la Transcaucasie, A(5), 253 pp. (in Russian; published August 1917). English translation: Byalynitskii-Birulya, A. A. 1964. *Arthrogastriac Arachnids of Caucasia. I. Scorpions*. Jerusalem: Israel Program for Scientific Translations, 170 pp. (in Russian).
- BIRULA, A. A. 1918. Miscellanea scorpilogica. XI. Materialy k scorpiofaune nizhnei Mesopotamii, Kurdistana i Severnoi Persii (Matériaux pour servir à la scorpiofaune de la Mésopotamie inférieure, du Kurdistan et de la Perse septentrionale). *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St.-Pétersbourg*, 22(1917): 1–44 (in Russian).
- BIRULA, A. A. 1937. Zametki o kolleksii skorpionov iz Yemena (Yu. V. Arabia). (Notes sur les collections des scorpions recueillis dans le Jémen (Arabie S. E.)). *Archives du Musée Zoologique de l'Université de Moscou*, 4: 101–110 (in Russian).
- BORELLI, A. 1915. Gli Scorpioni del Museo Civico di Storia naturale di Milano. *Atti della Società Italiana di Scienze Naturali*, 53: 456–464.
- 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.
- CAPES, E. M. & V. FET. 2001. A redescription of the scorpion genus *Plesiobuthus* Pocock, 1900 (Scorpiones: Buthidae) from Pakistan. *Entomo-*

- logische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13(164): 295–304.
- CRUCITTI, P. 1999. The scorpions of Anatolia: biogeographical patterns. *Biogeographia*, 20: 81–94.
- CRUCITTI, P. & V. VIGNOLI. 2002. Gli Scorpioni (Scorpiones) dell'Anatolia sud-orientale (Turchia). *Bulletino della Museo Scienze Naturali in Torino*, 19(2): 433–474.
- DUPRÉ, G., N. LAMBERT & P. GÉRARD. 1998. *Les Scorpions. Biologie. Élevage*. Paris, 82 pp.
- EL-HENNAWY, H. K. 1992. A catalogue of the scorpions described from the Arab countries (1758–1990) (Arachnida: Scorpionida). *Serket*, 2(4): 95–153.
- FARZANPAY, R. 1986. *Mesobuthus eupeus*, an indigenous scorpion from Iran. Origin and its geographical distribution. In Barrientos, J.A. (ed.), *Actas X. Congreso Internacional de Aracnología. Jaca (España) Septiembre 1986*, 1: 333–335.
- FARZANPAY, R. 1987 (1366). [Knowing Scorpions]. Teheran: Central University Publications, No. 312, Biology 4, 231 pp. (in Farsi, with Latin index).
- FARZANPAY, R. 1988. A catalogue of the scorpions occurring in Iran, up to January 1986. *Revue Arachnologique*, 8(2): 33–44.
- FARZANPAY, R. & G. PRETZMANN. 1974. Ergebnisse einiger Sammelreisen nach Vorderasien 4. Teil: Skorpione aus Iran. *Annalen des Naturhistorischen Museums in Wien*, 78: 215–217.
- FET, V. 1989. A catalogue of scorpions (Chelicerata: Scorpiones) of the USSR. *Rivista del Museo Civico di Scienze Naturali "Enrico Caffi"* (Bergamo), 13(1998): 73–171.
- FET, V. 1994. Fauna and zoogeography of scorpions (Arachnida: Scorpions) in Turkmenistan. Pp. 525–534 In: Fet V. & K. I. Atamuradov K. I. (eds.), *Biogeography and Ecology of Turkmenistan*. Kluwer Academic Publishers: Boston–Dordrecht.
- FET, V. 1997. *Neohemibuthus zarudnyi* (Birula, 1903) from Iran, a senior synonym of *N. kinzelbachi* Lourenço, 1996 (Scorpiones, Buthidae). *Revue Arachnologique*, 12(6): 65–68.
- FET, V. 2000. Family Scorpionidae Latreille, 1802. Pp. 427–486 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.
- FET, V. & F. KOVAŘÍK. 2003. First record of *Euscorpius (Polytrichobothrius) italicus* (Scorpiones: Euscorpiidae) from Iraq. *Acta Societatis Zoologicae Bohemicae*, 67: 179–181.
- 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.
- HABIBI, T. 1971. Liste de Scorpions de l'Iran. *Bulletin of the Faculty of Science, Teheran University*, 2(4): 42–47.
- HEMPRICH, F. G. & C. G. EHRENBERG. 1828: Animalia articulata. Arachnoidea, Scorpiones africani et asiatici. In: *Symbolae physicae seu icones et descriptiones Animalium evertebratorum sepositis insectis quae ex itinere per Africam Borealem et Asiam Occidentalem*. Berolini: Officina Academica, Decas Prima, Plates IX et X.
- HEMPRICH, F. G. & C. G. EHRENBERG. 1829. Vorläufige Uebersicht der in Nord-Afrika und West-Asien einheimischen Scorpione und deren geographischen Verbreitung, nach den eigenen Beobachtungen. *Verhandlungen der Gesellschaft Naturforschende Freunde in Berlin*, 1: 348–362.
- HEMPRICH, F. G. & C. G. EHRENBERG. 1831. Animalia Articulata, Arachnoidea, Scorpiones. In *Symbolae physicae animalia evertebrata, exclusis insectis, series prima, tabularum decade prima*. Berolini: Officina Academica 12 pp.
- HENDRIXSON, B. E. 2006. Buthid scorpions of Saudi Arabia, with notes on other families (Scorpiones: Buthidae, Liochelidae, Scorpionidae). *Fauna of Arabia*, 21: 33–120.
- KABAKIBI, M. M., N. KHALIL & Z. AMR. 1999. Scorpions of southern Syria. *Zoology in the Middle East*, 17: 79–89.
- KARATAŞ, A. 2003. New records on the occurrence of *Hottentotta saulcyi* (Simon, 1880) (Scorpiones: Buthidae) in Turkey. *Israel Journal of Zoology*, 49(4): 315–316.

- KARSCH, F. 1879. Skorpionologische Beiträge I. and II. *Mitteilungen des Münchener Entomologischen Vereins*, 3: 6–22, 97–136.
- KHALAF, K. I. 1963. Scorpions reported from Iraq. *Bulletin of Endemic Diseases* (Baghdad), 5(1–2): 59–70.
- KHALAF, L. 1962. A small collection of scorpions from Iraq. *Bulletin of the Iraq Natural History Institute*, 2(4): 1–3.
- KINZELBACH, R. 1984. Die Skorpionssammlung des Naturhistorischen Museums der Stadt Mainz – Teil II: Vorderasien. *Mainzer Naturwissenschaftliches Archiv*, 22: 97–106.
- KOVAŘÍK, F. 1992. A check list of scorpions (Arachnida: Scorpiones) in the collections of the Zoological Department, National Museum in Prague. *Acta Societatis Zoologicae Bohemoslovaca*, 56: 181–186.
- KOVAŘÍK, F. 1996. First report of *Compsobuthus matthiesseni* (Scorpiones: Buthidae) from Turkey. První zpráva o štíru *Compsobuthus matthiesseni* z Turecka. *Klapalekiana*, 32: 53–55.
- KOVAŘÍK, F. 1997a. Results of the Czech Biological Expedition to Iran. Part 2. Arachnida: Scorpiones with descriptions of *Iranobuthus krali* gen. n. et sp. n. and *Hottentotta zagrosensis* sp. n. (Buthidae). *Acta Societatis Zoologicae Bohemicae*, 61: 39–52.
- KOVAŘÍK, F. 1997b. A check-list of scorpions (Arachnida) in the collections of the Hungarian Natural History Museum, Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici*, 89: 177–185.
- 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. 2002. A checklist of scorpions (Arachnida) in the collection of the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany. *Serket*, 8(1): 1–23.
- KOVAŘÍK, F. 2003. Eight new species of *Compsobuthus* Vachon, 1949 from Africa and Asia (Scorpiones: Buthidae). *Serket*, 8(3): 87–112.
- KOVAŘÍK, F. 2004. Revision and taxonomic position of genera *Afghanorthochirus* Lourenço & Vachon, *Baloorthochirus* Kovařík, *Butheolus* Simon, *Nanobuthus* Pocock, *Orthochiroides* Kovařík, *Pakistanorthochirus* Lourenço, and Asian *Orthochirus* Karsch, with descriptions of twelve new species (Scorpiones, Buthidae). *Euscorpius*, 16: 1–33.
- KOVAŘÍK, F. 2005. Taxonomic position of species of the genus *Buthacus* Birula, 1908 described by Ehrenberg and Lourenço, and description of a new species (Scorpiones: Buthidae). *Euscorpius*, 28: 1–13.
- KOVAŘÍK, F. 2007. A revision of the genus *Hottentotta* Birula, 1908, with descriptions of four new species (Scorpiones, Buthidae). *Euscorpius*, 58: 1–107.
- KOVAŘÍK F. & Z. AHMED. 2007. Two new species of the genus *Compsobuthus* Vachon, 1949 from Afghanistan and Pakistan (Scorpiones: Buthidae). *Euscorpius*, 53: 1–6.
- KOVAŘÍK, F. & V. FET. 2006. Taxonomic position of the genus *Simonoides* Vachon et Farzanpay, 1987, and description of a new species of *Orthochirus* Karsch from Iran (Scorpiones, Buthidae). *Euscorpius*, 38: 1–10.
- KOVAŘÍK, F. & S. WHITMAN. 2005. Cataloghi del Museo di Storia Naturale dell’Università di Firenze – sezione di zoologia «La Specola» XXII. Arachnida Scorpiones. Tipi. Addenda (1998–2004) e checklist della collezione (Euscorpiinae esclusi). *Atti della Società Toscana di Scienze Naturali, Memorie*, serie B, 111 (2004): 103–119.
- KRAEPELIN, K. 1891. Revision der Skorpione. I. Die Familie des Androctonidae. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, 8(1890): 144–286 (1–144).
- KRAEPELIN, K. 1895. Nachtrag zu Theil I der Revision der Skorpione. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, 12(1894): 73–96.
- KRAEPELIN, K. 1899. Scorpiones und Pedipalpi. In F. DAHL (ed.), *Das Tierreich. Herausgegeben von der Deutschen Zoologischen Gesellschaft*. Berlin: R. Friedländer und Sohn Verlag, 8. Lieferung. 265 pp.

- KRAEPELIN, K. 1901. Catalogue des Scorpions des collections du Muséum d'Histoire Naturelle de Paris. *Bulletin du Muséum National d'Histoire Naturelle Paris*, 7: 265–274.
- KRAEPELIN, K. 1913. Neue Beiträge zur Systematik der Gliederspinnen. III. A. Bemerkungen zur Skorpionenfauna Indiens. B. Die Skorpione, Pedipalpen und Solifugen Deutsch-Ostafrikas. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, 30: 123–196.
- LAMPE, E. 1918. Katalog der Skorpione, Pedipalpen und Solifugen des Naturhistorischen Museums der Residentzstadt Wiesbaden. *Jahrbücher des Nassauischen Verein für Naturkunde*, 70(1): 185–203.
- LEVY, G. & P. AMITAI. 1980. *Fauna Palaestina, Arachnida I.—Scorpiones*. The Israel Academy of Sciences and Humanities, 132 pp.
- LEVY, G., P. AMITAI & A. SHULOV. 1973. New scorpions from Israel, Jordan and Arabia. *Zoological Journal of the Linnaean Society*, 52: 113–140.
- LOURENÇO, W. R. 1996. A new genus and a new species of scorpion (Buthidae) from Iran. *Zoology in the Middle East*, 12: 93–98.
- LOURENÇO, W. R. & A. PÉZIER. 2002. Taxonomic consideration of the genus *Odontobuthus* Vachon (Scorpiones, Buthidae), with description of a new species. *Revue suisse de Zoologie*, 109(1): 115–125.
- LOURENÇO, W. R. & M. VACHON. 1995. Un nouveau genre et deux nouvelles espèces de scorpions Buthidae d'Iran. *Bulletin du Muséum National d'Histoire Naturelle Paris*, 17: 297–305.
- LOURENÇO, W. R. & M. VACHON. 1997. Un nouveau genre et quatre nouvelles espèces de scorpions (Buthidae) du Moyen-Orient. *Zoosystema*, 19(2–3): 327–336.
- LOURENÇO, W. R. & M. VACHON. 2001. A new species of *Compsobuthus* Vachon, 1949 from Iran (Scorpiones: Buthidae). Pp. 179–182 in: Fet, V. & P. A. Selden (eds.), *Scorpions 2001. In Memoriam Gary A. Polis*. British Arachnological Society: Burhnam Beeches, Bucks.
- MASI, L. 1912. Note sugli Scorpioni appartenenti al R. Museo Zoologico di Roma. *Memorie della Società Entomologica Italiana*, 1(3): 88–108, 120–144.
- MONOD L. & W. R. LOURENÇO. 2005. Hemiscorpiidae (Scorpiones) from Iran, with descriptions of two new species and notes on biogeography and phylogenetic relationships. *Revue suisse de Zoologie*, 112(4): 869–941.
- MORITZ, M. & S.-CH. FISCHER. 1980. Die Typen der Arachniden-Sammlung des zoologischen Museums Berlin. III. Scorpiones. *Mittelungen aus dem Zoologischen Museum in Berlin*, 56: 309–326.
- NAVIDPOUR S., F. KOVÁŘÍK, M. E. SOLEGLAD & V. FET. 2008. Scorpions of Iran (Arachnida, Scorpiones). Part I. Khoozestan Province. *Euscorpius*, 65: 1–41.
- OLIVIER, G. A. 1807. *Voyage dans l'Empire Othoman, l'Égypte et la Perse*. Henri Agasse, Paris, Vol. 3: 96–97, fig. 2.
- PENTHER, A. 1912. Wissenschaftliche Ergebnisse der Expedition nach Mesopotamien, 1910. Scorpiones. *Annalen des Kaiserlich-Königlichen Naturhistorischen Hofmuseums in Wien*, 26(1/2): 109–115.
- PÉREZ MINNOCCI, S. 1974. Un inventario preliminar de los escorpiones de la región Paleártica y claves para la identificación de los géneros de la región Paleártica Occidental. Madrid: Universidad Complutense de Madrid, Facultad de Ciencias, Departamento de Zoología, Cátedra de Artrópodos, 7: 1–45.
- PETERS, W. 1861a. Eine neue Untergattung von Scorpionen, *Hemiscorpon lepturus*. *Monatsberichte der Königlichen Preussischen Akademie der Wissenschaften zu Berlin*, 1861: 426–427.
- PETERS, W. 1861b. Über eine neue Eintheilung der Skorpione und über die von ihm in Mossambique gesammelten Arten von Skorpionen. *Monatsberichte der Königlichen Preussischen Akademie der Wissenschaften zu Berlin*, 1861: 507–520.
- POCOCK, R. I. 1889. Notes on some Buthidae, new and old. *Annals and Magazine of Natural History*, 6(3): 334–351.
- POCOCK, R. I. 1895. On the Arachnida and Myriapoda obtained by Dr. Anderson's collector during Mr. T. Bent's expedition to the Hadramaut, South Arabia; with a supplement upon the scorpions obtained by Dr. Anderson in Egypt and the Eastern Soudan. *Journal of the Linnaean Society*, 25: 292–316.

- POCOCK, R. I. 1900. The scorpions of the genus *Heterometrus*. *Annals and Magazine of Natural History*, 7(6): 362–365.
- POCOCK R. I. 1902. A contribution to the systematics of scorpions. *Annals and Magazine of Natural History*, 7(10): 364–380.
- PRENDINI, L. 2000. Phylogeny and classification of the superfamily Scorpionoidea Latreille 1802 (Chelicerata, Scorpiones): an exemplar approach. *Cladistics*, 16: 1–78.
- PRINGLE, G. 1960. Notes on the scorpions of Iraq. *Bulletin of Endemic Diseases*, 3(3–4): 73–87.
- ROEWER, C. F. 1943. Über eine neuerworbene Sammlung von Skorpionen des Natur-Museums Senckenberg. *Senckenbergiana*, 26(4): 205–244.
- SIMARD, J. M. & D. D. WATT. 1990. Venoms and toxins. Pp. 414–444 in Polis, G. A. (ed.), *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- SIMON, E. 1872. Arachnides de Syrie, rapportés par M. Charles Piocard de la Brulerie (Scorpions et Galéodes). *Annales de la Société Entomologique de France*, (5)2: 245–266.
- SIMON, E. 1879. 3e Ordre. Scorpiones. Pp. 79–115 in : *Les Arachnides de France. VII. Contenant les Ordres des Chernetes, Scorpiones et Opiliones*. Paris: Roret.
- SIMON, E. 1880a. Études Arachnologiques 12e Mémoire. Part XVIII. Descriptions de Genres et Espèces de l'orde des Scorpiones. *Annales de la Société Entomologique de France*, 5(10)1880: 377–398.
- SIMON, E. 1880b. Quelques Scorpions qui lui ont été donnés par notre confrère M. Reiche, de la part de M. F. de Sauley, qui les a reçus de Mossoul (ancienne Ninive), sur le Tigre, en Mésopotamie. *Annales de la Société Entomologique de France*, 5(10): 29.
- SIMON, E. 1892. Liste des Arachnides Recueillis en Syrie par M. le Dr Théod. Barrois. *Revue Biologique du Nord de la France*, 5: 80–84.
- SIMON, E. 1910. Révision des Scorpions d'Egypte. *Bulletin de la Société Entomologique d'Egypte*, 1910: 57–87.
- SISSOM, W. D. 1990. Systematics, biogeography and paleontology. Pp. 64–160 in Polis, G. A. (ed.), *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- SISSOM, W. D. 1994. Descriptions of new and poorly known scorpions of Yemen (Scorpiones: Buthidae, Diplocentridae, Scorpionidae). *Fauna of Saudi Arabia*, 14: 3–39.
- SISSOM W. D. & V. FET. 1998. Redescription of *Compsobuthus matthiesseni* (Scorpiones, Buthidae) from southwestern Asia. *The Journal of Arachnology*, 26: 1–8.
- STATHI, I. & M. MYLONAS. 2001. New records of scorpions from the central-eastern Mediterranean area: biogeographical comments, with a special reference to the Greek species. Pp. 287–295 in: Fet, V. & P. A. Selden (eds.), *Scorpions 2001. In Memoriam Gary A. Polis*. British Arachnological Society. Burnham Beeches, Bucks.
- TULLGREN, A. 1909. Solifugae, Scorpiones und Chelonethi aus Ägypten und dem Sudan. Pp. 1–12 in: Jägerskiöld, L. A. (ed.), *Results of the Swedish Zoological Expedition to Egypt, 1901*, Uppsala, 3(21).
- VACHON, M. 1940a. Voyage en A. O. F. de L. Berland et J. Millot. Scorpions. V. *Bulletin de la Société Zoologique de France*, 65: 170–184.
- VACHON, M. 1940b. Sur la systématique des scorpions. *Mémoires du Muséum National d'Histoire Naturelle, Paris*, 13(2): 241–259.
- VACHON, M. 1951. Prof. Kosswig tarafından Türkiyede toplanan akrepler hakkında. À propos de quelques Scorpions de Turquie collectés par M. le Professeur Dr. Curt Kosswig. *Revue de la Faculté des Sciences de l'Université d'Istanbul, ser. B*, 16(4): 341–344.
- 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).
- VACHON, M. 1959. Scorpionidea (Chelicerata) de l'Afghanistan. The 3rd Danish Expedition to central Asia (Zoological Results 23). *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kobenhavn*, 120: 121–187.

- VACHON, M. 1966. Liste des scorpions connus en Égypte, Arabie, Israël, Liban, Syrie, Jordanie, Turquie, Irak, Iran. *Toxicon*, 4: 209–218.
- VACHON, M. 1974. Étude 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. *Bulletin du Muséum National d'Histoire Naturelle Paris*, 140: 857–958.
- VACHON, M. 1977. Scorpions. In The scientific results of the Oman flora and fauna survey 1975. *Journal of the Oman Studies*, 1: 209–218.
- VACHON, M. 1979. Arachnids of Saudi Arabia, Scorpiones. *Fauna Saudi Arabia* 1: 30–66.
- VACHON, M. & R. KINZELBACH. 1987. On the taxonomy and distribution of the scorpions of the Middle East. In Krupp, F., W. Schneider & R. Kinzelbach (eds.), *Proceedings of the Symposium on the Fauna and Zoogeography of the Middle East, Mainz (TAVO)*, 28(1985): 91–103.
- VACHON, M. & R. STOCKMANN. 1968. Contribution à l'étude des Scorpions africains appartenant au genre *Buthotus* Vachon 1949 et étude de la variabilité. *Monitore Zoologico Italiano*, (N. S.) (2. supplemento): 81–149.
- VIGNOLI, V. 2005. Description of a new species of *Compsobuthus* Vachon, 1949 (Scorpiones: Buthidae) from southern Iran. *Zoology in the Middle East*, 34: 79–86.
- VIGNOLI, V., F. KOVÁŘÍK & P. CRUCITTI. 2003. Scorpiofauna of Kashan (Esfahan Province, Iran) (Arachnida: Scorpiones). *Euscorpius*, 9: 1–7.
- WEIDNER, H. 1959. Die Entomologischen Sammlungen des Zoologischen Staatsinstituts und Zoologischen Museums Hamburg, I. Teil, Pararthropoda und Chelicerata I. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 57: 89–142.
- WERNER, F. 1916. Über einige Skorpione und Gliederspinnen des Naturhistorischen Museum in Wiesbaden. *Jahrbücher des Nassauischen Verein für Naturkunde*, 69: 79–97.
- WERNER, F. 1934. Scorpiones, Pedipalpi. In H. G. Bronns *Klassen und Ordnungen des Tierreichs*. Akademische Verlagsgesellschaft, Leipzig. 5(IV) 8 (Scorpiones pp. 1–316): 1–490.