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Review Article

Scorpion fauna (Arachnida, Scorpiones) of Hamadan Province, Iran

Summary

Five species of scorpions belonging to two families are reported from the Hamadan Province of Iran. Of these, two species are recorded from the province for the first time: *Hottentotta saulcyi* (Simon, 1880) and *Scorpio maurus kruglovi* Birula, 1910 also presented are keys to all species of scorpions found in the Hamadan province.

The various air currents of this region are: the north and North West winds of the spring and winter seasons, which are usually humid and bring rainfall. The west-east air currents that blow in the autumn and the local winds that develops due to difference in air-pressure between the elevated areas and the plains, like the blind wind of the Asad Abad region.

Hamadan is in the vicinity of the Alvand mountains and has a dry summer continental climate (Köppen climate classification Dsa), in transition with a cold semi-arid climate (Köppen climate classification BSk), with snowy winters. In fact, it is one of the coldest cities in Iran. The temperature may drop below -30°C (-22°F) on the coldest days. Heavy snowfall is common during winter and this can persist for periods of up to two months. During the short summer, the weather is mild, pleasant, and mostly sunny.

List of scorpions of hamadan province

Family Buthidae C. L. Koch, 1837

Androctonus crassicauda (Olivier, 1807)

Hottentotta saulcyi (Simon, 1880)

Mesobuthus eupeus iranensis (Birula, 1917)

Mesobuthus eupeus persicus (Pocock, 1899)

Odontobuthus doriae (Thorell, 1876) [2]

Family Scorpionidae Latreille, 1802

Scorpio maurus kruglovi Birula, 1910 (first report) [3]

Systematics

Family Buthidae C. L. Koch, 1837

Abbreviations

The institutional abbreviations listed below and used throughout are mostly after Arnett, et al., [1].

BMNH: The Natural History Museum, London, United Kingdom; FKCP: František Kovařík Collection, Praha, Czech Republic; MCSN: Museo Civico de Storia Naturale "Giacomo Doria", Genova, Italy; MHNG: Muséum 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, Karaj, 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.

Introduction

This paper continues a comprehensive province-by-province field study of the scorpion fauna of Iran by the RRLS team under Shahrokh Navidpour. The study includes documentation of biotope diversity, revisitation of previously known sites, some of them type localities, and sampling of all the encountered scorpion species. All specimens are collected with the help of UV light (night catch). Hamadan province, is one of the 31 provinces of Iran. Its center is Hamadan city. The province of Hamadan covers an area of 19,546 km² and lies in a temperate mountainous region to the east of Zagros. The vast plains of the north and northeast of the province are influenced by strong winds, that almost last throughout the year.



Androctonus crassicauda (Olivier, 1807)

Scorpio crassicauda Olivier, 1807: 97.

Buthus crassicauda: Simon, 1872: 247 (in part); Simon, 1879: 99; Simon, 1892: 83; Kraepelin, 1899: 16; Pocock, 1902 [4]: 373; Kraepelin, 1913: 124; Lampe, 1918: 190.

Androctonus crassicauda: Kraepelin, 1891: 175 (in part); Vachon, 1951 [5]: 343; Khalaf, 1962: 1; Khalaf, 1963 [6]: 60; Habibi, 1971 [7]: 42; Farzanpay & Pretzmann, 1974 [8]: 215; Pérez Minocci, 1974: 17; Vachon, 1974: 909; Vachon, 1979 [9]: 31; Farzanpay, 1987 [10]: 141; Farzanpay, 1988 [11]: 36; Fet, 1989: 78; Al-Safadi, 1992 [12]: 96; Amr & El-Oran, 1994: 187; Sissom, 1994 [13]: 36; Dupré et al., 1998 [14]: 59; Kovařík, 1998: 104; Crucitti, 1999 [15]: 83; Kabakibi et al., 1999 [16]: 80; Fet & Lowe, 2000 [17]: 72; Stathi & Mylonas, 2001 [18]: 288; Crucitti & Vignoli, 2002 [19]: 439; Kovařík, 2002: 5; Fet & Kovařík, 2003: 180; Vignoli et al., 2003 [20]: 2; Kovařík & Whitman, 2005 [21]: 105; Lourenço, 2005: 149; Hendrixson, 2006 [22]: 38; Akbari, 2007: 76, fig. p. 62; Navidpour et al., 2008a [23]:; Navidpour et al., 2008b [24]: 3; Navidpour et al., 2008c [25]: 3; Navidpour et al., 2008d [26]: 3; Pirali-Kheirabadi, et al., 2009 [27]: 3; Navidpour, et al., 2010 [28]: 3; Navidpour, et al., 2011 [29]: 3; Navidpour, et al., 2012 [30]: 3.

Prionurus crassicauda: Pocock, 1895 [31]: 292; Tullgren, 1909 [32]: 2; Birula, 1904 [33]: 29; Birula, 1905a [34]: 120; Masi, 1912: 91; Penther, 1912: 110.

Androctonus crassicauda crassicauda: Vachon, 1959: 124; Vachon, 1966 [35]: 210; Habibi, 1971 [7]: 42; Vachon, 1979 [9]: 34; Levy & Amitai, 1980: 23–29; Kovařík, 1997 [36]: 49.

= *Prionurus crassicauda orientalis* Birula, 1900 [37]: 355; Birula, 1903 [38]: 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 [35]: 210; Habibi, 1971 [7]: 42; Pérez Minocci, 1974: 18.

Androctonus amoreuxi baluchicus: Kovařík, 1997 [36]: 39 (see Vignoli et al., 2003 [20]: 4).

Type locality and type repository. Kashan, Persia, now Iran, Esfahan Province; MNHN

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Tasaran village, Kbootar ahang 35°20'22"N 48°38'29"E, 1726 m a.s.l. (Locality No. H-48.3), V.2016, 2♂ (RRLS), leg. Azimi; Dgh Dagh village, Kbootar ahang, 35°11'38"N 48°47'19"E, 1661 m a.s.l. (Locality No. H-03) V.2016, 1♂ (RRLS), leg. Azimi; Abroo village, 34°43'18"N 48°34'15"E, 2175 m a.s.l. (Locality No. H-91.1), V.2016, 1♂ (RRLS), leg. Azimi; Koozeh village, 34°42'32"N 49°01'33"E, 2175 m a.s.l. (Locality No. H-20.1), V.2016, 1♂1♂ (RRLS), leg. Azimi; Chenar sofla village, Asada bad, 34°45'32"N 49°11'19"E, 2002 m a.s.l. (Locality No. H-20.1), V.2016, 6♂1♂ (RRLS), leg. Azimi.

DISTRIBUTION: Widespread in Iran, found in most provinces. Recorded also from Armenia (Kraepelin, 1899: 17), Azerbaijan (Fet, 1989: 79), Bahrain (Crucitti & Vignoli, 2002 [19]: 439), Egypt (Fet & Lowe, 2000 [17]: 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 [22]: 39), Qatar (El-Hennawy, 1992: 100), Saudi Arabia (Pocock, 1895: 292; Hendrixson, 2006 [22]: 39), Syria (Simon, 1872: 247), Tunisia (Kraepelin, 1901 [39]: 266), Turkey (Pocock, 1902 [40]: 373), United Arab Emirates (Hendrixson, 2006 [22]: 40), and Yemen (Birula, 1937: 101).

Hottentotta saulcyi (Simon, 1880)

Buthus saulcyi Simon, 1880a: 378; Simon, 1880b: 29; Kraepelin, 1899: 18; Kraepelin, 1901 [39]: 267; Weidner, 1959: 99.

Buthus (Hottentotta) saulcyi: Birula, 1905a [34]: 136; Birula, 1917: 214; Birula, 1918: 30; Vachon, 1940b [40]: 255.

Buthotus saulcyi: Vachon, 1949: 147 (1952 [41]: 233); Vachon, 1959 [42]: 134; Pringle, 1960 [43]: 79; Khalaf, 1962: 2; Khalaf, 1963 [6]: 64; Vachon, 1966 [35]: 210; Vachon & Stockmann, 1968 [44]: 91; Habibi, 1971: 43; Pérez Minocci, 1974: 21; Farzanpay, 1987 [10]: 148; Farzanpay, 1988 [11]: 37; El-Hennawy, 1992 [45]: 118; Kovařík, 1992 [46]: 90; Kovařík, 1992 [46]: 183; Akbari, 2007: 76; Akbari et al., 1997 [47]: 112; Dupré, Lambert & Gérard, 1998: 70.

Hottentotta saulcyi: Kovařík, 1997a: 40; Crucitti & Vignoli, 2002 [19]: 446; Vignoli et al., 2003 [20]: 4; Karatas, 2003 [48]: 315; Kovařík, 2007: 61; Navidpour et al., 2008a: 10; Navidpour et al., 2008b: 13; Navidpour et al., 2008c: 8; Navidpour et al., 2008d: 5.

Hottentotta (Hottentotta) saulcyi: Kovařík, 1998: 110; Fet & Lowe, 2000 [17]: 143.

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

Type locality and type repository. Iraq, Mosul; MNHN, ZMUH

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Shirin soo village, Kbootar ahang 34°34'07"N 48°06'58"E, 1540 m a.s.l. (Locality No. H-05) V.2016, 3♂2♀ (RRLS), leg. Azimi; Koozeh village, 34°42'32"N 49°01'33"E, 2175 m a.s.l. (Locality No. H-20.1), V.2016, 3♂ (RRLS), leg. Azimi; Razan village, 35°25'18"N 49°06'36"E, 1934 m a.s.l. (Locality No. H-5) V.2016, 10♂8♀ (RRLS), leg. Azimi.

DISTRIBUTION: Iran, known from Kermanshah (formerly Bachtaran), Fars, Hamadan, Hormozgan, Ilam, Lorestan Provinces (Kovařík, 2007 [49]: 65), Bushehr and Khozestan Provinces (Akbari, 2007 [50]: 76, Akbari et al., 1997 [46]: 112), Kohgiluyeh & Boyer Ahmad (Navidpour et al., 2008d [23]: 5), and Chahar Machal & Bakhtiyari Province (first report); Afghanistan (Kovařík, 1997a: 40), Iraq (Simon, 1880a: 379), Turkey (Crucitti & Vignoli, 2002 [19]: 446).

Mesobuthus eupeus iranus (Birula, 1917)

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Toeichin village, 34°50'41"N 48°25'38"E, 2020 m a.s.l. (Locality No. H-66.3) V.2016, 15♂12♀ (RRLS), leg. Azimi.

Mesobuthus eupeus persicus (Pocock, 1899)

Buthus caucasicus persicus Pocock, 1899: 404; Pocock, 1900 [51]: 19.

Buthus eupeus persicus: Birula, 1905a [34]: 119, 122, 124–126; Birula, 1918 [52]: 10–13, figs.

Mesobuthus eupeus persicus: Vachon, 1959 [42]: 155; Vachon, 1966 [35]: 212; Habibi, 1971 [22]: 44; Farzanpay, 1988: 38; Fet, 1994: 527; Kovařík, 1997: 49; Kovařík, 1998: 114; Fet & Lowe, 2000 [17]: 174; Navidpour et al., 2011: 9, 6, 12, 41–44; Navidpour et al., 2012: 10.

Mesobuthus caucasicus persicus: Pérez Minocci, 1974: 25; Capes & Fet, 2001: 303.

= ? *Buthus eupeus kirmanensis* Birula, 1900: 364 (see Fet & Lowe, 2000 [17]: 173).

Buthus (Buthus) eupeus kirmanensis: Birula, 1917: 239; Birula, 1918 [52]: 14.

Mesobuthus eupeus kirmanensis: Vachon, 1959 [42]: 155; Vachon, 1966 [35]: 212; Habibi, 1971 [22]: 43; Farzanpay, 1988 [11]: 38; Fet, 1994: 527; Kovařík, 1997 [36]: 49; Kovařík, 1998: 114; Fet & Lowe, 2000 [17]: 173; Mirshamsi, et al., 2011 [53]: 9.

= ? *Buthus pachysoma* Birula, 1900: 370 (syn. by Navidpour et al., 2011: 9).

Buthus eupeus pachysoma: Birula, 1905a [34]: 128.

Buthus (Buthus) eupeus pachysoma: Birula, 1917: 239.

Mesobuthus eupeus pachysoma: Vachon, 1959 [42]: 155; Vachon, 1966 [35]: 212; Habibi, 1971 [22]: 43; Farzanpay, 1988 [11]: 38; Fet, 1994: 527; Kovařík, 1997 [36]: 49; Kovařík, 1998: 114; Fet & Lowe, 2000: 174.

TYPE LOCALITY AND TYPE REPOSITORY. Persia, now Iran, East Azarbaijan, Seir, E side of Lake Urmia (Urmi); BMNH.

TYPE MATERIAL EXAMINED. Iran, East Azarbaijan Province, Seir, Lake Urmi, 1♀ lectotype, BMNH No. 1900.1.15.

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Ghahavand village, 34°52'28"N 49°11'18"E, 1625 m a.s.l. (Locality No. H-72.3) V.2016, 3♂ (RRLS), leg. Azimi; Dagh village, Kabootar ahang, 35°11'38"N 48°47'19"E, 1661 m a.s.l. (Locality No. H-03) V.2016, 2♂4♀ (RRLS), leg. Azimi; Jorghhan village, 34°53'34"N 48°33'12"E, 1730 m a.s.l. (Locality No. H-07) V.2016, 3♂5♀ (RRLS), leg. Azimi; Shamsabad village, 34°41'14"N 48°37'17"E, 2250 m a.s.l. (Locality No. H-19.3) V.2016, 22♂1♀ (RRLS), leg. Azimi; Tokmeh dash village, 34°38'13"N 48°39'30"E, 2260 m a.s.l. (Locality No. H-68.3) V.2016, 10♂4♀ (RRLS), leg. Azimi; Abroo village, 34°43'18"N

48°34'15"E, 2175 m a.s.l. (Locality No. H-91.1), V.2016, 1♂ (RRLS), leg. Azimi; Shanabad village, 34°34'14"N 48°06'17"E, 1540 m a.s.l. (Locality No. H-63.5) V.2016, 4♂1♀ (RRLS), leg. Azimi; Cheshmeh ghasaban village, 35°52'24"N 48°25'37"E, 1875 m a.s.l. (Locality No. H-8.4) V.2016, 4♂ (RRLS), leg. Azimi; Chenar olya village, 34°51'18"N 48°33'46"E, 1816 m a.s.l. (Locality No. H-20.10) V.2016, 4♂6♀ (RRLS), leg. Azimi; Siyah kamar village, 34°59'48"N 48°33'56"E, 2054 m a.s.l. (Locality No. H-4) V.2016, 4♂1♀ (RRLS), leg. Azimi; Razan village, 35°25'18"N 49°06'36"E, 1934 m a.s.l. (Locality No. H-5) V.2016, 24♂2♀ (RRLS), leg. Azimi; Famin village, 35°09'48"N 49°01'26"E, 1656 m a.s.l. (Locality No. H-6) V.2016, 10♂14♀ (RRLS), leg. Azimi; Malayer village, 34°20'18"N 48°43'36"E, 1761 m a.s.l. (Locality No. H-7) V.2016, 6♂2♀ (RRLS), leg. Azimi; Saleh abad village, 34°56'48"N 48°21'16"E, 1783 m a.s.l. (Locality No. H-3) V.2016, 13♂4♀ (RRLS), leg. Azimi.

DISTRIBUTION: Iran, East Azarbaijan (Pocock, 1899: 404), Fars (Navidpour, et al., 2012 [30]: 11), Kerman, Sistan & Baluchistan (Birula, 1900 [37]: 364; Fet & Lowe, 2000 [17]: 173), Hormozgan (first report), and Yazd (Mirshamsi, et al., 2011 [53]: 9) Provinces; Pakistan (Pocock, 1900 [51]: 20).

Odontobuthus doriae (Thorell, 1876) [2]

Buthus doriae Thorell, 1876 [2]: 107; Kraepelin, 1891: 57–58, pl. I; Kraepelin, 1899: 27.

Odontobuthus doriae: Pringle, 1960 [43]: 83; Khalaf, 1963 [6]: 66; Vachon, 1966 [35]: 213; Habibi, 1971 [22]: 44; Pérez Minocci, 1974: 28; Farzanpay, 1988 [11]: 39; Kovařík, 1997 [49]: 47; Kovařík, 1998: 115; Fet & Lowe, 2000 [17]: 187; Kovařík, 2002: 9; Lourenço & Pézier, 2002 [54]: 116; Vignoli, et al., 2003 [20]: 4; Piralí-Kheirabadi et al., 2009 [27]: 9; Navidpour et al., 2011 [29]: 13; Karatas, et al., 2012 [55]: 116; Navidpour et al., 2012 [30]: 14.

Type locality and type repository. Iran, Teheran; MCSN

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Ghahavand village, 34°52'28"N 49°11'18"E, 1625 m a.s.l. (Locality No. H-72.3) V.2016, 2♂1♀ (RRLS), leg. Azimi; Cheshmeh ghasaban village, 35°52'24"N 48°25'37"E, 1875 m a.s.l. (Locality No. H-8.4) V.2016, 1♂ (RRLS), leg. Azimi; Chenar olya village, 34°51'18"N 48°33'46"E, 1816 m a.s.l. (Locality No. H-20.10) V.2016, 3♂ (RRLS), leg. Azimi; Malayer village, 34°20'18"N 48°43'36"E, 1761 m a.s.l. (Locality No. H-7) V.2016, 3♂ (RRLS), leg. Azimi; Saleh abad village, 34°56'48"N 48°21'16"E, 1783 m a.s.l. (Locality No. H-3) V.2016, 3♂2♀ (RRLS), leg. Azimi.

DISTRIBUTION: Iran, Esfahan, Fars, Hamadan, Kerman, Kermanshah, Mazandaran, Markazi, Teheran, West Azarbaijan, Yazd (Kovařík, 1997 [49]: 47, Lourenço & Pézier, 2002 [54]: 116, 117, 124), Chahar Machal & Bakhtiyari (Piralí-Kheirabadi et al., 2009 [27]: 10), Tehran, and Sistan & Baluchistan (Piralí-Kheirabadi et al., 2009 [27]: 14) Provinces.

Family Scorpionidae Latreille, 1802

Scorpio maurus kruglovi Birula, 1910

Heterometrus townsendi Pocock, 1900 [51]: 364.



? *Scorpio townsendi*: Birula, 1905a [33]: 147 (Birula, 1910: 184).

Scorpio maurus townsendi: Birula, 1910 [3]: 184; Fet, 2000: 477 (complete references list until 2000).

Scorpio maurus: Farzanpay, 1987 [10]: 165; Farzanpay, 1988 [11]: 42; Akbari, 2007: 76.

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

HAMADAN PROVINCE MATERIAL EXAMINED. Iran, Hamadan Province, Toeichin village, 34°50'41"N 48°25'38"E, 2020 m a.s.l. (Locality No. H-66.3) V.2016, 7♂22♀ (RRLS), leg. Azimi; Shirin soo village, Kbootar ahang 34°34'07"N 48°06'58"E, 1540 m a.s.l. (Locality No. H-05) V.2016, 2♂ (RRLS), leg. Azimi; Jorghhan village, 34°53'34"N 48°33'12"E, 1730 m a.s.l. (Locality No. H-07) V.2016, 1♂ (RRLS), leg. Azimi; Famin village, 35°09'48"N 49°01'26"E, 1656 m a.s.l. (Locality No. H-6) V.2016, 1♂ (RRLS), leg. Azimi.

DISTRIBUTION: IRAQ, JORDAN, KUWAIT, QATAR, SAUDI ARABIA, SYRIA (KINZELBACH, 1985; PRINGLE, 1960 [43]: 86; VACHON, 1979 [9]: 57), IRAN (KHERMANSHAH, NORTH KHORASAN, MAZENDRAN, QAZVIN, SEMNAN, TEHRAN (KARATAS et al., 2012) [54-73], ALBORZ AND MARKAZI PROVINCES and Hamadan Province (FIRST RECORDS).

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