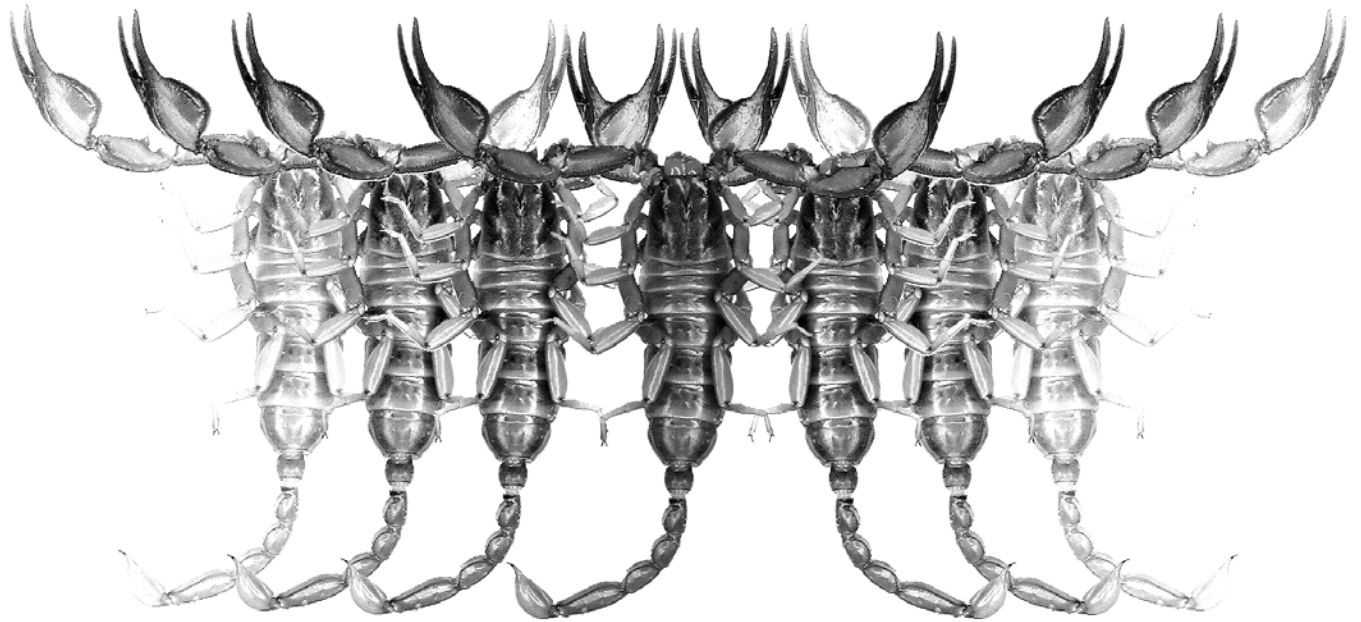


Euscorpilus

Occasional Publications in Scorpiology



**A Revision of the Genus *Hottentotta* Birula, 1908, with
Descriptions of Four New Species (Scorpiones, Buthidae)**

František Kovařík

September 2007 — No. 58

Euscorpilus

Occasional Publications in Scorpiology

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

ASSOCIATE EDITOR: Michael E. Soleglad, ‘soleglad@la.znet.com’

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

Derivatio Nominis

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

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

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

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

Publication date: 18 September 2007

A revision of the genus *Hottentotta* Birula, 1908, with descriptions of four new species (Scorpiones, Buthidae)

František Kovařík

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

Summary

The genus *Hottentotta* is revised and a key to the species is provided. Subgenera *Balfourianus* Vachon, 1979 and *Deccanobuthus* Lourenço, 2000 are synonymized with the subgenus *Hottentotta* Birula, 1908. Four new species of *Hottentotta* are described: *H. finneganae* **sp. n.** from Pakistan, *H. jabalpurensis* **sp. n.** from India (Madhya Pradesh), *H. jalalabadensis* **sp. n.** from Afghanistan, and *H. stockwelli* **sp. n.** from India (Andhra Pradesh and Maharashtra). The following species and subspecies are synonymized: *Buthotus alticola kabulensis* (Vachon, 1958) with *H. buchariensis* (Birula, 1897) **comb. n.**; *Hottentotta caboverdensis* Lourenço & Ythier, 2006 with *H. hottentotta* (Fabricius, 1787); *H. acostai* Lourenço, 2004 with *H. minax* (L. Koch, 1875); *H. (Deccanobuthus) geffardi* Lourenço, 2000 with *H. pachyurus* (Pocock, 1897); *Buthus hendersoni* Pocock, 1900 with *H. rugiscutis* (Pocock, 1897); *Buthus tamulus concanensis* Pocock, 1900, *Buthus tamulus gangeticus* Pocock, 1900, *Buthus tamulus gujaratensis* Pocock, 1900 and *Buthus tamulus indicus* Pocock, 1900 with *H. tamulus* (Fabricius, 1798). *H. buchariensis* (Birula, 1897) **comb. n.**, *H. gentili* (Pallary, 1924) **comb. n.**, *H. penjabensis* (Birula, 1897) **comb. n.**, and *H. salei* (Vachon, 1980) **comb. n.** are recognized as valid species. Lectotypes are designated for *Buthus alticola buchariensis* Birula, 1897; *Buthus (Hottentotta) franzwernerii* Birula, 1914; *Buthus hendersoni* Pocock, 1900; *Buthus jayakari* Pocock, 1895; *Buthus pachyurus* Pocock, 1897; *Buthus rugiscutis* Pocock, 1897; *Androctonus (Prionurus) scaber* Ehrenberg, 1828; *Buthus tamulus concanensis* Pocock, 1900; *Buthus tamulus gangeticus* Pocock, 1900; *Buthus tamulus gujaratensis* Pocock, 1900; and *Buthus tamulus indicus* Pocock, 1900. Neotypes are designated for *Scorpio hottentotta* Fabricius, 1787 and *Scorpio tamulus* Fabricius, 1798. *H. buchariensis* (Birula, 1897) **comb. n.** is for the first time recorded from Pakistan, and *H. salei* (Vachon, 1980) **comb. n.** from the United Arab Emirates and Yemen. *Buthus syrticus* Borelli, 1914 from Syria is considered a *nomen dubium*.

Introduction

Hottentotta is one of the most widely distributed genera of the family Buthidae, with species present throughout Africa, the Arabian Peninsula, and in Asia to Pakistan and India. It is perhaps the main reason why this genus has never been revised and published data are scattered in many short, often faunistically oriented articles. The most extensive work, dealing with African species, was published by Vachon & Stockmann (1968). Pocock published a series of papers on the Asian species between 1889 and 1903, and Tikader & Bastawade (1983) concentrated on the Indian species, which however due to lack of comparisons with taxa from other regions they transferred to the genus *Mesobuthus* and did not even compare them with species today assigned to *Mesobuthus*. This led to problems in defining *Hottentotta*, described as a subgenus by Birula (1908). Most citations are linked with its synonym *Buthotus* Vachon, 1949, which was used for all species of *Hottentotta* Birula until 1985. More recent treatments of various populations led to formation of two other subgenera, *Buthotus (Balfourianus)* Vachon, 1979 (with the type species *Buthus socotrensis* Pocock, 1889) and

Hottentotta (Deccanobuthus) Lourenço, 2000 (with the type species *Hottentotta geffardi* Lourenço, 2000).

It is possible to trace several complexes of *Hottentotta* that, without knowledge of other species, look like separate subgenera. However, a comprehensive study of all the species leads me to conclude that subgeneric divisions of *Hottentotta* are not justified. It is clear that *Hottentotta* is close to *Mesobuthus*, and only a future revision of the latter will enable us to more accurately determine the mutual relationship of these two genera.

The noted historical problems are reflected in published catalogues, which often contain species records only by country, without any data on localities and deposition of voucher specimens that would enable verification. In this revision such country records are included with the stipulation that the occurrence must be considered dubious. The same applies to some isolated older records for which accidentally switched or otherwise erroneous locality labels are a distinct possibility.

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

- BMNH – The Natural History Museum, London, United Kingdom;
- CASC – California Academy of Sciences, San Francisco, California, USA;
- FKCP – František Kovařík Collection, Praha, Czech Republic;
- HNHM – Hungarian Natural History Museum, Budapest, Hungary;
- JBCP – Jan Batelka Collection, Praha, Czech Republic;
- MCSN – Museo Civico de Storia Naturale "Giacomo Doria", Genua, Italy;
- MMBC – Moravian Museum, Brno, Czech Republic;
- MNHN – Muséum National d'Histoire Naturelle, Paris, France;
- MZUF – Museo Zoologico de "La Specola", Firenze, Italy;
- NHMW – Naturhistorisches Museum Wien, Vienna, Austria;
- NMPC – National Museum (Natural History), Praha, Czech Republic;
- NRHS – National Museum of Natural History, Leiden, Netherlands;
- SAMC – South African Museum, Cape Town, South Africa;
- SMFD – Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany;
- 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.
- franzwernerii* (Birula, 1914)] (syn. by Vachon, 1949: 146).
- = *Buthotus* Vachon, 1949: 143 (1952: 229); type species *Buthus judaicus* Simon, 1872 [= *Hottentotta judaicus* (Simon, 1872)]; Pérez Minocci, 1974: 20; Vachon, 1979: 233; Tikader & Bastawade, 1983: 164 (syn. by Francke, 1985: 4).
- Buthotus* (*Buthotus*): Vachon, 1979: 236.
- Hottentotta* (*Hottentotta*): Francke, 1985: 4.
- = *Buthotus* (*Balfourianus*) Vachon, 1979: 236; type species *Buthus socotrensensis* Pocock, 1889 [= *Hottentotta socotrensensis* (Pocock, 1889)]. **Syn. n.**
- Hottentotta* (*Balfourianus*): Francke, 1985: 4; Fet & Lowe, 2000: 145.
- = *Hottentotta* (*Deccanobuthus*) Lourenço, 2000: 192; type species *Hottentotta geffardi* Lourenço, 2000: 192 [= *Hottentotta pachyurus* (Pocock, 1897)]. **Syn. n.**
- Mesobuthus*: Tikader & Bastawade, 1983: 186.
- TYPE SPECIES. *Scorpio hottentotta* Fabricius, 1787.
- DIAGNOSIS: Dorsal trichobothria of femur arranged in beta-configuration with d_2 situated on dorsal surface. Trichobothrium d_3 of patella situated dorsal of dorso-medial carina. Trichobothrium *db* on the fixed finger of pedipalp usually located between *est* and *et*, or may be on level with trichobothrium *est*, rarely between *est* and *esb*. Trichobothrium *eb* clearly on fixed finger of pedipalp. Pectines with fulcra. Dentate margin of pedipalp-chela movable finger with distinct granules divided into 11–16 rows and 5–7 terminal granules. Cheliceral fixed finger with two ventral accessory denticles. Tergites I–VI of mesosoma bear three carinae. Carapace with distinct carinae, entire dorsal surface nearly planate. Third and fourth legs with well developed tibial spurs, first and second tarsomeres with paired ventral setae. First sternite with two granulated lateral stridulatory areas, which however may be reduced in some species (e. g. in *H. pachyurus* and *H. trilineatus*). Ventrolateral carinae of fifth metasomal segment with all granules more or less equal in size and never lobate. Total length 30–130 mm.

Systematics

Hottentotta Birula, 1908

(Figs. 1–153, Table 1)

Androctonus: C. L. Koch, 1838a: 45 (in part).

Buthus: Kraepelin, 1898: 3; Kraepelin, 1899: 9; Pocock, 1903a: 178.

Buthus (in part): Thorell, 1876: 103; Kraepelin, 1891: 185; Kraepelin, 1895: 80; Pocock, 1897a: 104; Pocock, 1899: 834; Pocock, 1900b: 56; Pocock, 1900a: 13; Kraepelin, 1903: 558; Kraepelin, 1913: 123; Werner, 1934: 269.

Buthus (*Buthus*) (in part): Pocock, 1890a: 126; Birula, 1897: 377.

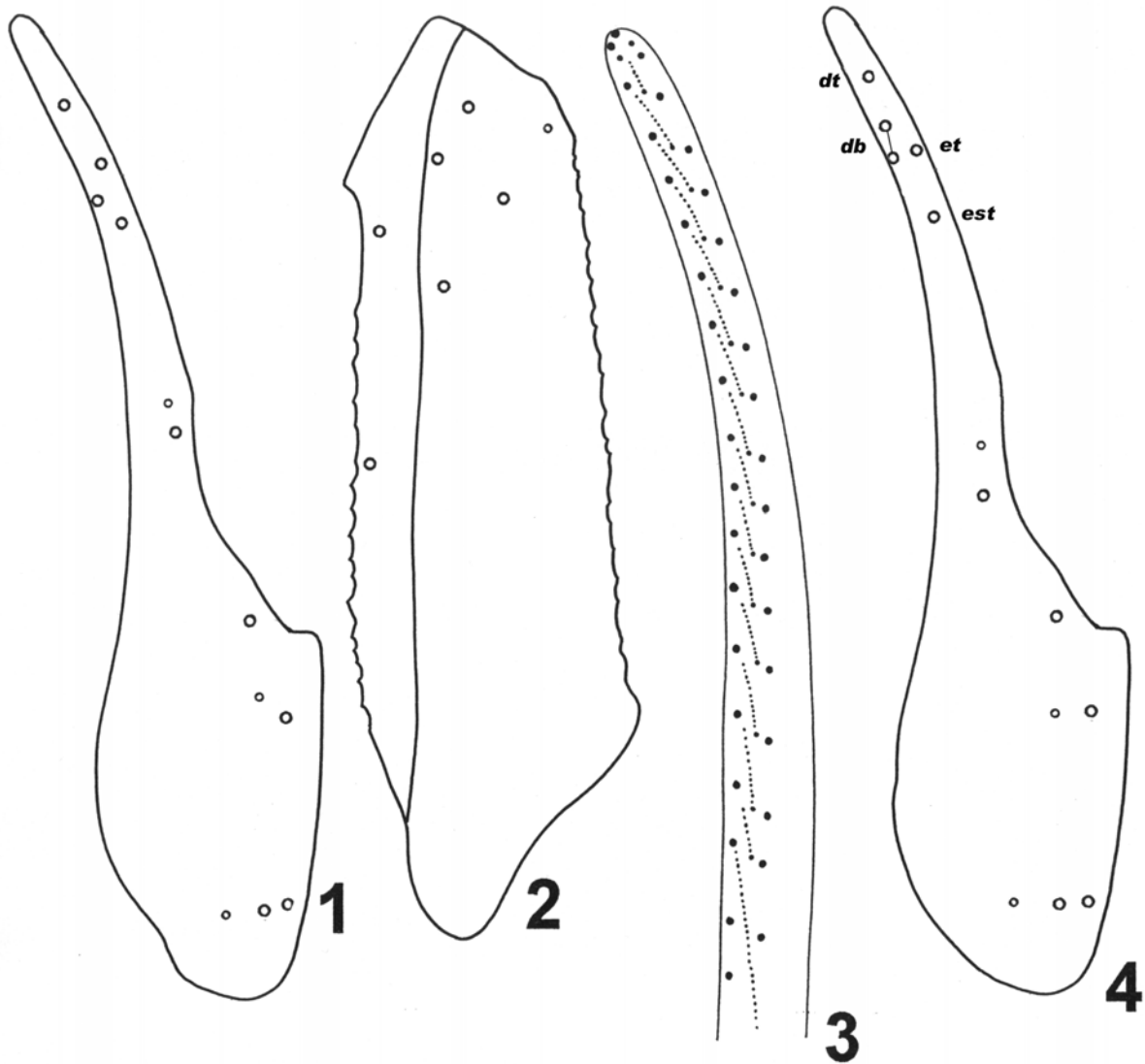
Buthus (*Hottentotta*) Birula, 1908: 141; Birula, 1917: 22; Simon, 1910: 71 (in part).

Hottentotta: Werner, 1934: 269; Fet, 1989: 81; Sissom, 1990: 101; Fet & Lowe, 2000: 133.

= *Dasyscorpio* Pallary, 1938: 279; type species *Buthus* (*Hottentotta*) *lutaui* Pallary, 1924 [= *Hottentotta*

COMMENTS. Most *Hottentotta* species are morphologically and colorwise sufficiently distinct and their distributions rarely overlap, which makes identifications relatively easy. In contrast, generic-level characters remain to be clearly defined, which has caused erroneous transfers of Indian species to the genus *Mesobuthus* and the creation of two subgenera that are hereby synonymized.

The genera *Hottentotta* and *Mesobuthus* have been often separated on unstable characters such as density of pubescence, shape (lyriform configuration) and definition of carinae on the carapace, and the number of terminal granules on movable fingers of pedipalps. It

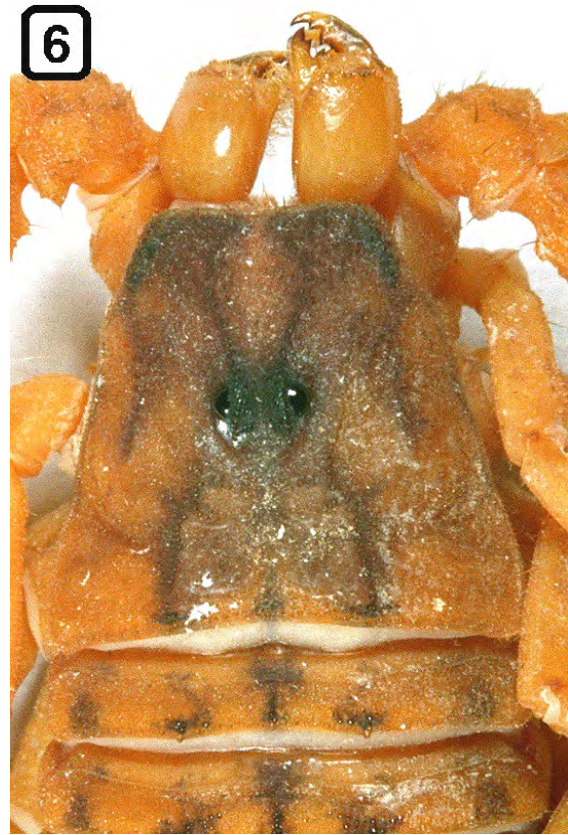


Figures 1–4: 1–3. *H. zagrosensis*, holotype. 1. chela external, 2. femur dorsal, 3. movable finger. 4. *H. socotrensis*, chela external.

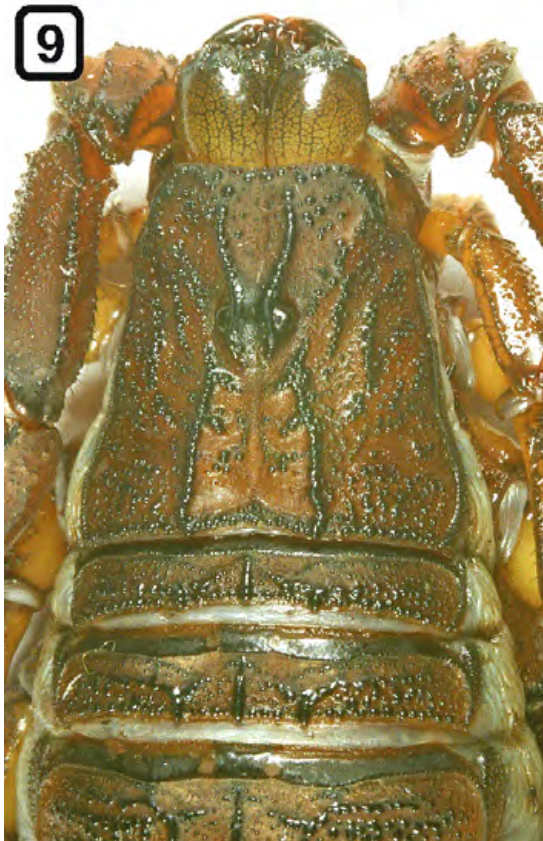
appears that the stable character that permits a clearcut separation of the two genera is the position of trichobothrium *db* on the fixed finger of pedipalp in relation to trichobothrium *est*. In *Hottentotta* the trichobothrium *db* is between *est* and *et* (Figs. 1 and 4), whereas in *Mesobuthus* it is always between *est* and *esb* (see fig. 3 in Vachon, 1958: 127). Vachon & Stockmann (1968: 102, figs. 18 and 19) found variation in the position of this trichobothrium in the African species *H. minax occidentalis*, in which one specimen had the *db* on the fixed finger between *est* and *esb*, and another had it between *est* and *et*. I found the same variation in another African species, *H. trilineatus*. Here it is important to note that the genus *Mesobuthus* is not known to occur in Africa. I therefore believe that the position of trichobothrium *db* is a reliable primary

character for distinguishing between *Hottentotta* and *Mesobuthus*, and that any possible exceptions can be satisfactorily resolved by other, secondary characters (*Hottentotta* has ventrolateral carinae on the fifth metasomal segment with all granules more or less equal in size and never lobate and different carination of the carapace).

Vachon (1978: 236) erected the subgenus *Balfourianus* with the type species *Buthus socotrensis* Pocock, 1889 and again used as the chief character the position of trichobothrium *db*, this time in relation to trichobothrium *et* (see figs. 7 and 8 in Vachon, 1978: 236). I had an opportunity to examine many specimens of this species and found that in some specimens the trichobothrium *db* is between trichobothria *et* and *dt*, as Vachon says, but in other specimens it is on the same



Figures 5–8: Carapace and chelicerae. **5.** *H. buchariensis*, female from Afghanistan, prov. Kabul, Poli Charky, FKCP. **6.** *H. conspersus*, male from Angola, Naulila env., FKCP. **7.** *H. franzwernerii*, male lectotype. **8.** *H. gentili*, female from Morocco, Bouizakame, Timoulye, FKCP.



Figures 9–12: Carapace and chelicerae. **9.** *H. hottentotta*, female from Ghana, FKCP. **10.** *H. hottentotta*, male from Burkina Faso (Volta Haute), Garango, 11°48'N 00°33'W, SMFD No. 39339. **11.** *H. jalalabadensis*, sp. nov., female paratype. **12.** *H. jayakari*, female from Oman, Wadi Bani Auf, on Salma Rd, shale scree in wadi, 23°13'N 57°22'E, FKCP.



Figures 13–16: Carapace and chelicerae. **13.** *H. judaicus*, female from Jordan, Zoubia, FKCP. **14.** *H. niloticus*, male from Sudan, Khartoum, Sunt Forest, FKCP. **15.** *H. pachyurus*, female from India, Tamil Nadu, Deccan, FKCP. **16.** *H. polystictus*, female from Kenya, North Horr, FKCP.



Figures 17–20: Carapace and chelicerae. **17.** *H. saulcyi*, female from Iran, prov. Bachtarán, Bisotul, 34°23'31"N 47°26'05"E, FKCP. **18.** *H. schach*, female from Iran, prov. Fars, 10 km E of Sivand vill., FKCP. **19.** *H. tamulus*, female from India, Maharashtra, Bombay, FKCP. **20.** *H. trilineatus*, male from Tanzania, Arusha distr., Naberera env., FKCP.

level as *et* (Fig. 4). *H. socotrensis* is morphologically similar to Afghan and Pakistan species (*H. alticola* complex), and I am not convinced that it deserves to be placed in a separate subgenus. There definitely are other, more distinct groups of *Hottentotta*, for instance the south African *H. arenaceus* and *H. conspersus* with extremely inflated vesicles (Fig. 28), or large and densely hirsute Asian species (e.g. *H. schach*, Fig. 105) versus smaller and much less hirsute but conspicuously granulate species that occur in both Africa and Asia (Figs. 121 and 77). For these reasons I consider the subgenus *Balfourianus* synonymous with the nominotypical subgenus. It is important to note that *H. socotrensis* is not the only species of the genus which has the trichobothrium *db* situated between trichobothria *et* and *dt*. The same position of trichobothrium *db* occurs in two South African species, *H. arenaceus* and *H. conspersus* (fig. 45 in Lamoral, 1979: 543 and diagnosis below), which are morphologically very different from *H. socotrensis*. Already noted have been the extremely inflated vesicles, and another difference is in the expression of sexual dimorphism.

Lourenço (2000: 192) erected the subgenus *Deccanobuthus* with the type species *Hottentotta (Deccanobuthus) geffardi* Lourenço, 2000 and characterized the subgenus by:

(1) “**The keels of the carapace are feeble; the anterior median being almost absent**”. This is a gradational, hard-to-evaluate character without much of taxonomic value. I have examined the holotype of *H. (D.) geffardi* Lourenço, 2000 and disagree that the carinae (keels) of the carapace are feeble (Fig. 79).

(2) “**The dentition on the distal part of pedipalpchela movable finger, present four terminal denticles**”. The holotype of *H. (D.) geffardi* has five terminal denticles (granules) on both movable fingers of pedipalps (Fig. 3).

This discrepancy in interpretation is evidently due to the way in which terminal granules have been counted. Some authors considered the presence of the so-called terminal granule (which they called “terminal denticle”) natural and counted only the other granules, which they called simply “granules” (for example Sissom, 1990: 98 and 100). For clarity, I give the total number of granules. However, the noted discrepancy does not change the fact that in *Hottentotta* we can find specimens that have five (four and one) terminal granules, but none that would have only four (three and one – which is characteristic of the genus *Buthus*) terminal granules (see Sissom, 1990: 98 and 100). The variation in the number of granules thus is exclusively upward, when in some species apart from specimens with five granules there are also specimens with six or seven granules (always one basal terminal granule, two internal terminal granules and a row from two to four external terminal granules).

(3) “**Metasomal segment I with 12 keels; II to IV with 10 keels and V with 7 keels**”.

The fifth metasomal segment with seven carinae, of which five are ventral (three median and two lateral), is the usual condition also in other species including e. g. *H. socotrensis*, that is in the so far accepted subgenus *Balfourianus* (Fig. 111). Unfortunately, this character cannot be utilized even on the species level because the ventral carinae are poorly developed in some specimens and the variation in their development cannot be attributed to sexual dimorphism. As to the 12 keels (carinae) on the first metasomal segment, Vachon (1978: 235) wrote of *H. socotrensis*: “According to R. I. Pocock (1903), because of the presence of a paired keel on the upper surface of the segment, the fourth segment bears 12 keels (which is unusual). Its existence could be settled. The keel consists of a row of granulae which may also occur (but less regularly) on the dorsal groove of almost all the segments, including the last one. It seems not to be a true keel.” A similar situation can be seen in the holotype of *H. (D.) geffardi*, where two carinae on the first metasomal segment are incomplete and consist of only a few granules; the same condition is present also in *H. pachyurus* (Pocock, 1897).

Finally it needs to be noted that when proposing *H. (D.) geffardi*, Lourenço accepted that all Indian species of *Hottentotta* belong in *Mesobuthus* and, therefore, did not compare the new species with any of them. Upon examination of his holotype I am convinced that *H. (D.) geffardi* Lourenço, 2000 is a synonym of *H. pachyurus* (Pocock, 1897) (see below). I therefore conclude that the subgenus *Deccanobuthus* is synonymous with the nominotypical subgenus.

Fet & Lowe (2000: 134) considered the generic name *Hottentotta* a masculine noun in apposition. This name was used as a species epithet for *Scorpio* by Fabricius and for *Buthus* or *Buthotus* by most of subsequent authors (except Gervais, 1844, who changed it to *hottentottus*).

List of species-group names in the genus *Hottentotta* Birula, 1908

Hottentotta alticola (Pocock, 1895)

Hottentotta alticola minusalta (Vachon, 1958)

Hottentotta alticola nigrifrons (Pocock, 1900)

Hottentotta arenaceus (Purcell, 1902)

Hottentotta buchariensis (Birula, 1897) **comb. n.**

= *Buthotus alticola kabulensis* (Vachon, 1958) **syn. n.**

Hottentotta conspersus (Thorell, 1876)

= *Buthus conspersus aeratus* Lawrence, 1927 (syn. by Lamoral, 1979).

= *Buthus angolensis* Monard, 1930 (syn. by Vachon & Stockmann, 1968).

Hottentotta finneganæ **sp. n.**

Hottentotta franzwernerii (Birula, 1914)

		<i>H. finneganae</i> sp. n.		<i>H. jabalpurensis</i> sp. n.		<i>H. jalalabadensis</i> sp. n.		<i>H. stockwelli</i> sp. n.	
		male	male	female	male	female	male	female	
		HT	HT	AT	HT	AT	AT	HT	
Total	length	53.8	60	65	87	88	41.2	50	
Carapace	length	5.7	6.6	7.3	9.2	10.7	4.7	6.2	
	width	5.8	6.9	8.5	9.3	11.5	4.7	7.1	
Metasoma									
and telson	length	31.0	36.1	36.6	51.9	53	24.7	31.1	
segment I	length	3.7	4.7	4.5	6.4	6.7	2.8	3.5	
	width	3.9	4.6	4.8	6.7	8.0	3.0	4.1	
segment II	length	4.2	5.4	5.1	7.5	7.7	3.2	4.1	
	width	3.9	4.2	4.5	6.3	7.8	2.9	3.8	
segment III	length	4.6	5.5	5.5	7.8	8.0	3.4	4.3	
	width	3.9	4.1	4.4	5.6	7.1	2.8	3.7	
segment IV	length	5.2	6.3	6.5	9.0	8.9	4.1	5.3	
	width	3.9	3.9	4.1	5.0	6.1	2.7	3.7	
segment V	length	6.5	7.2	7.1	10.6	10.7	5.4	6.7	
	width	3.7	3.9	4.0	5.1	5.5	2.7	3.7	
telson	length	6.5	7.0	7.6	10.1	10.5	5.4	6.9	
Pedipalp									
femur	length	4.7	6.1	6.0	9.6	9.6	4.0	5.2	
	width	1.6	1.9	1.9	2.5	2.8	1.2	1.5	
patella	length	5.9	7.5	7.0	10.9	10.6	4.9	6.4	
	width	2.1	2.6	2.7	3.3	3.7	1.8	2.5	
tibia	length	9.9	12.2	11.9	18.5	17.6	8.5	10.2	
	width	2.5	3.5	2.3	4.1	3.9	2.4	2.3	
finger mov.	length	6.2	7.4	8.0	12.0	12.4	5.2	6.8	
Pectinal teeth		25:26	31:32	26:29	35:35	26:26	25:24	24:24	

Table 1: Measurements (in millimeters) of type specimens of new *Hottentotta* species. Note, “metasoma and telson length” includes intersegment membranes.

= *Buthus (Hottentotta) lutaudi* Pallary, 1924 (syn. by Vachon, 1949).

***Hottentotta gentili* (Pallary, 1924) comb. n.**

= *Hottentotta gentili tazerouallensis* Pallary, 1937 (syn. by Vachon, 1949).

***Hottentotta hottentotta* (Fabricius, 1787)**

Hottentotta hottentotta nigrocarinatus (Simon, 1874)

= *Androctonus margarelon* C. L. Koch, 1838 (syn. by Kraepelin, 1891).

= *Androctonus pandarus* C. L. Koch, 1838 (syn. by Simon, 1885).

= ? *Androctonus panopeus* C. L. Koch, 1839 (syn. by Kraepelin, 1899).

= *Androctonus thessandrus* C. L. Koch, 1840 (syn. by Kraepelin, 1891).

= *Hottentotta caboverdensis* Lourenço & Ythier, 2006 **syn. n.**

***Hottentotta jabalpurensis* sp. n.**

***Hottentotta jalalabadensis* sp. n.**

***Hottentotta jayakari* (Pocock, 1895)**

***Hottentotta judaicus* (Simon, 1872)**

= *Buthus hedenborgii* Thorell, 1876 (syn. by Simon, 1879).

***Hottentotta minax* (L. Koch, 1875)**

Hottentotta minax occidentalis (Vachon & Stockmann, 1968)

= *Buthus isselii* Pavesi, 1883 (*nomen nudum*) (syn. by Pavesi, 1895).

= *Buthus hottentotta tigrinus* Caporiacco, 1937 (syn. by Kovařík, 2003).

= *Hottentotta acostai* Lourenço, 2004 **syn. n.**

***Hottentotta niloticus* (Birula, 1928)**

***Hottentotta pachyurus* (Pocock, 1897)**

= *Hemibuthus kraepelini* Roewer, 1943 (syn. by Kovařík, 1999).

= *Hottentotta (Deccanobuthus) geffardi* Lourenço, 2000 **syn. n.**

***Hottentotta penjabensis* (Birula, 1897) comb. n.**

***Hottentotta polystictus* (Pocock, 1896)**

***Hottentotta rugiscutis* (Pocock, 1897)**

= *Buthus hendersoni* Pocock, 1900 **syn. n.**

= *Buthus rugiscutis nigritus* Pocock, 1900 (syn. by Tikader & Bastawade, 1983).

***Hottentotta salei* (Vachon, 1980) comb. n.**

***Hottentotta sauleyi* (Simon, 1880)**

***Hottentotta scaber* (Ehrenberg, 1828)**

= *Buthus dimidiatus* Simon, 1882 (syn. by Pocock, 1891).

Hottentotta schach (Birula, 1905)

Hottentotta socotrensensis (Pocock, 1889)

Hottentotta stockwelli sp. n.

Hottentotta tamulus (Fabricius, 1798)

= *Buthus tamulus concanensis* Pocock, 1900 **syn. n.**

= *Buthus tamulus indicus* Pocock, 1900 **syn. n.**

= *Buthus tamulus gujaratensis* Pocock, 1900 **syn. n.**

= *Buthus tamulus gangeticus* Pocock, 1900 **syn. n.**

Hottentotta trilineatus (Peters, 1861)

= *Buthus eminii* Pocock, 1890 (syn. by Kraepelin, 1899).

= *Buthus trilineatus fuscatus* Masi, 1912 (syn. by Vachon & Stockmann, 1968).

= *Buthus fuscitruncus* Caporiacco, 1936 (syn. by Kovařík, 2003: 140).

Hottentotta zagrosensis Kovařík, 1997

Hottentotta alticola (Pocock, 1895)

(Figs. 21–22)

Buthus alticola Pocock, 1895: 302; Birula, 1897: 377; Kraepelin, 1899: 21; Pocock, 1900a: 21; Birula, 1905: 136; Kraepelin, 1913: 127; Takashima, 1945: 76; ? Mani, 1959: 11.

Buthus (Hottentotta) alticola: Birula, 1917: 214.

Buthotus alticola: Vachon, 1949: 147 (1952: 233); Serfaty & Vachon, 1950: 215; Alexander, 1957: 531; Vachon, 1958: 129; Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21; Francke & Sissom, 1984: 12; Farzanpay, 1988: 37.

Hottentotta alticola: Fet, 1989: 81; Khatoon, 1999: 211.

Hottentotta (Hottentotta) alticola: Kovařík, 1998: 109; Fet & Lowe, 2000: 134.

Buthus alticola forma alpha (typica): Birula, 1897: 382.

Buthus alticola (typicus): Kraepelin, 1899: 21.

Buthus (Hottentotta) alticola alticola: Birula, 1914: 654; Birula, 1917: 240; Fet & Lowe, 2000: 135.

Buthotus alticola alticola: Vachon, 1958: 135.

Buthotus alticola minusalta Vachon, 1958: 138; Pérez Minocci, 1974: 21; Vachon & Kinzelbach, 1987: 102.

Hottentotta (Hottentotta) alticola minusalta: Kovařík, 1998: 109; Fet & Lowe, 2000: 135.

Buthus nigrifrons Pocock, 1900a: 22; Kraepelin, 1913: 127; Pérez Minocci, 1974: 43.

Buthus (Hottentotta) nigrifrons: Birula, 1914: 654; Birula, 1917: 214, 241.

Buthotus alticola nigrifrons: Vachon, 1958: 134–135.

Hottentotta (Hottentotta) alticola nigrifrons: Kovařík, 1998: 109; Fet & Lowe, 2000: 136.

Hottentotta alticola nigrifrons: Capes & Fet, 2001: 303.

TYPE LOCALITY AND TYPE REPOSITORY. Chitrāl, now Pakistan; BMNH.

MATERIAL EXAMINED. **Pakistan**, Chitrāl, VI.2006, 1♂ (Figs. 21–22), leg. Zubair Ahmed, FKCP; Kalash

valleys, Bumburet valley, Brun vill., 5.VIII.1998, 1♂1♀, leg. L. Černý, FKCP.

DIAGNOSIS. Total length 70–90 mm. For habitus see Figs. 21–22. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to black, reticulate. Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 28–29 in males, 24–26 in females. Pedipalps and metasoma sparsely hirsute. The hairs on patella of pedipalps are long. Carapace and mesosoma black except seventh tergite that may be black. First to third metasomal segments brown, first usually lighter than third, fifth segment and telson entirely black. Pedipalps yellow to brown, chela usually slightly darker than femur. Legs yellow, rarely yellowish brown. Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14–16 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second and third segments with 8 or 10 carinae; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal carinae on metasomal segments bear larger terminal granules. Spaces between carinae of metasomal segments on ventral and lateral surfaces rugate and usually granulate. Dorsal surface smooth, but metasomal segments usually bear 2 short, inconspicuous carinae (see fig. 19 in Vachon, 1958: 137). First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.1.

COMMENTS. Unfortunately, I have not been able to see any specimens of *H. alticola minusalta* (Vachon, 1958) (type locality and type repository: Afghanistan, Herat, Lashkari-Bazar, Dilaram; MNHN), because MNHN would not lend types (see Kovařík, 2004: 27) and no other specimens are known. Therefore, data in the diagnosis and key below describe only examined specimens of *H. alticola alticola* from Pakistan. It is possible that a future examination of types of *H. alticola minusalta* reveals this taxon to be a separate species, not just a subspecies. The black telson links this taxon with *H. alticola alticola* and at the same time differentiates it from all other taxa of the *H. alticola* complex, which are here elevated to species.

Regrettably, I have not been able to see any specimens of *H. alticola nigrifrons* (Pocock, 1900) (type locality and type repository: Pakistan, Northern Baluchistan; BMNH), because its types cannot be found and no other specimens are known. Therefore, the data in the diagnosis and key below describe only examined specimens of *H. alticola alticola* from Pakistan. It is possible that a future examination of types of *H. alticola*



Figure 21: *Hottentotta alticola*, dorsal view, male from Pakistan, Chitrāl, FKCP.



Figure 22: *Hottentotta alticola*, ventral view, male from Pakistan, Chitrāl, FKCP.

nigrifrons reveals this taxon to be a separate species or a synonym of *H. penjabensis* (Birula, 1897) comb. n. *Buthus nigrifrons* was based on a 58 mm long female (Pocock, 1900a: 22–23) and Pocock distinguished it from *H. alticola alticola* by color (see Pocock, 1900a: 15).

DISTRIBUTION: Afghanistan (see Vachon, 1958: 138 for *H. alticola minusalta*), Pakistan (see Pocock, 1895: 302 for *H. alticola alticola* and Pocock, 1900a: 23 for *H. alticola nigrifrons*). Some records from Afghanistan, Iran and Pakistan should be understood only as referring to *H. alticola* complex. The one record for India (Mani, 1959: 11) must be considered incorrect.

Hottentotta arenaceus (Purcell, 1902)

Buthus arenaceus Purcell, 1902: 137; Kraepelin, 1914: 109; Hewitt, 1918: 104; Lawrence, 1927: 71; Lawrence, 1955: 225; Lawrence, 1972: 8.

Buthotus arenaceus: Vachon & Stockmann, 1968: 97; Lamoral & Reynders, 1975: 500; Lamoral, 1979: 541.

Hottentotta (Hottentotta) arenaceus: Kovařík, 1998: 110.

Hottentotta arenaceus: Fet & Lowe, 2000: 136; Leeming, 2003: 48; Prendini, 2005: 66.

TYPE LOCALITY AND TYPE REPOSITORY. RSA, between Henkries and Wolftoon, Little Bushmanland, Namaqualand; SAMC.

DIAGNOSIS. Total length 32 mm (male) to 43 mm (female). Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *dt*, close to or on level with *et*. Sexual dimorphism not readily apparent, width of pedipalp chela same in both sexes. Pectinal teeth number 21–24 in males, 16–19 in females. Entire body only very sparsely hirsute, especially metasomal segments. Color yellow to yellowish brown. Carinae on mesosoma and metasoma may be black. Chelicerae yellow, without reticulation, only tips of teeth on fingers of chelicerae are black. Femur of pedipalp with five carinae, patella with eight carinae. Chela very narrow and with dorsal carinae incomplete. Seventh metasomal segment with 4 well defined ventral carinae. First to fourth metasomal segments with 10 carinae. Fifth metasomal segment with 5 carinae. First metasomal segment width to length ratio 0.95–1.05 in males, 1.03–1.14 in females. Telson extremely bulbous.

COMMENTS. I have not been able to examine any specimens of this species. The above diagnosis is primarily after Lamoral (1979: 541–548), who adequately defined it. In contrast to Asian species, south African species of *Hottentotta* do not present taxonomic problems. This species can be confused only with *H.*

conspersus, which may be regarded as its sister species. Both species are very well characterized by the telson, which is extremely bulbous. *H. arenaceus* is smaller than *H. conspersus*, reaching at most 43 mm; a male only 32 mm long (see Lamoral, 1979: 541) is together with males of *H. rugiscutis* from India, of which the smallest in my collection (FKCP) measures 30 mm, the smallest adult specimen recorded for the genus.

DISTRIBUTION: Namibia (Kraepelin, 1914: 109), South Africa (Purcell, 1902: 139).

Hottentotta buchariensis (Birula, 1897) **comb. n.**
(Figs. 5, 23–25)

Buthus alticola buchariensis Birula, 1897: 378; Kraepelin, 1899: 21; Birula, 1904: 30.

Buthus alticola forma gamma (*buchariensis*): Birula, 1897: 382.

Buthus (Hottentotta) alticola buchariensis: Birula, 1914: 654; Birula, 1917: 240.

Hottentotta alticola buchariensis: Fet, 1989: 82.

Buthotus alticola buchariensis: Vachon, 1958: 134.

Buthotus buchariensis: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21.

Hottentotta (Hottentotta) alticola buchariensis: Kovařík, 1998: 109; Fet & Lowe, 2000: 135.

= *Buthotus alticola kabulensis* Vachon, 1958: 136; Pérez Minocci, 1974: 21; Vachon & Kinzelbach, 1987: 102.

Syn. n.

Hottentotta (Hottentotta) alticola kabulensis: Kovařík, 1998: 109; Fet & Lowe, 2000: 135.

Hottentotta alticola: Kovařík, 1993: 201 (in part); Kovařík, 2002: 7.

TYPE LOCALITY AND TYPE REPOSITORY. Regar (now Tursunzoda), Tajikistan; ZISP.

TYPE MATERIAL EXAMINED. **Tajikistan** [formerly Buchara], Dushanbe region, Regar (now Tursunzoda), 1887, 1♂ (lectotype hereby designated, Fig. 25), leg. Lidski, ZISP No. 210.

OTHER MATERIAL EXAMINED. **Afghanistan**, Kabul, 1962, 1♂(im.), FKCP; prov. Kabul, Poli Charky, 1♂1♀, FKCP, 1♂1♀(Figs. 5, 23–24), MMBC, 25.XI.1966, leg. Šimek; Kabul, 1800 m., collected at night around houses and garages, VII–IX.1977, 4♂2♀2juvs., collector unknown, CASC; Kabul, VIII.1987, 1♂, leg. Turtervaldová, FKCP. **Pakistan**, 1 mi E Saidu Sharif, Swat State, 8.III.1959, 2juvs., leg. S. Minton, CASC.

DIAGNOSIS. Total length 65–90 mm. For habitus see Figs. 23–25 and fig. 10 in Vachon (1959: 130). Trichobothrium *db* on the fixed finger of pedipalp



Figure 23: *Hottentotta buchariensis*, dorsal view, male from Afghanistan, prov. Kabul, Poli Charky, FKCP.



Figure 24: *Hottentotta buchariensis*, dorsal view, female from Afghanistan, prov. Kabul, Poli Charky, FKCP.

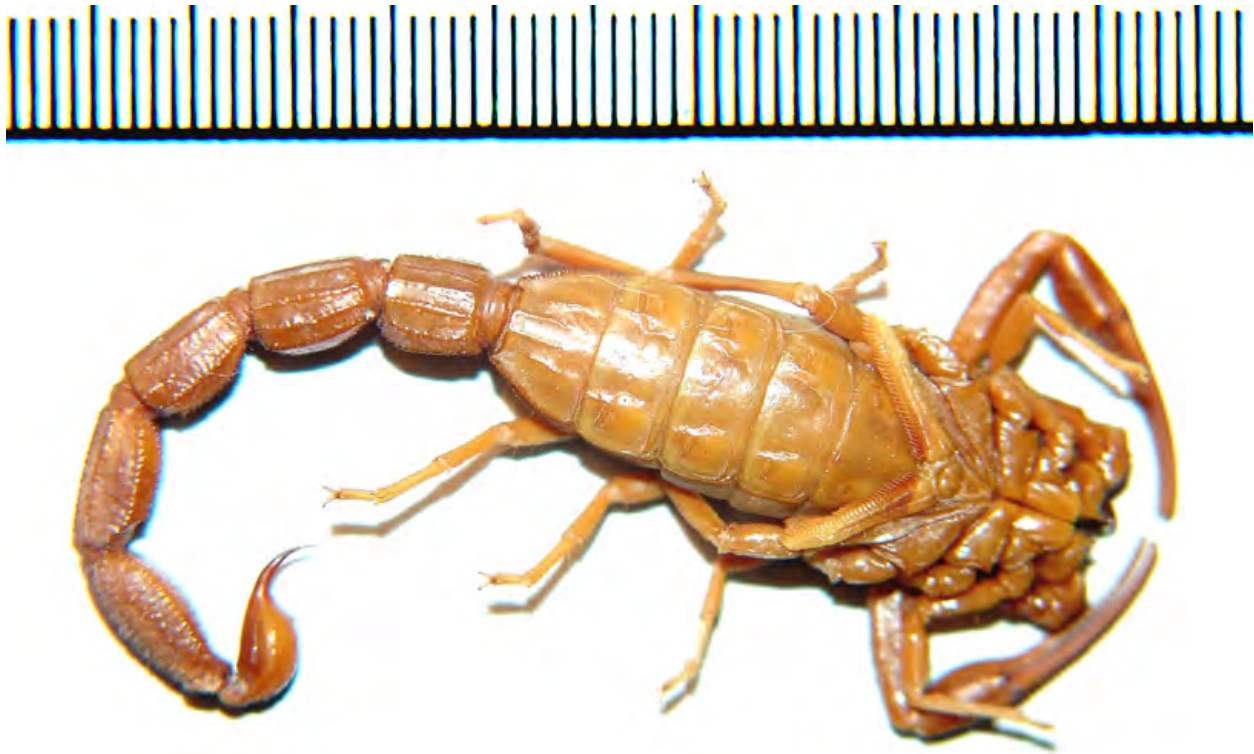


Figure 25: *Hottentotta buchariensis*, ventral view, male lectotype.

situated between *trichobothria et* and *est* (Fig. 1). Chelicerae yellow to black, reticulate. Male with longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 29–33 in males, 24–27 in females. Pedipalps and metasoma very sparsely hirsute. Carapace and mesosoma black except seventh tergite that is yellow to brown. Metasoma, legs and pedipalps yellow to yellowish red. Fingers of pedipalps in adults darker than chela. Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14–16 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. First metasomal segment with 10 carinae; second and third segments with 8 or 10 carinae; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal carinae of metasomal segments bear larger terminal granules. Spaces between carinae of metasomal segments on ventral and lateral surfaces usually smooth, without granules (except ventral surface of fifth metasomal segment). Dorsal surfaces of first through fourth metasomal segments smooth, without granules (see fig. 20 in Vachon, 1958: 137). First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. The lectotype is being designated in order to stabilize the nomenclature. It was photographed by Alexander Koval (see Fig. 25), and I have compared his photos and remarks with other cited specimens. Unfortunately, I have not been able to see the type of *Buthotus alticola kabulensis* Vachon, 1958 (type locality and type repository: Afghanistan, Kabul; MNHN) because MNHN would not lend types (see Kovářk, 2004: 27). However, examination of other specimens from the type locality and their comparison with the characters published by Vachon (1959: 136) and Birula (1897: 378) lead me to the conclusion that *Buthotus alticola kabulensis* Vachon, 1958 is a synonym of *H. buchariensis* (Birula, 1897) **comb. n.** The characters of this species are very similar to those of *H. penjabensis* (Birula, 1897) from Pakistan, in which, however, the metasomal and pedipalp segments of both sexes are markedly longer and narrower.

DISTRIBUTION: Afghanistan (Vachon, 1958: 136), Tajikistan (Birula, 1897: 381), Pakistan (first report).

Hottentotta conspersus (Thorell, 1876)
(Figs. 6, 26–29)

Buthus conspersus Thorell, 1876: 115; Kraepelin, 1895: 81; Pavesi, 1895b: 38; Pavesi, 1897: 156; Kraepelin, 1905: 195; Hewitt, 1918: 103; Lawrence, 1955: 225.



Figure 26: *Hottentotta conspersus*, dorsal view, male from Angola, Naulila env., FKCP.



Figure 27: *Hottentotta conspersus*, ventral view, male from Angola, Naulila env., FKCP.



Figure 28: *Hottentotta conspersus*, dorsal view, female from Angola, Naulila env., FKCP.



Figure 29: *Hottentotta conspersus*, ventral view, female from Angola, Naulila env., FKCP.

Buthotus conspersus: Vachon & Stockmann, 1968: 96; Lamoral & Reynders, 1975: 500; Lamoral, 1979: 549; Newlands, 1987: 38; El-Hennawy, 1992: 115.

Hottentotta conspersa: Sissom, 1990: 90; Kovařík, 2001b: 79; Kovařík, 2002: 7.

Hottentotta conspersus: Kovařík, 1998: 110; Fet & Lowe, 2000: 136; Prendini, 2000: 110; Leeming, 2003: 47; Prendini, 2005: 66.

Buthus trilineatus: Kraepelin, 1899: 21 (in part).

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

= *Buthus conspersus aeratus* Lawrence, 1927: 69; Lawrence, 1928: 269 (syn. by Lamoral, 1979: 549).

Buthus aeratus: Lawrence, 1955: 207, 225; Lawrence, 1959: 384; Lawrence, 1962: 220; Lawrence, 1972: 8.

Buthotus aeratus: Vachon & Stockmann, 1968: 94; Lamoral & Reynders, 1975: 500.

= *Buthus angolensis* Monard, 1930: 38; Monard, 1937: 253 (syn. by Vachon & Stockmann 1968: 94).

Buthotus angolensis: Vachon, 1949: 147 (1952: 233).

TYPE LOCALITY AND TYPE REPOSITORY. Caffraria; NRHS.

MATERIAL EXAMINED. **Angola**, Naulila env., 1985, 1♂1♀ (Figs. 6, 26–29), leg. J. Cimrman, FKCP. **Namibia**, 1938, 2♀ 1im., leg. G. Boss, SMFD No. 5393; Farm Okatji Komu, 2♀, 27.X.1952, SMFD; 1juv., 1956, leg. F. Gardes, SMFD; near Sesfontein, Kaoko, 2♀, IX.1965, FKCP, 24.I.2002, 1♀, leg. Werner, FKCP; 28 mi. N Outjo, 1200 m., 22.XII.1966, 1♀, leg. E. S. Ross & A. R. Stephen, CASC; Namib desert, Garob Mine, 750 m., 10.X.1967, 1♀ (im.), leg. E. S. Ross & A. R. Stephen, CASC; Farm Glucksburg 152 nr. Outjo, 23.IV.1980, 1♀, leg. A. Harington, CASC; 13 mi. SE Welwitschia, 800 m., 22.XII.1966, 1♂1♀, leg. E. S. Ross & A. R. Stephen, CASC.

DIAGNOSIS. Total length 40–65 mm. For habitus see Figs. 26–29. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *dt*, close to or on level with *et*. Sexual dimorphism not readily apparent, width of pedipalp chela same in both sexes. Pectinal teeth number 19–28 in males, 13–20 in females. Entire body only very sparsely hirsute, especially metasomal segments. Color yellow to yellowish brown. Carapace and carinae on mesosoma and metasoma may be black. As blackish may be the fifth metasomal segment and telson. Chelicerae yellow without reticulation, only tips of teeth on fingers of chelicerae are black. Femur of pedipalps with five carinae, patella with eight carinae. Dorsal surfaces of femur and patella usually granulated. Chela very narrow and with dorsal carinae incomplete. Movable fingers of pedipalps with 11–14 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well defined ventral carinae. Mesosoma and carapace granulated. First to

fourth metasomal segments with 10 carinae. Fifth metasomal segment with 5 carinae and two ventral rows of granules. Metasoma densely granulated between carinae. First metasomal segment width to length ratio 1.22–1.42 in males, 1.28–1.47 in females. Telson granulated and extremely bulbous.

DISTRIBUTION: Angola (Monard, 1930: 38), Namibia (Lawrence, 1927: 69). Reports from South Africa (Thorell, 1876: 118; Vachon & Stockmann, 1968: 94) are regarded as dubious, and definitely erroneous are also reports from Somalia (Pavesi, 1895b: 38; Pavesi, 1897: 156). Specimens from Somalia were most likely confused with *H. polystictus*, which has a telson usually more inflated than *Hottentotta* but smaller than *H. conspersus* and *H. arenaceus*. The latter species has been erroneously reported from South Africa.

Hottentotta finneganae sp. n.

(Figs. 30–31, 130–135, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **Pakistan**, 15 km north of Rawalpindi; FKCP.

TYPE MATERIAL. **Pakistan**, 15 km north of Rawalpindi, 1962, 1♂ (holotype, Figs. 30–31) 1im. (paratype), collector unknown, FKCP.

ETYMOLOGY. Named after Dr. Susan Finnegan who described the scorpion genus *Apistobuthus* in 1932.

DIAGNOSIS. Total length 54 mm. For habitus see Figs. 30–31. Trichobothrium *db* on the fixed finger of pedipalp situated on level with trichobothrium *est*. Male with fingers proximally slightly twisted, manus wider than female. Pectinal teeth number 25–26. Chelicerae yellow to yellowish brown, with reticulate only in anterior part. Entire body only sparsely hirsute. The hairs on pedipalps and metasoma are long. Color uniformly yellow to yellowish brown. Metasomal carinae may be black. Femur of pedipalp with 5 carinae. Patella with 8 carinae, of which some are indistinct. Dorsal surfaces of femur and all patella granulated. Chela lacks carinae. Movable fingers of pedipalps with 12 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. Dorsal surfaces of mesosoma and carapace granulated (granules are smaller than the spaces between them). First to fourth metasomal segments with 10 carinae; fifth segment with 5 carinae. Metasoma granulated between carinae except dorsal surface, which is sparsely granulated, usually smooth at center and often bears 2 short, inconspicuous carinae. Telson also granulated. Dorsal carinae of metasomal segments bear slightly larger terminal granules. First metasomal segment of adults wider than long, but



Figure 30: *Hottentotta finneganae*, sp. nov., dorsal view, male holotype.



Figure 31: *Hottentotta finneganae*, sp. nov., ventral view, male holotype.

second and third metasomal segment longer than wide. Second to fourth metasomal segment width ratio is less than 1.1. Length to width ratio of fourth metasomal segment less than 1.4.

DESCRIPTION: Total length 53.8 mm (male holotype). The habitus is shown in Figs. 30–31. Measurements of the carapace, telson, segments of the metasoma and of the pedipalps, and numbers of pectinal teeth in the holotype and allotype are given in Table 1. Trichobothrium *db* on the the fixed finger of pedipalp is situated on level with trichobothrium *est*. Pectinal teeth number 25–26. Chelicerae are yellow to yellowish brown, with reticulation only in anterior part. The male has fingers proximally slightly twisted. Although I have not seen a female, morphological similarity with other species leads me to assume that its manus is narrower than in the male.

COLORATION: The color is uniformly yellow to yellowish brown. Mesosomal segments and carapace usually bear orange spots and longitudinal black stripes. Metasomal carinae may be black as well.

MESOSOMA AND CARAPACE: The mesosoma has three carinae on the dorsal surface and two carinae on the ventral surface with the exception of the seventh segment, whose ventral surface bears four well marked carinae. The dorsal surface is granulated (granules are smaller than the spaces between them), whereas the ventral surface is smooth.

PEDIPALPS: The pedipalps are hirsute, but not densely. The hairs are long. The femur of pedipalp has five carinae and the dorsal surface is covered by granules. The patella is granulated and bears eight carinae, of which some are indistinct. Chela lacks carinae. The movable fingers of pedipalps bear 12 rows of granules and 5 terminal granules.

METASOMA AND TELSON: The first metasomal segment is wider than long, whereas the second and third segments are longer than wide. The first to fourth segments bear 10 carinae, and the fifth segment bears only five carinae. The surface between the carinae is granulated but dorsal granulation is diminished to absent in the center which often bears two short, inconspicuous carinae. The telson is also granulated. The dorsal carinae of metasomal segments bear slightly larger terminal granules. The second through fourth segment width ratio is less than 1.1. Length to width ratio of the fourth metasomal segment is less than 1.4.

AFFINITIES. The described features distinguish *H. finneganae* **sp. n.** from all other species of the genus. They are recounted in the key below. *H. finneganae* **sp.**

n. is closest to *H. stockwelli* **sp. n.** from India. Differences between these two species are discussed under *H. stockwelli* **sp. n.**

Hottentotta franzweneri (Birula, 1914)
(Figs. 7, 32–36)

- Buthus (Hottentotta) franzweneri* Birula, 1914: 636; Werner, 1929: 33; Werner, 1932: 305.
Dasyscorpio franzweneri: Pallary, 1938: 279.
Buthotus franzweneri franzweneri: Vachon, 1949: 151 (1952: 237); Pérez Minocci, 1974: 21.
Hottentotta (Hottentotta) franzweneri franzweneri: Fet & Lowe, 2000: 138.
Hottentotta franzweneri franzweneri: Kovařík, 2002: 7; Lourenço, 2003: 876.
Buthus (Buthus) franzweneri: Roewer, 1943: 206.
Hottentotta franzweneri: Pallary, 1925: 57; Lourenço & Cloudsley-Thompson, 1996: 450; Dupré, Lambert & Gérard, 1998: 61.
Buthotus franzweneri: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21; Vial & Vial, 1974: 139; Cloudsley-Thompson, 1986: 185; El-Hennawy, 1992: 115; Goyfon, 1993: 243.
Hottentotta (Hottentotta) franzweneri: Kovařík, 1998: 110; Fet & Lowe, 2000: 137.
= *Buthus (Hottentotta) lutaudi* Pallary, 1924: 220 (syn. by Vachon, 1949: 151).
Buthus (Hottentotta) lutaudi: Werner, 1932: 305.
Dasyscorpio lutaudi: Pallary, 1938: 279.

TYPE LOCALITY AND TYPE REPOSITORY. Algeria, Beni Ounif de Figuig; NHMW.

TYPE MATERIAL EXAMINED. **Algeria**, Beni Ounif de Figuig, VIII.1910, leg. F. Werner, 1♂ (lectotype hereby designated, Figs. 7, 32–33, 36) 1♀ (paralectotype, Figs. 34–36), NHMW No. 2454, 1♂(im.)1♀1juv. (paralectotypes), NHMW No. 2455; Colomb Bechar, 1911, leg. A. Weidholz, 1♂ (paralectotype), NHMW No. 2456.

OTHER MATERIAL EXAMINED. **Algeria**, Beni Ounif de Figuig, VIII.1910, 1im., leg. F. Werner, SMFD No. 5128; Ouahran env., 1980, 1♀, FKCP. **Morocco**, Figuig, 32°06'11"N 01°13'21"W, 868 m., 6.V.2007, 1♀, leg. M. Velechovský and A. Funk, FKCP.

DIAGNOSIS. Total length 70–110 mm. For habitus see Figs. 32–36. Trichobothrium *db* on the fixed finger of pedipalp located between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to black, with reticulation. Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 32–38 in males, 26–32 in females. Nearly

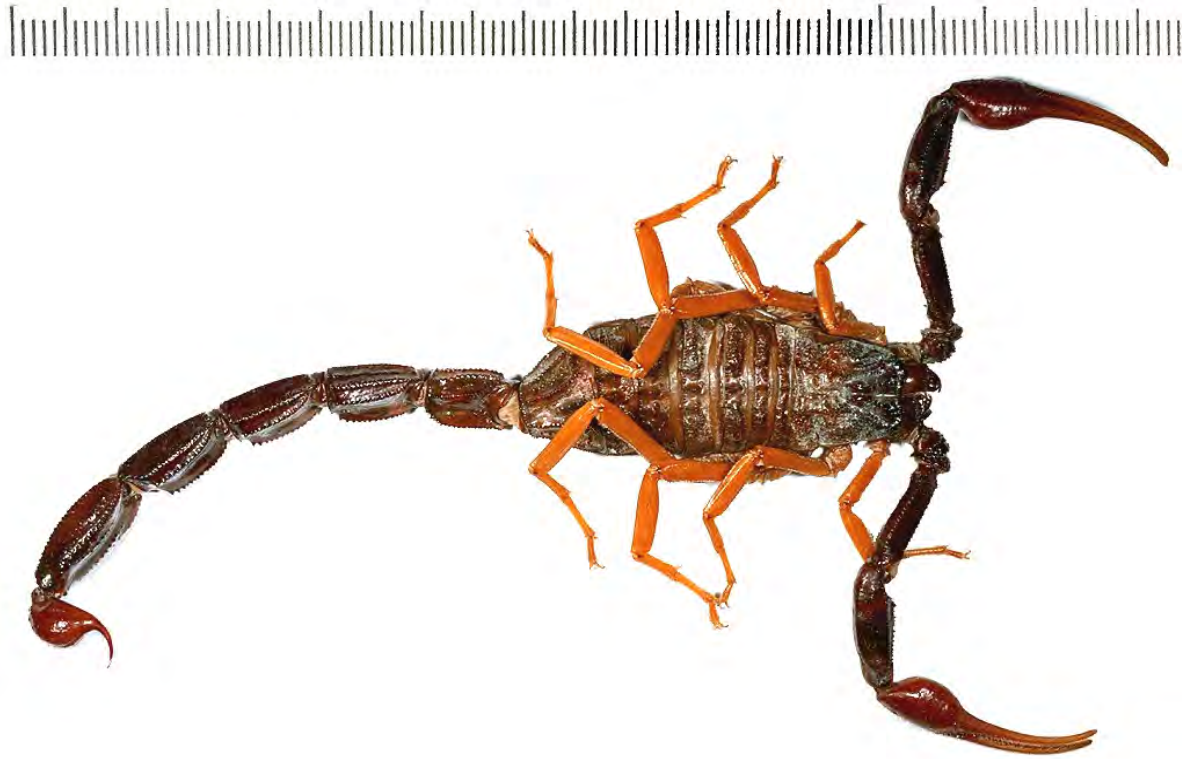


Figure 32: *Hottentotta franzwernerii*, dorsal view, male lectotype.



Figure 33: *Hottentotta franzwernerii*, ventral view, male lectotype.

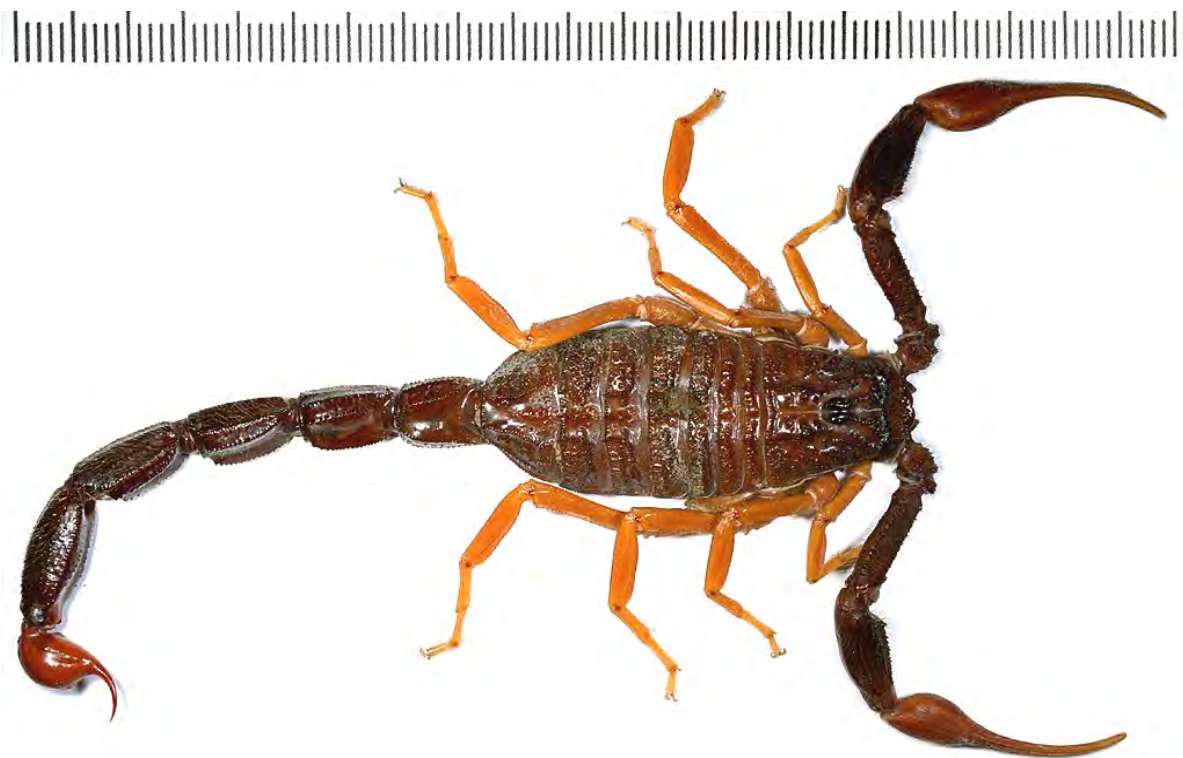


Figure 34: *Hottentotta franzweneri*, dorsal view, female paralectotype.

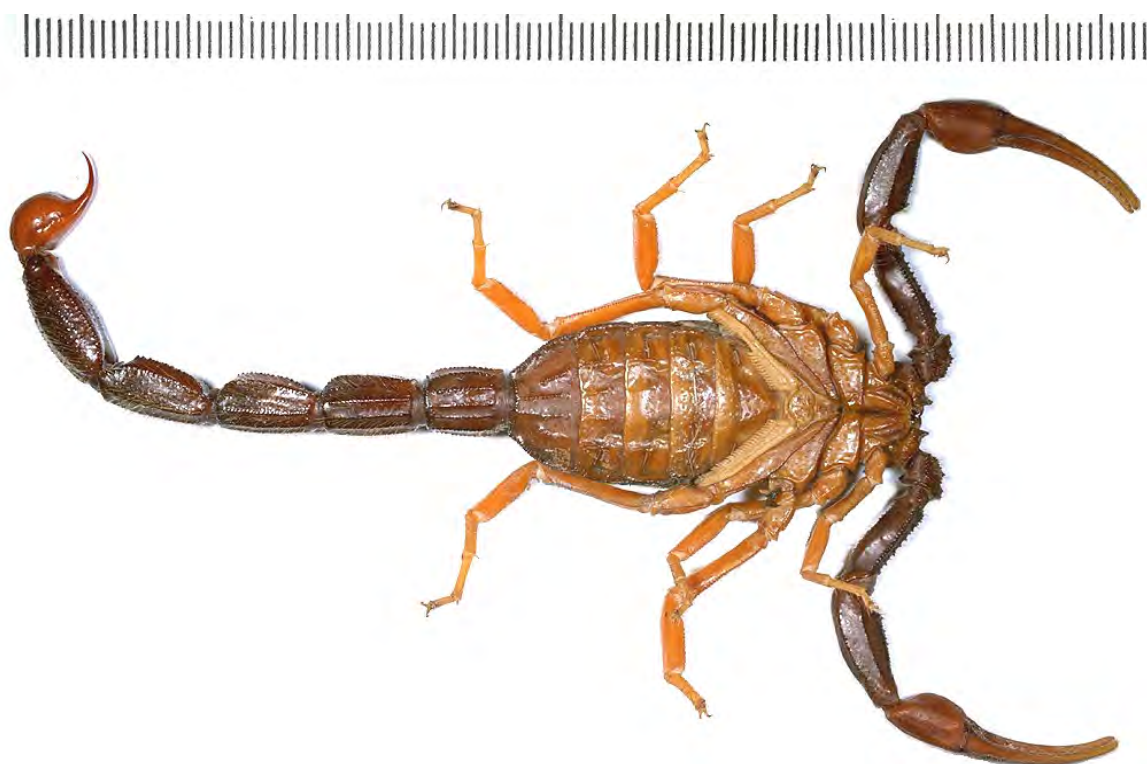


Figure 35: *Hottentotta franzweneri*, ventral view, female paralectotype.



Figure 36: *Hottentotta franzwernerii*, lateral view of metasoma, male lectotype (top) and female paralectotype (bottom).

entire body hirsute, pedipalps, legs, lateral and ventral surfaces of metasomal segments usually densely hirsute. Vesicle sparsely hirsute. Adult males usually only sparsely hirsute (Fig. 36). Color black except reddish brown chela of pedipalps and telson and yellow legs and tips of fingers of pedipalps. Femur of pedipalps with 5 carinae. Surfaces of femur and patella smooth to glossy. Patella with 8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 14–15 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. First metasomal segments with 10 carinae; second segment with 8 carinae and lateral median short row of granules; third and fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal surface smooth, fifth segment bears 2 short, inconspicuous carinae. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. The lectotype is being designated in order to stabilize the nomenclature.

DISTRIBUTION: Algeria (Birula, 1914: 646), Morocco (Pérez Minocci, 1974: 21).

***Hottentotta gentili* (Pallary, 1924) comb. n.**
(Figs. 8, 37–39)

Buthus gentili Pallary, 1924: 219.

Hottentotta gentili: Pallary, 1925: 57; Pallary, 1937: 100; Sergent, 1943: 84.

Buthus (Hottentotta) gentili: Werner, 1932: 305.

Buthotus franzwernerii gentili: Vachon, 1949: 152 (1952: 238); Vachon, 1954: 187; Pérez Minocci, 1974: 21; El-Hennawy, 1992: 116; Kovařík, 1992: 183; Dupre, 1995: 3; Kovařík, 1997a: 43; Dupre & Balliet, 1997: 5.

= *Hottentotta gentili tazerouallensis* Pallary, 1937: 101 (syn. by Vachon, 1949: 152).

Buthotus gentili tazeroualtensis: Pérez Minocci, 1974: 21.

Dasyscorpio gentili: Pallary, 1938: 279.

Hottentotta (Hottentotta) franzwernerii gentili: Kovařík, 1998: 110; Fet & Lowe, 2000: 138.

Hottentotta franzwernerii gentili: Kovařík, 2002: 7; Lourenço, 2003: 876.

TYPE LOCALITY AND TYPE REPOSITORY. Morocco, Grand Atlas entre Mogador et Bou Denib; MNHN.

MATERIAL EXAMINED. **Algeria**, Oran, 1♀, SMFD No. 6668/75. **Morocco**, 3♂3♀juvs., NMPC; Anti Atlas,



Figure 37: *Hottentotta gentili*, dorsal view, male from Morocco, prov. Tiznit, 25 km SE of Tiznit, 29°37'30"N 09°30'18"W, FKCP.

Anezi, 1♀(im.), 18.IV.1968, leg. P. Teisig, SMFD; 2juvs., det. 1988, FKCP; 2♀(Fig. 38), 10.V.1991, leg. V. Šípál, FKCP; Irhem, 1♂1im.1juv., 20.IV.1990, leg. S. Bečvář, FKCP; Tata, 1juv., 22.IV.1990, leg. S. Bečvář, FKCP; Tata, 1♀(im.), 22.IV.1990, leg. S. Bečvář, NMPC; Tizi-n-test, 1♀, 1.V.1990, leg. M. Král, FKCP; 1♀, VII.1990, 1♀, 10.V.1991, 1im., det. 1992, FKCP; Tenerhir, Gorges du Todre, 1♀, 14.V.1992, leg. A. Olexa, FKCP; 1♀, 1993, FKCP; Bouizakame, Timoulye, 9.IV.1995, 1♀(Figs. 8 and 39), leg. M. Snížek, FKCP; Tata, 1♂1juv., 10.IV.1995, leg. M. Snížek, FKCP; Anti Atlas, Ighrem, 1706 m., 1im.5juvs., 12.IV.1995, leg. M. Snížek, FKCP; Zagora, Jbel Amergou mer., Oued bou Tious, 1♀, 15.IV.1995, leg. M. Snížek, FKCP; Akka, Tisgui-El-Haratine, 1♂, 10.IV.1995, leg. M. Snížek, FKCP; Jbel Amergou, 1juv., 15.IV.1995, leg. M. Šárovec, FKCP; Erfoud, 1juv., 16.V.1995, leg. I. Šklíba, FKCP; Al-Rachidia, lake Barrage, Hasan-Adakhil, 1♂(im.), 24.IV.1995, FKCP; Haut Atlas, 1juv., 1997, FKCP; Quazazate, 1998, 1♀, FKCP; Tarfrount env., I. 2005, 1♀, leg. R.+H. Fouquè & S. Bečvář, FKCP; Tiznit prov., 25 km SE of Tiznit, 29°37'30"N 09°30'18"W, 10.II.2005, WGS84, 1♂(Fig. 37)2ims.(♂♀), leg. R.+H. Fouquè & S. Bečvář, FKCP; Haut Atlas mts., Agadir, 2 km S of Azazoul, 30°33.0'N 09°43.4'W, 86 m, 6.V.2007, 2ims.2juvs., leg. F. Kovařík, FKCP; Haut Atlas mts., Tizi-n-Test, 30°50.1'N, 08°22.6'W, 1521 m, 7.V.2007, 1im.1juv., leg. F. Kovařík, FKCP; Haut Atlas mts., Tizi-n-Test, 30°48.0'N 08°24.4'W, 1170 m, 8.V.2007, 1juv., leg. F. Kovařík, FKCP; Anti Atlas mts., Tezenakht env.,

30°41.2'N 07°16.3'W, 1593 m, 10.V.2007, 2♂7♀6ims.3juvs., leg. F. Kovařík, FKCP; Anti Atlas mts., NW of Anezi, 29°45.6'N 09°22.2'W, 399 m, 15.–16.V.2007, 2♀, leg. F. Kovařík, FKCP; Anti Atlas mts., NW of Anezi, 29°42.2'N 09°23.5'W, 246 m, 15.–16.V.2007, 1♀6ims.5juvs., leg. F. Kovařík, FKCP; Anti Atlas mts., 62 km SE of Agadir, 30°03.35'N, 09°04.4'W, 798 m, 16.V.2007, 1♀, leg. F. Kovařík, FKCP.

DIAGNOSIS. Total length 70–110 mm, males usually smaller than females. For habitus see Figs. 38–39. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae black or yellow, reticulate. Sexual dimorphism not pronounced, width of pedipalp chela same in both sexes. Pectinal teeth number 32–35 in males, 26–31 in females. Nearly entire body hirsute, pedipalps, legs, lateral and ventral surfaces of metasomal segments usually densely hirsute. Vesicle sparsely hirsute. Adult males usually only sparsely hirsute. Color black except reddish brown chela of pedipalp and telson. Femur of pedipalp with 5 carinae. Surfaces of femur and patella smooth to glossy. Patella with 8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 14–16 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. First metasomal segment with 10 carinae; second segment with 8 carinae and a short row of granules in center of lateral part; third and fourth segments with 8 carinae; fifth segment with 5 carinae, 3



Figure 38: *Hottentotta gentili*, dorsal view, female from Morocco, FKCP.



Figure 39: *Hottentotta gentili*, ventral view, female from Morocco, Bouizakame, Timoulye, FKCP.

ventral (1 median, 2 lateral) and 2 dorsal. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. Since 1949, this species has been regarded as a subspecies of *Hottentotta franzwernerii* (Birula, 1914). However, the two species are easily separated on color of the legs, which are black in *H. gentili* and yellow in *H. franzwernerii*.

DISTRIBUTION: Algeria (Vachon, 1949: 152), Morocco (Pallary, 1924: 220).

Hottentotta hottentotta (Fabricius, 1787)

(Figs. 9–10, 40–47)

Scorpio hottentotta Fabricius, 1787: 348; Fabricius, 1793: 435; Zimsen, 1964: 637.

Scorpio (Androctonus) hottentottus: Gervais, 1844b: 47.

Prionurus hottentotta: Karsch, 1881: 89.

Buthus (Prionurus) hottentotta: Karsch, 1885: 134.

Buthus hottentotta: Pavesi, 1881: 556; Thorell, 1893: 362 (in part); Pavesi, 1897: 156; Kraepelin, 1891: 185 (in part); Pocock, 1889: 336; Kraepelin, 1898: 3; Kraepelin, 1899: 22; Pocock, 1899: 834; Werner, 1902: 597; Birula, 1908: 143; Kraepelin, 1913: 170; Lampe, 1918: 191; Kraepelin, 1929: 87; Belfield, 1956: 44.

Buthus hottentota: Simon, 1885: 386; Kraepelin, 1901: 266; Borelli, 1911: 8; Borelli, 1913: 218; Monard, 1939: 83; Geeraerts, 1953: 1066.

Buthus (Buthus) hottentotta: Pocock, 1890a: 126.

Buthus (Hottentotta) hottentotta: Birula, 1908: 141; Werner, 1934: 269; Werner, 1936: 174; Vachon, 1940a: 170; Frade, 1947: 8.

Buthotus hottentotta: Vachon, 1949: 147 (1952: 233); Vachon, 1961: 31; Vachon & Stockmann, 1968: 110; Lamoral & Reynders, 1975: 501; Levy & Amitai, 1980: 53; Prost, 1982: 6; Cloudsley-Thompson, 1986: 185; El-Hennawy, 1992: 116.

Hottentotta hottentotta: Hadley, 1990: 327; Hjelle, 1990: 10; Dupre, 1990: 8; Warburg & Polis, 1990: 229; Lourenço & Cuellar, 1994: 22; Dupre & Balliet, 1997: 5; Maury, 1997: 5; Schmidt & Bauer, 1997: 1; Dupré, Lambert & Gérard, 1998: 52; Lourenço & Cuellar, 1999: 149; Delfosse, 2001: 26; Kovařík, 2002: 7; Bultel, 2003: 31; Toscano-Gadea, 2005: 866; Lourenço & Ythier, 2006: 71.

Hottentotta (Hottentotta) hottentotta: Kovařík, 1998: 110; Fet & Lowe, 2000: 139.

Buthus (Hottentotta) hottentotta hottentotta: Roewer, 1943: 207 (? in part).

Buthus hottentota hottentota: Monard, 1951: 237.

Hottentotta (Hottentotta) hottentotta hottentotta: Fet & Lowe, 2000: 139.

= *Androctonus margarelon* C. L. Koch, 1838a: 47, fig. 367; C. L. Koch, 1850: 89 (syn. by Kraepelin, 1891: 185).

= *Androctonus pandarus* C. L. Koch, 1838b: 94, fig. 402; C. L. Koch, 1850: 90 (syn. by Simon, 1885: 386).

= ? *Androctonus panopeus* C. L. Koch, 1839: 125, fig. 418; C. L. Koch, 1850: 90 (syn. by Kraepelin, 1899: 22).

= *Androctonus thessandrus* C. L. Koch, 1840: 77, fig. 486; C. L. Koch, 1850: 90 (syn. by Kraepelin, 1891: 185).

Buthus nigro-carinatus Simon, 1874: 280.

Buthus nigrocarinatus: Simon, 1885: 386.

Buthotus hottentotta nigrocarinatus: Vachon & Stockmann, 1968: 115.

Buthotus hottentota nigrocarinatus: Lamoral & Reynders, 1975: 502.

Hottentotta (Hottentotta) hottentotta nigrocarinatus: Kovařík, 1998: 110; Fet & Lowe, 2000: 139.

Hottentotta nigrocarinatus: Lourenço & Ythier, 2006: 71.

Buthus judaicus: Kraepelin, 1895: 81 (in part).

= *Hottentotta caboverdensis* Lourenço & Ythier, 2006: 72. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. Sierra Leone; original type lost. Neotype from Sierra Leone hereby designated; NMPC.

TYPE MATERIAL EXAMINED. **Sierra Leone**, 1♀ (neotype hereby designated, Fig. 40), 1985, collector unknown, NMPC.

OTHER MATERIAL EXAMINED. **Burkina Faso** (Volta Haute), Garango, 11°48'N 00°33'W, 17.X.1966, 1♂ (Figs. 10, 46–47), leg. Lamontellorie, SMFD No. 39339; Region Bobodioulasso, 2♀ (Figs. 42, 45), 1995, FKCP. **Cameroon**, 4.X.1911, 1♀, leg. Schubotz, SMFD No. 5248; Duala, 16.XII.1913, 1♀, leg. A. Haas, SMFD No. 5247; Edea, 1♀, SMFD No. 8863/205; 52 mi S Garoua, Boki River, 330 m., 29.IX.1966, 1♀, leg. E. S. Ross & K. Lorenzen, CASC; Ngaoundéré, 1100 m., 1.X.1966, 1♀ 1juv., leg. E. S. Ross & K. Lorenzen, CASC. **Cape Verde Islands**, Ribeira da Praia, 1993, 3♀ (Fig. 44), leg. Santos, SMFD No. 38561. **Congo**, Frz. Kongo, Kabo, 15.III.1911, 1juv., leg. Schubotz, SMFD No. 5249; Fort Archambault, 1911, 1juv., leg. Schubotz, SMFD No. 5250; Fort Crampel, 1911, 2juvs., leg. Schubotz, SMFD No. 5232. **Ghana**, Damongo, 2♀, 14.I.1972, leg. S. Y. Endrödy (Locality No. 515), HNHM; Wa, 1juv., 26.X.1971, leg. S. Y. Endrödy (Locality No. 509), HNHM; Tumu, 3♂ 3♀ 6juvs., 27.X.1971, leg. S. Y. Endrödy (Locality No. 511),



Figure 40: *Hottentotta hottentotta*, dorsal view, female neotype.



Figure 41: *Hottentotta hottentotta*, ventral view, female from Nigeria, 6 mi. S Jos, 1250 m., CASC.



Figure 42: *Hottentotta hottentotta*, dorsal view, female from Burkina Faso (Volta Haute), Region Bobodioulasso, FKCP.

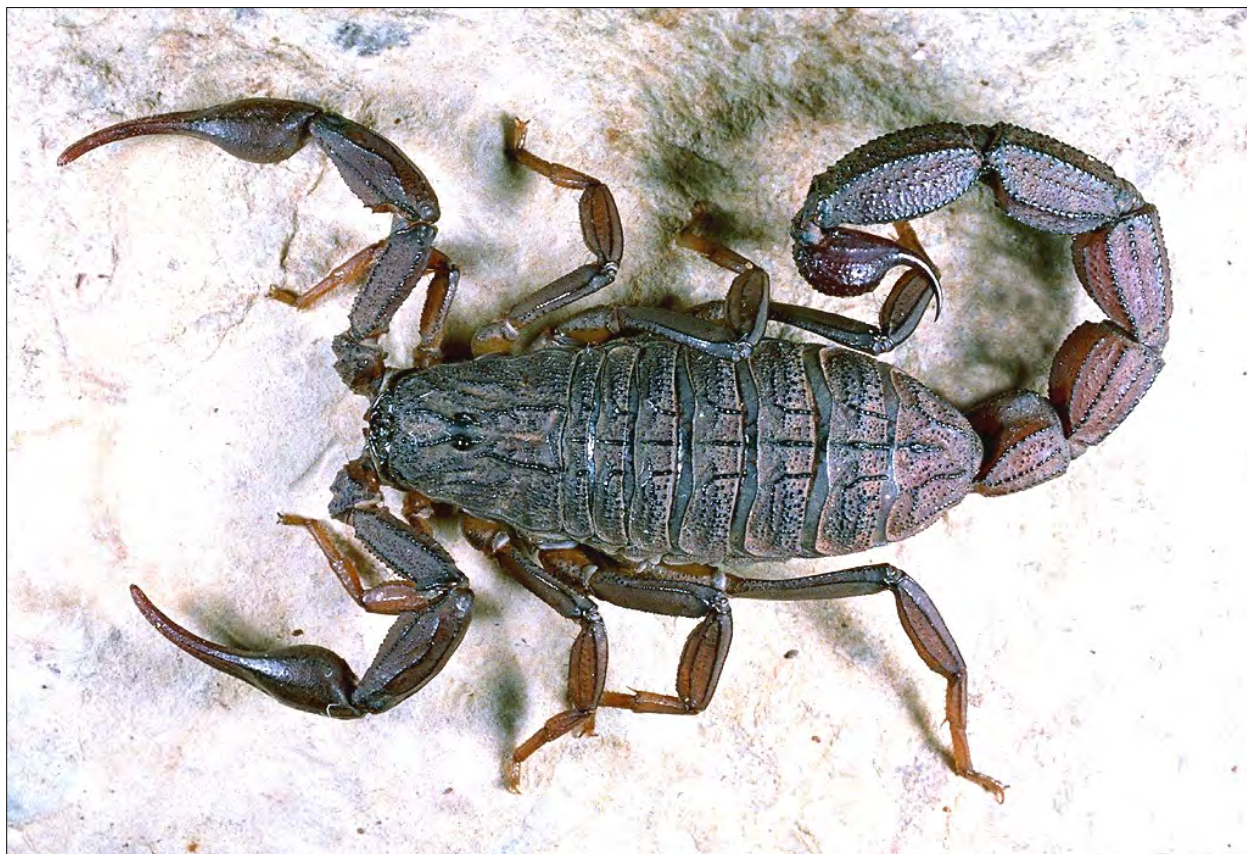


Figure 43: *Hottentotta hottentotta*, dorsal view, female from Ghana, FKCP.

HNHM; 1♀, 1990, 1♀(Figs. 9, 43), 2005, FKCP. **Guinea**, Franz. Guinea, 1♀, SMFD No. 6666/73. **Guinea-Bissau**, Portug. Guinea, 1♀1juv., SMFD No. 8862/204. **Ivory Coast**, M'Bahiakro, 3♀1juv., VI.1995, leg. M. Forti, FKCP. **Mali**, 13 mi. N Manankoro, 375 m., 22.VIII.1966, 1♀(im.), leg. E. S. Ross & K. Lorenzen, CASC; nort of lake Sélingue, 1♂, I.1980, FKCP. **Niger**, Say, Parc Natl. W, 17 km ENE La Tapoa, 12°30'N 2°33'E, 170 m., 23.XII.1996, 1♀, leg. J. Lattke, CASC. **Nigeria**, 19 mi. N Bokani, 250 m., 10.IX.1966, 1♀(im.), leg. E. S. Ross & K. Lorenzen, CASC; 45 mi. SW Kano, 680 m., 12.IX.1966, 1juv., leg. E. S. Ross & K. Lorenzen, CASC; 10 mi. NW Jos, 1225 m., 14.IX.1966, 1♀2juvs., leg. E. S. Ross & K. Lorenzen, CASC; 28 mi. NE Zaria, 720 m., 14.IX.1966, 1♀(im.)1juv., leg. E. S. Ross & K. Lorenzen, CASC; 6 mi. S Jos, 1250 m., 16.IX.1966, 1♀(Fig. 41)4juvs., leg. E. S. Ross & K. Lorenzen, CASC. **Senegal**, Niokolo Koba n. p., 2♀, VII.1995, FKCP. **Tanzania**?, probably error localities, 1♀, 1920–1950, 1♀, 2006, FKCP. **Togo**, 2♀, leg. Bayer, SMFD No. 37466.

DIAGNOSIS. Total length 55–80 mm. For habitus see Figs. 40–47. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* or on level with trichobothrium *est*. Sexual dimorphism not readily apparent, width of pedipalp chela same in both sexes. Males have fingers of pedipalps more twisted than females. Pectinal teeth number 25–29 in males, 22–26 in females (in the subspecies *H. h. nigrocarinatus* there may be 33 pectinal teeth in males and up to 32 in females). Much of female chelicera reticulate, only base smooth. The male chelicera is often only weakly reticulate and sometimes lacks reticulation altogether. Fingers of chelicerae black. Pedipalps hirsute, but not densely. Metasoma bears only a few hairs. Color usually uniformly reddish brown, but some populations colored yellowish brown to black. Mesosomal segments and carapace usually with orange spots and longitudinal black stripes. Metasomal carinae may be black as well. The coloration of juveniles is variable, in some uniformly brown and in others with the chela dark and the remaining segments of pedipalps yellow; they may also have the fifth metasomal segment darker than the preceding segments. Femur of pedipalp with 3 complete and 2 incomplete carinae. Patella with 8 carinae, of which some are smooth, without granules and obsolete. Chela lacks carinae. Movable fingers of pedipalps with 13–14 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First and second metasomal segments with 10 carinae; third and fourth segment with 8 or 10 carinae; fifth segment with 5 carinae, two lateral and two ventral rows of granules. All carinae granulated, dorsal carinae bear larger terminal granules. First metasomal segment of adults wider than long, second metasomal segment

usually longer than wide. Length to width ratio of fourth metasomal segment less than 1.6.

COMMENTS. *H. hottentotta* is the type species of *Hottentotta*, and as the bearer of characters that define the genus should have a type specimen. Fixing a neotype is important particularly because there have been attempts to split off some populations as separate species (*H. nigrocarinatus* (Simon, 1874) and *H. caboverdensis* Lourenço & Ythier, 2006). For this reason I designate a female from the type locality (Sierra Leone) as the neotype. It is a 67 mm long specimen that corresponds well with the above diagnosis.

The taxonomic position of the subspecies *H. h. nigrocarinatus* (type locality and type repository: Senegal, Saint Louis; MNHN) is questionable. Vachon & Stockmann (1968: 137) classified this taxon as a subspecies of *H. hottentotta* and distinguished it from other populations by *H. h. nigrocarinatus* having 33 pectinal teeth in the male and 30–32 in the female and *H. h. hottentotta* having 25–29 pectinal teeth in the male and 22–26 in the female. They saw other indications of subspecific status in granulation of the fourth metasomal segment and in subtle (from the standpoint of variation negligible) morphometric differences. Lourenço & Ythier (2006: 71) elevated this subspecies to species without giving any reasons for the status change. However, they state that the females have 28–30 pectinal teeth, which differs from Vachon and Stockmann (1968: 116). It is also worth noting that the type of *H. nigrocarinatus* measures 53 mm and Simon (1874: 281–282) compares it only with *Buthus tunetanus* and *Buthus peloponnensis*. Due to unavailability of MNHN types (see Kovařík, 2004: 27), I have no choice but to regard this taxon recorded from Senegal as a subspecies of *H. hottentotta*, with the stipulation that only a thorough study of the types can decide whether it is a synonym or a valid species.

Lourenço & Ythier (2006: 72) described *H. caboverdensis* (type locality and type repository: Cape Verde Islands, Island of São Tiago, region of Praia; MNHN), which they distinguish from *H. h. hottentotta* and *H. h. nigrocarinatus* by (1) smaller size (55 to 62 mm), (2) much darker coloration than in *H. hottentotta*, (3) more strongly marked granulations on the carapace and tergites than in *H. hottentotta* and *H. nigrocarinatus*, and (4) smaller number of pectinal teeth than are found in female specimens (22 to 24). As to characters (1), (2) and (4), I do not see any difference from *H. hottentotta* (see diagnosis), and character (3) lacks any objective value. I also studied three SMFD females from the type locality of *H. caboverdensis* and am certain that they are *H. hottentotta*. Their total length (1) is 61 to 78 mm, the coloration (2) is dark (Fig. 44) but not quite as black as in e.g. the population from Ghana (Fig. 43), granulation (3) is within the variation limits known for *H. hottentotta*, and the pectinal teeth (4) number 23–24 (in



Figure 44: *Hottentotta hottentotta*, dorsal view, female from Cape Verde Islands, Ribeira da Praia, SMFD No. 385.



Figure 45: *Hottentotta hottentotta*, dorsal view, female from Burkina Faso, Region Bobodioulasso, with offspring after the first ecdysis.



Figure 46: *Hottentotta hottentotta*, dorsal view, male from Burkina Faso (Volta Haute), Garango, 11°48'N 00°33'W, SMFD No. 39339.



Figure 47: *Hottentotta hottentotta*, ventral view, male from Burkina Faso (Volta Haute), Garango, 11°48'N 00°33'W, SMFD No. 39339.

other examined females of *H. hottentotta* the number of pectinal teeth is 22–26). I therefore consider *H. caboverdensis* a synonym of *H. hottentotta*.

DISTRIBUTION: Benin (Fet & Lowe, 2000: 139), Burkina Faso (Volta Haute), Cameroon, Chad (Roewer, 1943: 207; Vachon & Stockmann, 1968: 112), Cape Verde Islands (Schmidt & Bauer, 1997: 1), Congo (Kraepelin, 1929: 87), Cote d'Ivoire (Vachon & Stockmann, 1968: 111), Gambia (Pocock, 1889: 336), Guinea (Borelli, 1913: 218), Guinea-Bissau (Monard, 1939: 83), Mali (Vachon & Stockmann, 1968: 112), Niger (Pocock, 1889: 336), Nigeria (Pocock, 1899: 834), Central African Republic (Vachon & Stockmann, 1968: 112), Senegal (Kraepelin, 1901: 266), Sierra Leone (Fabricius, 1787: 348), Togo (Werner, 1902: 597).

Records from Egypt, Ethiopia, Somalia (see Fet & Lowe, 2000: 139) and Democratic Republic of Congo (Zaire; Geeraerts, 1953: 1066) must be considered dubious. Also records from Tanzania may in some instances be erroneous and probably concern *H. trilineatus* (Peters, 1862).

***Hottentotta jabalpurensis* sp. n.**

(Figs. 48–51, 136–141, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. India, Madhya Pradesh, Jabalpur; CASC and FKCP.

TYPE MATERIAL. India, *Madhya Pradesh*, Jabalpur, VIII.1957–VIII.1958, 23♂16♀21juvs. (holotype, allotype and paratypes, Figs. 48–51), leg. P. Susai Nathan. Holotype, allotype and most of paratypes are in CASC, 6 paratypes (3♂3♀) are in FKCP.

ETYMOLOGY. Named after the type locality.

DIAGNOSIS. Total length 50–80 mm. For habitus see Figs. 48–51. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* or level with trichobothrium *est*. Male with fingers proximally twisted, manus of pedipalps wider than female. Pectinal teeth number 30–36 in males, 26–30 in females. Chelicerae yellow, reticulate. Nearly entire body hirsute, pedipalps, dorsal surface of mesosoma, legs, lateral and ventral surfaces of metasomal segments, and vesicle densely hirsute. The hairs are long. Color uniformly yellow to reddish brown. Ventral carinae on metasomal segments usually black. Femur of pedipalp with 5 carinae. Patella with 2 or 4 carinae on internal surface, no other carinae. Chela lacks carinae. Movable fingers of pedipalps with 13–14 rows of granules and 5 or 6 terminal granules. Seventh mesosomal sternite smooth, with 4 well marked black carinae. First to fourth metasomal segments with 10 carinae; fifth segment with 5 or 7 carinae. Metasoma granulated between carinae.

Dorsal surface often very finely granulated, often bears 2 short, inconspicuous marginal carinae. Telson also granulated. Dorsal carinae of metasomal segments bear terminal granules of size approximately equal to preceding granules. First metasomal segments of adult female wider than long (in male usually as longer than wide), second metasomal segment longer than wide for both sexes. Second to fourth metasomal segment width ratio about 1.1. Telson bulbous, especially in large females.

DESCRIPTION: Total length of both sexes is 50 to 80 mm. The habitus is shown in Figs. 48–51. Measurements of the carapace, telson, segments of the metasoma and of the pedipalps, and numbers of pectinal teeth in the holotype and allotype are given in Table 1. Trichobothrium *db* on the fixed finger of pedipalp is situated between trichobothria *et* and *est* (Fig. 1), rarely is on the same level as trichobothrium *et*. Pectinal teeth number 30–36 in males and 26–30 in females. Chelicerae yellow, reticulate. The male has fingers proximally twisted, manus of pedipalps wider than female.

COLORATION: The color is uniformly yellow to reddish brown. Ventral carinae on metasomal segments are usually black. The specimens have been preserved in alcohol since 1958.

MESOSOMA AND CARAPACE: The mesosoma has three carinae on the dorsal surface and two carinae on the ventral surface with the exception of the seventh segment, whose ventral surface bears four well marked carinae. The dorsal surface is sparsely to densely granulated, whereas the ventral surface is smooth.

PEDIPALPS: The pedipalps are densely hirsute. The hairs are long. The femur of pedipalps has five carinae and the dorsal surface is covered by very fine granules. The ventral surfaces of femur and patella are smooth to glossy. The patella with 2 or 4 carinae on internal surface, no other carinae. Chela lacks carinae. The movable fingers of the pedipalps have 13–14 cutting rows of granules and 5 or 6 terminal granules.

METASOMA AND TELSON: The first metasomal segment of adult female wider than long (in male usually as longer than wide), second metasomal segment longer than wide for both sexes. The first through fourth segments bear 10 carinae, and the fifth segment bears five carinae and on the ventral surface has additional rows of granules that may form two more carinae. The dorsal surface is often very finely granulated and may bear two short, inconspicuous marginal carinae. Surfaces between carinae are sparsely to densely granulated. Dorsal carinae of metasomal segments bear terminal



Figure 48: *Hottentotta jabalpurensis*, **sp. nov.**, dorsal view, male holotype.



Figure 49: *Hottentotta jabalpurensis*, **sp. nov.**, ventral view, male holotype.

granules of size approximately equal to preceding granules. Second to fourth metasomal segment width ratio about 1.1. Telson bulbous, especially in large females.

AFFINITIES. The described features distinguish *H. jabalpurensis* **sp. n.** from all other species of the genus. They are recounted in the key below. *H. jabalpurensis* **sp. n.** is closest to *H. tamulus*, from which it differs in having the entire body and especially the metasoma densely hirsute, and the patella of pedipalp with long hairs. In contrast, *H. tamulus* has the metasoma only

sparsely hirsute and the patella of pedipalp bears dense but short hairs.

***Hottentotta jalalabadensis* sp. n.**
(Figs. 11, 52–59, 142–147, Table 1)

Hottentotta alticola: Kovařík, 1993: 201 (in part).

TYPE LOCALITY AND TYPE REPOSITORY. **Afghanistan**, prov. Nengrahar, Jalalabad; MMBC and FKCP (for description of the type locality see Jakeš & Povolný, 1967).



Figure 50: *Hottentotta jabalpurensis*, sp. nov., dorsal view, female allotype.



Figure 51: *Hottentotta jabalpurensis*, sp. nov., ventral view, female allotype.

TYPE MATERIAL. **Afghanistan**, prov. Nengrahar, Jalalabad, 28.I–30.III.1965, 9♂14♀15juvs. (holotype, allotype and paratypes, Figs. 11, 52–59), IV–V.1967, 4♀ (paratypes), leg. D. Povolný; 8km ESE of Jalalabad, 16.II.1966, (PT 11), 3♂ (paratypes); 28.II.1966, 1♀1juv. (paratypes), (PT 22), 5.III.1966, 2♀1juv. (paratypes), (PT 25), leg. D. Povolný & F. Tenora; 10km ESE of Jalalabad, 19.II.1966, 1♀(im.) (paratype), (PT 15), 21.II.1966, 1♀ (paratype), (PT 16), 23.II.1966, 1♀2juvs. (paratypes), (PT 18), leg. D. Povolný & F. Tenora; 12–20km ESE of Jalalabad, 7.III.1966, 2♂2juvs. (paratypes), (PT 26), 16.III.1966, 1♂2♀1juv. (paratypes), (PT 36), leg. D. Povolný & F. Tenora; Samrachel, 15.II.1966, 4♀1♀(im.)1♂(im.)8juvs. (paratypes), (PT 9), leg. D. Povolný & F. Tenora; Nemla, 18.II.1966, 2♀2ims. (paratypes), (PT 14), leg. D. Povolný & F. Tenora. Holotype, allotype and most of paratypes are in MMBC, 12 paratypes (6♂6♀) are in FKCP. Data in parentheses, for example (PT 11), give a more accurate description of the locality (see Jakeš & Povolný, 1967).

ETYMOLOGY. Named after the type locality.

DIAGNOSIS. Total length 65–90 mm. For habitus see Figs. 52–54. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*, close to or on level with *est* (Fig. 1). Chelicerae yellow to black, reticulate. Male with slightly longer and narrower metasomal and pedipalp segments, width of pedipalp chela same in both sexes. Pectinal teeth number 31–35 in males, 24–29 in females. Pedipalps and metasoma very sparsely hirsute. Carapace and mesosoma black except seventh tergite. Seventh mesosomal segment, metasoma, legs and pedipalps including fingers uniformly yellow to yellowish brown. Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 15–16 rows of granules and 5 or 6 terminal granules. Seventh mesosomal segment with 4 well marked ventral granulated carinae. First and second metasomal segments with 10 carinae; third segment bears 8 carinae and sometimes a short row of granules in center of lateral part; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal carinae of metasomal segments bear larger terminal granules. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First metasomal segments of both sexes wider than long, in female also second metasomal segment wider than long. Second through fourth metasomal segment width ratio in females 1.26–1.29.

DESCRIPTION: Total length of both sexes is 65 to 90 mm. The habitus is shown in Figs. 52–54. Measurements of the carapace, telson, segments of the metasoma and of the pedipalps, and numbers of pectinal teeth in the

holotype and allotype are given in Table 1. Trichobothrium *db* on the the fixed finger of pedipalp is situated between trichobothria *et* and *est* (Fig. 1), rarely is on the same level as trichobothrium *et*. Pectinal teeth number 31–35 in males and 24–29 in females. Chelicerae are yellow to black, reticulate, fingers of chelicerae are black. The male has slightly longer and narrower metasomal and pedipalp segments, width of the pedipalp chela is the same in both sexes. The female has very broad first through third metasomal segments, the first and second segments are also wider than long (see Table 1).

COLORATION: Carapace and mesosoma are black except the seventh tergite. The seventh mesosomal segment, metasoma, legs and pedipalps including fingers are uniformly yellow to yellowish brown. Immature specimens may be yellow with a black spot only in the anterior part of carapace.

MESOSOMA AND CARAPACE: The mesosoma has three carinae on the dorsal surface and two carinae on the ventral surface with the exception of the seventh segment, whose ventral surface bears four well marked carinae. The dorsal surface is granulated, whereas the ventral surface is smooth.

PEDIPALPS: The pedipalps are hirsute, but not densely. The hairs are long. The femur of pedipalps has five carinae and the dorsal surface is covered by very fine granules. The ventral surfaces of femur and patella are smooth to glossy. The patella has eight carinae. The chela lacks carinae. The movable fingers of the pedipalps have 15–16 cutting rows of granules and 5 or 6 terminal granules.

METASOMA AND TELSON: The first metasomal segment of both sexes is always wider than long, and the female has also the second metasomal segment wider than long. In females, the second through fourth metasomal segment width ratio is 1.26–1.29. The first and second segments bear 10 carinae, the third segment bears eight carinae and sometimes a short row of granules in the center of lateral part; the fourth segment bears eight carinae, and the fifth segment bears only five carinae. The dorsal surface is smooth and glossy, with the fifth segment and sometimes also the fourth segment bearing two short, inconspicuous carinae. Lateral carinae are smooth and ill-defined, whereas dorsal carinae of all segments are well granulated and have larger terminal granules. Surfaces between carinae are smooth, without granules, only the ventral surface of the fifth segment bears additional rows of granules. A subaculear tooth is absent; the telson is essentially smooth, with only a few scattered granules.



Figure 52: *Hottentotta jalalabadensis*, sp. nov., dorsal view, male holotype.



Figure 53: *Hottentotta jalalabadensis*, sp. nov., dorsal view, female paratype.



Figure 54: *Hottentotta jalalabadensis*, sp. nov., ventral view, female paratype.



Figure 55: *Hottentotta jalalabadensis*, sp. nov., sternocoxal area and pectines, male holotype.

AFFINITIES. The described features distinguish *H. jalalabadensis* sp. n. from all other species of the genus. They are recounted in the key below. This species is well characterized by very broad first and second metasomal segments in relation to the fourth metasomal segment, namely in females (Figs. 56–59). This unusual feature is present in only one other *Hottentotta* species, *H. scaber* from Arabia, which has characteristically colored metasomal segments (the first through third

segments are yellow and the fifth and the telson are black; see Fig. 100) and cannot possibly be confused with *H. jalalabadensis* sp. n.

Hottentotta jayakari (Pocock, 1895)
(Figs. 12, 60–63)

Buthus jayakari Pocock, 1895: 300; Kraepelin, 1899: 19;
Kraepelin, 1901: 267.



56



57



58



59

Figures 56–59: *Hottentotta jalalabadensis*, sp. nov., metasoma. **56.** male holotype, dorsal. **57.** male holotype, ventral. **58.** female paratype, dorsal. **59.** female paratype, ventral.

Buthus (Hottentotta) jayakari : Birula, 1914: 654; Birula, 1917: 214.

Buthus (Buthus) jayakeri: Roewer, 1943: 206.

Buthotus jayakari: Vachon, 1949: 147 (1952: 233); Vachon, 1958: 134; Vachon, 1966: 210; Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21; Vachon, 1977: 210; Farzanpay, 1988: 37; Al-Safadi, 1992: 97; El-Hennawy, 1992: 116.

Hottentotta jayakari: Sissom, 1994: 36; Kovářík, 1997a: 49.

Hottentotta (Hottentotta) jayakari: Kovářík, 1998: 110; Fet & Lowe, 2000: 140.

Buthotus jayakari jayakari: Vachon, 1980: 255.

Hottentotta (Hottentotta) jayakari jayakari: Fet & Lowe, 2000: 140.

Hottentotta jayakari jayakari: Hendrixson, 2006: 78.



Figure 60: *Hottentotta jayakari*, dorsal view, male lectotype.



Figure 61: *Hottentotta jayakari*, dorsal view, male from Oman, Wadi Bani Auf, on Salma Rd, shale scree in wadi, 23°13'N 57°22'E, FKCP.



Figure 62: *Hottentotta jayakari*, dorsal view, female from Oman, Wadi Bani Auf, on Salma Rd, shale scree in wadi, 23°13'N 57°22'E, FKCP.



Figure 63: *Hottentotta jayakari*, ventral view, female from Oman, Wadi Bani Auf, on Salma Rd, shale scree in wadi, 23°13'N 57°22'E, FKCP.

TYPE LOCALITY AND TYPE REPOSITORY. Oman, Muscat; BMNH.

TYPE MATERIAL EXAMINED. **Oman**, Muscat, 1♂ (lectotype hereby designated, Fig. 60) 2♀ (paralectotypes), leg. A. G. Jayakar, BMNH No. 1894.3.14.4–6.

OTHER MATERIAL EXAMINED. **Oman**, Mu'askar al Murtafa'a (near Rusayl), garden on rocky slope, 23°34'N 58°13'E, 50m, 27.VIII.1983, 1♂, leg. P. & N. Cookson, det. G. Lowe, FKCP; Wadi Bani Auf, on Salma Rd, shale scree in wadi, 23°13'N 57°22'E, 900m, 14.X.1993, 2♀1♂ (Figs. 12, 61–63), leg. A. S. Gardner, det. G. Lowe, FKCP; Izki army camp, in cracks of a dry stone wall, well lit populated area, 22°56'N 57°46'E, 17.X.1994, 2♀, 19:30, leg. J. Dundon, det. G. Lowe, FKCP.

DIAGNOSIS. Total length 65–90 mm. For habitus see Figs. 60–63. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to brown, reticulate. Sexual dimorphism not readily apparent; width of pedipalp chela and metasomal segments same in both sexes, males have fingers of pedipalps somewhat more twisted than females. Pectinal teeth number 37–42 in males, 32–35 in females. Pedipalps densely hirsute, metasoma sparsely hirsute. Carapace, mesosoma, patella and chela of pedipalps, fourth and fifth metasomal segments and telson yellowish brown to black. Anterior part of carapace with black spot. Mesosomal segments often with a median longitudinal yellowish-brown stripe. Femur of pedipalps, legs, and first and second metasomal segments yellow to yellowish green (Fig. 62). Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14–15 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second segment with 8 carinae and lateral median short row of granules; third and fourth segments with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. All metasomal carinae granulated. Dorsal carinae of metasomal segments bear larger terminal granules. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First metasomal segment of adults usually longer than wide or as long as wide, second metasomal segment always longer than wide. Second to fourth metasomal segment width ratio less than 1.1.

COMMENTS. The lectotype is being designated in order to stabilize the nomenclature. Fet & Lowe (2000: 140)

listed the female as the holotype, but Pocock did not designate the holotype.

DISTRIBUTION: United Arab Emirates (Hendrixson, 2006: 79), Oman (Pocock, 1895: 302), Saudi Arabia (Hendrixson, 2006: 79), and Yemen (Al-Safadi, 1992: 97). Record for Iran (Werner, 1929: 243; Farzanpay, 1988: 37) and India (Kraepelin, 1901: 267) must be considered dubious.

Hottentotta judaicus (Simon, 1872)
(Figs. 13, 64–67)

Buthus judaicus Simon, 1872: 252; Thorell, 1876: 115; Simon, 1879: 99; Simon, 1880b: 29; Simon, 1884: 191; Pocock, 1891: 242; Simon, 1892: 83; Kraepelin, 1895: 81(in part); Pavesi, 1895a: 4; Kraepelin, 1899: 19; Kraepelin, 1901: 267; Werner, 1902: 597; Birula, 1905: 136; Schenkel, 1932: 379; Werner, 1935: 211; Bücherl, 1959: 257; Amitai et al., 1981: 1083.

Buthus (Buthus) judaicus: Pocock, 1890a: 126; Birula, 1900: 12; Werner, 1934: 269; Roewer, 1943: 206.

Buthus (Hottentotta) judaicus: Birula, 1914: 654; Vachon, 1940b: 255.

Dasyscorpio judaicus: Pallary, 1938: 279.

Buthotus judaicus: Vachon, 1949: 144 (1952: 230); Vachon, 1951: 344; Shulov, 1958: 879; Shulov & Amitai, 1959: 223; Vachon, 1958: 134; Shulov & Amitai, 1958: 354; Vachon, 1966: 210; San Martin & Gambardella, 1967: 18; Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21; Levy & Amitai, 1980: 54; Kinzelbach, 1984: 100; Amr et al., 1988: 373; El-Hennawy, 1988: 14; El-Hennawy, 1992: 116; Amr & El-oran, 1994: 186; Kabakibi, Khalil & Amr, 1999: 80.

Buthotus (Hottentotta) judaicus: Birula, 1910: 170; Birula, 1917: 200; Vachon, 1947a: 26; Vachon, 1947b: 162.

Hottentotta judaica: Hadley, 1990: 327; Polis & Sissom, 1990: 166; Sissom, 1990: 92; Warburg & Polis, 1990: 225; Dupre & Balliet, 1997: 5; Kovařík, 2002: 7.

Hottentotta judaicus: Kovařík, 1997a: 43; Crucitti, 1999: 82; Stathi & Mylonas, 2001: 288; Karatas, 2003: 315.

Hottentotta (Hottentotta) judaica: Kovařík, 1998: 110; Fet & Lowe, 2000: 140.

= *Buthus hedenborgii* Thorell, 1876: 113 (syn. by Simon, 1879: 99).

Buthus hottentotta (in part): Kraepelin, 1891: 185 (see Kraepelin, 1899: 19).

TYPE LOCALITY AND TYPE REPOSITORY. Israel, Jerusalem, Jordan Valley, shores of the Dead Sea; MNHN.

MATERIAL EXAMINED. **Israel**, Tel-Aviv, 2♀, SMFD No. 6663/70; Jaffa, 1885, 1♂1♀(im.), leg. H. Simon, SMFD



Figure 64: *Hottentotta judaicus*, dorsal view, male from Jordan, King Talal Dam, FKCP.



Figure 65: *Hottentotta judaicus*, ventral view, male from Jordan, King Talal Dam, FKCP.

No. 5255; Haifa, 1886, 1♂3♀, leg. H. Simon, SMFD No. 5243. **Jordan**, 1juv., 10.V.1956, leg. J. Klapperich, HNHM; Betlem, 2♂1♀2juvs., 1985, FKCP; Gastel Aulun, 1♂(im.), 5.V.1995, leg. M. Kaftan, FKCP; Jerash, 1♂(im.), 5.V.1995, leg. V. Šejna, FKCP; King Talal Dam, 1♂(Figs. 64–65), 28.IV.1996, leg. D. Modrý, FKCP; NW, Zoubia, 3♀(Figs. 13, 66–67)1♂, IV.1996, leg. D. Modrý, FKCP. **“Palestina”**, 1♂1♀(im.), det.1992, FKCP. **Syria**, 1839, 1♂1♀, leg. Rosenbach, SMFD No. 5244; Qunawat, 1juv., 30.VI.1994, leg.



Figure 66: *Hottentotta judaicus*, dorsal view, female from Jordan, Zoubia, FKCP.



Figure 67: *Hottentotta judaicus*, ventral view, female from Jordan, Zoubia, FKCP.

D.Vlasta, FKCP; 1♀, 1994, leg. D. Modrý, FKCP; 1♂, V.1994, leg. D. Modrý, FKCP.

DIAGNOSIS. Total length 60–80 mm, males usually smaller than females. For habitus see Figs. 64–67.

Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae black, reticulate. Sexual dimorphism not pronounced, width of pedipalp chela same in both sexes. Pectinal teeth number 27–32 in males, 22–27 in females.

Pedipalps sparsely hirsute. Metasoma bears only a few hairs. Color black except for reddish brown fingers of pedipalps; ends of first and second tarsomeres may be yellow in some specimens. Femur of pedipalp with 5 carinae. Surfaces of femur and patella granulate. Patella with 8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 13–14 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second segment with 8 or 10 carinae; third segment with 8 carinae and sometimes a short row of granules in center of lateral part; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

DISTRIBUTION: Israel (Simon, 1872: 252), Jordan (Birula, 1914: 654), Lebanon (Vachon, 1966: 210), “Palestine” (Kraepelin, 1899: 19), Syria (Kraepelin, 1899: 19), and Turkey (Birula, 1910: 170).

Hottentotta minax (L. Koch, 1875)

(Figs. 68–74)

Buthus minax L. Koch, 1875: 4; Simon, 1879: 99; Pavesi, 1885: 197; Hirst, 1911b: 217; Kraepelin, 1913: 171 (in part); Borelli, 1915: 460; Werner, 1916: 80; Lampe, 1918: 191; King, 1925: 80; Borelli, 1929: 297; Borelli, 1931: 218; Moritz & Fischer, 1980: 319.

Buthus (Buthus) minax (? in part): Pocock, 1890a: 126.

Buthus hottentotta minax: Kraepelin, 1899: 22; Tullgren, 1909: 2; Gough & Hirst, 1927: 4; Kraepelin, 1929: 87.

Buthus (Hottentotta) minax: Birula, 1908: 141; Werner, 1911: 185; Birula, 1915a: 123; Birula, 1928: 81; Werner, 1934: 269; Caporiacco, 1947: 231.

Buthus (Hottentotta) minax: Simon, 1910: 72; Moriggi, 1941: 86.

Buthus (Hottentotta) hottentotta minax: Roewer, 1943: 207.

Buthotus minax: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 118; Probst, 1973: 329; Lamoral & Reynders, 1975: 502; Armas, 1986: 16; Cloudsley-Thompson, 1986: 185; El-Hennawy, 1992: 117.

Hottentotta minax: ? Loveridge, 1925: 305; Simard & Watt, 1990: 436; Warburg & Polis, 1990: 229; Kovařík, 2002: 7; Soleglad & Fet, 2003a: 5; Soleglad & Fet, 2003b: 7; Kovařík, 2003: 140; Lourenço, 2004: 216; Kovařík & Whitman, 2005: 106.

Hottentotta (Hottentotta) minax: Kovařík, 1998: 110; Fet & Lowe, 2000: 141.

Buthotus minax minax: Vachon & Stockmann, 1968: 119.

Buthotus minax typicus: Probst, 1973: 329.

Hottentotta (Hottentotta) minax minax: Fet & Lowe, 2000: 141.

Buthus hottentotta minaci: Caporiacco, 1937: 357.

Buthus hottentotta (in part): Pavesi, 1895c: 495; Kraepelin, 1891: 185; Thorell, 1893: 362.

= *Buthus isselii* Pavesi, 1883: 3 (nomen nudum) (syn. by Pavesi, 1895c: 495).

= *Buthus hottentotta tigrinus* Caporiacco, 1937: 355; Bartolozzi, Vanni & Mascherini, 1987: 295; Kovařík & Whitman, 2005: 106 (syn. by Kovařík, 2003: 140).

Buthus (Hottentotta) tigrinus: Moriggi, 1941: 87; Caporiacco, 1947: 231.

Buthotus hottentotta tigrinus: Vachon & Stockmann, 1968: 124; El-Hennawy, 1992: 117.

Buthotus minax tigrinus: Probst, 1973: 329; Lamoral & Reynders, 1975: 503.

Hottentotta (Hottentotta) minax tigrinus: Kovařík, 1998: 110; Fet & Lowe, 2000: 142.

Buthotus minax occidentalis Vachon & Stockmann, 1968: 128; Vachon, 1974: 885; Lamoral & Reynders, 1975: 503; Stockmann, 1979: 405; Francke & Sissom, 1984: 12; Dupre & Balliet, 1997: 5.

Hottentotta minax occidentalis: Polis & Sissom, 1990: 197.

Hottentotta (Hottentotta) minax occidentalis: Kovařík, 1998: 110; Fet & Lowe, 2000: 142.

Hottentotta occidentalis: Lourenço, 2004: 213.

= *Hottentotta acostai* Lourenço, 2004: 213. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. Egypt, Cairo; ZMHB.

TYPE MATERIAL EXAMINED. **Chad**, South of Tibesti, NE Sherda-Zouar (steppe formation), 1♂1♀1♀(im.) (paratypes of *Hottentotta acostai* Lourenço, 2004, Figs. 73–74), 7.IV.1968, leg. P. M. Brignoli, ZMUH No. A37/04. **Egypt**, Cairo, 1♂(Fig. 68)1im. (lectotype and paralectotype No. 1), leg. Jickeli, ZMHB No. 2518; Habab, 2♂2♀ (paralectotypes Nos. 2–5), leg. Jickeli, ZMHB No. 2519. **Eritrea**, Press Adua, terr. Gherungara, V.1936, 1♂ (lectotype of *Buthus hottentotta tigrinus* Caporiacco, 1937), MZUF No. 780.

OTHER MATERIAL EXAMINED. **Egypt**, 1♂, SMFD No. 5246. **Ethiopia**, presso Adua, torrente Gherungurà, V.1936, 1♀, leg. R. Cimmaruta, MZUF No. 634; 1990, 5♂3♀(Figs. 69–72)1juv., FKCP. **Eritrea**, Adi Ugri, 1900, 1♀, leg. A. Andreini, MZUF No. 634; Ghinda, Val. R. Embatkalla, 29.XII.1900, 8♀3 juvs., leg. A. Andreini, MZUF No. 626; Ghinda, Val. R. Embatkalla, sotto sassi, 29.XII.1900, 3♀, leg. A. Andreini, MZUF No. 625; Saganeiti, IV.1901, 3 juvs., leg. A. Andreini, MZUF No. 628; Saganeiti, IV.1901, 1♂6♀, leg. A.



Figure 68: *Hottentotta minax*, dorsal view, male lectotype.

Andreini, MZUF No. 620; Adi Ugri, V.1901, 1♂1♀6 juvs., leg. A. Andreini, MZUF No. 633; Adi Ugri, dintorni, sotto sassi, V.1901, 3♀, leg. A. Andreini, MZUF No. 632; Adi Ugri, VI.1901, 4♂5♀9juvs., leg. A. Andreini, MZUF No. 635; Enda Abba Mali, terr[itorio di] Adi Ugri, 8.VI.1901, 2 ♂2♀, leg. A. Andreini, MZUF No. 630; Enda Abba Mali, Adi Ugri, 8.VI.1901, 1♂2juvs., leg. A. Andreini, MZUF No. 631; Adi Ugri, VII.1901, 1♂, leg. A. Andreini, MZUF No. 636; Adi Caieh, IV.1902, 3♀, leg. A. Andreini, MZUF No. 624; Adi Caieh, dintorni, IV.1902, 2♀2juvs., leg. A. Andreini, MZUF No. 629; Adi Caieh, sotto sassi, V.1902, 1♀, leg. A. Andreini, MZUF No. 627; Adi Caieh, V.1902, 1♀, leg. A. Andreini, MZUF No. 621; Adi Caieh, VI.1902, 1♂, leg. A. Andreini, MZUF No. 623; Adi Caieh, sotto sassi, VII.1902, 1♀, leg. A. Andreini, MZUF No. 622. ? **Kenya**, D. O. Afrika, Tabora, 1913, 5♂5♀1juv., leg. Schablitzki, SMFD No. 5220.

DIAGNOSIS. Total length 45–70 mm. For habitus see Figs. 68–74. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*, may be on level with *est*. Sexual dimorphism not pronounced; manus of pedipalp usually of same width in both sexes,

but males have fingers twisted whereas females have them straight. Pectinal teeth number 19–28. Chelicerae yellow, without reticulation, only tips of teeth on cheliceral fingers are black. Pedipalps sparsely hirsute. Metasoma bears only a few hairs. Color usually uniformly yellowish brown, only ventral carinae of metasoma black; mesosoma and carapace may be black in some specimens. Femur of pedipalps with 5 carinae that may be incomplete. Patella with 8 carinae, of which some are smooth, without granules and obsolete. Chela lacks carinae. Movable fingers of pedipalps with 12 or 13 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First to third metasomal segments with 10 carinae; fourth segment with 8 or 10 carinae; fifth segment with 5 carinae. Lateral carinae may not be discernible in some males. All carinae granulated, dorsal carinae bear larger terminal granules. Metasoma strongly granulated, accessoric rows of granules present on dorsal surfaces of segments as well as on ventral surface of fifth segment. First metasomal segment of adults always wider than long; second metasomal segment usually also wider than long, but in smaller, less developed specimens of both sexes may be longer than wide. Second to fourth metasomal segment width ratio less than 1.2.



Figure 69: *Hottentotta minax*, dorsal view, male from Ethiopia, FKCP.



Figure 70: *Hottentotta minax*, ventral view, male from Ethiopia, FKCP.



Figure 71: *Hottentotta minax*, dorsal view, female from Ethiopia, FKCP.



Figure 72: *Hottentotta minax*, ventral view, female from Ethiopia, FKCP.



Figure 73: *Hottentotta minax*, dorsal view, male paratype of *Hottentotta acostai*.



Figure 74: *Hottentotta minax*, dorsal view, female paratype of *Hottentotta acostai*.

TYPE LOCALITY AND TYPE REPOSITORY. Chad, South of Tibesti, NE Sherda-Zouar; ZMUH.

COMMENTS. *H. acostai* Lourenço, 2004 is based on six specimens of which I have seen three paratypes. Lourenço (2004: 216) distinguishes *H. acostai* from *H. minax*, actually *H. minax occidentalis*, by 1) smaller size (45 and 51 mm); 2) much more pale coloration; 3) more marked granulation on carapace and tergites; and 4) pectinal tooth counts, which in *H. acostai* show a less number of teeth (22 or 23 in males and 19 or 20 in females). As for character 1), I found one female paratype to be 59 mm long (Fig. 74). Characters 2) and 3) are valueless and, as is apparent from Figs. 68–74, do not show any difference. And neither character 4) shows anything that would separate the paratypes from *H. minax* (see diagnosis). The only difference, which Lourenço does not mention, may be a somewhat narrower metasoma (see Figs. 71 and 74), however that is common even in the same population (see discussion below) and e.g. in the MZUF collection have specimens with narrower metasoma often been labeled as *Hottentotta minax tigrinus*. Also the females paratypes of *H. minax* have the metasoma narrower than the specimen in Fig. 71.

The taxonomic position of the subspecies *H. minax occidentalis* is questionable. Vachon & Stockmann (1968: 128) described this taxon (type locality and type repository: Chad, Djermaya; MNHN) as a subspecies and distinguished it from other populations only on the positions of trichobothria on the femur of pedipalp, whose difference (figs. 36 and 37 in Vachon & Stockmann, 1968: 117) are due to variability and therefore not taxonomically useful. Another difference is ventral granules on the fifth metasomal segment that, however, are also quite variable. Lourenço (2004: 213) elevated this subspecies to species without giving any reasons for the status change. Due to unavailability of MNHN types (see Kovařík, 2004: 27), I have no choice but to regard this taxon recorded from Chad and Cameroon as a subspecies of *H. minax*, with the stipulation that only a thorough study of the types can decide whether it is a synonym or a valid species.

DISTRIBUTION. Chad, Cameroon (Vachon & Stockmann 1968: 129), Egypt (L. Koch, 1875: 7), Eritrea, Ethiopia (Borelli, 1915: 460), Kenya, Libya (Fet & Lowe, 2000: 142), Sudan (Birula, 1908: 141). This species has been reported also from Tanzania (Lampe, 1918: 191; Werner, 1916: 80; Loveridge, 1925: 305; Werner, 1936: 175), however I suspect all such reports to concern misidentified *H. trilineatus*. Also Uganda records (Birula, 1908: 141) are most likely dubious.

Hottentotta niloticus (Birula, 1928)

(Figs. 14, 75–76)

Buthus (Hottentotta) minax niloticus Birula, 1928: 82.
Buthotus minax niloticus: Vachon & Stockmann, 1968: 124; Probst, 1973: 329; Lamoral & Reynders, 1975: 502; El-Hennawy, 1992: 117.
Hottentotta (Hottentotta) minax niloticus: Kovařík, 1998: 110; Fet & Lowe, 2000: 142.
Hottentotta niloticus: Kovařík, 2003: 140.
Buthotus minax: Kovařík, 1992: 183.

TYPE LOCALITY AND TYPE REPOSITORY. Sudan, Nile River valley, Kordofan and Sennaar regions; ZISP.

MATERIAL EXAMINED. **Sudan**, south, 1♂, FKCP; Wad Medani, 2♂, 8.VIII.1982, leg. J. Kotásek, FKCP, 1♂2♀, NMPC; Khartoum, Sunt Forest, 1♂ (Figs. 14, 75–76), 29.IX.1967, leg. P. Štys, FKCP; Khartoum, 1♀, 10.VIII.1973, leg. V. Seichert, FKCP.

DIAGNOSIS. Total length 45–70 mm. For habitus see Figs. 75–76. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*, may be level with *est*. Male manus of pedipalp broader and fingers of pedipalps twisted (straight in female). Pectinal teeth number 22–27. Chelicerae yellow, without reticulation, only tips of teeth on cheliceral fingers are black. Pedipalps sparsely hirsute. Metasoma bears only a few hairs. Color usually uniformly yellowish brown, only ventral carinae of metasoma black; mesosoma and carapace may be black in some specimens. Femur of pedipalps with 5 carinae that may be incomplete. Patella with 8 carinae, of which some are smooth, without granules and obsolete. Chela lacks carinae. Movable fingers of pedipalps with 12 or 13 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First to third metasomal segments with 10 carinae; fourth segment with 8 or 10 carinae; fifth segment with 5 carinae. Lateral carinae may not be discernible in some males. All carinae granulated, dorsal carinae bear larger terminal granules. Metasoma strongly granulated, accessoric rows of granules present on dorsal surfaces of segments as well as on ventral surface of fifth segment. First metasomal segment of adults always wider than long; second metasomal segment of both sexes usually also wider than long. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. *H. niloticus* is very closely related to *H. minax*, from which it differs only in being more sexually dimorphic – the male manus of pedipalp in adult *H. niloticus* is markedly broader than that of the female. In the examined specimens of *H. minax* the width of the manus is the same in both sexes.



Figure 75: *Hottentotta niloticus*, dorsal view, male from Sudan, Khartoum, Sunt Forest, FKCP.



Figure 76: *Hottentotta niloticus*, ventral view, male from Sudan, Khartoum, Sunt Forest, FKCP.

DISTRIBUTION. Sudan (Birula, 1928: 82).

Hottentotta pachyurus (Pocock, 1897)
(Figs. 15, 77–81)

- Buthus pachyurus* Pocock, 1897a: 107; Kraepelin, 1899: 20; Pocock, 1900a: 27; Kraepelin, 1913: 129 (in part); Lindberg, 1946: 152; Takashima, 1945: 75.
Buthus pachyurus typicus: Kraepelin, 1913: 130.
Buthus (Buthus) pachyurus: Roewer, 1943: 206.
Buthotus pachyurus: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91; Kovařík, 1992: 183.
Hottentotta (Hottentotta) pachyurus: Kovařík, 1998: 110.
Hottentotta pachyura: Kovařík, 2001b: 83; Kovařík, 2002: 7.
Mesobuthus pachyurus: Tikader & Bastawade, 1983: 236; Fet & Lowe, 2000: 178; Bastawade, 2002: 294.
 = *Hemibuthus kraepelini* Roewer, 1943: 213 (syn. by Kovařík, 1999: 291).
Hottentotta (?) kraepelini: Fet & Lowe, 2000: 141.
 = *Hottentotta (Deccanobuthus) geffardi* Lourenço, 2000: 192; Lourenço, 2004: 211; Lourenço & Ythier, 2006: 71. **Syn. n.**
Hottentotta rugiscutis: Kovařík, 1999: 291 (in part); Kovařík, 2002: 7.

TYPE LOCALITY AND TYPE REPOSITORY. India, Maharashtra, Mundla; BMNH.

TYPE MATERIAL EXAMINED. **India, Maharashtra**, Mundla, 1♀ (lectotype hereby designated, Figs. 77–78), leg. A. N. Cacia, BMNH No. 1896.9.26.17–19; **Tamil Nadu**; Dekan, Nilgiris, 1♀ (lectotype of *Hemibuthus kraepelini* Roewer, 1943, Figs. 80–81) and 2♂ (paralectotypes Nos 1–2 of *Hemibuthus kraepelini* Roewer, 1943), SMFD No. 8880/222; **Maharashtra**, Deccan Kurduvadi, 18°05'N 75°26'E, VII.1939, 1♀ (holotype of *Hottentotta (Deccanobuthus) geffardi* Lourenço, 2000, Fig. 79), leg. K. Lindberg, ZMUH No. A70/00.

OTHER MATERIAL EXAMINED. **India, Tamil Nadu**, Deccan, Nilgiris, 1♂2♀1juv., SMFD No. 8851/193 and No. 1084/15; Deccan, 2♀(Fig. 15), 1985, FKCP.

DIAGNOSIS. Total length 35–50 mm. For habitus see Figs. 77–81. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*. Male with fingers proximally twisted, manus and metasomal segments slightly wider than female, and with slightly longer and narrower metasomal segments. Pectinal teeth number 20–24. Chelicerae yellow to green, usually reticulate. Nearly entire body hirsute, pedipalps, dorsal surface of mesosoma, legs, lateral and ventral surfaces of metasomal segments, and vesicle densely hirsute. The

hairs on patella of pedipalps are long. Color uniformly reddish brown to black. Femur of pedipalp with 5 carinae. Dorsal surface of femur granulated. Patella usually with 2 carinae on internal surface, other carinae poorly defined or absent. Chela lacks carinae. Movable fingers of pedipalps with 12 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. Dorsal surfaces of mesosoma and carapace granulated. First to fourth metasomal segments with 10 carinae; fifth segment with 5 carinae. Entire metasoma (except smooth dorsal surface with but a few solitary granules) densely granulated. Granules large, conspicuous, may obscure carinae. Telson also densely granulated. First to third metasomal segments of adult females wider than long. Second to fourth metasomal segment width ratio about 1.1. Length to width ratio of fourth metasomal segment less than 1.2.

COMMENTS. Tikader & Bastawade (1983: 185–188) placed this species together with *H. tamulus* and *H. rugiscutis* in *Mesobuthus*. However, according to Fet & Lowe (2000: 134) the placement of this “Indian lineage” in *Mesobuthus* is uncertain. Lourenço (2000: 192) accepted the transfer of Indian species from *Hottentotta* to *Mesobuthus*, but left the Indian *Hottentotta (Deccanobuthus) geffardi* Lourenço, 2000 in *Hottentotta*. Examination of the holotype (Fig. 79) has shown this taxon to be a synonym of *H. pachyurus* (Fig. 77). In this revision, all Indian species of *Mesobuthus* are moved back to *Hottentotta*.

I originally synonymized *Hemibuthus kraepelini* Roewer, 1943 (Figs. 80 and 81) with *H. rugiscutis* (see Kovařík, 1999: 291). At that time I did not see the types of *H. rugiscutis*, *H. hendersoni*, and *H. pachyurus* and based the synonymy only on published information. Now, upon examination of types of the said taxa and of several hundred other specimens from India I am convinced that *Hemibuthus kraepelini* Roewer, 1943 is a synonym of *H. pachyurus*. The lectotype is being designated in order to stabilize the nomenclature.

DISTRIBUTION: India (Pocock, 1897a: 108).

Hottentotta penjabensis (Birula, 1897) **comb. n.**
(Figs. 82–83)

- Buthus hottentotta* (in part): Kraepelin, 1891: 192 (Birula, 1897: 377).
Buthus alticola forma beta (*penjabensis*) Birula, 1897: 382.
Buthus alticola penjabensis: Kraepelin, 1899: 21; Pocock, 1900a: 22; Kraepelin, 1913: 127; Vachon, 1958: 139.
Buthus (Hottentotta) alticola pendjabensis: Birula, 1914: 654.



Figure 77: *Hottentotta pachyurus*, dorsal view, female lectotype.



Figure 78: *Hottentotta pachyurus*, ventral view, female lectotype.



Figure 79: *Hottentotta pachyurus*, dorsal view, female holotype of *Hottentotta (Deccanobuthus) geffardi*.

Buthus (Hottentotta) alticola pendschabensis: Birula, 1917: 241.

Buthotus alticola penjabensis: Pérez Minocci, 1974: 21.

Buthotus alticola punjabensis: Tikader & Bastawade, 1983: 164.

Hottentotta (Hottentotta) alticola penjabensis: Kovařík, 1998: 109; Fet & Lowe, 2000: 136.

TYPE LOCALITY AND TYPE REPOSITORY. Northern Punjab, India; now Pakistan or India; ZISP.

MATERIAL EXAMINED. **Pakistan**, Baluchistan, Hazarganji Chiltan n. p., 10 km W from Quetta, 18.VII.1998, 2♂1♀, leg. L. Černý, FKCP; Baluchistan, Zhob, VI. 2006, 2♂(Figs. 82–83), leg. Zubair Ahmed, FKCP.

DIAGNOSIS. Total length 60–90 mm. For habitus see Figs. 82–83. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to black, reticulate. Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 29–34 in males, 23–26 in females. Pedipalps and metasoma sparsely hirsute. The hairs on patella of pedipalps are long. Color yellow to yellowish green or brown except black anterior part of carapace and fingers of pedipalps; in some specimens entire carapace and mesosomal segments except seventh tergite may be black (Fig. 82). Femur of pedipalp with 5 carinae,

patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14 or 15 rows of granules and 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second segment with 8 or 10 carinae; third and fourth segments with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal carinae of metasomal segments bear larger terminal granules. Dorsal surface smooth, but fourth and fifth segments bear 2 short, inconspicuous carinae each. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.1.

COMMENTS. Fet & Lowe (2000: 136) state that the type locality is probably in Pakistan, not in India as assumed by previous authors. An occurrence of this species in Pakistan, Quetta, published by Vachon (1959: 139) was based on BMNH specimens. Also, specimens in my collection are from the vicinity of Quetta (Hazarganji Chiltan n. p.). Two males were found by the Pakistani arachnologist Zubair Ahmed at Zhob (Figs. 82–83). The species is known from only a small number of specimens. Vachon (1959: 139) measured an immature male from Quetta (BMNH) at 46 mm, but Tikader & Bastawade (1983: 165) gave length of the same specimen as 50 mm. An adult male collected by Zubair Ahmed is 85 mm long. Total length of 87 mm is given by Birula (1914: 656).



Figure 80: *Hottentotta pachyurus*, dorsal view, male lectotype of *Hemibuthus kraepelini*.



Figure 81: *Hottentotta pachyurus*, ventral view, male lectotype of *Hemibuthus kraepelini*.



Figure 82: *Hottentotta penjabensis*, dorsal view, male from Pakistan, Baluchistan, Zhob, FKCP.



Figure 83: *Hottentotta penjabensis*, ventral view, male from Pakistan, Baluchistan, Zhob, FKCP.



Figure 84: *Hottentotta polystictus*, dorsal view, female holotype.



Figure 85: *Hottentotta polystictus*, dorsal view, female from Kenya, North Horr, FKCP.



Figure 86: *Hottentotta polystictus*, dorsal view, male from Somalia, Oasi di Galgala, MZUF No. 842.

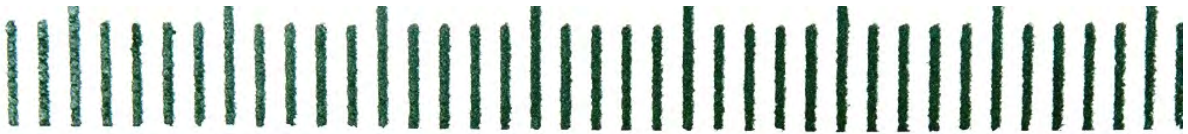


Figure 87: *Hottentotta polystictus*, ventral view, male from Somalia, Oasi di Galgala, MZUF No. 842.

DISTRIBUTION: Pakistan (? Birula, 1897: 382), ? India (? Birula, 1897: 382).

Hottentotta polystictus (Pocock, 1896)
(Figs. 16, 84–87)

Buthus polystictus Pocock, 1896a: 178; Pocock, 1897b: 402; Kraepelin, 1899: 22; Pocock, 1900b: 57; Kraepelin, 1901: 266; Hirst, 1911b: 217; Lönnberg, 1912: 2; Masi, 1912: 96; Kraepelin, 1913: 170; Birula, 1916: 51; Borelli, 1919: 363; Borelli, 1925b: 316; Borelli, 1931: 218; Moriggi, 1941: 87.

Buthus polystictus: Borelli, 1904a: 1.

Buthus emini polystictus: Kraepelin, 1903: 560.

Buthus (Hottentotta) polystictus: Birula, 1915b: 12; Vachon, 1940b: 255; Caporiacco, 1947: 231.

Buthotus polystictus: Vachon & Stockmann, 1968: 99; Probst, 1973: 320; Lamoral & Reynders, 1975: 503; El-Hennawy, 1992: 117.

Hottentotta (Hottentotta) polystictus: Kovařík, 1998: 110; Fet & Lowe, 2000: 142.

Hottentotta polysticta: Kovařík, 2001b: 84.

Hottentotta polystictus: Kovařík, 2003: 140; Kovařík & Whitman, 2005: 107.

TYPE LOCALITY AND TYPE REPOSITORY. Somalia, Goolis Mountains, inland of Berbera; BMNH.

TYPE MATERIAL EXAMINED. **Somalia**, Goolis Mountains, inland of Berbera, 2♀ im. (holotype and paratypes, Fig. 84), leg. E. Lort Phillips, BMNH No. 1895.6.1.46–7.

OTHER MATERIAL EXAMINED. **Ethiopia**, Assab, 2♀ 3ims., 1940, FKCP. **Kenya**, North Horr, 3.IX.2003, 2♀ (Figs. 16 and 85), leg. T. Mazuch, FKCP. **Somalia**, tra Villabruzzi e Bolo Burti, 100 km da Villabruzzi, Staz. 8, 14.VII.1962, 1♂ 1juv., leg. B. Lanza, MZUF No. 837; duna consolidata 4 km da Mogadiscio, 3–4.VII.1962, 1♂ 1♀ 1juv., MZUF No. 836; Vittoria d’Africa, sotto pietra in boscaglia xerofila su duna, 29.IV.1968, 2♀, leg. B. Lanza, MZUF No. 838; Bud Bud, 15.VIII.1968, 5♂ 2♀ 5juvs., MZUF No. 839, 16.VIII.1968, 2♀, MZUF No. 840, 16.–17.VIII.1968, 1♂, MZUF No. 835, 17.VIII.1968, 1♀, MZUF No. 834; Run, valle del Nogal, VIII.1969, 1♀, MZUF No. 841; Oasi di Galgala, X.1973, 2♂ (Figs. 86–87) 14♀ 19juvs. and 21juvs. before first ecdysis, MZUF No. 842; 1♀ (im.), VIII.1968, MZUF No. 952; 1♀ 1juv., circa 1972, MZUF No. 843.

DIAGNOSIS. Total length 40–60 mm, some males may be only 35 mm long. For habitus see Figs. 84–87. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*. Sexual dimorphism not pronounced; manus of pedipalp of approximately same width in both sexes, but males have

fingers of pedipalps slightly twisted. Pectinal teeth number 23–27 in males, 18–22 in females. Chelicerae yellow, without reticulation, only tips of teeth on cheliceral fingers are black. Pedipalps sparsely hirsute. Metasoma with only a few hairs. Color uniformly yellowish brown, only mesosoma and carapace may be black. Femur of pedipalp with 5 carinae that may be incomplete. Patella with 8 carinae, of which some are smooth, without granules and obsolete. Chela lacks carinae but is usually granulate. Movable fingers of pedipalps with 12–14 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment bears 4 well marked ventral carinae, usually with granules. First to third metasomal segments with 10 carinae; fourth segment with 8 or 10 carinae; fifth segment with 5 carinae. All carinae granulated, dorsal carinae bear larger terminal granules. Metasoma very narrow. First metasomal segment of adults usually longer than wide or as long as wide, second metasomal segment always longer than wide. Second to fourth metasomal segment width ratio less than 1.1. Length to width ratio of fourth metasomal segment less than 1.4. Telson bulbous.

DISTRIBUTION: Eritrea, Ethiopia (Kraepelin, 1903: 560; Borelli, 1931: 218; Vachon & Stockmann, 1968: 107), Djibouti (Kraepelin, 1903: 560), Kenya (Lönnberg, 1912: 2), Somalia (Pocock, 1896a: 178), Tanzania (Probst, 1973: 320).

Hottentotta rugiscutis (Pocock, 1897)
(Figs. 88–92)

Buthus rugiscutis Pocock, 1897a: 106; Kraepelin, 1899: 20; Pocock, 1900a: 26; Takashima, 1945: 74; Weidner, 1959: 99.

Buthus (Buthus) rugiscutis: Roewer, 1943: 206.

Buthotus rugiscutis: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91; Kovařík, 1992: 183.

Hottentotta (Hottentotta) rugiscutis: Kovařík, 1998: 110.

Hottentotta rugiscutis: Kovařík, 1999: 291 (in part); Kovařík, 2001b: 83.

Buthus pachyurus: Kraepelin, 1913: 130 (in part).

Buthus pachyurus rugiscutis: Kraepelin, 1913: 130.

Mesobuthus rugiscutis: Tikader & Bastawade, 1983: 229; Fet & Lowe, 2000: 178; Bastawade, 2002: 294.

= *Buthus rugiscutis nigritus* Pocock, 1900a: 27 (syn. by Tikader & Bastawade, 1983: 235).

Hottentotta (Hottentotta) rugiscutis nigritus: Kovařík, 1998: 110.

Buthus pachyurus nigritus: Kraepelin, 1913: 130.

= *Buthus hendersoni* Pocock, 1900a: 26; Kraepelin, 1913: 129; Takashima, 1945: 76. **Syn. n.**

Buthotus hendersoni: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91.

Hottentotta (Hottentotta) hendersoni: Kovařík, 1998: 110.



Figure 88: *Hottentotta rugiscutis*, dorsal view, female lectotype.



Figure 89: *Hottentotta rugiscutis*, ventral view, female lectotype.

Hottentotta hendersoni: Kovařík, 1998: 110; Kovařík, 2001b: 83.

Mesobuthus hendersoni: Tikader & Bastawade, 1983: 223; Fet & Lowe, 2000: 177.

TYPE LOCALITY AND TYPE REPOSITORY. Madras, Yercaud, Cuddapah, Trichinopoly, Tanjore, India; BMNH Nos. 1896.7.30.51–8.

TYPE MATERIAL EXAMINED. **India, Maharashtra**, Mahableshwar, 1♀ (lectotype hereby designated, Figs. 88–89), leg. R.C. Wroughton, BMNH No. 1896.6.13.1–7; **Tamil Nadu**, Madras, Tanjore, 1♀ (lectotype of *Buthus hendersoni* hereby designated, Fig. 90), leg. E. P. Popert, BMNH No. 1896.7.30.50.

OTHER MATERIAL EXAMINED. **India, Andhra Pradesh**, Nellore, Kovour Taluk, 12.IX.1966, 2♀, leg. Elizabeth



Figure 90: *Hottentotta rugiscutis*, ventral view, female lectotype of *Buthus hendersoni*.

Jacob, CASC; Podile, 13.VI.1966, 2♀, 13.II.1967, 1♂, VIII.1967, 2♀, leg. D. E. Johnson, CASC; Merireddy Palem, 12.VII.1966, 1♀24juvs. before first ecdysis, 7.VIII.1966, 1♀, 10.VIII.1966, 1♀, leg. D. E. Johnson, CASC; Kodavalur, 12.IX.1966, 3♀, leg. E. Jacob, CASC; Tharigoppula, 3.VIII.1967, 2♂, leg. A. L. Slater, CASC; **Goa**, near Ponda, II.2005, 1♀ (Fig. 91), leg. V. Fura, FKCP; **Jharkhand**, 6 mi. NE Dhanbad, 250 m., 7.XI.1961, 1♀, leg. E. S. Ross et D. Cavagnaro, CASC; 12 mi. NE Dumka, 200 m., 31.X.1961, 2♀, leg. E. S. Ross et D. Cavagnaro, CASC; **Karnataka**, Shimoga dist., Agumbe ghat, 2000 ft., T.R.S.N., V.2001, 1♂1♀, FKCP; **Kerala**, Walayar forest, V.1960, 1im.2juvs., CASC; **Madhya Pradesh**, Jabalpur, VII.1958, 2♂5♀, leg. P. Susai Nathan, CASC; **Maharashtra**, Ajanta Caves, 500 m., 28.I.1962, 2♀, leg. E. S. Ross & D. O. Cavagnaro, CASC; Bombay, IV.1964, 1♀, leg. F. B. Steiner, CASC; Mahabaleshvar, II.2005, 1♂5♀ (Fig. 92), leg. V. Fura, FKCP; **Pondicherry**, Karaikal, VII.1954, 1♀, II.1961, 2♂3♀, III. 1962, 2♀, leg. P. Susai Nathan, CASC; St. Karikal, P.S.N., V.1968, 1♀, FKCP; Karaikal, T.R.S.N., 2001, 1♀, 2002, 14♀5♂, 2003, 6♂21♀, FKCP; **Tamil Nadu**, Tirunelveli, 3 mi. S. Kuniyur, 50 m., 28.III.1962, 2♂1juv., leg. E. S. Ross & D. Cavagnaro, CASC; 10 mi S Udamalpet, 450 m., 19.III.1962, 5juvs., leg. E. S. Ross & D. Cavagnaro, CASC; Chingleput (now Chengalpattu), 14.IV.1962, 1im., leg. S. Ross & D. Q. Cavagnaro, CASC; Coimbatore, XII.1951, 1♀, IX.1963, 1♀, 12.IX.1966, 2♀, 11.X.1966, 1♂1♀, 10.-14.XI.1966, 1♀1♀(im.), leg. K. N. Banerjee and P. Susai Nathan, CASC; Sethumadai, near Pollachi, 375 m., 18.III.1962, 1juv., leg. E. S. Ross & D. Cavagnaro, CASC; Madras,

II.1993, 1♀, leg. M. Veselý, FKCP; Tamil, 29.IX.1993, 1♀, FKCP; 25 km N Pudukottai, 20.X.1997, 1♂, leg. Werner, FKCP; Batlagundu-Kodaikanal, 22.X.1997, 1♀, leg. Werner, FKCP; North Arcot dist., Tiruvannamalai, T.R.S.N. coll., XII. 2000, 1♂2♀, X. 2001, 3♀, FKCP; Coimbatore Dist, Marudamaiai Hills, 1800 feet, P.S.N. coll., 2001, 1♀, XII.2003, 3♂5♀, XII.2004, 1♂, FKCP; **West Bengal**, Calcutta, 12.I.1967, 1♂, leg. D. N. Santra, CASC.

DIAGNOSIS. Total length 30–60 mm. For habitus see Figs. 88–92. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* or on level with trichobothrium *est*. Male with fingers proximally twisted, manus of pedipalps wider than female. Pectinal teeth number 23–29 in males, 19–26 in females. Chelicerae yellow to green, reticulate, reticulation may be poorly developed in males. Entire body only sparsely hirsute, especially metasomal segments. The hairs on patella of pedipalps are short. Color uniformly yellow to reddish brown. In specimens with darker mesosoma legs always lighter than mesosoma. Femur of pedipalp with 5 carinae. Dorsal surfaces of femur and patella usually granulated. Patella with 2 or 4 carinae on internal surface, no other carinae. Chela lacks carinae. Movable fingers of pedipalps with 12–14 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. Dorsal surfaces of mesosoma and carapace granulated. First to fourth metasomal segments with 10 carinae; fifth segment with 5 carinae. Metasoma densely granulated between carinae except dorsal surface, which is sparsely granulated, usually smooth at center and often bears 2 short,



Figure 91: *Hottentotta rugiscutis*, dorsal view, female from India, Goa, near Ponda, FKCP.



Figure 92: *Hottentotta rugiscutis*, dorsal view, male from India, Maharashtra, Mahabaleshvar, FKCP.

inconspicuous carinae. Granules on ventral and namely lateral surfaces of metasoma large, conspicuous, sometimes obscuring carinae. Telson also densely granulated. Dorsal carinae of metasomal segments bear larger terminal granules. First and second metasomal segments of adults wider than long, but second segment of males may be rarely slightly longer than wide. Third metasomal segment usually longer than wide, but in females may also be wider than long. Second to fourth metasomal segment width ratio is around 1.1. Length to width ratio of fourth metasomal segment less than 1.3.

COMMENTS. Pocock (1897) described *Hottentotta rugiscutis* as *Buthus rugiscutis* and based the species on a pair deposited at BMNH. I examined the female and designate it the lectotype in order to stabilize the taxon.

Pocock (1900) described *Hottentotta hendersoni* as *Buthus hendersoni* on the basis of several specimens deposited at BMNH. I examined a female and designate it the lectotype in order to stabilize the taxon. Pocock (1900: 26) stated that the third metasomal segment of *Buthus hendersoni* is longer than wide, but in the female lectotype (Fig. 90) it is 3.3 mm wide and 3.1 mm long. Examination of both lectotypes and of many other specimens (see material) convinces me that *Buthus hendersoni* is a synonym of *H. rugiscutis*. Pocock (1900) further described the subspecies *Buthus rugiscutis nigritus* from one female, also deposited at BMNH, which he characterized primarily by its color. However, since in reality the color is variable, I agree with Tikader & Bastawade (1983: 235) that that this taxon is also a synonym of *H. rugiscutis*.

DISTRIBUTION: India (Pocock, 1897a: 107).

***Hottentotta salei* (Vachon, 1980) comb. n.**
(Figs. 93–94)

Buthus jayakari salei Vachon, 1980: 255; Vachon & Kinzelbach, 1987: 100; El-Hennawy, 1992: 116.

Hottentotta (Hottentotta) jayakari salei: Kovařík, 1998: 110; Fet & Lowe, 2000: 140.

TYPE LOCALITY AND TYPE REPOSITORY. Oman, Dhofar, Jabal Samhan, Wadi Rabkut; MNHN.

MATERIAL EXAMINED. **United Arab Emirates**, Ras Al Khaimah, env. river dam, 24°59'43.2"N 56°07'00.8"E, 25.XI.2006, 1juv., leg. J. Batelka et H. Pinda, JBCP. **Yemen**, Al Mahra gov., Wadi N of DAMQUT vill., 16°34'20"N 52°50'03"E, 24 m [GPS], 16.–17.X.2005, 1♀1juv. (Figs. 93–94), leg. D. Král, FKCP; Wadi Dawan, NW Al Mukalla, 15°09'N 48°28'E, 946 m., 20.X.2005, 1♀(im.), leg. P. Kabátek, FKCP.

DIAGNOSIS. Total length 65–80 mm. For habitus see Figs. 93–94. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to brown, reticulate. Sexual dimorphism not readily apparent; width of pedipalp chela and metasomal segments same in both sexes, males have fingers of pedipalps somewhat more twisted than females. Pectinal teeth number 37–42 in males, 32–34 in females. Pedipalps densely hirsute, metasoma sparsely hirsute. Carapace, mesosoma, and chela of pedipalps, fourth and fifth metasomal segments and telson yellowish brown to black. Anterior part of carapace with black spot. Femur and patella of pedipalps, legs, and first to third metasomal segments yellow to yellowish green (Fig. 93). Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14–15 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second segment with 8 carinae and lateral median short row of granules; third and fourth segments with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. All metasomal carinae granulated. Dorsal carinae of metasomal segments bear larger terminal granules. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First metasomal segment of adults usually longer than wide or as long as wide, second metasomal segment always longer than wide. Second to fourth metasomal segment width ratio less than 1.1.

COMMENTS. The metasoma is much less hirsute than the pedipalps, but is more hirsute than in the sister species *H. jayakari*. This species was originally described as a subspecies of *H. jayakari*, however the distributions of the two taxons overlap and the species are easily separated by color.

DISTRIBUTION: United Arab Emirates (first report), Oman (Vachon, 1980: 255), Yemen (first report).

***Hottentotta saulcyi* (Simon, 1880)**
(Figs. 17, 95–99)

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

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

Buthus saulcyi: Vachon, 1949: 147 (1952: 233); Vachon, 1958: 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, 1988: 37; El-



Figure 93: *Hottentotta salei*, dorsal view, female from Yemen, Al Mahra gov., Wadi N of Damqut vill., 16°34'20"N 52°50'03"E, FKCP.



Figure 94: *Hottentotta salei*, dorsal view, female from Yemen, Al Mahra gov., Wadi N of Damqut vill., 16°34'20"N 52°50'03"E, FKCP.



Figure 95: *Hottentotta saulcyi*, dorsal view, male from Iran, prov. Bachtarán, Hasrouabad, 34°10'09"N 46°21'56"E, FKCP.



Figure 96: *Hottentotta saulcyi*, ventral view, male from Iran, prov. Bachtarán, Hasrouabad, 34°10'09"N 46°21'56"E, FKCP.



Figure 97: *Hottentotta saulcyi*, dorsal view, female from Iran, prov. Ilám, 30 km NW Ilám, 33°43'N 46°41'E, FKCP.



Figure 98: *Hottentotta saulcyi*, sternocoxal area and pectines, female from Iran, prov. Bachtarán, Bisotul, 34°23'31"N 47°26'05"E, FKCP.



Figure 99: *Hottentotta saulcyi*, dorsal view, male from Iran, prov. Fars, Shiraz, NHMW No. 1842 I.33.

Hennawy, 1992: 118; Kovařík, 1992: 90; Kovařík, 1992: 183; Dupré, Lambert & Gérard, 1998: 70.

Hottentotta saulcyi: Kovařík, 1997a: 40; Crucitti & Vignoli, 2002: 446; Vignoli, Kovařík & Crucitti, 2003: 4; Karatas, 2003: 315.

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.

MATERIAL EXAMINED. **Afghanistan**, Djebel us Saraj, 1♂, det.1990, FKCP. **Iraq**, Bagdad, 1♂, leg. V. Kálalová, NMPC. **Iran**, 115 km östlich von Bandar Abbas, 3.IV.1972, 1juv., leg. K. Bilek, det. R. Farzanpay, NHMW No. 4707; prov. Fars, Shiraz, 1842, leg. Th. Kotschy, 1♂(Fig. 99), NHMW, No. 1842 I.33; 1♀, exp. Nat. Mus. Prague, 1977, NMPC; prov. Hamadán, ca 2000 m, 35 km SE of Hamadán, Gonbad vill. env., 1♀2juvs., 7.-8.V.1996, leg. M. Kaftan, FKCP; prov. Hamadán, Alandže, 1700 m, 34°44'54"N 47°57'52"E, 2♀, 5.-6.X.1998, leg. P. Kabátek, FKCP; prov. Bachtarán, Bisotul, 1300–1600 m, 34°23'31"N 47°26'05"E, 1♂3♀1juv., 6.-8.X.1998, leg. P. Kabátek, 1♀(Figs. 17 and 98), leg. M. Kaftan, FKCP; prov. Bachtarán, Hasrouabad, 1300 m, 34°10'09"N 46°21'56"E, 2♂(Figs. 95–96)1♀1im., 17.-18.X.1998, leg. P. Kabátek, FKCP; prov. Lorestán, Dorūd, 80 km E Horramabad, 33°27'N 49°01'E, 10.VI.1999, 1♂, leg. P. Kabátek, FKCP; prov. Ilám, 1786 m., 30 km NW Ilám, 33°43'N 46°41'E, 7.VII.2004, 1♀(Fig. 97), leg. P. Kabátek, FKCP.

DIAGNOSIS. Total length 75–120 mm, males usually smaller than females. For habitus see Figs. 95–99. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 28–36 in males, 24–29 in females. Nearly entire body hirsute, pedipalps, dorsal surface of mesosoma, legs, lateral and ventral surfaces of metasomal segments, and vesicle densely hirsute. The hairs on patella of pedipalps are long. Chelicerae black, reticulate. Color yellow to yellowish green or brown, except black anterior part of carapace, telson and fifth metasomal segment. Ventral carinae on third and fourth metasomal segments may be also black. Femur of pedipalp with 5 carinae. Patella with 4–8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 14–16 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second and third segments with 8 or 10 carinae; fourth segment with 6–10 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Carinae of metasomal segments often smooth. All metasomal segments smooth, without granules between carinae. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. This species has movable fingers of pedipalps with 5 or 6 terminal granules. One examined male from Iran has only 4 terminal granules on the right movable finger and 5 on the left movable finger. I have not found 4 terminal granules in any other specimen of

Hottentotta and consider the missing granule to be an aberration without any taxonomic value.

Pectinal teeth number 28 in one male from Iraq, 30 and 32 in a male from Afghanistan, and 32–34 in males from Iran.

The oldest examined specimen is an NHMW male from Iran (Shiraz), which has been in alcohol since 1842 and as a result lacks all dark spots (Fig. 99). Also its chelicerae are now yellow, without reticulation, and the dense pubescence characteristic of this species has been lost. These consequences of long preservation in alcohol must be taken into account in study of older specimens.

DISTRIBUTION: Afghanistan (Kovářík, 1997a: 40), Iraq (Simon, 1880a: 379), Iran (Vachon, 1966: 210), and Turkey (Crucitti & Vignoli, 2002: 446). Record for Syria (Kinzelbach, 1985; El-Hennawy, 1992: 118) must be considered dubious.

Hottentotta scaber (Ehrenberg, 1828)

(Figs. 100–104)

Androctonus (Prionurus) scaber Ehrenberg in Hemprich & Ehrenberg, 1828: pl. 2, fig. 7; Hemprich & Ehrenberg, 1829: 359; Hemprich & Ehrenberg, 1831: 10; Moritz & Fischer, 1980: 323; Braunwalder & Fet, 1998: 32.

Scorpio (Androctonus) scaber: Gervais, 1844b: 46.

Buthus scaber: Karsch, 1879a: 9; Pavesi, 1885: 197; Pocock, 1891: 241; Kraepelin, 1895: 82; Kraepelin, 1899: 19; Kraepelin, 1901: 266; Pocock, 1903b: 215; Borelli, 1915: 459; Pérez Minocci, 1974: 43; Moriggi, 1941: 84; Whittick, 1971: 2.

Buthus (Hottentotta) scaber: Birula, 1914: 654; Birula, 1917: 214; Caporiacco, 1947: 230.

Buthus scaber: Vachon, 1958: 134; Pringle, 1960: 82; Khalaf, 1963: 65; Vachon, 1966: 210; Vachon & Stockmann, 1968: 91; Probst, 1973: 329; Lamoral & Reynders, 1975: 503; Vachon, 1977: 211; El-Hennawy, 1992: 118.

Hottentotta scaber: Sissom, 1994: 36; Kovářík, 2001a: 44; Kovářík, 2003: 140; Kovářík & Whitman, 2005: 108.

Hottentotta (Hottentotta) scaber: Kovářík, 1998: 110; Fet & Lowe, 2000: 143.

? *Buthus gibbosus* (in part): Kraepelin, 1891: 193.

= *Buthus dimidiatus* Simon, 1882: 244; Simon, 1889: 122; Pocock, 1895: 293, 316; Simon, 1890: 122; Lamoral & Reynders, 1975: 505 (syn. by Pocock, 1891: 241).

Buthus scaber dimidiatus: Pocock, 1903b: 215.

Buthus (Hottentotta) scaber dimidiatus: Birula, 1910: 171; Birula, 1917: 230; Birula, 1937: 101.

TYPE LOCALITY AND TYPE REPOSITORY. Arkiko, Abyssinia; ZMHB.

TYPE MATERIAL EXAMINED. ? **Eritrea**, Arkiko (Abyssinia), 2♀ (lectotype hereby designated and paralectotype, Fig. 104) leg. Ehrenberg, ZMHB No. 130.

OTHER MATERIAL EXAMINED. **Saudi Arabia**, island *Seir Farasān Kebir*, spiaggia e duna zona NE della Janāba Bay, 1.IV.1984, 1♀, leg. B. Lanza, MZUF No. 1108.

Yemen, XI.1999, 2♀(ims.)2juvs., leg. K. Šťastný, FKCP; Al Mahwit env., wadi sari, 15°25'56"N 43°28'58"E, 840 m., 18.XI.2003, 3juvs., leg. Petr Kabátek and David Král, FKCP; S Nuqbah (S Habbān), 18°04'N 51°31'E, 970 m., 22.X.2005, 3juvs., leg. P. Kabátek, FKCP; Shabwah gov., 22.X.2005, S of An Nuqbah, Al Aram vill., 14°13'48"N 47°04'59"E, 970 m., 1juv., leg. D. Král, FKCP; Abyan gov., 22.–23.X.2005, Lawdar env., 13°52'36"N 45°48'01"E, 1151 m., 1♂1♀ (Figs. 100–103), leg. D. Král, FKCP; Al Mahwit gov., Al Mahwit SW env., by road, 15°25'49"N 43°28'59"E, 841 m., 1.–2.XI.2005, 1♀, leg. D. Král, FKCP.

DIAGNOSIS. Total length 60–85 mm. For habitus see Figs. 100–104. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Chelicerae yellow to black, reticulate. Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 34–37 in males, 28–33 in females. Pedipalps and legs densely hirsute, metasoma sparsely hirsute, fifth metasomal segment more hirsute than first. The hairs on patella of pedipalps are long. Carapace, mesosoma except seventh tergite (or its posterior part), fifth metasomal segment and telson black. First three metasomal segments, legs and pedipalps including fingers uniformly pale yellow. Ventral carinae on metasomal segments also black. Femur of pedipalp with 5 carinae, patella with 8 carinae, chela lacks carinae. Movable fingers of pedipalps with 14–15 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First and second metasomal segments with 10 carinae; third and fourth segments with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. All metasomal carinae granulated. Dorsal carinae of metasomal segments bear larger terminal granules. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First and second metasomal segments of both sexes wider than long. Second through fourth metasomal segment width ratio in both sexes = 1.26–1.30.

COMMENTS. The lectotype is being designated in order to stabilize the nomenclature. Both type females are immatures and therefore have metasomal segments narrower than examined adults from Yemen.

H. scaber has three characters unusual for the genus. It differs from all other species in coloration, with



Figure 100: *Hottentotta scaber*, dorsal view, male from Yemen, Abyan gov., Lawdar env., 13°52'36"N 45°48'01"E, FKCP.



Figure 101: *Hottentotta scaber*, ventral view, male from Yemen, Abyan gov., Lawdar env., 13°52'36"N 45°48'01"E, FKCP.



Figure 102: *Hottentotta scaber*, dorsal view, female from Yemen, Abyan gov., Lawdar env., 13°52'36"N 45°48'01"E, FKCP.



Figure 103: *Hottentotta scaber*, ventral view, female from Yemen, Abyan gov., Lawdar env., 13°52'36"N 45°48'01"E, FKCP.

the carapace, mesosoma, the fifth metasomal segment and telson black and all other parts pale yellow (Figs. 100–103). Exceptional is also the combination of densely hirsute pedipalps and sparsely hirsute metasoma, which indicates closeness to *H. jayakari* and *H. salei* inhabiting the same areas. Most unusual are the very broad first and second metasomal segments in relation to the fourth metasomal segment, namely in females (Figs. 100–103). This unusual feature is otherwise present only

in *H. jalalabadensis* **sp. n.** (Figs. 56–59), which is easily distinguished by other noted characters (pubescence and color).

DISTRIBUTION: Eritrea, Ethiopia (Hemprich & Ehrenberg, 1829: 359; Birula, 1917: 214), Saudi Arabia (Birula, 1914: 654), and Yemen (Simon, 1890: 122). Records from Egypt (Vachon & Stockmann 1968) and Iraq (Khalaf, 1963: 65) must be considered dubious.

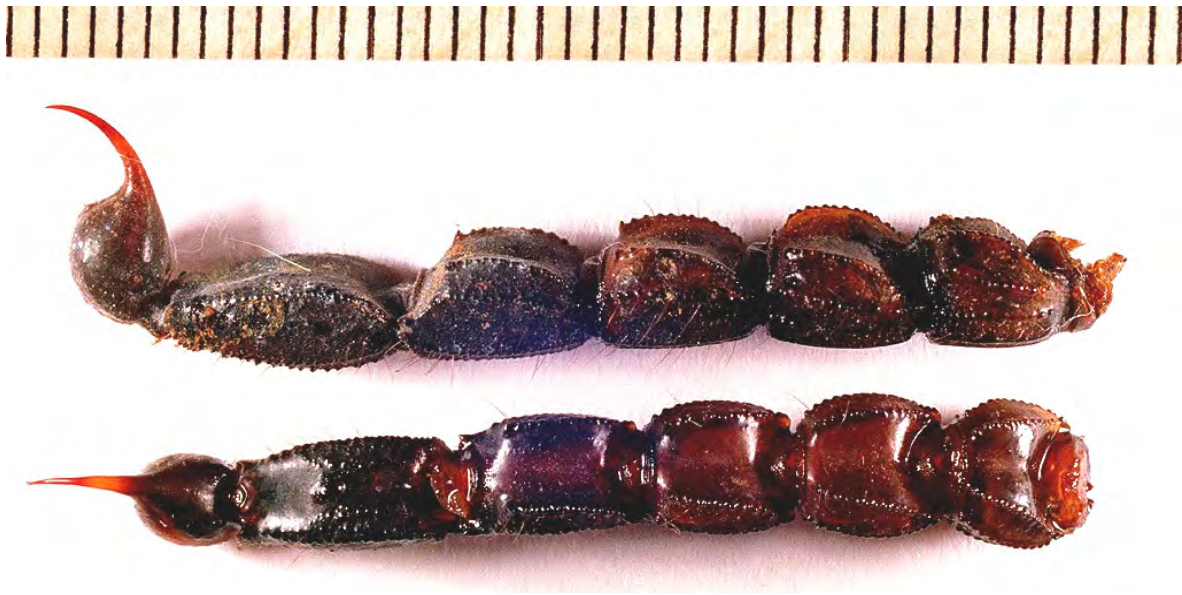


Figure 104: *Hottentotta scaber*, metasomas, females lectotype and paralectotype.

Hottentotta schach (Birula, 1905)
(Figs. 18, 105–106)

Buthus schach Birula, 1905: 134.

Buthus (Hottentotta) schach: Birula, 1914: 652; Birula, 1917: 214; Birula, 1918: 31.

Buthotus schach: Vachon, 1949: 147 (1952: 233); Vachon, 1958: 134; Vachon, 1966: 211; Vachon & Stockmann, 1968: 91; Habibi, 1971: 43; Pérez Minocci, 1974: 20; Farzanpay, 1988: 37; El-Hennawy, 1992: 118.

Hottentotta schach: Farzanpay & Pretzmann, 1974: 215; Kovařík, 1997a: 40.

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

TYPE LOCALITY AND TYPE REPOSITORY. Dech-i-Dis (now Dehdez), Arabistan (now Khuzestan Province, Iran); ZISP.

MATERIAL EXAMINED. **Iran**, Pass 160 km NE Shiraz, 20.IV.1970, 1♀(im.)1juv., leg. Pietzmann and Bilek, det. R. Farzanpay, NHMW No. 3401; Fars prov., alt. ca 1700m, 10 km E of Sivand vill., 29–30.IV.1996, 2♀(Figs. 18, 105–106), leg. M. Kaftan, 1♂, leg. V. Šejna, FKCP.

DIAGNOSIS. Total length 100–130 mm. For habitus see Figs. 105–106. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* (Fig. 1). Male with slightly longer and narrower metasomal and pedipalp segments, width of pedipalp chela same in both sexes. Pectinal teeth number 33–35 in males, 26–29 in females. Nearly entire body hirsute, pedipalps, dorsal surface of mesosoma, legs, lateral and ventral surfaces

of metasomal segments, and vesicle densely hirsute. The hairs on patella of pedipalps are long. Color yellowish green except black patella and chela of pedipalps, anterior part of carapace, telson and fourth and fifth metasomal segments. Ventral surfaces of second and third metasomal segments may be also black. Chelicerae black, reticulate. Femur of pedipalp with 5 carinae. Patella with 8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 15 or 16 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First metasomal segment with 10 carinae; second segment with 8 or 10 carinae; third segment with 8 carinae and a short row of granules in center of lateral part; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal. Dorsal surface smooth, fifth metasomal segment bears 2 short, inconspicuous carinae. First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

COMMENTS. This is the largest species of the genus.

DISTRIBUTION: Iraq (Vachon, 1966: 211), Iran (Birula, 1905: 134).

Hottentotta socotrensis (Pocock, 1889)
(Figs. 4, 107–111)

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

Buthus socotrensis Pocock, 1889: 337; Kraepelin, 1899: 20; Pocock, 1903a: 178; ? Borelli, 1915: 460; Strand, 1916: 49.

Buthus (Buthus) socotrensis: Pocock, 1890a: 126; Birula, 1917: 213, 229.



Figure 105: *Hottentotta schach*, dorsal view, female from Iran, prov. Fars, 10 km E of Sivand vill., FKCP.



Figure 106: *Hottentotta schach*, ventral view, female from Iran, prov. Fars, 10 km E of Sivand vill., FKCP.

Buthus hottentotta socotrensis: Lönnberg, 1897: 183.

Buthotus (Balfourianus) socotrensis: Vachon, 1979: 233.

Buthotus socotrensis: Probst, 1973: 329.

Hottentotta (Balfourianus) socotrensis: Kovařík, 1998: 111; Fet & Lowe, 2000: 145; Lourenço, 2004: 211.

Hottentotta socotrensis: Kovařík, 2000: 64; Šťastný, Kovařík & Bejček, 2000: 64; Kabátek, Kovařík & Král, 2005: 73.

TYPE LOCALITY AND TYPE REPOSITORY. Socotra Island; BMNH.

MATERIAL EXAMINED. Yemen, **Socotra** Island, XI.1999, 5♂13♀(Fig. 107)7juvs., leg. K. Šťastný, III.2000, 3♂8♀3ims.4juvs., leg. K. Šťastný, FKCP; Ayhaft, 3.IX.2000, 1juv., leg. V. Bejček & K. Šťastný, FKCP; Firmihin, 12°47'N 54°01'E, 530 m., X.2000, 1♂1♀1juv.,



Figure 107: *Hottentotta socotrensis*, dorsal view, female and male from Yemen, Socotra Island, FKCP.

leg. V. Bejček & K. Šťastný, FKCP; Noged, 12°31'N 53°67'E, 250 m., 12.–13.XI.2000, 1♀, leg. V. Bejček & K. Šťastný, FKCP; Calanthia, 29–30.III.2001, 2♂ (Figs. 108–109), leg. V. Bejček & K. Šťastný, FKCP; Hadiboh env., ca 10–100 m., 12°65'02"N 54°02'04"E, 21.XI.–12.XII.2003, 2♂2♀ (Figs. 110–111) 2ims., leg. P. Kabátek & D. Král, FKCP; Wadi Hoq, 54 m., 12°41'32"N 54°01'35"E, 22.XI.2003, 1♀, leg. D. Král, FKCP; Suq, sand dune, 20–170 m., 12°40'02"N 54°03'45"E, 22.XI.2003, 1♀1juv., leg. D. Král, FKCP; Gubbah vill. env., 7 m., 12°36'35"N 53°46'56"E, 23.XI.2003, 1♂1juv., leg. D. Král, FKCP; Wadi Ayhaft, 190 m., 12°36'38"N 53°58'49"E, 24.–26.XI.2003, 1♂4♀5ims.5juvs., leg. P. Kabátek & D. Král, FKCP; Wadi Deneghen, 85 m., 12°36'55"N 54°03'49"E, 27.XI.2003, 1♀, leg. D. Král, FKCP; Qaariah vill. env., 11 m., 12°38'05"N 54°12'39"E, 28.XI.2003, 1♀, leg. D. Král, FKCP; Homhil protected area, 364 m., 12°34'27"N 54°18'32"E, 28.–29.XI.2003, 1♂, leg. D. Král, FKCP; Wadi Shederhed, 290 m., 12°36'11"N 54°08'07"E, 30.XI.2003, 1juv., leg. D. Král, FKCP; Dixam plateau, Sirhin area, 812 m., 12°31'08"N 53°59'09"E, 1.–2.XII.2003, 1♀1juv., leg. D. Král, FKCP; Al Haghier mts., W slopes, Skant area, 12°35'52"N 54°00'01"E, 1240 m., 2.XII.2003, 1♀, leg. D. Král, FKCP; Dixam

plateau, Firmihin area, 428 m., 12°47'40"N 54°01'53"E, 3.XII.2003, 2juvs., leg. D. Král, FKCP; Ba'a vill. env., 234 m., 2°32'19"N 54°10'41"E, 5.XII.2003, 2♀1juv., leg. D. Král, FKCP; Noged plain, Qaareh (waterfall), 57 m., 12°20'10"N 53°37'56"E, 5.–6.XII.2003, 1im.2juvs., leg. D. Král, FKCP; Noged plain, sand dunes, 11 m., 12°21'09"N 54°01'47"E, 5.–6. XII.2003, 1♂, leg. D. Král, FKCP; Noged plain, Wadi Ireeh, 95 m., 12°23'11"N 53°59'47"E, 6.–7.XII.2003, 1im.2juvs., leg. D. Král, FKCP; Qalansiyah env., Ditwah (lagoon), 23 m., 12°41'42"N 53°30'08"E, 9.XII.2003, 1♀1juv., leg. D. Král, FKCP; Qalansiyah env., Khayra mts., N slopes, 12°38'50"N 53°27'45"E, 85–592 m., 9.–10. XII.2003, 1♀1juv., leg. D. Král, FKCP.

DIAGNOSIS. Total length 60–80 mm. For habitus see Figs. 107–110. Trichobothrium *db* on the fixed finger of pedipalp located between trichobothria *et* and *dt* or on level with trichobothrium *et* (Fig. 4). Male metasomal and pedipalp segments longer and narrower, fingers of pedipalps slightly twisted, vesicle narrower (female vesicle markedly inflated). Pectinal teeth number 27–32 in males, 22–26 in females. Entire body only sparsely hirsute, especially metasomal segments. Color yellow to yellowish brown, only front parts of carapace, fingers



Figure 108: *Hottentotta socotrensis*, dorsal view, male from Yemen, Socotra Island, Calanthia, FKCP.



Figure 109: *Hottentotta socotrensis*, ventral view, male from Yemen, Socotra Island, Calanthia, FKCP.



Figure 110: *Hottentotta socotrensis*, dorsal view, female from Yemen, Socotra Island, Hadiboh env., 12°65'02"N 54°02'04"E, FKCP.

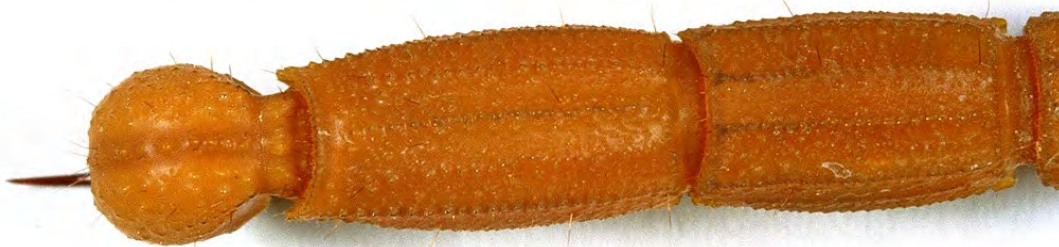


Figure 111: *Hottentotta socotrensis*, dorsal view of fourth and fifth metasomal segments, female from Yemen, Socotra Island, Hadiboh env., 12°65'02"N 54°02'04"E, FKCP.

and chelicerae black. Chelicerae reticulate. Femur of pedipalps with five carinae, patella with eight carinae. Most carinae smooth, often indistinct, with only a few granules. Chela lacks carinae. Movable fingers of pedipalps with 14 or rarely 15 rows of granules and 5 or 6 terminal granules. Seventh metasomal segment with four well defined ventral carinae. First to fourth metasomal segments with 10 carinae. Fifth metasomal segment with 7 carinae, 5 ventral (3 median, 2 lateral)

and 2 dorsal, any of which may be indistinct. First metasomal segment of female may be wider than long, in male is always longer than wide. Second metasomal segment always longer than wide. Second to fourth metasomal segment width ratio less than 1.2.

DISTRIBUTION: Yemen: Socotra Islands (Pocock, 1889: 337). Record for Aden (Borelli, 1915: 460) must be considered dubious.

***Hottentotta stockwelli* sp. n**
(Figs. 112–113, 148–153, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. India, Andhra Pradesh, Gooty; FKCP.

TYPE MATERIAL. **India, Andhra Pradesh**, Gooty, 1♀ (holotype, Figs. 112–113), II.2005, leg. V. Fura, FKCP. **Maharashtra**, Bombay env., 1♂ (allotype), collector unknown, FKCP.

ETYMOLOGY. Named after Dr. Scott A. Stockwell, who has contributed to our knowledge of scorpions in many areas.

DIAGNOSIS. Total length 41–50 mm. For habitus see Figs. 112–113. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est*, near *est*. Male with fingers proximally twisted, manus and metasomal segments wider than female, Pectinal teeth number 24–25. Chelicerae yellow to green, without reticulation. Entire body only sparsely hirsute, especially metasomal segments. The hairs on patella of pedipalps are short. Color uniformly yellow to yellowish brown. Metasomal carinae may be black. Femur of pedipalp with 5 carinae. Dorsal surfaces of femur and internal surface of patella granulated. Patella with 2 or 4 carinae on internal surface, no other carinae. Chela lacks carinae. Movable fingers of pedipalps with 14 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral granulated carinae. Dorsal surfaces of mesosoma and carapace densely granulated. First to third metasomal segments with 10 carinae; fourth segment with eight carinae and a short row of granules in the center of lateral part; fifth segment with 5 carinae. Metasoma granulated between carinae except dorsal surface, which is sparsely granulated, usually smooth at center and often bears 2 short, inconspicuous carinae. Telson also granulated. Dorsal carinae of metasomal segments bear larger terminal granules. First metasomal segment of adults wider than long, but second and third metasomal segment longer than wide in both sexes. Second to fourth metasomal segment width ratio is around 1.1. Length to width ratio of fourth metasomal segment around 1.4–1.5.

DESCRIPTION: Total length 41 (male allotype)–50 (female holotype) mm. The habitus is shown in Figs. 112–113. Measurements of the carapace, telson, segments of the metasoma and of the pedipalps, and numbers of pectinal teeth in the holotype and allotype are given in Table 1. Trichobothrium *db* on the fixed finger of pedipalp is situated between trichobothria *et* and *est* (Fig. 1), nearly on the same level as trichobothrium *est*. Pectinal teeth number 24–25 in male

and 24–24 in female. Chelicerae yellow to green, without reticulation, only tips of teeth on fingers of chelicerae are black. The male with fingers proximally twisted, manus and metasomal segments wider than female, long of the metasomal segments is the same in both sexes.

COLORATION: Color uniformly yellow to yellowish brown. Mesosomal segments usually with orange posterior band. Metasomal carinae may be black as well.

MESOSOMA AND CARAPACE: The mesosoma has three carinae on the dorsal surface and two carinae on the ventral surface with the exception of the seventh segment, whose ventral surface bears four well marked carinae. The dorsal surface is densely granulated (granules take up more space than the gaps between them), whereas the ventral surface is smooth.

PEDIPALPS: The pedipalps are hirsute, but not densely. The hairs are short. The femur of pedipalps has five carinae and the dorsal surface is covered by granules. Patella with 2 or 4 carinae and granules on internal surface, no other carinae. Chela lacks carinae. Movable fingers of pedipalps with 14 rows of granules and 5 terminal granules.

METASOMA AND TELSON: The first metasomal segment of both sexes is always wider than long, but the second and third metasomal segments longer than wide in both sexes. The first to third segments bear 10 carinae, the fourth segment bears eight carinae and a short row of granules in the center of lateral part, and the fifth segment bears only five carinae. Metasoma granulated between carinae except dorsal surface, which is sparsely granulated, usually smooth at center and often bears 2 short, inconspicuous carinae. Telson also granulated. Dorsal carinae of metasomal segments bear larger terminal granules. Second to fourth metasomal segment width ratio is around 1.1. Length to width ratio of fourth metasomal segment around 1.4–1.5 (see Table 1).

COMMENTS. Since the examined male is mounted dry, I therefore designate a female preserved in alcohol as the holotype.

AFFINITIES. The described features distinguish *H. stockwelli* sp. n. from all other species of the genus. They are recounted in the key below. *H. stockwelli* sp. n. is closest to *H. finneganae* sp. n. from Pakistan. Apart from the number of rows of granules on the movable fingers (see key), which may be found to some degree to be variable in newly discovered specimens, the two species differ in the granulation of mesosomal segments, with the granules markedly larger and much more dense in *H. stockwelli* (granules take up more space than the



Figure 112: *Hottentotta stockwelli*, **sp. nov.**, dorsal view, female holotype.



Figure 113: *Hottentotta stockwelli*, **sp. nov.**, ventral view, female holotype.

gaps between them). Also the hair cover of the pedipalps is different, denser and much shorter in *H. stockwelli* sp. n. These two species are similar to the widely distributed *H. rugiscutis*, with which they share size and number of teeth in the pecten. However, they have markedly narrower metasoma, in which the second segment of both sexes is longer than wide (see Table 1 and Figs. 88 and 112).

As to the pubescence of pedipalps, it should be added that three Indian species (*H. rugiscutis*, *H. stockwelli* sp. n. and *H. tamulus*) have the patella densely covered by short hairs with scattered sparse long hairs. All other species of *Hottentotta* have only long hairs on the patella, either dense or sparse.

***Hottentotta syrticus* (Borelli, 1914), nomen dubium**

Buthus syrticus Borelli, 1914: 156; Borelli, 1934: 172; Caporiacco, 1937: 350; Vachon, 1949: 162 (1952: 248); Pérez Minocci, 1974: 22.

Buthotus syrticus: El-Hennawy, 1992: 118.

Hottentotta (Hottentotta) syrticus: Kovařík, 1998: 110; Fet & Lowe, 2000: 144.

TYPE LOCALITY AND TYPE REPOSITORY. Libya, Homs, type lost (MCSN).

COMMENTS. The MCSN holotype (a male) could not be located and no additional specimens are known. The original description causes me to suspect that it could be a synonym of *H. minax* or *H. niloticus*, however since Libya has been fairly well surveyed and no *Hottentotta* found, it is also possible that the locality is wrong or the name is a synonym of some *Buthus*. This species was transferred to *Buthotus* (= *Hottentotta*) only formally by El-Hennawy (1992: 118) and the only indication to justify the act was that Borelli (1914: 156) compared it to *Buthus hottentotta*.

DISTRIBUTION: Libya (Borelli, 1914: 158).

***Hottentotta tamulus* (Fabricius, 1798)**
(Figs. 19, 114–120)

Scorpio tamulus Fabricius, 1793: 152 (nomen nudum); Fabricius, 1798: 294; Herbst, 1800: 85; Kraepelin, 1891: 228; Zimsen, 1964: 638.

Buthus tamulus: Pocock, 1900a: 23; Kraepelin, 1905: 195; Simon, 1905: 160; Takashima, 1945: 76; Tolunay, 1959: 368; Khatoon, 1986: 645.

Buthus (Hottentotta) tamulus: Birula, 1914: 654; Birula, 1917: 214.

Buthotus tamulus: Vachon, 1949: 147 (1952: 233); Vachon & Stockmann, 1968: 91; Pérez Minocci, 1974: 21; Kovařík, 1992: 183.

Mesobuthus tamulus: Hjelle, 1990: 48; Simard & Watt, 1990: 419; Dupré, Lambert & Gérard, 1998: 70; Fet & Lowe, 2000: 179; Khatoon, 1999: 212.

Hottentotta (Hottentotta) tamulus: Kovařík, 1998: 110.

Hottentotta tamula: Kovařík, 2001b: 84; Kovařík, 2002: 8.

Hottentotta tamulus: Kovařík & Whitman, 2005: 108.

Buthus tamulus typicus: Pocock, 1900a: 24.

Mesobuthus tamulus tamulus: Tikader & Bastawade, 1983: 216; Bastawade, 1992: 221; Bastawade, 1994: 435; Fet & Lowe, 2000: 179; Bastawade, 2002: 294.

= *Buthus nigro lineatus* Dufour, 1856: 570 (syn. by Kraepelin, 1899: 20).

Buthus nigrolineatus: Kraepelin, 1905: 196.

= *Buthus grammurus* Thorell, 1889: 567; Kraepelin, 1899: 20; Kraepelin, 1901: 267; Kraepelin, 1913: 128; Roewer, 1929: 611; Vachon, 1940b: 248 (syn. by Pocock, 1900a: 23).

Buthus (Buthus) grammurus: Roewer, 1943: 206.

Buthus martensii: Pocock, 1889: 335; Pocock, 1890b: 236 (in part); Pocock, 1893: 303; Kraepelin, 1895: 82 (in part) (syn. by Pocock, 1900a: 23).

= *Buthus tamulus concanensis* Pocock, 1900a: 25. **Syn. n.**

Mesobuthus tamulus concanensis: Tikader & Bastawade, 1983: 188; Fet & Lowe, 2000: 179; Bastawade, 2002: 294.

Hottentotta (Hottentotta) tamulus concanensis: Kovařík, 1998: 110.

= *Buthus tamulus indicus* Pocock, 1900a: 25; Birula, 1917: 241. **Syn. n.**

Buthotus tamulus indicus: Pérez Minocci, 1974: 21.

Mesobuthus tamulus indicus: Tikader & Bastawade, 1983: 194; Fet & Lowe, 2000: 180.

Hottentotta (Hottentotta) tamulus sindica: Kovařík, 1998: 110.

= *Buthus tamulus gujaratensis* Pocock, 1900a: 25. **Syn. n.**

Buthotus tamulus gujaratensis: Pérez Minocci, 1974: 22.

Mesobuthus tamulus gujaratensis: Tikader & Bastawade, 1983: 201; Fet & Lowe, 2000: 180.

Hottentotta (Hottentotta) tamulus gujaratensis: Kovařík, 1998: 110.

= *Buthus tamulus gangeticus* Pocock, 1900a: 25; Kraepelin, 1913: 129. **Syn. n.**

Buthotus tamulus gangeticus: Pérez Minocci, 1974: 22.

Mesobuthus tamulus gangeticus: Tikader & Bastawade, 1983: 208; Fet & Lowe, 2000: 180.

Hottentotta (Hottentotta) tamulus gangeticus: Kovařík, 1998: 110.

TYPE LOCALITY AND TYPE REPOSITORY. India orientalis; original type lost. Neotype from India, Maharashtra, Bombay env., hereby designated; NMPC.



Figure 114: *Hottentotta tamulus*, dorsal view, male lectotype of *Buthus tamulus concanensis*.



Figure 115: *Hottentotta tamulus*, ventral view, male lectotype of *Buthus tamulus concanensis*.

TYPE MATERIAL EXAMINED. **India, Gujarat**, Karaghora in Kattywar 1♀ (lectotype of *Buthus tamulus gujaratensis* Pocock, 1900 hereby designated, Figs. 116–117) 1♀ (paralectotype of *Buthus tamulus gujaratensis* Pocock, 1900), leg. H. Buckley, BMNH No. 1896.7.30.44–46; **Maharashtra**, Bombay env., 1965, 1♂ (neotype of *Scorpio tamulus* Fabricius, 1793 hereby designated, Fig. 118), NMPC; Ratnágiri, South Konkan, 1♂ (lectotype of *Buthus tamulus concanensis* Pocock,

1900 hereby designated, Figs. 114–115), 1♀ (paralectotype of *Buthus tamulus concanensis* Pocock, 1900), leg. W. H. Drew, BMNH No. 1896.7.30.6–16; **Uttar Pradesh**, Dehra Dun, 1♂ (lectotype of *Buthus tamulus gangeticus* Pocock, 1900 hereby designated) 3♀2juvs. (paralectotypes of *Buthus tamulus gangeticus* Pocock, 1900), leg. A. V. Kembal, BMNH No. 1896.10.20.34–39. **Pakistan**, Khalat frontier in Upper Sind, 1♂ (No. 946, lectotype of *Buthus tamulus indicus*



Figure 116: *Hottentotta tamulus*, dorsal view, female lectotype of *Buthus tamulus gujaratensis*.



Figure 117: *Hottentotta tamulus*, ventral view, female lectotype of *Buthus tamulus gujaratensis*.

Pocock, 1900 hereby designated, Fig. 119) 2♂3♀ (paralectotypes of *Buthus tamulus indicus* Pocock, 1900), leg. A. V. Kemball, BMNH No. 1896.10.20.728–33.

OTHER MATERIAL EXAMINED. **India**, Lanooli, 1♂3♀, 10.XII.1911, leg. Löw-Ber, SMFD Nos. 5251 and 5260; Dekan, Nilgiris, 1im., SMFD No. 8851/193; Dekan, Anamalei, 1juv., SMFD No. 8852/194; mouth of



Figure 118: *Hottentotta tamulus*, ventral view, male neotype.



Figure 119: *Hottentotta tamulus*, dorsal view, male lectotype of *Buthus tamulus indicus*.



Figure 120: *Hottentotta tamulus*, dorsal view, female from India, Behr, Mongyo Dist., FKCP.

a river Ganga, 1♂4♀, leg. Šmala, NMPC; N. India, Behr, Mongyo Dist., 2♂2♀(Fig. 120)1juv., FKCP; **Andhra Pradesh**, 2 mi W Narkatpalli, 800 m, 7.XI.1962, 1juv., leg. E. S. Ross et D. Cavagnaro, CASC; Gandavaram, 2.IX.1966, 1♀, leg. E. Jacob, CASC; Nellore, Kovur Taluk, 11.IX.1966, 4♀, 12.IX.1966, 3♀, leg. E. Jacob, CASC; Podile, 10.VIII.1966, 1♀, 13.II.1967, 1♀20juvs before first ecdysis, 23.VIII.1967, 1♂1♀, leg. D. E. Johnson, CASC; Kandukur env., IX.1980, 2♂4♀, leg. P. Rojek, FKCP; ? **Andhra Pradesh**, Tharigoppula, 2.VII.1967, 1im., 3.VIII.1967, 2♀1juv., leg. A. L. Slater, CASC; Merireddy Palem, 7.VIII.1966, 1♂, 10.VIII.1966, 1♀, 12.VII.1966, 1♀, leg. D. E. Johnson, CASC; Hanamkonda, 10.VIII.1967, 1juv., leg. E. Wiebe, CASC; **Bihar**, 3 mi. N Kodarma, 440 m., 12.XI.1961, 1♀2juvs., leg. E. S. Ross et D. Cavagnaro, CASC; **Gujarat**, Bhuj-Hill, Desert of Kutch, X.1970, 1♀, leg. M. S. Dubale, CASC; **Jharkhand**, 12 mi. NE Dumka, 200 m., 31.X.1961, 1♀1♀(im.)5juvs., leg. E. S. Ross et D. Cavagnaro, CASC; Dhanbad env., XI.1980, 1♀, leg. P. Rojek, FKCP; Deoghar env. X.1980, 2♀, leg. P. Rojek, FKCP; **Madhya Pradesh**, 5 mi SW Manpur, 480 m., 13.I.1962, 2juvs, leg. E. S. Ross et D. Cavagnaro, CASC; 21 mi from Damoh, 15.VII.1965, 1♀, leg. S. N. Banerjee, CASC; **Maharashtra**, 3 mi NW Sinnar, 700 m., 16.I.1962, 1juv., leg. E.S.Ross et D. Cavagnaro, CASC; Khandala, 500 m., 19.I.1962, 1juv, CASC; Daulatabad, 625 m., 27.I.1962, 1im., leg. E. S. Ross et D. Cavagnaro, CASC; 3 mi W Edalabad, 240 m., 28.I.1962, 2♀(ims.)1juv., leg. E. S. Ross et D. Cavagnaro, CASC; 5 mi SE Indapur, 450 m., 9.II.1962, 1♀(im.), leg. E. S. Ross & D. O. Cavagnaro, CASC; Dekan, Bombay 6♂18♀17juvs., SMFD No. 327/1; Bombay env., 1965, 1♂, FKCP; Bombay, IV.1980, 1♀(Fig. 19), leg. P. Rojek, FKCP; S. Poona, 5 km N Sartara, 11.VII.1996, 2♀, leg. Werner & Lorenz, FKCP; **Pondichery**, Karaikal, 31.V.1951, 1juv., 16.VII.1951, 1juv., VII.1951, 1♀, III.1952, 2♂5♀, VI.1952, 3♀1juv., 22.VI.1952, 1♀, VI.1953, 1♂, VII.1953, 1♀, IV.1961, 1♀, V.1961, 1♂2♀, III.1962, 1♀, X.1962, 1♀, leg. P. Susai Nathan, CASC; Karaikal, T.R.S.N. coll., 2002, 1♂1♀, 2003, 4♀1im., 2003, 2♂2♀, FKCP; **Rajasthan**, Dausa, 1650 ft., 5.I.1962, 2juvs., leg. E. S. Ross et D. Cavagnaro, CASC; Mahwah, 280 m., 5.I.1962, 1juv., leg. E. S. Ross et D. Cavagnaro, CASC; Barr, 450 m., 7.I.1962, 1juv., leg. E. S. Ross et D. Cavagnaro, CASC; Hill S. Pali, 275 m., 8.I.1962, 1im.1juv., leg. E. S. Ross et D. Cavagnaro, CASC; Alwar district, Naranimata env., 27°05,46 N 76°17,17 E, 380 m., VI–VIII.2002, 1♂1im.1juv., leg. P. Šrámek, FKCP; **Tamil Nadu**, Kurumbargum, VII.1954, 1♀, II.1957, 1♀, CASC; Coimbatore, VII.1951, 1♀, 29.XII.1951, 1♀, 14.IX.1953, 1♀, V.1961, 1♀, CASC; 10 mi S Udamalpet, 450 m., 19.III.1962, 1♀, leg. E. S. Ross & D. Cavagnaro, CASC; outside of Madras (now

Chennai), XII.1964, 1♂(im.), leg. F. B. Steiner, CASC; Tiruparan Kundram, 8 km SW. Madurai, 26.XII.1989, 1juv., leg. V. et B. Roth, CASC; Alagarkoil, 21 km NE Madurai, 27–28.XII.1989, 6juvs., leg. V. et B. Roth, CASC; Nagia Birbhan, 30 mi. SW Agra, 240 m., 2.I.1962, 1juv., leg. E. S. Ross et D. Cavagnaro, CASC; Dindigul Anna district, 10 km NE di Dindigul, 21.X.1997, 1♂, leg. A. Sforzi & L. Bartolozzi, MZUF No.735; Coimbatore, X.1980, 1♀, leg. P. Rojek, FKCP; **West Bengal**, Calcutta, 13.VIII.1965, 1♂, col. Manik Lal Seth, 17.VIII.1965, 2♂3♀2juvs., VIII.1965, 1♀, leg. B. V. College, 9.VIII.1966, 1♂, 26.III.1967, 1♀, leg. Duial Mondal, IV.1967, 1♂, leg. K. N. Das, 4–15.IV.1967, 1♀, leg. D. N. Santra, 9.VII.1967, 1im.1juv., leg. Duial Mondal, 15.VII.1967, 1♀, leg. Madhab, CASC; 6 mi. NE Borio, 220 m., 30.X.1961, 1♀, leg. E. S. Ross et D. Cavagnaro, CASC; Calcutta, X.1980, 1♀, leg. P. Rojek, FKCP. **Pakistan**, 7 mi NW Las Bela dist., 2.I.1960, 1♀, leg. S. A. Minton, CASC; 7 mi NW Uthal, Las Bela dist., 2.I.1960, 1♂, leg. S. A. Minton, CASC; Tatta env., XII.1979, 1♀, 1980, 1♂, leg. P. Rojek, FKCP.

DIAGNOSIS. Total length 50–90 mm. For habitus see Figs. 114–120. Trichobothrium *db* on the fixed finger of pedipalp chela situated between trichobothria *et* and *est* or on level with trichobothrium *est*. Male with fingers proximally twisted, manus of pedipalps wider than female. Pectinal teeth number 30–39 in males, 27–34 in females. Chelicerae yellow, reticulate. Pedipalps densely hirsute, legs and metasoma sparsely hirsute. The hairs on patella of pedipalps are short. Color uniformly yellow to reddish, mesosoma dark. Ventral carinae on metasomal segments usually black. Femur of pedipalp with 5 carinae. Patella with 2 or 4 carinae on internal surface, no other carinae. Chela lacks carinae. Movable fingers of pedipalps with 13–15 rows of granules and 5 or 6 terminal granules. Seventh mesosomal sternite smooth, with 4 well marked black carinae. First to third metasomal segments with 10 carinae; fourth metasomal segment with 10 or rarely 8 carinae; fifth segment with 5 or 7 carinae. Metasoma sparsely to densely granulated between carinae. Dorsal surface densely and very finely granulated, often bears 2 short, inconspicuous marginal carinae. Telson also granulated. Dorsal carinae of metasomal segments bear terminal granules of size approximately equal to preceding granules. First metasomal segments of adult female wider than long (in male usually as long as wide), second metasomal segment longer than wide for both sexes. Second to fourth metasomal segment width ratio about 1.1. Length to width ratio of fourth metasomal segment about 1.5. Telson bulbous, especially in large females.

COMMENTS. Fixing a neotype of *H. tamulus* is important because some populations were described as subspecies

which are here synonymized. Since the species is widely distributed, it is important to narrow down the type locality. For these reasons I designate a male in the NMPC collection as the neotype. It is a 72 mm long specimen that matches all characters in the above diagnosis.

The lectotypes are being designated in order to stabilize the nomenclature. Fine dorsal granulation of metasomal segments and fine ventral granulation of the mesosoma are variable and their gradation used by Pocock (1900: 23–26) and Tikader & Bastawade (1983: 187–188) to distinguish subspecies of *H. tamulus* becomes invalid as soon as a sufficient number of specimens is examined. Generally, this granulation is much weaker in males.

The variability of coloration (Figs. 114 and 120) cuts across the subspecies described by Pocock (1900: 25). It is worth mentioning that for the subspecies *H. t. gangeticus* Pocock (1900: 25) recorded both dark and light forms.

DISTRIBUTION: India (Fabricius, 1798: 295), Pakistan (Pocock, 1900a: 25; Khatoon, 1986: 645).

Hottentotta trilineatus (Peters, 1862)

(Figs. 20, 121–125)

Centrurus trilineatus Peters, 1862: 515; Pocock, 1896b: 425; Moritz & Fischer, 1980: 324.

Buthus trilineatus: Kraepelin, 1899: 21; Pocock, 1900b: 57; Kraepelin, 1901: 266; Borelli, 1904a: 1; Kraepelin, 1905: 195; Tullgren, 1907: 2; Hirst, 1911a: 1; Masi, 1912: 95; Kraepelin, 1913: 169; Hewitt, 1918: 103, 175; Loveridge, 1925: 305; Hewitt, 1935: 465; Roewer, 1952: 27; Geeraerts, 1953: 1066; Lawrence, 1955: 225; Lawrence, 1961: 153; Lawrence, 1964: 34; Lawrence, 1967: 84; Aguiar, 1978: 108.

Buthus (Hottentotta) trilineatus: Werner, 1936: 175; Caporiacco, 1941: 33; Moriggi, 1941: 85; Roewer, 1943: 207; Caporiacco, 1947: 231.

Hottentotta trilineatus trilineatus: Caporiacco, 1949: 314.

Buthus trilineatus: Vachon & Stockmann, 1968: 103; Probst, 1973: 320; Lamoral & Reynders, 1975: 504; Stahnke & Calos, 1977: 119; Newlands & Martindale, 1980: 53; El-Hennawy, 1992: 118.

Hottentotta trilineata: Dupre & Balliet, 1997: 5.

Hottentotta (Hottentotta) trilineatus: Fet & Lowe, 2000: 144.

Hottentotta (Hottentotta) trilineata: Kovařík, 1998: 110.

Hottentotta trilineata: Kovařík, 2001b: 84; Kovařík, 2002: 8; Kovařík, 2003: 140.

Hottentotta trilineatus: Leeming, 2003: 47; Kovařík & Whitman, 2005: 108; Prendini, 2005: 66.



Figure 121: *Hottentotta trilineatus*, dorsal view, male and female from Tanzania, Arusha distr., Naberera env., FKCP.

Buthus hottentotta (in part): Kraepelin, 1891: 185 (see Kraepelin, 1899: 21).

= *Buthus eminii* Pocock, 1890c: 98; Kraepelin, 1895: 83; Pocock, 1896b: 425; Pocock, 1897b: 402; Pocock, 1898a: 430; Pocock, 1898b: 499; Pocock, 1900b: 57; Kraepelin, 1903: 559; Hirst, 1911b: 217; Birula, 1915a: 121; Birula, 1916: 60; Borelli, 1919: 362; Loveridge, 1925: 305; Borelli, 1925a: 9; Caporiacco, 1936: 135 (syn. by Kraepelin, 1899: 21).

Buthus (Buthus) eminii: Pocock, 1890a: 126.

Buthus (Hottentotta) emini: Birula, 1915a: 123; Birula, 1915b: f11; Werner, 1934: 269; Caporiacco, 1939: 304; Moriggi, 1941: 86; Caporiacco, 1947: 231.

Buthus hottentotta emini: Kraepelin, 1929: 88.

Buthotus emini: Vachon & Stockmann, 1968: 107; Probst, 1973: 321.

Hottentotta (Hottentotta) eminii: Fet & Lowe, 2000: 137.

= *Buthus trilineatus fuscatus* Masi, 1912: 95 (syn. by Vachon & Stockmann, 1968: 106).

Buthus hottentotta minax fuscata: Caporiacco, 1937: 358.

Hottentotta (Hottentotta) trilineata fuscata: Kovařík, 1998: 111.

= *Buthus fuscitruncus* Caporiacco, 1936: 136; Caporiacco, 1937: 358; Vachon, 1949: 162 (1952: 248) (syn. by Kovařík, 2003: 140).

Buthus (Hottentotta) fuscitruncus: Caporiacco, 1939: 304; Moriggi, 1941: 87.

Buthotus fuscitruncus: Vachon & Stockmann, 1968: 110; Probst, 1973: 329; Lamoral & Reynders, 1975: 500; El-Hennawy, 1992: 116.

Hottentotta (Hottentotta) fuscitruncus: Kovařík, 1998: 110; Fet & Lowe, 2000: 138.

Hottentotta cf. *polystictus*: Kovařík, 1997b: 180.

TYPE LOCALITY AND TYPE REPOSITORY. Mozambique, Tette; ZMHB.

TYPE MATERIAL EXAMINED. **Mozambique**, Tette, 1♀ (holotype), leg. W. Peters, ZMHB No. 2328. **Kenya**, South shore of Victoria Nyanza, 1♀ (holotype of *Buthus eminii* Pocock, 1890, Fig. 125), BMNH No. 90.4.15.2. **Somalia**, Belet Amin, 1♂ (holotype of *Buthus fuscitruncus* Caporiacco, 1936), VII.1934, MCSN.

OTHER MATERIAL EXAMINED. **Botswana**, bor., Kasane env., 29.XII.1996–7.I.1997, 1♀1juv., leg. M. Snížek, FKCP. **Egypt**, ? probably locality error, 1♀, SMFD No. 5246. **Eritrea**, Assab, 1882–1884, Bouturlin, 1♂3♀1juv. before first ecdysis, MZUF No. 653; Ghenafena (8 km from Serae), V.1901, 1♂1♀1juv., V. 1901, MZUF Nos. 660 and 646. **Ethiopia**, Aegyptem vagy Abyssinia, 1898, 2ims., leg. Frundsberg, HNHM No. 1183; Dongollo, 20–30.XII.1900, 1♀, leg. A.



Figure 122: *Hottentotta trilineatus*, dorsal view, male from Kenya, Magadi, Lake Magadi env., FKCP.



Figure 123: *Hottentotta trilineatus*, ventral view, male from Kenya, Magadi, Lake Magadi env., FKCP.



Figure 124: *Hottentotta trilineatus*, dorsal view, male from Kenya, between Madogo and Garissa, west of Tana river, FKCP.

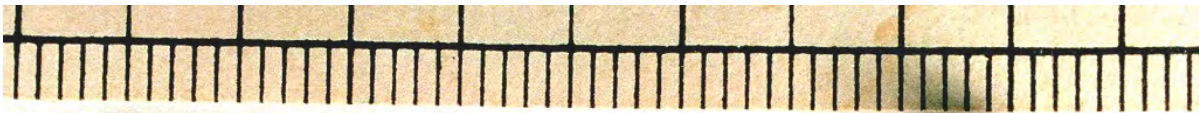


Figure 125: *Hottentotta trilineatus*, dorsal view, female lectotype of *Buthus eminii*.

Andreini, MZUF No. 654; Amba Mussolinii, 12.II.1937, 1♂, leg. U. Ignesti, MZUF No. 655; Neghelli, Borana, 1938, 1♀, leg. E. Zavattari, MZUF No. 652; Sagan Omo, Dande, 23.III.1939, 1♀, leg. Zavattari, MZUF No. 651; Sagan Omo, El Bano, 1juv., 30.IV.1939, 2♂1♀2juvs., 2.V.1939, 1♀, 5.V.1939, 1♂4♀1juv., 9.V.1939, 2juvs., 30.V.1939, 1♀, 7.VI.1939, 2♂1♀1juv., 10.VI.1939, 2♀, VI.1939, leg. E. Zavattari, MZUF Nos. 637–643, 656; Sagan Omo, El Meti, 1♂1♀2juvs., 14.V.1939, leg. E. Zavattari, MZUF No. 645; Sagan Omo, El Dire, 15–18.V.1939, 1♂1♀2juvs., leg. E. Zavattari, MZUF No. 644; Sagan Omo, Gondaraba, 1juv., 2.VI.1939, 1♂1juv., 10.VI.1939, 1♀, 13.VI.1939, 1♂2juvs., 18.VI.1939, leg. E. Zavattari, MZUF Nos. 647–9, 657; Sagan Omo, Gongabacno [= Gongabainu?], 17.VI.1939, 1♂2 juvs., leg. E. Zavattari, MZUF No. 650; Caschei, 10.VII.1939, 1♂3♀, leg. E. Zavattari, MZUF No. 658; Yambo, 2♂2♀, IV.1995, leg. R. Lízler, FKCP; Kersabor, V. 1996, 1♀, leg. R. Lízler, FKCP; Gemu Gofa, Arba Minch, 2–3.V.1997, 2♀, leg. Werner, FKCP; Sidamo, near Negele borana, 7–8.V.1997, 1♂1juv., leg. Werner & Lízler, FKCP; Wachile-Yavello, Sidamo, 1♂, 28–29.IV.1998, leg. Werner, FKCP; Parco Nazionale Awash, Harerge Region, Habro, boscaglia, 25.VII.2002, 1♀, leg. Sforzi & L. Bartolozzi. MZUF No. 659. **Kenya**, O. A. Afrika, Mombasa, 1♀, 25.XII.1969, leg. M. Grasshoff, SMFD; Voi, 1♀, XI.1978, leg. M. Grasshoff, SMFD; Sangala Hills, 1♀1♂(im.), XII.1993, leg. Werner, FKCP; Babati, XII.1993, 1♀, leg. Werner, NMPC; Taita district, surroundings of Voi, 31.V–03.VI.1994, 1♀, leg. L. Bartolozzi, B. Cecchi & A. Sforzi, MZUF No. 1107; Voi (Tsavo), 1♂1♀, 24–28.I.1996, 2♂1juv., 10.XII.1999, leg. M. Snížek, 22.XI–2.XII.1996, 4♂5♀1juv., leg. M. Snížek, 3♀, 1.VI.1997, leg. O. Bužga, 13–17.XII.1997, 8♂12♀, leg. M. Snížek, 3♂, 2001, leg. M. Snížek, FKCP; Lodwar, 2♀1juv., 20.XII.1995, leg. M. Snížek & Smrž, FKCP; 50 km N of Namanga, Ilbisil env., 18.XI.1997, 3♂3♀1juv., leg. M. Snížek, FKCP; Eastern Mwingi env., 4.XII.1997, 1♀, leg. M. Snížek, FKCP; S. Magadi, Lake Magadi env., 6.XII.1997, 19♂(Figs. 122–123)26♀4juvs.10juvs. before first ecdysis, leg. M. Snížek, FKCP; Nairobi env., 36°62'E 01°30'S, 2000 m., 7.XII.1997, 5♂15♀, leg. M. Snížek, FKCP; Katutu-Kithioko, 27.XI.1999, 5♂7♀1juv., leg. M. Snížek, FKCP; between Isiola and Turkana lake, IX.2003, 1♂1juv., leg. T. Mazuch, FKCP; between Madogo and Garissa, west of Tana river, VIII.2005, 1♂(Fig. 124)2♀, leg. T. Mazuch, FKCP. **Mozambique**, Tete, 1♂3♀4juvs, IV.1947, SMFD; Tette, 2juvs.(♀ and ♂), IV.1980, FKCP. **Somalia**, 1♂8♀, circa 1970, MZUF Nos. 870 and 1170; Afgoi, 1.V.1937, 1♀, 13.VII.1959, 1♀, 1960, 1♂, 1970, 1♂, leg. A. Simonetta, MZUF Nos. 846, 850, 1166; Gelib, d. Missione Cattolica, 1962, 1♂, MZUF No. 847; Belet Amin, VII.1934, 2♂1♀, leg. S. Patrizi MZUF No. 844; Bur Dinsor, 300–370 m., 19.VII.1962,

1♂1juv., 3.VI.1978, 1♂1♀1juv., leg. B. Lanza, MZUF Nos. 848, 866 and 1104; 2 km dopo Mahas, 3.VIII.1969, 1juv., S.B.S., MZUF No. 849; Giohar, 8.VIII.1970, 1♂4♀, S.B.S., MZUF No. 851; ca 50 km da Chisimaio venendo da Badadda, 19.VIII.1970, 3♀1juv., MZUF No. 852; Chisimajo, duna, 20.VIII.1970, 1♀, leg. F. Ferrara & B. Lanza MZUF No. 853; Sar Uanle, 1♂, 31.XI.1971, 2♂, XI.1971, 1♂1♀, IX.1972, 2♀, V.1973, 1♀, 7.VI.1973, 4♀, 1.VIII.1975, 2♀, 11.VIII.1975, 1♀, 14.VIII.1975, MZUF Nos. 854–863, 871; Baidoa, 12–28.VI.1978, 3♂4♀, MZUF No. 867; Berdale, 13.VI.1978, 1♂4♀lim., MZUF No. 868; El Ure, 16 km da Vegit sulla pista per Lug, 16.VI.1978, 1♂1♀, MZUF No. 865; Edain Caboda, 18.VI.1978, 2♂1♀2juvs., MZUF No. 864; Arbasala, 56 km NW di Ischia Baidoa, 25.VI.1978, 1♀1juv., MZUF No. 869. **South Africa**, Transvaal, Southpansberg env., Steinen, XI.1970, 1♂1♀, leg. Lamoral, SMFD No. 29296; 1998, 1♂1♀, FKCP. **Tanzania**, O. Afrika, Tanga, 1♀, SMFD No. 6674/81; Laiverere, 1♂, 28.I.1960, leg. J. Szunyeghy, HNHM; Mto Wa Mbu, IV.1997, 5♂8♀2juvs., leg. P. Senft, FKCP; Arusha distr., Naberera env., 8–13.IV.1997, 10♂15♀2juvs.(Figs. 20 and 121), leg. J. Rolčík & P. Senft, FKCP; Arusha distr. Mto Wa Mbu env., 15.–20.IV.1997, 1♂, leg. J. Stolarczyk, FKCP; near Babati, 6.XII.1997, 1♂4♀, leg. Werner & Lízler, FKCP; near Babati, 6.XII.1997, 1♂4♀, leg. Werner & Lízler, FKCP; E. Usambara Mts, dint. di Amani, 17–20.VI.1998, 1♂3♀, leg. L. Bartolozzi & A. Sforzi, MZUF No. 882; 20 km a SE di Mto Wa Mbu sulla strada per Makuyuni, 1100 m., 10–25.IV.1999, 2♂3♀1juv., leg. L. Bartolozzi, B. Carletti, B. Cecchi, L. Dapporto, F. Fabiano & A. Sforzi, MZUF No. 881. ? **Tanzania**, O. Afrika, Iraku-Landschaft, Kohl-Larsen, 1939, 1♂1♀, SMFD No. 5388; O. Afrika, Matelebach, Kohl-Larsen, 2♀, SMFD No. 5389; D. O. Afrika, 2♂, leg. F. Kinkelin, SMFD No. 5219. **Zimbabwe**, NW, 70 km W of Karoi, Masanga env., 20.XII.1998, 1♀, leg. S. Bečvář, FKCP; Victoria Falls, 6.I.2002, 1♀, leg. L. Adámek, FKCP.

DIAGNOSIS. Total length 35–65 mm. For habitus see Figs. 121–125. Trichobothrium *db* on the fixed finger of pedipalp situated between trichobothria *et* and *est* or on level with trichobothrium *est*, or rarely between *est* and *esb*. Male with fingers proximally twisted and manus and metasomal segments wider than female. Pectinal teeth number 22–28 in males, 17–25 in females. Chelicerae yellow, without reticulation. Nearly entire body hirsute, but not densely. Color uniformly yellow to reddish brown, mesosomal segments and carapace usually with orange spots and longitudinal black stripes. Metasomal carinae may be black as well. Femur of pedipalp with 3 complete and 2 incomplete carinae. Patella with 8 carinae, of which some are smooth, without granules and obsolete. Chela lacks carinae.

Movable fingers of pedipalps with 11–13 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First to third metasomal segments with 10 carinae; fourth segment with 8 or 10 carinae; fifth segment with 5 carinae and two ventral rows of granules. All carinae granulated, dorsal carinae bear larger terminal granules. In males granules usually larger and more pronounced than in females. First metasomal segment of adults wider than long, second metasomal segment usually longer than wide, but in males may be wider than long. Second to fourth metasomal segment width ratio less than 1.1. Length to width ratio of fourth metasomal segment less than 1.6.

COMMENTS. This widely distributed and very common species enabled me to study variation within the taxon. I have examined many specimens brought by Czech entomologists from Kenya and Tanzania, as well as those from Somalia and Ethiopia deposited in Italian museums. Some smaller males have only slightly widened manus of pedipalp and their metasomal segments are only as wide (in relation to body width) as in females. Conversely, some larger males have extremely wide manus, very conspicuously granulated metasomal carinae, and their fourth and fifth metasomal segments are often wider and more bulging than in smaller males. In the largest females the morphology approaches that of males, especially in the granulation of metasomal carinae and the relative width of metasomal segments. Color is also variable, lighter in specimens from drier areas of Somalia, Ethiopia and northern Kenya (Fig. 124). As in other widely distributed species, it is likely that the color (Figs. 121–124) is influenced by the color and texture of the substrate (see Hendrixson, 2006: 84). The described variation has resulted in a surplus of names, as small samples from disparate areas may easily give the impression of separate species.

DISTRIBUTION: Botswana (Probst, 1973: 320), Democratic Republic of Congo (Fet & Lowe, 2000: 144), Djibouti (Kraepelin, 1901: 266), Eritrea, Ethiopia (Borelli, 1901: 1; Kraepelin, 1903: 560), Kenya (Pocock, 1890c: 99), Mozambique (Peters, 1862: 516), Somalia (Pocock, 1897b: 402), South Africa (Hewitt, 1918: 103), Tanzania (Pocock, 1898a: 430), Uganda (Fage & Simon, 1936: 301), Zambia (Newlands & Martindale, 1980: 72), Zimbabwe (Hirst, 1911a: 12). Records from Egypt (see Kraepelin, 1901: 266 and the SMFD female above) and Namibia must be considered dubious, see also Vachon & Stockmann (1968: 103) and Fet & Lowe (2000: 144).

***Hottentotta zagrosensis* Kovařík, 1997**
(Figs 1–3, 126–129)

Hottentotta zagrosensis Kovařík, 1997a: 41; Kovařík, 1998: 111; Fet & Lowe, 2000: 144.

TYPE LOCALITY AND TYPE REPOSITORY. Iran, Fars prov., alt. ca. 1000 m, Zagros Mts., Abshar vill. env., 30°23'N 51°30'E; FKCP.

TYPE MATERIAL EXAMINED. **Iran**, Fars prov., alt. ca. 1000 m., Zagros Mts., Abshar vill. env., 2–3.V.1996 1♂ (holotype, Figs. 126–127) 1♂(im.) and its ecdysis (paratype No. 1), leg. J. Pitulová, 1♀ (allotype, Fig. 129) 2juvs. (paratypes No. 2 and No. 3), leg. V. Šejna, 1juv. (paratype No. 4), leg. D. Král, FKCP.

OTHER MATERIAL EXAMINED. **Iran**, West Azerbaijan prov., Bastan, 1270 m., 38°54'40"N 44°59'39"E, 1♀, 30.IX–1.X.1998, leg. P. Kabátek, FKCP; Húžestán prov., 10km W. Ize, 900 m, 31°45'19"N 49°48'18"E, 1♂(Fig. 128) 1♀1juv., 12–13.X.1998, leg. P. Kabátek, FKCP; 5 km SE of Posht Chenár, 20.4.2000, 29°12'941"N 53°20'014"E, alt. 1692 m., 1♀, leg. M. Kaftan, FKCP.

DIAGNOSIS. Male holotype 102 mm long, female allotype 103 mm long. For habitus see Figs. 126–129. Trichobothrium *db* on the fixed finger of pedipalp located between trichobothria *et* and *est* (Fig. 1). Male with slightly longer and narrower metasomal segments, width of pedipalp chela same in both sexes. Pectinal teeth number 34–36 in males, 27–33 in females. Nearly entire body hirsute, pedipalps, dorsal surface of mesosoma, legs, lateral and ventral surfaces of metasomal segments, and vesicle densely hirsute. The hairs on patella of pedipalps are long. Color black except reddish brown chela of pedipalps; sometimes ends of first and second tarsomeres yellow, coxa and trochanter on ventral side of mesosoma marbled, and pectens yellowish brown (Fig. 128). Femur of pedipalps with 5 carinae and a row of granules in middle part of internal surface. Ventral surfaces of femur and patella smooth to glossy. Patella with 8 carinae. Chela lacks carinae. Movable fingers of pedipalps with 16 rows of granules and 5 terminal granules. Seventh metasomal segment with 4 well marked ventral carinae. First and second metasomal segments with 10 carinae; third segment with 8 or 10 carinae; fourth segment with 8 carinae; fifth segment with 5 carinae, 3 ventral (1 median, 2 lateral) and 2 dorsal, smooth and sometimes indistinct. Dorsal surface smooth and glossy, fifth segment bears 2 short, inconspicuous carinae. First metasomal segment of female may be wider than long, in male is always longer than wide. Second metasomal segment always longer than wide. Second to fourth metasomal segment width ratio less than 1.1.

DISTRIBUTION: Iran (Kovařík, 1997a: 41).



Figure 126: *Hottentotta zagrosensis*, dorsal view, male holotype.



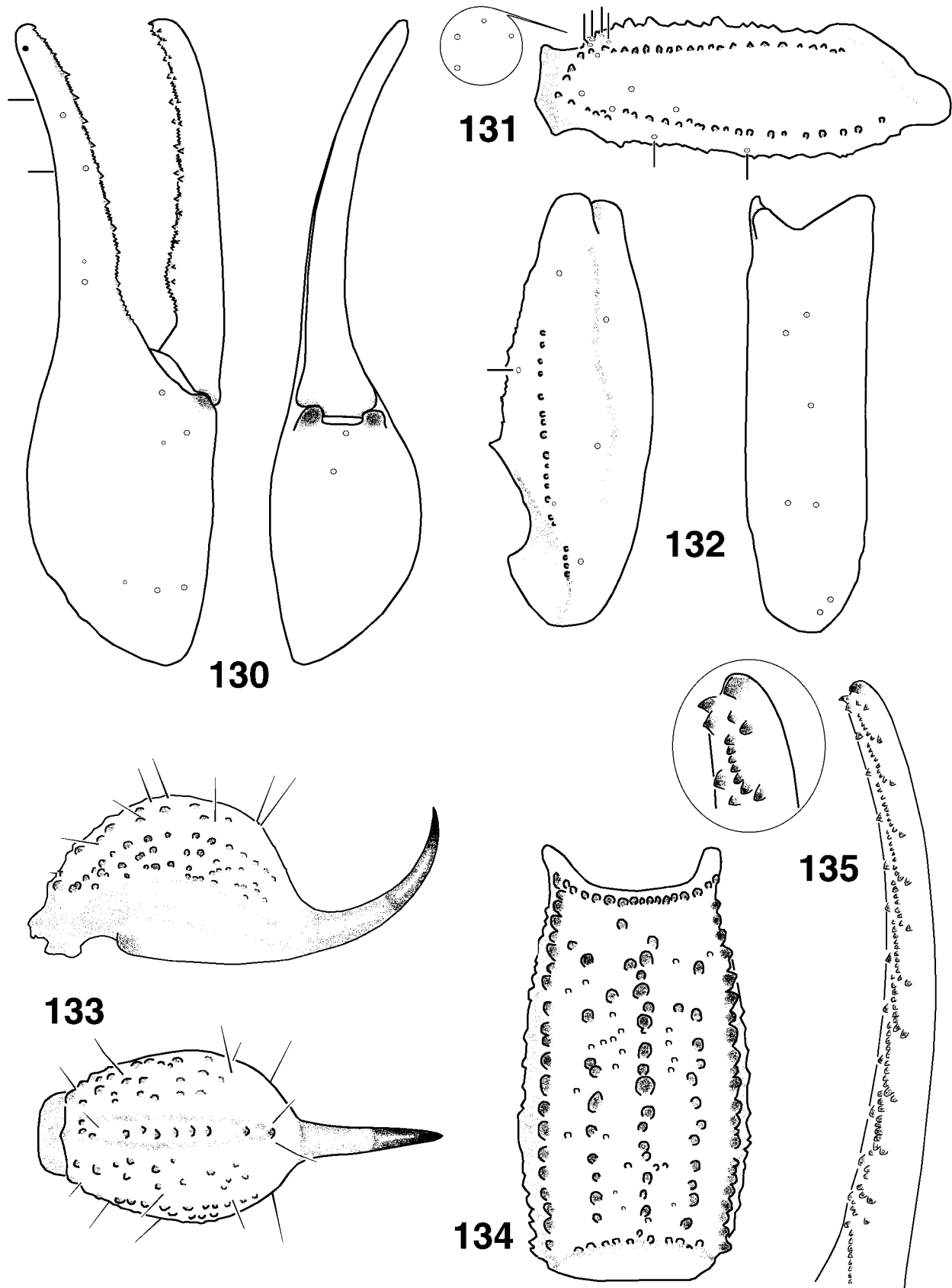
Figure 127: *Hottentotta zagrosensis*, ventral view, male holotype.



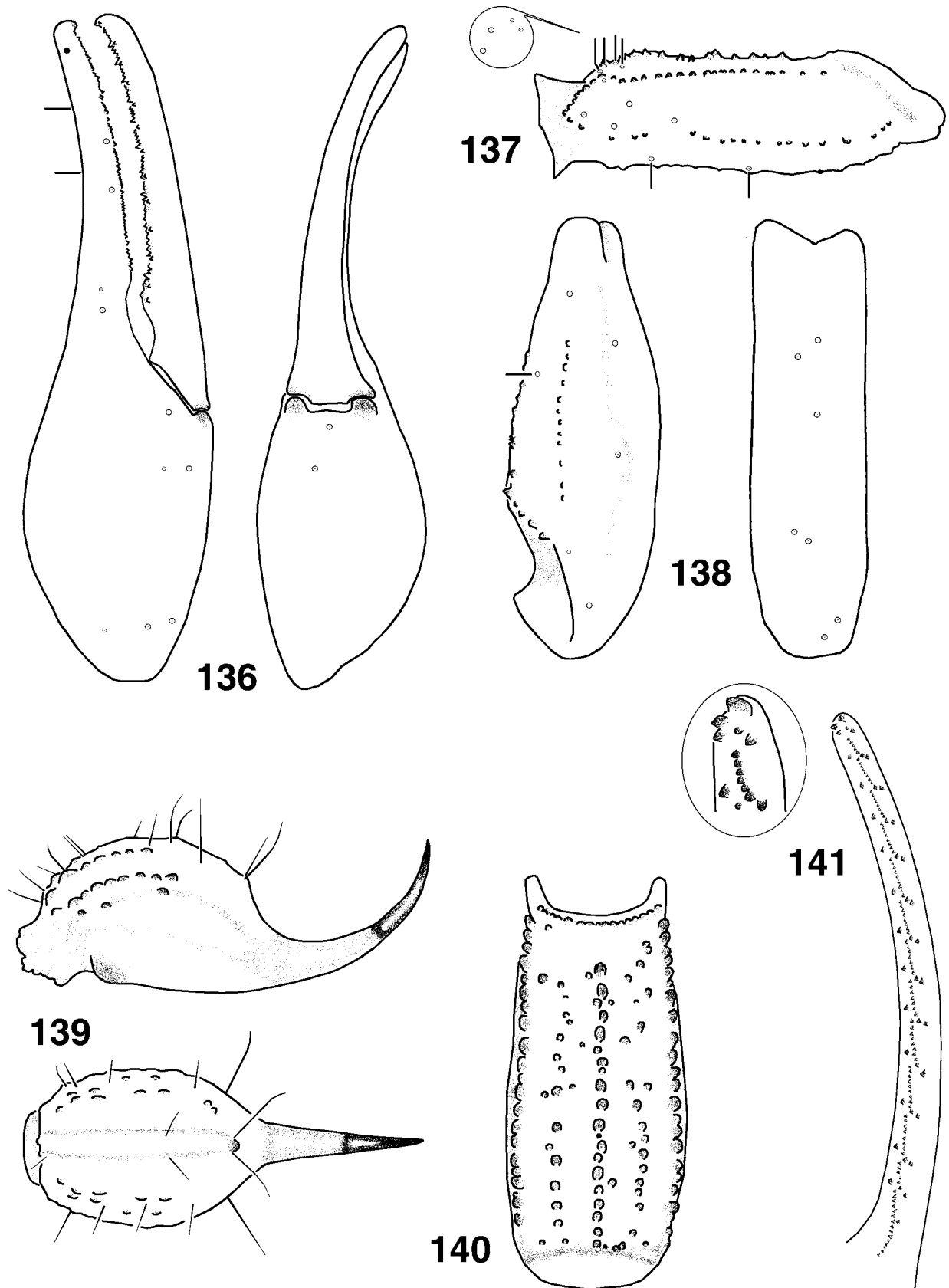
Figure 128: *Hottentotta zagrosensis*, dorsal view, male from Iran, prov. Húžestán, 10 km W Ize, 31°45'19"N 49°48'18"E, FKCP.



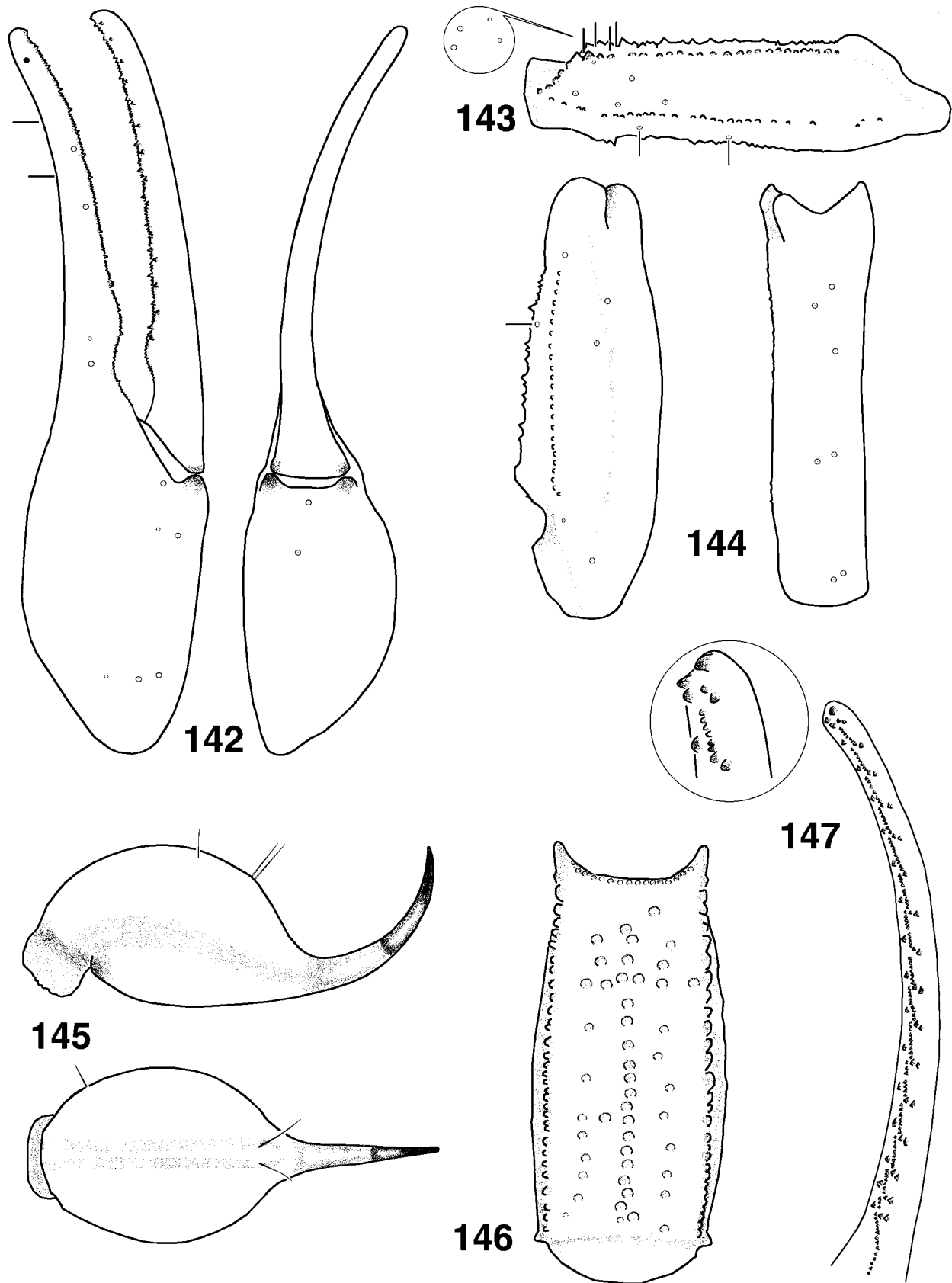
Figure 129: *Hottentotta zagrosensis*, dorsal view, female allotype.



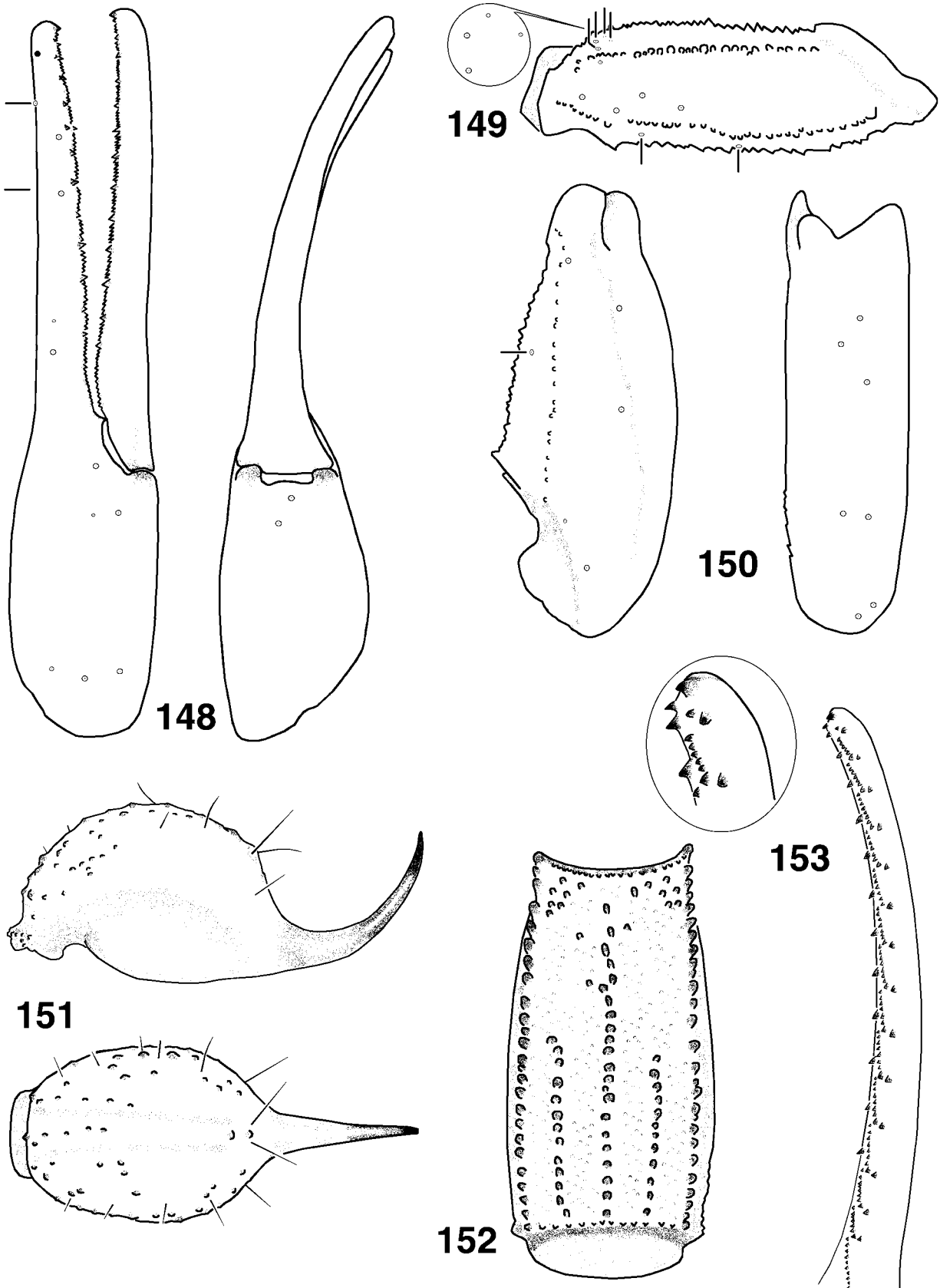
Figures 130–135: *Hottentotta finneganae*, sp. nov., male holotype. **130–132.** Pedipalp trichobothrial pattern. **130.** Chela, external and ventral views; closed circle on chelal fixed finger external view designates internal trichobothrium *i*. **131.** Femur, dorsal view; circled area shows internal trichobothria of femur from an internal perspective. **132.** Patella, dorsal and external views. **133.** Telson, lateral and ventral views. **134.** Metasomal segment V, ventral view. **135.** Chelal movable finger showing dentition; closeup of finger tip shown in ellipse.



Figures 136–141: *Hottentotta jabalpurensis*, sp. nov., male paratype. **136–138.** Pedipalp trichobothrial pattern. **136.** Chela, external and ventral views; closed circle on chelal fixed finger external view designates internal trichobothrium *i*. **137.** Femur, dorsal view; circled area shows internal trichobothria of femur from an internal perspective. **138.** Patella, dorsal and external views. **139.** Telson, lateral and ventral views. **140.** Metasomal segment V, ventral view. **141.** Chelal movable finger showing dentition; closeup of finger tip shown in ellipse.



Figures 142–147: *Hottentotta jalalabadensis*, **sp. nov.**, male paratype. **142–144.** Pedipalp trichobothrial pattern. **142.** Chela, external and ventral views; closed circle on chelal fixed finger external view designates internal trichobothrium *i*. **143.** Femur, dorsal view; circled area shows internal trichobothria of femur from an internal perspective. **144.** Patella, dorsal and external views. **145.** Telson, lateral and ventral views. **146.** Metasomal segment V, ventral view. **147.** Chelal movable finger showing dentition; closeup of finger tip shown in ellipse.



Figures 148–153: *Hottentotta stockwelli*, sp. nov., male holotype. **148–150.** Pedipalp trichobothrial pattern. **148.** Chela, external and ventral views; closed circle on chelal fixed finger external view designates internal trichobothrium *i*. **149.** Femur, dorsal view; circled area shows internal trichobothria of femur from an internal perspective. **150.** Patella, dorsal and external views. **151.** Telson, lateral and ventral views. **152.** Metasomal segment V, ventral view. **153.** Chelal movable finger showing dentition; closeup of finger tip shown in ellipse.

Key to species of the genus *Hottentotta* Birula, 1908 occurring in Asia

1. Color black except reddish brown chela of pedipalp. Legs may also be reddish-brown. Does not occur in India 2
 - Color not entirely black except for specimens from India which may be entirely brown to black 3
2. Movable fingers of pedipalps with 16 cutting edges. Ventral surfaces of metasomal segments and vesicle densely hirsute. Occurs in Iran *H. zagrosensis* Kovařík, 1997
 - Movable fingers of pedipalps with 13–14 cutting edges. Metasoma bears only a few hairs. Does not occur in Iran *H. judaicus* (Simon, 1872)
3. Chela of pedipalp always darker than femur of pedipalp *H. schach* (Birula, 1905)
 - Chela of pedipalp of same color as femur of pedipalp, not darker 4
4. Male has markedly broader manus than female 6
 - Width of manus of pedipalp same in both sexes 5
5. Ventral surfaces of metasomal segments and vesicle densely hirsute *H. sauleyi* (Simon, 1880)
 - Metasoma only sparsely hirsute 7
6. Ventral surfaces of metasomal segments and vesicle densely hirsute 13
 - Metasoma only sparsely hirsute 10
7. Telson black *H. alticola* (Pocock, 1895)
 - Telson yellow to yellowish brown 8
8. First metasomal segment of both sexes always wider than long, in female also second metasomal segment wider than long. Second to fourth metasomal segment width ratio in females 1.26–1.29
 *H. jalalabadensis* sp.n.
 - First and second metasomal segments of both sexes longer than wide. Second to fourth metasomal segment width ratio less than 1.2 9
9. Dorsal surface of fourth metasomal segment bears 2 short, inconspicuous carinae (see fig. 19 in Vachon, 1958: 137) *H. penjabensis* (Birula, 1897)
 - Dorsal surface of fourth metasomal segment smooth, without granules and carinae (see fig. 20 in Vachon, 1958: 137) *H. buchariensis* (Birula, 1897)
10. Total length 30–60 mm. Pectinal teeth number 23–29 in males, 19–26 in females 11

- Total length 50–90 mm. Pectinal teeth number 30–39 in males, 27–34 in females
 *H. tamulus* (Fabricius, 1798)
11. Second metasomal segment of female wider than long *H. rugiscutis* (Pocock, 1897)
 - Second metasomal segment in adults of both sexes always longer than wide 12
12. Movable fingers of pedipalp with 12 cutting edges. Hairs on patella of pedipalp long. Occurs in Pakistan *H. finneganae* sp. n.
 - Movable fingers of pedipalp with 14 cutting edges. Hairs on patella of pedipalp short. Occurs in India *H. stockwelli* sp. n.
13. Total length 35–50 mm. Pectinal teeth number 20–24 *H. pachyurus* (Pocock, 1897)
 - Total length 50–80 mm. Pectinal teeth number 26–36 *H. jabalpurensis* sp. n.

Key to species of the genus *Hottentotta* Birula, 1908 occurring in Africa and Arabia

1. All metasomal segments uniformly colored 4
 - First two or three metasomal segments yellow, fifth segment and telson black 2
2. All segments of pedipalps uniformly colored *H. scaber* (Ehrenberg, 1828)
 - Femur of pedipalp yellow to yellowish brown, chela dark 3
3. Patella of pedipalp as dark as chela
 *H. jayakari* (Pocock, 1895)
 - Patella of pedipalp as yellow to yellowish brown as femur *H. salei* (Vachon, 1980)
4. Telson extremely inflated (Fig. 28), both sexes with very narrow chelae. Occurs only in Angola, South Africa, and Namibia 5
 - Telson much less inflated 6
5. Total length 32–43 mm. First metasomal segment width/length ratio 0.95–1.05 in males, 1.03–1.14 in females *H. arenaceus* (Purcell, 1902)
 - Total length 40–65 mm. First metasomal segment width/length ratio 1.22–1.42 in males, 1.28–1.47 in females *H. conspersus* (Thorell, 1876)
6. Ventral surfaces of metasomal segments and vesicle of female densely hirsute 7
 - Metasoma of both sexes bears only a few hairs 8
7. Legs yellow *H. gentili* (Pallary, 1924)

- Legs black or reddish brown
..... *H. franzwerner* (Birula, 1914)
8. Trichobothrium *db* on the fixed finger of pedipalp located between trichobothria *et* and *dt* or on level with trichobothrium *et* (Fig. 4). Occurs in Socotra *H. socotrensis* (Pocock, 1889)
- Trichobothrium *db* on the fixed finger of pedipalp located between trichobothria *et* and *est* or *esb* (Fig. 1). Does not occur in Socotra 9
9. Entire body black, does not occur in Africa *H. judaicus* (Simon, 1872)
- Usually uniformly reddish brown, some populations yellowish brown to black. Occurs in Africa 10
10. Chelicerae of both sexes yellow, without reticulation 11
- Chelicerae always reticulated in females, reticulation may be absent in males
..... *H. hottentotta* (Fabricius, 1787)
11. Metasoma wide. First metasomal segment of adults always wider than long, second metasomal segment usually wider than long 12
- Metasoma narrow. First metasomal segment usually longer than wide or as wide as long (except for some males of *H. trilineata*) 13
12. Male with manus of pedipalp markedly broader than in female *H. niloticus* (Birula, 1928)
- Width of manus of pedipalp same in both sexes *H. minax* (L. Koch, 1875)
13. Metasoma very narrow. Fourth metasomal segment length/width ratio higher than 1.6
..... *H. polystictus* (Pocock, 1896)
- Fourth metasomal segment length/width ratio less than 1.6 *H. trilineatus* (Peters, 1861)

DISCUSSION. Most species of *Hottentotta* are uniform yellowish brown, sometimes with a dark mesosoma or at least a dark spot on the anterior part of the carapace. Four species, *H. franzwerner* (Birula, 1914) (Fig. 32), *H. gentili* (Pallary, 1924) **comb. n.** (Fig. 37), *H. judaicus* (Simon, 1872) (Fig. 64) and *H. zagrosensis* Kovařík, 1997 (Fig. 129), are black; in *H. franzwerner* with yellow legs (Fig. 32) and in the other species with legs often lighter than the body, often reddish brown (Figs. 64 and 128). In other four species, *H. salei* (Vachon, 1980) **comb. n.** (Fig. 93), *H. sauleyi* (Simon, 1880) (Fig. 95), *H. scaber* (Ehrenberg, 1828) (Fig. 100) and *H. schach* (Birula, 1905) (Fig. 105), the color pattern contrasts alternating black and yellow segments of pedipalps or/and metasoma, and intraspecific

variation in this regard is negligible. Close to this group is *H. jayakari* (Pocock, 1895), in which however the base color cannot be unequivocally described as yellow but rather ranges from yellow to brown (Fig. 62).

Color-wise the most interesting group of species comprises *H. hottentotta* (Fabricius, 1787) (Figs. 42 and 43), *H. rugiscutis* (Pocock, 1897) (Figs. 92 and 91), *H. tamulus* (Fabricius, 1798) (Figs. 114 and 120) and *H. trilineatus* (Peters, 1862) (Figs. 124 and 122). They lack contrasting colors, but in all of them some specimens are pale yellow (Fig. 124), some nearly black (Fig. 43), and many range from shades of yellowish green to reddish brown (Fig. 42). Despite inhabiting two continents and being allopatric, these four species have much in common and appear to belong to the same species complex. Their sexual dimorphism is similar, males have fingers proximally twisted and the manus of pedipalp wider than females (Figs. 114 and 116), and they are highly variable in the position of trichobothrium *db* on the fixed finger of pedipalp in relation to trichobothrium *est*. Their habitus is similar and they are often confused with the genus *Mesobuthus*, to which they seem to be much closer than other species of *Hottentotta*. All of them can also be characterized as adaptable and thus having wide geographic distributions (in comparison with other species of *Hottentotta*), and usually being quite common (in comparison with other scorpion genera). These attributes make the group taxonomically difficult and endowed by the most synonyms, as descriptions are often based on small samples that do not permit recognition of intraspecific variability.

Examination of a large number of specimens has allowed me to discern variation in the width to length ratio of some metasomal segments, i.e. a character which is generally regarded as stable and which in case of the first and second segments I use in the simplified key to differentiate species with broader metasomas (*H. niloticus* (Birula, 1928) and *H. minax* (L. Koch, 1875)) from those with narrower metasomas (*H. polystictus* (Pocock, 1896) and *H. trilineatus* (Peters, 1861)). All these species show a degree of variation, namely in the width of the fourth metasomal segment, which crosses population boundaries and does not appear to be related to individual size, and this must be taken into account in species determinations. I have not found any discernible variation in the width to length ratio of the first metasomal segment, however.

Acknowledgments

I am most grateful to the following individuals and institutions for making this study possible. Janet Beccaloni (BMNH), Darrel Ubick and Charles Griswold (CASC), Sándor Mahunka and Jeno Kontschán (HNHM), Vít Kubáň and Oldřich Jakeš (MMBC), Sarah

Whitman (MZUF), Jürgen Gruber (NHMW), Antonín Kůrka (NMPC), Caroline Pepermans (NRHS), Julia Altmann and Peter Jäger (SMFD), Shahin Navai (ZMHB), and Hieronymus Dastyh (ZMUH) arranged for loans from collections in their care.

Special thanks are due to Alexander Koval (ZISP) for photography of the lectotype of *H. buchariensis* (see Fig. 25), and for Michael E. Soleglad for line drawings of Figs. 130–153.

Lukáš Adámek, Jan Batelka, Stanislav Bečvář, Vladimír Bejček, Jára Cimrman, Ladislav Černý, R. and H. Fouqué, Andrej Funk, Vladimír Fura, Petr Kabátek, Milan Kaftan, Jan Kotásek, David Král, M. Král, Robert Lízler, Tomáš Mazuch, David Modrý, Jana Pitulová, Petr Rojek, Jakub Rolčík, Václav Seichert, Pavel Senft, Miroslav Snížek, J. Stolarczyk, Milan Šárovec, Vladimír Šejna, Petr Šrámek, Karel Šťastný, Marek Velechovsky, Milan Veselý, and Dan Vlasta of the Czech Republic, Zubair Ahmed of Pakistan, Karl Werner of Germany, and Graeme Lowe of USA, passed specimens on to me.

Jiří Zídek (Praha, Czech Republic) translated the text and The National Library of the Czech Republic (International Loans Department) helped with borrowing literature.

I thank two anonymous reviewers for their important comments that led to the improvement of this manuscript.

References

- AGUIAR, O. B. 1978. Alguns escorpiões de Moçambique. *Garcia Orta Zool.*, Lisboa 7(1–2): 107–114.
- ALEXANDER, A. J. 1957. The courtship and mating of the scorpion, *Opisthophthalmus latimanus*. *Proceedings of the Zoological Society of London*, 128(4): 529–544.
- AL-SAFADI, M. M. 1992. Additions to the scorpion fauna of Yemen. *Zoology in the Middle East*, 6: 95–99.
- AMITAI, J., Z. KATZIR, G. MANN & P. AMITAI. 1981. Convulsions following a black scorpion (*Buthus judaicus*) sting. *Israel Journal of Zoology*, 17: 1083–1084.
- AMR, Z. S. & R. EL-ORAN. 1994. Systematics and distribution of scorpions (Arachnida, Scorpionida) in Jordan. *Bolletino 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.
- ARMAS, L. F., DE. 1986. Biología y morfometría de *Rhopalurus garridoi* Armas (Scorpionida: Buthidae). *Poeyana*, 333: 1–27.
- 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.
- BARTOLOZZI, L., S. VANNI & S. W. MASCHERINI. 1987. Cataloghi del Museo zoologico “La Specola” (sezione del Museo di Storia naturale) dell’Università di Firenze. V. Arachnida Scorpiones: Tipi. *Atti della Società Toscana dei Naturalisti, Memorie*, ser. B., 94: 293–298.
- BASTAWADE, D. B. 1994. A study of hemispermatothores in Indian scorpions of the families Chaerilidae, Vaejoividae and Ischnuridae. *Records of the Zoological Survey of India*, 94(2–4): 435–437.
- BASTAWADE, D. B. 2002. Scorpion diversity and checklist of scorpions. In Jagtap, A.P. & N.P. Singh (eds). *Biodiversity of the Western Ghats of Maharashtra - Current knowledge*. Dehra Dun, Bishen Singh Mahendra Pal Singh, 608 pp.
- BELFIELD, W. 1956. A preliminary check list of the West African scorpions and key for their identification. *Journal of the West African Science Association*, 2(1): 41–47.
- BIRULA, A. A. 1897. Miscellanea scorpologica. II. Zur Synonymie der russischen Skorpione. (Fortsetzung). *Annuaire du Musée Zoologique de l’Académie Impériale des Sciences de St.-Petersbourg*, 2: 377–391.
- BIRULA, A. A. 1900. Scorpiony Sredizemnomorskoi podoblasti, khanyashchiesya v Zoologicheskom Muzee Imperatorskogo Moskovskogo Universiteta. (Scorpiones mediterranei Musei Zoologici Mosquensis). *Izvestiya Imperatorskogo Obshchestva Lyubitelei Prirody, Istorii, Antropologii i Etografii*, 98: 8–20.
- BIRULA, A. A. 1904. Miscellanea scorpologica. VII. Synopsis der russischen Skorpione. *Annuaire du Musée Zoologique de l’Académie Impériale des Sciences de St.-Petersbourg*, 9: 28–38.
- BIRULA, A. A. 1905. Beiträge zur Kenntniss der Scorpionenfauna Persiens (Dritter Beiträge).

- Bulletin de l'Académie Impériale des Sciences de St.-Petersbourg*, 23: 119–148.
- BIRULA, A. A. 1908. Ergebnisse der mit Subvention aus der Erbschaft Treitl unternommenen zoologischen Forschungsreise Dr. F. Werner's nach dem ägyptischen Sudan und Nord-Uganda. XIV. Skorpiones und Solifugae. *Sitzungsberichte der Kaiserlich-Königlichen Akademie der Wissenschaften. Wien*, 117/2 (1): 121–152.
- 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. 1915a. Miscellanea scorpiologica. X. Bemerkungen über die von S. F. Swatosch in British Ost-Afrika gesammelten Skorpionen-Arten. *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg*, 19(1914): 114–124.
- BIRULA, A. A. 1915b. A general list of the Scorpions of British East Africa. *Scientific Results of the Zoological Expedition to British East Africa and Uganda*, 9: 1–31.
- BIRULA, A. A. 1916. Arachnologische Beiträge. V. Weitere Bemerkungen über die Skorpionen-Fauna British Ost-Afrika. *Revue Russe d'Entomologie*, 15(1915): 50–65.
- BIRULA, A. A. 1917. Chlenistobryukhie paukoobraznye Kavkazskogo Kraya. Part I. Scorpiones. *Mémoires du Musée du Caucase*, 5: 1–253.
- BIRULA, A. A. 1918. Miscellanea scorpiologica. XI. Materialy k scorpiofaune nizhnei Mesopotamii, Kurdistana i Severnoi Persii (Matériaux pour servir á 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.-Petersbourg*, 22(1917): 1–44.
- BIRULA, A. A. 1928. Wissenschaftliche Ergebnisse der mit Unterstützung der Akademie der Wissenschaften in Wien aus der Erbschaft Treitl von F. Werner unternommenen Zoologischen Expedition nach dem Anglo-Ägyptischen Sudan (Kordofan) 1914. XXV. Skorpione. *Denkschriften der Akademie der Wissenschaften in Wien*, 101: 79–88.
- BIRULA, A. A. 1937. Zаметки о коллекции скорпионов из Йемена (Ю. В. Аравия). (Notes sur les collections des scorpions recueillis dans le Yémen (Arabie S. E.)). *Archives du Musée Zoologique de l'Université de Moscou*, 4: 101–110.
- BORELLI, A. 1904. Di alcuni scorpioni della Colonia Eritrea. *Bollettino dei Musei di Zoologia ed Anatomia Comparata della Reale Università di Torino*, 19 (463): 1–5.
- BORELLI, A. 1911. Scorpioni raccolti da Leonardo Fea nell'Africa occidentale. *Annali del Museo Civico di Storia Naturale di Genova*, 45(5): 8–13.
- BORELLI, A. 1913. Scorpioni raccolti dal prof. F. Silvestri nell'Africa occidentale. *Bollettino del Laboratorio di Zoologia Generale e Agraria della Reale Scuola Superiore d'Agricoltura in Portici*, 7: 218–220.
- BORELLI, A. 1914. Contributo allo Studio della Fauna Libica. Materiali raccolti nelle zone di Misurata e Homs (1912–13) dal Dott. Alfredo Andreini, Capitano Medico. Scorpioni. *Annali del Museo Civico di Storia Naturale di Genova*, ser. 3a, 6 (46): 148–159.
- BORELLI, A. 1915. Gli Scorpioni del Museo Civico di Storia naturale di Milano. *Atti della Società Italiana di Scienze Naturali*, 53: 456–464.
- BORELLI, A. 1919. Missione per la frontiera Italo Etiopica sotto il comando del Capitano Carlo Citeri. Risultati Zoologici. Scorpioni. *Annali del Museo Civico di Storia Naturale di Genova*, 48(1918–19): 359–381.
- BORELLI, A. 1925a. Scorpioni nuovi o poco noti della Somalia Italiana. *Annali del Museo Civico di Storia Naturale di Genova*, 52: 9–16.
- BORELLI, A. 1925b. Di alcuni Scorpioni della Somalia Italiana. *Annali del Museo Civico di Storia Naturale di Genova*, 51: 316–326.
- BORELLI, A. 1929. Scorpions du Soudan. *Annals and Magazine of Natural History*, 10(3): 297–300.
- BORELLI, A. 1931. Spedizione del barone Raimondo Franchetti in Danalia. Scorpioni e Solifughi.

- Annali del Museo Civico di Storia Naturale di Genova*, 55: 218–219.
- BORELLI, A. 1934. Scorpiones. Pp. 169–173 and 920 in Zavattari, E. (ed.), *Prodromo della Fauna della Libia*, Pavia, 12.
- 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.
- BÜCHERL, W. 1959. Escorpiões e escorpionismo no Brasil. X. Catálogo da coleção escorpionica do Instituto Butantan. *Memórias do Instituto de Butantan*, 29: 255–275.
- BULTEL, P. 2003. Note sur la sociabilité chez *Hottentotta hottentotta*. *Bulletin de Phyllie*, 16 : 31–32.
- CAPES, E. M. & V. FET. 2001. A redescription of the scorpion genus *Plesiobuthus* Pocock, 1900 (Scorpiones: Buthidae) from Pakistan. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13(164): 295–304.
- CAPORIACCO, L. DI. 1936. Scorpioni, Pedipalpi, Solifugi e Chernetidi di Somalia e Dancalia. *Annali del Museo Civico di Storia Naturale di Genova*, 58: 135–149.
- CAPORIACCO, L. DI. 1937. Risultati scientifici della missione del Prof. G. Scortecci nel Fezzan e sui Tassili (1936) con aggiunta di esemplari di altre località Libiche. *Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale in Milano*, 76(3): 340–354.
- CAPORIACCO, L. DI. 1939. Arachnida. Missione Biol. Paese Borana Roma, 3(2): 303–385.
- CAPORIACCO, L. DI. 1941. Arachnida (Esc. Acarina). *Missione Biologica Sagan-Omo*, *Zoologia*, 6: 21–175.
- CAPORIACCO, L. DI. 1947. Scorpioni dell'Eritrea del Museo zoologici di Firenze. *Acta Pontificae Academiae Scientiarum Novi Lyncei*, 11(19): 227–233.
- CAPORIACCO, L. DI. 1949. Aracnidi della Colonia del Kenya raccolti da Toschi e Meneghetti negli anni 1944–46. *Acta Pontificae Academiae Scientiarum Novi Lyncei*, 13(6): 309–492.
- CLOUDSLEY-THOMPSON, J. L. 1986. Arachnids. Pp. 174–204 in Cloudsley-Thompson, J.L. (ed.), *Key Environments of the Sahara Desert*. Pergamon Press, IUCNNR.
- 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). *Bollettino della Museo Scienze Naturali in Torino*, 19(2): 433–474.
- DELFOSSÉ, E. 2001. Sur un Scorpion du Nigeria (Arachnida, Scorpiones, Buthoidea, Buthidae). *Bulletin de Phyllie*, 8 : 26.
- DUFOUR, L. 1856. Histoire anatomique et physiologique des Scorpions. *Mémoires Présentés par Divers Savants a l'Académie des Sciences de l'Institut Impérial de France*, 14: 561–657.
- DUPRÉ, G. 1990. Notes sur la repartition des scorpions du Togo. *Arachnides*, 6: 8–10.
- DUPRÉ, G. 1995. Les Scorpions du Maroc (2e note). Description d'un Biotope: Le Djbel Touchka. *Arachnides*, 25: 1–4.
- DUPRÉ, G. & P. BALLIET. 1997. Première observation sur la reproduction d'*Hottentotta franzwernerii gentili* (Pallary, 1924) (Scorpiones, Buthidae). *Arachnides*, 35: 5–6.
- DUPRÉ, G., N. LAMBERT & P. GERARD. 1998. *Les Scorpions. Biologie. Élevage*. Paris, 82 pp.
- EL-HENNAWY, H. K. 1988. Scorpions of Jordan. *Serket*, 1(2): 13–20.
- EL-HENNAWY, H. K. 1992. A catalogue of the scorpions described from the Arab countries (1758–1990) (Arachnida: Scorpionida). *Serket*, 2(4): 95–153.
- FABRICIUS, J. CH. 1787. *Mantissa insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis, specificis, emendationibus, observationibus. Tom. I. Hafniae: Impensis Christ. Gottl. Proft., 348 pp.*
- FABRICIUS, J. CH. 1793. *Entomologiae Systematica emendata et aucta secundum classes, ordines, genera, species adiectis synonymis, Locis, obser-*

- vationibus, descriptionibus. Tom. II. Hafniae: Impensis Christ. Gottl. Proft., 519 pp.
- FABRICIUS, J. CH. 1798. *Entomologiae Systematicae. Supplementum*. Hafniae: Apud Proft et Storch, 572 pp.
- 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(1988): 73–171.
- 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.
- FRADE, F. 1947. Escorpiões, Solifugos e Pedipalpos da Guiné Portuguesa. *Trab. 2a, Conf. Int. Afr. Occid. Bissau* 1947, 3: 265–270 (7–18).
- FRANCKE, O. F. 1985. Conspectus genericus Scorpionorum 1758–1982 (Arachnida: Scorpiones). *Occasional Papers of the Museum, Texas Tech University*, 98: 1–32.
- FRANCKE, O. F. & W. D. SISSOM. 1984. Comparative review of the methods used to determine the number of molts to maturity in scorpions (Arachnida), with analysis of the post-birth development of *Vaejovis coahuilae* Williams (Vaejovidae). *Journal of Arachnology* 12: 1–20.
- GEERAERTS, J. 1953. Studie over gift en antigift in verband met de schorpionen van Belgisch-Kongo. *Bull. Agric. Congo Belge* 44(5): 1055–1084.
- GERVAIS, P. 1844. Scorpions. Pp. 14–74 in Walckenaer, C. W. & P. Gervais. (eds.). 1844. *Histoire naturelle des Insectes*. Paris: Lib. Encyclop. Roret, Tome 3, 418 pp.
- GOUGH, L. H. & S. HIRST. 1927. Key to identification of Egyptian scorpions. A method of identifying Egyptian scorpions from the fifth caudal segment and stings. *Bulletin of the Ministry of Agriculture of Egypt, Technical Scientific Service*, 76: 1–7.
- GOYFFON, M. 1993. Les Scorpions des régions Montagneuses. *Actes du 116e Congrès National des Sociétés Savantes, Ed. C.T.H.S., Paris*: 241–254.
- HABIBI, T. 1971. Liste de Scorpions de l'Iran. *Bulletin of the Faculty of Science, Teheran University*, 2(4): 42–47.
- HADLEY, N. F. 1990. Environmental physiology. Pp. 321–340 in Polis, G. A. (ed.), *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- HEMPRICH, F. G. & CH. G. EHRENBERG. 1828: Animalia articulata. Arachnoidea, Scorpiones africani et asiatici. In: *Symbolae physicae seu icones et descriptiones Animalium evertibratorum sepositis insectis quae ex itinere per Africam Borealem et Asiam Occidentalem*. Berolini: Officina Academica, Decas Prima, Plates IX et X.
- HEMPRICH, F. G. & CH. 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. & CH. G. EHRENBERG. 1831. Animalia Articulata, Arachnoidea, Scorpiones. In *Symbolae physicae animalia evertabrata, 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.
- HERBST, J. F. W. 1800. Naturgeschichte der Skorpionen. *Natursystem der Ungeflügelten Insekten*. Berlin: Bei Gottlieb August Lange, 86 pp.
- HEWITT, J. 1918. A survey of the scorpion fauna of South Africa. *Transactions of the Royal Society of South Africa*, 6: 89–192.
- HEWITT, J. 1935. Scientific results of the Vernay-Lang Kalahari expedition, March to September, 1930. The trap-door spiders, scorpions and solifuges. *Annals of the Transvaal Museum*, 16(3): 459–479.

- HIRST, S. 1911a. On a collection of Arachnida and Chilopoda, made by Mr. S. A. Neave in Rhodesia, North of the Zambezi. *Memoirs of the Linnean Philosophical Society*, 56(2): 1–11.
- HIRST, S. 1911b. Scorpions and Solifugae collected by Captain S. S. Flower in the Anglo-Egyptian Sudan. *Annals and Magazine of Natural History*, VIII(7): 217–222.
- HJELLE, J. T. 1990. Anatomy and morphology. Pp. 9–63 in Polis, G. A. (ed.): *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- ICZN (International Commission on Zoological Nomenclature). 1999. *International Code of Zoological Nomenclature*. 4th Ed. International Trust for Zoological Nomenclature, London, 306 pp.
- JAKEŠ, O. & D. POVOLNÝ. 1967. Beiträge zur Kenntnis der Fauna Afghanistan. Reisebericht und Charakteristik des Sammelgebietes. Verzeichnis der Lokalitäten. *Acta Musei Moraviae (Scientiae Naturales Supplementum)* 52: 9–34.
- KABAKIBI, M. M, N. KHALIL & Z. AMR. 1999. Scorpions of southern Syria. *Zoology in the Middle East*, 17: 79–89.
- KABÁTEK, P., F. KOVAŘÍK & D. KRÁL. 2005. Dioscorida – Bájny ostrov Sokotra. *Akva Tera Fórum* 1(11): 68–75 [in Czech].
- KARATAŞ, AY. 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.
- KARSCH, F. 1881. Uebersicht der europäischen Skorpione. *Berliner Entomologische Zeitschrift*, 25: 89–91.
- KARSCH, F. 1885. Myriopoden und Arachnoiden. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalt*, 2(1884): 133–138.
- 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.
- KHATOON, S. 1986. A Checklist of Arachnids of Pakistan. I. *Bulletin of the Hydrobiological Research*, 1985–86, 36–37: 645–650.
- KHATOON, S. 1999. Scorpions of Pakistan (Arachnida: Scorpionida). *Proceedings of the Pakistan Congress of Zoology*, 19: 207–225.
- KING, H. H. 1925. Notes on Sudan scorpions. *Sudan Notes and Records*, 8: 79–84.
- KINZELBACH, R. 1984. Die Skorpionssammlung des Naturhistorischen Museums der Stadt Mainz – Teil II: Vorderasien. *Mainzer Naturwissenschaftliches Archiv*, 22: 97–106.
- KOCH, C. L. 1838a. *Die Arachniden*. 5(3): 45–49, Figs. 366–367, Nürnberg.
- KOCH, C. L. 1838b. *Die Arachniden*. 5(5): 93–95, Figs. 401–402, Nürnberg.
- KOCH, C. L. 1839. *Die Arachniden*. 5(6): 125–128, Figs. 418–419, Nürnberg.
- KOCH, C. L. 1840. *Die Arachniden*. 6(4): 75–79, Figs. 485–486, Nürnberg.
- KOCH, C. L. 1850. *Übersicht des Arachnidensystems*. 5. Nürnberg: C. H. Zeh'schen Buchhandlung., 104 pp.
- KOCH, L. 1875. *Aegyptische und Abyssinische Arachniden gesammelt von Herrn C. Jickeli*. Verlage von Bauer & Raspe, Nürnberg, 96 pp.
- 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. 1993. The Fauna of Afghanistan IV: Scorpionida I. *Acta Musei Moraviae, Scientiae Naturales*, 78: 201–204.
- 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. 1999. *Hemibuthus kraepelini*, a junior synonym of *Hottentotta rugiscutis* (Scorpiones: Buthidae). *Acta Societatis Zoologicae Bohemicae*, 63: 291–293.
- KOVAŘÍK, F. 2000. The Socotra Island and its scorpions. *Akvárium terárium*, 43(7): 63–67 (in Czech).
- KOVAŘÍK, F. 2001a. *Lanzatus somalicus* gen. et sp. n. (Scorpiones: Buthidae) from Somalia. *Acta Societatis Zoologicae Bohemicae*, 65: 41–44.
- KOVAŘÍK, F. 2001b. 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. Scorpions of Djibouti, Eritrea, Ethiopia, and Somalia (Arachnida: Scorpiones), with a key and descriptions of three new species. *Acta Societatis Zoologicae Bohemicae*, 67: 133–159.
- 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. & 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. 1898. Die Skorpione Ostafrikas. In K. Moebius (ed.), *Die Thierwelt Ost-Afrikas und der Nachbargebiete. Wirbellose Thiere*. Berlin, 4(5): 1–5.
- 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. 1903. Scorpione und Solifugen Nordost-Afrikas, gesammelt 1900 und 1901 von Carlo Freiherrn von Erlanger und Oscar Neumann. *Zoologische Jahrbücher, Abtheilung für Systematik*, 18(4–5): 557–578.
- KRAEPELIN, K. 1905. Zur Nomenklatur der Skorpione und Pedipalpen. *Zoologischer Anzeiger*, 28: 195–204.
- 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.
- KRAEPELIN, K. 1914. Skorpiones und Solifugae. Pp. 107–136 in Michaelsen, W. (ed.) *Beiträge zur Kenntnis der Land- und Sübwasserfauna Deutsch-Südwestafrikas*, Hamburg.
- KRAEPELIN, K. 1929. Skorpione, Pedipalpen und Solifugen der Zweiten Deutschen Zentral-Afrika-Expedition 1910–1911. *Abhandlungen aus dem Gebiete der Naturwissenschaften Hamburg*, 22(2): 86–91.
- LAMORAL, B. H. 1979. The scorpions of Namibia. *Annals of the Natal Museum*, 23(3): 497–784.

- LAMORAL, B. H. & S. REYNDERS. 1975. A catalogue of the scorpions described from the Ethiopian Faunal Region up to December 1973. *Annals of the Natal Museum*, 22(2): 489–576.
- 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.
- LAWRENCE, R. F. 1927. Contributions to a knowledge of the fauna of South-West Africa. V. Arachnida. *Annals of South African Museum*, 25(1): 1–75.
- LAWRENCE, R. F. 1928. Contributions to a knowledge of the fauna of South-West Africa. VII. Arachnida (Part 2.). *Annals of South African Museum*, 25: 217–312.
- LAWRENCE, R. F. 1955. Solifugae, Scorpions and Pedipalpi, with checklist and keys to South African families, genera and species. Results of the Lund University Expedition in 1950–1951. *South African Animal Life*, Uppsala, 1955: 152–262.
- LAWRENCE, R. F. 1959. A collection of Arachnida and Myriapoda from the Transvaal Museum. *Annals of the Transvaal Museum*, 23: 363–386.
- LAWRENCE, R. F. 1961. New scorpions and solifuges from South West Africa and Angola. *Kungl Fysiografiska Sällskapet i Lund Forhandlingar*, 31(15): 147–160.
- LAWRENCE, R. F. 1962. Solifuges, scorpions and Chilopoda of the Namib Desert. *Annals of the Transvaal Museum*, 24: 213–222.
- LAWRENCE, R. F. 1964. The Solifugae, scorpions and Pedipalpi of the Kruger National Park. *Koedoe*, 7: 30–39.
- LAWRENCE, R. F. 1967. Supplementary list of the Solifugae, scorpions and Pedipalpi of the Kruger National Park. *Koedoe*, 10: 82–86.
- LAWRENCE, R. F. 1972. Collecting scorpions in South West Africa. *News Bulletin Zoology Society of Southern Africa*, 10(2), 1969: 8–9.
- LEEMING, J. 2003. Scorpions of Southern Africa. *Struik Publishers*, 88 pp.
- LEVY, G. & P. AMITAI. 1980. *Fauna Palaestina, Arachnida I.–Scorpiones*. The Israel Academy of Sciences and Humanities, 132 pp.
- LINDBERG, K. 1946. Pigure par un scorpion (*Buthus pachyurus* Pocock). Auto-observation. *Acta Tropica*, 3(2): 152–154.
- LÖNNBERG, E. 1897. Scorpioner och Pedipalper i Upsala universitets zoologiska museum. *Entomologisk Tidskrift*, 18: 175–192.
- LÖNNBERG, E. 1912. Scorpions, solpugids and ixodides collected by the Swedish Zoological Expedition to Brit. East-Africa 1911. Scorpions and solpugids. *Arkiv för Zoologi (Stockholm)*, 7(24): 1–3.
- LOURENÇO, W. R. 2000. The genus *Hottentotta* Birula, 1908, with the description of a new subgenus and species from India (Scorpiones, Buthidae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13(162): 191–195.
- LOURENÇO, W. R. 2003. Compléments à la faune de scorpions (Arachnida) de l’Afrique du Nord, avec des considérations sur le genre *Buthus* Leach, 1815. *Revue suisse de Zoologie*, 110(4): 875–912.
- LOURENÇO, W. R. 2004. On the genus *Hottentotta* Birula 1908, with the description of a new species from Chad (Scorpiones: Buthidae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 14(170): 211–218.
- LOURENÇO, W. R. & J. L. CLOUDSLEY-THOMPSON J. 1996. The evolutionary significance of colour, colour patterns and fluorescence in scorpions. *Revue suisse de Zoologie*, H.S. 2: 449–458.
- LOURENÇO, W. R. & O. CUELLAR. 1994. Notes on the geography of parthenogenetic scorpions. *Biogeographica*, 70(1): 19–23.
- LOURENÇO, W. R. & O. CUELLAR. 1999. A new all-female scorpion and the first probable case of arrhenotoky in scorpions. *Journal of Arachnology*, 27(1): 149–153.
- LOURENÇO, W. R. & E. YTHIER. 2006. Description of a new species of *Hottentotta* Birula 1908 (Scorpiones, Buthidae) from the Cape Verde Islands. *Boletín Sociedad Entomológica Aragonesa*, 38: 71–75.
- LOVERIDGE, A. 1925. Notes on East African Scorpions and Solifugiae, collected 1916–1923. *Proceedings of the Zoological Society of London*, 1925: 303–309.

- MANI, M. S. 1959. On a collection of high altitude scorpions and pseudo-scorpion (Arachnida) from the North-West-Himalaya. *Agra University Journal of Research Science*, 8: 11–16.
- MASI, L. 1912. Note sugli Scorpioni appartenenti al R. Museo Zoologico di Roma. *Memorie della Società Entomologica Italiana*, 1(3): 88–108, 120–144.
- MAURY, E. A. 1997. *Tityus trivittatus* en la Argentina nuevos datos sobre distribución, partenogenesis, sinantropia y peligrosidad (Scorpiones, Buthidae). *Publ. Museo Argentino Ciencias Naturales "Bernardino Rivadavia"*, 24: 1–24.
- MONARD, A. 1930. Matériaux de la mission scientifique suisse en Angola. Scorpions. *Bulletin de la Société Neuchâteloise des Sciences Naturelles*, 54: 37–43.
- MONARD, A. 1937. Scorpions, Solifuges et Opilions d'Angola. *Revue suisse de Zoologie*, 44: 251–270.
- MONARD, A. 1939. Résultats de la Mission scientifique du Dr. Monard en Guinée Portugaise 1937–1938. *Arquivos do Museu Bocage*, 10: 81–85.
- MONARD, A. 1951. Résultats de la mission Zoologique Suisse au Cameroun. Scorpions. *Mémoires de l'Institut Français d'Afrique Noire*, 1: 237.
- MORIGGI, M. 1941. Gli Scorpioni dell'Africa orientale Italiana. *Rivista di Biologia Coloniale*, 4: 77–103.
- MORITZ, M. & S.-CH. FISCHER. 1980. Die Typen der Arachniden-Sammlung des zoologischen Museums Berlin. III. Scorpiones. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 56: 309–326.
- NEWLANDS, G. 1987. Scorpions. *The Insight Series*, Ed. de Jager-Haum, Pretoria, 40 pp.
- NEWLANDS, G. & C. B. MARTINDALE. 1980. The buthid scorpion fauna of Zimbabwe-Rhodesia with checklists and keys to the genera and species, distributions and medical importance (Arachnida: Scorpiones). *Zeitschrift für Angewandte Zoologie*, 67: 51–77.
- PALLARY, P. 1924. Description de trois Scorpions nouveaux du Maroc. *Archives de l'Institut Pasteur d'Algérie*, 2(2): 219–222.
- PALLARY, P. 1925. Etudes sur les Scorpions de la Berberie. *Archives de l'Institut Pasteur d'Algérie*, 3(1): 45–58.
- PALLARY, P. 1937. Notes sur divers scorpions de l'Afrique du Nord. *Archives de l'Institut Pasteur d'Algérie*, 15(1): 97–101.
- PALLARY, P. 1938. Sur des scorpions de la Berbérie, de la Syrie et du Congo. *Archives de l'Institut Pasteur d'Algérie*, 16(3): 279–282.
- PAVESI, P. 1881. Studi sugli Aracnidi Africani. II. Aracnidi d'Inhambane, raccolti da Carlo Fronasini, e considerazioni sull'Aracnofauna de Mozambico. *Annali del Museo Civico di Storia Naturale di Genova*, 16: 536–560.
- PAVESI, P. 1883. Considerazioni sull'aracnofauna dell'Abissinia. *Rendiconti Reale Istituto Lombardo di Scienze e Lettere*, 16(9): 1–5 (496–501).
- PAVESI, P. 1885. Aracnidi raccolti dal conte Bouturlin ad Assab e Massaua. *Bollettino della Società Entomologica Italiana*, 17: 197–200.
- PAVESI, P. 1895a. Viaggio del Dott. E. Festa in Palestina, nel Libano e regioni vicine. *Bollettino dei Musei di Zoologia ed Anatomia Comparata*, 10(216): 1–11.
- PAVESI, P. 1895b. Aracnidi raccolti nel Paese dei Somali dall'ing L. Bricchetti-Robecchi. *Bollettino Scientifico*, 17: 37–46.
- PAVESI, P. 1895c. Esplorazione del Giuba e dei suoi affluenti compiuta dal Cap. V. Bottego durante gli anni 1892–3. 18. Aracnidi. *Annali del Museo Civico di Storia Naturale di Genova*, 5(35): 491–537.
- PAVESI, P. 1897. Studi sugli Aracnidi Africani, IX. Aracnidi Somali E Galla. *Annali del Museo Civico di Storia Naturale di Genova*, 18: 151–188.
- 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. 1862. 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. 1890a. A revision of the genera of scorpions of the family Buthidae, with descriptions of some South-African Species. *Proceedings of the Zoological Society*, 1890: 114–141.
- POCOCK, R. I. 1890b. Report upon a small collection of scorpions and centipedes sent from Madras by Mr. Edgar Thurston, of the Government Central Museum. *Annals and Magazine of Natural History*, 6(5): 236–245.
- POCOCK, R. I. 1890c. Descriptions of two new species of scorpions brought by Emin Pasha from the inland parts of East Africa. *Annals and Magazine of Natural History*, 6(6): 98–101.
- POCOCK, R. I. 1891. Notes on some scorpions collected by Mr. J. J. Walker, with descriptions of two new species and a new genus. *Annals and Magazine of Natural History*, 6(8): 241–247.
- POCOCK R. I. 1893. Report upon a small collection of scorpions sent to the British Museum by Mr. Edgar Thurston, of The Government Central Museum, Madras. *Journal of the Bombay Branch of the Royal Asiatic Society*, 7(3): 297–312.
- 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. 1896a. Report upon the scorpions, spiders, centipedes, and millipedes obtained by Mr. and Mrs. E. Lort Philips in the Goolis Mountains inland of Berbera, N. Somaliland. *Annals and Magazine of Natural History*, 6(18): 178–186.
- POCOCK, R. I. 1896b. On the scorpions, centipedes, and millipedes obtained by Dr. Gregory on his expedition to Mount Kenia, East Africa. *Annals and Magazine of Natural History*, 6(17): 425–444.
- POCOCK, R. I. 1897a. Descriptions of some new species of scorpions from India. *Journal of the Bombay Natural History Society*, 11: 102–117.
- POCOCK, R. I. 1897b. Solifugae, Scorpiones, Chilopoda, and Diplopoda. Appendix C to Donaldson Smith's *Through Unknown African Countries. The first expedition from Somaliland to Lake Lamu*, 1897: 392–407.
- POCOCK, R. I. 1898a. The Arachnida from the regions of Lakes Nyasa and Tanganyika contained in the collection of the British Museum. *Annals and Magazine of Natural History*, 7(2): 429–448.
- POCOCK, R. I. 1898b. On the scorpions, spiders and solpugas collected by Mr. C. Stewart Betton in British East Africa. *Proceedings of the Zoological Society of London*, 1898: 497–524.
- POCOCK, R. I. 1899. On the Scorpions, Pedipalps, and Spiders from Tropical West Africa represented in the Collection of the British Museum. *Proceedings of the Zoological Society of London*, 1899: 833–885.
- POCOCK, R. I. 1900a. Arachnida. *The Fauna of British India, including Ceylon and Burma*. Published under the authority of the Secretary of State for India in Council. London: W. T. Blandford, xii, 279 pp.
- POCOCK, R. I. 1900b. On a collection of insects and arachnids made in 1895 and 1897 by Mr. C.A.V. Peel, F.Z.S. in Somaliland, with descriptions of new species. 10. General list of the scorpions of Somaliland and the Boran Country. *Proceedings of the Zoological Society of London*, 1900: 55–63.
- POCOCK, R. I. 1903a. The scorpions and spiders of Sokotra. Pp.178–182 in Forbes, H. O. *The natural History of Sokotra and Abd-el-Kuri (Special Bulletin of the Liverpool Museums)*. Henry Young and Sons, Liverpool.
- POCOCK, R. I. 1903b. Some Arachnida collected by Mr. G. W. Bury in Yemen. *Annals and Magazine of Natural History*, 7(11): 214–219.
- POLIS, G. A. & W. D. SISSOM. 1990. Life history. Pp. 161–223 in Polis, G. A. (ed.): *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- PRENDINI, L. 2000. Chelicerata (Scorpiones). *Cimbebasia Memoir*, 9: 109–120.
- PRENDINI, L. 2005. Scorpion diversity and distribution in southern Africa: Pattern and process. Pp. 25–68 in Huber, B.A., B. J. Sinclair & K.-H. Lampe (Eds.) *African Biodiversity: Molecules, Organisms, Ecosystems. Proceedings of the 5th International Symposium on Tropical Biology, Museum Alexander Koenig, Bonn*. Springer Verlag, New York.

- PRINGLE, G. 1960. Notes on the scorpions of Iraq. *Bulletin of Endemic Diseases*, 3(3-4): 73-87.
- PROBST, P. 1973. A review of the scorpions of East Africa with special regard to Kenya and Tanzania. *Acta Tropica*, 30: 312-335.
- PROST, A. 1982. L'identification des scorpions de Haute-Volta. *Notes et Documents Voltaïques*, 13(1): 4-10.
- PURCELL, W. F. 1902. On some South African Arachnida belonging to the Orders Scorpiones, Pedipalpi, and Solifugae. *Annals of South African Museum*, 2: 137-225.
- ROEWER, C. F. 1929. Süd-indische Skorpione, Chelonethi und Opilioniden. *Revue Suisse de Zoologie*, 36(21): 609-613.
- ROEWER, C. F. 1943. Über eine neuerworbene Sammlung von Skorpionen des Natur-Museums Senckenberg. *Senckenbergiana*, 26(4): 205-244.
- ROEWER, C. F. 1952. Solifuga, Opiliones, Pedipalpi and Scorpiones (Arachnoidea). *Exploration du Parc Nationale de l'Upemba, Mission G. F. de Witte*, 5: 1-36.
- SAN MARTIN, P. R. & L. A. GAMBARDELLA. 1967. Descripción del espermatoforo de *Bothriurus bucherli* San Martin 1963 (Scorpiones: Bothriuridae). *Revista de la Sociedad de Entomología de Argentina*, 29(1-4): 17-20.
- SCHENKEL, E. 1932. Notizen über einige Scorpione und Solufugen. *Revue suisse de Zoologie*, 39 (15): 375-396.
- SCHMIDT, G. & S. BAUER. 1997. Skorpione und Spinnen von der kapverdischen Insel Santiago (Scorpiones, Araneae). *Arachnologische Magazine*, 5(9): 1-5.
- SERFATY, A. & M. VACHON. 1950. Quelques remarques sur la biologie d'un Scorpion de l'Afganistan: *Buthotus alticola* (Pocock). *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 215-218.
- SERGENT, E. 1943. Sur un Scorpion du sud Marocain (*Hottentota gentili* Ply). *Archives de l'Institut Pasteur d'Algérie*, 21(2): 83-88.
- SHULOV, A. 1958. Observations on the mating habits of two scorpions, *Leiurus quinquestriatus* H. et E. and *Buthotus judaicus* E. S. *Proceedings 10th International Congress of Entomology* 1(1956): 877-880.
- SHULOV, A. & P. AMITAI. 1958. On mating habits of three scorpions: *Leiurus quinquestriatus* H. et E., *Buthotus judaicus* E. Sim. and *Nebo hierichonticus* E. Sim. *Archives de l'Institut Pasteur d'Algérie*, 36(3): 351-369.
- SHULOV, A. & P. AMITAI. 1959. Observations sur les scorpions *Buthus occitanus* ssp. *mardochei* var. *israelis* var. nov. *Archives de l'Institut Pasteur d'Algérie*, 37(1): 218-225.
- 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 Piochard de la Brulerie (Scorpions et Galéodes). *Annales de la Société Entomologique de France*, (5)2: 245-266.
- SIMON, E. 1874. Etudes Arachnologiques VI. Description d'un Scorpion appartenant au genre *Buthus* Leach. *Annales de la Société Entomologique de France*, 5(5): 280-282.
- 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'ordre 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 Saulcy, qui les a recus de Mossoul (ancienne Ninive), sur le Tigre, en Mésopotamie. *Annales de la Société Entomologique de France*, 5(10): 29.
- SIMON, E. 1882. Viaggio ad Assab nel Mar Rosso, dei signori G. Doria ed O. Beccari con il R. Avviso "Esploratore" dal 16. Novembre 1879 al 26. Febbraio 1880. II. Étude sur les Arachnides de l'Yemen méridional. *Annali del Museo Civico di Storia Naturale di Genova*, 18: 207-260.

- SIMON, E. 1889. Etudes arachnologiques XXXIV. Étude sur les Arachnides de l'Yemen. *Études Arachnologiques*, 22: 122(46).
- SIMON, E. 1890. Étude sur les Arachnides de l'Yemen. *Annales de la Société Entomologique de France*, 6(10): 77–124.
- 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. 1905. Voyage de M. Maurice Maindron dans l'Inde méridionale. Arachnides. *Annales de la Société Entomologique de France*, 74: 160–180.
- SIMON, E. 1910. Révision des Scorpions d'Égypte. *Bulletin de la Société Entomologique d'Égypte*, 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.
- SOLEGLAD, M. E. & V. FET. 2003a. The scorpion sternum: structure and phylogeny (Scorpiones: Orthosterni). *Euscorpius*, 5: 1–34.
- SOLEGLAD, M. E. & V. FET. 2003b. High-level systematics and phylogeny of the extant scorpions (Scorpiones: Orthosterni). *Euscorpius*, 11: 1–175.
- STAHNKE, H. L. 1970. Scorpion nomenclature and mensuration. *Entomological News*, 81(12): 297–316.
- STAHNKE, H. L. & M. CALOS. 1977. A key to the species of the genus *Centruroides*. *Entomological News*, 88(5–6): 111–120.
- ŠTÁSTNÝ, K., F. KOVÁŘÍK & V. BEJČEK. 2000. The Socotra Island and its scorpions. *Akvárium terárium*, 43(7): 63–67 [in Czech].
- 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.
- STOCKMANN, R. 1979. Développement postembryonnaire et cycle d'intermue chez un scorpion Buthidae–*Buthotus minax occidentalis*. *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 4: 405–420.
- STRAND, E. 1916. Collectanea Arachnologica. Beiträge zur Bibliographie und Geschichte der Arachnologie. *Archiv für Naturgeschichte, Berlin*, 82: 42–69.
- TAKASHIMA, H. 1945. Scorpions of Eastern Asia. *Acta Arachnologica*, Tokyo, 9: 68–106.
- THORELL, T. 1876. Études scorpologiques. *Atti della Società Italiana di Scienze Naturali*, 19: 75–272.
- THORELL, T. 1889. Viaggio di Leonardo Fea in Birmanie e regioni vicine. XXI. – Aracnidi Artrogastri Birmani raccolti da L. Fea nel 1885–1887. *Annali del Museo Civico di Storia Naturale di Genova*, 27: 521–729.
- THORELL, T. 1893. Scorpiones exotici R. Musei Historiae Naturalis Florentini. *Bolletino della Società Entomologica Italiana*, 25: 356–387.
- TIKADER, B. K. & D. B. BASTAWADE. 1983. Scorpions (Scorpionida: Arachnida). In *The Fauna of India*, Vol. 3. (Edited by the Director). Calcutta: Zoological Survey of India, 671pp.
- TOLUNAY, A. 1959. Zur Verbreitung der Skorpione in der Türkei. *Zeitschrift für Angewandte Entomologie*, 43(4): 366–370.
- TOSCANO-GADEA, C. A. 2005. Confirmation of parthenogenesis in *Tityus trivittatus* Kraepelin, 1898 (Scorpiones, Buthidae). *Journal of Arachnology*, 33: 866–869.
- TULLGREN, A. 1907. Pedipalpi, Scorpiones, Solifugae, Chelonethi. *Sjöstedts Kilimandjaro Expedition*, 20(1): 1–15.
- 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. 1947a. Répartition et origine des scorpions de Turquie. *Comptes Rendus des Séances de la Société de Biogéographie*, 24, 206–208(3): 26–29.
- VACHON, M. 1947b. Remarques préliminaires sur la faune des Scorpions de Turquie. *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 19(2): 161–164.
- VACHON, M. 1966. Liste des scorpions connus en Égypte, Arabie, Israël, Liban, Syrie, Jordanie, Turquie, Irak, Iran. *Toxicon*, 4: 209–218.
- 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. 1954. Les Hamada Sud-Marocaines. II. Scorpions. *Travaux de l'Institut Scientifique Chéri-fien*, 2: 187–188.
- VACHON, M. 1958. The 3rd Danish Expedition to Central Asia. Zoological Results 23. Scorpionidea (Chelicerata) de l'Afganistan. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening*, 120: 121–187.
- VACHON, M. 1961. Le parc national du Niokolo-Koba, Fasc.2. III. Scorpions. *Mémoires de l'Institut Français pour Afrique Noire*, 62: 31–32.
- 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. Notes on the types of scorpions in the British Museum (Natural History), London. *Buthus socotrensis* Pocock, 1889 (Family: Buthidae). *Bulletin of the British Museum, Natural History (Zoology)*, 36(4): 233–237.
- VACHON, M. 1980. Scorpions du Dhofar. *Journal of the Oman Studies*, 2: 251–263.
- 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.
- VIAL, P. Y. & M. VIAL. 1974. Scorpions. Pp. 137–140 in *Sahara Milieu vivant*. Ed. Hatier.
- VIGNOLI, V., F. KOVAŘÍK & P. CRUCITTI. 2003. Scorpiofauna of Kashan (Esfahan Province, Iran) (Arachnida: Scorpiones). *Euscorpius*, 9: 1–7.
- WARBURG, M. R. & G. A. POLIS. 1990. Behavioral responses, rhythms and activity patterns. Pp. 224–246 in Polis, G. A. (ed.), *The Biology of Scorpions*. Stanford: Stanford University Press, 587 pp.
- 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. 1902. Die Scorpione, Pedipalpen und Solifugen in der zoologisch-vergleichend-anatomischen Sammlung der Universität Wien. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, 52: 595–608.
- WERNER, F. 1911. Scorpions and allied annulated spiders of the Anglo-Egyptian Sudan. *Report of the Wellcome Research Laboratories at the Gordon Memorial College*, 4B: 179–194.
- WERNER, F. 1916. Über einige Skorpione und Gliederspinnen des Naturhistorischen Museum in Wiesbaden. *Jahrbücher des Nassauischen Verein für Naturkunde*, 69: 79–97.

- WERNER, F. 1929. Wissenschaftliche Ergebnisse einer zoologischen Forschungsreise nach Westalgerien und Marokko. *Sitzungsberichte der Kaiserlich-Königlichen Akademie der Wissenschaften*, Wien, 138: 1–34.
- WERNER, F. 1932. Ergebnisse einer zoologischen Forschungsreise nach Marokko. Unternommen 1930 mit Unterstützung der Akademie der Wissenschaften in Wien von Franz Werner und Richard Ebner. VI: Skorpione. *Sitzungsberichte der Kaiserlich-Königlichen Akademie der Wissenschaften*, Wien, 141: 284–306.
- 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.
- WERNER, F. 1935. Über Skorpione aus Palästina. *Zoologischer Anzeiger*, 109: 211–216.
- WERNER, F. 1936. Neu-Eingänge von Skorpionen im Zoologischen Museum in Hamburg. *Festschrift zum 60. Geburtsage von Professor Dr. Embrik Strand*, Riga, 2: 171–193.
- WHITTICK, R. J. 1971. Scorpions from Palestine, Syria, Iraq and Iran. *Field Research Projects*, 1971: 1–4.
- ZIMSEN, E. 1964. *The Type Material of I. C. Fabricius*. Copenhagen: Munksgaard, 639 pp.