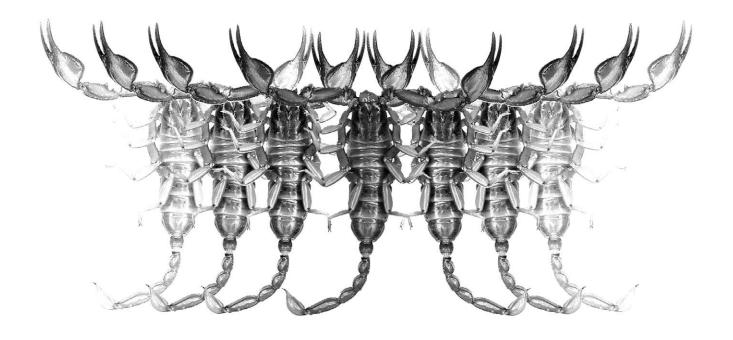
Euscorpius

Occasional Publications in Scorpiology



Scorpions of the Horn of Africa (Arachnida, Scorpiones).

Part XVI. Compsobuthus maidensis sp. n. (Buthidae) from
Somaliland

František Kovařík

Euscorpius

Occasional Publications in Scorpiology

EDITOR: Victor Fet, Marshall University, 'fet@marshall.edu' ASSOCIATE EDITOR: Michael E. Soleglad, 'soleglad@znet.com'

Euscorpius is the first research publication completely devoted to scorpions (Arachnida: Scorpiones). **Euscorpius** 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). **Euscorpius** 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 *Euscorpius* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

Euscorpius is located at: http://www.science.marshall.edu/fet/Euscorpius

(Marshall University, Huntington, West Virginia 25755-2510, USA)

ICZN COMPLIANCE OF ELECTRONIC PUBLICATIONS:

Electronic ("e-only") publications are fully compliant with ICZN (<u>International Code of Zoological Nomenclature</u>) (i.e. for the purposes of new names and new nomenclatural acts) when properly archived and registered. All **Euscorpius** issues starting from No. 156 (2013) are archived in two electronic archives:

- **Biotaxa**, http://biotaxa.org/Euscorpius (ICZN-approved and ZooBank-enabled)
- Marshall Digital Scholar, http://mds.marshall.edu/euscorpius/. (This website also archives all *Euscorpius* issues previously published on CD-ROMs.)

Between 2000 and 2013, ICZN did not accept online texts as "published work" (Article 9.8). At this time, *Euscorpius* was produced in two identical versions: online (*ISSN 1536-9307*) and CD-ROM (*ISSN 1536-9293*) (laser disk) in archive-quality, read-only format. Both versions had the identical date of publication, as well as identical page and figure numbers. Only copies distributed on a CD-ROM from *Euscorpius* in 2001-2012 represent published work in compliance with the ICZN, i.e. for the purposes of new names and new nomenclatural acts.

In September 2012, ICZN Article 8. What constitutes published work, has been amended and allowed for electronic publications, disallowing publication on optical discs. From January 2013, **Euscorpius** discontinued CD-ROM production; only online electronic version (ISSN 1536-9307) is published. For further details on the new ICZN amendment, see http://www.pensoft.net/journals/zookeys/article/3944/.

Publication date: 17 April 2018

Scorpions of the Horn of Africa (Arachnida, Scorpiones). Part XVI. *Compsobuthus maidensis* sp. n. (Buthidae) from Somaliland

František Kovařík

P. O. Box 27, CZ-145 01 Praha 45, Czech Republic; www.scorpio.cz

http://zoobank.org/urn:lsid:zoobank.org:pub:E7E8E112-E7B9-4292-A064-53D6C8FA662

Summary

Compsobuthus maidensis sp. n. from Somaliland is described and fully complemented with color photos of specimens, as well as its habitat. Data on the occurrence of the genus Compsobuthus Vachon, 1949 in the Horn of Africa is summarized.

Introduction

In the years of 2011–2017, the author had an opportunity to participate in expeditions to the Horn of Africa, studied scorpions at 113 localities in Ethiopa, Eritrea, and Somaliland, and published a number of papers on this fauna. This paper is the 16th in a series concerning the distribution of a particular genus in the Horn of Africa, and the second focused on the genus *Compsobuthus* Vachon, 1949 (see Kovařík et al., 2016).

Methods, Material & Abbreviations

Nomenclature and measurements follow Stahnke (1970), Kovařík (2009), and Kovařík & Ojanguren Affilastro (2013), except for trichobothriotaxy (Vachon, 1974). Short, stout spiniform macrosetae are termed spinules.

I intentionally use here the name Somaliland (Hargeisa) for the northern territory corresponding to the former British colony (British Somaliland), which we distinguish from Somalia (Mogadisho). Somaliland has its own currency, and a functional government with representation in several countries. Specimens used for this study were collected and imported with permitions of Amoud and Hargeisa Universities and Ministry of the Environment of the Republic of Somaliland.

Specimens were found by ultraviolet (UV) detection at night, or by searching under surface debris and rocks by day. All collected material was preserved in 80% ethanol. *Specimen Depositories*: FKCP (František Kovařík, private collection, Prague, Czech Republic); MZUT (Museo Regionale di Scienze Naturali, Turin, Italy); ZISP (Zoological Institute, Russian Academy of

Sciences, St. Petersburg, Russia); and ZMHB (Museum für Naturkunde der Humboldt-Universität, Berlin, Germany). *Morphometrics*: D, depth; L, length; W, width.

Systematics

Family Buthidae C. L. Koch, 1837 *Compsobuthus* Vachon, 1949 (Figs. 1–39, Table 1)

Compsobuthus Vachon, 1949: 93 (1952: 213); Fet & Lowe, 2000: 124 (complete reference list until 1998); Kovařík, 2003a: 88 (in part); Kovařík, 2009: 31; Kovařík & Ojanguren, 2013: 145–158, figs. 777–941; Kovařík et al., 2016: 1–21, figs. 1–77.

Type species. Buthus acutecarinatus Simon, 1882.

DIAGNOSIS. Total length 20-55 mm. Dorsal trichobothria of femur arranged in beta-configuration. Trichobothrium db on chela of pedipalp basal to est. Trichobothrium eb located on fixed finger of chela. Pectines with fulcra. Pectinal teeth number 9-34. Tibial spurs present on third and fourth legs. Cheliceral fixed finger with two ventral denticles. Carapace with distinct carinae. Central lateral and posterior lateral carinae of carapace connected to form continuous linear series of granules extending to posterior margin. Carapace in lateral view with entire dorsal surface horizontal or nearly so. Dentate margin of pedipalp chela movable finger with distinct granules divided into 8-14 rows and 4 terminal granules and one basal terminal granule. Tergites I–VI of mesosoma bear three carinae projecting beyond posterior margin as distinct spiniform processes.

Compsobuthus abyssinicus (Birula, 1903) (Fig. 39)

Buthus acutecarinatus abyssinicus Birula, 1903: 108. Compsobuthus acutecarinatus abyssinicus: Kraepelin, 1913: 127.

Compsobuthus abyssinicus: Vachon, 1949: 99 (1952: 219); Fet & Lowe, 2000: 124; Kovařík, 2003a: 88–89; Kovařík, 2003b: 138; Kovařík & Whitman, 2005: 107 (in part); Kovařík & Ojanguren, 2013: 146–147, figs. 777–782, 921–925; Kovařík et al., 2016: 3, figs. 1–4, 15–16, 19–22, 77.

Compsobuthus acutecarinatus: Sissom, 1994: 9 (in part, record from Assab, Eritrea)

Compsobuthus maindroni: Kovařík, 2003b: 138, fig. 1 (misidentification).

TYPE LOCALITY AND TYPE REPOSITORY. Ethiopia (Abyssinia), Kachenuha; ZISP.

MATERIAL EXAMINED. Djibouti, Barra Yer (Petit Barre), 11°18'33.56"N 42°42'39.17"E, 585 m., I. 2017, 1&2juvs., leg. R. Štarha. Ethiopia, 30 km W Metahara, VIII.1982, 2♀; Awash, Metahara env., 08°54'N 39°54'E, 960-1050 m a.s.l. (Locality 11EA), 2008, 1♀, leg. Trailin, 19.-22.VII.2011, 3∂1♀3ims., leg. F. Kovařík; Awash, 09°00'34.5"N 40°17'56.5"E, 1012 m a.s.l. (Locality 11EW), 19.VII.2011, 1∂1♀, leg. F. Kovařík; Awash n. p., 08°52'N 40°05'E, 981 m a.s.l. (Locality 11EX), 20.VII.2011, 1♀2juvs before first ecdysis, leg. F. Kovařík; 13°43'10"N 39°55'34"E, 879 m a.s.l. (Locality 12EI), 18.XI.2012, 1im.1juv., leg. F. Kovařík; 11°29' 47"N 40°25'07"E, 766 m a.s.l. (Locality 12EL), 20.XI.2012, 1♂1♀, leg. F. Kovařík; Gewane, 10°09' 38"N 40°39'45"E, 631 m a.s.l. (Locality 12EO), 23.XI.2012, 12, leg. F. Kovařík; 09°34'06"N 40°23' 45.9"E, 601 m a.s.l. (Locality 12EQ), 24.XI.2012, 13, leg. F. Kovařík; Awash, 09°00'34.5"N 40°17'56.5"E, 1012 m. a.s.l. (Locality 12EW), 1♀, 25.XI.2012, leg. F. Kovařík; Awash, Metahara env., 08°54'N 39°54'E, 960-1050 m a.s.l. (Locality 12EX), 25.XI.2012, 1♀, leg. F. Kovařík: Afar State. Awash. 09°09'03.6"N 40°31'38.8" E, 1378 m a.s.l. (Locality 14ES), 26.XI.2014, 1♀, leg. F. Kovařík; Afar State, 09°34'06"N 40°23'45.9"E, 601 m a.s.l. (Locality 14EU =12EQ), 27.XI.2014, 12, leg. F. Kovařík; Oromia State, East Shewa, Fantale zone, volcanic crater Fantale near Metahara, 09°00'56.2"N 39° 51'21"E, 1050 m a.s.l. 29.XI.2014, (Locality 14EV), 4♂3♀3juvs., leg. F. Kovařík. Somaliland, 4 km S of Borama, Awdal, 09°53'01"N 43°11'56"E, 1662 m a.s.l., 17.I.2015, 13, leg. T. Mazuch. All specimens are in FKCP.

DIAGNOSIS. Total length 28–40 mm. Sexual dimorphism minor, adult males with chela of pedipalps broader and fingers of pedipalps flexed proximally; there is no

difference in length and width of metasomal segments. Base color uniformly reddish to gray. Pedipalps with or without spots. Movable finger of pedipalp bears 10 rows of granules, all without external and with internal accessory granules (acutecarinatus group). Pedipalp chela length/width ratio 3.7-3.8 in males and 4.4-4.6 in females. Manus of chela shorter than fixed finger. Trochanter of pedipalps with numerous long setae. Anterior margin of carapace bears eight symmetrically distributed spinae. First to third metasomal segments bear 10 carinae, fourth bears 8 or 10 carinae. All metasomal segments longer than wide. Pectinal teeth number 19-24. Sternites and ventral surface of metasoma granulated and with numerous small black setae. Seventh sternite bears four crenulate carinae. Telson bulbous, aculeus shorter than vesicle. Subaculear tubercle present but not spinoid.

Compsobuthus eritreaensis Kovařík, Lowe, Plíšková et Šťáhlavský, 2016 (Fig. 39)

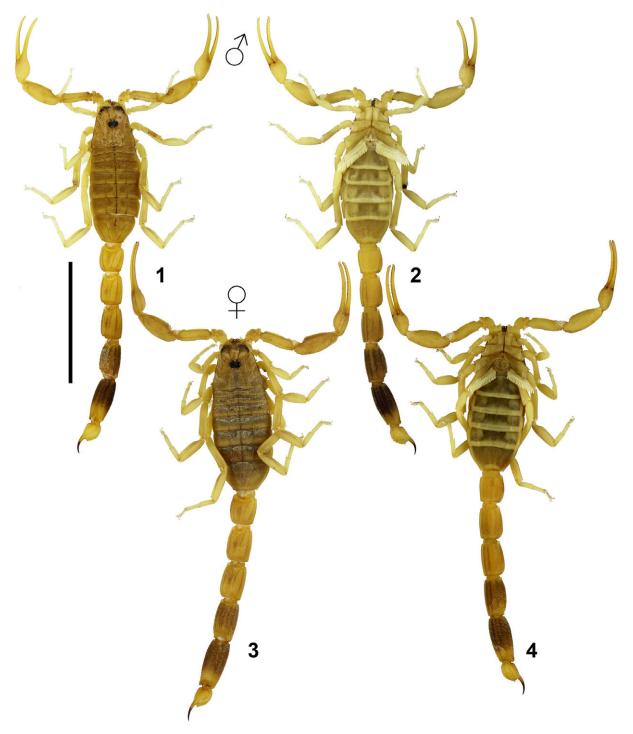
? *Compsobuthus abyssinicus*: Kovařík & Whitman, 2005: 107 (in part).

Compsobuthus eritreaensis Kovařík et al., 2016: 3–11, figs. 5–14, 27–60, 77.

Type Locality and type Repository. Eritrea, near Massawa, 15°36'58.7"N 39°22'32.8"E, 74 m a.s.l., 4.-5.XI.2015, (Locality 15EI), FKCP.

Type Material Examined. **Eritrea**, near Massawa, $15^{\circ}36'58.7"N$ $39^{\circ}22'32.8"E$, 74 m a.s.l., 4.-5.XI.2015, (Locality 15EI, Fig. 56), $7\sqrt[3]{12}$ (holotype and paratypes), leg. F. Kovařík; Dese Island, $15^{\circ}26'39.2"N$ $39^{\circ}45'32.7"E$, 8 m a.s.l., 5.-7.XI.2015, (Locality 15EJ), $2\sqrt[3]{8}$ 1juv. (paratypes), leg. F. Kovařík; near Massawa, $15^{\circ}36'55"N$ $39^{\circ}24'22"E$, 30 m a.s.l., 8.XI.2015, (Locality 15EK), $1\sqrt[3]{9}$ (paratype), leg. F. Kovařík; route Massawa to Gahtiela, $15^{\circ}36'03.7"N$ $39^{\circ}16'38.4"E$, 115 m a.s.l., 8.XI.2015, (Locality 15EL), $1\sqrt[3]{1}$ 1im., leg. F. Kovařík. All types are in the FKCP.

DIAGNOSIS. Total length 26 (male) – 41 mm (female). Sexual dimorphism minor, adult males with chela of pedipalps broader and fingers of pedipalps slightly flexed proximally; there is no difference in length and width of metasomal segments. Base color uniformly yellow to yellowish brown with dark spot on fifth metasomal segment. Movable finger of pedipalp bears 10–11 rows of granules, all without external and with internal accessory granules (*acutecarinatus* group of Levy & Amitati, 1980). Pedipalp chela length/width ratio 4.5 in males and 5.4 in females. Manus of chela shorter than fixed finger. Pedipalp chela length/movable finger length ratio 1.32–1.38 in both sexes. Trochanter



Figures 1–4: Compsobuthus maidensis sp. n. Figures 1–2. Male holotype in dorsal (1) and ventral (2) views. Figures 3–4: Female paratype in dorsal (3) and ventral (4) aspects. Scale bar: 10 mm.

of pedipalps with ten to twelve spinules and two setae. Anterior margin of carapace bears 8 symmetrically distributed spinules. First to third metasomal segments bear 10 carinae, fourth bears 8 or 10 carinae. All meta-

somal segments longer than wide. Pectinal teeth number 22–26 in males and 18–23 in females. Sternites and ventral surface of metasoma granulated, more so in males. Seventh sternite bears four crenulate carinae. Tel-

son bulbous, aculeus shorter than vesicle. Subaculear tubercle present but not spinoid. Ratio of length vesicle/aculeus is 1.1–1.2.

Compsobuthus maidensis sp. n. (Figs. 1–39, Table 1)

http://zoobank.org/urn:lsid:zoobank.org:act:442AA0 FF-2FFB-465A-9EE2-95404CFF2429

Type Locality and type depository. Somaliland, Maid, 11°00'03"N 47°06'30"E, 52 m a.s.l.; FKCP.

Type Material Examined. **Somaliland**, Maid, 11°00′ 03"N 47°06′30"E, 52 m a.s.l. (Fig. 38, Locality No. 17SN), 3.-4.IX.2017, 1♂3♀ (holotype and paratypes), leg. F. Kovařík, FKCP.

ETYMOLOGY. Named after the village of collection.

DIAGNOSIS. Total length 30-33.5 mm. Sexual dimorphism minor, fingers of pedipalps straight in both sexes; there is no difference in length and width of metasomal segments. Base color uniformly yellow to yellowish brown with dark spot on fifth and four metasomal segment. Movable finger of pedipalp bears 10 rows of granules, all without external and with internal accessory granules (acutecarinatus group of Levy & Amitati, 1980). Pedipalp chela length/width ratio 4.49 in males and 4.9 in females. Manus of chela shorter than fixed finger. Pedipalp chela length/movable finger length ratio 1.40–1.41 in both sexes. Trochanter of pedipalps with 3– 7 spinules and 2 setae. Anterior margin of carapace bears 8 symmetrically distributed spinules. First to third metasomal segments bear 10 carinae, fourth bears 8 or 10 carinae. All metasomal segments longer than wide. Pectinal teeth number 19-20 in male and 16-18 in females. Sternites and ventral surface of metasoma granulated. Seventh sternite bears four crenulate carinae. Telson bulbous, aculeus shorter than vesicle. Subaculear tubercle present but not spinoid.

DESCRIPTION. Total length 30–33.5 mm in both sexes. The habitus is shown in Figs. 1–4. For position and distribution of trichobothria of pedipalps see Figs. 20–28. Sexual dimorphism minor, fingers of pedipalps straight in both sexes (Figs. 22 and 32); there is no difference in length and width of metasomal segments.

Coloration (Figs. 1–4). The base color is uniformly yellow to yellowish brown, with dark spot on anterior half of the fifth and fourth metasomal segment; other spots missing or indicated only.

Carapace and mesosoma (Figs. 5–8). The entire carapace is covered by granules of different sizes. The carinae are moderately to strongly developed and granular. The anterior margin of the carapace is medially weakly concave, and bears eight symmetrically distri-

buted spinules. The tergites are granulated. Tergites I-VI bear very strong, denticulate lateral carinae. Each carina terminates in a spiniform process that extends well past the posterior margin of the tergite. Tergite VII is pentacarinate, with lateral pairs strong, serratocrenulate and the median carina moderate, crenulate and present only in the proximal half. The pectinal tooth count is 18–19 in male and 16-18 (2x16, 4x18) in females. The pectine marginal tips extend to one-third of the fourth sternite in the female and to half of the fifth sternite in the male. The pectines have three marginal lamellae and six to eight middle lamellae. The lamellae bear numerous dark setae, each fulcrum with two or three dark setae. All sternites are finely granulated. The glabrous wide zone on posterior part of fifth sternite developed medially and absent on other sternites in male. The sixth and seventh segments bear four ventral crenulate carinae, which are more strongly developed on the seventh segment. The other sternites bear two carinae.

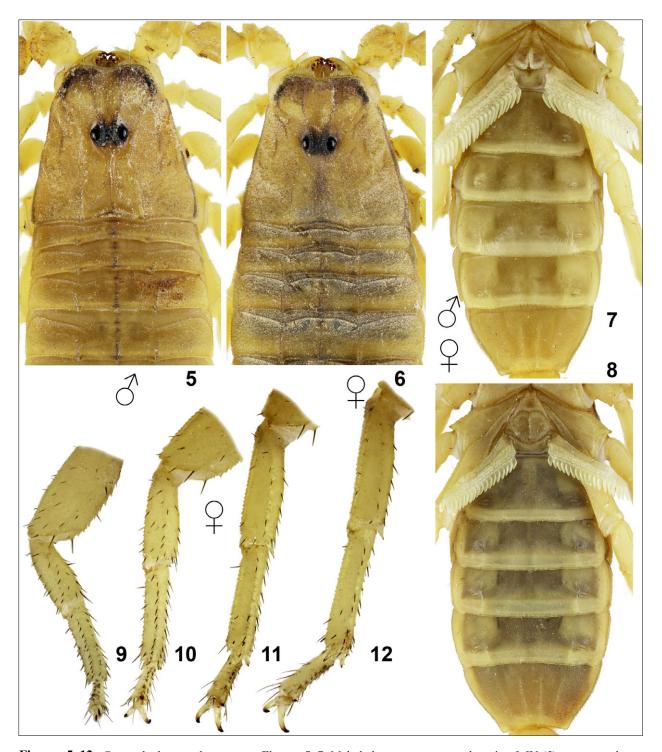
Metasoma and telson (Figs. 13–20). The first to third segments bear 10 carinae, the fourth segment bears 8 or 10 carinae and the fifth segment bears five carinae. Intermediate carinae of the fourth segment are replaced by isolated granules that may also form carinae. All segments are sparsely setose and densely granulated. Accessory rows of granules are present on dorsal surfaces of segments as well as on the ventral surface of the fifth segment. The telson is bulbous, with the aculeus a little shorter than the vesicle. A subaculear tubercle is present and variously short.

Pedipalps (Figs. 21–37). The pedipalps are granulated and hirsute. The femur bears five carinae. The patella bears seven granular carinae. The chela bears five carinae. The movable and fixed fingers bear 10 rows of granules, all without external and with internal granules. Pedipalp chela length/width ratio 4.49 in males and 4.9 in females. Manus of chela shorter than fixed finger. Pedipalp chela length/movable finger length ratio 1.40–1.41 in both sexes. The trochanter of pedipalps bears 3–7 spinules and 2 setae.

Legs (Figs. 9–12). Legs III and IV bear moderate tibial spurs. Retrolateral and prolateral pedal spurs are present on all legs. The tarsomeres bear two rows of macrosetae on the ventral surface and several macrosetae on the other surfaces. Bristlecombs are absent. The femur bears four carinae and the patella bears four to six carinae. The femur and patella bear only solitary macrosetae and are granulated except for external lateral surfaces, which are smooth.

Measurements. See Tab. 1.

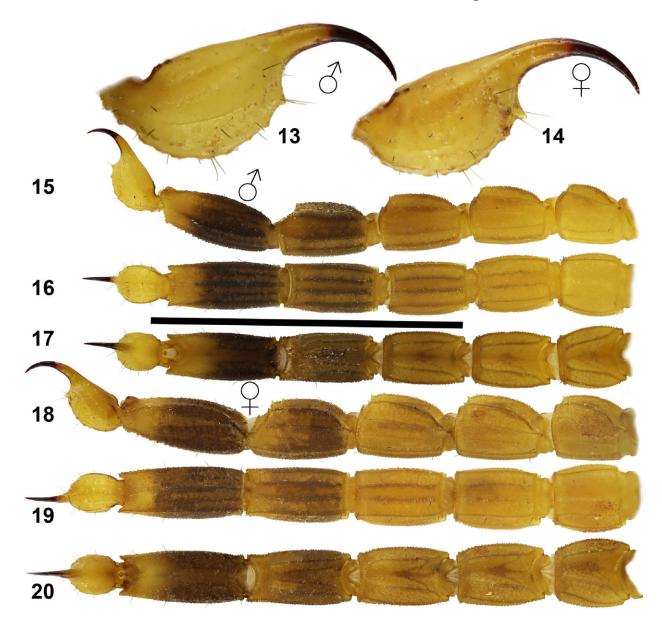
AFFINITIES. The described features distinguish *Compsobuthus maidensis* **sp. n.** from all other species of the genus. *C. maidensis* **sp. n.** is morphologically the most similar to *C. eritreaensis* Kovařík et al., 2016 (see key in Kovařík et al., 2016: 19) but these two species occur in



Figures 5–12: *Compsobuthus maidensis* **sp. n. Figures 5, 7**. Male holotype, carapace and tergites I–IV (5), coxosternal area and sternites (70). **Figures 6, 8–12**. Female paratype, carapace and tergites I–IV (6), coxosternal area and sternites (8), left legs I–IV, retrolateral aspects (9–12).

remote areas (Fig. 39) and can be morphologically unequivocally separated by: 1) Pectinal teeth number 19–20 in male and 16–18 in females in *C. maidensis* sp. n. vs. 22–26 in males and 18–23 in females in *C. eritreaensis*; 2) pedipalp chela length/movable finger

length ratio is 1.40–1.41 in both sexes in *C. maidensis* **sp. n.** vs. 1.32–1.38 in *C. eritreaensis*; **3**) trochanter of pedipalps with 3–7 spinules and 2 setae in *C. maidensis* **sp. n.** vs. 10–12 spinules and 2 setae in *C. eritreaensis*; **4**) fingers of pedipalps straight in both sexes in *C.*



Figures 13–20: Compsobuthus maidensis **sp. n. Figures 13, 15–17**. Male holotype, lateral view of telson (13), metasoma and telson lateral (15), ventral (16), and dorsal (17). **Figures 14, 18–20**. Female paratype, lateral view of telson (14), metasoma and telson lateral (18), ventral (19), and dorsal (20). Scale bar: 10 mm (15–20).

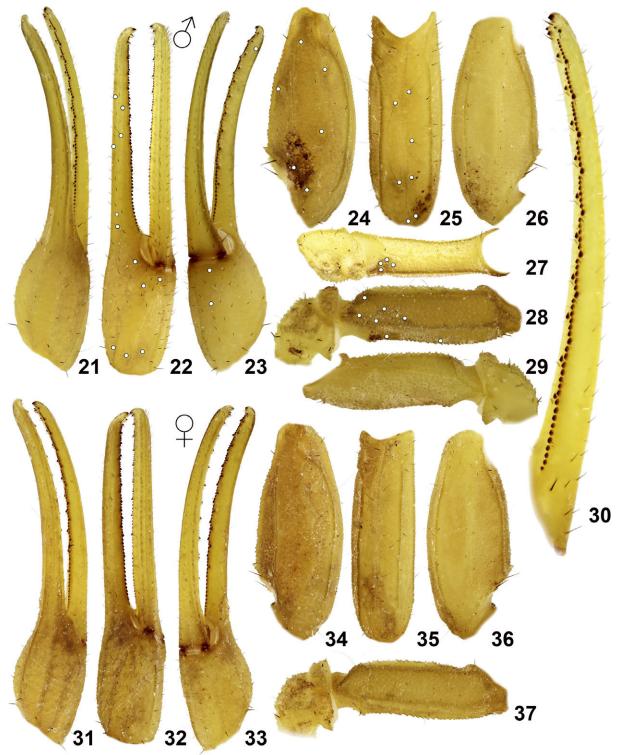
maidensis **sp. n.** (Figs. 28 and 30) vs. adult males with fingers of pedipalps slightly flexed proximally (figs. 28 and 30 in Kovařík et al., 2016: 7) in *C. eritreaensis*; **5**) glabrous wide zone on posterior part of fifth sternite developed medially and absent on other sternites in male in *C. maidensis* **sp. n.** (Fig. 7) vs. reduced/indicated on sternites in male in *C. eritreaensis* (fig. 11 in Kovařík et al., 2016: 6).

COMMENTS ON LOCALITIES AND LIFE STRATEGY. The type locality, 17SN is sandy semi-desert to desert (Fig. 38). The types of *Compsobuthus maidenensis* sp. n. were obtained at night during UV collecting together

with *Gint maidensis* Kovařík et al., 2018, *Hottentotta* sp., *Leiurus* sp., and *Neobuthus* sp. (Buthidae). The first author arrived at the locality at night on 3th September 2017 at 21.00. At this time the temperature was 38.6 °C and humidity 52%. Minimum temperature of 31.9 °C and humidity of 46% were recorded on 4th September 2017 in the early morning.

Compsobuthus somalilandus Kovařík, 2012 (Fig. 39)

Compsobuthus somalilandus Kovařík, 2012: 7–8, figs. 8–19, 37–42; Kovařík & Ojanguren, 2013: 157,



Figures 21–37: *Compsobuthus maidensis* **sp. n. Figures 21–30**. Male holotype, pedipalp chela dorsal (20), externodorsal (22) and ventrointernal (23), pedipalp patella dorsal (24), external (25) and ventral (26), trochanter and femur internal (27) dorsoexternal (28), and ventrointernal (29), movable finger dentition (30). **Figures 31–37**. Female paratype, pedipalp chela dorsal (31), externodorsal (32) and ventrointernal (33), pedipalp patella dorsal (34), external (35) and ventral (36), trochanter and femur dorsoexternal (37). Trichobothrial pattern is indicated in Figures 22–25 and 27–28.



Figure 38: The type locality of *Compsobuthus maidensis* sp. n., Somaliland, Maid.

Dimensions (MM)		C. maidensis sp. n. ♂ holotype	C. maidensis sp. n. ♀ paratype
Carapace	L/W	3.575 / 3.825	4.050 / 4.400
Mesosoma	L	8.300	8.750
Tergite VII	L/W	2.250 / 3.650	2.550 / 4.400
Metasoma & telson	L	18.450	20.575
Segment I	L/W/D	2.375 / 2.125 / 1.888	2.700 / 2.275 / 2.200
Segment II	L/W/D	2.750 / 1.925 / 1.900	3.075 / 2.125 / 2.150
Segment III	L/W/D	2.950 / 1.800 / 1.900	3.275 / 2.000 / 2.100
Segment IV	L/W/D	3.300 / 1.700 / 1.825	3.650 / 1.950 / 1.950
Segment V	L/W/D	3.950 / 1.625 / 1.625	4.275 / 1.888 / 1.775
Telson	L/W/D	3.125 / 1.300 / 1.300	3.600 / 1.375 / 1.350
Pedipalp	L	12.800	13.725
Femur	L/W	3.225 / 0.950	3.200 / 1.050
Patella	L/W	3.625 / 1.475	4.075 / 1.600
Chela	L	5.950	6.450
Manus	L/W/D	1.725 / 1.325 / 1.200	1.85 / 1.300 / 1.175
Movable finger	L	4.225	4.600
Total	L	30.33	33.38

Table 1: Comparative measurements of adults of *Compsobuthus maidensis* **sp. n.** Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

figs. 783–794, 926–931; Kovařík et al., 2016: 11–15, figs. 17–18, 23–26, 61–62, 77.

TYPE LOCALITY AND TYPE REPOSITORY. Somaliland, near Berbera, 10°14'25.8"N 45°04'55.4"E, 407 m a.s.l.; FKCP.

TYPE MATERIAL EXAMINED. **Somaliland**, near Berbera, $10^{\circ}14'25.8"N$ $45^{\circ}04'55.4"E$, 407 m a.s.l., 9.VII.2011, $4 \circlearrowleft 4 \circlearrowleft (\text{holotype} \text{ and paratypes}, \text{Figs. } 17-18, 23-26, 61), leg. F. Kovařík; near Berbera, <math>10^{\circ}15'30.5"N$ $45^{\circ}06'04.2"$ E, 376 m a.s.l., 12.VII.2011, $1 \circlearrowleft$, leg. F. Kovařík; near Sheikh, foothills of Goolis Mts., $09^{\circ}59.881'N$ $45^{\circ}09.762'E$, 896 m a.s.l., $2 \circlearrowleft (\text{allotype} \text{ and paratype})$, XI.2010, leg. T. Mazuch and P. Novák. All types are in the FKCP.

OTHER MATERIAL EXAMINED. **Somaliland**, between Berbera and Burao, 10°02'12"N 44°47'21"E, 60 m a.s.l. (Locality No. 17SG), 30.VIII.2017, 1♂ leg. F. Kovařík, FKCP; Gerissa, N of Borama, 10°36'01"N 43°26'07"E, 245 m a.s.l. (Locality No. 17ST), 7♂4♀1juv., 11.-12.IX.2017, leg.F. Kovařík, FKCP.

DIAGNOSIS. Total length 28–32 mm. Sexual dimorphism minor, adult males with chela of pedipalps broader and fingers of pedipalps flexed proximally; there is no difference in length and width of metasomal segments. Base color uniformly yellow to yellowish brown, with dark spots. Movable finger of pedipalp bears 10 rows of granules, all without external and with internal accessory granules (*acutecarinatus* group of Levy & Amitai,

1980). Pedipalp chela length/width ratio 4.0 in males and 4.8 in females. Manus of chela shorter than fixed finger. Trochanter of pedipalps with one to twelve spinules and without setae. Anterior margin of carapace bears 8 symmetrically distributed spinules. First to third metasomal segments bear 10 carinae, fourth bears 8 or 10 carinae. All metasomal segments longer than wide. Pectinal teeth number 18–21 in males and 15–18 in females. Sternites and ventral surface of metasoma granulated. Seventh sternite bears four crenulate carinae. Telson bulbous, aculeus shorter than vesicle. Subaculear tubercle present, long and spinoid.

Compsobuthus werneri (Birula, 1908) (Fig. 39)

Buthus acutecarinatus werneri Birula, 1908: 131.

Compsobuthus werneri (in part): Vachon, 1949: 97 (1952: 217); Fet & Lowe, 2000: 128; Kovařík, 2003a: 104, fig. 5; ? Kovařík, 2003b: 138, fig. 2; ? Kovařík & Whitman, 2005: 107.

Compsobuthus werneri: Kovařík & Ojanguren, 2013: 158, figs. 831–838, 850; Kovařík et al., 2016: 16–18, figs. 63–77.

TYPE LOCALITY AND TYPE REPOSITORY. Sudan, Wadi-Halfa, northern Nubia; MZUT.

MATERIAL EXAMINED. **Eritrea**, Keren, 15°48'33"N 38° 28'14.6"E, 1328 m a.s.l. (Locality No. 15EG), 2.XI. 2015, 3♂, leg. F. Kovařík, FKCP. **Sudan**, Khartoum, I.-III.1966, 2♀, leg. P. Štys, FKCP; Sabaloro, 16.VIII.

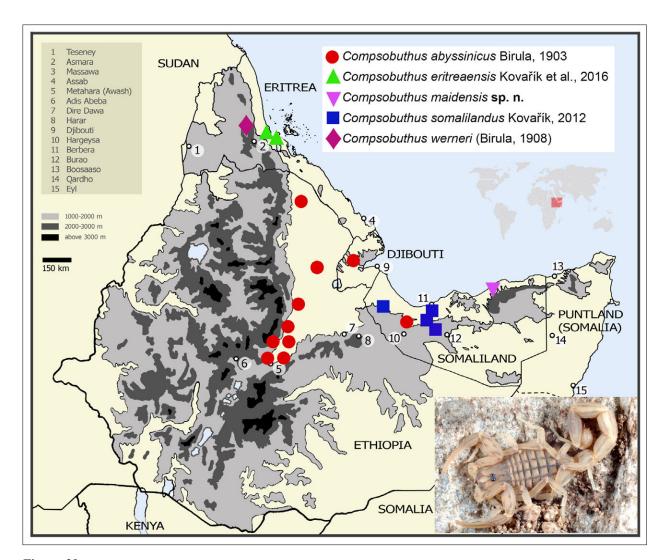


Figure 39: Map showing confirmed distribution of *Compsobuthus* spp. Points indicate sites sampled mainly during 2011–2017 expeditions. Scorpion in the inside map of the photos is the male paratype of *C. somalilandus*.

1966, 1juv., leg. P. Štys, FKCP; Hasa Heisa, 1♂, XI. 1973, leg. V. Seichert, FKCP; Sabaloka Mt., ca 16°20'N 32°30'E, 24.X.–14.XI.2011, 10♂3♀, leg. P. Pokorný, FKCP; Northern State, Dongola farm, 19°10'11.37"N 30°28'29.62"E, 7.VI.2016, 1♂1♀, leg. Manal Siyam, ZMHB; River Nile State, Atbara farm, 17°43'N 33°59'E, 30.X.2016, 1♂im, leg. Manal Siyam, ZMHB; Northern State, El Gaab wadi, 6.V.2017, 1♀, leg. Manal Siyam, ZMHB.

DIAGNOSIS. Total length 24–40 mm. Movable finger of pedipalp bears 10–11 rows of granules, with external and internal accessory granules. Sexual dimorphism minor, there is no difference between males and females in length of pedipalps and metasomal segments. Male with fingers of pedipalps very slightly flexed proximally. Carapace, mesosoma, metasoma, telson, and pedipalp femur and patella of adults densely granulated.

First and second metasomal segments bear 10 carinae, third bears 8 or 10 carinae. Fifth metasomal segment length/width ratio less than 2.4. All metasomal segments sparsely setose and densely granulated. Telson with very small subaculear tubercle. Pectinal teeth number 16–22. Seventh sternite bears 4 well developed carinae. Telson elongate, with aculeus aproximately as long as vesicle.

Acknowledgments

Thanks are due to: Petra Frýdlová, Daniel Frynta, Martin Häckel, Hynek Kmoníček, Pavel Just, David Král, and Pavel Kučera (Czech Republic), Mohamud Yousuf Muse (President of University of Hargeisa), Mohamed A. Sulub (Director, Corporate Communication Directorate, University of Hargeisa), Suleiman Ahmed Gulair (President of Amound University), Ahmed A. Bogore (Vice President, Academic Affairs of

Amound University), and Yesuf Ahmed Ali (Director General of Higher Education, Hargeisa, Republic of Somaliland) for their help. Special thanks to Abdiqaadir Abdilahi, Abdisalaan Shabele, Omar Yussuf Hussein (Republic of Somaliland), Jason Dunlop (ZMHB), Manal Siyam (University of Khartoum, Sudan), and Tomáš Mazuch (Czech Republic); Victor Fet and Michael Soleglad for their help in processing the manuscript. Further, we thank two anonymous reviewers for their comments to the manuscript.

References

- BIRULA, A. A. B. 1903. Bemerkungen über einige neue oder wenig bekannte Scorpionenformen Nord-Afrikas. Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg, 19: 105–113.
- 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. Scorpiones und Solifugae. Sitzungsberichte der Kaiserlich-Königlichen Akademie der Wissenschaften, Wien, 117/2 (1): 121–152.
- FET, V. & G. LOWE. 2000. Family Buthidae C. L. Koch, 1837. Pp. 54–286 in Fet, V., W. D. Sissom, G. Lowe & M. E. Braunwalder. *Catalog of the Scorpions of the World (1758–1998)*. New York: The New York Entomological Society, 689 pp.
- KOVAŘÍK, F. 2003a. Eight new species of *Compsobuthus* Vachon, 1949 from Africa and Asia (Scorpiones: Buthidae). *Serket*, 8(3): 87–112.
- KOVAŘÍK, F. 2003b. 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. 2009. Illustrated catalog of scorpions. Part I. Introductory remarks; keys to families and genera; subfamily Scorpioninae with keys to Heterometrus and Pandinus species. Prague: Clairon Production, 170 pp.
- KOVAŘÍK, F. 2012. Three new species of *Compsobuthus* Vachon, 1949 from Yemen, Jordan, Israel,

- and Somaliland (Scorpiones: Buthidae). *Euscorpius*, 150: 1–10.
- KOVAŘÍK, F., G. LOWE, J. PLÍŠKOVÁ & F. ŠŤÁHLAVSKÝ. 2016. Scorpions of the Horn of Africa (Arachnida, Scorpiones). Part VI. *Compsobuthus* Vachon, 1949 (Buthidae) with description of *C. eritreaensis* sp. n. *Euscorpius*, 226: 1–21.
- KOVAŘÍK, F. & A.A. OJANGUREN AFFILASTRO. 2013. *Illustrated catalog of scorpions. Part II. Bothriuridae; Chaerilidae; Buthidae I. Genera* Compsobuthus, Hottentotta, Isometrus, Lychas, *and* Sassanidotus. Prague: Clairon Production, 400 pp.
- 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. 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.
- SISSOM, W. D. 1994. Descriptions of new and poorly known scorpions of Yemen (Scorpiones: Buthidae, Diplocentridae, Scorpionidae). *Fauna of Saudi Arabia*, 14: 3–39.
- STAHNKE, H. L. 1970. Scorpion nomenclature and mensuration. *Entomological News*, 81: 297–316.
- VACHON, M. 1952. Études sur les scorpions. *Institut Pasteur d'Algérie, Alger*, 1–482. (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. 1974. Études des caractères utilisés pour classer les familles et les genres des scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum national d'Histoire naturelle*, 3e série, 140 (Zoologie, 104): 857–958.