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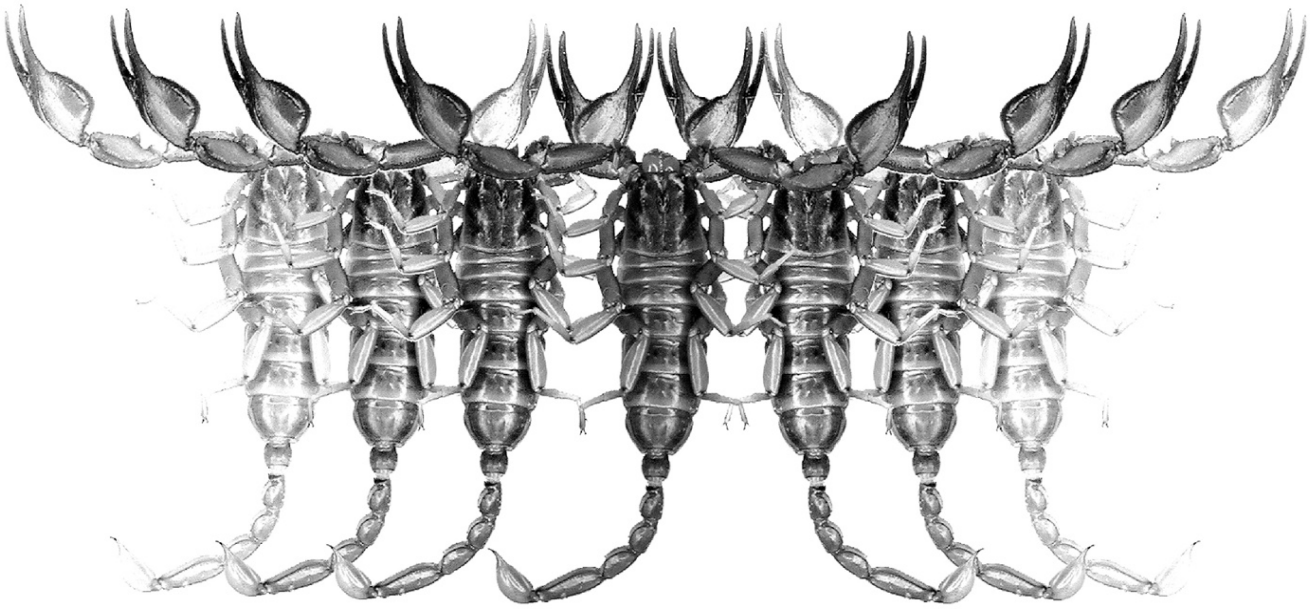

Scorpions of the Horn of Africa (Arachnida: Scorpiones). Part XLII. *Parabuthus qaraaf* sp. n. from Ethiopia (Buthidae)

František Kovařík & Hassan Sh Abdirahman Elmi

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Euscorpius — Occasional Publications in Scorpiology. 2025, No. 419

Scorpions of the Horn of Africa (Arachnida: Scorpiones). Part XLII. *Parabuthus qaraaf* sp. n. from Ethiopia (Buthidae)

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http://zoobank.org/urn:lsid:zoobank.org:pub:A48B266C-D70E-4589-A183-EDB2BE64A170

Summary

A new species *Parabuthus qaraaf* **sp**. **n**. from Ethiopia is described. Combination of six characters: metasoma V black; pectine teeth number 33–42 in both sexes; pedipalp chela length/ width ratio 3.3 in male and 4.2 in female; pedipalp patella length/ wide ratio 2.36–2.38 in both sexes; fingers of pedipalp of male with inner side of base smooth, no trace of tubercle; metasoma V length/ wide ratio is 1.50 in male distinguish *P. qaraaf* **sp**. **n**. from all other species in the region. Included is also a map of distribution of *Parabuthus* species in Horn of Africa, with newly confirmed localities for *Parabuthus granimanus* Pocock, 1895 and *P. robustus* Kovařík et al., 2019.

Introduction

Kovařík et al. (2016, 2019, 2024, 2025) and Kovařík (2025) revised all known species of *Parabuthus* Pocock, 1890 from the Horn of Africa. Analysis of additional new material from Ethiopia allowed to describe another new species *P. qaraaf* **sp**. **n**. and to confirm new localities of *P. robustus* (see map, Fig. 58).

Methods, Material & Abbreviations

Nomenclature and measurements follow Stahnke (1971), Kovařík (2009), and Kovařík & Ojanguren Affilastro (2013), except for trichobothriotaxy (Lowe & Kovařík, 2019; Vachon, 1974).

Specimen Depositories: FKCP (František Kovařík, private collection, Prague, Czech Republic, to be merged in future with collections of National Museum of Natural History, Prague, Czech Republic).

Morphometrics: D, depth; L, length; W, width.

Systematics

Buthidae C. L. Koch, 1837
Parabuthus Pocock, 1890
(Figures 1–59, Table 1)

Buthus (*Parabuthus*): Pocock, 1890: 124–125.

Parabuthus: Pocock, 1895: 309–314, plate IX, figs. 4a–d; Fet & Lowe, 2000: 200–211 (complete reference list until 2000); Kovařík, 2009: 22, 31; Prendini & Esposito, 2010: 673–710, figs. 1–17; Kovařík et al., 2016: 1–58, figs. 1–204, tables 1–2; Kovařík et al., 2019: 1–62, figs. 1–305, tables 1–5; Kovařík et al., 2024: 1–27, figs. 1–129, table 1; Kovařík, 2025: 1–10, figs. 1–51, tables 1–2; Kovařík et al., 2025: 1–11, figs. 1–47, tables 1–2.

= *Heterobuthus* Kraepelin, 1891: 205–211 (63–69) (syn. by Kraepelin, 1895: 79 (7)).

= *Riftobuthus* Lourenço et al., 2010: 281, figs. 1 and 2 (syn. by Kovařík et al., 2016: 2).

Type species. *Androctonus* (*Prionurus*) *liosoma* Ehrenberg in Hemprich et Ehrenberg, 1828

diagnosis. Total length 35–180 mm. Carapace without distinct carinae, in lateral view with entire dorsal surface horizontal or nearly so. Five pairs of lateral eyes and eyespot present. Pectines with fulcra, female pectines typically with dilated or lobate basal middle lamella. Pectine teeth number 18–62. Hemispermatophore flagelliform, capsule with '2+1' lobe configuration, with broad posterior lobe, small simple anterior lobe, and robust hook-like basal lobe; flagellum arising distally from posterior lobe, pars recta short and narrow, pars reflecta long and fusiform. Sternum subtriangular. Mesosoma with tergites I–VI monocarinate, sternites III–VI with slit-like spiracles. Dorsal surfaces of first and second metasomal segments with stridulatory areas. Telson without subaculear tubercle. Chelicera with typical buthid dentition, fixed finger with two ventral denticles. Orthobothriotaxic type A, dorsal trichobothria of pedipalp femur arranged in α-configuration. Patellar trichobothrium d_2 located external to dorsomedian carina (when carina is present). Chela manus with trichobothria V_1 and V_2 axis oblique, Eb_{1-3} in γ-configuration. Trichobothrium *eb* located on fixed finger of chela. Dentate margin of pedipalp chela movable finger with distinct granules divided into 9–14 rows, 3 terminal granules and one basal terminal granule. Tibial spurs present on third and fourth pairs of legs.

Figures 1–**2**. *Parabuthus qaraaf* **sp**. **n**., male (1) and female (2) paratopotypes in vivo habitus on locality 25EB.

Dimensions (mm)		*Parabuthus qaraaf* sp. n. ♂ holotype	*Parabuthus qaraaf* sp. n. ♀ paratype
Carapace	L / W	8.15 / 8.98	10.41 / 11.81
Mesosoma	L	21.47	32.60
Tergite VII	L / W	5.67 / 8.66	7.76 / 11.72
Metasoma + telson	L	46.40	54.33
Segment I	L / W / D	6.00 / 5.93 / 5.21	7.10 / 7.19 / 6.26
Segment II	L / W / D	6.87 / 5.97 / 5.08	8.04 / 7.19 / 6.26
Segment III	L / W / D	7.20 / 6.20 / 5.31	8.45 / 7.26 / 6.12
Segment IV	L / W / D	8.55 / 6.25 / 5.19	9.53 / 7.11 / 5.91
Segment V	L / W / D	8.86 / 5.89 / 5.03	10.54 / 6.55 / 5.54
Telson	L / W / D	8.92 / 4.31 / 3.77	10.67 / 5.84 / 5.07
Pedipalp	L	25.06	29.31
Femur	L / W	6.25 / 2.24	7.26 / 2.63
Patella	L / W	7.13 / 3.01	8.37 / 3.55
Chela	L	11.97	13.68
Manus	W / D	3.60 / 3.49	3.29 / 3.26
Movable finger	L	7.05	8.76
Total	**L**	**76.02**	**97.34**

Table 1. Comparative measurements of holotype male and paratopotype female of *Parabuthus qaraaf* **sp**. **n**. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

Parabuthus qaraaf sp. n.

(Figures 1–50, 58–59, Table 1)

http://zoobank.org/urn:lsid:zoobank.org:act:6AC25CB1-9FE0-45C0-83EC-01A8C0B0936E

Type locality and type depository. **Ethiopia**, Somali Province, S of Kebri Dahar, NE of Wabiyar village (farm), 6.55°N 44.25°E, 480 m a. s. l.; FKCP.

Material examined (FKCP). **Ethiopia**, Somali Province, S of Kebri Dahar, NE of Wabiyar village (farm), 6.55°N 44.25°E, 480 m a. s. l. (locality No. **25EB**, Fig. 59, fig. 130 in Kovařík et al., 2024, and fig. 2 in Kovařík & Elmi, 2025), 13–16 June 2025, 1♂ (holotype), 2♂4♀5juvs.♀ (paratopotypes, DNA No. 2891), leg. F. Kovařík et H. Elmi; Somali Province, Kebri Dahar, 06°42'20"N 44°18'52"E, 498 m a. s. l. (locality No. **25EA)**, 1♂1juv.♂ (paratypes), 12 June 2025, leg. F. Kovařík.

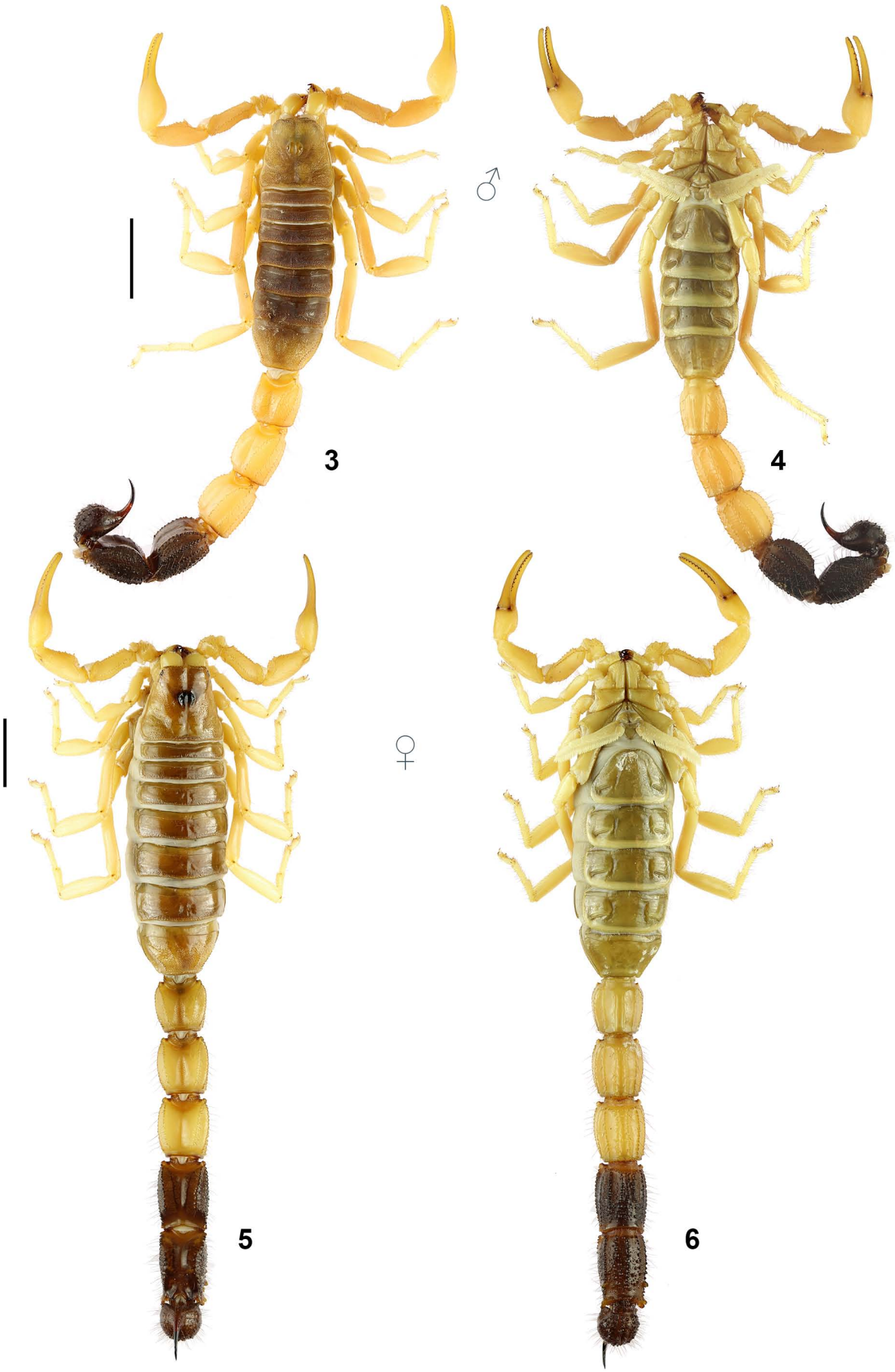
Etymology. *Qaraaf* means a large scorpion in Somali language.

Diagnosis ♂♀. Males 70–85 mm long; females 90–100 mm long. Base color uniformly yellow to yellowish orange, metasoma IV–V and telson black. Pectine teeth number 40–42 in males and 33–37 in females. Stridulatory area present on dorsal surface of metasoma I–III (large in metasoma I and reduced in metasoma III), and absent in metasoma IV–V. Metasoma hirsute in both sexes. Metasoma V length/width ratio is 1.50 (males) –1.60 (females). Dorsal carina of metasoma IV composed posteriorly of blunt denticles, of which the posteriormost denticle is not enlarged. Movable and fixed fingers of pedipalp bear 12–13 rows of granules, all with external and internal accessory granules. Fingers of pedipalp not elongated. Fingers of pedipalps of male with inner side of base smooth, no trace of tubercle. Manus of pedipalp of male broader than in female, pedipalp chela length/width ratio 3.3 in males and 4.2 in females. Pedipalp chela smooth and hirsute. Tarsomere I of legs I–III with bristle-combs.

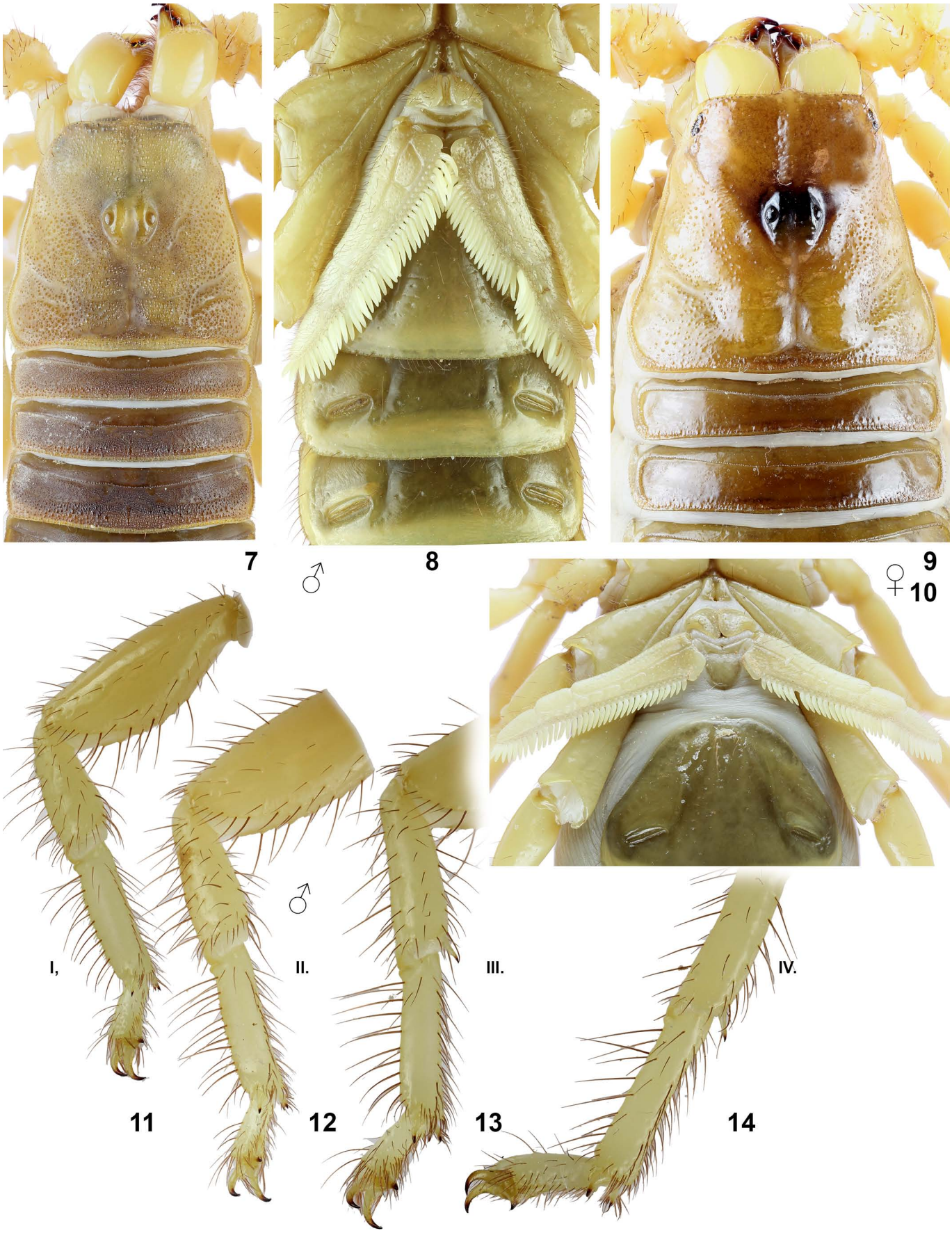
Description ♂♀. The adults are 70–85 mm (males) and 90–100 mm (females) long. The habitus is shown in Figs. 1–6. For position and distribution of trichobothria of pedipalps see Figs. 23–27, 29–30.

Coloration (Figs. 1–6). The base color is uniformly yellow to yellowish orange. The pedipalps and legs are yellow to orange, fingers are orange to brown. The mesosoma is brownish. The metasoma I–III is yellow, metasoma IV–V and telson are black.

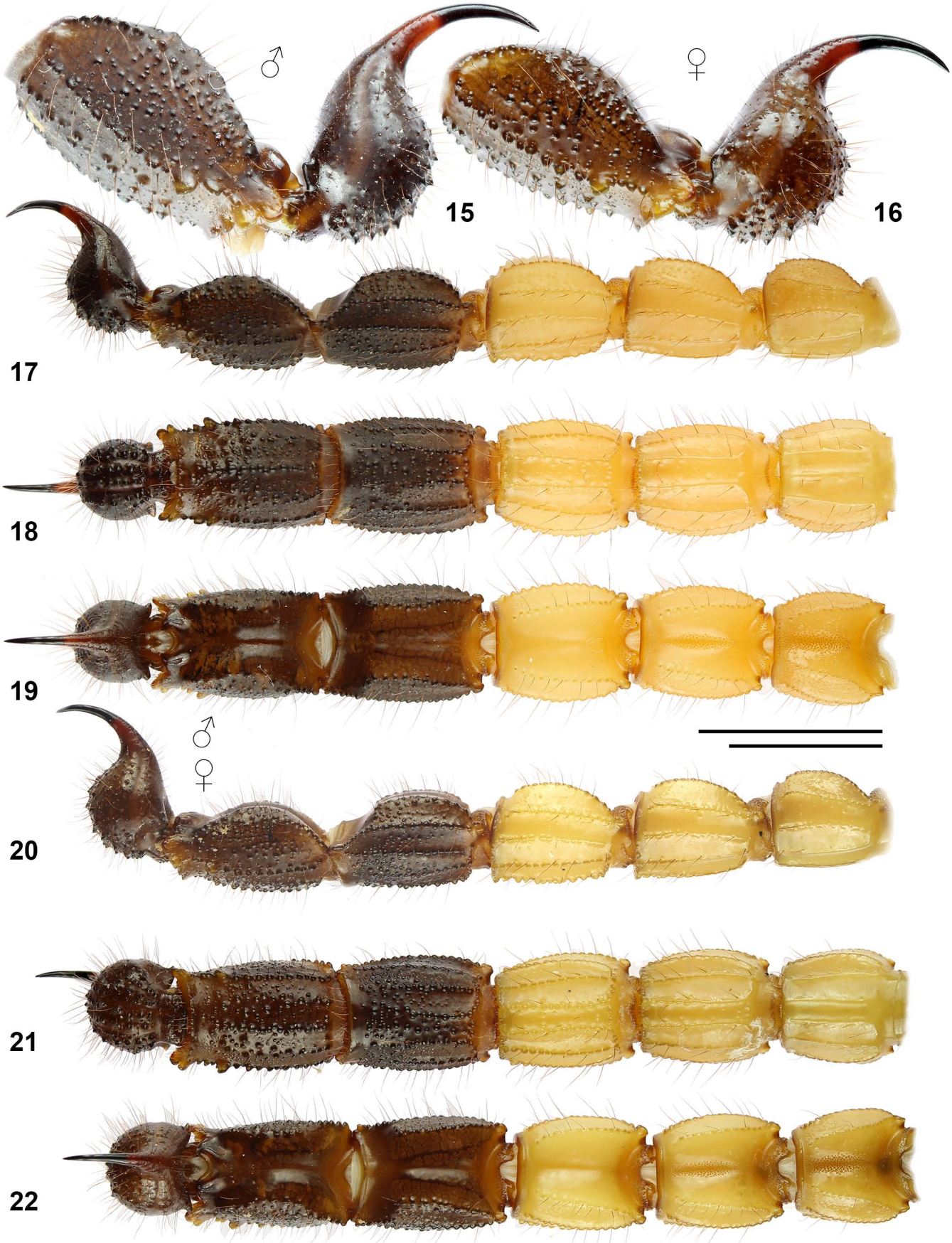
Carapace and mesosoma (Figs. 3–10). The entire carapace is covered with large granules, carinae are absent. The anterior margin of the carapace is straight, medially weakly convex, and bears 12–16 symmetrically distributed stout spiniform macrosetae. The tergites are densely granulated in males and rather smooth in females. Tergite VII is densely granulated in both sexes and pentacarinate, with lateral pairs of carinae strong, serratocrenulate. The pectinal tooth count is 40–42 (6 x 40, 2 x 41, 2 x 42) in males and 33–37 (1 x 33, 4 x 34, 4 x 35, 8 x 36, 3 x 37) in females. The pectine marginal tips extend to the ca half of the fourth sternite in males and end of sternite III in females-. The pectines have



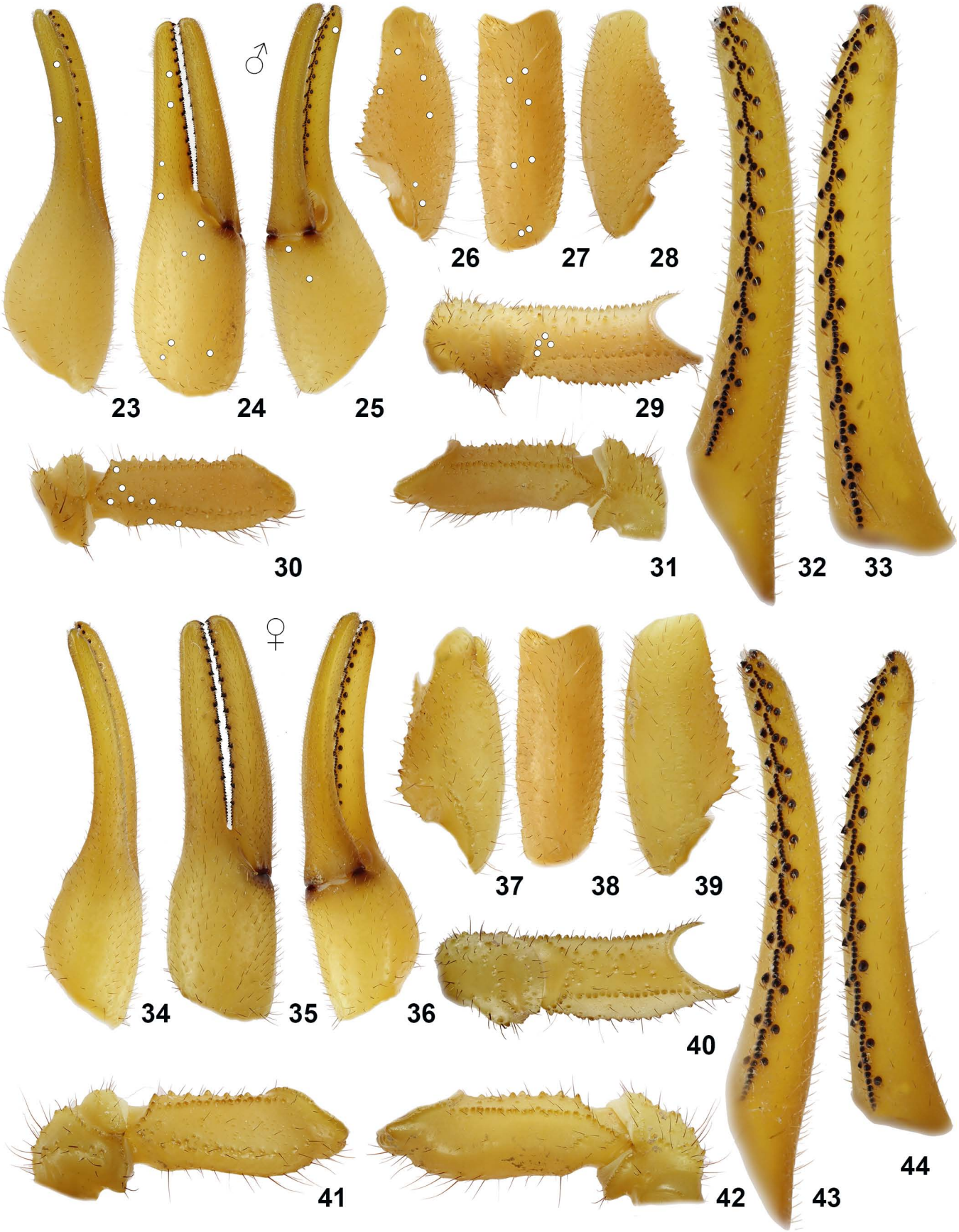
Figures 3–**6**: *Parabuthus qaraaf* **sp**. **n**. **Figures 3**–**4**. Male holotype, in dorsal (3) and ventral (4) views. **Figures 5**–**6**. Female paratopotype, in dorsal (5) and ventral (6) views. Scale bar: 10 mm (3–4, 5–6).



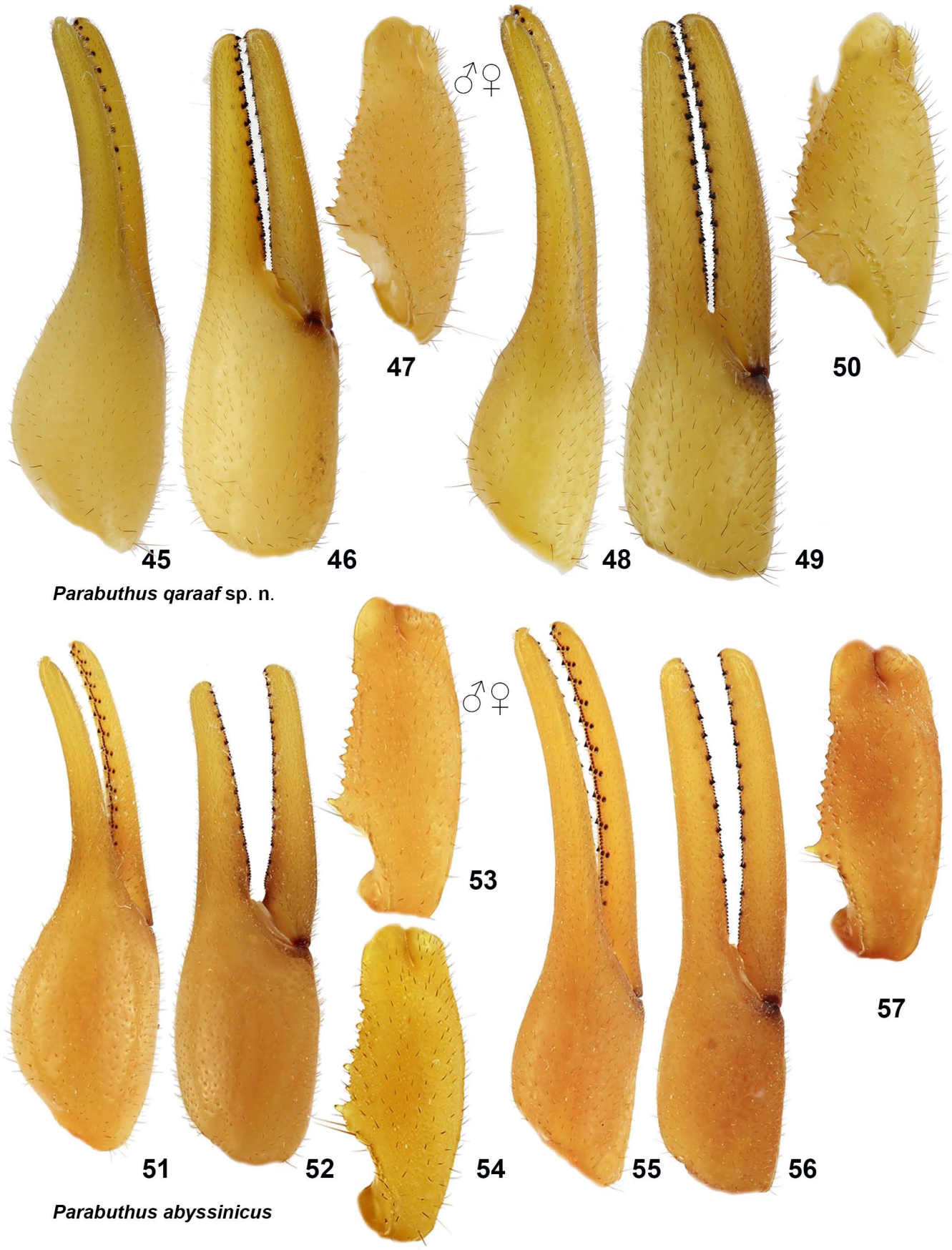
Figures 7–14: *Parabuthus qaraaf* **sp. n. Figures 7–8, 11–14**. Male holotype, carapace and tergites I–III (7), sternopectinal area and sternites III–V (8), right legs I–IV, retrolateral aspect (11–14). **Figures 9–10**. Female paratopotype, carapace and tergites I–II (9), sternopectinal area and sternite III (10).



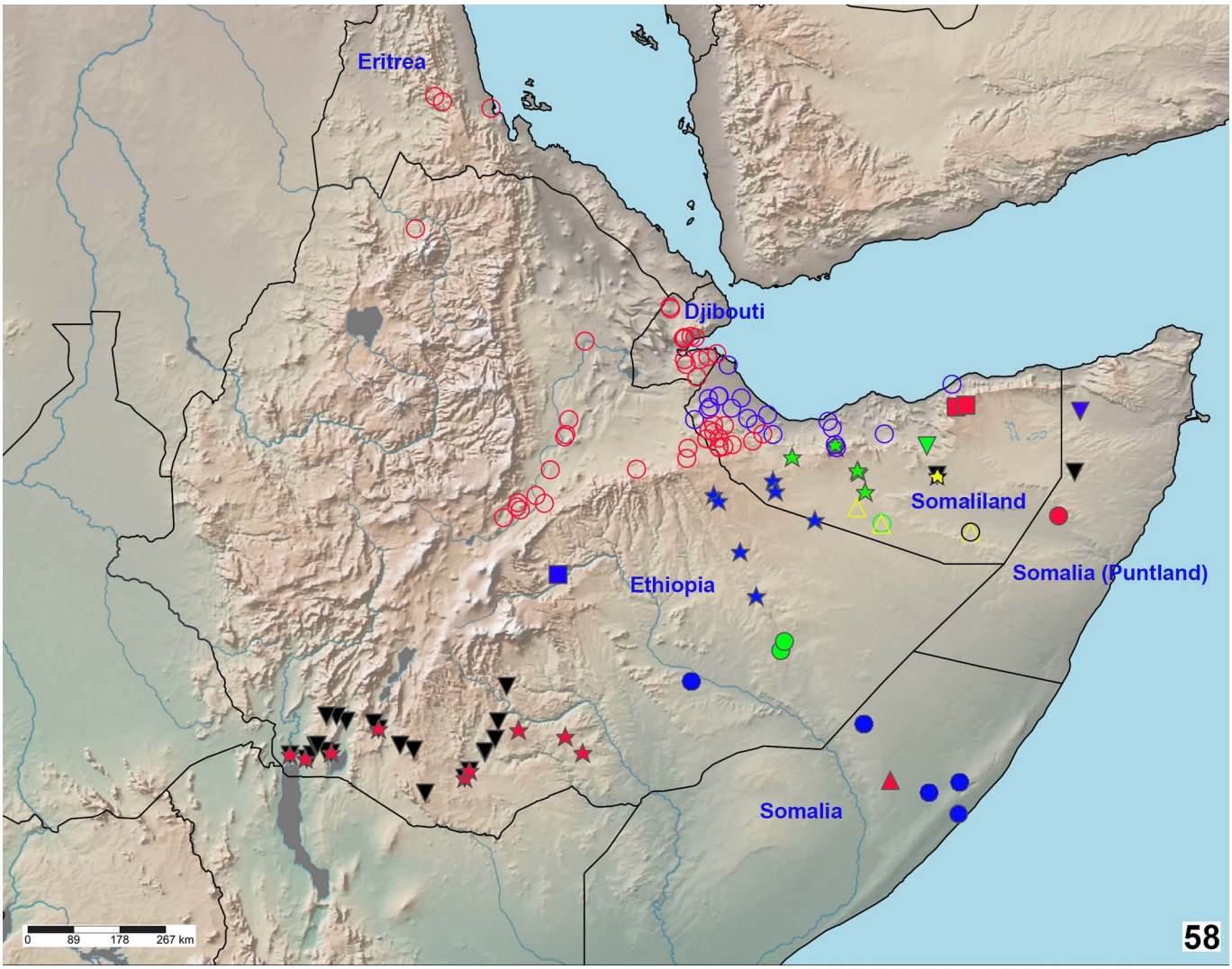
Figures 15–**22**: *Parabuthus qaraaf* **sp**. **n**. **Figures 15**, **17**–**19**. Male holotype, metasoma V and telson V in lateral (15) view, metasoma and telson in lateral (17), ventral (18), and dorsal (19) views. **Figures 16**, **20**–**22**. Female paratopotype, metasoma V and telson in lateral (16) view, metasoma and telson in lateral (20), ventral (21), and dorsal (22) views. Scale bar: 10 mm (17–19, 20–22).



Figures 23–44. *Parabuthus qaraaf* **sp. n.**, pedipalps of male holotype (23–33) and female paratopotype (34–44). Right pedipalp, chela in dorsal (23, 34), external (24, 35), and ventral (25, 36) views, patella in dorsal (26, 37), external (27, 38), and ventral (28, 39) views, femur and trochanter in internal (29, 40), dorsal (30, 41), and ventral (31, 42) views. Dentate margins of movable (32, 43) and fixed (33, 44) fingers. Trichobothrial pattern indicated in Figures 23–27 and 29–30 by white circles.



Figures 45–57: Comparision of pedipalp chela and patella, chela in dorsal (45, 48, 51, 55) and external (46, 49, 52, 56) views, patella in dorsal (47, 50, 53, 54, 57) views. **Figures 45–50**. *Parabuthus qaraaf* **sp. n.**, male holotype (45–47) and female paratopotype (48–50). **Figures 51–57**. *P. abyssinicus*, male from locality 15EG, Eritrea, Keren, 15°48'33"N 38°28'14.6"E, 1328 m a. s. l. (51–53), male from locality 17SR, Somaliland, Borama, campus Amound University, 09°56'49"N 43°13'23"E, 1394 m a. s. l., and female from locality 15EF, Eritrea, route Halibaret to Keren, 15°43'31.4"N 38°36'02.7"E, 1457 m a. s. l. (55–57).



○ *Parabuthus abyssinicus* Pocock, 1901
▲ *Parabuthus cimrmani* Kovařík, 2004
☆ *Parabuthus dorisae* Kovařík et al., 2024
■ *Parabuthus erigavoensis* Kovařík et al., 2019
▼ *Parabuthus eritreaensis* Kovařík, 2003
○ *Parabuthus evae* Kovařík et al., 2024
○ *Parabuthus granimanus* Pocock, 1895
★ *Parabuthus hamar* Kovařík et al., 2016
● *Parabuthus heterurus* Pocock, 1897
△ *Parabuthus kabateki* Kovařík et al., 2019
■ *Parabuthus kajibu* Kovařík et al., 2016
⬡ *Parabuthus mazuchi* Kovařík et al., 2019
▼ *Parabuthus pallidus* Pocock, 1895
● *Parabuthus qaraaf* **sp. n.**
▼ *Parabuthus quincyae* Kovařík et al., 2024
★ *Parabuthus robustus* Kovařík et al., 2019
★ *Parabuthus somalilandus* Kovařík et al., 2019
● *Parabuthus starhai* Kovařík, 2025
▼ *Parabuthus puntlandus* Kovařík et al., 2025

Figures 58–59: **Figure 58**. Map showing confirmed distribution of *Parabuthus* spp. in Djibouti, Eritrea, Ethiopia, Somalia (including Puntland), and Somaliland. **Figure 59**. *Parabuthus qaraaf* **sp. n.**, type locality.

three marginal lamellae and 9–10 middle lamellae. The lamellae and fulcra bear numerous dark setae. All sternites are smooth, except that there is a stridulatory area on the third sternite. Sternite VII bears four smooth carinae which are less noticeable in females.

Metasoma and telson (Figs. 15–22). The metasoma I–IV with a total of 10 granulated carinae. The fifth segment has five carinae, metasoma IV–V with ventral and lateral surfaces granulated, metasoma I laterally partly granulated, other surfaces smooth. Dorsolateral carinae of the metasomal segments composed of blunt denticles, of which the posterior-most denticle is not enlarged. The stridulatory area is located on the dorsal surface of the metasoma I–III, large on metasoma I and reduced on metasoma III. On the fourth and fifth segments the stridulatory area is absent. The entire metasoma and the telson are rather sparsely hirsute with long hairs. The ventral surface of the telson is granulated. The metasoma V length/ width ratio is 1.50 (males)–1.60 (females). The telson is rather bulbous, with the aculeus approximately the same length as the vesicle.

Pedipalps (Figs. 23–50). The whole pedipalps including trochanter are hirsute with short setae. The femur bears four carinae. The chela is smooth, without carinae. The patella is granulate, with carinae indicated. The movable and fixed fingers of pedipalp bear 12–13 rows of granules, all with external and internal accessory granules. The fingers of pedipalps of both sexes with inner side of base smooth, tubercle absent. The manus of pedipalp of male broader than in female, pedipalp chela length/width ratio 3.3 in males and 4.2 in females.

Legs (Figs. 11–14). Legs III and IV bear tibial spurs. Retrolateral and prolateral pedal spurs are present on all legs. All legs without distinct carinae and smooth. The tarsomeres bear two rows of macrosetae on the ventral surface and other macrosetae on the other surfaces. The bristle-combs are present on all legs, although slightly reduced on the fourth leg.

Measurements. See Table 1.

Affinities. Combination of three characters, metasoma V black, pectine teeth number 33–42 in both sexes and pedipalp chela length/ width ratio 3.3 in male and 4.2 in female is present in fourth species from the Horn of Africa area: *P. qaraaf* **sp**. **n**., *P. abyssinicus* Pocock, 1901, *P. granimanus* Pocock, 1895, and *P. hamar* Kovařík et al., 2016 (see table 2 in Kovařík et al., 2025).

P. qaraaf **sp**. **n**. can be distinguished:

- from *P. abyssinicus* Pocock, 1901, which is the most similar species, by shape of pedipalp segments, mainly patella; pedipalp patella length/ wide ratio 2.7–2.8 in both sexes of *P. abyssinicus* versus 2.36–2.38 in both sexes of *P. qaraaf* **sp**. **n**. (Figs. 47 and 50 versus 53, 54 and 57);
- from *P. granimanus* Pocock, 1895, by smooth manus, fingers of pedipalp of male with inner side of base smooth, no trace of tubercle;
- from *P. hamar* Kovařík et al., 2016, by not so strongly granulated pedipalp patela and by sexual dimorphism, which is not so evident in shape of metasomal segments (metsoma IV length/ wide ratio 1.42 in male and 1.34–1.37 in females) as in *P. hamar* (metasoma IV length/ wide ratio 1.70 in male and 1.35–1.37 in females). Metasoma V length/ wide ratio is 1.50 in male *P. qaraaf* **sp**. **n**. and 1.82–2.05 in *P. hamar.*

Comments on localities and life strategy. The type locality, 25EB is semi-desert with red sands and small rocky areas (Fig. 59, fig. 130 in Kovařík et al., 2024, and fig. 2 in Kovařík & Elmi, 2025). The types of *P. qaraaf* **sp**. **n**. were recorded at night during UV collecting together with *Barbaracurus lowei* Kovařík et Elmi, 2025 (type locality), *Gint derbiae* Kovařík et al., 2024 (type locality), *Hottentotta polystictus* (Pocock, 1896), and *Pandinurus smithi* (Pocock, 1897). The authors visited the locality on 13–16 June 2025 and recorded maximum daytime temperature of 27 ºC and a minimum nighttime temperature of 21 ºC (rainy season).

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