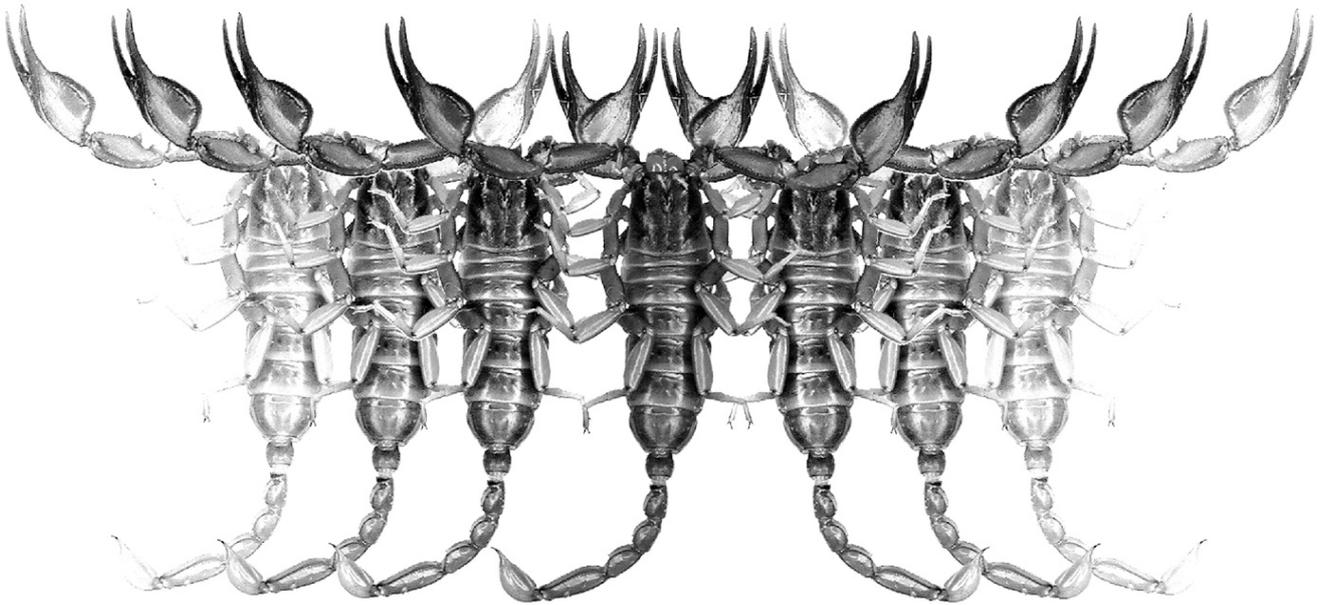


Euscorpius

Occasional Publications in Scorpiology



Scorpions of the Horn of Africa (Arachnida, Scorpiones)

Part XXXI. Two new genera from Somaliland:

Sanaag gen. n. and *Sahil* gen. n. (Buthidae)

František Kovařík

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Occasional Publications in Scorpiology

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

Part XXXI. Two new genera from Somaliland:

Sanaag gen. n. and *Sahil* gen. n. (Buthidae)

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<http://zoobank.org/urn:lsid:zoobank.org:pub:D792C9D7-1879-4006-A5BF-00FFA934F83F>

Summary

Two new monotypic buthid genera are described: *Sanaag* gen. n. and *Sahil* gen. n. from Somaliland, both belonging to the ‘*Buthus*’ group. *Sanaag* gen. n. (type species *Gint maidensis* Kovařík et al., 2018) differs from *Gint* Kovařík et al., 2013 in the structure of its hemispermatophore, which has a large, tall, subtriangular hook-like basal lobe, and in the shape of its telson which is rather bulbous. *Sahil* gen. n. (type species *Sahil elmii* sp. n.) differs from all morphologically similar small-sized genera of the Horn of Africa in having the ventral aspect of cheliceral fixed finger with two denticles, and the movable finger of the pedipalp with 7 subrows of denticles.

Introduction

Sanaag maidensis (Kovařík et al., 2018) **comb. n.** is morphologically similar to the species of *Gint* Kovařík et al., 2013. This species was placed originally under the genus *Gint* in spite of several characters which distinguish it from all other species of *Gint*. The important differentiating characters were cited in the very first paragraph of our key to the species of genus *Gint* (see Kovařík et al., 2018: 38). Further DNA (Just et al., 2022) and phylogenetic (Kovařík & Lowe, 2022) analyses clearly demonstrated that this taxon represents a separate, new genus.

The second new genus was discovered during the expedition to Sahil region in 2021.

Methods, Material & Abbreviations

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

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

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

Systematics

Family Buthidae C. L. Koch, 1837

Sanaag gen. n.

(Fig. 1, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:70E9D5C9-38FB-4FA8-93C9-FE3709912D94>

TYPE SPECIES. *Gint maidensis* Kovařík, Lowe, Just, Awale, Elmi & Šťáhlavský, 2018

ETYMOLOGY. The generic epithet *Sanaag* (masculine) named after the region of occurrence.

DIAGNOSIS. Total length up to 31–37 mm (male) or 39–48 mm (female); carapace trapezoidal, in lateral view preocular area not distinctly inclined towards anterior margin, level with or higher than postocular area; surface of carapace densely granular, with only anterior median carinae developed; ventral aspect of cheliceral fixed finger with two denticles; tergites densely granular, with three carinae of which lateral pair on I and II are inconspicuous; sternites III–VI with finely micro-denticulate posterior margins, lacking larger non-contiguous denticles; pectinal tooth number 25–31; pectines with fulcra, hirsute; hemispermatophore with large, tall, subtriangular hook-like basal lobe; metasomal segment I with 8 carinae, ventromedial pair being obsolete; metasoma II–III with 10 carinae; metasoma I ventrally smooth; metasoma V with enlarged ‘lobate’ dentition on ventrolateral carinae which may be reduced; telson rather bulbous, more so in males, vesicle with moderate posterior slope, not sharply inclined or truncated, lacking subaculear tubercle, aculeus shorter or the same as vesicle; all segments of metasoma and pedipalps sparsely hirsute, with long setae in both sexes, dentate margin of movable finger of pedipalp with 9–10 rows of granules, each with one external and one internal accessory granule, 5 terminal granules (4 terminal and one proximal terminal); trichobothrial pattern orthobothriotaxic type A; dorsal trichobothria of femur arranged in β -configuration; pedipalp patella with 7 external trichobothria; patella trichobothrium d_3 internal to dorsomedian carina; tibial spurs present on legs III–IV.



Figure 1. *Sanaag maidensis* (Kovařík et al., 2018) **comb. n.**, male paratype in vivo habitus.

Dimensions (mm)		<i>Sanaag maidensis</i>	<i>Sanaag maidensis</i>	<i>Sahil elmii</i> gen. et sp. n.
		♂ holotype	♀ paratype	♂ holotype
Carapace	L / W	3.80 / 4.02	4.62 / 5.95	3.36 / 3.59
Mesosoma	L	9.60	14.10	7.65
Tergite VII	L / W	2.90 / 3.95	3.75 / 5.75	1.80 / 3.54
Metasoma + telson	L	23.02	29.47	17.37
Segment I	L / W / D	3.10 / 2.55 / 2.21	3.75 / 3.07 / 2.52	2.23 / 2.02 / 1.74
Segment II	L / W / D	3.55 / 2.42 / 2.17	4.35 / 2.85 / 2.60	2.63 / 1.84 / 1.81
Segment III	L / W / D	3.70 / 2.40 / 2.25	4.65 / 2.82 / 2.70	2.83 / 1.82 / 1.88
Segment IV	L / W / D	4.10 / 2.30 / 2.15	5.20 / 2.85 / 2.65	3.18 / 1.82 / 1.60
Segment V	L / W / D	4.55 / 2.30 / 1.95	5.87 / 2.92 / 2.55	3.51 / 1.87 / 1.55
Telson	L / W / D	4.02 / 1.52 / 1.45	5.65 / 2.35 / 2.05	2.99 / 1.38 / 1.10
Pedipalp	L	12.60	16.03	8.83
Femur	L / W	3.25 / 1.00	4.13 / 1.15	2.34 / 0.82
Patella	L / W	3.95 / 1.35	5.05 / 1.75	2.57 / 1.02
Chela	L	5.40	6.85	3.92
Manus	W / D	1.08 / 1.10	1.55 / 1.55	0.89 / 0.95
Movable finger	L	3.35	4.80	2.59
Total	L	36.43	48.20	28.38

Table 1. Comparative measurements of types of *Sanaag maidensis* (Kovařík et al., 2018) **comb. n.** and *Sahil elmii* gen. et sp. n. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

AFFINITIES. *Sanaag* **gen. n.** belongs to the ‘*Buthus*’ group of Fet et al., 2005 (Štundlová et al., 2022), according to the following characters: trichobothrial pattern type A-β; patella trichobothrium d_3 internal to dorsomedian carina, manus Eb_1 - Eb_2 - Eb_3 in δ configuration; tibial spurs present on legs III–IV; pedipalp chela finger median denticle rows non-imbricated; and posterior margins of tergite VII & metasoma I–III bearing fringes of microsetae. Within this group, it represents a sister genus of *Gint* Kovařík et al., 2013, where its type species, *S. maidensis* **comb. n.**, was originally placed despite several differences. Further DNA (Just et al., 2022) and phylogenetic (Kovařík & Lowe, 2022) analyses, however, clearly demonstrated that *S. maidensis* **comb. n.** belongs to a separate, new genus. The two genera differ in the shape of the hemispermatophore, which has a large, tall, subtriangular hook-like basal lobe in *Sanaag* **gen. n.** and a small to medium sized, low, rounded, scoop-like basal lobe in *Gint*. Also, telson is rather bulbous in *Sanaag* **gen. n.** (telson L/D ratio 2.67–2.78 in males) and rather elongated in *Gint* (telson L/D ratio 2.98–3.60 in males).

Sanaag maidensis (Kovařík et al., 2018), **comb. n.**

(Fig. 1, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:27A902B0-0636-472F-AF81-0A793B75C2AE>

Gint maidensis Kovařík et al., 2018: 31–37, figs. 78–120, 124, 143–145, 179–182, 189–194, 197, 202, tables 2–3; Kovařík, 2018: 7; Kovařík & Lowe, 2019: 5, 9, 11; Just et al., 2022: 887, 890, 892–893, 894, 895, figs. 1–2, 4–6; Kovařík & Lowe, 2022: 30–31, 37, figs. 205–211.

TYPE LOCALITY AND TYPE DEPOSITORY. Somaliland, Sanaag region, Maid, 11°00'03"N 47°06'30"E, 52 m a. s. l.; FKCP.

MATERIAL EXAMINED (FKCP). Somaliland, Sanaag region, Maid, 11°00'03"N 47°06'30"E, 52 m a. s. l. (Locality No. 17SN), 3.-4.IX.2017, 11♂9♀1im.♂1im.♀ (holotype, paratypes) leg. F. Kovařík, 25.VIII.2018, 2♂1♀1juv. (topotypes), leg. F. Kovařík.

DIAGNOSIS. See generic diagnosis and Kovařík et al. (2018).

Sahil **gen. n.**

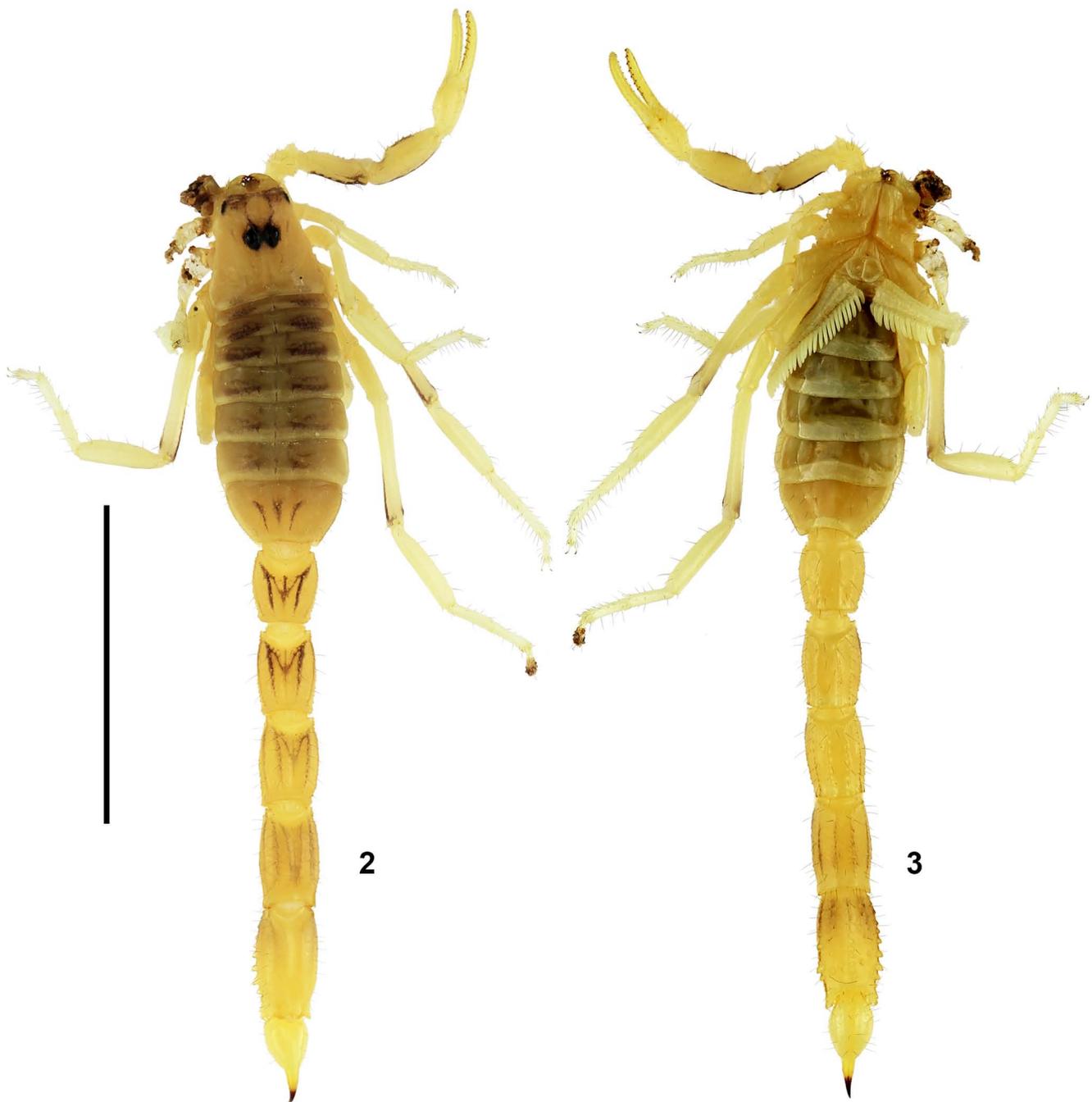
(Figs. 2–32, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:C32105D2-C3FD-46C5-AADC-0BB5A5B6B5D6>

TYPE SPECIES. *Sahil elmii* **sp. n.**

ETYMOLOGY. The generic epithet *Sahil* (masculine) is given after the region of occurrence.

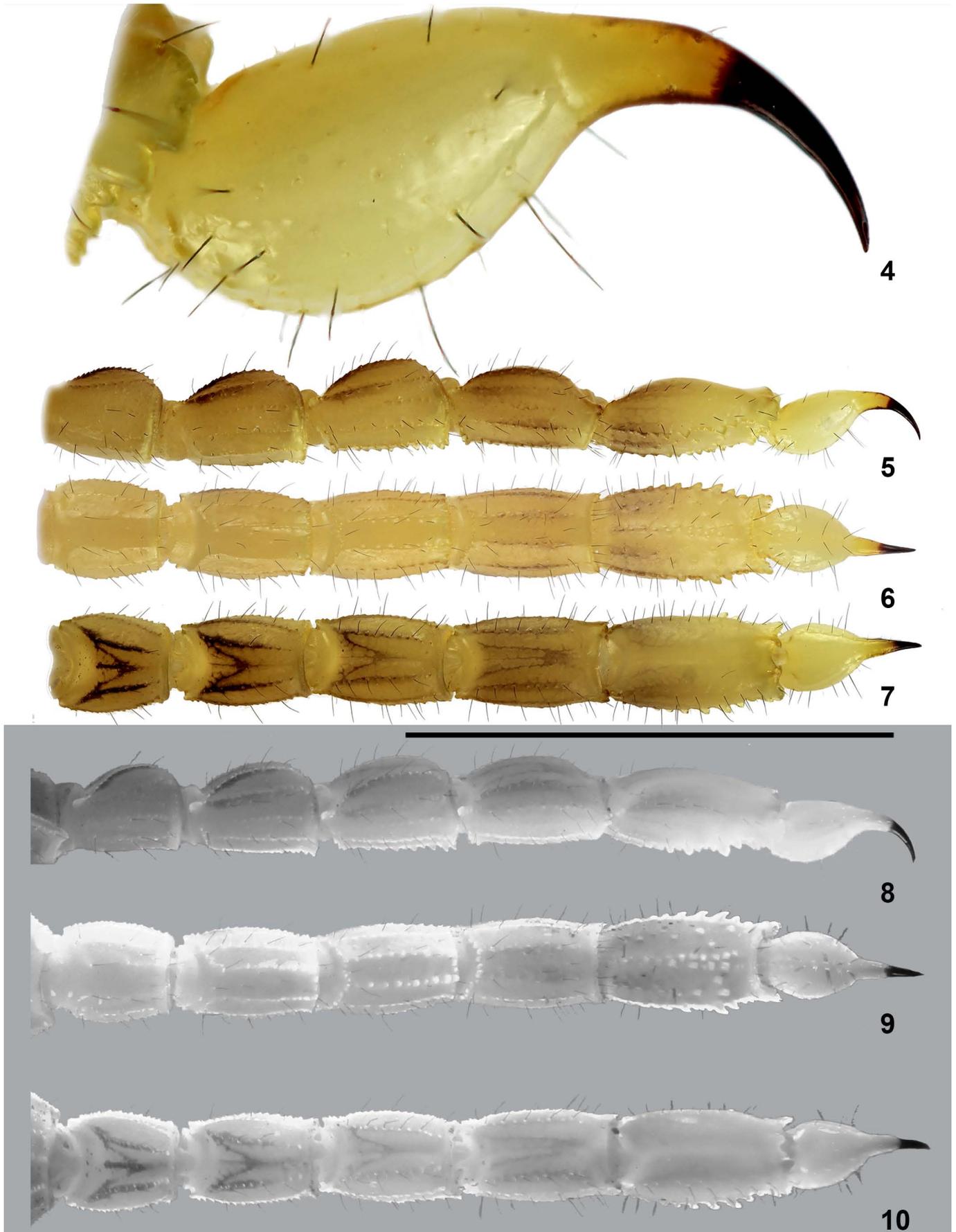
DIAGNOSIS (♂). Adult size small, total length of male 28 mm. Carapace trapezoidal, granulate, without carinae which are partly indicated, anterior margin almost straight; median eyes large, ocular tubercle raised; five pairs of lateral eyes present, two reduced in size. Sternum type 1, relatively small, and triangular to subpentagonal in shape; posterior depression very large and deep. Pectines large, with 24–25 teeth in male; fulcra present. Tergites I–VI tricarinate, all tergites granulate. Sternites with slit-like spiracles; sternite V without a well-defined smooth patch; sternites without carinae. Metasomal segments relatively



Figures 2–3. *Sahil elmii* gen. et sp. n., male holotype in dorsal (2) and ventral (3) views. Scale bar: 10 mm.

short and stout, nearly uniform in width, with carination well developed; metasoma I–IV with 10 carinae; enlarged dentition on ventrolateral and ventromedian carinae of metasoma II–III; metasoma V with irregular, enlarged lobate dentition on ventrolateral carinae; metasoma and telson with hirsute. Telson with elongate vesicle, aculeus stout, about same length as vesicle, subaculear tubercle absent. Cheliceral dentition follows typical buthid pattern (Vachon, 1963), fixed finger with two denticles on ventral surface. Pedipalps slender, patella slightly narrower than chelae; trichobothrial pattern neobothriotaxic type C, femur with trichobothrium d_2 absent, d_1 - d_3 - d_4 arranged

in β -configuration (non-reflex angle opening internally), patella d_3 located between dorsomedian and dorsointernal carinae, chela manus Eb_1 - Eb_2 - Eb_3 in δ configuration, V_1 - V_2 axis straight, eb on distal manus (not fixed finger), fixed finger with db situated near base of finger and distal to est , dt on anterior part of finger distal to et (et is between dt and est); dentate margins of pedipalp fingers straight, without lobe/ notch combination, equipped with 7 (movable finger) or 8 (fixed finger) rows of median denticles arranged nearly linearly, non-imbricated, rows I–VI flanked by a single external and internal accessory granule; 5 subterminal granules. Legs I–III with tibia and tarsi



Figures 4–10: *Sahil elmii* gen. et sp. n., male holotype, metasoma and telson under white light (4–7) and under UV fluorescence (8–10). Figure 4. Telson lateral. Figures 5–10. Metasoma and telson lateral (5, 8), ventral (6, 9), and dorsal (7, 10) views. Scale bar: 10 mm (5–10).



Figures 11–12. *Sahil elmii* gen. et sp. n., male holotype, carapace and tergites I–IV (11) and coxosternal area and sternites (12) under white light.

short, curved, flat, with setation modified into bristlecombs on basitarsi only, telotarsi with two rows of long setae on ventral surface; tibial spurs moderate, tarsal spurs well-developed

AFFINITIES. *Sahil* gen. n. belongs to the ‘*Buthus*’ group of Fet et al., 2005 (Štundlová et al., 2022), according to the following characters: trichobothrial pattern type A-β; patella trichobothrium d_3 internal to dorsomedian carina, manus Eb_1 - Eb_2 - Eb_3 in δ configuration; tibial spurs present on legs III–IV; pedipalp chela finger median denticle rows non-imbricated; and posterior margins of tergite VII & metasoma I–III bearing fringes of microsetae. Within this group, it is similar to other small-sized, monotypic genera from Asia, *Kraepelinia* Vachon, 1974 and *Fetilia* Lowe & Kovařík, 2021, which also have:

enlarged dentition on ventrolateral and ventromedian carinae of metasoma II–III; irregular, enlarged lobate dentition on ventrolateral carinae of metasoma V; and trichobothrium *eb* located on distal manus. However, *Kraepelinia* differs from *Sahil* gen. n. in several other characters: thickened pedipalp fingers that are atypical for buthids; smooth carapace and tergites; metasoma V with large, lobate denticles on ventral surface; telson bulbous and granulate. *Fetilia* differs from *Sahil* gen. n. in different shape of carapace (posterior/anterior margins width ratio is 1.8 in *Sahil* gen. n. and 2.2 in *Fetilia*); wider metasomal segments; and granulated sternites. Chelal trichobothria *dt* situated at anterior part of finger distal to *et* (*et* is localized between *dt* and *est*) in *Sahil* gen. n. (*dt* at mid-finger and level with *et* in *Fetilia*).



Figures 13–14. *Sahil elmii* gen. et sp. n., male holotype, carapace and tergites I–IV (13) and coxosternal area and sternites (14), under UV fluorescence

Other small-sized buthid genera found in the region (Horn of Africa) strongly differ from *Sahil* gen. n. *Gint* has movable finger of pedipalp with 8–10 subrows of denticles, femur petite trichobothrium present, and narrower metasomal and pedipalp segments. *Lanzatus* Kovařík, 2001 has ventral aspect of cheliceral fixed finger with single denticle and metasomal segments acarinate. *Neobuthus* Hirst, 1911 has ventral aspect of cheliceral fixed finger with single denticle, movable finger of pedipalp with 4–6 subrows of denticles, pedipalp manus trichobothrium V_2 positioned internal relative to V_1 , short metasoma macrosetae in males, and telson vesicle posterior ventral surface steeply sloped. *Somalibuthus* Kovařík, 1998 has strong anterosubmedian carinae on the carapace, ventral aspect of cheliceral fixed finger with a single denticle, pedipalp manus trichobothrium V_2 positioned internal relative to V_1 , and non-lobate dentition on the ventrolateral carinae of metasoma V.

DISTRIBUTION. Known only from the type locality in Somaliland (Fig. 32).

***Sahil elmii* sp. n.**

(Figs. 2–32, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:CD62300E-71DF-4245-8CFF-AC6D820631AF>

TYPE LOCALITY AND TYPE DEPOSITORY. Somaliland, Sahil region, Laas Dhuure Village, 10.176807°N 45.983479°E, ca 540 m a. s. l.; FKCP.

TYPE MATERIAL EXAMINED. **Somaliland**, Sahil region, Laas Dhuure Village, 10.176807°N 45.983479°E, ca 540 m a.s.l. (Locality No. 21SK, Fig. 32), 11–12 October 2021, 1♂ (holotype, DNA 1999), leg. F. Kovařík.

ETYMOLOGY. The specific epithet is a patronym honoring Hassan ShAbdirahman Elmi (Somaliland, Amoud University), who helped with Somaliland expeditions and collecting scorpions.

DIAGNOSIS. See generic diagnosis.

DESCRIPTION (♂). The male holotype is 28 mm long. The habitus is shown in Figs. 1–2. For position and distribution of trichobothria of pedipalp see Figs. 15–19, and 21–22.

Coloration (Figs. 2–3). The base color is uniformly yellow to yellowish orange, with two symmetrical dark spots in anterior part of carapace; two symmetrical dark stripes on tergites I–VI and metasoma I–IV dorsal. Tergite VII with three dark stripes. Other dark reduced spots and stripes are on metasoma dorsal and metasoma IV–V also on lateral and ventral surfaces and on femur of legs posteriorly.

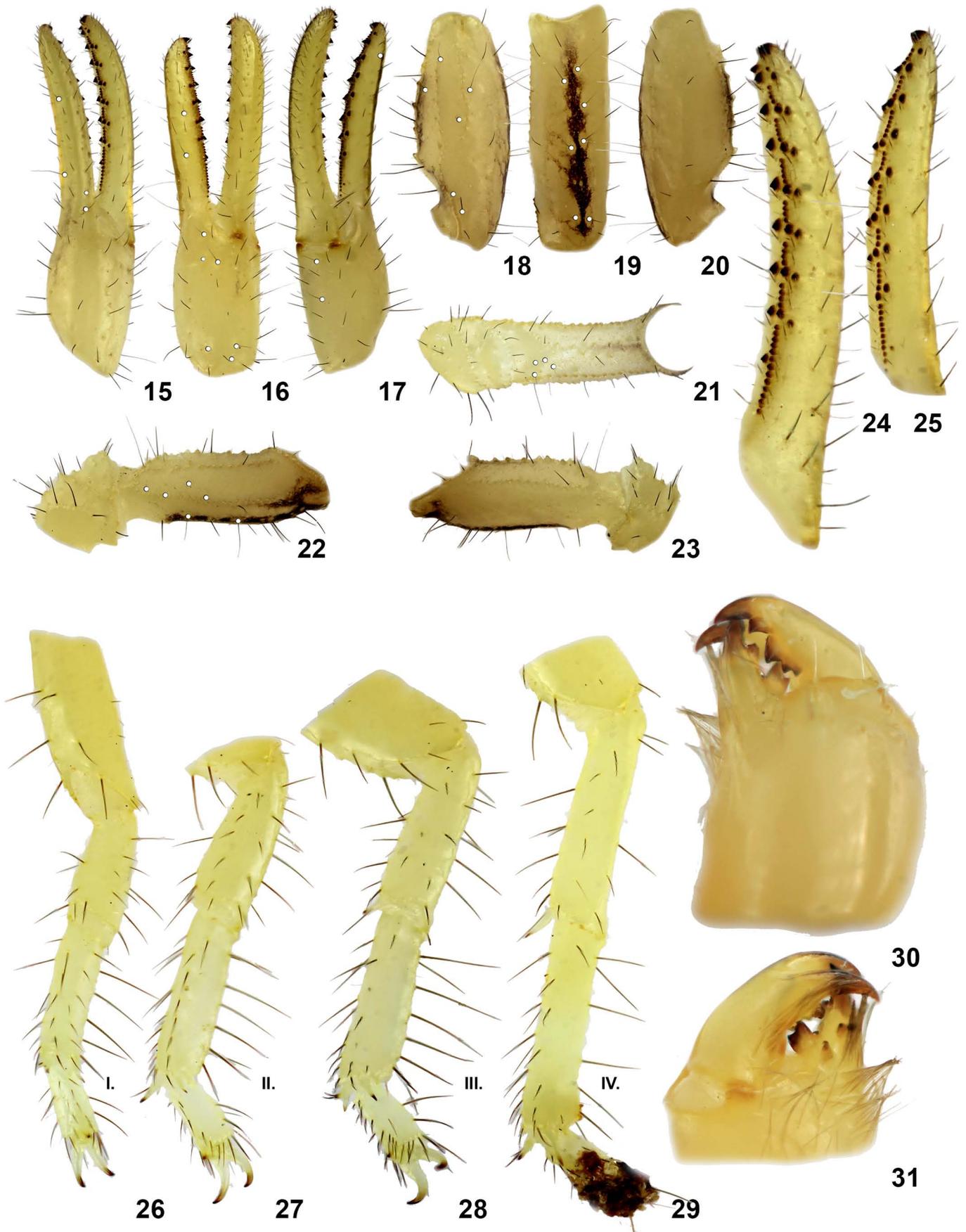
Carapace (Figs. 11, 13). Trapezoidal, anterior margin almost straight, with 6 marginal macrosetae; surface with dense, coarse granulation, weaker laterally; carinae absent; median ocular tubercle granulate, median eyes large, well separated; 5 lateral eyes (3 larger, 2 reduced).

Chelicera (Figs. 30–31). Fingers comply with the basic pattern of buthid dentition (Vachon, 1963); fixed finger with large distal denticle, one subdistal denticle and two basal denticles fused into bicuspid, two denticles on ventral surface; dorsal margin of movable finger with 5 denticles: one large distal denticle, medium-sized subdistal denticle, large medial denticle, and two small basal denticles; ventral margin with 3 denticles: one large distal denticle, and two smaller denticles in medial and basal positions.

Mesosoma (Figs. 11–14). *Tergites* I–VI tricarinate with a median carina, and an anteriorly diverging pair of lateral carinae; carinae coarsely granular, the lateral pair on tergites I–II rather indistinct; all carinae short with only ca. 2–5 granules, confined to posterior third of tergite; entire tergites sparsely covered with coarse granulation; pretergites smooth; tergite VII pentacarinate, median carina indicated, lateral carinae well developed, coarsely granular; *sternites* with slit-like spiracles; with smooth surfaces locally finely granulated, on sternite III and laterally on sternite VII; sternite III–VII without carinae; *sternal chaetotaxy*: sternite III–VI posterior margins bearing 3–5 macrosetae, III without macrosetae on medial surface, IV–VII with 2–4 macrosetae; *pectines* with margins extending to quarter of sternite V, with 3 marginal lamellae, 12 middle lamellae; lamellae and fulcra bear numerous short, fine, dark macrosetae; pectine basal piece and genital opercula smooth with fine macrosetae; pectinal tooth counts 24–25 in male. Sternum type 1, relatively small, and triangular to subpentagonal in shape; posterior depression very large and deep.

Metasoma and telson (Figs. 4–10). *Metasoma* I–IV with 10 granulated carinae, median lateral carinae on segments I–II complete, median lateral carinae on segments I–IV incomplete, indicated by ca. 7–11 granules on posterior part; ventromedian and ventrolateral carinae stronger on segments II–III, with conspicuously enlarged, dentate granules increasing in size posteriorly; metasoma V with 3 granulated ventral carinae, dorsolateral carinae granulated on IV and reduced to absent on V, ventrolateral carinae strong, irregularly crenulated on V with several enlarged, lobate granules that become larger posteriorly; intercarinal surfaces predominantly smooth and partly irregularly granulated; lateral anal arch divided into 4 lobes; ventral anal arch armed with a regular series of coarse granules; *telson* with distinctly elongated smooth vesicle; aculeus robust, equal to or shorter than vesicle in length, moderately curved; subaculear tubercle absent; *chaetotaxy*: metasomal segments and telson sparsely setose; long macrosetae dispersed irregularly on lateral and ventral surface.

Pedipalps (Figs. 15–25). Segments slender, with patella slightly narrower than chelae; *femur* with 3 strong, granulated carinae: dorsoexternal, dorsointernal, and ventrointernal; ventromedian carina indicated by several strong granules; dorsal, lateral and ventral surfaces smooth except for a few small solitary granules, internal surface granulated; *patella* with two granulated and 5 smooth, obsolete carinae; setation sparse, with large solitary macrosetae; *chela* smooth, carinae obsolete, rather densely covered by large macrosetae; dentate margins of fingers with 7 (movable finger) or 8 (fixed finger)



Figures 15–31: *Sahil elmii* gen. et sp. n., male holotype. **Figures 15–25.** Pedipalp segments, chela dorsal (15), external (16), ventral (17) views, patella dorsal (18), external (19), and ventral (20) views, femur and trochanter internal (21), dorsoexternal (22), and ventrointernal (23) views, movable (24) and fixed (25) finger dentition. Trichobothrial pattern is indicated by white circles in Figures 15–19 and 21–22. **Figures 26–29.** Right legs I–IV, retrolateral aspect (respectively). **Figures 30–31.** Chelicerae dorsal (30) and ventral (31).



Figures 32. *Sahil elmii* gen. et sp. n., type locality, Somaliland, Laas Dhuure Village.

rows of granules, 6 of them flanked by a single external and internal accessory granule, 7th row with a single external granule, 8th row of fixed finger without accessory granule; distal ends of movable finger with 5 subterminal granules; trichobothrial pattern neobothriotaxic type A- β (femur petite d_2 absent), fixed finger with *db* situated near base of finger and distal to *est*, *dt* at anterior part of finger distal to *et* (*et* is between *dt* and *est*).

Legs (Figs. 26–29). Legs with robust patellae, tibiae and tarsi; femora with a few solitary macrosetae; tibiae I–III with 5–7 long macrosetae in dorsal (retrosuperior) series, rather not forming a tibial ‘bristle comb’; basitarsi I–III compressed, with two irregular series of shorter ventral (proinferior and retroinferior) macrosetae, and a single linear series of 6–8 longer dorsal macrosetae (forming a basitarsal ‘bristle comb’); leg IV without basitarsal compression, longer than legs I–III; tibial spur on legs III–IV moderate; proteral and retrolateral pedal spurs well-developed.

Measurements. See Table 1.

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