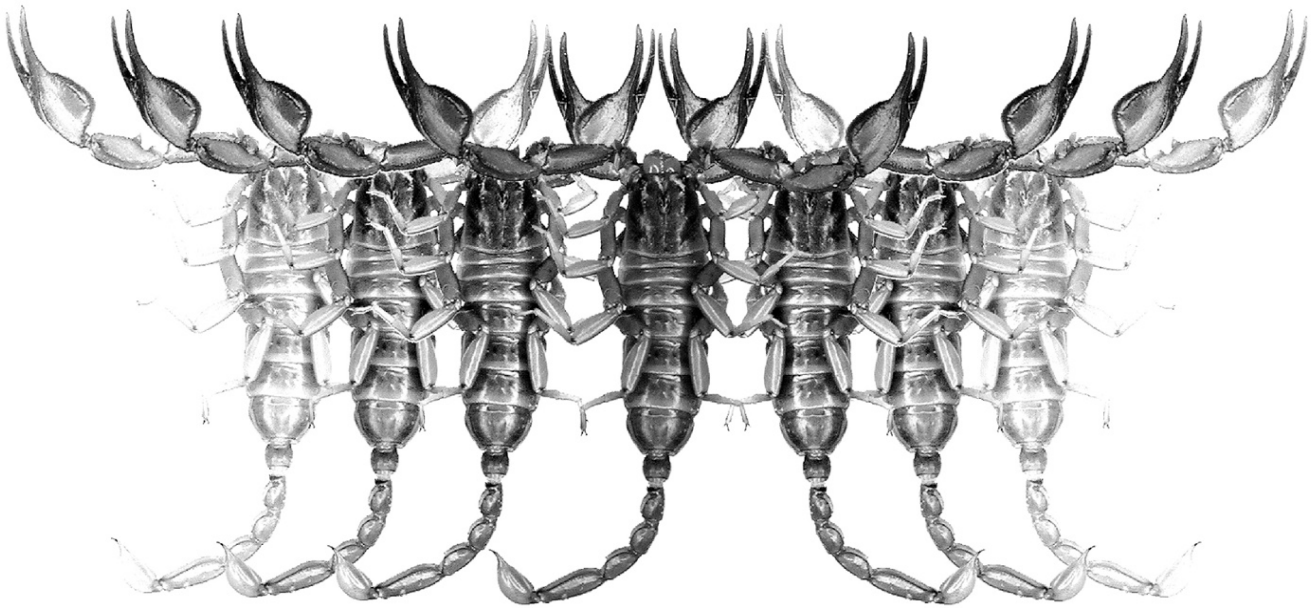


Euscorpius

Occasional Publications in Scorpiology



**Nine new species of *Scorpiops* Peters, 1861
(Scorpiones: Scorpiopidae)
from China, India, Nepal, and Pakistan**

František Kovařík

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Euscorpius

Occasional Publications in Scorpiology

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

ASSOCIATE EDITOR: Michael E. Soleglad, 'msoleglad@gmail.com'

TECHNICAL EDITOR: František Kovařík, 'kovarik.scorpio@gmail.com'

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Publication date: 9 March 2020

<http://zoobank.org/urn:lsid:zoobank.org:pub:6C4BC10A-F418-48E0-8BF8-D33DE4BA62A2>

Nine new species of *Scorpiops* Peters, 1861 (Scorpiones: Scorpiopidae) from China, India, Nepal, and Pakistan

František Kovařík

P. O. Box 27, CZ-145 01 Praha 45, Czech Republic; <http://www.scorpio.cz>

<http://zoobank.org/urn:lsid:zoobank.org:pub:6C4BC10A-F418-48E0-8BF8-D33DE4BA62A2>

Summary

Nine new species are described: *Scorpiops furai* sp. n. (India), *S. grosseri* sp. n. (India), *S. harmsi* sp. n. (Nepal), *S. hofereki* sp. n. (Pakistan), *S. kejvali* sp. n. (India), *S. tryznai* sp. n. (India), *S. wrzecionkoi* sp. n. (China), *S. yagmuri* sp. n. (Pakistan), and *S. zubairi* sp. n. (Pakistan), fully complemented with color photographs of preserved specimens. New species are distinguished from all other species of the family Scorpiopidae by combinations of eight major characters: position of pedipalp chelal trichobothrium *Eb*₃; number of pedipalp patella ventral trichobothria; shape of pedipalp fingers; number of inner accessory denticles (IAD) of pedipalp movable finger; chela length to width ratio; telson length to depth ratio; total length; and pecten morphology. Also, *Scorpiops vonwicki* Birula, 1913 stat. n. (India) is elevated to species rank; a new diagnosis of its only known specimen (female holotype) is given, fully illustrated with color photographs; and the fascinating story of its discovery is revealed for the first time.

Introduction

The genus *Scorpiops* was described by Peters (1861: 510) with type species *Scorpio hardwickii* Gervais, 1843. Later, several related genera or subgenera (later elevated to genera) were described, all now placed in the family Scorpiopidae: *Parascorpiops* Banks, 1928, *Dasyscorpiops* Vachon, 1974, *Alloscorpiops* Vachon, 1980, *Euscorpiops* Vachon, 1980, *Neoscorpiops* Vachon, 1980, *Plethoscorpiops* Lourenço, 2017, and *Vietscorpiops* Lourenço & Pham, 2015, as well as subgenus *Alloscorpiops* (*Laoscorpiops*) Lourenço, 2013 (now in synonymy with *Alloscorpiops*). The taxonomic position of these genera is unclear. Validity of generic characters was disputed already by Francke (1976) and Kovařík (2000); all these genera require a revision.

Methods, Material & Abbreviations

Nomenclature and measurements follow Stahnke (1971), Soleglad & Sissom (2001), 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); ZISP (Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia).

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

Movable finger dentition: ID, inner denticles; IAD, inner accessory denticles; MD, median denticles; OD, outer denticles.

Family Scorpiopidae Kraepelin, 1905

Genus *Scorpiops* Peters, 1861

(Figures 1–241, Tables 1–3)

Scorpiops Peters, 1861: 510; Kraepelin, 1899: 179–182; Vachon, 1980: 143–159; Tikader & Bastawade, 1983: 403–452, figs. 1129–1246; Sissom, 1990: 114; Kovařík, 1998: 142; Lourenço, 1998: 246; Fet, 2000: 491–495; Kovařík, 2000: 162–198, figs. 1–7, 14–22, 25, 28, 29, 31–72 (in part); Soleglad & Sissom, 2001: 93–97, figs. 3, 13–14, 86, 96, 101, 114, 147, 159, 183, 202, 220; Qi et al., 2005: 2–14, figs. 1–46; Kovařík, 2009: 27, 32; Kovařík & Ahmed, 2009: 1–10, figs. 1–26.

TYPE SPECIES. *Scorpio hardwickii* Gervais, 1843.

DIAGNOSIS. Total length 24–75 mm. Inner accessory denticles present on pedipalp chelal fingers. Outer denticles (OD) of pedipalp chelal fingers are present but displaced to outer aspect of fingers. Pedipalp chelal finger denticles aligned in straight row or rows. Pedipalp chela is flat in appearance. Trichobothrial pattern type C. Two subdistal denticles present on cheliceral movable finger dorsal edge. Cheliceral movable finger ventral edge either smooth or with crenulations. Ventral edge of cheliceral movable finger equipped with 5–7 (usually 7) denticles. Ventral aspect of cheliceral fixed finger smooth, without denticles. Two pedal spurs present on legs. Tarsal spurs on legs absent. Sternum pentagonal in shape. Hemispermaphore lamelliform in shape. Telson without

Dimensions (MM)		<i>S. furai</i> sp. n. ♀ holotype	<i>S. grosseri</i> sp. n. ♀ holotype	<i>S. harmsi</i> sp. n. ♀ holotype	<i>S. hofereki</i> sp. n. ♀ holotype
Carapace	L / W	7.75 / 7.64	8.05 / 7.50	7.71 / 7.68	6.62 / 6.07
Mesosoma	L	17.90	21.72	20.12	19.42
Tergite VII	L / W	3.08 / 6.69	4.20 / 6.42	3.99 / 6.13	3.06 / 5.03
Metasoma + telson	L	26.66	28.80	26.95	22.65
Segment I	L / W / D	2.81 / 3.46 / 2.85	3.30 / 2.75 / 2.49	2.72 / 3.17 / 2.70	2.30 / 2.55 / 2.11
Segment II	L / W / D	3.20 / 3.06 / 2.87	3.66 / 2.61 / 2.45	3.12 / 2.76 / 2.33	2.80 / 2.15 / 1.91
Segment III	L / W / D	3.43 / 2.95 / 2.70	4.10 / 2.37 / 2.38	3.39 / 2.52 / 2.60	2.99 / 1.96 / 1.84
Segment IV	L / W / D	3.90 / 2.85 / 2.50	4.15 / 2.37 / 2.17	3.97 / 2.36 / 2.30	3.40 / 1.78 / 1.81
Segment V	L / W / D	6.41 / 2.56 / 2.32	6.41 / 2.13 / 2.17	6.53 / 2.09 / 2.15	5.48 / 1.74 / 1.65
Telson	L / W / D	6.91 / 2.42 / 2.25	7.18 / 2.80 / 2.71	7.22 / 2.32 / 2.18	5.68 / 2.16 / 2.13
Pedipalp	L	26.69	26.99	26.99	23.6
Femur	L / W	6.29 / 2.64	6.60 / 2.71	6.60 / 2.46	6.00 / 2.25
Patella	L / W	6.75 / 2.92	6.64 / 3.08	6.39 / 2.73	5.58 / 2.42
Chela	L	13.65	13.75	14.00	12.02
Manus	W / D	4.82 / 4.35	5.16 / 3.83	5.00 / 3.70	4.12 / 3.05
Movable finger	L	6.96	7.48	6.56	6.67
Total	L	52.31	58.57	54.78	48.69

Table 1. Comparative measurements of adults of *Scorpiops furai* sp. n., *S. grosseri* sp. n., *S. harmsi* sp. n. and *S. hofereki* sp. n. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

subaculear tubercle. Median eyes and tubercle present. Two or three pairs of lateral eyes present. Patella of pedipalps usually with 16–19 external trichobothria. Ventral surface of manus usually bears 4 trichobothria, of which V_4 , if not absent, is usually located on ventral aspect of chela. Trichobothrium Eb_3 on external surface of chela, usually located between trichobothria Db and Dt , along proximo-distal axis of manus.

Scorpiops furai sp. n.

(Figures 1–22, 240–241, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:75F84D79-5DF7-4195-9CFD-27B40E6AA91D>

TYPE LOCALITY AND TYPE REPOSITORY. India, Meghalaya State, West Garo Hills District, Tura, 25°30.7'N 90°13.9'E, ca 700 m a. s. l. (Fig. 241); FKCP.

TYPE MATERIAL. **India**, Meghalaya State, West Garo Hills District, Tura, 25°30.7'N 90°13.9'E, ca 700 m a. s. l., 5–7 May 1996, 1♀ (holotype), leg. E. Jendek & O. Šauša; West Garo Hills, ca 1100 m a. s. l., 9–17 May 1996, 1♂juv. (paratype), leg. E. Jendek & O. Šauša; Ri-Bhoi District, Nongpoh env., 25.9°N, 91.88°E (Fig. 241), 1♀ (paratype), December 2007, leg. V. Fura, FKCP.

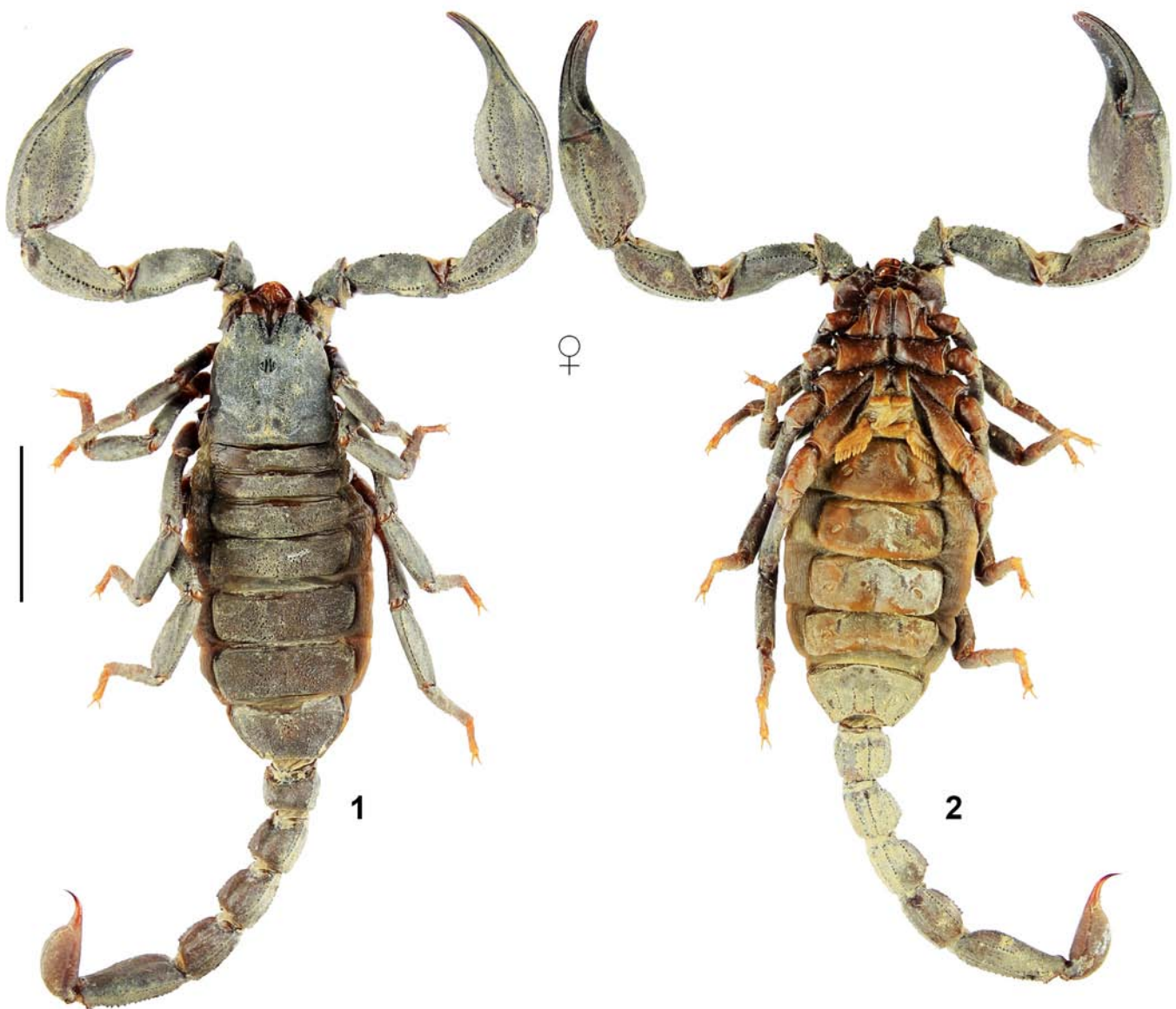
ETYMOLOGY. The species epithet is a patronym honoring Vladimír Fura, the collector of paratype of the new species.

DIAGNOSIS (♀♂juv.). Total length 45–52 mm. Base color uniformly reddish brown to black, telson and metatarsus of legs reddish brown. Pectinal teeth number 8 in male and 7–8

in females, fulcra absent, pectens with two marginal lamellae and a compact middle lamella. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Fingers of pedipalps straight in female. Chela length to width ratio 2.83 in female. Chelal trichobothrium Eb_3 is located in proximal half of external surface between trichobothria Dt and Db . Pedipalp movable finger with 51–58 IAD, which form a second row, parallel with MD (ca 60 in number); there are also 4 ID and 12–13 OD present. Tarsomere II of legs with 4–6 stout median ventral spines in a row and two other parallel spines. Telson elongate and sparsely granulate, length to depth ratio 3.07 in females; annular ring indicated.

DESCRIPTION (♀♂juv.). Total length 45–52 mm of females, adult male unknown. The habitus is shown in Figs. 1–2. For position and distribution of trichobothria of pedipalps, see Figs. 3–9. Fingers of pedipalps are straight in females (Fig. 4). **Coloration** (Figs. 1–2). The base color is uniformly reddish brown to black, telson and metatarsus of legs reddish brown, sternites lighter, reddish brown. Chelicerae are yellowish brown and reticulate, fingers black.

Carapace and mesosoma (Figs. 1–2, 13–14). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are smooth to finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carina. Pectinal teeth number 8 in male and 7–8 in females, fulcra are absent. The



Figures 1–2. *Scorpiops furai* sp. n., female holotype in dorsal (1) and ventral (2) views. Scale bar: 10 mm.

pectens have two marginal lamellae and a compact middle lamella.

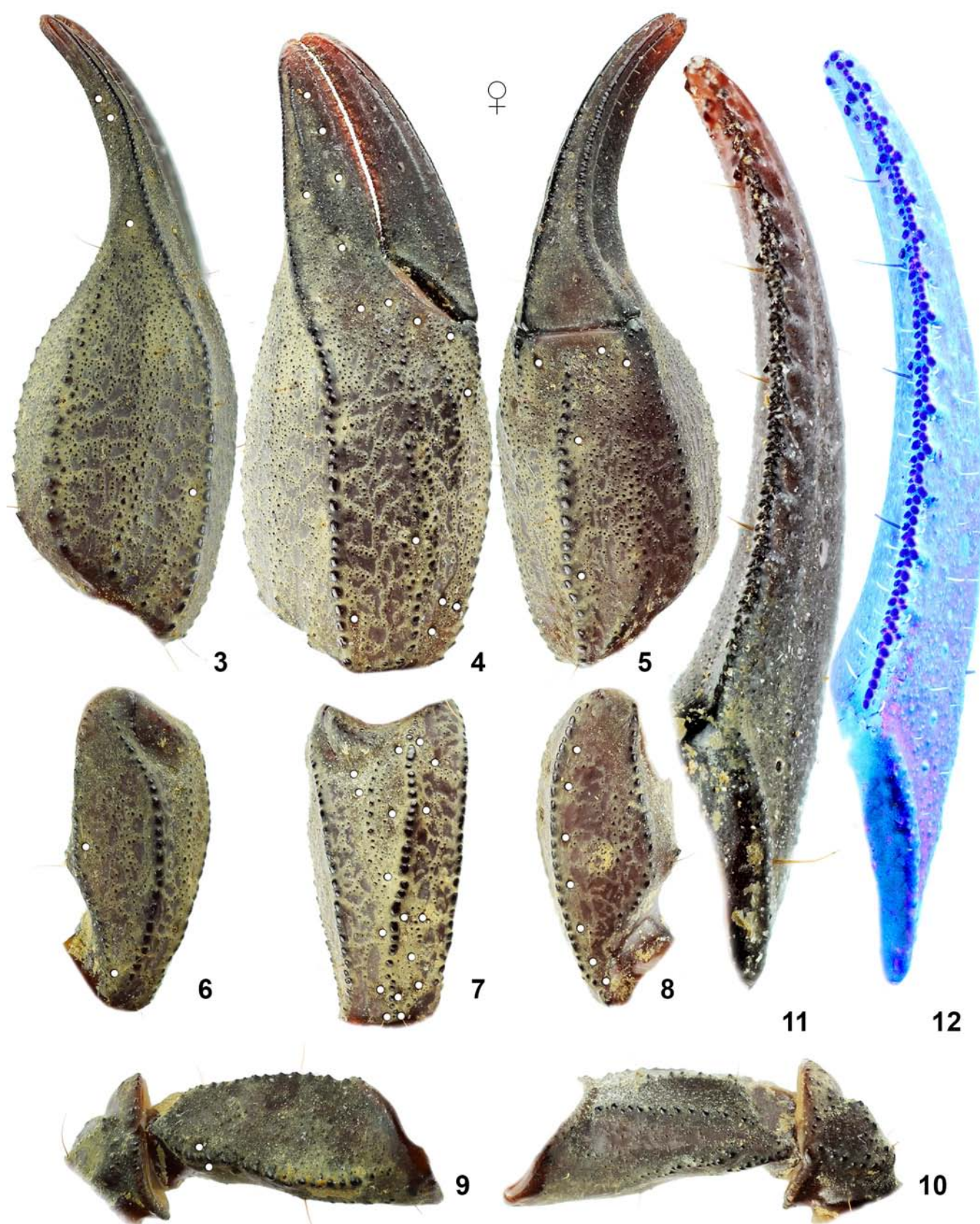
Metasoma and telson (Figs. 19–22). The metasoma is sparsely hirsute and granulated, with sparse, relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma II and V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV are granulate with sharp granules, which are not posteriorly terminated with pronounced tooth. The telson is elongate and granulate, annular ring indicated in females.

Pedipalps (Figs. 3–12). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external trichobothria and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are granulated. The femur has 5 granulose carinae, of which the ventral can be incomplete,

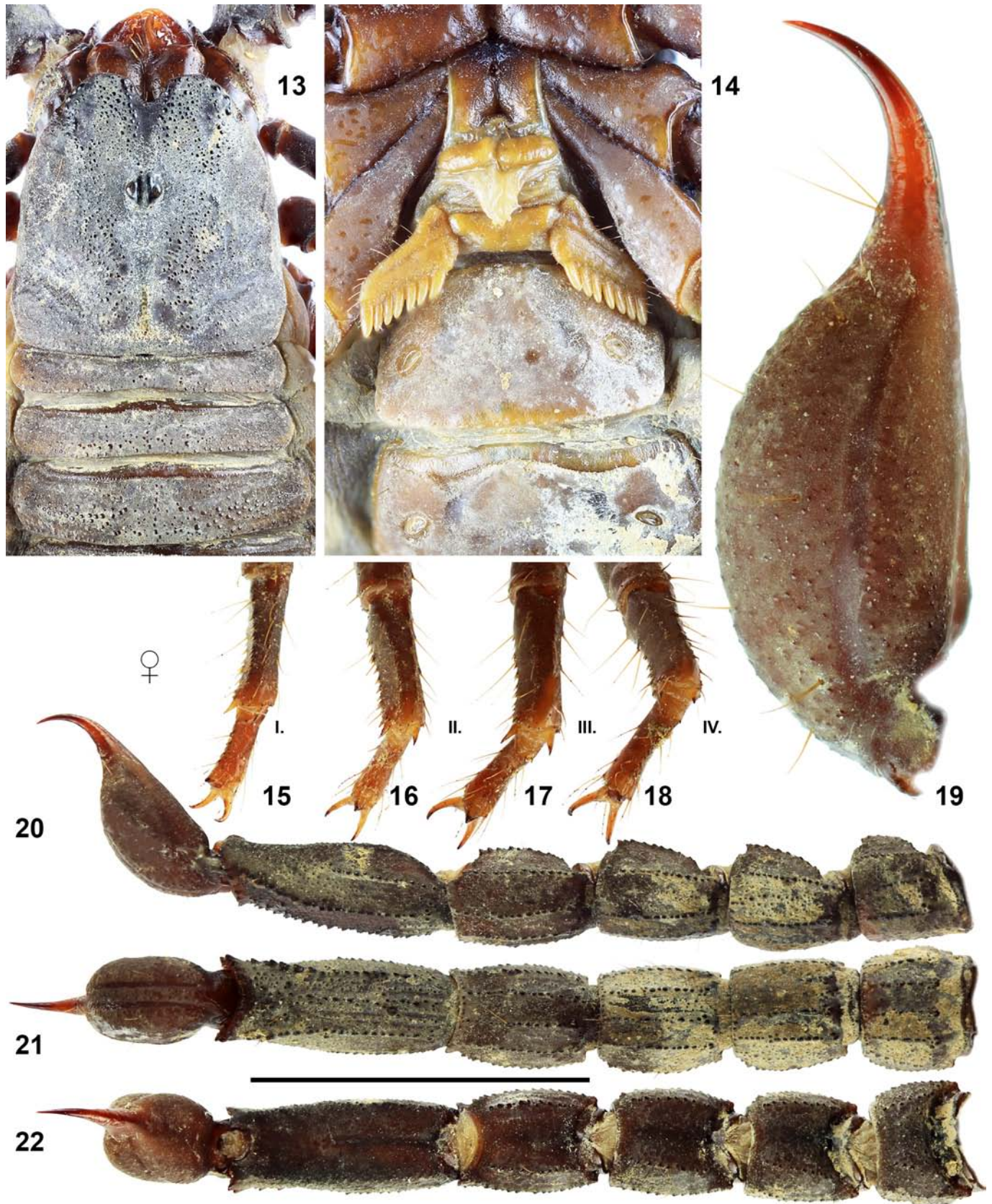
and the patella has 5 complete carinae with reduced internal tubercle. The manus dorsally bears fine, rounded granules, which are in the central area represented by large granules forming a longitudinal irregular incomplete carina. The external surface of the chela is covered by minute granules and bears an almost complete median carina with larger sparse granules. The movable fingers with 51–58 IAD, which form a second row, parallel to MD (ca 60 in number). There are also 4 ID and 12–13 OD present.

Legs (Figs. 15–18). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surface. Tarsomere II of legs I–IV with 4–6 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

Measurements. See Table 1.



Figures 3–12. *Scorpions furai* sp. n., female holotype, pedipalp segments. Chela dorsal (3), external (4) and ventral (5) views. Patella dorsal (6), external (7) and ventral (8) views. Femur and trochanter dorsal (9), and ventral (10) views. Movable finger dentition under white light (11) and UV fluorescence (12). Trichobothrial pattern is indicated by white circles.



Figures 13–22. *Scorpiops furai* sp. n., female holotype. Carapace and tergites I–III (13), posterior coxosternal area and sternites III–IV (14). Left legs I–IV, retrolateral aspect (15–18 respectively). Telson lateral (19). Metasoma and telson lateral (20), ventral (21), and dorsal (22) views. Scale bar: 10 mm (20–22).

AFFINITIES. The described features distinguish *S. furai* sp. n. from all other species of the genus. The combination of six characters (chelal trichobothrium Eb_3 located in proximal half of external surface between trichobothria *Dt* and *Db*; fingers of pedipalps straight in female; pedipalp movable finger with 51–58 IAD; chela length to width ratio 2.8 in female; telson length to depth ratio 3.07 in female; and patella of pedipalp with 7 ventral trichobothria) is unique in the entire genus *Scorpiops*.

DISTRIBUTION. India, Meghalaya State (Fig. 240).

***Scorpiops grosseri* sp. n.**

(Figures 23–48, 240, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:A35EF8E9-3C89-4CF7-99C1-4444D41C7C06>

TYPE LOCALITY AND TYPE REPOSITORY. India, Himachal Pradesh State, Shimla District, Narkanda, 31.26°N 77.45°E, 2646 m a. s. l.; FKCP.

TYPE MATERIAL. **India**, Himachal Pradesh State, Shimla District, Narkanda, 31.26°N 77.45°E, 2646 m a. s. l., 3–5 May 2016, 1 ♀ (holotype), leg. W. Grosser, FKCP.

ETYMOLOGY. The species epithet is a patronym honoring a Czech entomologist Walter Grosser, the collector of types of the new species.

DIAGNOSIS (♀). Total length 59 mm long. Base color uniformly reddish brown to black, telson and legs yellow to yellowish brown. Pectinal teeth number 4–5 in female, fulcra absent; a pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium Eb_3 is located in proximal half of external surface between trichobothria *Dt* and *Db*. Fingers of pedipalps flexed in female. Chela length to width ratio 2.66 in female. Pedipalp movable finger with 34–36 IAD, which form a second row, parallel to MD (60–65 in number); there are also 4 ID and 8 OD present. Tarsomere II of legs with 4–6 stout median ventral spines in a row and two other parallel spines. Telson bulbous and finely granulate, length to depth ratio 2.65 in female; annular ring present.

DESCRIPTION (♀). Total length of female holotype 59 mm, male unknown. The habitus is shown in Figs. 23–24. For position and distribution of trichobothria of pedipalps see Figs. 29–34 and 36. Fingers of pedipalps are flexed in the female (Fig. 30). **Coloration** (Figs. 23–24). The base color is uniformly reddish brown to black. The telson and legs yellow to yellowish brown. Chelicerae are reddish black and reticulate.

Carapace and mesosoma (Figs. 40–43). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are smooth with two parallel furrows except sternite VII, which bears four sparsely granulate carinae. Pectinal teeth number 4–5 in female, fulcra are absent. A pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae.

Metasoma and telson (Figs. 25–28). The metasoma is very sparsely hirsute and granulated, with relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV granulate with rounded granules, which are not posteriorly terminated with a pronounced tooth. The telson is bulbous and finely granulate, with annular ring present.

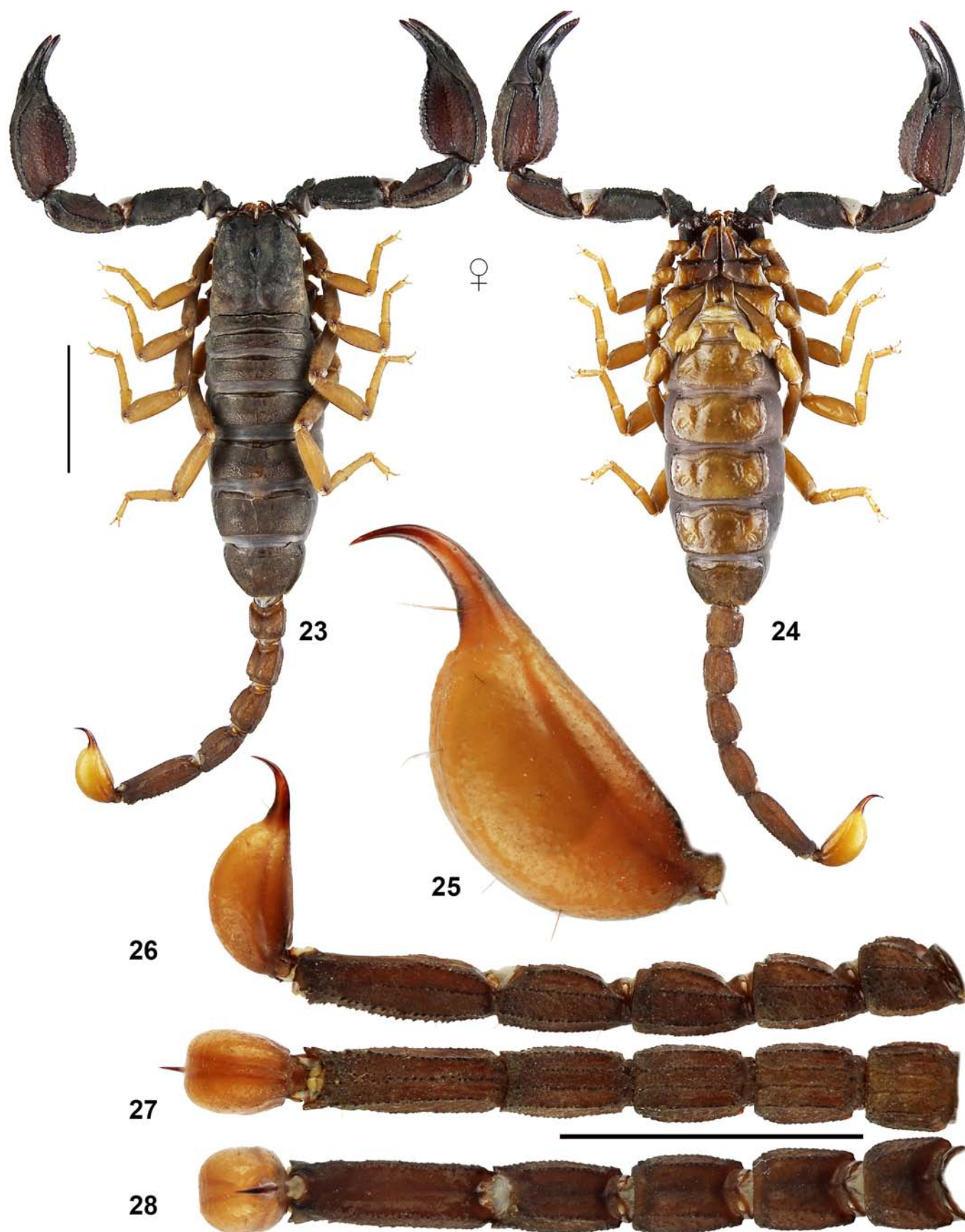
Pedipalps (Figs. 29–39). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external trichobothria and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are granulated. The femur has 5 granulose carinae and the patella has 5 complete carinae with dorsal and ventral patellar spurs present. The manus dorsally bears granules, which are in the central area replaced by large granules forming a longitudinal irregular incomplete carina. The external surface of the chela is covered by minute and larger sparse granules, which form another complete median carina. The movable fingers with 34–36 IAD, which form a second row, parallel to MD (60–65 in number); there are also 4 ID and 8 OD present.

Legs (Figs. 44–48). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surface. Tarsomere II of legs I–IV with 4–6 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

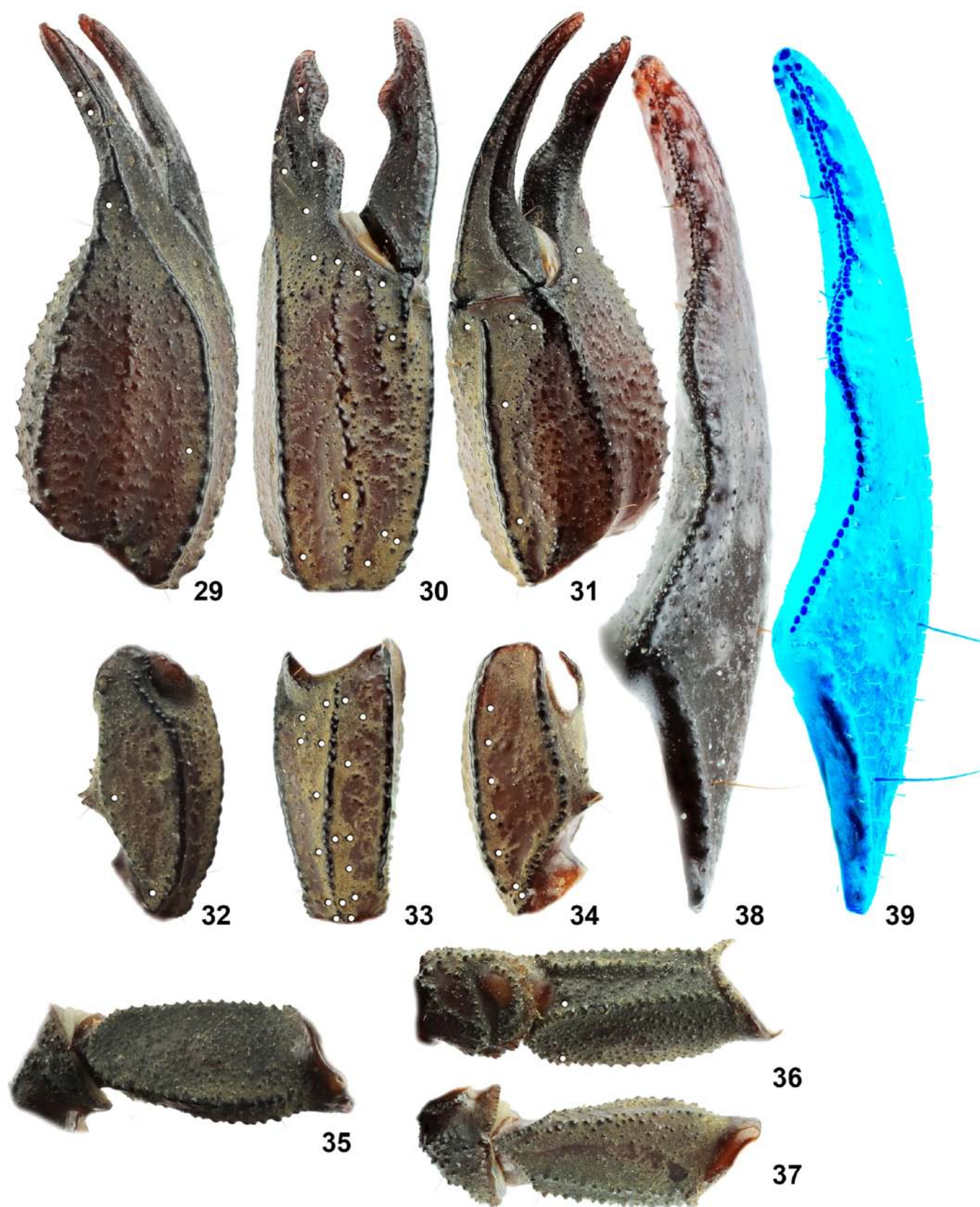
Measurements. See Table 1.

AFFINITIES. The described features distinguish *S. grosseri* sp. n. from all other species of the genus. The combination of five characters (chelal trichobothrium Eb_3 located in proximal half of external surface between trichobothria *Dt* and *Db*; total length over 50 mm; fingers of pedipalps flexed in female; pedipalp movable finger with 34–36 IAD; and chela length to width ratio 2.6 in female) is unique in the entire genus *Scorpiops*.

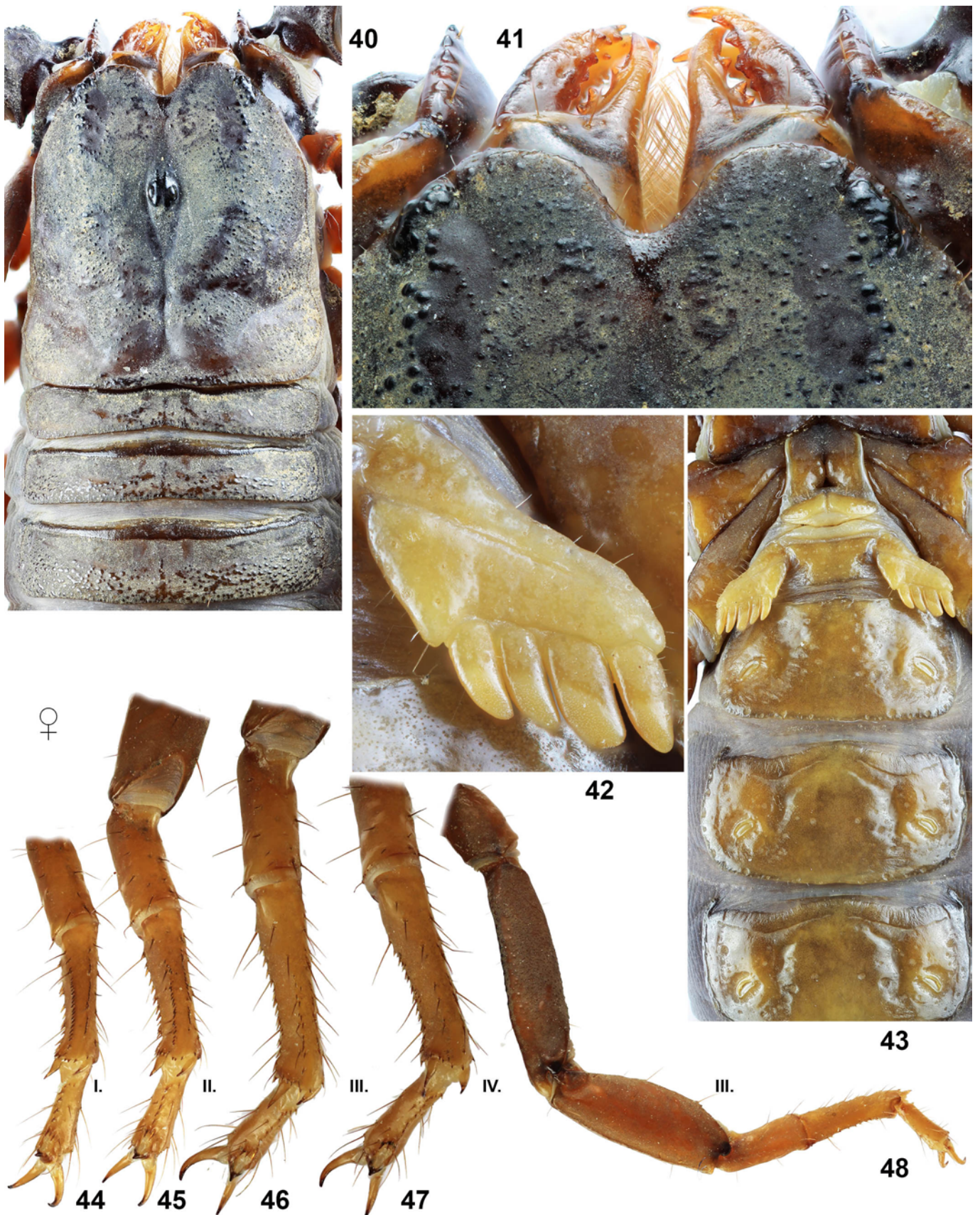
DISTRIBUTION. India, Himachal Pradesh State (Fig. 240).



Figures 23–28. *Scorpiops grosseri* sp. n., female holotype. Dorsal (23) and ventral (24) views. Telson lateral (25). Metasoma and telson lateral (26), ventral (27), and dorsal (28) views. Scale bars: 10 mm (23–24, 26–28).



Figures 29–39. *Scorpiops grosseri* sp. n., female holotype, pedipalp segments. Chela dorsal (29), external (30) and ventral (31) views. Patella dorsal (32), external (33) and ventral (34) views. Femur and trochanter dorsal (35), internal (36), and ventral (37) views. Movable finger dentition under white light (38) and UV fluorescence (39). Trichobothrial pattern is indicated by white circles.



Figures 40–48. *Scorpiops grosseri* sp. n., female holotype. Carapace and tergites I–III (40), anterior margin of carapace and chelicerae (41), pectine (42), posterior coxosternal area and sternites III–V (43). Left legs I–IV, retrolateral aspect (44–47 respectively) and leg III dorsal view (48).

***Scorpiops harmsi* sp. n.**

(Figures 49–68, 240, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:1975A1CE-FF6F-4811-9360-5AFE6C27AA92>

TYPE LOCALITY AND TYPE REPOSITORY. Nepal, Annapurna massif, Mardi Himal (28.48°N 83.927°E), Deuvali, 2100 m a. s. l.; FKCP.

TYPE MATERIAL. **Nepal**, Annapurna massif, Mardi Himal (28.48°N 83.927°E), Deuvali, 2100 m a. s. l., 10.V.2001, 1♀ (holotype), leg. J. Schmidt, FKCP.

ETYMOLOGY. The species epithet is a patronym honoring a German zoologist Danilo Harms, the curator of arachnids and myriapods at the Zoological Museum Hamburg, who greatly helped the author and his colleagues by loaning many type specimens of scorpions.

DIAGNOSIS (♀). Total length 55 mm long. Base color uniformly reddish brown to black, telson and tarsomere II of legs yellowish to reddish brown. Pectinal teeth number 5–6 in female, fulcra absent; pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium *Eb*₃ located in proximal half of external surface between trichobothria *Dt* and *Db*. Fingers of pedipalps very slightly undulate in female. Chela length to width ratio 2.8 in female. Pedipalp movable finger with 40–42 IAD, which form a second row, parallel to MD (70–73 in number); there are also 4 ID and 7–8 OD present. Tarsomere II of legs with 7–8 stout median ventral spines in a row and two other parallel spines. Telson elongate and very sparsely granulate, length to depth ratio 3.31 in female.

DESCRIPTION (♀ holotype). Total length 55 mm. Male unknown. The habitus is shown in Figs. 49–50. For position and distribution of trichobothria of pedipalps see Figs. 51–56. Fingers of pedipalps are very slightly undulate in female (Fig. 52).

Coloration (Figs. 49–50). The base color is uniformly reddish brown to black, telson and tarsomere II of legs yellowish to reddish brown, sternites reddish black. Chelicerae are reddish brown and reticulate, fingers reddish brown.

Carapace and mesosoma (Figs. 59–60). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carinae. Pectinal teeth number 7 in female, fulcra are absent. A pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae.

Metasoma and telson (Figs. 65–68). The metasoma is sparsely hirsute and granulated, with relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma II are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV granulate with sharp granules, which are not posteriorly terminated with a pronounced tooth. The telson is elongate and very sparsely granulate, with annular ring slightly indicated in female.

Pedipalps (Figs. 51–58). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external trichobothria and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are granulated. The femur has 5 granulate carinae and the patella has 5 complete carinae with reduced dorsal and ventral patellar spurs. The manus dorsally bears fine, rounded granules, which are not enlarged in the central area. The external surface of the chela is covered by minute and larger sparse granules. The movable fingers with 40–42 IAD, which form a second row, parallel to MD (70–73 in number); there are also 4 ID and 7–8 OD present.

Legs (Figs. 61–64). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surface. Tarsomere II of legs I–IV with 7–8 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

Measurements. See Table 1.

AFFINITIES. The described features distinguish *S. harmsi* sp. n. from all other species of the genus. The combination of five characters (chelal trichobothrium *Eb*₃ located in proximal half of external surface between trichobothria *Dt* and *Db*; fingers of pedipalps slightly undulate in female; pedipalp movable finger with 40–42 IAD; chela length to width ratio 2.8 in female; and patella of pedipalp with 7 ventral trichobothria) is unique in the entire genus *Scorpiops*.

DISTRIBUTION. Nepal (Fig. 240).

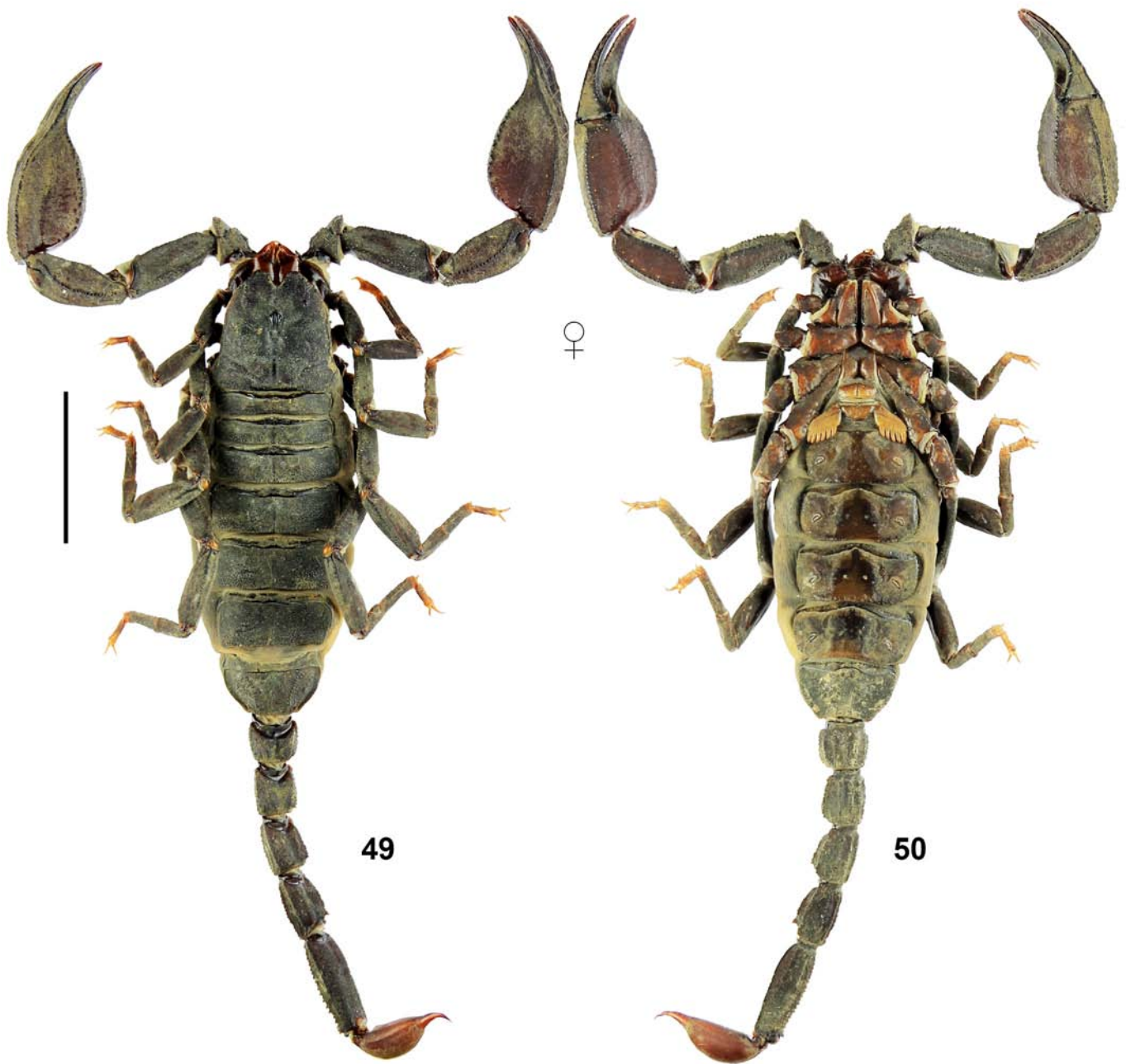
***Scorpiops hofereki* sp. n.**

(Figures 69–92, 240, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:10A76C0E-2759-47A0-8063-7DE46ADA205C>

TYPE LOCALITY AND TYPE REPOSITORY. Pakistan, Gilgit-Baltistan Region, Diamer District, Chilas, ca 35°25'N 74°06'E; FKCP.

TYPE MATERIAL. **Pakistan**, Gilgit-Baltistan Region, Diamer District, Chilas, ca 35°25'N 74°06'E, 1♀ (holotype), 2005, FKCP; Khyber Pakhtunkhwa (formerly North-West Frontier) Province, Mansehra District, Kaghan Valley, Thathabaya, 2200 m a. s. l., 34.60°N 73.433°E, 1♀ (paratype), 2005, FKCP.



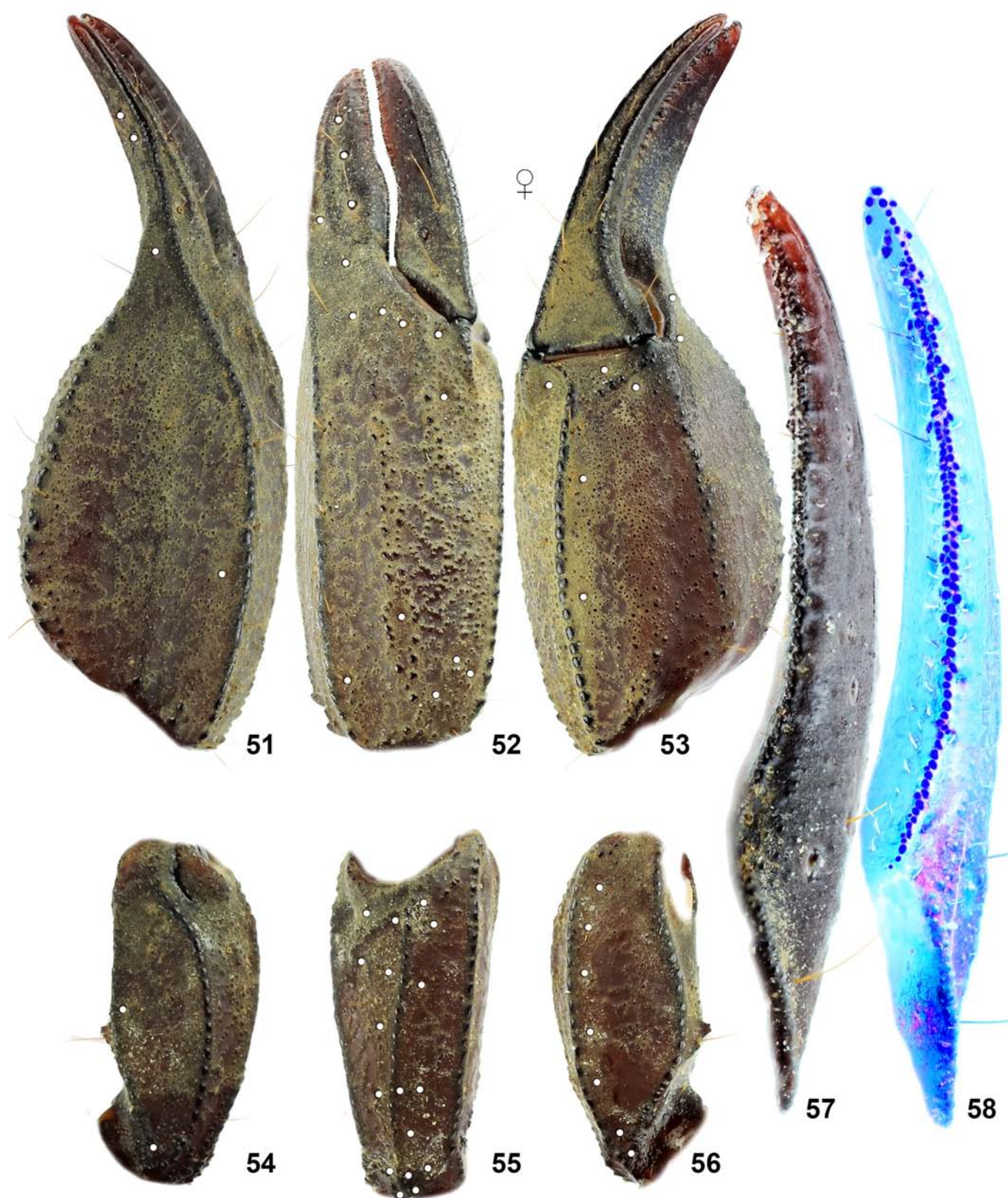
Figures 49–50. *Scorpiops harmsi* sp. n., female holotype in dorsal (49) and ventral (50) views. Scale bar: 10 mm.

ETYMOLOGY. The specific epithet honors David Hoferek (Czech Republic) for his contribution to understanding scorpions.

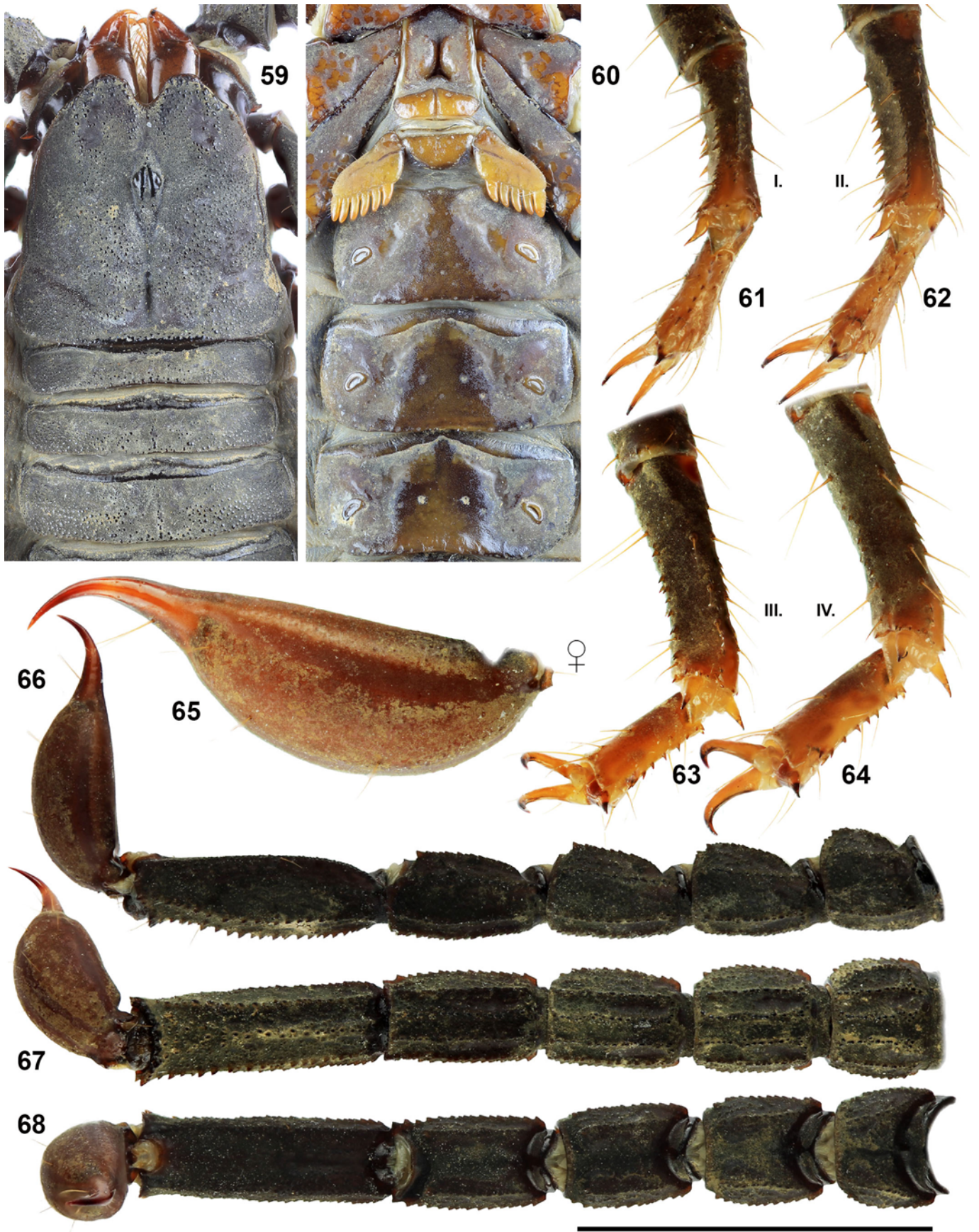
DIAGNOSIS (♀). Total length 48–60 mm. Base color uniformly reddish brown to black, telson and tarsomere II of legs yellowish to reddish brown. Pectinal teeth number 4–6 in females, fulcra absent; marginal lamella I (basal) present, the remaining pectinal surface forming one compact unit. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium *Eb*₃ located in lower half of external surface

between trichobothria *Dt* and *Db*. Fingers of pedipalps undulate in females. Chela length to width ratio 2.9–3.1 in females. Pedipalp movable finger with ca 38 IAD, which form a second row, parallel to MD (62–68 in number); there are also 5 ID and 9–10 OD present. Tarsomere II of legs with 6–9 stout median ventral spines in a row and two other parallel spines. Telson bulbous and finely granulate, length to depth ratio 2.6–3 in females; annular ring present.

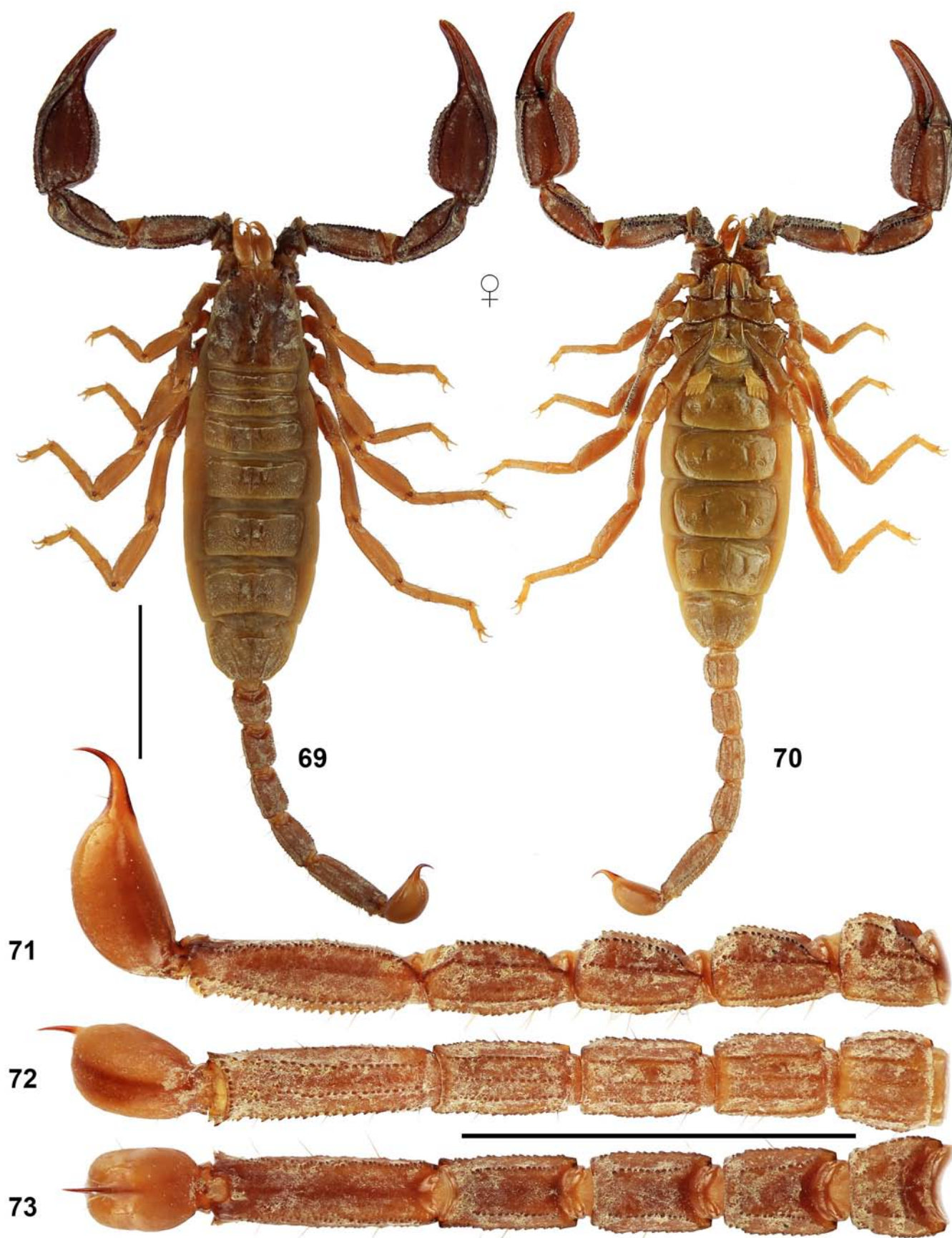
DESCRIPTION (♀). Total length 48–60 mm of females, male unknown. The habitus is shown in Figs. 69–70. For position and distribution of trichobothria of pedipalps see Figs. 74–80. Fingers of pedipalps are undulate in females (Fig. 75).



Figures 51–58. *Scorpiops harmsi* sp. n., female holotype, pedipalp segments. Chela dorsal (51), external (52) and ventral (53) views. Patella dorsal (54), external (55) and ventral (56) views. Movable finger dentition under white light (57) and UV fluorescence (58). Trichobothrial pattern is indicated by white circles.



Figures 59–68. *Scorpiops harmsi* sp. n., female holotype. Carapace and tergites I–III (59), posterior coxosternal area and sternites III–V (60). Left legs I–IV, retrolateral aspect (61–64 respectively). Telson lateral (65). Metasoma and telson lateral (66), ventral (67), and dorsal (68) views.



Figures 69–73. *Scorpiops hofereki* sp. n., female holotype. Dorsal (69) and ventral (70) views. Metasoma and telson lateral (71), ventral (72), and dorsal (73) views. Scale bars: 10 mm (69–70, 71–73).



Figures 74–82. *Scorpiops hofereki* sp. n., female holotype, pedipalp segments. Chela dorsal (74), external (75) and ventral (76) views. Patella dorsal (77), external (78) and ventral (79) views. Femur and trochanter dorsal (80) and ventral (81) views. Movable finger dentition (82). Trichobothrial pattern is indicated by white circles.

Coloration (Figs. 69–70). The base color is uniformly reddish brown (holotype) to black (paratype). The telson and tarsomere II of legs yellowish to reddish brown. Chelicerae are reddish black and reticulate.

Carapace and mesosoma (Figs. 83–84, 88). The entire carapace is covered with large and minute granules; carinae are absent but larger granules form two parallel rows in the anterior part of carapace. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes, of which one can be reduced. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinat. The sternites are finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carinae. Pectinal teeth number 4–6 in females, fulcra are absent. The pectens have marginal lamella I (basal) present, the remainder of the pectinal surface forming one compact unit.

Metasoma and telson (Figs. 71–73, 87). The metasoma is very sparsely hirsute and granulated, with relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV are granulate with sharp granules, which are not posteriorly terminated with a pronounced tooth. The telson is bulbous and sparsely granulate, with annular ring present.

Pedipalps (Figs. 74–82). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on ventral surface. The femur and patella are granulated. The femur has 5 granulate carinae and the patella has 5 complete carinae with dorsal and ventral patellar spurs present but reduced. The manus dorsally bears fine, rounded reticulated granules. The external surface of the chela is covered by minute and larger sparse granules, which form another almost complete carina. The movable fingers with 9–10 IAD, parallel with MD (62–68 in number) and there are also 5 ID and 9–10 OD present.

Legs (Figs. 89–92). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surface. Tarsomere II of legs I–IV with 6–9 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

Measurements. See Table 1.

AFFINITIES. The described features distinguish *S. hofereki* sp. n. from all other species of the genus. The combination of four characters (chelal trichobothrium *Eb*₃ located in proximal half of external surface between trichobothria *Dt* and *Db*; total length over 45 mm; fingers of pedipalps undulate in females; chela length to width ratio 2.9–3.1 in females; and patella of pedipalp with 7 ventral trichobothria) is unique in the entire genus *Scorpiops*.

DISTRIBUTION. Pakistan (Fig. 240).

Scorpiops kejvali sp. n.

(Figures 93–131, 240, Table 2)

<http://zoobank.org/urn:lsid:zoobank.org:act:EB52FA43-3FC9-41D3-B0B0-3349670C0F70>

TYPE LOCALITY AND TYPE REPOSITORY. India, Uttarakhand (formerly Uttaranchal) State, ca 55 km of Bageshwar (29.84°N 79.73°E), E of Munsyari, 2200–2400 m a. s. l.; FKCP.

TYPE MATERIAL. **India**, Uttarakhand (formerly Uttaranchal) State, ca 55 km E of Bageshwar (29.84°N 79.73°E), E of Munsyari, 2200–2400 m a. s. l., 6–9 July 2003, 1♂ (holotype), leg. Z. Kejval & M. Trýzna; ca 30 km E of Bageshwar, SE of Dhakuri vill., 2600–2800 m a. s. l., 25–26 June 2003, 5♀juvs(♂♀) (paratypes), leg. Z. Kejval & M. Trýzna, FKCP.

ETYMOLOGY. The species epithet is a patronym honoring a Czech entomologist Zdeněk Kejval, the collector of the types of the new species.

DIAGNOSIS (♂♀). Total length 37 mm (male) to 52 mm (female). Base color uniformly reddish brown to black, telson and tarsomere II of legs reddish brown. Pectinal teeth number 7 in male, 5–6 in females, fulcra absent. Marginal lamella I (basal) present, the remainder of the pectinal surface forming one compact unit. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium *Eb*₃ is located in proximal half of external surface between trichobothria *Dt* and *Db*. Fingers of pedipalps slightly undulate in both sexes. Chela length to width ratio 3.15 in male, 2.64 in females. Pedipalp movable finger with 7–9 larger and 24–26 smaller IAD, which form a second row, parallel to MD (60–68 in number); there are also 4 ID and 8–10 OD present. Tarsomere II of legs with 8–9 stout median ventral spines in a row and two other parallel spines. Metasoma I with 10, and metasoma II–IV with 8 carinae. Telson elongate and sparsely granulate, length to depth ratio 3.16 in male and 3.05 in females; annular ring developed in both sexes.

DESCRIPTION (♂♀). Total length 37 mm (male) to 52 mm (female). The habitus is shown in Figs. 93–96. For position and distribution of trichobothria of pedipalps see Figs. 97a–102a. Sexual dimorphism minor: adult males have relatively larger pectens and slightly elongate pedipalp chela; fingers of pedipalps are very slightly undulate in both sexes (Figs. 98 and 106).

Coloration (Figs. 93–96). The base color is uniformly reddish brown to black, telson and tarsomere II of legs reddish brown to black, sternites obviously lighter, reddish brown. Chelicerae are yellowish brown and reticulate, fingers black.

Carapace and mesosoma (Figs. 124–127). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three

Dimensions (MM)		<i>S. kejvali</i> sp. n.	<i>S. kejvali</i> sp. n.	<i>S. tryznai</i> sp. n.	<i>S. wrzecionkoi</i> sp. n.
		♂ holotype	♀ paratype	♀ holotype	♀ holotype
Carapace	L / W	5.89 / 5.32	6.99 / 7.42	8.34 / 7.43	7.42 / 6.53
Mesosoma	L	11.52	19.00	24.27	18.03
Tergite VII	L / W	2.55 / 4.28	3.02 / 6.20	4.59 / 6.21	3.56 / 5.37
Metasoma + telson	L	19.52	24.51	28.19	22.87
Segment I	L / W / D	2.09 / 2.42 / 2.20	2.59 / 2.86 / 2.47	3.06 / 3.03 / 2.42	2.48 / 2.46 / 2.43
Segment II	L / W / D	2.35 / 2.12 / 2.02	2.92 / 2.67 / 2.31	3.49 / 2.67 / 2.25	2.67 / 2.12 / 2.31
Segment III	L / W / D	2.55 / 1.86 / 1.95	3.20 / 2.47 / 2.26	3.87 / 2.48 / 2.27	2.89 / 2.09 / 2.23
Segment IV	L / W / D	2.97 / 1.78 / 1.81	3.55 / 2.29 / 2.10	4.12 / 2.28 / 2.17	3.37 / 1.98 / 2.01
Segment V	L / W / D	4.60 / 1.61 / 1.68	5.84 / 2.02 / 2.02	6.65 / 2.10 / 1.91	5.72 / 1.86 / 1.79
Telson	L / W / D	4.96 / 1.67 / 1.57	6.41 / 2.10 / 2.05	7.00 / 2.55 / 2.46	5.74 / 2.27 / 2.23
Pedipalp	L	20.33	24.63	29.29	24.60
Femur	L / W	4.97 / 2.21	6.14 / 2.34	7.44 / 2.89	6.12 / 2.54
Patella	L / W	5.10 / 2.20	6.00 / 2.49	7.23 / 3.35	5.68 / 2.59
Chela	L	10.26	12.49	14.62	12.80
Manus	W / D	3.26 / 2.56	4.73 / 3.62	4.67 / 3.77	4.68 / 3.58
Movable finger	L	5.06	6.11	7.19	6.96
Total	L	36.93	50.5	60.80	48.32

Table 2. Comparative measurements of adults of *Scorpiops kejvali* sp. n., *S. tryznai* sp. n. and *S. wrzecionkoi* sp. n. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinat. The sternites are smooth to finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carina. Pectinal teeth number 7 in male and 5–6 in females, fulcra are absent. The marginal lamella I (basal) is present, the remainder of the pectinal surface forming one compact unit.

Metasoma and telson (Figs. 116–123). The metasoma is sparsely hirsute and granulated, with sparse, relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV posteriorly are not terminated in a pronounced tooth. The telson is elongate and sparsely granulate, with annular ring developed in both sexes.

Pedipalps (Figs. 97–115). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are granulated. The femur has 5 granulose carinae, and the patella has 5 carinae with reduced dorsal and ventral patellar spurs. The manus dorsally bears rounded granules of different sizes. The external surface of the chela is covered by minute granules and bears an almost complete median carina composed of larger, sparse granules. The movable fingers with 7–9 larger and 24–26 smaller IAD, which form a second row, parallel to MD (60–68 in number). There are also 4 ID and 8–10 OD present.

Legs (Figs. 128–131). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces

but with rows of spines on dorsolateral and ventrolateral surfaces. Tarsomere II of legs I–IV with 8–9 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 carinae; both femur and patella are granulated.

Measurements. See Table 2.

AFFINITIES. The described features distinguish *S. kejvali* sp. n. from all other species of the genus. The combination of five characters (chela trichobothrium *Eb*₃ located in proximal half of external surface between trichobothria *Dt* and *Db*; fingers of pedipalps slightly undulate in both sexes; pedipalp movable finger with 33–45 IAD; chela length to width ratio 2.6 in females; and patella of pedipalp with 7 ventral trichobothria), is unique in the entire genus *Scorpiops*.

DISTRIBUTION. India, Uttarakhand (formerly Uttaranchal) State (Fig. 240).

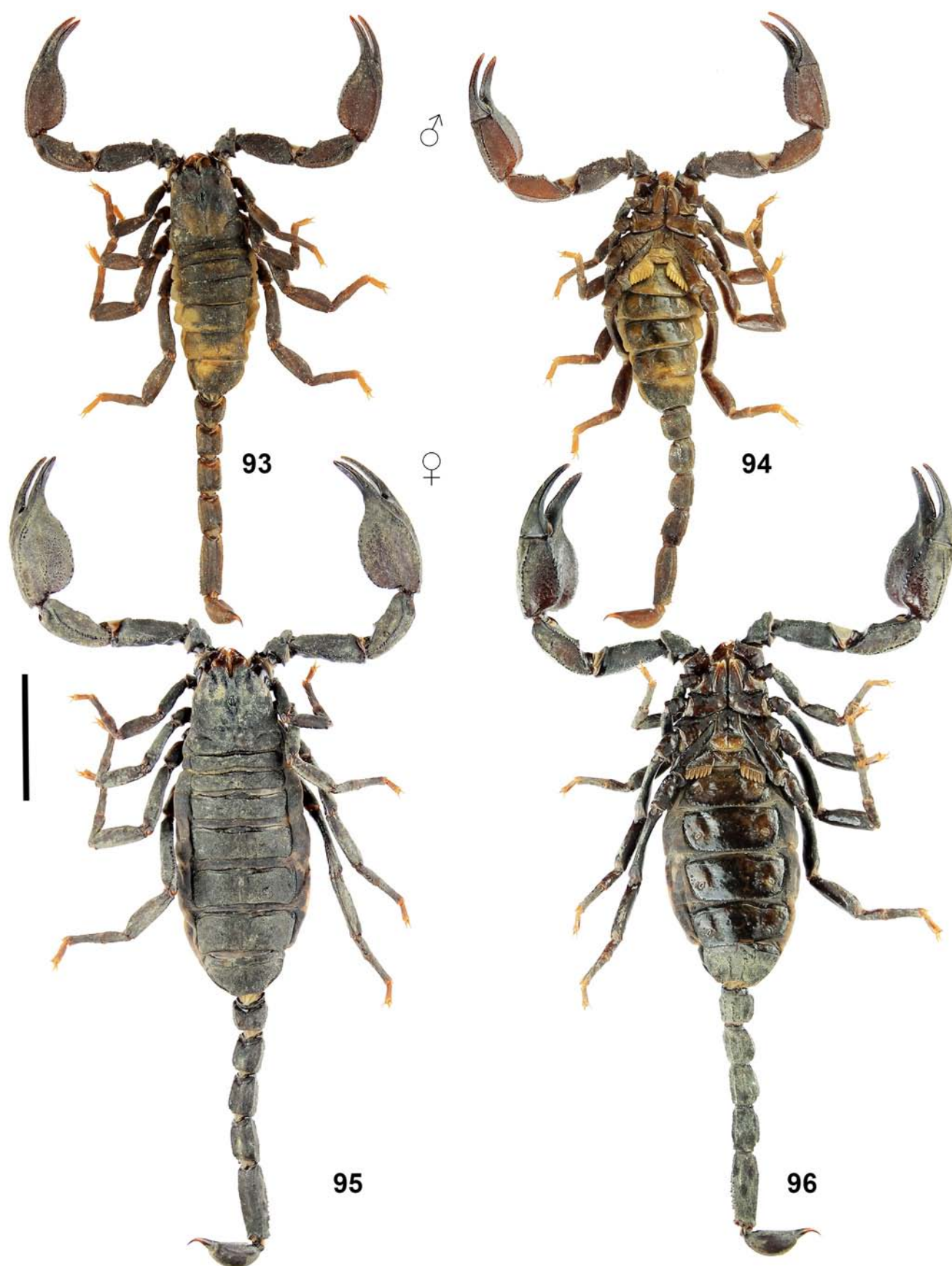
Scorpiops tryznai sp. n.

(Figures 132–155, 240, Table 2)

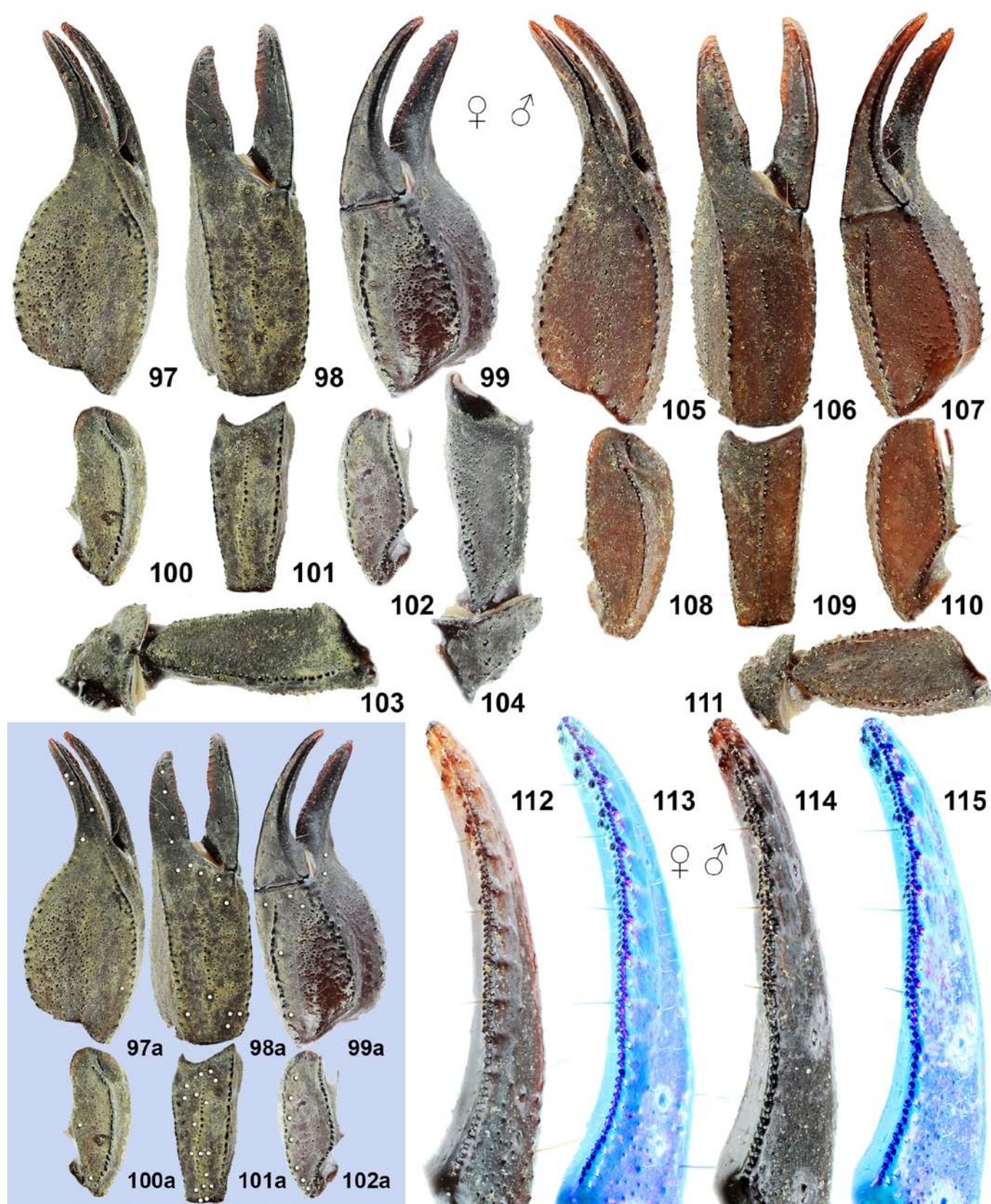
<http://zoobank.org/urn:lsid:zoobank.org:act:2B7CA65D-8002-4E35-9740-7A2E1D4B980D>

TYPE LOCALITY AND TYPE REPOSITORY. India, Uttarakhand (formerly Uttaranchal) State, ca 15 km NE of Mussoorie, Dhanaulti (30.40°N 78.19°E) env., 2250 m a.s.l.; FKCP.

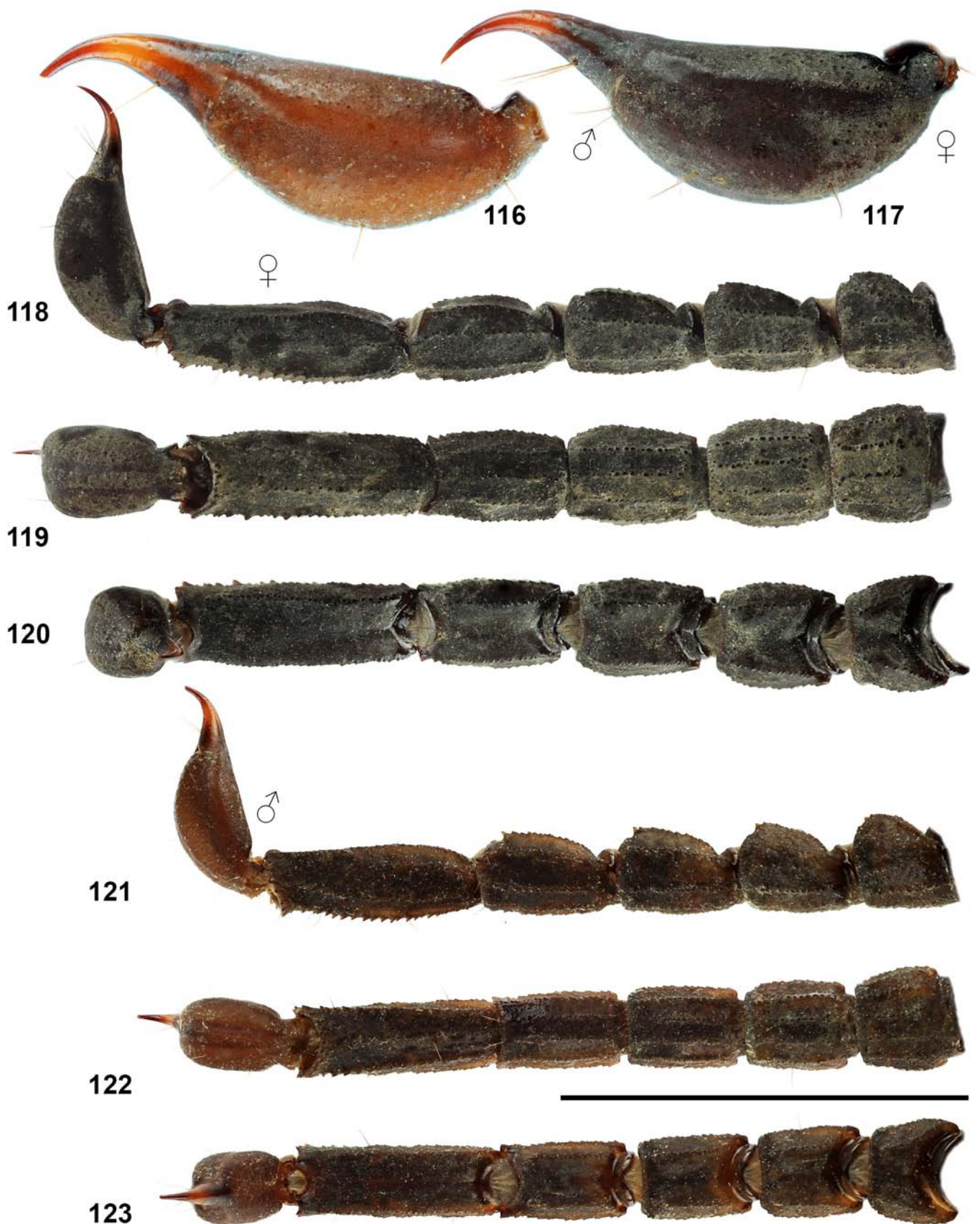
TYPE MATERIAL. **India**, Uttarakhand (formerly Uttaranchal) State, ca 15 km NE of Mussoorie, Dhanaulti (30.40°N 78.19°E) env., 2250 m a. s. l., 1 August 2003, 1♀ (holotype), leg. Z. Kejval & M. Trýzna.



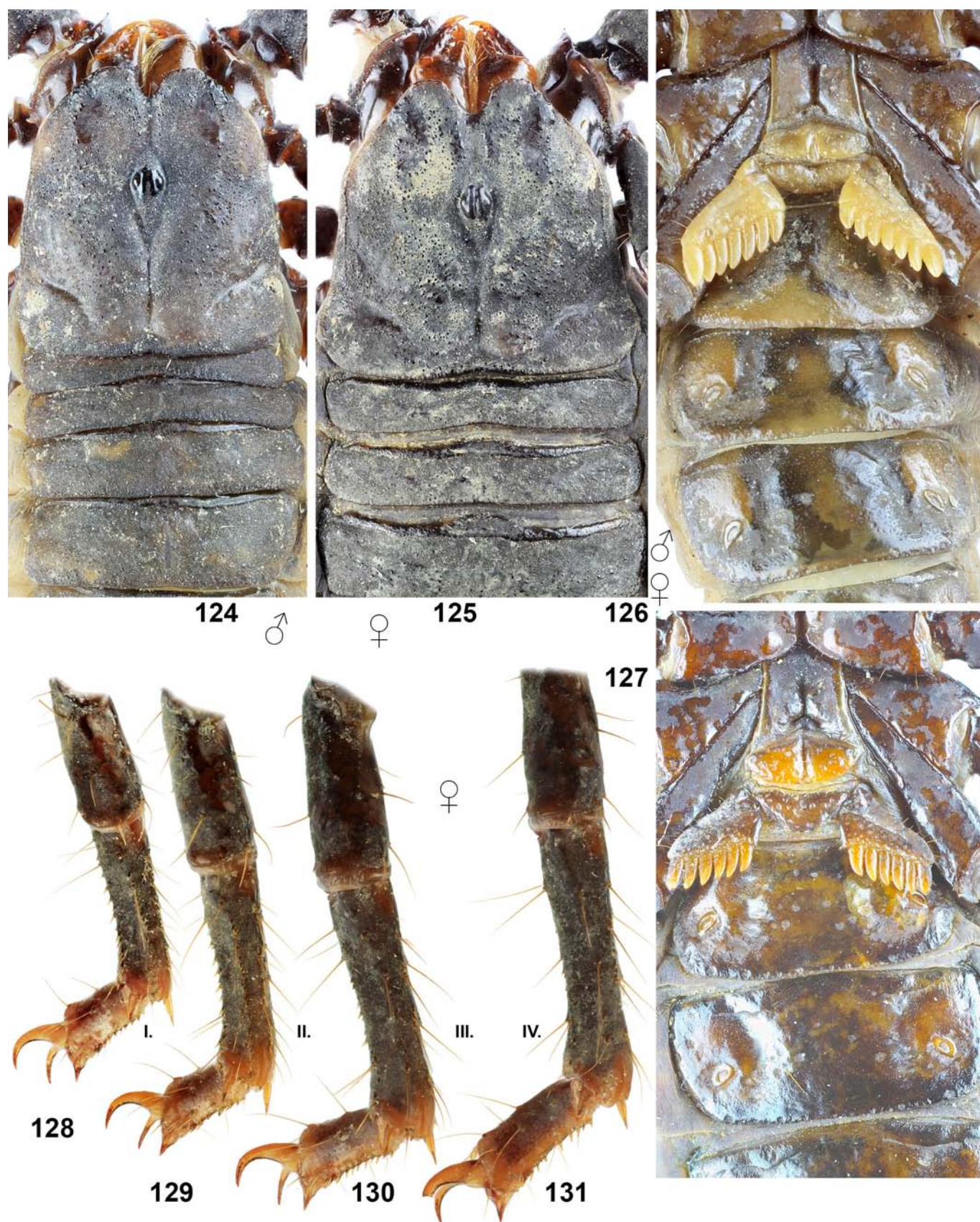
Figures 93–96: *Scorpiops kejvali* sp. n. **Figures 93–94.** Male holotype in dorsal (93) and ventral (94) views. **Figures 95–96.** Female paratype in dorsal (95) and ventral (96) views. Scale bar: 10 mm.



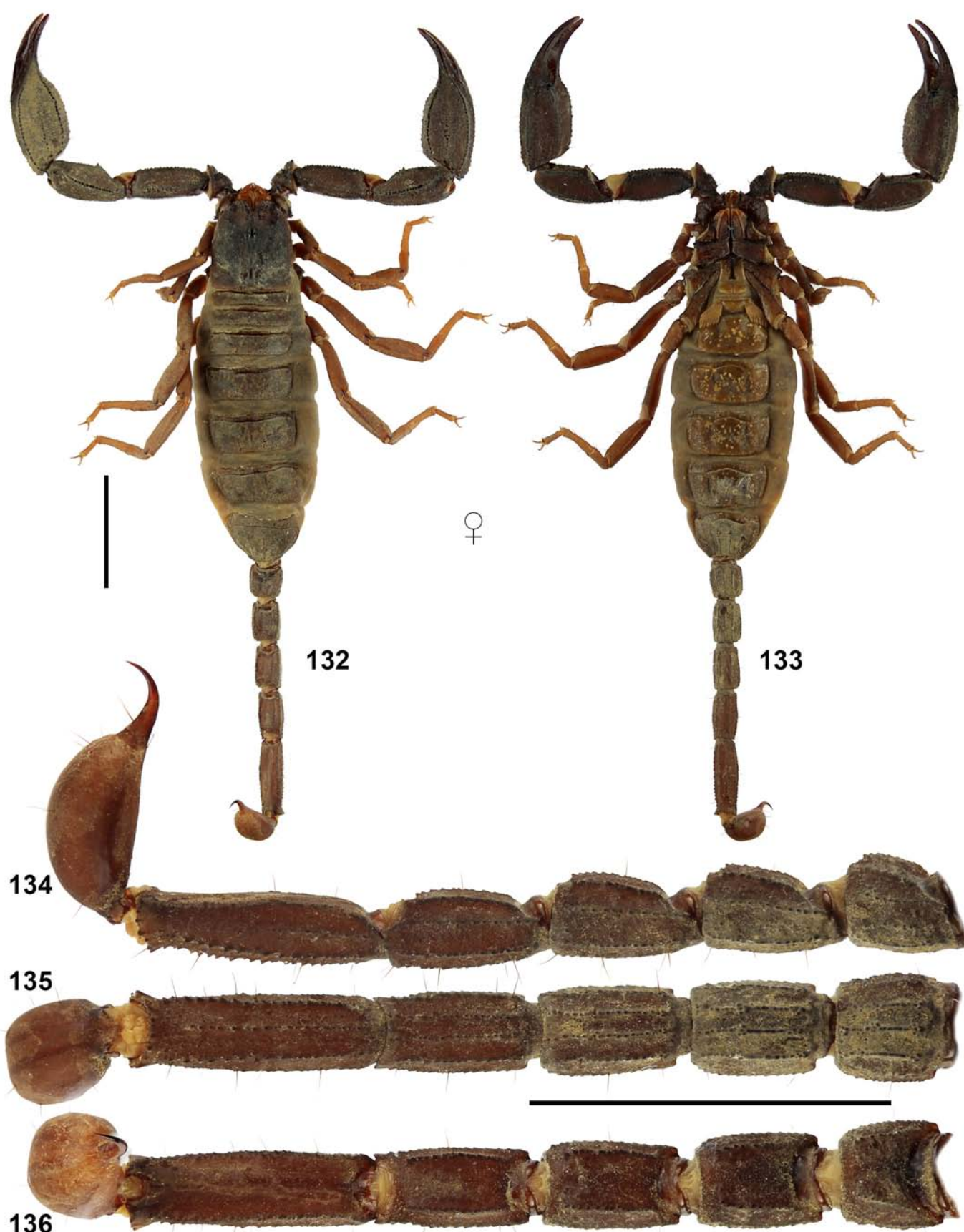
Figures 97–115. *Scorpiops kejvali* sp. n., pedipalp segments of female paratype (97–104, 112–113) and male holotype (105–111, 114–115). Chela dorsal (97, 105), external (98, 106) and ventral (99, 107) views. Patella dorsal (100, 108), external (101, 109) and ventral (102, 110) views. Femur and trochanter dorsal (103, 111) and ventral (104). Movable finger dentition under white light (112, 114) and UV fluorescence (113, 115). Trichobothrial pattern is indicated by white circles (97a–102a).



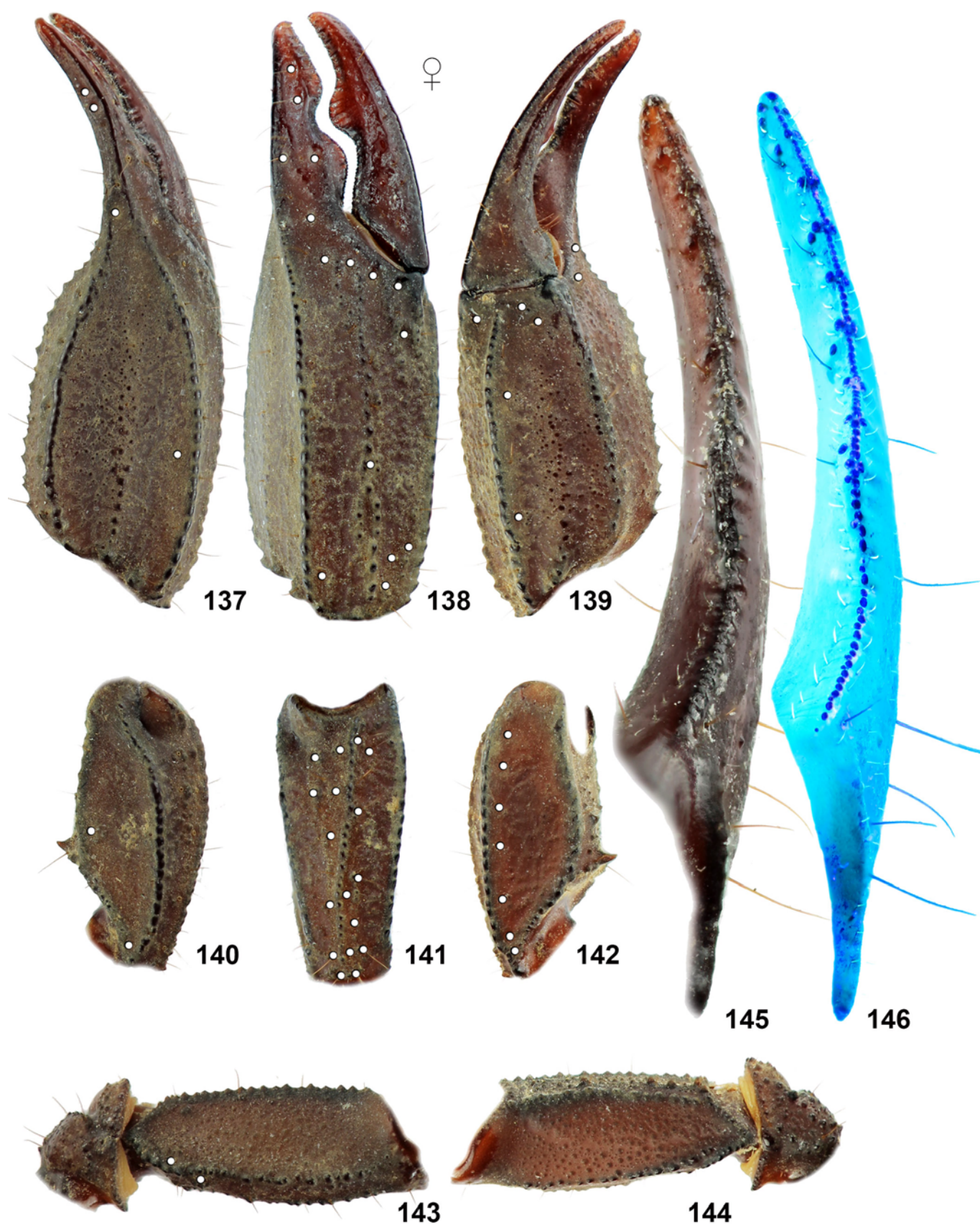
Figures 116–123: *Scorpiops kejvali* sp. n., metasoma and telson. **Figures 117–120.** Female paratype, telson lateral (117), metasoma and telson lateral (118), ventral (119), and dorsal (120) views. **Figures 116, 121–123.** Male holotype, telson lateral (116), metasoma and telson lateral (121), ventral (122), and dorsal (123) views. Scale bar: 10 mm (118–123).



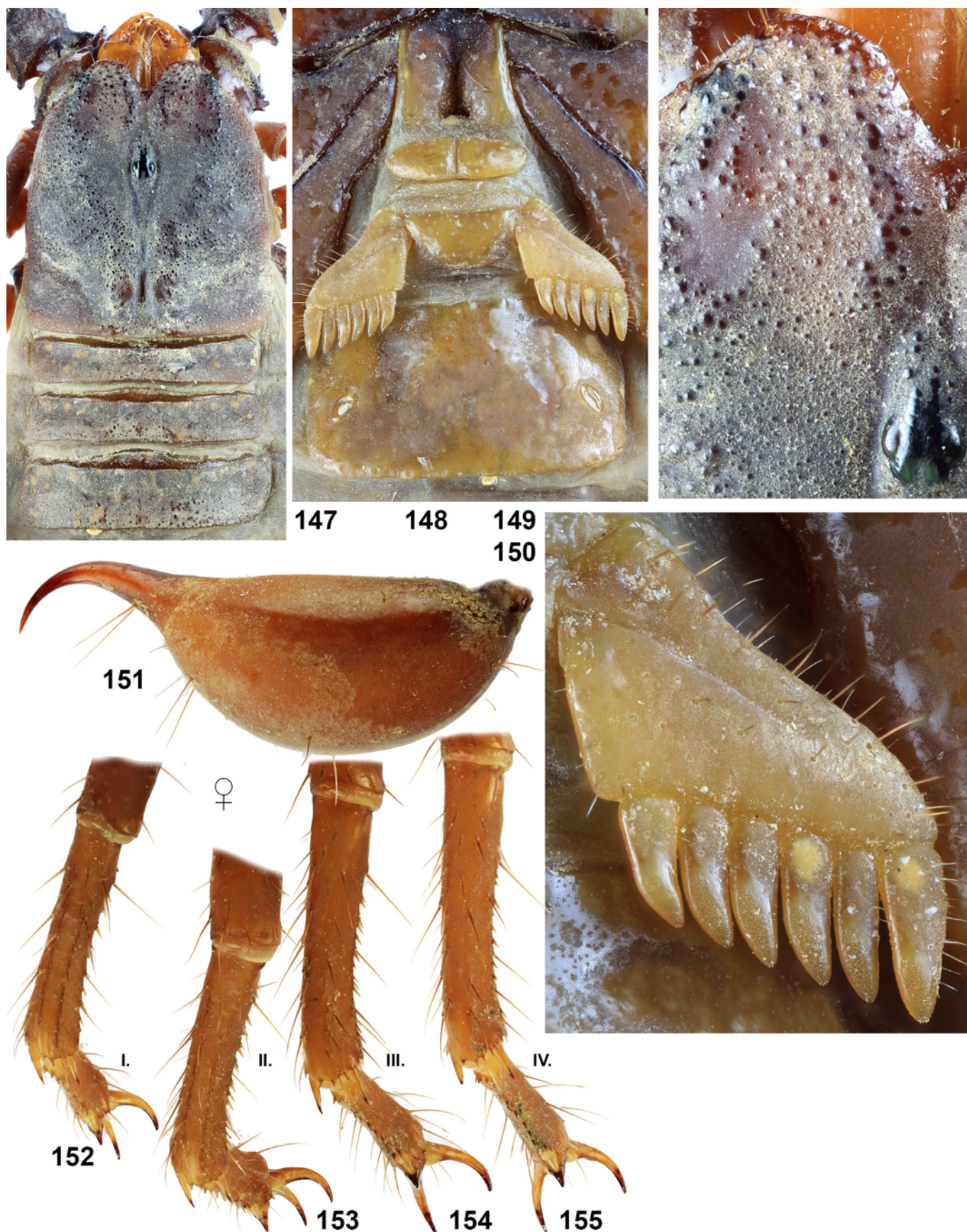
Figures 124–131: *Scorpiops kejvali* sp. n. **Figures 124, 126.** Male holotype, carapace and tergites I–IV (124), posterior coxosternal area and sternites III–V (126). **Figures 125, 127–131.** Female paratype, carapace and tergites I–III (125) and posterior coxosternal area and sternites III–IV (127), left legs I–IV, retrolateral aspect (128–131 respectively).



Figures 132–136. *Scorpiops tryznai* sp. n., female holotype. Dorsal (132) and ventral (133) views. Metasoma and telson lateral (134), ventral (135), and dorsal (136) views. Scale bars: 10 mm (132–133, 134–136).



Figures 137–146. *Scorpiops tryznai* sp. n., female holotype, pedipalp segments. Chela dorsal (137), external (138) and ventral (139) views. Patella dorsal (140), external (141) and ventral (142) views. Femur and trochanter dorsal (143) and ventral (144) views. Movable finger dentition under white light (145) and UV fluorescence (146). Trichobothrial pattern is indicated by white circles.



Figures 147–155. *Scorpiops tryznai* sp. n., female holotype. Carapace and tergites I–III (147), posterior coxosternal area and sternite III (148). Median and left lateral eyes (149). Pectine (150). Telson lateral (151). Right legs I–IV, retrolateral aspect (152–155 respectively).

ETYMOLOGY. The species epithet is a patronym honoring a Czech entomologist Miloš Trýzna, one of the collectors of holotype of the new species.

DIAGNOSIS (♀). Total length 61 mm. Base color uniformly reddish black to black, telson and legs reddish brown. Pectinal teeth number 6 in female, fulcra absent; a pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium *Eb*₃ is located in proximal half of external surface in line with *Dt*. Fingers of pedipalps flexed in female. Chela length to width ratio 3.13 in female. Pedipalp movable finger with 9 IAD, ca 74 MD, 4 ID and 11–13 OD present. Tarsomere II of legs with 7–8 stout median ventral spines in a row and two other parallel spines. Telson rather bulbous and smooth, length to depth ratio 2.85 in female; annular ring present.

DESCRIPTION (♀). Total length 61 mm of female holotype, male unknown. The habitus is shown in Figs. 132–133. For position and distribution of trichobothria of pedipalps see Figs. 137–143. Fingers of pedipalps are flexed in female (Fig. 138).

Coloration (Figs. 132–133). The base color is uniformly reddish brown to black. The telson and legs are reddish brown but lighter than mesosoma. Chelicerae are reddish black and reticulate.

Carapace and mesosoma (Figs. 147–150). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are smooth with two parallel furrows except sternite VII, which bears four sparsely granulate carina. Pectinal teeth number 6 in female, fulcra are absent. A pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae.

Metasoma and telson (Figs. 134–136, 151). The metasoma is very sparsely hirsute and granulated, with relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV are granulate with sharp granules, which are not posteriorly terminated with a pronounced tooth. The telson is rather bulbous and smooth, with annular ring present.

Pedipalps (Figs. 137–146). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 7 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are granulated. The femur has 5 granulate carinae and the patella has 5 complete carinae with dorsal and ventral patellar spurs present. The manus dorsally bears

granules, which are in the central part replaced by large granules forming a longitudinal irregular incomplete carina. The external surface of the chela is covered by minute and larger sparse granules, which form another complete median carina. The movable fingers with 9 IAD, ca 74 MD; there are also 4 ID and 11–13 OD present.

Legs (Figs. 152–155). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surface. Tarsomere II of legs I–IV with 7–8 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

Measurements. See Table 2.

AFFINITIES. The described features distinguish *S. tryznai* sp. n. from all other species of the genus. *S. tryznai* sp. n. is very similar to *S. vonwicki* Birula, 1913. It is possible to differentiate these two species according to pecten morphology. *S. vonwicki* has fulcra present (*S. tryznai* sp. n. has fulcra absent). *S. vonwicki* has separate, formed marginal lamellae I and III; marginal lamella II is not defined but forms a single compact unit with middle lamella. In *S. tryznai* sp. n., a pecten forms one compact unit with an incomplete furrow between places for marginal and middle lamellae. Trichobothria *Dt* and *Eb*₃ are located more basally in *S. vonwicki* (Figs. 161–162 versus 137–138). Also, localities of these two species are far apart.

DISTRIBUTION. India, Uttarakhand (formerly Uttaranchal) State (Fig. 240).

***Scorpiops vonwicki* Birula, 1913 stat. n.**
(Figures 156–174, 240, Table 3)

Scorpiops petersi von-wicki Birula, 1913: 417–418; Vachon, 1980: 150.

Scorpiops petersii vonwicki: Fet, 2000: 494.

Scorpiops petersii (in part): Kovařík, 2000: 192–194.

TYPE LOCALITY AND TYPE REPOSITORY. India, “Assam, Aboren-Gebirge” [now Arunachal Pradesh State, Abor Hills, ca. 28.46°N 94.54°E; see Comments]; ZISP.

TYPE MATERIAL. **India**, “Assam, Aboren-Gebirge (Dr. Williamson 1911 leg.). 1912, S. N. von-Wick ded.” [see Comments]; 1 ♀ (holotype), ZISP No. 1054.

DIAGNOSIS (♀ holotype). Total length 52 mm. Base color uniformly reddish brown, telson and legs lighter. Pectinal teeth number 5–6 in female, fulcra present; marginal lamellae I (basal) and III present, marginal lamella II is not defined, connected with middle lamella in one compact unit. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, and 4 *et*) external and 7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal

Dimensions (MM)		<i>S. vonwicki</i> ♀ holotype	<i>S. yagmuri</i> sp. n. ♂ holotype	<i>S. yagmuri</i> sp. n. ♀ paratype	<i>S. zubairi</i> sp. n. ♂ holotype	<i>S. zubairi</i> sp. n. ♀ paratype
Carapace	L / W	6.74 / 6.28	7.33 / 7.30	8.03 / 7.75	5.54 / 5.72	6.26 / 6.86
Mesosoma	L	18.35	14.82	14.30	9.67	10.27
Tergite VII	L / W	5.58 / 3.35	2.95 / 4.60	3.01 / 5.17	2.16 / 4.96	2.82 / 6.10
Metasoma + telson	L	26.46	21.01	23.91	21.62	23.49
Segment I	L / W / D	2.76 / 2.62 / 2.15	2.16 / 1.88 / 1.87	2.51 / 2.58 / 2.25	2.16 / 2.65 / 2.47	2.46 / 3.26 / 2.72
Segment II	L / W / D	3.08 / 2.28 / 1.94	2.13 / 1.93 / 1.87	2.63 / 2.29 / 2.11	2.70 / 2.47 / 2.35	2.88 / 2.93 / 2.39
Segment III	L / W / D	3.64 / 2.20 / 1.92	2.62 / 1.79 / 1.83	2.95 / 1.94 / 2.01	2.90 / 2.41 / 2.23	3.18 / 2.76 / 2.51
Segment IV	L / W / D	4.15 / 2.04 / 1.79	3.05 / 1.63 / 1.81	3.42 / 1.94 / 2.05	3.14 / 2.30 / 2.19	3.47 / 2.48 / 2.50
Segment V	L / W / D	6.48 / 1.86 / 1.90	5.05 / 1.54 / 1.73	5.75 / 1.81 / 1.94	5.32 / 2.11 / 2.01	5.52 / 2.29 / 2.07
Telson	L / W / D	6.35 / 1.99 / 2.12	6.00 / 1.75 / 1.70	6.65 / 2.21 / 1.92	5.40 / 2.55 / 2.34	5.98 / 2.65 / 2.20
Pedipalp	L	25.63	29.15	32.84	18.25	20.69
Femur	L / W	6.36 / 2.38	7.94 / 3.02	9.11 / 3.39	4.16 / 1.92	4.82 / 2.27
Patella	L / W	6.27 / 2.70	6.79 / 3.04	7.80 / 3.23	4.77 / 2.19	5.35 / 2.56
Chela	L	13.00	14.42	15.93	9.32	10.52
Manus	W / D	4.45 / 3.62	4.04 / 2.77	4.69 / 3.18	4.44 / 3.47	4.92 / 3.84
Movable finger	L	5.67	6.95	6.89	4.89	5.56
Total	L	51.55	43.16	46.24	36.83	40.02

Table 3. Comparative measurements of adults of *Scorpiops vonwicki* Birula, 1913, *S. yagmuri* sp. n., and *S. zubairi* sp. n. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

trichobothrium Eb_3 is located basally in proximal half of external surface at the same level as Dt . Fingers of pedipalps flexed in female. Chela length to width ratio 2.92 in female. Pedipalp movable finger with ca 10 IAD, ca 65 MD, 4 ID and 11–13 OD present. Tarsomere II of legs with 7–8 stout median ventral spines in a row and two other parallel spines. Telson rather elongate and smooth, length to depth ratio 3 in female; annular ring present.

COMMENTS. (Victor Fet, pers comm): This taxon was described based on a single holotype female; no other specimens are known. The holotype was brought to St. Petersburg by S. N. [Sergei Nikolaevich] von Wick [Russ. Сергей Николаевич фон Вик], a Russian zoologist of German extraction who explored India and Africa before World War I. Von Wick collected numerous zoological specimens for ZISP (then the Imperial Zoological Museum); a detailed travelogue of his expedition to Assam in January–March 1912 was published (von Wick, 1913).

However, according to Birula (1913: 417; information absent from the specimen label, see under Figs. 156–157), the holotype female of *Scorpiops petersi von-wicki* was collected not by von Wick in 1912 but by a “Dr. Williamson in 1911 in the mountains of the Abors” (in Birula’s German text, “Aboren-Gebirge”). Indeed, von Wick (1913: XV) specifically mentioned several animal specimens he received as a gift in Sadiya (where von Wick’s expedition stayed on 11–15 February 1912) from a British political official “who said that those were collected by Dr. Williamson in 1911 in the mountains of the Abors” (our translation from Russian).

Sadiya (27.83°N 95.67°E), a town on the Brahmaputra River (123 m a. s. l.) was the extreme northeastern frontier station of British Raj. It is most likely that the original collector was a former British Political Officer (not a “Doctor”), also stationed at Sadiya, Noel Williamson, infamously murdered by the locals in the Abor Hills in March 1911. Later same year, the British authorities sent the punitive Abor Expeditionary Force to enforce jurisdiction of this frontier.

Stanley W. Kemp (1882–1945), then of the Indian Museum (Calcutta) and his collector R. Hodgart accompanied the Abor Expeditionary Force and became the first zoologists who extensively collected in the Abor country in November 1911–April 1912. An impressive volume, “The Zoological Results of Abor Expedition” was published by the Indian Museum in 1912–1922 in 18 parts. There, Henderson (1913) listed two more common species of scorpions (“*Scorpiops longimanus* Poc. and *Chaerilus tricostratus* Poc.”) collected by Kemp in the “Abor country”, now in Arunachal Pradesh, the most northeastern state of India.

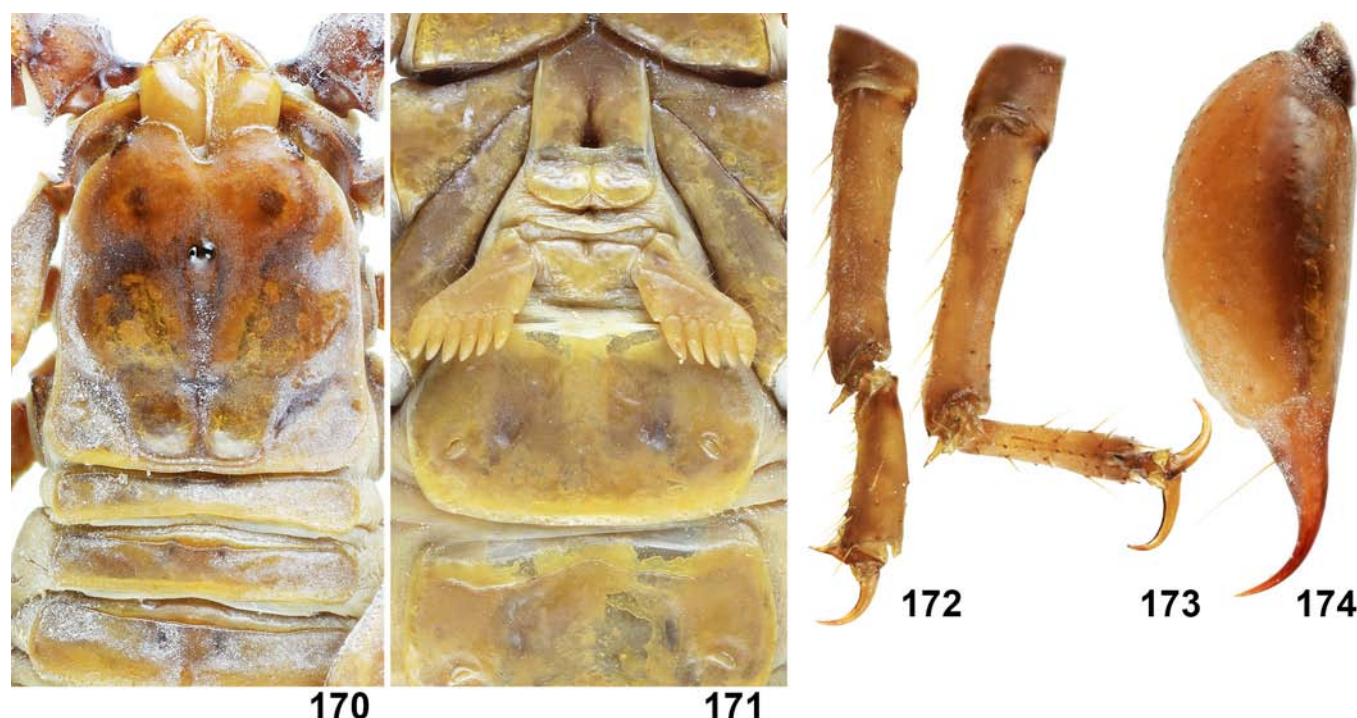
One of the most interesting discoveries of the Abor Expedition was *Typhloperipatus williamsoni* Kemp, 1913, a new genus and species of velvet worm (Onychopora), the only one known from India. Kemp (1914: 472) wrote: “The specific name is given in honour of the late Mr. Noel Williamson, one time Assistant Political Officer at Sadiya, who was treacherously murdered by Minyong Abors on March 30th, 1911, at Komsing, a village not many miles distant from the spot where the specimens were obtained. It was owing, chiefly, to the murder of Mr. Williamson and of his companion, Dr. Gregorson, that the expedition of 11–12 was undertaken.”



Figures 156–160. *Scorpiops vonwicki* Birula, 1913 stat. n., female holotype. Dorsal (156) and ventral (157) views. Metasoma and telson lateral (158), dorsal (159), and ventral (160) views. Scale bars: 10 mm (156–157, 158–160).



Figures 161–169. *Scorpiops vonwicki* Birula, 1913 **stat. n.**, female holotype, pedipalp segments. Chela dorsal (161), external (162) and ventral (163) views. Patella dorsal (164), external (165) and ventral (166) views. Femur and trochanter dorsal (167) view. Movable finger (168) and fixed finger (169) dentition. Trichobothrial pattern is indicated by white circles



Figures 170–174. *Scorpiops vonwicki* Birula, 1913 **stat. n.**, female holotype, carapace and tergites I–III (170), posterior coxosternal area and sternites III–IV (171), right legs III–IV, retrolateral aspect (172–173 respectively), telson lateral (174).

Several other new species in the same volume honored Williamson and Gregorson. The famous Himalayan explorer, Lieutenant-Colonel Henry Haversham Godwin-Austen (1834–1923), named a new genus and species of land snail, *Rotungia williamsoni*, explaining: “I name this species in honour and in memory of Mr. Noel Williamson of the Indian Civil Service, who lost his life (30th March, 1911) penetrating into wilds of the Abor country, keen on their exploration and the desire of getting on friendly relations with the tribesmen. ... His murder led to the expedition up the Tsanspu, to the subjection of the Abors, and the accurate mapping by the officers of the Indian Survey of a vast area of unknown country in this part of the Eastern Himalaya, while the zoological collections have proved of extraordinary value and interest.” (Godwin-Austen, 1918: 591).

As we can see, von Wick collected at the same time but completely independently from the Abor Expedition (which he did not mention) and did not venture beyond Sadiya into the dangerous “mountains of the Abors”. Several specimens of “*Scorpiops longimanus*” collected by von Wick elsewhere in Assam (now Meghalaya State) are listed in the same paper by Birula (1913: 416).

It is now evident that the sole specimen, described as *Scorpiops petersi von-wicki* by a famous Russian scorpologist Alexei A. Birula, was a gift passed on from Noel Williamson. His grave still exists in the village of Komsing on Siang River, with an original stone inscription and a more recent brass plaque “On this spot was murdered Noel Williamson, Assistant Political Officer Sadiya, 31st March 1911”.

DISTRIBUTION. India (Arunachal Pradesh State) (Fig. 240).

Scorpiops wrzecionkoi sp. n.

(Figures 175–185, 240, Table 2)

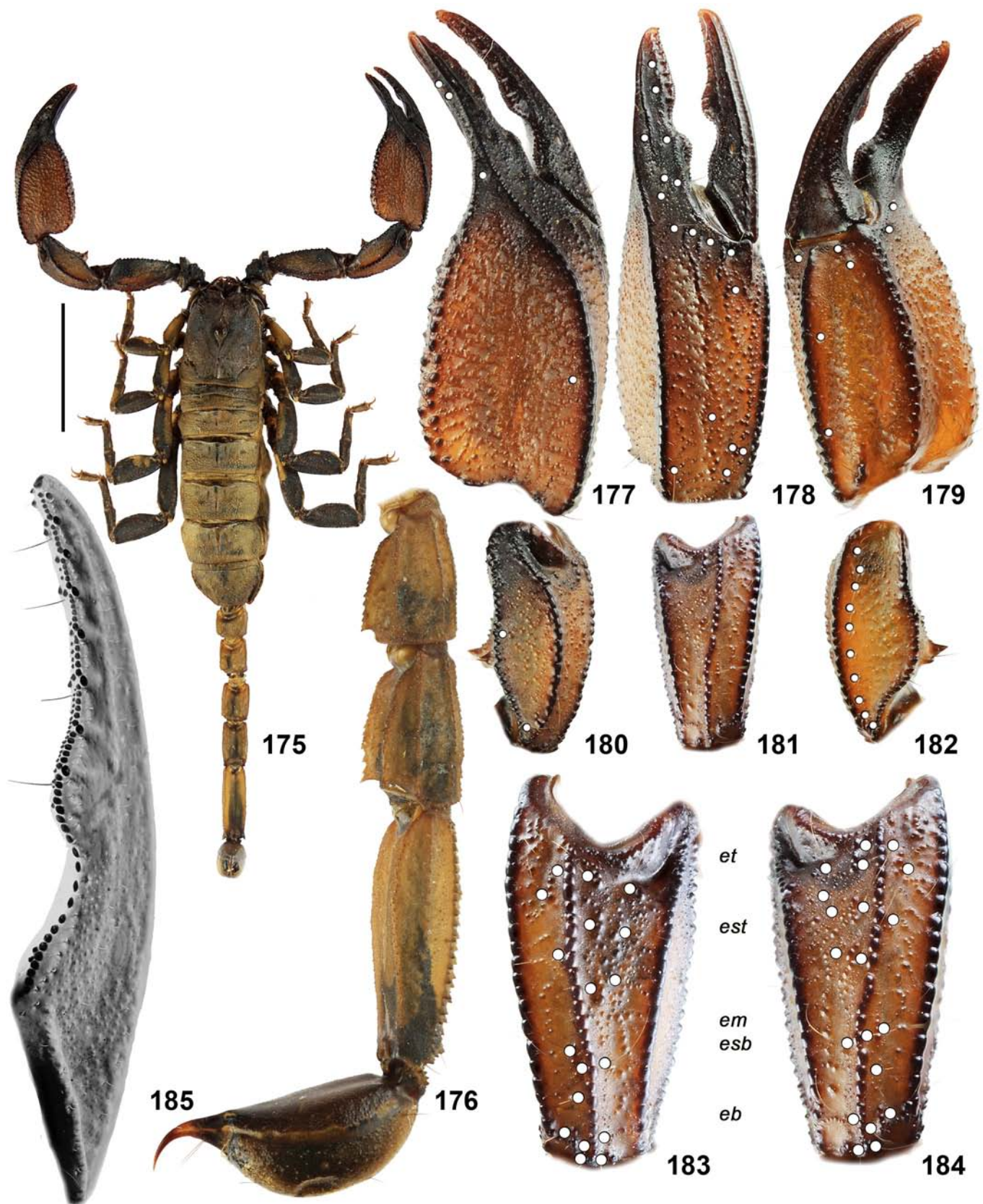
<http://zoobank.org/urn:lsid:zoobank.org:act:B045E1F5-E683-4909-98AC-3BBCB0112C92>

TYPE LOCALITY AND TYPE REPOSITORY. China (Tibet), 100 km S. of Lhasa, Kamba La (29.20°N 90.58°E), 5000 m a. s. l.; FKCP.

TYPE MATERIAL. **China** (Tibet), 100 km S. of Lhasa, Kamba La (29.20°N 90.58°E), 5000 m a. s. l., 8 June 2001, 1 ♀ (holotype) 1 ♀ 1 juv. (paratypes), leg. A. Wrzecionko.

ETYMOLOGY. The species epithet is a patronym honoring Antonin Wrzecionko, the collector of the types of the new species.

DIAGNOSIS (♀). Total length of females 45–50 mm. Base color reddish brown to black including telson and legs. Pectinal teeth number 8–9 in females, fulcra present. Pectens have three marginal and 4 middle lamellae present. Patella of pedipalp with 18–20 (5 *eb*, 2 *esb*, 2 *em*, 5 *est*, 4–6 *et*) external and 9–11 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface and two additional trichobothria *eb*₁ and *eb*₂. Chelal trichobothrium *Eb*₃ is located in the proximal half of manus between trichobothria *Dt* and *Db*. Fingers of pedipalps flexed in female. Chela length to width ratio 2.7 in females. Pedipalp movable finger with ca 30 IAD, which form a second row, parallel to MD (ca 60 in number); there are also 4 ID and 8 OD present. Tarsomere II of legs with 6–9 stout median ventral spines in a row and two other two parallel spines. Metasoma I with 10, and metasoma



Figures 175–185: *Scorpiops wrzecionkoi* sp. n., female holotype. **Figures 175.** Dorsal view. **Figures 176.** Metasoma III–V and telson lateral. **Figures 177–185.** Pedipalp segments. Chela dorsal (177), external (178) and ventral (179) views. Patella dorsal (180), external (181) and ventral (182) views. Patella external left (183) and right (184) comparison. Movable finger dentition under UV fluorescence (185). Trichobothrial pattern is indicated by white circles. Scale bar: 10 mm (175).

II–IV with 8 carinae. Telson bulbous and sparsely granulate, length to depth ratio 2.6 in females; annular ring present.

DESCRIPTION (♀ holotype). Total length 45–50 mm of females, male unknown. The habitus is shown in Fig. 175. For position and distribution of trichobothria of pedipalps, see Figs. 177–180 and 182–184. Fingers of pedipalps are flexed in female (Fig. 178).

Coloration (Fig. 175). The base color is uniformly reddish brown to black including telson and legs. Chelicerae are reddish black and reticulate.

Carapace and mesosoma (Fig. 178). The entire carapace is covered both large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carinae. Pectinal teeth number 8–9 in females, fulcra are present. The pectens have three marginal and 4 middle lamellae present.

Metasoma and telson (Fig. 176). The metasoma is very sparsely hirsute and granulated, with relatively large granules. Metasomal segment I with 10, II–IV with 8, and V with 5 carinae. The median lateral carinae of metasoma II and V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV granulate with sharp granules, which are posteriorly terminated with a pronounced tooth. The telson is bulbous and sparsely granulate, with annular ring present.

Pedipalps (Figs. 177–184). The pedipalps are very sparsely hirsute. The patella bears 18–20 (5 *eb*, 2 *esb*, 2 *em*, 5 *est*, 4–6 *et*) external and 9–11 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface and two additional trichobothria *eb*₁ and *eb*₂ (Fig. 178). The femur and patella are granulated. The femur has 5 granulose carinae and the patella has 5 complete carinae with developed dorsal and ventral patellar spurs. The manus dorsally bears fine, rounded granules, which are not enlarged in the central area. The external surface of the chela is covered by minute and larger sparse granules, which indicate another carina. The movable fingers with 29–32 IAD, which form a second row, parallel to MD (ca 60 in number); there are also 4 ID and 8 OD present.

Legs. The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral surfaces. Tarsomere II of legs I–IV with 6–9 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 incomplete carinae; both femur and patella are finely granulated.

Measurements. See Table 2.

AFFINITIES. The described features distinguish *S. wrzecionkoi* sp. n. from all other species of the genus. Among species, which have chelal trichobothrium *Eb*₃ located in proximal half of external surface between trichobothria *Dt* and *Db*, only two

other species have more than 17 external trichobothria on the pedipalp patella. *S. demisi* Kovařík, 2005 from India has 18 of these trichobothria but has 14–15 ventral trichobothria on the patella (*S. wrzecionkoi* sp. n. has 9–11 of these trichobothria) and has an elongate telson with length to depth ratio 3.6 in the female (*S. wrzecionkoi* sp. n. has telson bulbous with the ratio 2.6 in females). *S. lindbergi* Vachon, 1980 from Afghanistan and Pakistan has 17–19 external trichobothria on the pedipalp patella but differs from *S. wrzecionkoi* sp. n. in many characters, mainly in having light color and straight fingers in females.

DISTRIBUTION. China (Tibet) (Fig. 240).

Scorpiops yagmuri sp. n.

(Figures 186–204, 240, Table 3)

<http://zoobank.org/urn:lsid:zoobank.org:act:8814751C-DF35-4673-ADFB-86A41F7271AC>

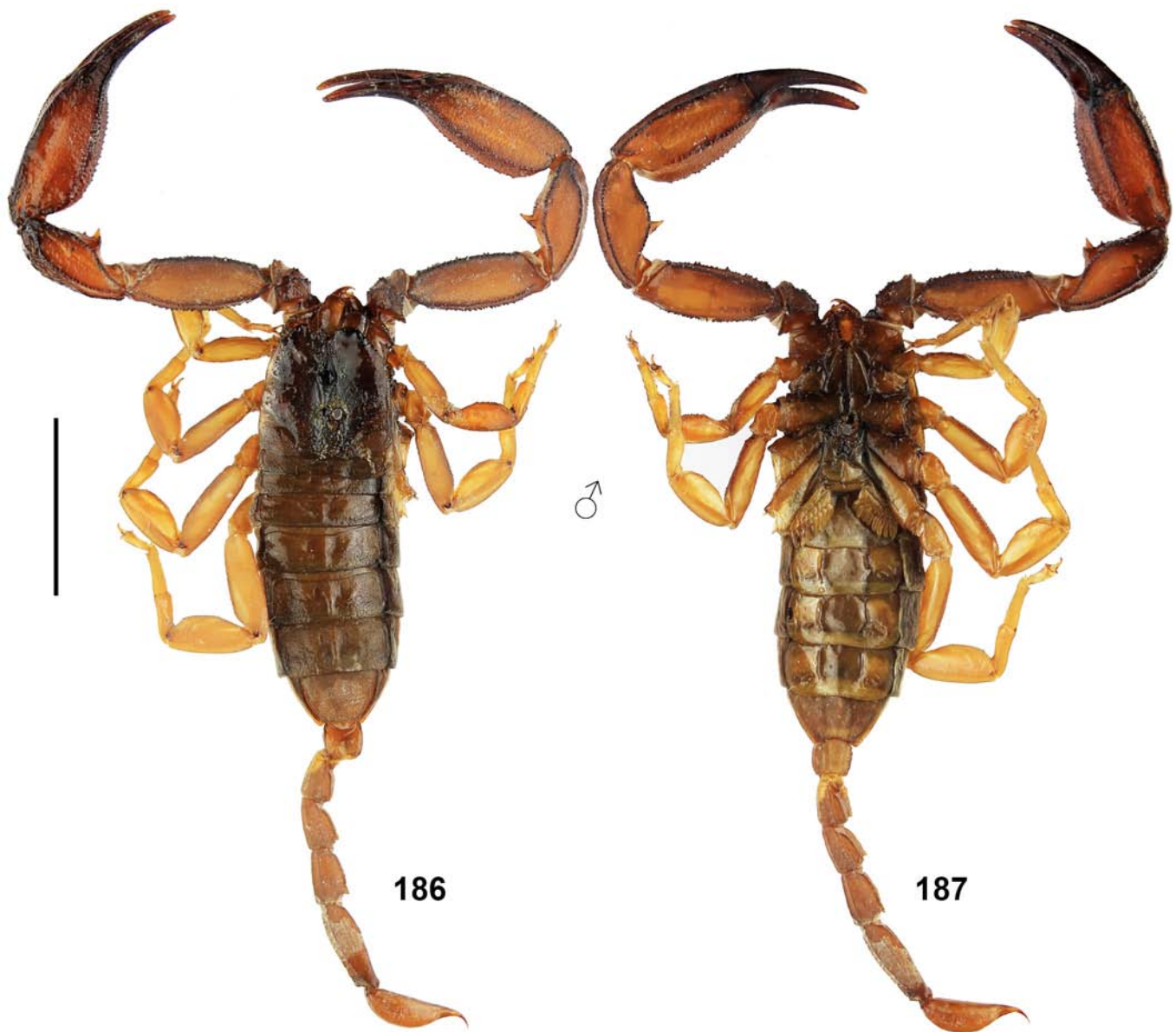
TYPE LOCALITY AND TYPE REPOSITORY. Pakistan, Khyber Pakhtunkhwa Province (formerly North-West Frontier Province), Swat District, Matta (34.84°N 72.21°E); FKCP.

TYPE MATERIAL. **Pakistan**, Khyber Pakhtunkhwa Province (formerly North-West Frontier Province), Swat District, Matta (34.84°N 72.21°E), 25 October 2006, 1♂1♀ (paratypes), 28 July 2007, 1♂ (holotype) 3♂juvs.4♀juvs. (paratypes), leg. Zubair Ahmed; FKCP.

ETYMOLOGY. This species is named after my good friend and colleague, a prominent scorpiologist Ersen Aydın Yağmur (Turkey).

DIAGNOSIS (♂♀). Total length 43–47 mm. Base color uniformly orange to brown, legs yellow. Pectinal teeth number 8–9 in males, 7–8 in females; fulcra absent; three marginal and five middle lamellae present. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 18 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on ventral surface. Chelal trichobothrium *Eb*₃ is located in the proximal half of external surface between trichobothria *Dt* and *Db*. Fingers of pedipalps flexed in both sexes. Chela length to width ratio 3.57 in males, 3.40 in females. Pedipalp movable finger with ca 70 IAD, which have the same size as MD (more than 100 in number) and form a second row; there are also 5 ID and 13–15 OD present. Tarsomere II of leg III with seven stout median ventral spines in a row and two other parallel spines. Metasoma I with 10, and metasoma II–IV with 8 carinae. Telson elongate and granulate, length to depth ratio 3.43 in males and 3.00 in females; annular ring indicated.

DESCRIPTION (♂♀). Total length 43–47 mm. The habitus is shown in Figs. 186–187. For position and distribution of trichobothria of pedipalps see Figs. 188–194. Sexual dimorphism: adult males have relatively larger pectens; fingers of pedipalps are flexed in both sexes.



Figures 186–187. *Scorpiops yagmuri* sp. n., male holotype in dorsal (186) and ventral (187) views. Scale bar: 10 mm.

Coloration (Figs. 186–187). The base color is uniformly orange to brown, legs yellow, telson orange. Chelicerae are yellow and slightly reticulate, fingers reddish black.

Carapace and mesosoma (Figs. 197–198). The entire carapace is covered with large granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes, of which two are normal and one is reduced. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are smooth with two parallel furrows except sternite VII, which is finely granulated with two carinae indicated. Pectinal teeth number 8–9 in males, 7–8 in females. The pectens have 3 marginal lamellae and 5 middle lamellae; fulcra are absent.

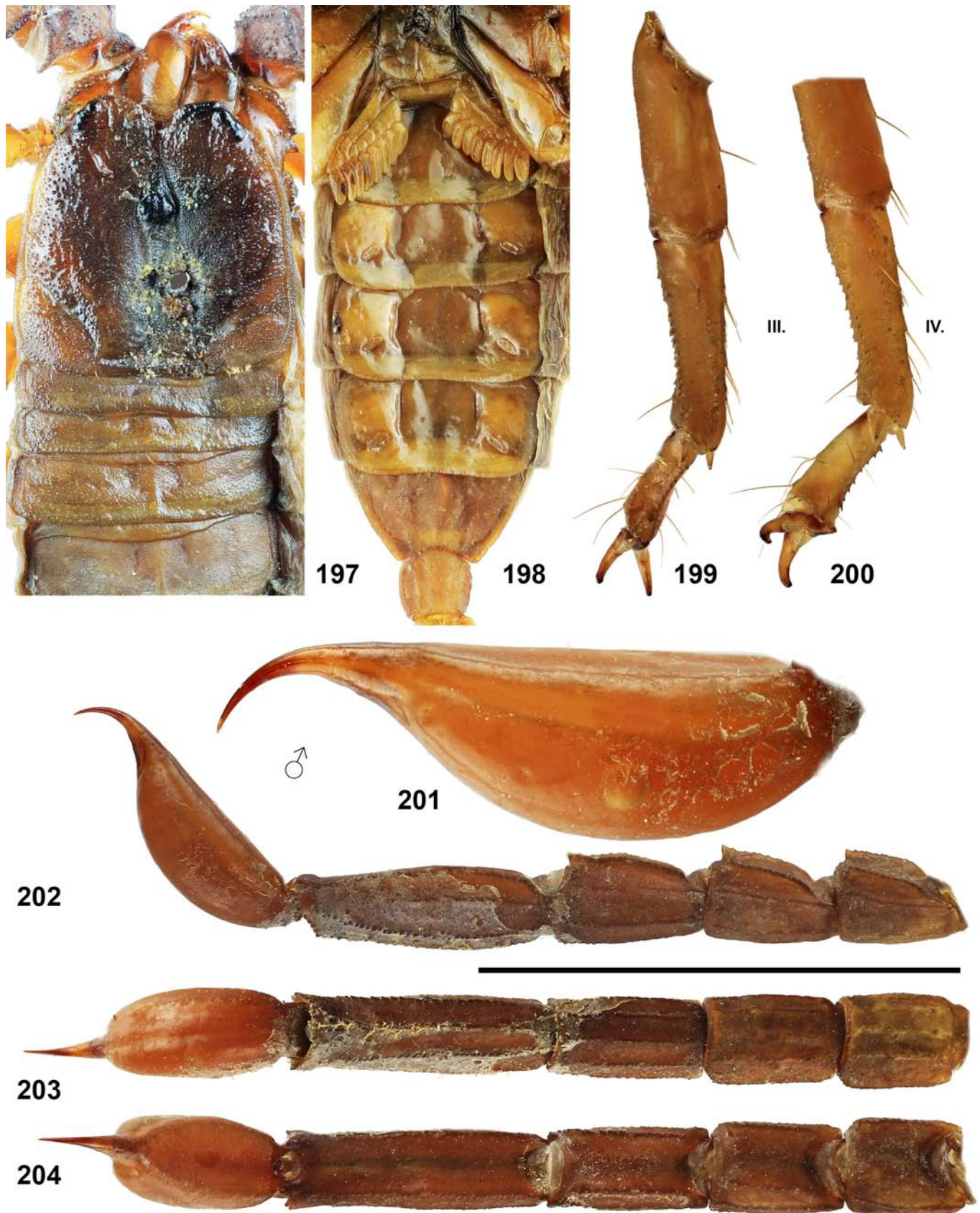
Metasoma and telson (Figs. 201–204). The metasoma is sparsely hirsute and granulated, with sparse granules.

Metasomal segment I with 10, II–IV with 8, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments II–IV posteriorly terminated in a pronounced tooth. The telson is elongate and smooth, with annular ring indicated.

Pedipalps (Figs. 188–196). The pedipalps are very sparsely hirsute. The patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 18 ventral trichobothria. The chela bears 4 ventral trichobothria located on the ventral surface. The femur and patella are finely granulated. The femur has 5 granulose carinae, and the patella has 5 carinae with pronounced dorsal and ventral patellar spurs. The manus dorsally bears fine, rounded granules, which in the central area do not form another carina. The external surface of the chela is densely covered by minute granules and bears an almost complete median carina.



Figures 188–196. *Scorpiops yagmuri* sp. n., male holotype, pedipalp segments. Chela dorsal (188), external (189) and ventral (190) views. Patella dorsal (191), external (192) and ventral (193) views. Femur and trochanter dorsal (194), and ventral (195) views. Movable finger dentition (196). Trichobothrial pattern is indicated by white circles.



Figures 197–204. *Scorpiops yagmuri* sp. n., male holotype. Carapace and tergites I–IV (197), posterior coxosternal area and sternites including metasoma I ventral (198). Left legs III–IV, retrolateral aspect (199–200 respectively). Telson lateral (201). Metasoma and telson lateral (202), ventral (203), and dorsal (204) views. Scale bar: 10 mm (202–204).

The movable fingers bear ca 70 IAD, which have the same size as MD (more than 100 in number) and form a second row. There are also 5 ID and 13–15 OD present.

Legs (Figs. 199–200). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral surfaces and on legs I–II and partly III also on ventrolateral surface. Tarsomere of legs I–IV with 5–7 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 incomplete and patella, 4–5 developed carinae.

Measurements. See Table 3.

AFFINITIES. The described features distinguish *S. yagmuri* sp. n. from all other species of the genus. Among species, which have chelal trichobothrium *Eb*₃ placed in proximal half of external surface between trichobothria *Dt* and *Db*, only one other species, *S. pseudomontanus* Kovařík & Ahmed, 2009, has 18 ventral trichobothria on the pedipalp patella. It is possible to differentiate these two species according to the shape of chela because chela length/width ratio in female is 3.4 in *S. yagmuri* sp. n. and 2.9 in *S. pseudomontanus*; the movable fingers bear ca 70 IAD in *S. yagmuri* sp. n. and ca 45 in *S. pseudomontanus*.

DISTRIBUTION. Pakistan (Fig. 240).

***Scorpiops zubairi* sp. n.**

(Figures 205–240, Table 3)

<http://zoobank.org/urn:lsid:zoobank.org:act:26E6A285-856D-4234-92E7-D45765941FBE>

TYPE LOCALITY AND TYPE REPOSITORY. Pakistan, Azad Kashmir, Bagh (35.09°N 71.04°E); FKCP.

TYPE MATERIAL (FKCP). **Pakistan**, Azad Kashmir, Bagh (35.09°N 71.04°E), 1♂ (holotype) 2♀ims. (paratypes), 12 June 2008, leg. Zubair Ahmed; Khyber Pakhtunkhwa Province (formerly North-West Frontier Province), Swat District, Ilam (34.62°N 72.31°E), 1♀ (Table 3) 1im. (paratypes), 5 September 2010, leg. Zubair Ahmed; Khyber Pakhtunkhwa Province (formerly North-West Frontier Province), Upper Dir District (35.31°N 71.39°E), 2♀ims. (paratypes), 13 May 2010, leg. Zubair Ahmed.

ETYMOLOGY. The species epithet is a patronym honoring Zubair Ahmed, the collector of the types of the new species.

DIAGNOSIS (♂♀). Total length 37 mm (male) to 40 mm (female). Base color uniformly reddish black to black, telson and tarsomere II of legs reddish black. Pectinal teeth number 6–7 in male, 5 in females, fulcra absent. Marginal lamella I (basal) present or indicated, the remainder of the pectinal surface forming one compact unit. Patella of pedipalp with 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 6–7 ventral trichobothria. Chela of pedipalp with 4 ventral trichobothria located on the ventral surface. Chelal trichobothrium *Eb*₃

is located in proximal half of external surface between trichobothria *Dt* and *Db*. Fingers of pedipalps flexed in male and undulate in female. Chela length to width ratio 2.1–2.2 in both sexes. Pedipalp movable finger with 7–8 larger and 15–18 smaller IAD among them, which form a second row, parallel with MD (ca 45 in number); there are also 4 ID and 8–9 OD present. Tarsomere II of legs with 5–7 stout median ventral spines in a row and two other parallel spines. Metasoma I with 10, and metasoma II–IV with 8 carinae. Telson bulbous and granulate, length to depth ratio 2.12 in male and 2.26 in female; annular ring developed in both sexes.

DESCRIPTION (♂♀). Total length 37 mm (male) to 40 mm (female). The habitus is shown in Figs. 205–208. For position and distribution of trichobothria of pedipalps, see Figs. 219–224. Sexual dimorphism minor: adult males have relatively larger pectens and fingers of pedipalps are flexed in male and undulate in female (Figs. 212 and 220).

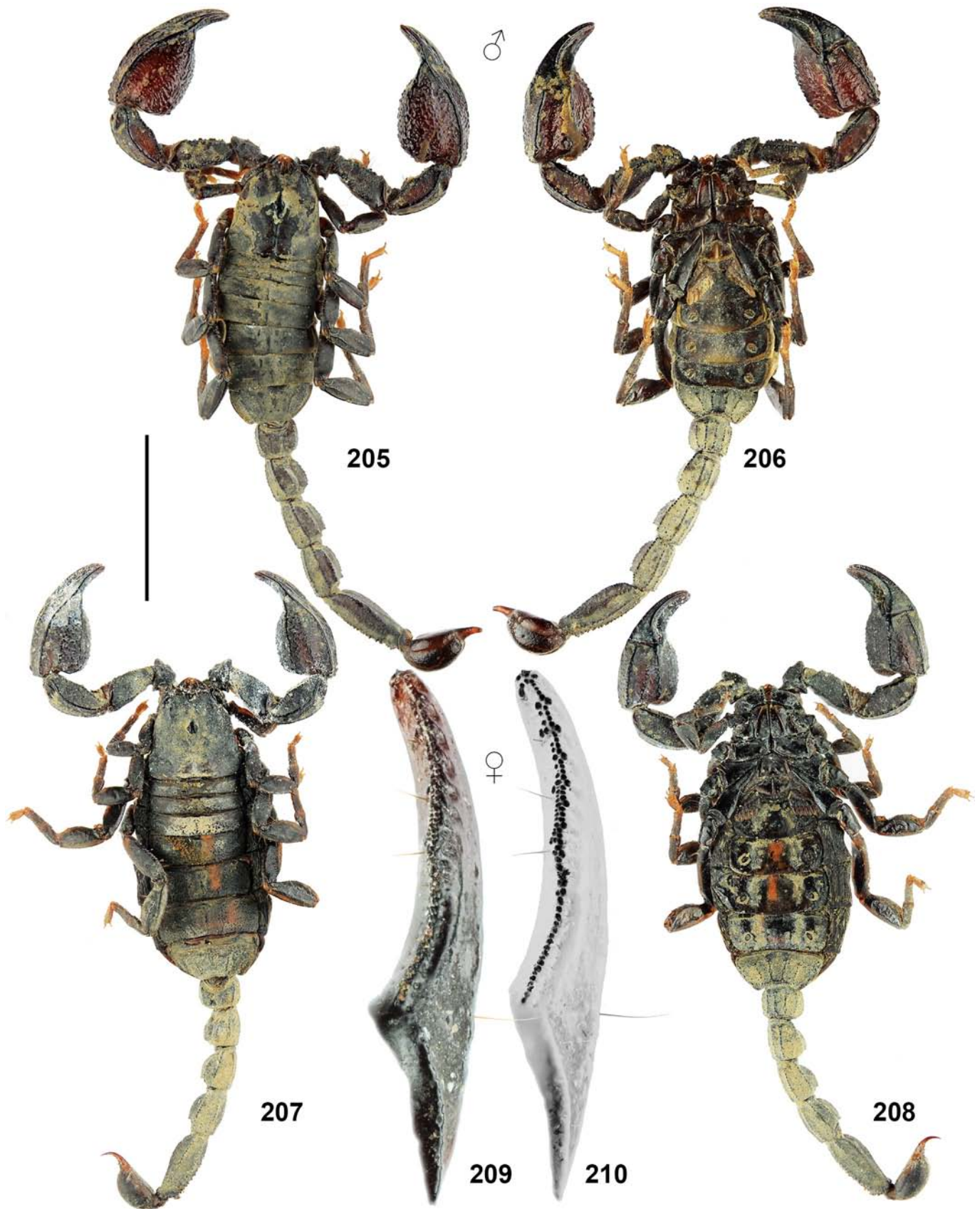
Coloration (Figs. 205–208). The base color is uniformly reddish black to black, telson and tarsomere II of legs reddish black. Chelicerae are reddish brown.

Carapace and mesosoma (Figs. 205–208, 225–227). The entire carapace is covered with large and minute granules; carinae are absent. The anterior margin of the carapace is markedly depressed, convex in the middle. The carapace bears three lateral eyes. The mesosoma is granulated, with one median carina. Tergite VII is pentacarinata. The sternites are smooth to finely granulated with two parallel furrows except sternite VII, which bears four sparsely granulate carina. Pectinal teeth number 6–7 in male and 5 in females, fulcra are absent. The marginal lamella I (basal) is present or indicated, the remainder of the pectinal surface forming one compact unit.

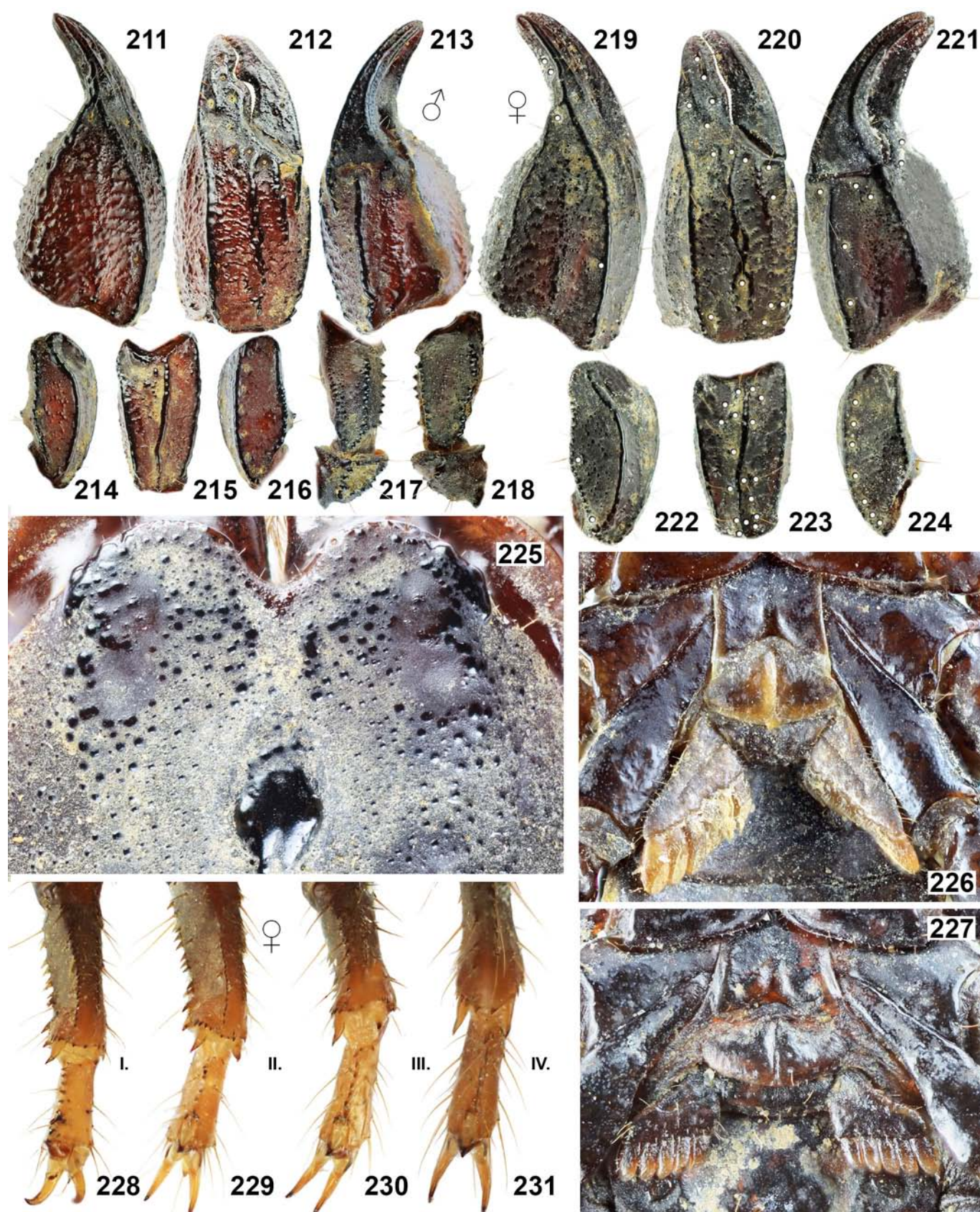
Metasoma and telson (Figs. 232–239). The metasoma is sparsely hirsute and granulated, with sparse, relatively large granules. Metasomal segment I with 10 carinae, II–IV with 8 carinae, and V with 5 carinae. The median lateral carinae of metasoma V are indicated by isolated granules that may coalesce into carinae. The dorsolateral carinae of segments III and IV posteriorly are not terminated in a pronounced tooth. The telson is bulbous and granulate, with annular ring developed in both sexes, more in male.

Pedipalps (Figs. 209–224). The pedipalps are very sparsely hirsute. The patella bears 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) external and 6–7 ventral trichobothria. The chela bears 4 ventral trichobothria located on ventral surface. The femur and patella are granulated. The femur has 5 granulate carinae, and the patella has 5 carinae with reduced dorsal and ventral patellar spurs. The manus bears rounded reticulate granules of different sizes. The external surface of the chela bears a complete median carina and other parallel carinae in anterior part. The movable fingers with 7–8 larger and 15–18 smaller IAD among them, which form a second row, parallel to MD (ca 45 in number). There are also 4 ID and 8–9 OD present.

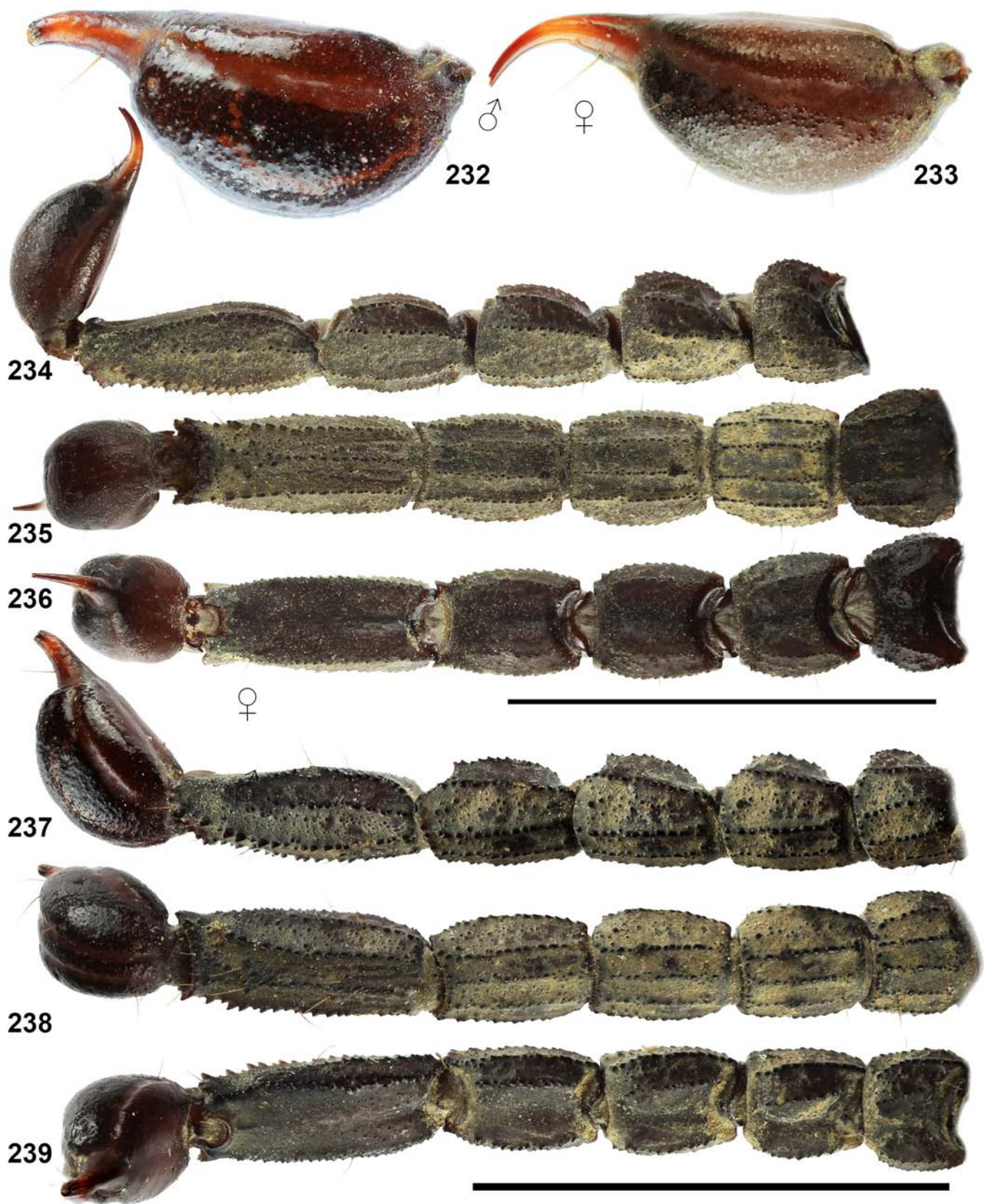
Legs (Figs. 228–231). The tibia and tarsomeres of legs with several setae not arranged into bristlecombs on dorsal surfaces but with rows of spines on dorsolateral and ventrolateral



Figures 205–210: *Scorpiops zubairi* sp. n. **Figures 205–206.** Male holotype in dorsal (205) and ventral (206) views. **Figures 207–210.** Female paratype in dorsal (207) and ventral (208) views, and movable finger dentition under white light (209) and UV fluorescence (210). Scale bar: 10 mm (205–208).



Figures 211–231: *Scorpiops zubairi* sp. n., male holotype (211–218, 226) and female paratype (219–225, 227–231). **Figures 211–224.** Pedipalp segments. Chela dorsal (211, 219), external (212, 220) and ventral (213, 221) views. Patella dorsal (214, 222), external (215, 223) and ventral (216, 224) views. Femur and trochanter ventral (217) and dorsal (218) views. Trichobothrial pattern is indicated by white circles (219–224). **Figure 225.** Anterior part of carapace. **Figures 226–227.** Coxosternal areas. **Figures 228–231.** Left legs I–IV, retrolateral aspect.



Figures 232–239: *Scorpiops zubairi* sp. n., metasoma and telson. **Figures 233–236.** Female paratype, telson lateral (233), metasoma and telson lateral (234), ventral (235), and dorsal (236) views. **Figures 232, 237–239.** Male holotype, telson lateral (232), metasoma and telson lateral (237), ventral (238), and dorsal (239) views. Scale bar: 10 mm (234–236, 237–239).

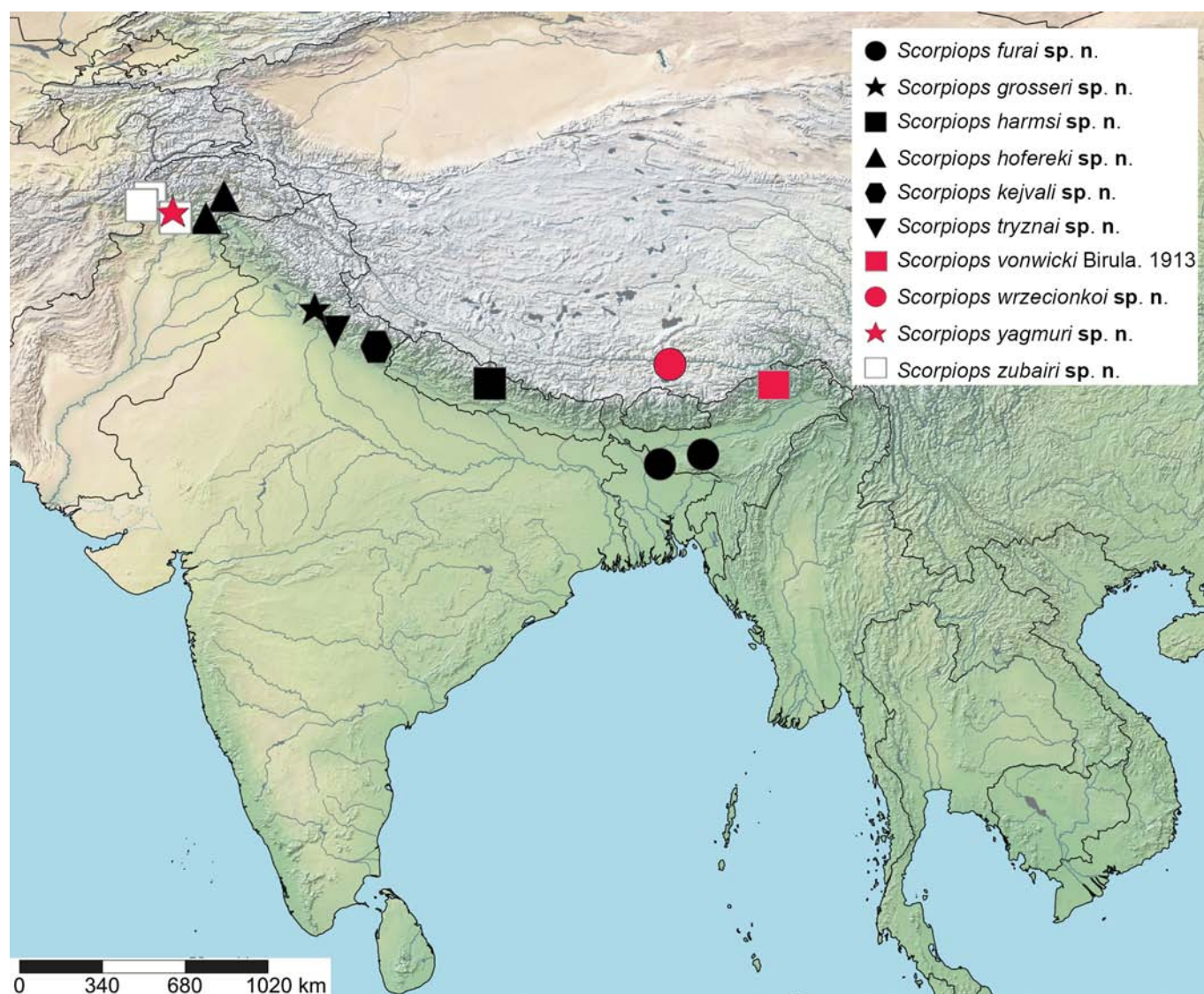


Figure 240. Map of distribution of nine new species described here and *Scorpions vonwicki* Birula, 1913.

surface. Tarsomere II of legs I–IV with 5–7 stout median ventral spines in a row and two other parallel spines. The femur bears 3–4 and patella, 4–5 carinae; both femur and patella are granulated.

Measurements. See Table 3.

AFFINITIES. The described features distinguish *S. zubairi* sp. n. from all other species of the genus. The new species is similar to *Scorpions hardwickii*. It is possible to differentiate these two species according to the shape of chela, because the chela length/width ratio is 2.1–2.2 in *S. zubairi* sp. n. and 2.5 in the male holotype of *S. hardwickii*. The granules on the manus are reticulated and connected in *S. zubairi* sp. n. versus separated in *S. hardwickii*. The telson is more bulbous in the male of *S. hardwickii* with length to depth ratio 2.4 versus 2.12 in the male of *S. zubairi* sp. n. *S. zubairi* sp. n. is known from Pakistan (Fig. 240) while the type locality of *S. hardwickii* is “Himalaya (Nepal)” (Gervais, 1844: 66). Also studied were specimens of *S. hardwickii* from India, Uttarakhand (formerly Uttaranchal)

State, ca 30 and 55 km from Bageshwar (29.84°N 79.73°E) relatively near to the India/Nepal border. It is assumed that *S. hardwickii* occurs only in the area around India/Nepal border and that specimens cited from other localities are misidentified and need to be revised.

DISTRIBUTION. Pakistan (Fig. 240).

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Figures 241. *Scorpiops furai* sp. n., locality of paratype, India, Meghalaya State, Nongpoh env.

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