

Article

A New Species of *Scorpio* from Saudi Arabia (Scorpiones: Scorpionidae) [†]

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Abstract

A new species of *Scorpio* Linnaeus, 1758 is described from Al Ula Governorate, Al Madinah Province, Saudi Arabia. *Scorpio fuvvus* sp. nov. is distinguished from closely related congeners, including *S. fuscus*, *S. kruglovi*, *S. palmatus*, *S. jordanensis*, and *S. yemenensis*, by a unique combination of morphological characters notably the granulation pattern of the pedipalp chela, metasomal proportions, pectinal structure and length, and overall dark coloration. Morphometric comparisons further support its distinct status. The discovery of this species highlights the underestimated diversity of the genus *Scorpio* in the Arabian Peninsula and reinforces the view that the *Scorpio maurus* complex comprises multiple geographically restricted taxa requiring continued integrative taxonomic investigation.

Keywords: Arabian Peninsula; arid habitat; *Scorpio fuvvus*; Scorpionidae; taxonomy

1. Introduction

During the past few decades, research on the scorpion fauna of Saudi Arabia has accelerated considerably, particularly in the fields of taxonomy, systematics, and phylogeny. Several new taxa have been described recently, and faunistic surveys have greatly improved our understanding of the country's scorpion diversity [1–12]. However, members of the family Scorpionidae remain relatively poorly studied despite their wide distribution and ecological significance across various habitats of the Arabian Peninsula.

Within this family, the genus *Scorpio* Linnaeus, 1758, represents one of the most taxonomically complex and historically challenging groups in the region. The *Scorpio maurus* Linnaeus, 1758 complex, in particular, has long confused researchers due to the morphological conservatism of its populations and the scarcity of clearly diagnostic characters. This has resulted in a proliferation of subspecies and uncertain records, many of which were established based on limited material and inadequate comparative analysis. Recent phylogenetic analyses of the genus *Scorpio* have revealed substantial cryptic diversity and complex evolutionary divergence, identifying twenty distinct lineages grouped into two main clades in North Africa and the Middle East, and suggesting that additional, yet undescribed species likely exist [13].

Traditionally, *Scorpio fuscus* (Ehrenberg, 1829) has been reported from the western mountains of Saudi Arabia, particularly around Khamis Mushait and Taif [14,15]. Consequently, *S. kruglovi* (Birula, 1910) was recorded from the region by several authors [14,16–19].



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Scorpio palmatus (Ehrenberg, 1829) was also documented from southwestern Saudi Arabia [17,20]. However, the validity of many of these records remains uncertain, as most of the cited studies lack detailed taxonomic diagnoses or direct comparisons with type material. In some instances, researchers have refrained from assigning specimens to a specific taxon and instead referred to them as *Scorpio maurus sensu lato* or *Scorpio* sp., reflecting the persistent ambiguity within the genus across the Arabian Peninsula [21]. Additionally, two subspecies, *Scorpio maurus yemenensis* Werner, 1936 and *Scorpio maurus arabicus* Pocock, 1900, have been reported from “Arabia,” a term that historically encompassed several modern countries in the region.

Scorpio fuscus was originally described from Beirut, Lebanon [22], and later redescribed in detail based on material from the Sinai Peninsula [23] and from Jordan [24]. This species exhibits a particular affinity for Mediterranean-type landscapes, where it constructs burrows in terra rossa soils, typically in regions characterized by relatively high rainfall and cool winters. In contrast, the environments where *S. fuscus* has been reported in Saudi Arabia are markedly different: arid to semi-arid zones with lower precipitation, higher temperatures, and distinct soil composition, representing a completely different ecological biotope. Since species of the genus *Scorpio* generally exhibit highly specific ecological requirements and limited adaptability to differing substrates and climatic conditions, the occurrence of *S. fuscus* in Saudi Arabia appears very unlikely.

The first record of *Scorpio fuscus* from Saudi Arabia, reported by Vachon [14], was based on immature specimens. The validity of this record was questioned by Sissom [25], and later, Hendrixson [21] refrained from assigning similar material to any recognized taxon. Considering the morphological similarities between the new species described herein and *S. fuscus*, as well as the ecological discrepancies and taxonomic uncertainty surrounding earlier Saudi records, it is probable that these specimens represent misidentified individuals of the new species or another undescribed species.

Recent fieldwork in Al Ula Governorate, Al Madinah Province, in Saudi Arabia, has yielded a series of *Scorpio* specimens exhibiting a combination of morphological characters that do not correspond to any known species. Detailed comparison with regional congeners revealed consistent differences supporting their recognition as a distinct new species, which is described herein.

2. Materials and Methods

Specimens were collected by UV detection at night. The specimens were preserved in 80% alcohol. Illustrations and measurements were made with the aid of stereoscopic microscope with a camera and an ocular micrometer (efix). Illustration under UV illumination was after Volschenk [26]. The trichobothrial nomenclature follows Vachon [27,28], and morphological nomenclature was after Francke [29], Stahnke [30], Sissom [31], and Hjelle [32].

Total length was defined as the distance from the tip of chelicerae to the end of telson. Chela length was measured as the distance from the tip of fixed finger to the joint with patella. Chela depth was measured as the maximum height in the plane of movement of the movable finger. The length of the fixed finger of pedipalp was measured from the tip of fixed finger along dentate margin to the joint of the movable finger. Movable finger length was measured as the distance from the tip of movable finger to the joint of the movable finger with manus on the ventral side. Manus length was defined as the distance from the joint between fixed and the movable finger to the joint of manus with patella.

Holotype female and other paratypes are deposited in the collection of Taibah University, Department of Biology, Al-Madinah Al-Munawwarah, Saudi Arabia.

3. Results

3.1. Systematics

Family **Scorpionidae** Latreille, 1802

Scorpio Linnaeus, 1758

Scorpio furvus sp. n

(Figures 1–6, 8a, 9a and 10a, Tables 1 and 2)

TYPE LOCALITY AND TYPE DEPOSITORY. **Holotype:** 1 ♀, (TUS-2026:01), Saudi Arabia, Al Madinah Province, Harrat Uwayrid, 27°41′0.89″ N, 37°27′13.96″ E, 1038 m a.s.l., 5 October 2025, *leg.* A. Aloufi.

Paratypes: 2 ♀♀, (TUS-2026:02-03), 1 ♂, (TUS-2026:04), Al Madinah Province, Harrat Uwayrid, 27°41′0.89″ N, 37°27′13.96″ E, 1038 m a.s.l., 8 November 2025, *leg.* A. Aloufi, 4 ♀♀juv, 3 ♂♂juv, Al Madinah Province, Harrat Uwayrid, 27°41′0.89″ N, 37°27′13.96″ E, 1038 m a.s.l., 8 November 2025, *leg.* A. Aloufi.

ETYMOLOGY. The specific epithet *furvus* is a Latin adjective meaning “dark”, “dusky” or “black”. It refers to the overall dark reddish-brown to brownish-black coloration that characterizes this species.

DIAGNOSIS.

Medium- to large-sized species relative to its congeners. Adults are about 64 mm in the only known adult male and 57–72 mm in females in total length. General coloration dark reddish brown to brownish black. Carapace slightly wider than long. Carapace anterior margin distinctly bilobed with a deep median indentation. Carapace lacks carinae. Around median eyes and anterior region of carapace smooth, remainder of carapace shagreened with small, scattered granules. Tergites I–VI acarinate. Tergites I–VI matt and shagreened, moderately covered with medium-sized rounded granules in males; smooth, lustrous, moderately covered with medium-sized flattened granules in females. Genital operculum is heart-shaped in females, ovoid in males. Pectinal teeth numbers 10–12 in males and 9–12 in females. Metasoma I–II wider than long, III–V longer than wide. Metasoma I with 10, II–IV with 8, and V with 5 carinae. Vesicle globular and smooth, granulated ventrally with spinoid granules in both sexes. Pedipalp femur with three carinae, patella with two carinae. The retrolateral surface of chela manus covered with densely isolated rounded or flattened granules. Prolateral surface of chela manus covered with small to moderate, pointed granules. Chela manus flattened, slightly longer than wide. Chela fingers are relatively long without granules. Trichobothriotaxy of type C, orthobothriotaxic [21], pedipalp chela trichobothrium *it* placed basally along fixed finger near *ib*. Tibial spurs absent. Tarsi of right legs I to IV with 5/9–6/9–7/10–7/10 prolateral and retrolateral spines arranged in series.



Figure 1. *Scorpio furvus* sp. n., female paratype. Habitus under white light.

Description: (Female holotype, unless otherwise specified).

Coloration (Figures 1 and 2): General coloration dark reddish brown to brownish black. Carapace: Brownish black. Mesosoma: Tergites I–VII brownish black. Coxae and sternum yellowish brown. Genital operculum and pectines yellowish brown. Sternites III–VI yellowish brown with darker patches; sternites VII yellowish brown to brown with dark reticulations. Pedipalp: Femur and patella dark reddish brown with blackish reticulations. Chela manus dark reddish to reddish black; reticular granulation, granules and carinae reddish black. Fingers black but anterior tips reddish brown. Metasoma: Metasomal segments dark reddish brown to reddish black. Carinae and granules reddish black. Vesicle of telson dark reddish brown, aculeus reddish at the base and black at the tip. Legs: Telotarsus, basitarsus and tibia yellowish brown, femur and patella reddish brown with reticulation. Spinules and condyles reddish brown. Chelicerae: Chelicera manus reddish brown anteriorly, rest of manus yellowish brown with blackish reticulations. Fingers dark brown, tips of fingers and teeth reddish brown.

Carapace (Figure 4a): Carapace is slightly wider than its length. Carapace anterior margin distinctly bilobed with a deep median indentation. Carapace acarinate, area around median eyes and anterior region of carapace smooth, rest of carapace shagreened with small, scattered granules. Along anterior margin a rounded and flattened row of granules present. Median ocular tubercle not distinct and located in the center of the carapace. A pair of median eyes exist, lateral eyes with three ocelli (MLMa, PLMa, PDMi) (Type 3A [33]). The anteromedian furrow is narrow but deep and distinct. The posteromedian furrow is wide and bifurcated as an inverted T-shaped. Posterior lateral furrows wide and distinct. A few setae exist on the anterior area of carapace.

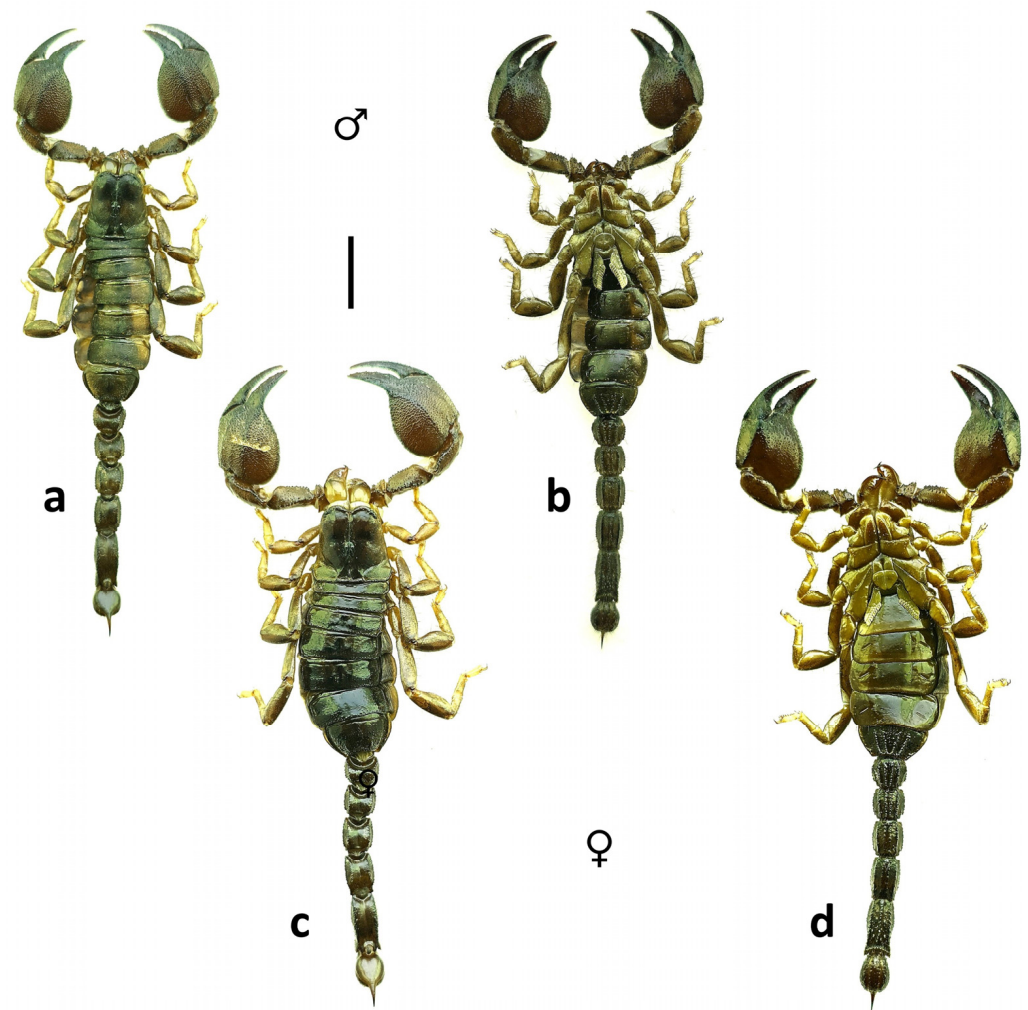


Figure 2. *Scorpio furvus* sp. n., habitus under white light. Figures (a,b): Male paratype, in dorsal (a) and ventral (b) views. Figures (c,d): Female holotype, in dorsal (c), and ventral (d) views. Scale bar: 10 mm.

Chelicerae (Figure 4a): Cheliceral dentition characteristic for the family Scorpionidae [26]. Smooth longitudinal ridges present anteriorly.

Mesosoma (Figures 3 and 4): Tergites I–VI acarinate. Tergites I–VI matt and shagreened, moderately covered with medium-sized rounded granules in males; smooth, lustrous, moderately covered with medium-sized flattened granules in females. Tergite VII matt and shagreened, densely covered with medium-sized rounded granules in males, and smooth, lustrous, densely covered with medium-sized flattened granules in females. Sternites III–VI almost smooth with scattered setae in males; smooth and lustrous without setae in females. Sternite VII granular with four spaced granular carinae. Genital operculum is heart-shaped in females, ovoid in males. Pectinal teeth numbers 10–12 in males and 9–12 in females. Three marginal and three to five median lamellae. Stigmas linear, angled 45° and conspicuous.

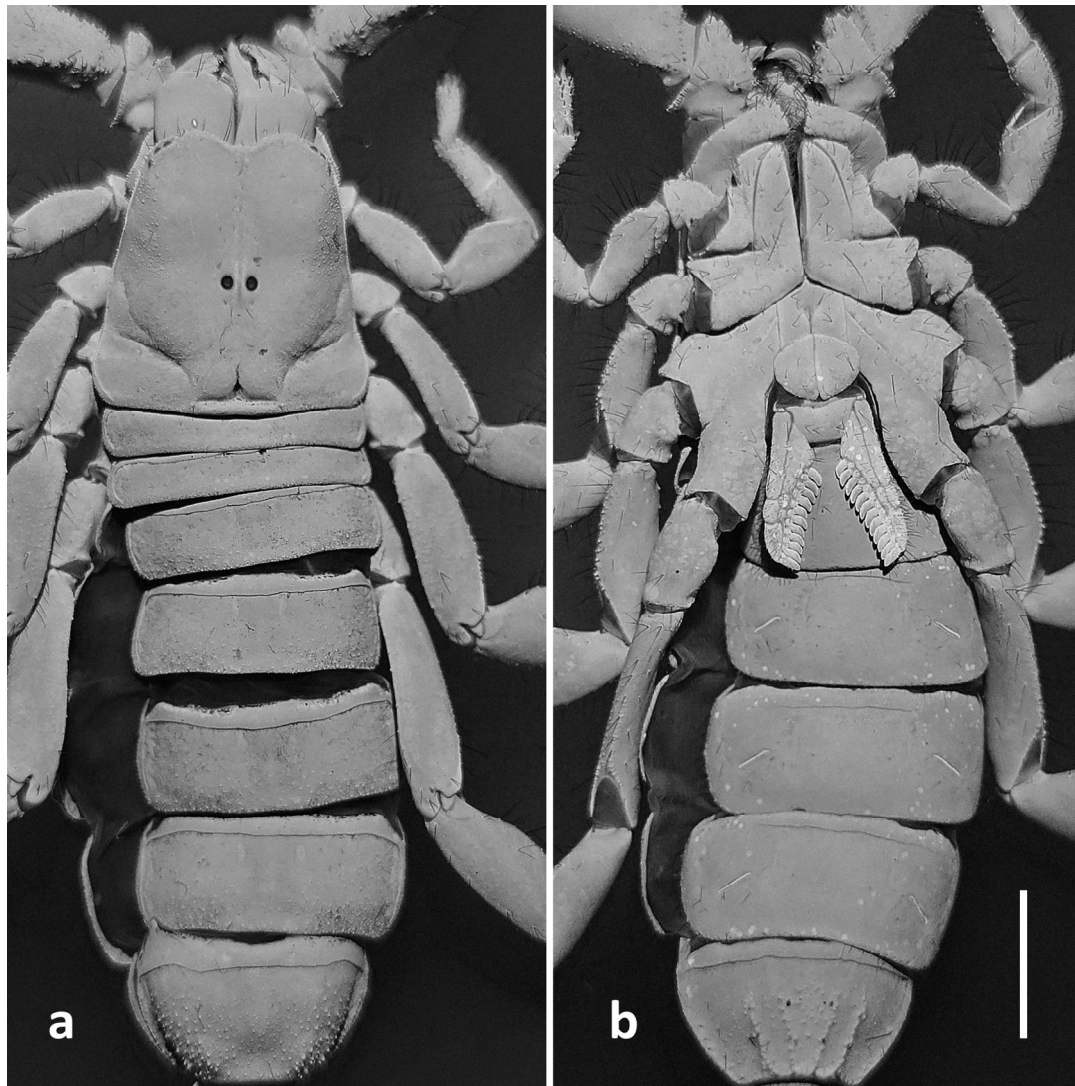


Figure 3. *Scorpio furvus* sp. n., male paratype under UV light. Figure (a): Carapace and mesosoma. Figure (b): sternoplectinal area and ventral of mesosoma. Scale bar: 5 mm.

Metasoma and telson (Figures 6 and 10a): Metasomal segments I–II wider than long, III–V longer than wide. Metasoma I with 10, II–IV with 8, and V with 5 carinae. Lateral inframedian carinae on segment I indistinct with spaced rounded granules. Ventral submedian carinae moderate and ventrolateral carinae with moderate and rounded granules on segments I–IV, the granules somewhat flattened and fused; more obsolete in segments III–IV. Dorsolateral carinae and lateral supramedian carinae strong and crenulated on segments I–IV with pointed and spaced spinoid granules. Segment V: Ventromedian carina moderate with large, spinoid and pointed granules; ventrolateral carinae strong and serrated with spaced large and pointed granules, gradually increasing posteriorly, continues in lateral of anal arch; dorsolateral carinae moderate and rounded with moderate spinoid granules; segment V with a row of granules laterally at posterior half. Intercarinal area smooth and covered with scattered small granules. Ventral and lateral surfaces covered with moderately variable-sized setae. Vesicle globular and smooth, granulated ventrally with spinoid granules in both sexes. Vesicle with numerous macrosetae reaching the base of aculeus. Aculeus strongly curved and shorter than vesicle.

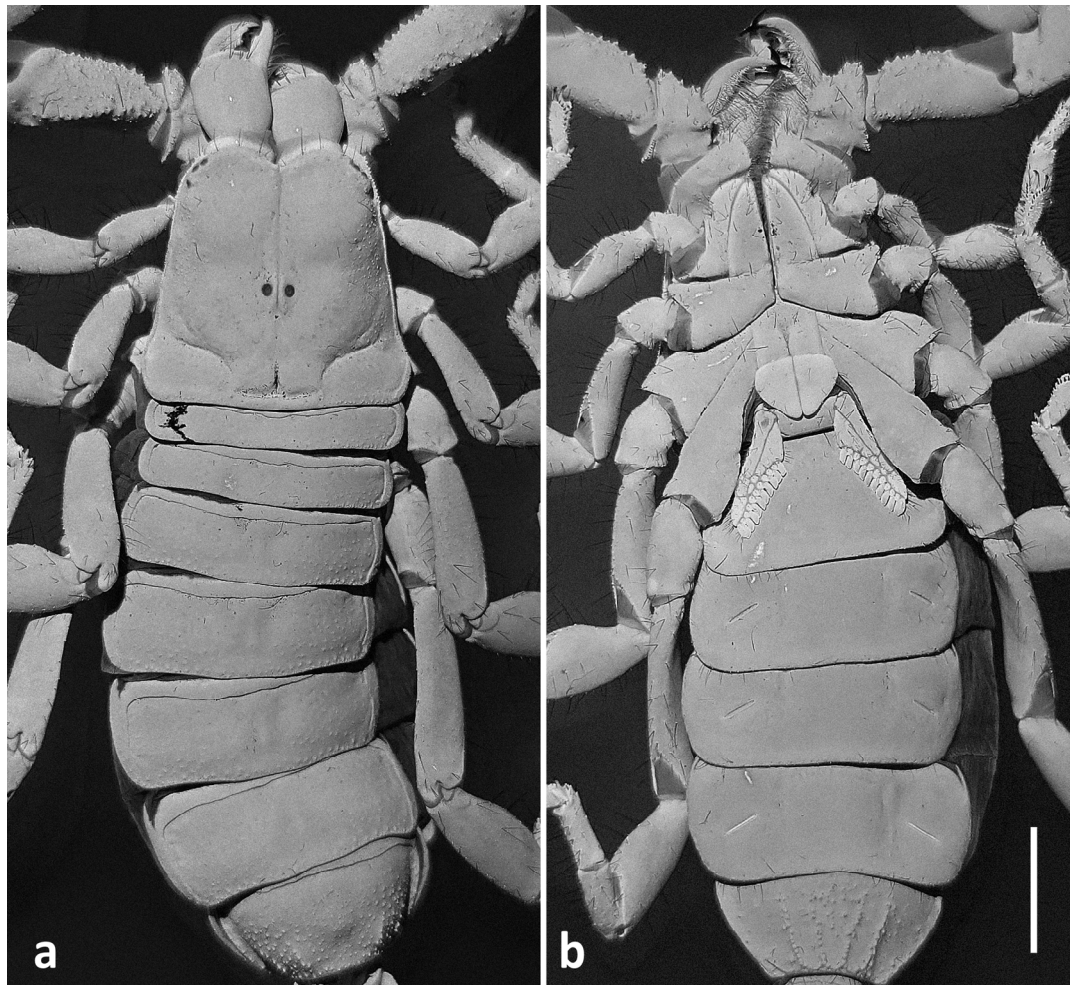


Figure 4. *Scorpio fuvvus* sp. n., female holotype under UV light. Figure (a): Carapace and mesosoma. Figure (b): sternopectinal area and ventral of mesosoma. Scale bar: 5 mm.

Pedipalp (Figures 5 and 7a,b): Pedipalp femur with three carinae; dorsal prolateral and ventral prolateral carinae moderate with spaced rounded granules; dorsal retrolateral carinae strong with separated, large and rounded granules. Intercarinal area shagreened with various-sized granules dorsally, smooth ventrally. Intercarinal surface with a few distinct setae. Patella with two carinae; dorsomedian carina strong with flattened and fused granules; ventral prolateral carinae obsolete without granules. Intercarinal area smooth and lustrous in dorsal, ventral and retrolateral surfaces, but prolateral surface shagreened. Intercarinal surface with a few distinct setae. The retrolateral surface of chela manus covered with densely isolated rounded or flattened granules. Posterior margin of retrolateral surface with a few large, rounded or flattened granules. Prolateral surface of chela manus covered with small to moderate, pointed granules. Ventral retrolateral carina strong, with flattened and fused granules; ventral prolateral carina smooth, rounded without granules. Digital carina not distinct with granules larger and more distinct than other granules and not fused; retrolateral secondary carina distinct with large and fused granules that become denser anteriorly. Chela manus flattened, slightly longer than wide. Chela fingers are relatively long without granules. Fixed and movable fingers with 4 or 5 strong accessory denticles. Intercarinal surface with few distinct setae on manus but fingers hirsute. Trichobothriotaxy of type C; orthobothriotaxic [21].

Legs: Telotarsi of right legs I to IV with 5/9–6/9–7/10–7/10 prolateral and retrolateral spines arranged in series.

Sexual dimorphism: Adult males differed from adult females as follows: (a) tergites I–VI matt, completely covered with fine granules in males, but glossy and smooth in females; sternites III–VI wrinkled medially in males, but smooth and shining in females; (b) fixed finger of pedipalp chela in adult females longer than in males; fixed finger length to chela length ratio 0.41 in the male; 0.42–0.45 with average 0.44 in females ($n = 3$); (c) genital operculum ovoid in males, but heart-shaped in females (Figures 8a and 9a).

Measurements: See Table 1.

Table 1. Comparative measurements of *Scorpio fuvvus* sp. n. Abbreviations: length (L), width (W), depth (D).

Dimensions (mm)		<i>Scorpio fuvvus</i> TUS-2026:04 ♂Paratype	<i>Scorpio fuvvus</i> TUS-2026:01 ♀Holotype	<i>Scorpio fuvvus</i> TUS-2026:02 ♀Paratype	<i>Scorpio fuvvus</i> TUS-2026:03 ♀Paratype
Carapace	L/W	9.60/9.36	10.56/10.92	9.72/9.84	9.00/9.24
Mesosoma	L	19.33	24.97	16.81	15.97
Segment I	L/W	3.72/4.80	3.60/4.80	3.60/4.68	3.24/4.20
Segment II	L/W	4.08/4.32	4.20/4.44	4.08/4.20	3.60/3.84
Segment III	L/W	4.56/4.08	4.68/ 4.26	4.56/3.96	3.96/3.72
Segment IV	L/W	5.40/3.96	5.52/3.96	5.40/3.72	4.80/3.48
Segment V	L/W/D	7.44/3.60/3.00	7.78/3.72/3.12	7.20/3.36/3.00	6.60/3.24/3.00
Telson	L	7.80	8.40	7.20	7.08
Vesicle of telson	L/W/D	5.16/4.08/3.00	5.88/4.08/3.48	5.16/3.60/3.12	4.68/3.36/2.88
Aculeus	L	2.64	2.52	2.04	2.40
Pedipalp femur	L/W	6.12/2.88	6.72/3.00	6.48/3.00	6.00/2.76
Pedipalp patella	L/W	6.24/3.48	7.20/3.24	6.60/3.00	6.12/3.00
Pedipalp chela	L	14.90	16.93	15.37	14.53
Manus	L/W/D	9.00/4.92/8.76	10.20/5.28/9.48	9.12/4.92/8.46	8.52/4.80/8.16
Movable finger	L	8.04	9.36	8.16	7.80
Fixed finger	L	6.18	7.56	6.48	6.60
Total	L	64.93	72.71	61.57	57.25

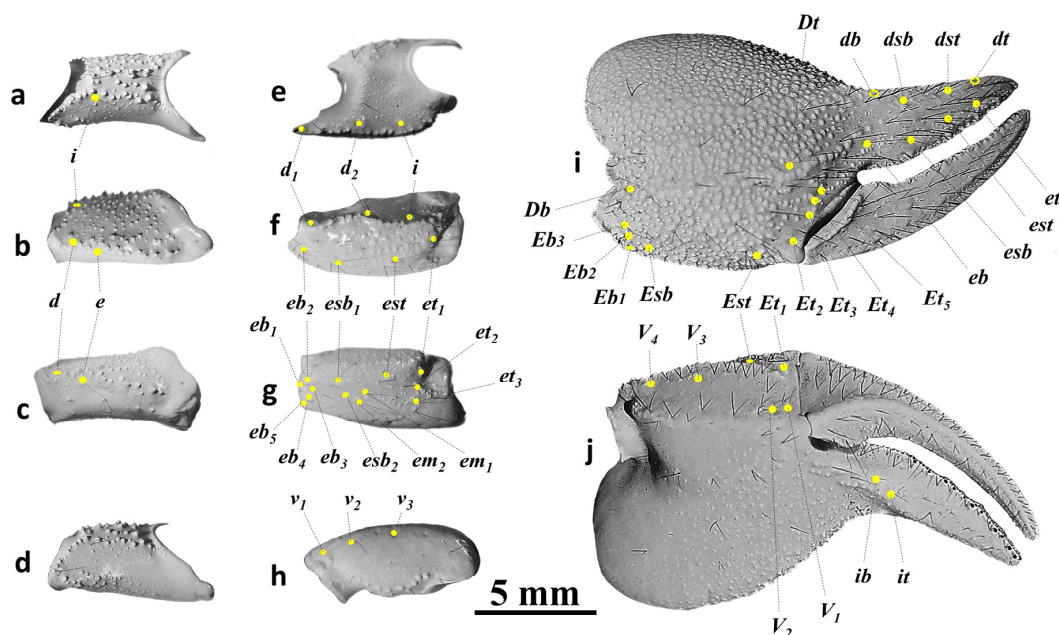


Figure 5. Dextral pedipalp segments of *Scorpio fuvvus* sp. n., female holotype. Figures (a–d): Femur in prolateral (a), dorsal (b), retrolateral (c), and ventral (d) views. Figures (e–h): Patella in prolateral (e), dorsal (f), retrolateral (g), and ventral (h) views. Figures (i,j): Chela in dorsal (i), and ventral (j) views. Trichobothrial pattern indicated by yellow circles. Scale bar: 5 mm.

AFFINITIES.

The new species exhibits diagnostic characteristics shared with *S. fuscus* in terms of color and size, but *S. furvus* sp. n. can be distinguished from *S. fuscus* by several characters shown in Table 2: (a) the retrolateral surface of pedipalp chela covered with densely isolated rounded or flattened granules in *S. furvus* sp. n. (Figures 5i and 7a), while in *S. fuscus* with reticular fused and flattened granulation (Figure 7c); (b) the prolateral surface of pedipalp chela covered with small to moderate, pointed granules in *S. furvus* sp. n. (Figures 5j and 7b), while in *S. fuscus* smooth overall with moderate, pointed granules confined on anterior area (Figure 7d); (c) pedipalp chela hand is less elongated in *S. furvus* sp. n. than in *S. fuscus* (Figure 7a–d, Table 2); (d) pectines are longer in male of *S. furvus* sp. n. than in male of *S. fuscus*; pectines extending well beyond coxa–trochanter articulation of leg IV in male of *S. furvus* sp. n. (Figure 8a), whereas extending approximately to the coxa–trochanter articulation of leg IV in male of *S. fuscus* (Figure 8b); (e) metasomal segment II is wider than long in *S. furvus* sp. n., whereas longer than wide in *S. fuscus*; (f) the fixed finger of pedipalp chela is relatively longer in *S. furvus* sp. n.; fixed finger L/chela L ratio is higher in the new species.

S. furvus sp. n. can be distinguished from *Scorpio kruglovi* Birula, 1910 by a combination of the following characters (Table 2): (a) general coloration is dark reddish brown to brownish black in *S. furvus* sp. n., whereas it is brownish yellow to reddish yellow in *S. kruglovi*; (b) the basal lamellae (marginal and median) of pectines is less elongated and broader in females of *S. furvus* sp. n. than in females of *S. kruglovi*; the basal median lamellae is broadly triangular in shape in *S. furvus* sp. n. (Figure 9a), whereas it is narrowly triangular in *S. kruglovi* (Figure 9c); (c) the retrolateral surface of pedipalp chela covered with densely isolated rounded or flattened granules in female *S. furvus* sp. n. (Figure 5i), while in female *S. kruglovi* almost smooth (Figure 7g); (d) the prolateral surface of pedipalp chela covered with small to moderate, pointed granules in female *S. furvus* sp. n. (Figure 5j), while in female *S. kruglovi* smooth overall with moderate, pointed granules confined to anterior area (Figure 7h); (e) pectines are shorter in female of *S. furvus* sp. n. than in female of *S. kruglovi*; pectines extending approximately to the coxa–trochanter articulation of leg IV in female of *S. furvus* sp. n. (Figure 9a), whereas extending well beyond coxa–trochanter articulation of leg IV in female of *S. kruglovi* (Figure 9c); (f) aculeus strongly curved and shorter than vesicle in *S. furvus* sp. n. (Figure 10a), while telson vesicle rather narrow, elongated, almost as long as the moderately curved aculeus in *S. kruglovi* (Figure 10b); (g) *S. furvus* sp. n. has less slender metasomal segment V than in *S. kruglovi* (Figure 10a,b).

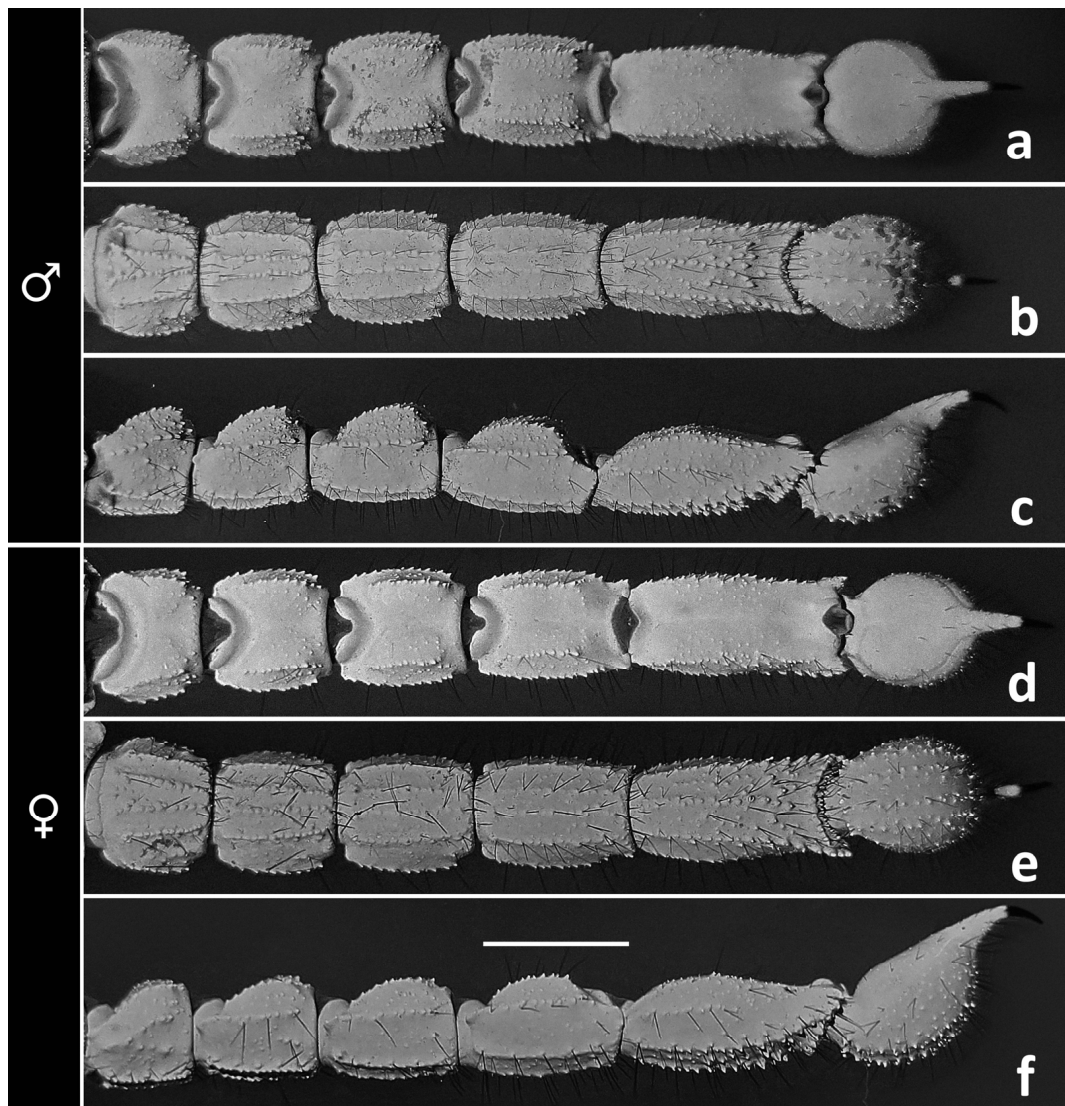


Figure 6. *Scorpio furvus* sp. n. Figures (a–c): Male paratype. Figures (d–f): Female holotype. Metasoma and telson under UV light, in dorsal (a,d), ventral (b,e), and lateral (c,f) views. Scale bar: 5 mm.

S. furvus sp. n. can be distinguished from *S. jordanensis* Abu Afifeh et al., 2024 by several characters (Table 2): (a) the fixed finger of pedipalp chela is relatively longer in *S. furvus* sp. n.; fixed finger L/ chela L ratio is higher in the new species (Table 2); (b) general coloration is dark reddish brown to brownish black in *S. furvus* sp. n., whereas it is light reddish yellow in *S. jordanensis*; (c) *S. furvus* sp. n. is larger in size (adults 57–72 mm) than *S. jordanensis* (adults 53–56 mm).

S. furvus sp. n. can be distinguished from *S. palmatus* by several characters shown in Table 2: (a) general coloration is dark reddish brown to brownish black in *S. furvus* sp. n. whereas it is light olive brown to yellow in *S. palmatus*; (b) *S. furvus* sp. n. is larger in size (adults 57–72 mm) than *S. palmatus* (adults 46–50 mm); (c) the prolateral surface of pedipalp chela covered with small to moderate, pointed granules in male *S. furvus* sp. n. (Figure 7b), while in males of *S. palmatus* smooth overall with moderate, pointed granules confined on anterior area (Figure 7f); (d) the retrolateral surface of pedipalp chela covered with densely isolated rounded or flattened granules in male of *S. furvus* sp. n. (Figure 7a), while in male *S. palmatus* with very large and very flattened granules, more distinct and rounded on anterior area, posterior part nearly smooth (Figure 7e).

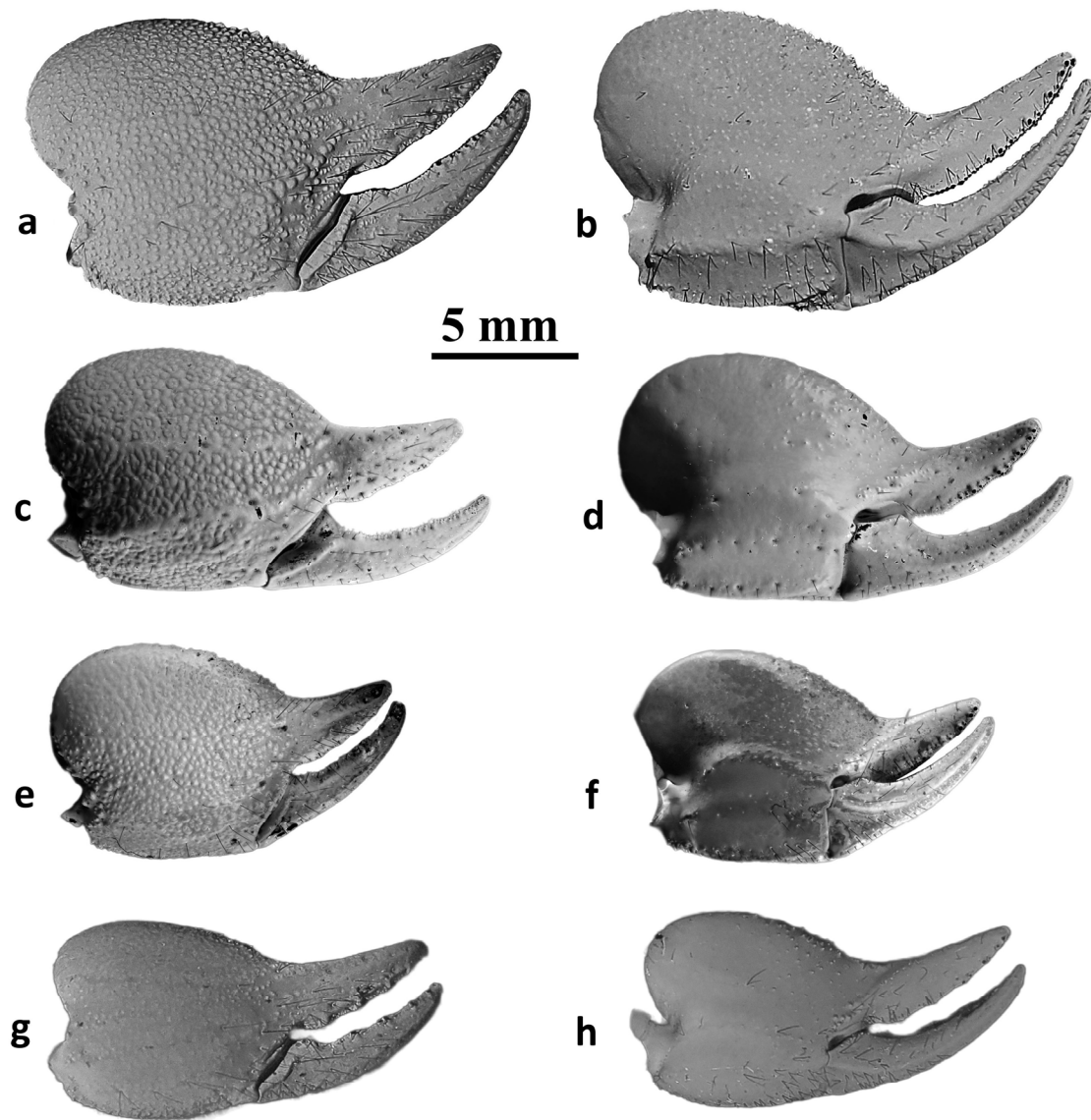


Figure 7. Chelae of right pedipalps under UV light. Figures (a,b): *Scorpio furvus* sp. n., male paratype. Figures (c,d): *Scorpio fuscus*, male from Jordan. Figures (e,f): *Scorpio palmatus*, male from Egypt. Figures (g,h): *Scorpio kruglovi*, female from Saudi Arabia. Figures (a,c,e,g) in dorsal views. Figures (b,d,f,h) in ventral views. Scale bar: 5 mm.

S. furvus sp. n. can be distinguished from *S. yemenensis* by the following: (a) general coloration is dark reddish brown to brownish black in *S. furvus* sp. n. whereas it is light yellow-brown in *S. yemenensis*; (b) the prolateral surface of pedipalp chela covered with small to moderate, pointed granules in *S. furvus* sp. n., while in *S. yemenensis* with sparse coarse granulation along dorsal margin; (c) pectinal tooth count 10–12 in males and 9–12 in females of *S. furvus* sp. n., while 9–10 in males and 6–11 in females of *S. yemenensis*.

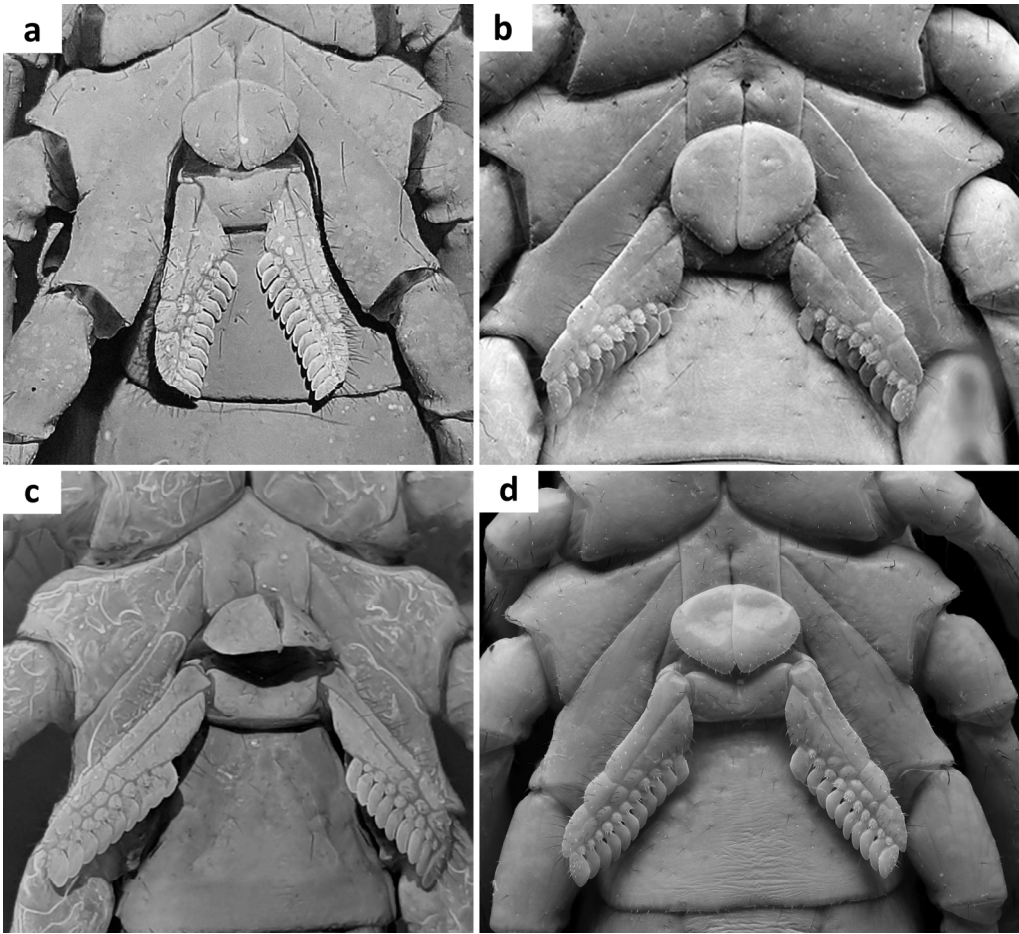


Figure 8. Pectines, genital operculum and sternum under UV light. Males of *Scorpio* species. Figure (a): *Scorpio furvus* sp. n. Figure (b): *Scorpio fuscus* (Birqish Forest, Irbid Governorate, northwestern Jordan). Figure (c): *Scorpio kruglovi* (Quraeah, Tabuk Province, Saudi Arabia). Figure (d): *Scorpio palmatus* (Bahig village, Alexandria, Egypt).

Table 2. Summary of diagnostic characters separating six *Scorpio* species. (*) Asterisk refers to a female syntype of *Scorpio maurus kruglovi* Birula, 1910, Syrie, Deir-Zor, Birula A. det. MNHN Paris- RS1239.

		Total Size (mm) Range (Average)	General Coloration	Basal Lamellae of Pectines	Retrolateral Surface of Chela Granulations	Pectinal Tooth no. Range (Average)	Pectines Length	Metasoma II L/W Range (Average)	Manus L/Chela Depth Ratio Range, (Average)	Fixed Finger L/Chela L Ratio Range, (Average)
<i>S. furvus</i>	♂	64.93 (n = 1)	Generally dark reddish brown to brownish black	Broadly triangular	Densely isolated rounded or flattened granules	10–12 (10.7) (10 combs)	Extending beyond coxa–trochanter articulation	0.94 (0.94) (n = 1)	1.03 (1.03) (n = 1)	0.41 (0.41) (n = 1)
	♀	57.25–72.71 (63.84) (n = 3)				9–12 (10.5) (8 combs)	Reaching coxatrochanter articulation	0.94–0.97 (0.95) (n = 3)	1.04–1.08 (1.07) (n = 3)	0.42–0.45 (0.44) (n = 3)
<i>S. jordaniensis</i>	♂	42.50–53.54 (49.37) (n = 20)	Generally light reddish yellow	Broadly triangular	Isolated rounded or flattened granules	10–13 (11.4) (46 combs)	Extending beyond coxatrochanter articulation	0.89–0.97 (0.94) (n = 20)	1.00–1.09 (1.06) (n = 9)	0.35–0.36 (0.35) (n = 9)
	♀	45.70–56.90 (52.38) (n = 20)				9–13 (10.6) (36 combs)	Reaching coxatrochanter articulation	0.85–0.96 (0.91) (n = 20)	1.05–1.09 (1.07) (n = 9)	0.36–0.39 (0.38) (n = 9)

Table 2. Cont.

		Total Size (mm) Range (Average)	General Coloration	Basal Lamellae of Pectines	Retrolateral Surface of Chela Granulations	Pectinal Tooth no. Range (Average)	Pectines Length	Metasoma II L/W Range (Average)	Manus L/Chela Depth Ratio Range, (Average)	Fixed Finger L/Chela L Ratio Range, (Average)
<i>S. fuscus</i>	♂	62.30–67.55 (64.45) (n = 3)	Generally dark reddish brown to brownish black	Broadly triangular	Reticulated fused or flattened granules	9–10 (9.9) (8 combs)	Reaching coxatrochanter articulation	1.01–1.05 (1.02) (n = 4)	1.07–1.13 (1.10) (n = 4)	0.38–0.40 (0.39) (n = 4)
	♀	61.70–62.42 (62.06) (n = 2)				8–11 (9.8) (16 combs)	Reaching coxatrochanter articulation	1.03–1.05 (1.04) (n = 2)	1.11–1.13 (1.12) (n = 2)	0.39–0.40 (0.40) (n = 2)
<i>S. palmatus</i>	♂	47.96–50.29 (49.13) (n = 2)	Generally light olive brown to yellow	Broadly triangular	Isolated rounded or flattened granules	10–13 (11.5) (14 combs)	Extending beyond coxatrochanter articulation	0.91–1.00 (0.96) (n = 2)	1.04–1.06 (1.05) (n = 2)	0.36–0.41 (0.38) (n = 7)
	♀	46.52–49.63 (48.08) (n = 2)				8–12 (10.4) (38 combs)	Reaching coxatrochanter articulation	0.96–1.07 (1.02) (n = 2)	1.10–1.13 (1.12) (n = 2)	0.38–0.45 (0.42) (n = 18)
<i>S. wah-behi</i>	♂	61.75–64.95 (63.10) (n = 4)	Reddish yellow to olive brown	Broadly triangular	Large flattened, less distinct granules, posterior part nearly smooth	12–15 (12.6) (12 combs)	Extending beyond coxatrochanter articulation	1.00–1.06 (1.03) (n = 6)	1.12–1.18 (1.15) (n = 6)	0.38–0.41 (0.40) (n = 6)
	♀	60.90–68.79 (65.47) (n = 8)				10–13 (11.0) (22 combs)	Extending beyond coxatrochanter articulation	1.00–1.05 (1.02) (n = 8)	1.14–1.19 (1.16) (n = 9)	0.42–0.44 (0.43) (n = 10)
<i>S. kruglovi</i>	♂	64.00–67.00 (65.50) (n = 2)	Brownish yellow	Broadly triangular	Large and flattened granules	12–13 (12.5) (8 combs)	Extending beyond coxatrochanter articulation	NA	1.05–1.13 (1.09) (n = 4)	0.43–0.46 (0.45) (n = 4)
	♀	66.00–80.00 (74.10) (n = 10)				9–12 (10.7) (26 combs)	Reaching coxatrochanter articulation (*)	NA	1.00–1.02 (1.01) (n = 8)	0.45–0.48 (0.46) (n = 10)

Note: Data for *S. fuscus* and *S. palmatus* are based on Talal et al. [34].

3.2. Habitat

The specimens were collected in a distinctly arid landscape characterized by sparse vegetation. The site consists of a flat desert plain covered by a thin layer of sand overlying compact gravel, with scattered sandstone outcrops of varying sizes. Numerous abandoned rodent burrows were observed in the area. Farther west, the terrain transitions into more extensive sandstone deserts intersected by narrow wadi systems. Vegetation is scarce and patchy, represented mainly by *Haloxylon salicornicum*, *Retama raetam*, *Panicum* sp., and *Citrullus colocynthis*.

The habitat falls within a hyper-arid climatic zone, where annual rainfall rarely exceeds 50 mm and summer temperatures commonly surpass 40 °C. Precipitation is irregular and highly unpredictable, occurring mainly during short seasonal events. Prolonged dry periods, intense solar radiation, and strong evaporation rates dominate the environment, resulting in sparse vegetation cover and limited soil moisture throughout most of the year.

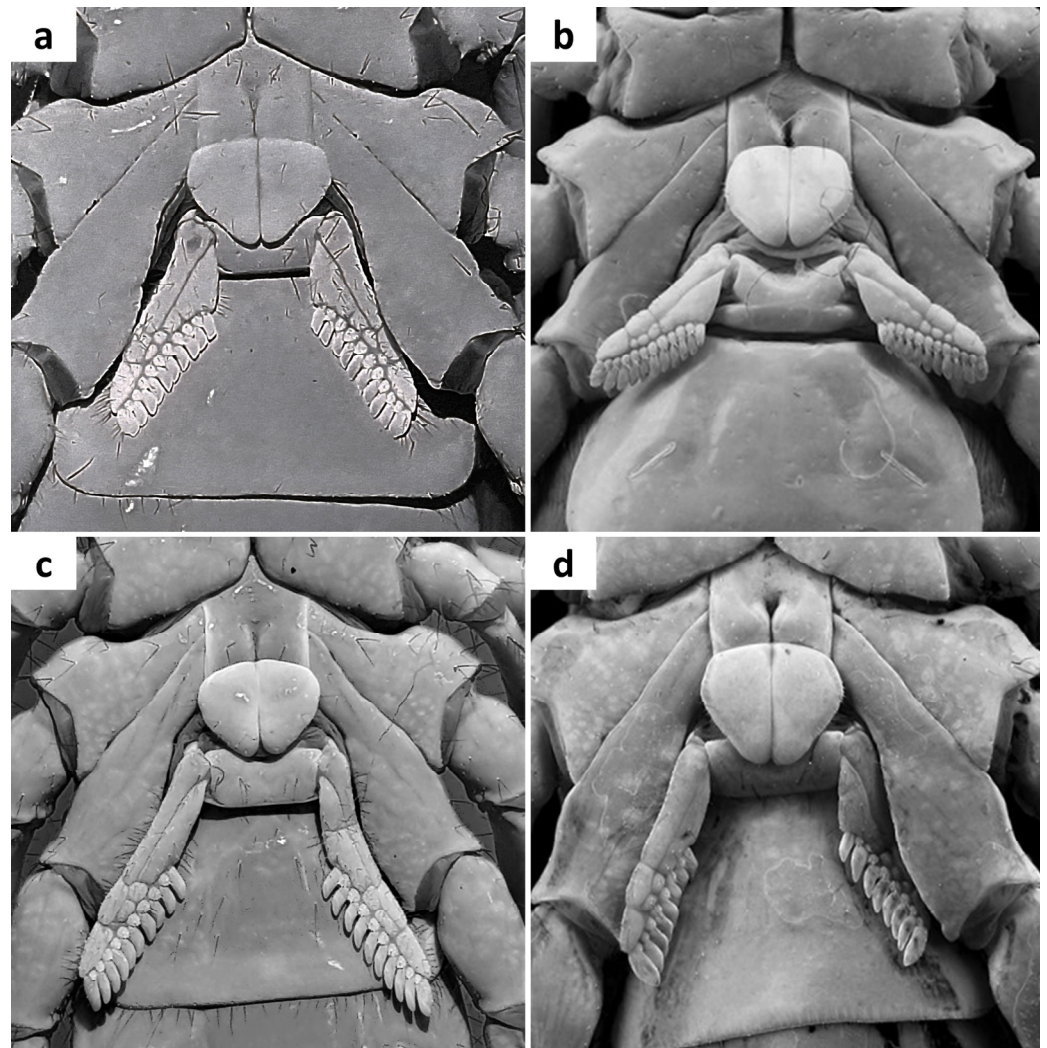


Figure 9. Pectines, genital operculum and sternum under UV light. Females of *Scorpio* species. Figure (a): *Scorpio fuvrus* sp. n. Figure (b): *Scorpio fuscus* (Birqish Forest, Irbid Governorate, northwestern Jordan). Figure (c): *Scorpio kruglovi* (Quraeah, Tabuk Province, Saudi Arabia). Figure (d): *Scorpio palmatus* (Bahig village, Alexandria, Egypt).

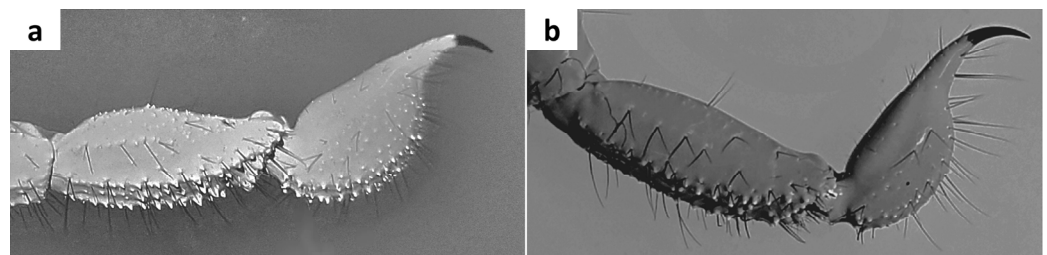


Figure 10. Metasomal segment V and telson under UV light. Figure (a): Female holotype *Scorpio fuvrus* sp. n. Figure (b): Female *Scorpio kruglovi* (Quraeah, Tabuk Province, Saudi Arabia).

4. Discussion

The present study adds further evidence that the diversity of the genus *Scorpio* in the Arabian Peninsula remains insufficiently understood. Although representatives of this genus are widely distributed across Saudi Arabia, much of the available information is based on historical records or faunistic surveys that lacked detailed comparative taxonomic analysis. As a result, several records (particularly those attributed to *Scorpio fuscus*) have remained questionable.

The discovery of *Scorpio furvus* sp. n. from Al Ula Governorate provides clarification regarding some of these ambiguities. Its morphological similarity to *S. fuscus* likely contributed to earlier misidentifications, especially given the conservative external morphology typical of members of the *Scorpio maurus* complex. However, consistent differences in pedipalp granulation, metasomal proportions, pectinal morphology, and morphometric ratios support its recognition as a distinct species. The ecological context is also noteworthy. *S. fuscus* is associated with Mediterranean-type environments characterized by terra rossa soils and relatively mesic conditions, whereas the habitat of *S. furvus* sp. n. lies within a markedly arid landscape. This ecological separation further supports the taxonomic distinction.

Recent revisions in neighboring regions have demonstrated that populations historically assigned to *Scorpio maurus* sensu lato often represent distinct, geographically restricted taxa. The recent work of Abu Afifeh et al. [24] in Jordan, which resulted in the recognition of additional species and even a new genus, clearly illustrates how underestimated diversity can persist within morphologically conservative groups. The description of *S. furvus* sp. n. suggests that a similar pattern occurs in Saudi Arabia.

Given the ecological heterogeneity of the Arabian Peninsula, including mountain ranges, volcanic fields, sandy deserts, and rocky plateaus, it is reasonable to expect further undocumented diversity within *Scorpio*. Continued fieldwork, combined with detailed morphological comparisons and molecular data where possible, will be essential for resolving species boundaries and clarifying distribution patterns within this complex genus.

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