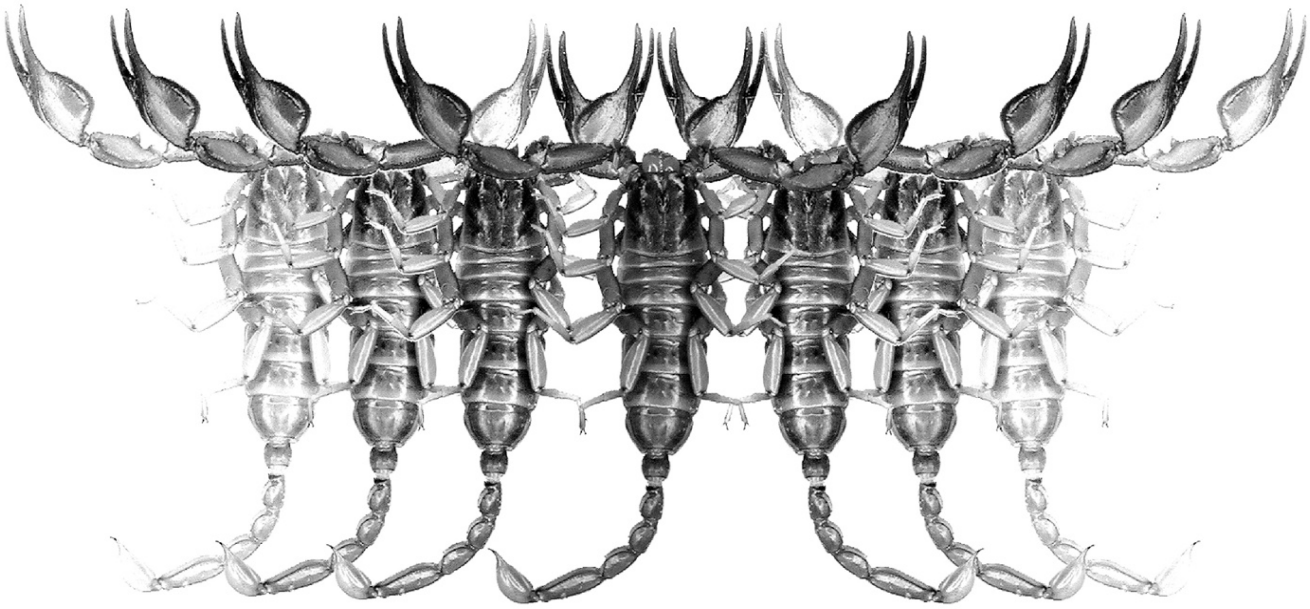
Euscorpius

Occasional Publications in Scorpiology



Review of *Androctonus* Ehrenberg, 1828 in Iran, with redescription of *A. crassicauda* (Olivier, 1807) and *A. orientalis* (Birula, 1900) stat. n., and descriptions of four new species (Scorpiones: Buthidae)

Ersen Aydın Yağmur, František Kovařík, Victor Fet, Graeme Lowe, Mohammad Moradi & Farzaneh Kalami

August 2025 — No. 422

Euscorpius

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Derivatio Nominis

The name ***Euscorpius*** Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

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Euscorpius — Occasional Publications in Scorpiology. 2025, No. 422

Review of *Androctonus* Ehrenberg, 1828 in Iran, with redescription of *A. crassicauda* (Olivier, 1807) and *A. orientalis* (Birula, 1900) stat. n., and descriptions of four new species (Scorpiones: Buthidae)

Ersen Aydın Yağmur [1]*, František Kovařík [2], Victor Fet [3], Graeme Lowe [4], Mohammad Moradi [5] & Farzaneh Kalami [5]

[1] Manisa Celal Bayar University, Alaşehir Vocational School, Alaşehir, Manisa, 45600 Turkey; email: ersen.yagmur@gmail.com
[2] Department of Zoology, Charles University, Viničná 7, CZ-128 44 Praha 2, Czech Republic; http://www.scorpio.cz
[3] Department of Biological Sciences, Marshall University, Huntington, West Virginia 25755-2510, USA; email: fet@marshall.edu
[4] Monell Chemical Senses Center, 3500 Market St., Philadelphia, PA 19104-3308, USA
[5] Department of Biology, Faculty of Sciences, University of Zanjan, Zanjan, Iran
* *Corresponding Author*

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Summary

Androctonus crassicauda (Olivier, 1807) is redescribed, based on the male neotype hereby designated, and a female topotype. *Prionurus crassicauda orientalis* Birula, 1900 is removed from synonymy, and elevated to species status as *A. orientalis* (Birula, 1900) **stat. n.**, based on the lectotype, hereby designated, a paralectotype and newly collected specimens. *A. rostami* Barahoei et al., 2025 is synonymized with *A. orientalis* (Birula, 1900) **stat. n.**, **syn. n.** In addition, four new species are described: *A. azerianus* **sp. n.** (Iran), *A. barahoeii* **sp. n.** (Iran), *A. caspius* **sp. n.** (Iran), *A. transcaucasicus* **sp. n.** (Armenia, Azerbaijan, Iran). All species are described and illustrated, and a map showing the confirmed distribution of the *Androctonus* species in Iran is provided.

Introduction

Androctonus crassicauda was originally described from Kashan, Iran, as *Scorpio crassicauda* by Olivier (1807). Although Ehrenberg (in Hemprich & Ehrenberg, 1828) established the genus *Androctonus* with *A. australis* (Linnaeus, 1758) as the type species, Simon (1872) later transferred *Scorpio crassicauda* to the genus *Buthus*. Subsequently, Kraepelin (1891) reassigned it to *Androctonus*, but Pocock (1895) placed it under the genus *Prionurus* Ehrenberg, 1828. Much later, Vachon (1948) transferred it back to *Androctonus*. *Prionurus crassicauda orientalis* was originally described by Birula (1900) from Chous-Muzafyr, Sirkuh County (now Howz-e Mozaffari, Zirkuh), located in South Khorasan Province, and from Khyn-i-Kaka, located in Sistan and Baluchestan Province, Persia (now Iran). A short time later, Birula (1903) recorded this species from four additional localities in Sistan and Baluchistan Province: eastern Persia (now eastern Iran), near Bampur, Geh (bridge on the Rong River), and Kalagan (Pork-i-Surkh) in Sistan and Baluchistan Province. Vachon (1958) transferred this taxon to *Androctonus*, but Levy and Amitai (1980) synonymized it without examining the syntypes designated by Birula (1900). No subsequent study has examined the syntypes or reassessed the systematic position of this taxon, and the decision by Levy and Amitai (1980) has been accepted as valid until the present study.

Due to the unclear morphology of *A. crassicauda* s. str. and taxonomic uncertainties within the genus *Androctonus*, many populations in Iran, the Middle East, and Turkey have been identified as *A. crassicauda* or *P. crassicauda*. While no comprehensive study had previously been conducted to resolve the systematic position of *A. crassicauda*, Yağmur (2021) described *A. turkiyensis* from Şanlıurfa Province of Turkey and designated a neotype for *A. crassicauda*.

Until the present study, the systematic positions of *Androctonus* populations, including those assigned to *Androctonus crassicauda* s. lat. in the Middle East, remained unclear. Following Yağmur (2021), the taxonomic status of populations previously identified as *A. crassicauda* has gradually begun to be resolved. Yağmur (2023) described *A. kunti* from Iğdır Province, Turkey; Khazali & Yağmur (2023)

Figures 1–**4**: *A crassicauda*. **Figures 1**–**2**. Male neotype, dorsal (1) and ventral (2) views. **Figures 3**–**4**. Female topotype, dorsal (3) and ventral (4) views. Scale bar: 10 mm.

Dimensions (mm)		*A. crassicauda* ♂ neotype	*A. crassicauda* ♀ topotype
Carapace	L / W	9.65 / 10.12	9.53 / 10.12
Mesosoma	L	21.91	19.98
Tergite VII	L / W	6.19 / 9.98	5.98 / 9.52
Metasoma + telson	L	54.83	49.49
Segment I	L / W / D	7.39 / 6.67 / 5.92	6.02 / 5.96 / 5.39
Segment II	L / W / D	7.96 / 7.78 / 6.81	6.93 / 6.53 / 5.92
Segment III	L / W / D	8.30 / 8.56 / 7.66	7.74 / 6.94 / 6.64
Segment IV	L / W / D	10.28 / 8.14 / 7.57	9.61 / 6.73 / 6.37
Segment V	L / W / D	11.62 / 7.38 / 5.48	10.18 / 6.00 / 4.62
Telson	L / W / D	9.28 / 4.06 / 3.42	9.01 / 3.92 / 3.20
Pedipalp	L	33.30	32.35
Femur	L / W	7.96 / 2.87	7.73 / 2.63
Patella	L / W	9.38 / 3.86	9.10 / 3.62
Chela	L	15.96	15.52
Manus	W / D	4.17 / 4.54	3.70 / 4.40
Movable finger	L	10.93	10.98
Total	**L**	**86.39**	**79.00**

Table 1. Comparative measurements of adults *A. crassicauda* (Olivier, 1807). Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

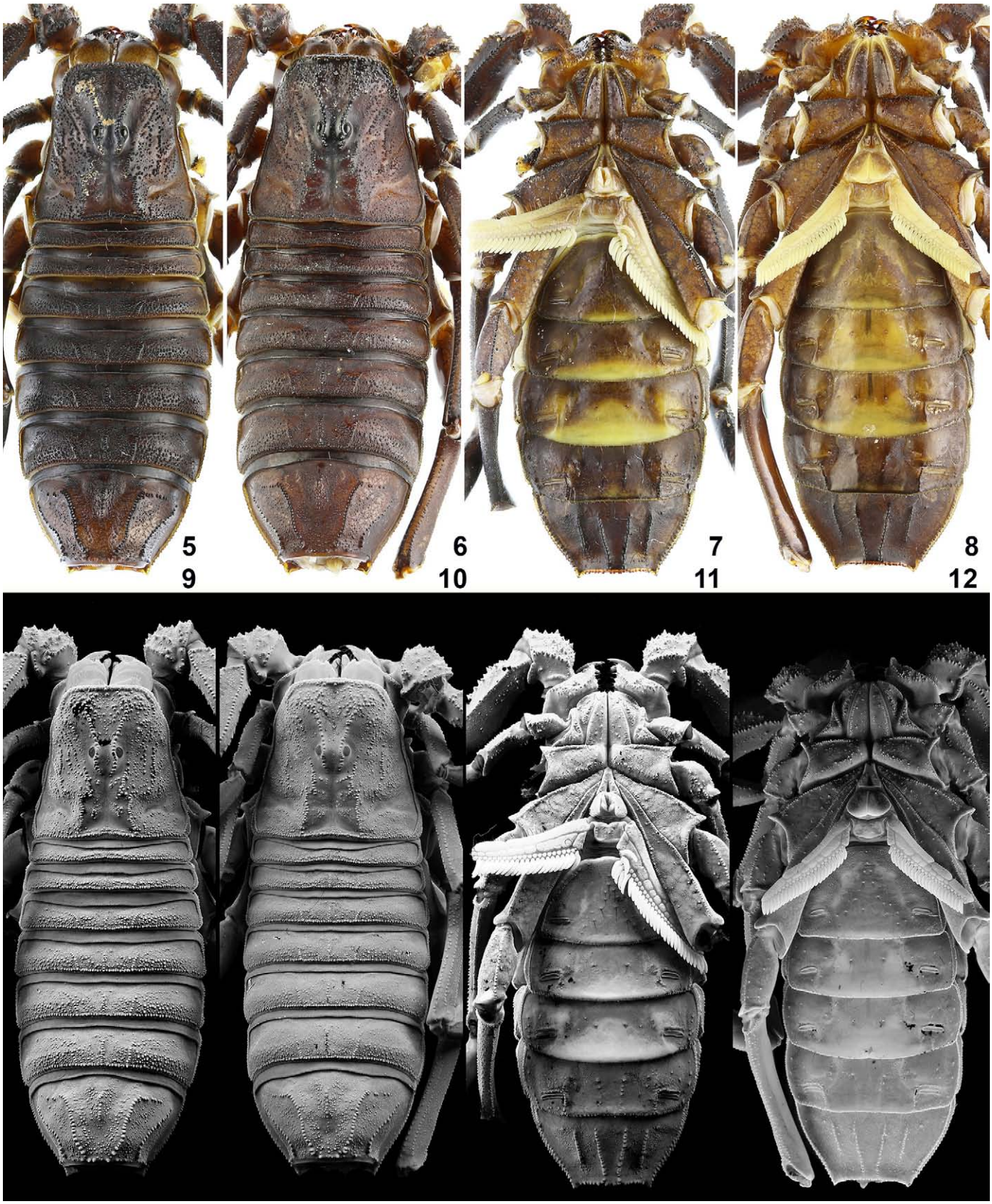
described *A. sumericus* from Dhi Qar Province, Iraq; Yağmur et al. (2025b) described *A. ishtar* from Duhok and Nineveh Provinces, Iraq; and Yağmur et al. (2025a) described *A. ammoneus* from Jordan. Additionally, Alqahtani et al. (2023) recently described *A. tihamicus* from the Tihamah plain of Saudi Arabia, a population previously considered part of *A. australis*.

In Iran, *Androctonus crassicauda* s. lat. has a very wide distribution in Iran and has been reported from the provinces of Alborz, Ardabil, Bushehr, Chaharmahal and Bakhtiari, East Azerbaijan, Esfahan, Fars, Gilan, Hamadan, Hormozgan, Ilam, Kerman, Kermanshah, Khuzestan, Kohgiluyeh and Boyer-Ahmad, Kurdistan, Lorestan, Markazi, Qazvin, Qom, Razavi Khorasan, Semnan, Sistan and Baluchestan, South Khorasan, West Azerbaijan, Yazd, and Zanjan Provinces (Barahoei et al., 2020). Kovařík (1997) recorded *A. baluchicus* (Pocock, 1900) from Kashan (Esfahan Province); this record was later corrected to *A. crassicauda* by Vignoli et al. (2003).

Birula (1900) reported a record of *Prionurus finitimus* Pocock, 1897 (now *A. finitimus*) from the present Sistan and Baluchistan Province in Iran. Yağmur et al. (2016) reported *A. robustus* Kovařík & Ahmed, 2013 based on a male specimen from Zabol (Sistan and Baluchestan Province). However, Barahoei et al. (2022) reviewed *A. baluchicus* (Pocock, 1900), described *A. sistanus* Barahoei & Mirshamsi, 2022 from Sistan and Baluchestan Province, and corrected the record of *A. robustus* as *A. sistanus*. The *A. finitimus* record of Birula (1900) also appears to be *A. sistanus*.

More recently, Barahoei et al. (2025b) reviewed *Androctonus* populations across Iran using both morphological and molecular analyses. They described and illustrated *A. crassicauda* s. str. and reported its presence in Esfahan, Hamadan, Qom, and Yazd Provinces. In addition, they described *A. rostami* Barahoei et al., 2025 from Hormozgan, Kerman, Razavi Khorasan, Sistan and Baluchistan, and South Khorasan Provinces, and recorded *A. sumericus* from Khuzestan Province in Iran. However, the distributional ranges of *A. rostami* and *A. orientalis* (Birula, 1900) **stat**. **n**. overlap, and Barahoei et al. (2025b) did not address the taxonomic position of *Prionurus crassicauda orientalis* Birula, 1900. Some records of *A. baluchicus* (Pocock, 1900) from the southern regions of Sistan and Baluchestan Province, reported by Moradi et al. (2020), were reviewed in the present study, and the specimens were re-examined. These records are herein corrected as *A. orientalis* (Birula, 1900) **stat**. **n**.

In a separate study, Barahoei et al. (2025a) examined populations from East Azerbaijan Province and reported the presence of both *A. kunti* Yağmur, 2023 and *A. turkiyensis* Yağmur, 2021. However, *Androctonus* populations from West Azerbaijan and Zanjan Provinces of Iran are still known as *A. crassicauda* (Habibi, 1971; Karataş et al., 2012; Mohammadi-Bavani et al., 2017; Moradi et al., 2015, 2018). In the present study, populations from East Azerbaijan, West Azerbaijan Provinces were examined and are herein described as *A. transcaucasisus* **sp**. **n**., and those from Zanjan Province as *A. azerianus* **sp**. **n**. Other populations referred to *A. crassicauda* s. lat. are herein also recognized as distinct and are described as two new species: *A. caspius* **sp**. **n**. in the Alborz Mountains in the north, and *A. barahoeii* **sp**. **n**. in the Zagros Mountains in the west. Additionally, we examined the syntypes of



Figures 5–**12**: *A crassicauda* under white light (5–8) and under UV fluorescence (9–12). **Figures 5**–**6**, **9**–**10**. Carapace and tergites. **Figures 7**–**8**, **11**–**12**. sternopectinal area and sternites. **Figures 5**, **7**, **9**, **11**. Male neotype. Male neotype. **Figures 6**, **8**, **10**, **12**. Female. topotype.

Prionurus crassicauda orientalis Birula, 1900, removed it from synonymy, elevated it to species rank, and synonymized the recently described species *A. rostami* Barahoei et al., 2025 with *A. orientalis* (Birula, 1900) **stat. n.**, **syn. n.**

Material and Methods

Nomenclature and measurements generally follow Francke (1977), Hjelle (1990), Kovařík (2009), Kovařík & Ojanguren Affilastro (2013) and Stahnke (1971), with the exception of trichobothriotaxy (Vachon, 1974, 1975).
Specimen depositories: AZMM (Alaşehir Zoological Museum, Manisa Celal Bayar University, Alaşehir, Manisa, Turkey), FKCP (František Kovařík, private collection, Prague, Czech Republic; will in future be merged with the collections of the NMPC, 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.

Systematics

Buthidae C. L. Koch, 1837
Androctonus Ehrenberg, 1828
(Figures 1–344, Tables 1–5)

Androctonus Ehrenberg in Hemprich & Ehrenberg, 1828 (part), pl. II, fig. 1–2, 4–5, 8.

Type species. *Scorpio australis* Linnaeus, 1758.

Diagnosis. Adults 50–110 mm in length. Carapace subrectangular, granulate, with distinct anterior submedian, superciliary, central median, central lateral and posterior median carinae, the latter two usually not fused into a lyre configuration. Five pairs of lateral eyes, in type 5 pattern (Loria & Prendini, 2014). Sternum type 1 (Soleglad & Fet, 2003), relatively small, and markedly triangular in shape. Tergites granulate, I–VI with 1–3 carinae, VII with 5 carinae. Sternites III–VI smooth, spiracles narrow, slit-like; sternite VII with 4 carinae; metasoma I with 10 carinae, II–III with 8–10 carinae, V with 5 carinae. Metasomal segments robust, wide and deep, with strong carinae. Metasoma I–IV with dorsal carinae elevated posteriorly and dorsomedian furrow excavated; metasoma V with dorsal carinae granulate. Posterior margins of tergite/ sternite V, and metasoma I–III with microsetal fringes. Telson vesicle pyriform, lacking subaculear tubercle; aculeus stout, long, strongly curved. Chelicerae with typical buthid dentition (Vachon 1963), fixed finger with two denticles on ventral surface. Pedipalps orthobothriotaxic, type Aβ (Vachon 1974, 1975): femur with d_2 on dorsal surface, e_2 distal to d_5; patella with d_3 internal to dorsomedian carina; chela with Eb_2 proximal to Eb_1, *eb* on proximal fixed finger, *db* in middle region of fixed finger, *db* proximal to or level with *est*, *dt* and *it* located on distal fixed finger. Pedipalp femur with dense, compact distal external macrosetal cluster (Lowe & Tang, 2024). Dentate margins of fixed and movable chela fingers with 9–16 linear, non-imbricated subrows of denticles, each flanked by single internal and external accessory denticles. Movable finger typically with 3 large subterminal denticles. Fixed and movable fingers with two pairs of subterminal Cruz-Armas sensilla, distal pair elongate (Lowe & Fet, 2024). Male fingers with or without lobe/ notch combination on basal dentate margins. Pectines with fulcra and internal fulcra, lacking accessory internal fulcra, basal teeth and basal middle lamella unmodified. Pectinal tooth counts: ♂ 24–37, ♀ 19–29. Legs III–IV with tibial spurs. Legs I–III typically with bristle combs on tarsomere I. All legs with two submedian rows of macrosetae on ventral surface of telotarsus, and prolateral and retrolateral pedal spurs. Hemispermatophore with moderately long trunk, capsule with 3-lobed sperm hemiduct, basal lobe hook-like, flagellum folded with shorter, broader pars recta, and longer, narrower pars reflecta.

Androctonus crassicauda (Olivier, 1807)
(Figures 1–74, 344, Table 1)

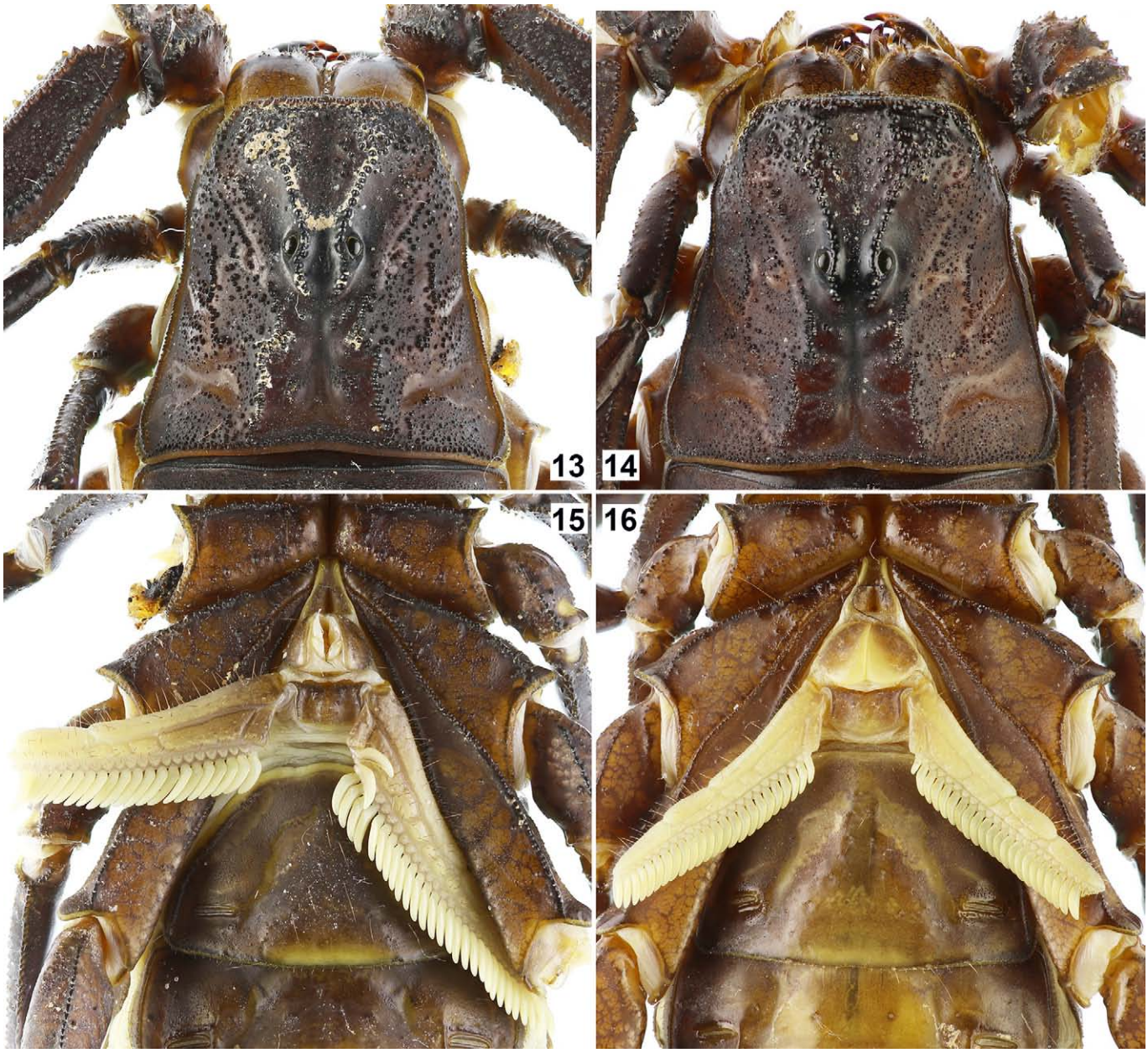
Scorpio crassicauda Olivier, 1807: 97, pl. XLII, fig. 2.
Androctonus crassicauda: Kraepelin, 1891: 175 (in part); Fet & Lowe, 2000: 72 (in part) (complete reference list until 1998); Vignoli et al., 2003: 2, 4, tab. 1; Yağmur, 2021: 4, 16, fig. 69 (nec 70); Al-Khazali & Yağmur, 2023: 3; Yağmur, 2023: 18–19; Barahoei et al., 2025: 4–6, (in part), figs. 1–2, S2, fig. S3 (in part); Yağmur et al., 2025b: 1762.

Type locality and type depository. **Iran**, *Esfahan Province*, Kashan County, 11 km NW of Kashan Town (South of Ab Shirin Village), 34.091°N 51.53°E, 898 m a. s. l.; AZMM.

Type material examined (AZMM). **Iran**, *Esfahan Province*, Kashan County, 11 km NW of Kashan Town (South of Ab Shirin Village), 34.091°N 51.53°E, 898 m a. s. l., 5.VII.2019, 1♂ (neotype hereby designated), leg. E. A. Yağmur & M. Moradi, AZMM/Sco-2019:1.

Other material examined. **Iran**, *Esfahan Province*, Kashan County, 11 km NW of Kashan Town (South of Ab Shirin Village), 34.091°N 51.53°E, 827 m a. s. l., 2♂, 5.VII.2019, leg. E. A. Yağmur & M. Moradi, AZMM/Sco-2019:2, FKCP. Kashan County, Kashan Town, 34.090833°N 51.530000°, 897 m a. s. l., 1♀, 6.VII.2019, E. A. Yağmur & M. Moradi, AZMM/Sco-2019:17. *Zanjan Province*, Exact locality unknown, 2015, 2♂1♀, AZMM/Sco-2015:67-69.

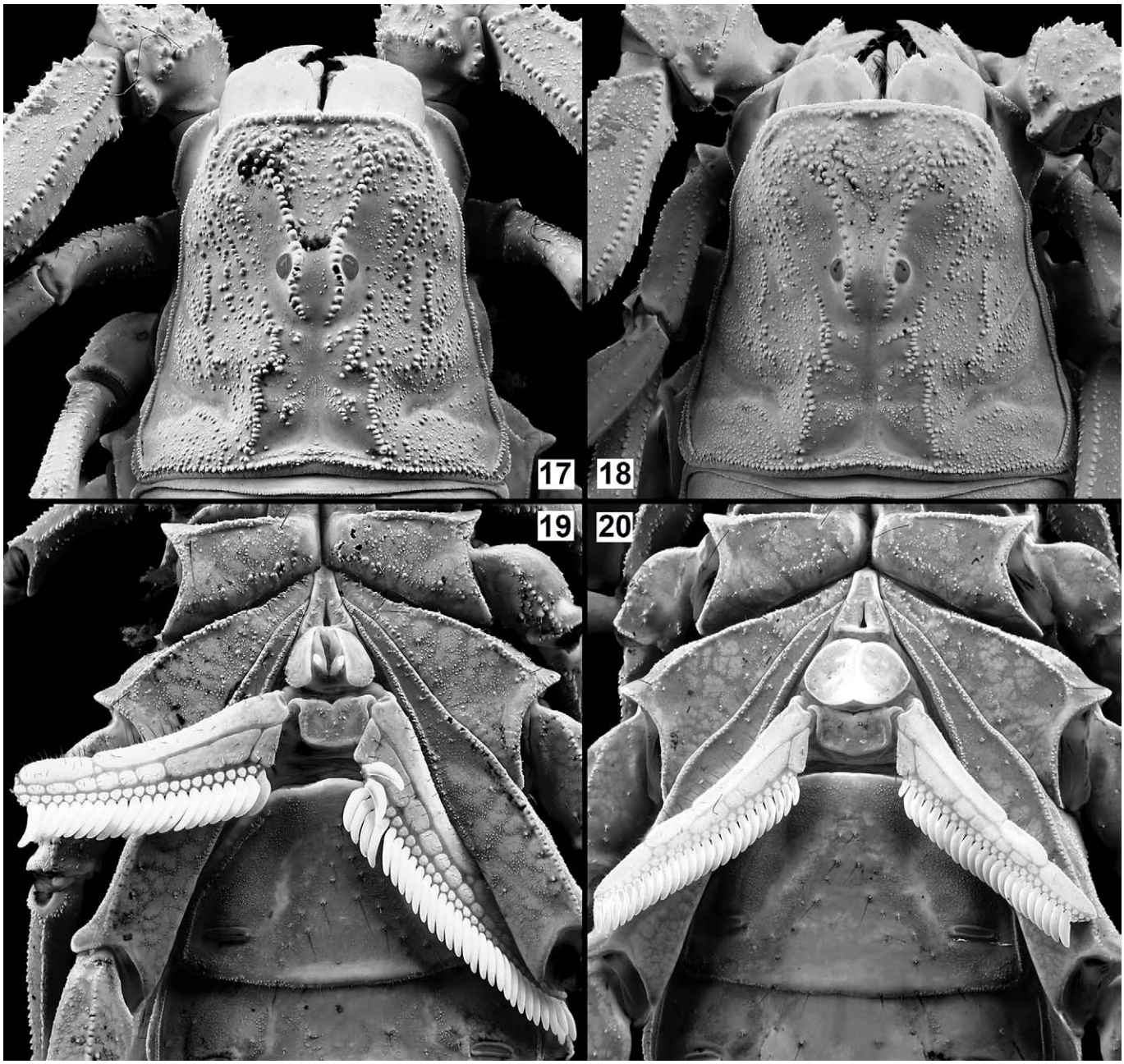
Diagnosis ♂♀. Adults 65–85 mm in length. Base color uniformly blackish-brown to black. Trichobothrium *et* located between *est* and *dt*, proximal to *dt*; *est* located approximately midway between between *et* and *db*. Pectinal tooth count 26–32 in males, 24–26 in females. Metasoma II–IV with ventral and lateral surfaces granulate, dorsally smooth; metasoma I dorsally finely granulated. Metasoma I–V with 10-8-8-8-



Figures 13–16: *A. crassicauda*. **Figure 13**, **15**. Male neotype. **Figure 14**, **16**. Female topotype. **Figures 13–14**. Carapace. **Figures 15–16**. Sternopectinal area.

5 carinae; metasoma II–III with lateral inframedian carinae absent, represented by only 3–4 denticles on posterior part. Metasoma I–II and IV–V longer than wide, metasoma III wider than long; metasoma IV length/ width ratio 1.05–1.09 in both sexes. Metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V without enlarged denticles. Sternite V with smooth patch, large in adult males, slightly smaller in females; sternite VII finely granulated with 4 granulated carinae. Pedipalp chela somewhat thick and slightly wider than patella. Pedipalp fixed and movable fingers with 13–15 rows of denticles, each flanked by external and internal accessory denticles, fingers with basal lobe/notch combination. Fingers elongated, chela narrow with length/width ratio 3.82–4.17 in both sexes. Tarsomere I of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description ♂♀. **Coloration** (Figs. 1–4, 74). Base color dark brown to blackish-brown. *Carapace*. Blackish-brown in male, dark reddish-brown in female; carinae and granules black. Area surrounding and between the median eyes black. *Chelicerae*. Manus lustrous brownish-yellow with dark brown reticulations in male, yellowish-brown with blackish-brown reticulations in female; fingers reddish-brown to dark brown, with reddish-brown teeth. *Pedipalps*. Femur and patella blackish-brown dorsally, dark reddish-brown ventrally; carinae and granules black. Chela manus lustrous, very dark

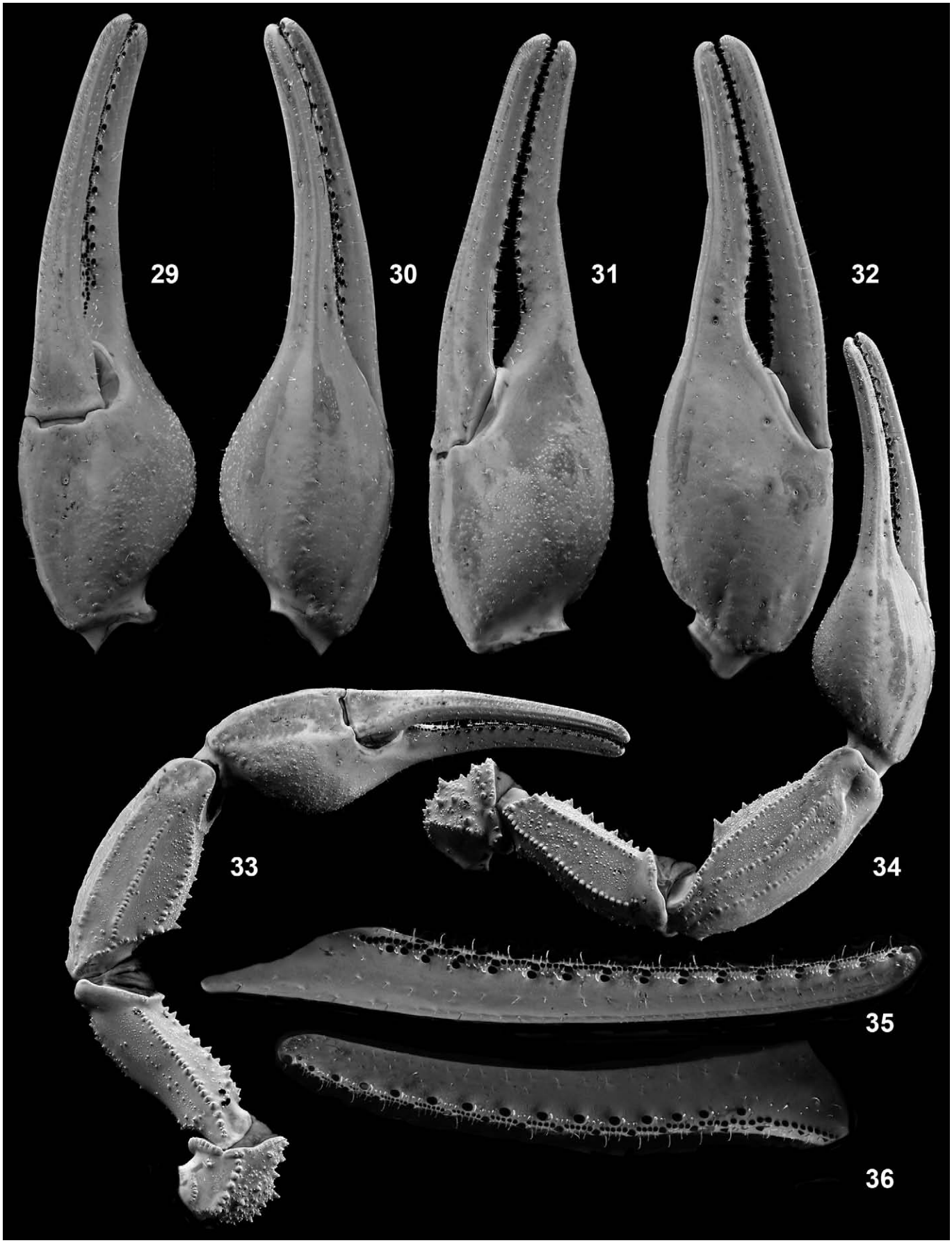


Figures 17–**20**: *A. crassicauda*, under UV fluorescence. **Figures 17**, **19**. Male neotype. **Figure 18**, **20**. Female topotype. **Figures 17**–**18**. Carapace. **Figures 19**–**20**. Sternopectinal area.

reddish-brown with brownish-black spots and reticulations; fingers brownish-black, dorsal and ventral margins and fingertips yellow. Denticles reddish-black. *Legs*. Tarsi dark yellow, other segments dark brown. *Mesosoma*. Blackish-brown in male; dark reddish-brown in female. Sternites III-V yellowish-brown; poststernites pale yellow medially in male, brownish-yellow, pale yellow to light brownish-yellow medially in female. Sternites VI-VII dark brown in male, reddish-brown in female. Coxae yellowish-brown with dark brown reticulations. Sternum brown, margins pale yellow. Genital operculum pale yellow to light brown. Pectines pale yellow. *Metasoma*. Segments I-V dark reddish-brown to blackish-brown. Carinae brownish-black. *Telson*. Vesicle brownish-black in male, reddish-brown in female. Aculeus: reddish-brown at base, reddish-black at tip.

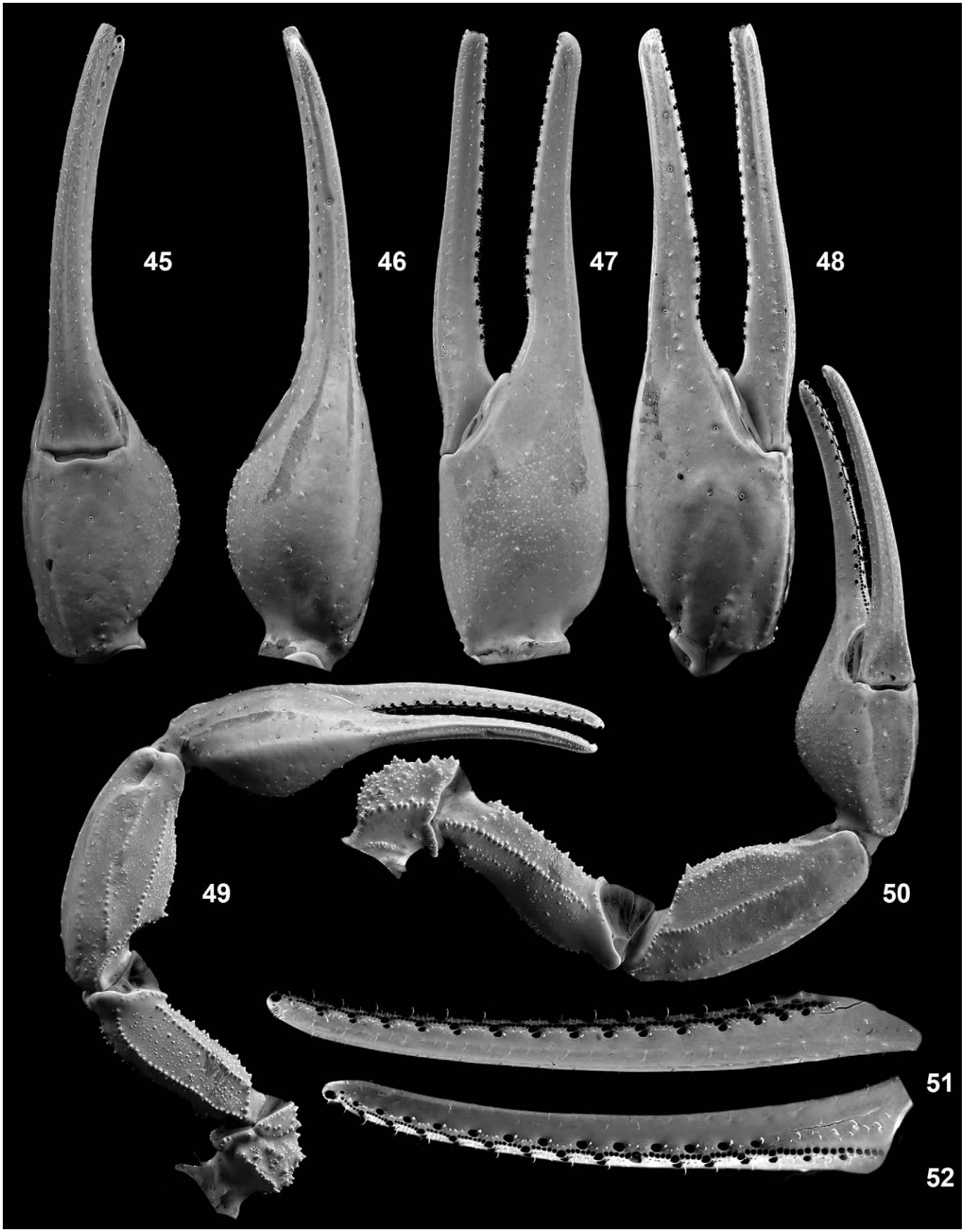
Carapace and mesosoma (Figs. 5–20). *Carapace*. Trapezoidal, wider than long. Carinae strong with coarse granules in male, and moderate sized granules in female. Intercarinal area densely covered with coarse granules in male, densely covered with medium to minute-sized granules in female. Anterior area with large rounded granules, regions between posteromedian carinae and between median eyes mostly smooth, bearing several fine granules. Anterior margin almost straight and crenulate, bearing several stout macrosetae and a row of large, rounded granules. All furrows moderate in depth. Median ocular tubercle located slightly anterior to

Figures 21–**28**. *A. crassicauda*, male neotype, pedipalp segments. Chela ventral (21), dorsal (22), internal (23) and external (24) views. Pedipalp ventral (25) and dorsal (26) views. Movable (27) and fixed (28) fingers dentition. Trichobothrial pattern is indicated by white circles in Figures 21–26.

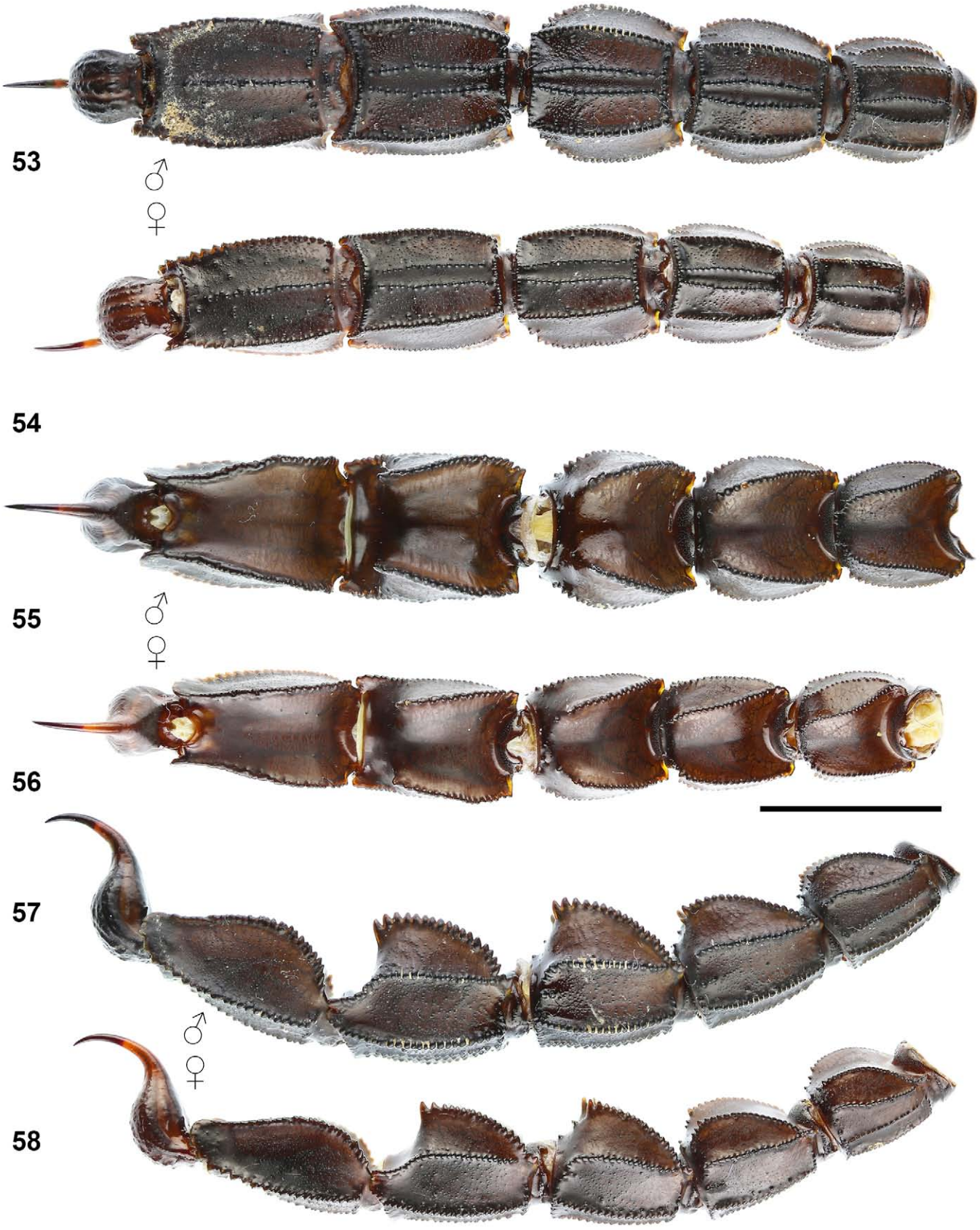


Figures 29–**36**. *A. crassicauda*, male neotype, pedipalp segments under UV fluorescence. Chela ventral (29), dorsal (30), internal (31) and external (32) views. Pedipalp ventral (33) and dorsal (34). Movable (35) and fixed (36) fingers dentition.

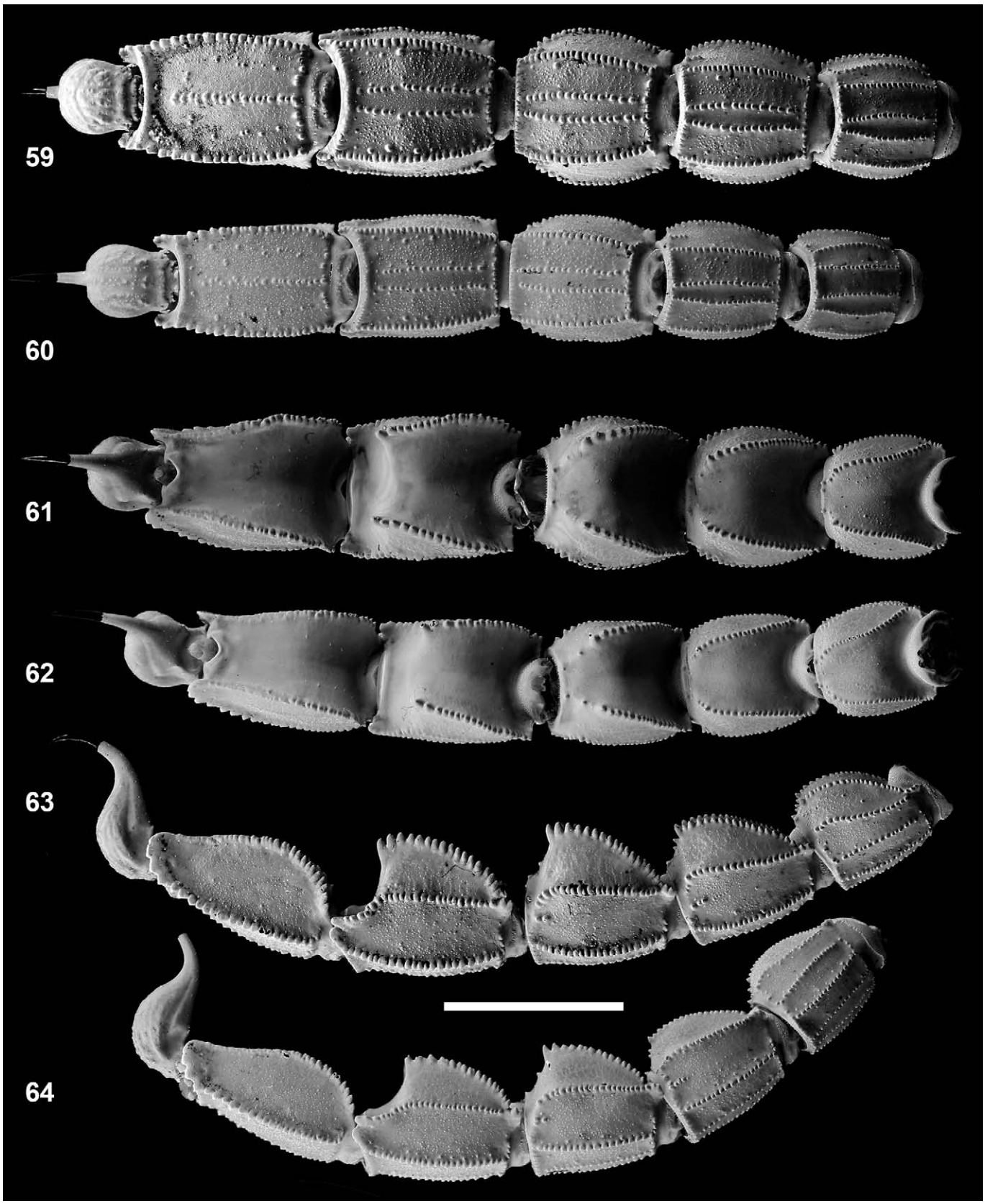
Figures 37–44. *A. crassicauda*, female topotype, pedipalp segments. Chela ventral (37), dorsal (38), internal (39) and external (40) views. Pedipalp dorsal (41) and ventral (42). Movable (43) and fixed (44) fingers dentition. Trichobothrial pattern is indicated by white circles in Figures 37–42.



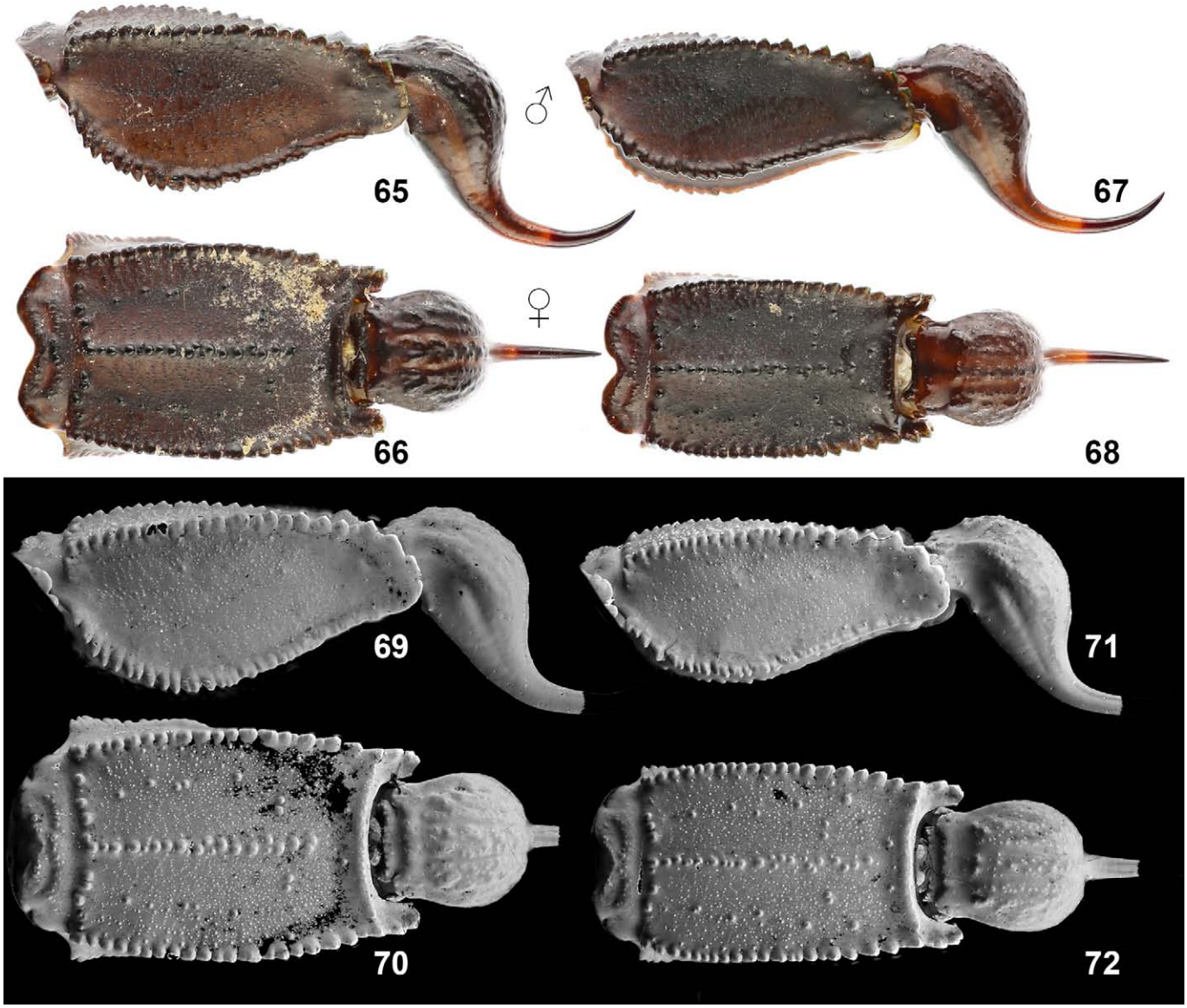
Figures 45–**52**. *A. crassicauda*, female topotype, pedipalp segments, under UV fluorescence. Chela ventral (45), dorsal (46), internal (47) and external (48) views. Pedipalp ventral (49) and dorsal (50). Movable (51) and fixed (52) fingers dentition.



Figures 53–58: *A. crassicauda*, metasoma and telson. **Figures 53**, **55**, **57**. Male neotype, ventral (53), dorsal (55), and lateral (57) views. **Figures 54**, **56**, **58**. Female topotype, ventral (54), dorsal (56), and lateral (58) views. Scale bar: 10 mm.



Figures 59–**64**: *A crassicauda*, metasoma and telson, under UV fluorescence. **Figures 59**, **61**, **63**. Male neotype, ventral (59), dorsal (61), and lateral (63) views. **Figures 60**, **62**, **64**. Female topotype, ventral (60), dorsal (62), and lateral (54) views. Scale bar: 10 mm.



Figures 65–**72**: *A. crassicauda* metasoma V and telson, under white light (65–68) and under UV fluorescence (69–72). **Figures 65**, **66**, **69**, **70**. Male neotype. **Figures 67**, **68**, **71**, **72**. Female topotype. **Figures 65**, **67**, **69**, **70**. Lateral views. **Figures 66**, **68**, **70**, **72**. Ventral views.

center of carapace (ratio of distance from center of the median eyes to anterior margin of carapace, to carapace length is 0.43 in male, 0.44 in female). Median eyes separated by a distance equivalent to two ocular diameters. Five pairs of lateral eyes: the first three moderate in size, aligned, and located above an area with moderate granulation; the last two vestigial. *Sternopectinal area*. Sternum typical for the genus (Type 1), triangular and narrow, longer than wide, bearing several fine granules. Genital operculum longitudinally divided into two semi-oval plates. Pectines long, narrow, and densely setose; in male, extending beyond the leg IV coxa-trochanter joint; in female, barely reaching it. Pectinal tooth count 26–32 in males and 24–26 in females, each comb with 3 marginal and 9–10 median lamellae. Basal plate heavily sclerotized and wider than long; anterior margin with a strong median indentation, posterior margin broadly convex. *Tergites*. Tergites I-VI with three distinct granular carinae (median and paired submedian), bearing coarse, rounded granules that do not extend beyond the posterior margin; submedian carinae reduced on tergites I–II. Pretergites of tergites I–VI densely covered with fine granules. Posttergites I-VI densely covered with coarse, rounded granules in male, and moderately covered with moderately coarse and somewhat flattened granules in female. Posterior margins of tergites I–VI with a row of coarse, somewhat elongate and slightly pointed granules. Tergite VII pentacarinate, with median, paired submedian and paired lateral carinae; all carinae strong and coarsely granular; median and submedian carinae bear rounded granules, while lateral carinae bear spinoid granules. Submedian and lateral carinae not fused, a median carina present on anterior half. The intercarinal area of tergite VII densely covered with granules of varying sizes. *Sternites*. All sternites very sparsely setose. Sternites III–VI smooth medially, with fine granule patches laterally. Sternite VII densely granular with fine granules.

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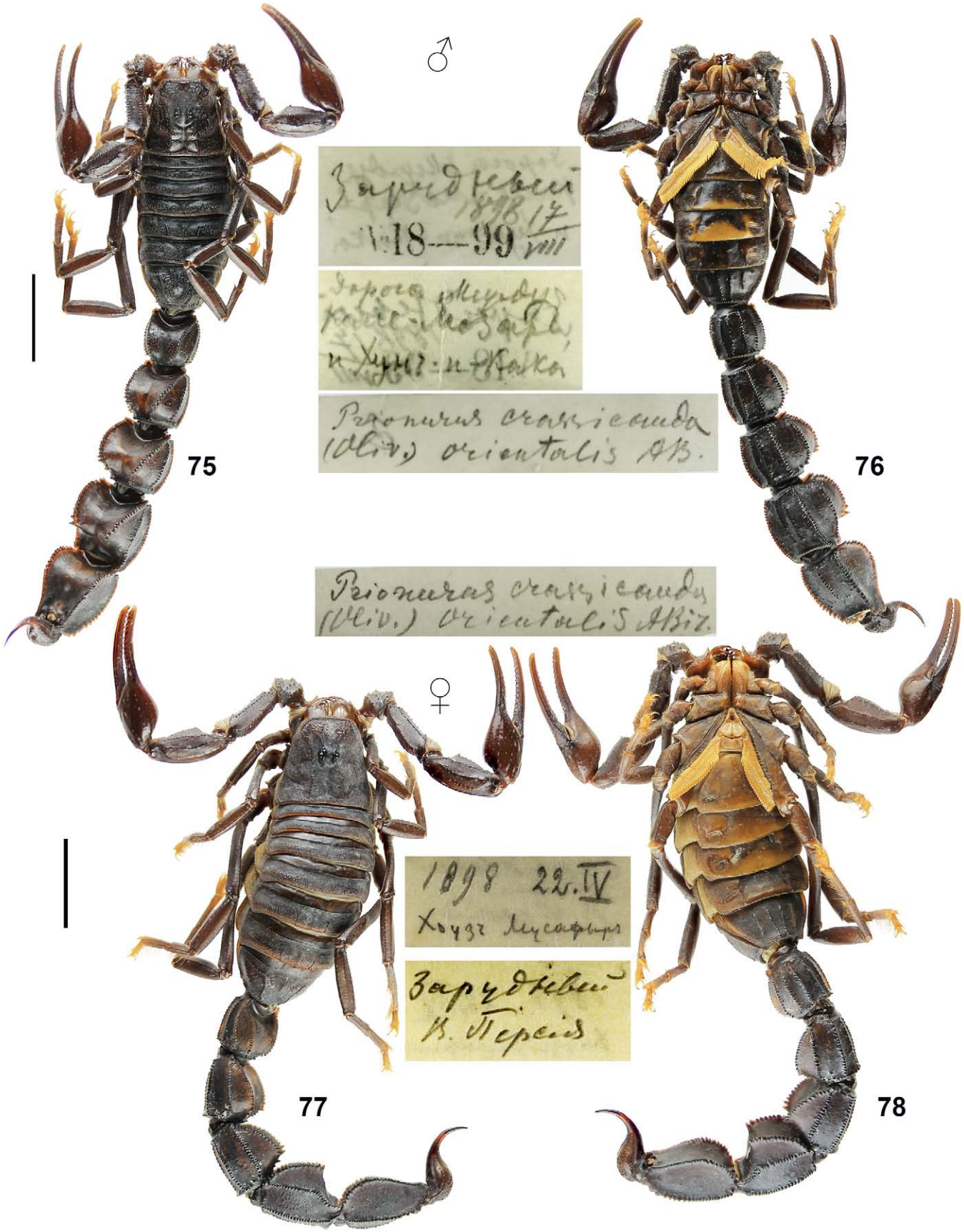
Figures 73–**74**: *A. crassicauda*, male neotype**. Figures 73**: Tibia, basitarsus and tarsus of right legs I–IV. **Figure 74**: In vivo habitus.



Figures 75–78: *A orientalis* **stat. n**. **Figures 75–76**. Lectotype male, dorsal (75) and ventral (76) views. **Figures 77–78**. Paralectotype female, dorsal (77) and ventral (78) views. Scale bar: 10 mm.

Dimensions (mm)		*A. orientalis* **stat. n.** ♂ lectotype	*A. orientalis* **stat. n.** ♀ paralectotype	*A. orientalis* **stat. n.** ♂ from Iranshahr	*A. orientalis* **stat. n.** ♀ from Iranshahr
Carapace	L / W	8.94 / 9.27	9.98 / 10.76	9.50 / 10.50	10.48 / 11.97
Mesosoma	L	16.97	25.14	20.27	30.92
Tergite VII	L / W	4.99 / 9.19	5.67 / 10.14	5.61 / 9.66	7.65 / 12.13
Metasoma + telson	L	49.58	50.65	54.25	57.55
Segment I	L / W / D	7.20 / 7.00 / 6.29	6.60 / 6.64 / 5.82	6.82 / 6.73 / 6.12	7.43 / 7.13 / 6.68
Segment II	L / W / D	7.40 / 6.70 / 6.56	7.58 / 7.15 / 6.48	7.95 / 7.54 / 6.91	8.46 / 7.74 / 7.02
Segment III	L / W / D	7.90 / 7.60 / 7.43	7.91 / 7.41 / 7.32	8.37 / 8.34 / 8.12	8.78 / 8.47 / 8.23
Segment IV	L / W / D	8.67 / 7.96 / 7.47	9.23 / 7.43 / 7.28	10.46 / 8.07 / 8.13	10.92 / 8.23 / 8.32
Segment V	L / W / D	9.85 /7.65 / 5.31	10.31 / 7.36 / 5.88	11.13 / 7.66 / 5.76	12.24 / 7.70 / 6.74
Telson	L / W / D	8.56 / 3.68 / 3.08	9.02 / 4.43 / 3.06	9.57 / 3.67 / 3.29	9.38 / 4.36 / 3.54
Pedipalp	L	32.30	32.25	33.85	35.78
Femur	L / W	7.79 / 2.38	7.42 / 2.75	7.88 / 2.62	8.18 / 3.01
Patella	L / W	9.13 / 3.67	8.98 / 3.67	9.25 / 3.68	9.80 / 4.18
Chela	L	15.38	15.85	16.72	17.80
Manus	W / D	4.13 / 3.99	4.30 / 4.30	4.20 / 4.74	4.61 / 4.96
Movable finger	L	10.34	11.00	10.88	12.35
Total	**L**	**75.49**	**85.77**	**84.02**	**98.95**

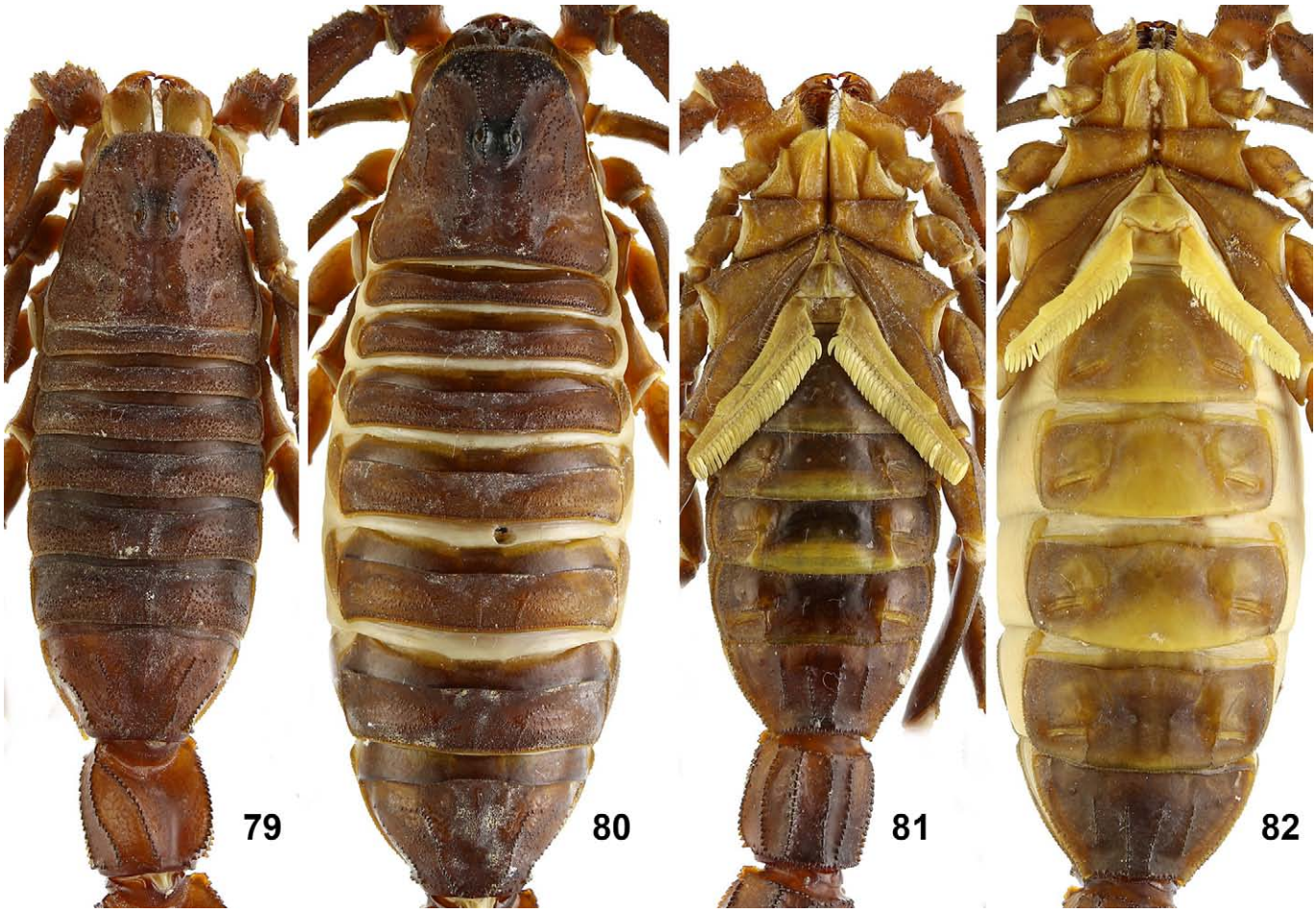
Table 2. Comparative measurements of adults of *A. orientalis* (Birula, 1900) **stat. n**. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

Sternite VI with four weak, finely granular carinae. Sternite VII with four moderate, granular carinae bearing moderately developed granules.

Chelicerae (Figs. 13–14). Dentition typical for the genus; surface of manus smooth with small, rounded granules arranged in longitudinal ridges.

Pedipalps (Figs. 21–52). *Trichobothrial pattern*. Type A, orthobothriotaxic; dorsal trichobothria of femur arranged in *β*-configuration with d_2 located on dorsal surface. *Femur*: moderately slender and straight, pentacarinate; dorsomedian, dorsoexternal, and ventrointernal carinae strong, bearing coarse, rounded granules; ventroexternal carina weak, with small sized, spaced, conical granules on anterior portion. Dorsointernal carina weak, with 7 spaced, coarse, conical and pointed granules. Dorsal intercarinal surface densely covered with granules of various sizes, while ventral intercarinal surface bears fine granules. *Patella*. Moderately slender, with eight carinae; dorsointernal carina strong and strongly crenulate, bearing four coarse, conical, and pointed granules, along with a well-developed dorsal patellar spur. Dorsal, dorsomedian, and ventromedian carinae strong, bearing coarse, rounded granules. Dorsoexternal and ventroexternal carinae moderate, bearing small, indistinct, and flattened granules. Exteriomedian carina moderate and smooth. Ventrointernal carina strong and granular, bearing coarse, pointed granules with a weakly developed ventral patellar spur. Dorsal surface densely covered with granules of various sizes, while ventral intercarinal surface bears fine granules. *Chela*. surface smooth, without carinae. Internal surface of manus densely covered with fine granules. Manus somewhat thick and wider than patella. Fingers partly curved, moderately elongated, movable finger length/manus length ratio 1.88 in male, 1.99 in female. Pedipalp movable finger without scalloping, but fixed finger with a distinct gap; fixed and movable fingers with 14–15 rows of denticles, with external and internal accessory granules, and movable fingers with three distal granules. Trichobothrium *et* located between *est* and *dt*, proximal to *dt*; trichobothrium *est* located approximately midway between *et* and *db*.

Metasoma and telson (Figs. 53–72). *Metasoma*. All segments very sparsely setose, robust. Metasoma I-II and IV-V longer than wide, metasoma III wider than long. All segments both wider and longer than deep. Widths of metasoma I-III gradually increase posteriorly. Dorsal surface finely granular on segment I and smooth on metasoma II-V. Lateral surfaces rough and finely granular, with smooth patches and reticular granulations between dorsolateral and lateral supramedian carinae on metasoma I-IV in male. Lateral surfaces with smooth patches and reticular granulations in male, finely granular in female on segment V. Ventral surfaces of metasoma I-V rough and densely granular with fine granules and bear scattered medium-sized granules. Dorsal furrow moderately wide and deep on metasoma I-V. Metasoma I–V with 10-8-8-8-5 carinae. Lateral inframedian carinae complete, strong, and coarsely granular on segment I; reduced to three coarse granules on segment II; further reduced to two coarse granules on segment III and present only in the posterior one-fourth. Dorsolateral carinae strong and serrate, with moderate sized granules, sizes gradually increasing posteriorly on segments I–II, and terminating in a single large conical granule. Carinae on segment III



Figures 79–82: *A. orientalis* **stat**. **n**. **Figure 79**, **81**. Male. **Figure 80**, **82**. Female. **Figures 79–80**. Carapace and tergites. **Figures 81–82**. Sternopectinal area and sternites.

coarsely granular, serrate to dentate, with granules gradually increasing in size and length posteriorly, terminating in three large conical granules. Carinae on segment IV coarsely dentate with large conical and somewhat elongated granules, which also gradually increase in size and length posteriorly; anterior portion distinctly serrate with pointed, subspinoid granules, posterior portion granular, bearing rounded and flattened granules on segment V. Granules on dorsolateral carinae of segments I–V larger in male than in female. Lateral supramedian and ventrolateral carinae strong and granulate on segments I–IV; granules moderate and rounded on segments I–II, coarse and rounded on segments II-IV. Ventrolateral carinae strong and coarsely granular, bearing gradually increasing, semi-pointed subspinoid granules posteriorly, without enlarged denticles on segment V. Ventral submedian carinae moderate, with moderate-sized, rounded granules on segment I, and coarse, rounded granules on segments II–IV. Ventromedian carina on segment V moderate, bearing coarse, rounded granules, not bifurcate. Anal arch with two large, rounded lobes distolaterally, the inferior lobe twice as large as the superior one and partially divided. *Telson*. Slender, lacking setae, length/width ratio 2.28 in male, 2.29 in female. Vesicle small, somewhat elongated, vesicle width/depth ratio 1.18 in male, 1.22 in female, narrower than segment V; surface glossy and rough, bearing several flattened granules two smooth furrows. Aculeus long and thin, about as long as vesicle, abruptly curved.

Legs (Fig. 73). Legs long, slender, covered by dense macrosetae. Basitarsi of legs I-III with bristle combs; basitarsus of leg IV without bristle combs. Proventral and retroventral basitarsal (pedal) spurs present and distinct. Tibial spurs present on legs III and IV and indistinct. Basitarsus and telotarsus of legs I-IV ventrally with long spine-like setae arranged in two rows.

Measurements. See Table 1.

Androctonus orientalis (Birula, 1900), **stat**. **n**.

(Figures 75–121, 344, Table 2)

Prionurus crassicauda orientalis Birula, 1900: 355–356.

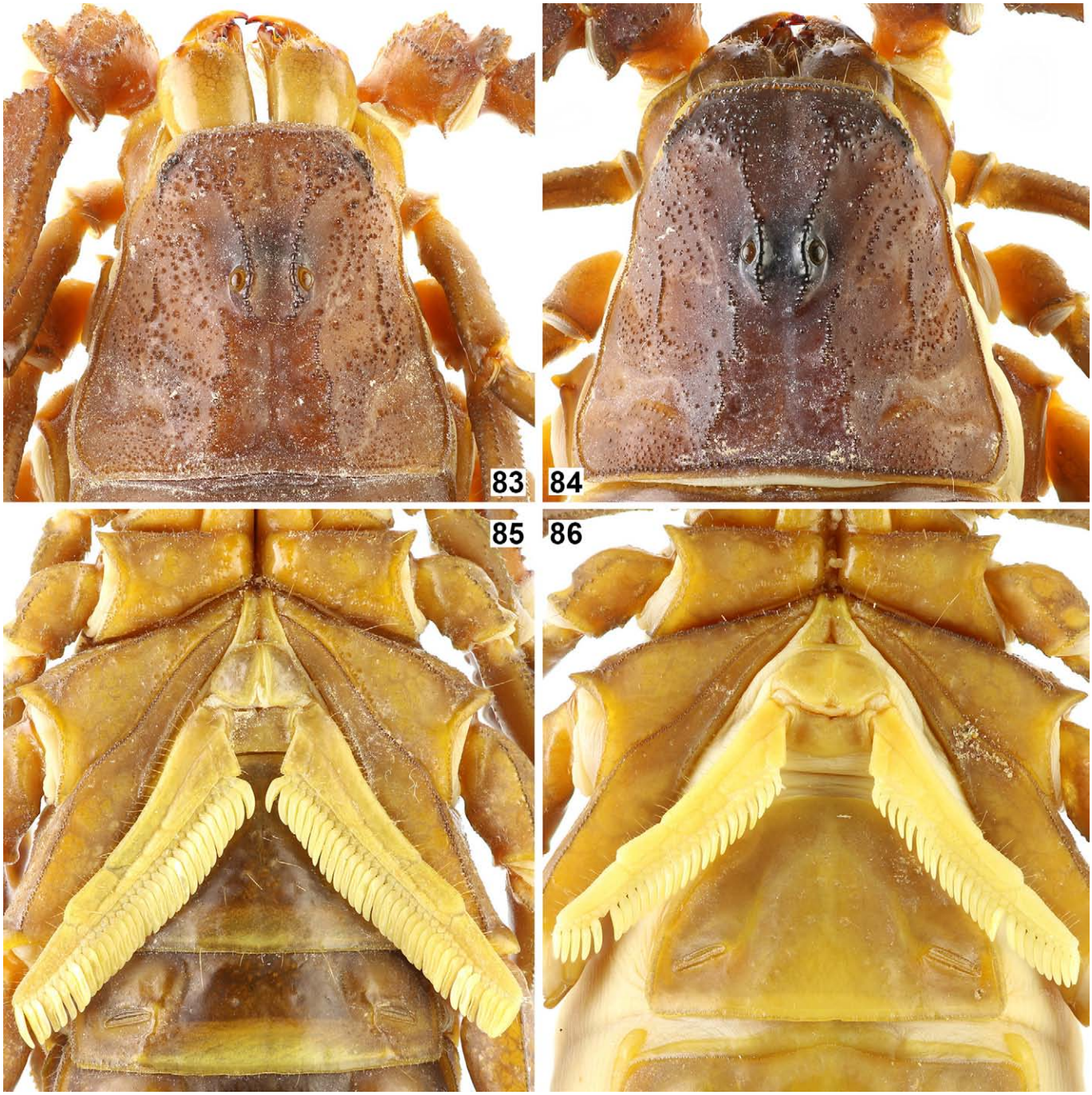
Buthus (*Prionurus*) *crassicauda orientalis*: Birula, 1903: 67–68; Birula, 1917: 93, 240.

Androctonus crassicauda orientalis: Vachon, 1958: 124; Vachon, 1966: 210; Habibi, 1971: 42; Perez, 1974: 18.

Androctonus crassicauda: Navidpour et al, 2013: 3–4.

= *Androctonus rostami* Barahoei et al., 2025b: 53–57, figs. 3-7. **Syn**. **n**.

Androctonus crassicauda (in part): Navidpour et al, 2011: 3, figs. 4, 10, 17–20.



Figures 83–86: *A, orientalis* **stat. n**. **Figure 83**, **85**. Male. **Figure 84**, **86**. Female. **Figures 83–84**. Carapace. **Figures 85–86**. Sternopectinal area.

Type locality and type depository. **Iran**, *Sistan and Baluchestan Province*, Khun-kaka (Khun-i-Kaka); ZISP.

Type material examined (ZISP). **Iran**, *Sistan and Baluchestan Province*, Khun-kaka (Khun-i-Kaka), 28.29°N 60.38°E, 17.VIII.1898, 1♂ (lectotype hereby designated, Figs. 75–76, 103–105, 114, 116, 118, 120), leg. N. Zarudny, ZISP 42; South Khorassan, Sirkuh (now Zirkuh District), Chous-Muzafyr (now Howz-e Mozaffari), 22.IV.1898, 1♀ (paralectotype, Figs. 77–78, 106–108, 115, 117, 119), leg. N. Zarudny, ZISP 41.

Other material examined. **Iran**, *Hormozgan Province*, Beshagerd Mts., Davari vil., 26.45°N 57.63°E, 6-11.IV.2000, 1juv., leg. V. Siniaev & A. Plutenko, FKCP; Lengeh Port, 27.13°N 55.82°E, 12 m a. s. l. (Locality No. HO-142), V.2009, 1♀, leg. Masihipour, Hayader and Habibzadeh, FKCP; Hassan Langi env., 60km E Bandar Abbas, 27.37°N 56.77°E, 124 m a. s. l., 25.V.2014, 1♀, leg. P. Kučera, FKCP. *Kerman Province*, Jupar road, 30.12°N 57.19°E, 1819 m a. s. l. (Locality No. KE-29), V.2009, 1♀im., leg. Koohpaye, Jamalizadeh and Ebrahimi, FKCP; 5 km NW of Fahrej, 28.98°N 58.83°E,

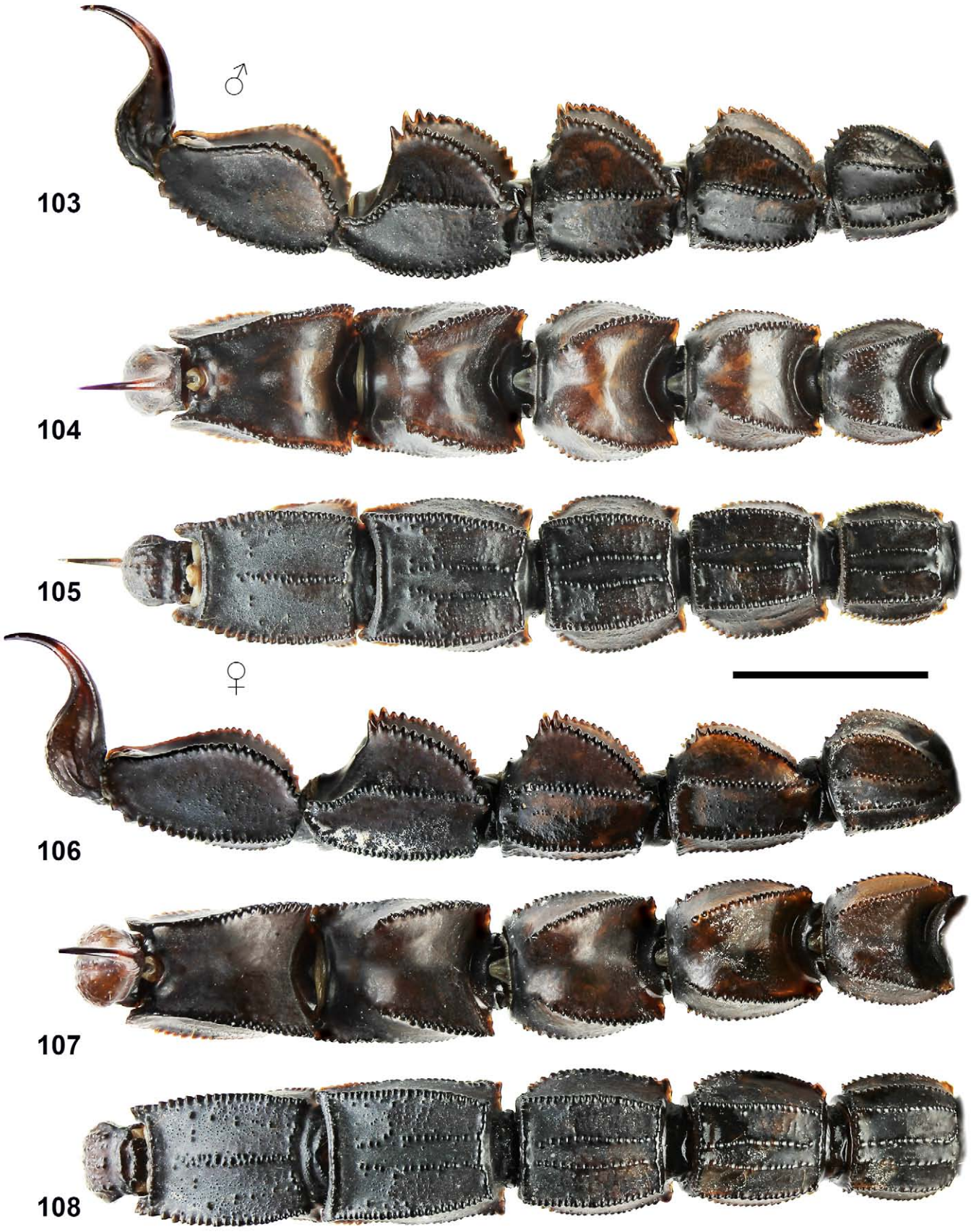
Figures 87–**94**. *A. orientalis* **stat**. **n**., male, pedipalp segments. Chela ventral (87), dorsal (88), internal (89) and external (90) views. Pedipalp ventral (91), dorsal (92). Movable (93) and fixed (94) fingers dentition. Trichobothrial pattern is indicated by white circles in Figures 87–92.

Figures 95–102. *A. orientalis* **stat**. **n**., female, pedipalp segments. Chela ventral (95), dorsal (96), internal (97) and external (98) views. Pedipalp dorsal (99), ventral (100). Movable (101) and fixed (102) fingers dentition. Trichobothrial pattern is indicated by white circles in Figures 95–100.

620 m a. s. l., 6.V1997, 1♂, leg. M. Kaftan, FKCP; Zarand, 30.79°N 56.59°E, 1678 m a. s. l. (Locality No. KE-36), V.2009, 1♂, leg. Koohpaye, Jamalizadeh et Ebrahimi, FKCP. *Sistan and Baluchestan Province*, Chabahar, Voshnam Morid Village, 25.765833°N 60.850556°E, 61 m a. s. l., 15.III.2019, 1♂3 juvs., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2019:22-25; Dalgan, Ahmadabad Village, 26.674444°N 60.102500°E, 996 m a. s. l., 9.VII.2018, 1♂4♀, 25.X.2019, 1♀, 12.IX.2019, 1juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:245-249, AZMM/Sco-2019:26–27; Dalegan, Central, 27.574167°N 59.436944°E, 416 m a. s. l., 11-15.III.2018, 3♂4♀, 11.VIII.2018, 4♂, 4.V.2019, 2♂4♀1juv., 26.VIII.2019, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:250-256, AZMM/Sco-2018:257-260, AZMM/Sco-2019:28-35; Dalegan, Malekabad Village, 27.433333°N 59.433333°E, 385 m a. s. l., 11.VIII.2018, 1juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:261; Dalegan, Darab Village, 26.823611°N 59.074722, 579 m a. s. l., 15.VIII.2019, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2019:36; Sarbaz, Afshan Village, 26.652500°N 61.690278°E, 1012 m a. s. l., 9.IX.2018, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:262; Sarbaz, Soldan village, 26.153333°N, 61.786389°E, 252 m a. s. l., 1.IX.2018, 1juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:263; Iranshahr, Abtar Village, 27.216667°N 60.883333°E, 678 m a. s. l., 29.VII.2018, 1♂2♀1juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:264-267; Iranshahr, Bampur Village, 27.202500°N 60.444167°E, 511 m a. s. l., 15.VIII.2018, 1♂, 7.IX.2019, 1♂, 3.X.2019, 1 juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:268, AZMM/Sco-2019:37-38; Iranshahr, Abbasabad village, 28.532778°N 60.032778°E, 879 m a. s. l., 20.IV.2018, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:269; Iranshahr, Central, 27.223611°N 60.663333°E, 603 m a. s. l., 3.VIII.2019, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2019:39; Iranshahr, Gazhak Village, 27.566944°N 59.900000°E, 572 m a. s. l., 3.V.2019, 1♀, 6.VIII.2018, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2019:40, AZMM/Sco-2018:270; Iranshahr, Saeid Abad Village, 27.166667°N 60.368611°E, 501 m a. s. l., 3.VIII.2019, 1♀, 15.VIII.2018, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2019:41, AZMM/Sco-2018:271; Iranshahr, Sarzeh Village, 27.207222°N 60.730833°E, 577 m a. s. l., 20.VIII.2018, 1♂, 12.X.2018, 1♂1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:272, AZMM/Sco-2018:273-274; Iranshahr, Tordan Village, 27.186944°N 60.432500°E, 513 m a. s. l., 9.VIII.2018, 2♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:275-276; Khash, Abbasabad Village, 28.285833°N 61.159167°E, 1461 m a. s. l., 4.VIII.2018, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:277; Khash, Gur Band Village, 27.555833°N 61.131944°E, 1267 m a. s. l., 11.IX.2017, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2017:27; Khash, Porchangi Village, 28.270000°N 61.800000°E, 1410 m a. s. l., 2.VIII.2018, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:278; Khash, Dadkan Village, 27.604722°N 60.958056°E, 1110 m a. s. l., 2.VIII.2018, 1juv., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:279; Nikshahr, Central, 26.227500°N 60.237778°E, 491 m a. s. l., 6.-9.VI.2018, 1♂4juvs., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:280-284; Nikshahr, Chay ghazli, 26.145556°N 59.491667°E, 1109 m a. s. l., 28.VIII.2018, 1♂, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:285; Nikshahr, Chahan Village, 26.072778°N, 59.730833°E, 777 m a. s. l., 7.IX.2018, 1♀, leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:286; Nikshahr, Takhte Malek Village, 26.446111°N 60.046111°E, 797 m a. s. l., 07.IX.2018, 2juvs., leg. M. Soltanabadi & S. M. Sarpiri, AZMM/Sco-2018:287-288.

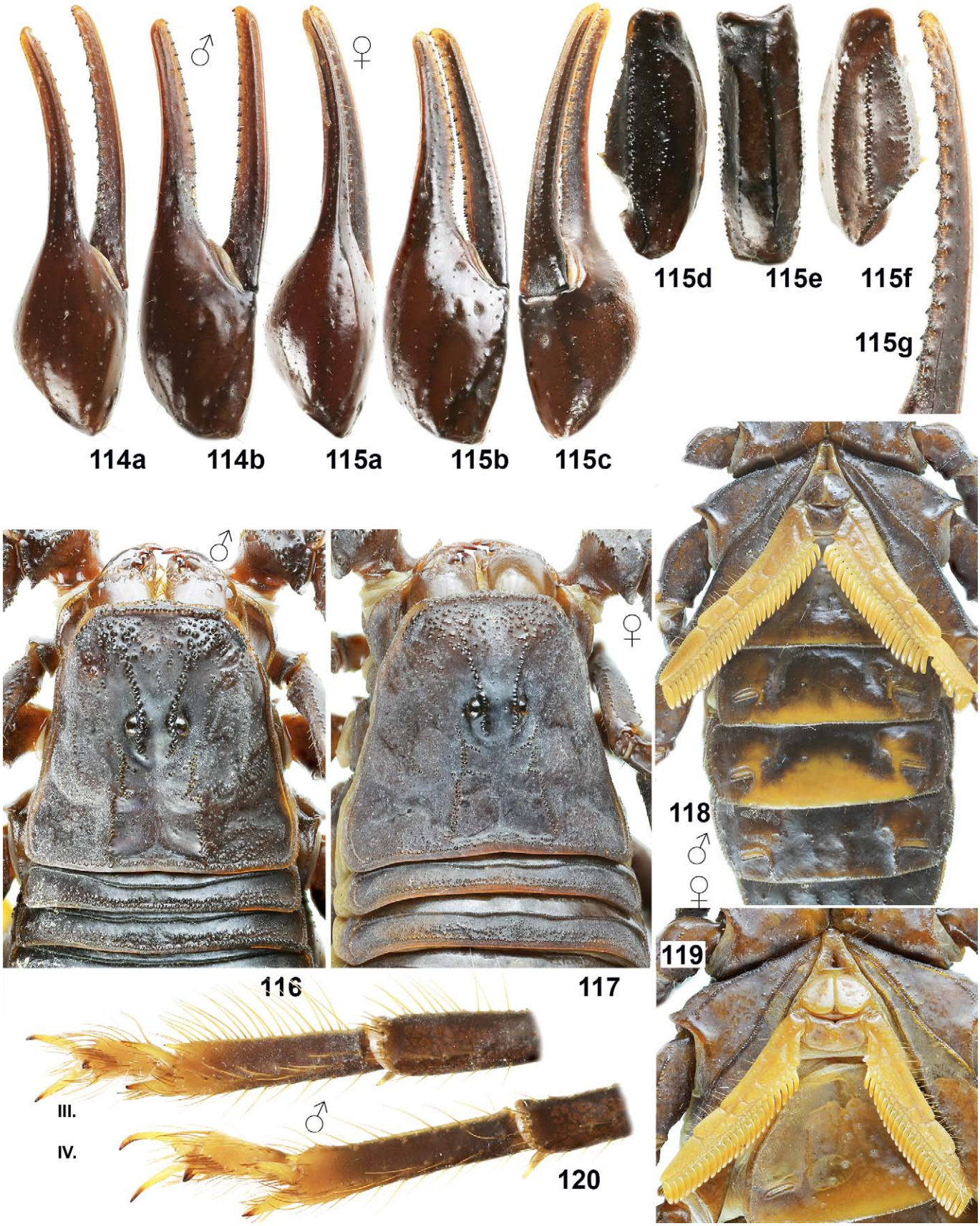
Diagnosis ♂♀. Adults 75–100 mm in length. Base color uniformly blackish-brown to black. Trichobothrium *et* located between *est* and *dt*, proximal to *dt*; trichobothrium *est* located approximately midway between *et* and *db*. Pectinal tooth count 28–34 in males, 23–26 in females. Metasoma II–IV with ventral and lateral surfaces granulate, dorsally smooth; metasoma I dorsally finely granulated. Metasoma I–V with 10-8-8-8-5 carinae; metasoma II–III with lateral inframedian carinae reduced to absent. Metasoma I–V longer than wide. Metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V without enlarged denticles. Sternite V with smooth patch, visibly large in both sexes; sternite VII smooth with 4 granulated carinae. Pedipalp chela somewhat thick and little bit wider than the patella. Pedipalp fixed and movable fingers with 14–16 rows of denticles, each flanked by external and internal accessory denticles, fingers with basal lobe/notch combination. Fingers elongated, chela narrow with length/width ratio 3.86–3.98 in both sexes. Basitarsi of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description. **Coloration** (Figs. 75–78, 121). Base color dark reddish-brown to dark yellowish-brown. *Carapace*. Light brown in male, reddish-brown in female. Interocular area dark brown. Area between median eyes blackish-brown. Carinae and granules dark brown or blackish-brown. *Chelicerae*. Manus lustrous, dark yellow with light brown reticulations in male; brown with dark brown reticulations in female. Fingers reddish-yellow, with blackish-red teeth. *Pedipalps*. Femur and patella brown; carinae and granules blackish-brown. Chela manus lustrous reddish-brown with blackish-brown reticulations on external surface; fingers brown. Ventral margin of the fixed finger, dorsal margin of the movable finger, and fingertips dark yellow. Denticles reddish-black. *Legs*. Tarsi dark yellow, other segments brown with dark brown reticulations and yellowish-brown marbling. *Mesosoma*. Dark reddish-brown in male, dark yellowish-brown in female. Carinae and granules dark brown. Sternites III–V dark brown, with poststernites pale yellow medially in male; brownish-yellow to honey yellow, with dark yellow medial areas in female. Sternites VI–VII dark brown in male, yellowish-



Figures 103–**108**: *A. orientalis* **stat**. **n**., metasoma and telson. **Figures 103**–**105**. Lectotype male, lateral (103), dorsal (104), and ventral (105) views. **Figures 106**–**108**. Paralectotype female, lateral (106), dorsal (107), and ventral (108) views. Scale bar = 10 mm.

Figures 109–**113**: *A. orientalis* **stat**. **n**., metasoma V and telson (109–112), tibia, basitarsus and tarsus of right legs I–IV (113). **Figures 109**–**110**, **113** (top row). Male. **Figures 111**–**112**, **113** (bottom row). Female topotype.



Figures 114–120: *A. orientalis* **stat. n. Figures 114**, **116**, **118**, **120**. Lectotype male, pedipalp chela in dorsal (114a), and external (114b) views, carapace (116), sternopectinal area with sternites III–VI (118), and legs III–IV (120). **Figures 115**, **117**, **119**. Paralectotype female, pedipalp chela in dorsal (115a), external (115b) and ventral (115c) views, pattella in dorsal (115d), external (115e), and ventral (115f) views, movable finger dentition (115g), carapace (117), and sternopectinal area (119).

Figures 121. Male of *A. orientalis* **stat**. **n**. in vivo habitus.

brown in female. Coxae yellowish-brown. Sternum brownish-yellow. Genital operculum brown in male, brownish-yellow in female. Pectines dark yellow to brownish-yellow in male, dark yellow in female. Metasoma: Segments I–V reddish-brown; carinae blackish-brown. *Telson*. Vesicle brownish-red in male, blackish-red in female. Aculeus yellowish-red at the base, dark reddish-at the tip.

Carapace and mesosoma (Figs. 79–86). *Carapace*. Trapezoidal, wider than long. Carinae strong with coarse granules. Intercarinal area moderately densely covered with medium sized granules in male, and smaller, less dense granules in female. Anterior area with large, rounded granules. Regions between posteromedian carinae and between median eyes smooth. Anterior margin almost straight and crenulate, bearing several stout macrosetae and a row of large, rounded granules. All furrows moderate in depth. Median ocular tubercle located slightly anterior to the center of the carapace (the ratio of distance from center of median eyes to anterior margin of the carapace, to carapace length 0.46 in male, 0.41 in female). Median eyes separated by a distance equivalent to two ocular diameters. Five pairs of lateral eyes: the first three moderate in size, aligned, and located above an area with moderate granulation; the last two vestigial. *Sternopectinal area*. Sternum typical for the genus (Type 1), triangular and narrow, longer than wide, smooth. Genital operculum longitudinally divided into two semi-oval plates. Pectines long, in male, extending beyond the leg IV coxa-trochanter joint; in female, barely reaching it, narrow, and densely setose. Pectinal tooth count 28–34 in male, 23–26 in female, each comb with 3 marginal and 7–8 median lamellae. Basal plate heavily sclerotized and wider than long; anterior margin with a strong median indentation, posterior margin broadly convex. *Tergites*. Tergites I–VI with three moderately granular carinae (median and paired submedian), bearing

moderate, rounded granules that do not extend beyond the posterior margin. Submedian carinae reduced on tergites I–II. Pretergites of tergites I–VI nearly smooth, with sparse fine granules. Posttergites I–VI moderately densely covered with coarse, rounded granules in male, the granules less dense and flattened in female. Posterior margins of tergites I–VI bear a row of moderate, rounded granules. Tergite VII pentacarinate, with median, paired submedian and paired lateral carinae; all carinae strong and coarsely granular; median and submedian carinae bear rounded granules, while lateral carinae bear spinoid granules that increase gradually in size posteriorly. Submedian and lateral carinae not fused, a median carina present on anterior half. Intercarinal area of tergite VII moderately densely covered with minute granules. *Sternites*. All sternites very sparsely setose. Sternites III–VII smooth, with scattered minute granules laterally. Sternite VI with two weak, finely granular carinae. Sternite VII with four moderate, granular carinae with moderately developed granules.

Chelicerae (Figs. 83–84). Dentition typical for the genus; surface of manus smooth with possesses small, rounded granules arranged in longitudinal ridges.

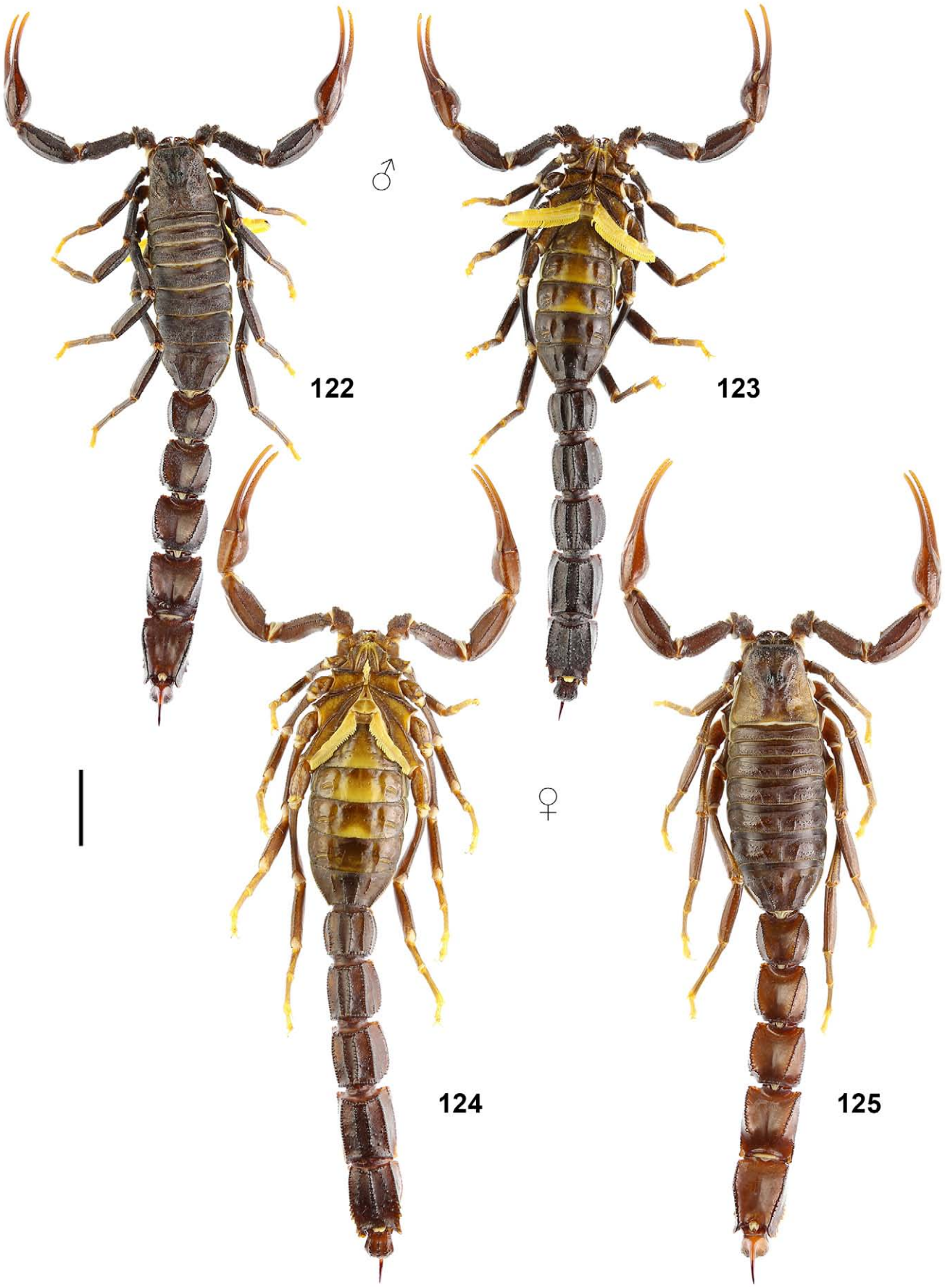
Pedipalps (Figs. 87–102). *Trichobothrial pattern*. Type A, orthobothriotaxic; dorsal trichobothria of femur arranged in *β*-configuration with d_2 located on dorsal surface. *Femur*. Moderately slender and straight, pentacarinate; dorsomedian, dorsoexternal, and ventrointernal carinae strong, bearing coarse, rounded granules; ventroexternal carina weak and almost smooth, with a few small, spaced, subspinoid granules posteriorly. Dorsointernal carina weak, with 8–9 spaced, coarse, conical, pointed granules. Dorsal intercarinal surface moderately densely covered with granules of various sizes; ventral intercarinal surface almost smooth, bearing a few scattered minute granules and a granule row on the anterior third. *Patella*. Moderately slender, with eight carinae; dorsointernal carina strong and crenulate, bearing four coarse, subspinoid, pointed granules, along with a well-developed dorsal patellar spur. Dorsal and ventromedian carinae strong, bearing coarse, rounded granules. Dorsomedian and ventroexternal carinae moderate, bearing small, indistinct, flattened granules. Dorsoexternal and exteriomedian carinae moderate and almost smooth. Ventrointernal carina strong and granular, bearing coarse, spaced, pointed, conical granules with a moderately developed ventral patellar spur in male, and bearing coarse, spaced, rounded granules with a moderately developed ventral patellar spur in female. Dorsal surface moderately, densely granular with fine granules, ventral intercarinal surface smooth, except for an area between ventromedian and ventrointernal carinae bearing fine granules. *Chela*. Surface smooth, without carinae; internal surface of manus densely covered with fine granules. Manus somewhat thick and wider than patella, chela width/patella width ratio 1.14 in male, 1.10 in female. Fingers moderately elongated, movable finger length/manus length ratio 1.60 in male, 1.84 in female; chela length/manus width ratio 3.98 in male, 3.86 in female and mildly curved. Movable finger with weakly developed scalloping, fixed finger with a moderately developed gap. Fixed and movable fingers with 14–16 rows of denticles, with external and internal accessory granules; movable finger also bears three distal granules. Trichobothrium *et* is located between *est* and *dt*, proximal to *dt*; trichobothrium *est* is situated approximately midway between *et* and *db*.

Metasoma and telson (Figs. 103–112). *Metasoma*. Very sparsely setose, all segments robust. Metasoma I–V longer than wide and deep, metasoma I–III and V wider than deep. Widths of metasoma I–III gradually increasing posteriorly. Dorsal surface of metasoma I can be finely granulated, of metasoma II–V smooth. Lateral surfaces rough and sparsely covered with fine granules. Ventral surfaces of metasoma I–V rough, smooth with scattered granules on metasoma I–II, sparsely granular on metasoma III, densely granular with granules of various sizes on metasoma IV, and densely granular with fine granules on metasoma V. Dorsal furrow moderately wide and deep on segments I–V. Metasoma I–V with 10-8-8-8-5 carinae. Dorsolateral carinae strong and serrate, with subspinoid granules that gradually increase in size posteriorly on metasoma I–II and terminate in a single large conical granule; coarsely serrate, with granules gradually increasing in size and length posteriorly, terminating in two large conical granules on segments III–IV; anterior portion distinctly serrate, bearing pointed and subspinoid granules, posterior portion granular with rounded and flattened granules on segment V. Granules on dorsolateral carinae of metasoma I–II larger in male than in female. Lateral supramedian and ventrolateral carinae strong and granulate on metasoma I–IV; granules moderate and rounded on metasoma I–II, coarse and rounded on metasoma II–IV. Ventrolateral carinae on segment V strong and coarsely granular, with granules gradually increasing in size posteriorly, bearing rounded, coarse granules in anterior portion, and pointed, conical granules in posterior portion, without enlarged denticles. Ventral submedian carinae moderate, with moderately sized and rounded granules on metasoma I–II, coarse and rounded granules on metasoma III–IV. Ventromedian carina on segment V moderate, bearing coarse, rounded granules, not bifurcate. Anal arch with two large, rounded lobes distolaterally; inferior lobe twice as large as superior lobe, partially divided. *Telson*. Slender, lacking setae, length/width ratio 2.60 in male, 2.15 in female. Vesicle small and somewhat elongated, vesicle width/depth ratio 1.71 in male, 1.61 in female, narrower than segment V; surface glossy and rough, bearing several flattened granules and two smooth furrows. Aculeus long and thin, about as long as vesicle, abruptly curved.

Legs (Fig. 113). Legs long, slender, covered by dense macrosetae. Basitarsi of legs I–III with bristle combs; basitarsus of leg IV without bristle combs. Proventral and retroventral basitarsal (pedal) spurs present and distinct. Tibial spurs present on legs III and IV and indistinct. Basitarsus and telotarsus of legs I–IV ventrally with long spine-like setae arranged in two rows.

Measurements. See Table 2.

Affinities. The described characters distinguish *A. orientalis* **stat**. **n**. from all other species of the genus including *A. crassicauda*, and are recounted in the key below.



Figures 122–125: *A, azerianus* **sp. n. Figures 122–123**. Male holotype, dorsal (122) and ventral (123) views. **Figures 124–125**. Female paratype, dorsal (124) and ventral (125) views. Scale bar: 10 mm.

Figures 126–129: *A. azerianus* **sp. n**. **Figure 126**, **128**. Male holotype. **Figure 127**, **129**. Female paratype. **Figures 126–127**. Carapace and tergites. **Figures 128–129**. Sternopectinal area and sternites.

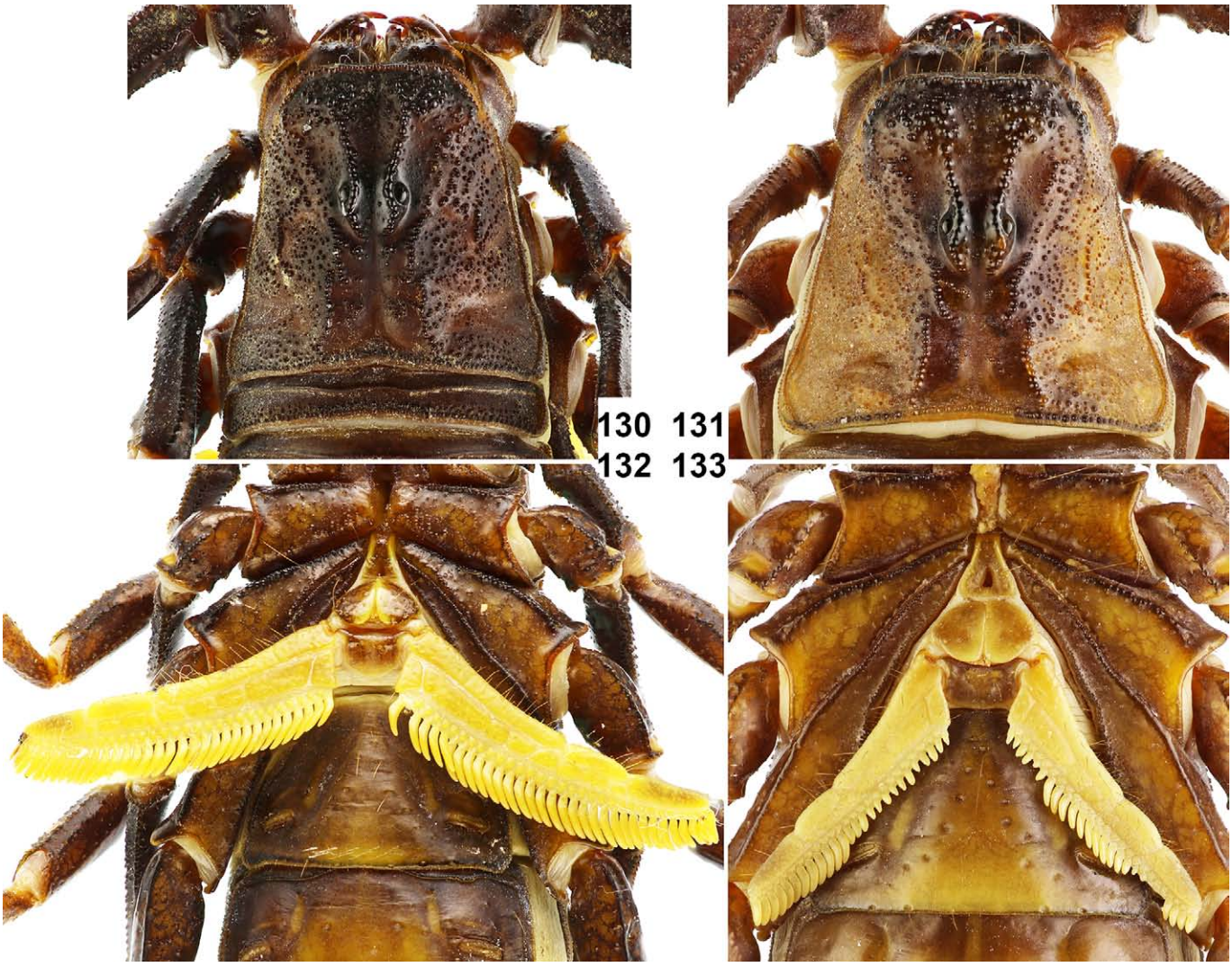
Androctonus azerianus Yağmur & Kovařík, **sp. n.**
(Figures 122–162, 344, Table 3)
http://zoobank.org/urn:lsid:zoobank.org:act:E20A6A9C-010B-4FDF-A65E-54FDDE93E795

Type locality and type depository. **Iran**, Zanjan Province, Soltanieh, Qale-ye-Soltāniye, 36.456389°N 48.797222°E, 61 m a. s. l., 1.III.2016; AZMM.

Type material. **Iran**, *Zanjan Province*, Soltanieh, Qale-ye-Soltāniye, 36.456389°N 48.797222°E, 61 m a. s. l., 1.III.2016, 1♂ (holotype), leg. M. Moradi, AZMM/Sco-2015:70; *West Azerbaijan Province*, Takab, 36.372778°N 47.141389°E, 1854 m a. s. l., 18.VII.2017, 1♂ (paratype), 10.X.2019, 2♀ (paratypes), leg. S. A. Heydarabad, AZMM/Sco-2017:15, AZMM/Sco-2019:19-20, 18.X.2018, 1♀ (paratype), leg. M. Moradi, AZMM/Sco-2018:243; Takab, Tazekand, 36.610278°N 47.218611°E, 5.X.2016, 2141 m a. s. l., 1♂1♀ (paratypes), leg. S. A. Heydarabad, AZMM/Sco-2016:42-43. *Zanjan Province*, Central, Around Zanjan Town, 36.641111°N 48.622778°E, 1745 m a. s. l., 1.X.2017, 1♂1♀ (paratypes), 1.IV-1.VI.2015, 11♂15♀7juvs. (paratypes), 1.X.2017, 1♀ (paratype), 1.V.2017, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2017:16-17, AZMM/Sco-2015:71-103, AZMM/Sco-2017:18; Central, Campus of Zenjan University, 36.693889°N 48.383889°E, 1579 m a. s. l., 1.IX.2019, 1♂ (paratype), 25.VI.2017, 1♂1♀ (paratypes), 1.IV.2014, 3♂1juv. (paratypes), 15.X.2017, 1♂ (paratype), 10.VI.2019, 1♂ (paratype), 12.X.2014, 2juvs. (paratypes), 15.VIII.2016, 1♂1♀1juv. (paratypes), leg. M. Moradi, NMPC, AZMM/Sco-2017:19-20, AZMM/Sco-2014:5-8, AZMM/Sco-2017:21, AZMM/Sco-2019:21, AZMM/Sco-2014:9-10, NMPC; Central, Yamch Village, 36.776111°N 48.207778°E, 1523 m a. s. l., 20.VI.2018, 1♀ (paratype), M. Moradi, NMPC; Khodabandeh District, 1 km west of Katale Khor Cave, 36.835000°N 48.162500°E, 1710 m a. s. l., 13.VIII.2014, 1♂ 2♀1juv. (paratypes), leg. M. Moradi, F. Ahmadi & E. A. Yağmur, AZMM/Sco-2014:11-14; Tarom, 36.926944°N 48.940278°E, 609 m a. s. l., 1.V.2017, 1♀1juv. (paratypes), 1.V.2017, 1♀ (paratype), M. Moradi, AZMM/Sco-2017:22-26; Tarom, Qalat Village, 36.915278°N 48.850833°E, 558 m a. s. l., 1.VII.2015, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2015:104.

Etymology. The specific epithet "*azerianus*" is dedicated to the Azeri people of the Zanjan Province of Iran, where the new species is recorded.

Diagnosis ♂♀. Adults 70–85 mm in length. Base color uniformly blackish-brown to black or brown. Trichobothrium *et* located between *est* and *dt*, proximal to *dt*; trichobothrium *est* located between *et* and *db*, proximal to *db*. Pectine teeth 29–33 in males, 25–27 in females. Metasoma I–V smooth with solitary granules on lateral surfaces and fine granulation on ventral surface of metasoma II–V; metasoma I–V with 10-8-8-8-5 carinae; metasoma II with lateral inframedian carinae incomplete but developed on the posterior three-fourths. Metasoma I wider than long, metasoma II–V longer than wide. Metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V with enlarged denticles. Sternite V with smooth patch in both sexes; sternite VII smooth with 4 granulated carinae. Pedipalp chela somewhat thick and slightly wider than patella. Pedipalp fixed and movable fingers with 15–17 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal



Figures 130–133: *A. azerianus* **sp. n. Figure 130**, **132**. Male holotype. **Figure 131**, **133**. Female paratype. **Figures 130–131**. Carapace. **Figures 132–133**. Sternopectinal area.

lobe/notch combination. Fingers elongated, chela narrow with length/width ratio 4.41–4.76 in both sexes; basitarsi of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description ♂♀. **Coloration** (Figs. 122–125, 161–162). Base color of all sclerites uniformly blackish-brown in male and uniformly brown in female. *Carapace*. Blackish-brown in the male, yellowish brown in the female; carinae and granules blackish-brown. Area between median eyes and anterior part of the carapace black in male, brownish-black in female. *Chelicerae*. Manus lustrous brownish-black; fingers reddish-black with reddish-brown teeth. *Pedipalps*. Femur and patella blackish-brown with black carinae and granules in the male; reddish-brown with dark reddish-brown carinae and granules in the female. The chela manus lustrous dark reddish-brown with reddish-black reticulations and reddish-brown marbling in the male, and reddish-brown with dark brown reticulations and reddish-brown marbling in the female. Fingers reddish-black; dorsal margins of fixed finger, ventral margins of movable finger, and fingertips dark yellow or light reddish-yellow. Denticles reddish-black. *Legs*. Tarsi dark yellow; other segments dark brown with yellowish-brown marbling. *Mesosoma*. Dark brown in male; dark reddish-brown in female. Sternites III–V dark brown in both sexes; poststernites dark yellow medially in male, yellowish-brown with dark yellow medial coloration in female. Sternites VI–VII dark brown in male, yellowish-brown in female. Coxae dark yellowish brown with light brown reticulations in male, and yellowish-brown with dark yellow reticulations in female. Sternum and genital operculum dark brown with pale yellow margins in male, light yellow to dark yellow in female. Pectines pale yellow. *Metasoma*. Segments I–V dark reddish-brown to blackish-brown in male, and reddish-brown in female; carinae brownish-black in male and reddish-black in female. *Telson*. Vesicle reddish-black in male, reddish-brown in female. Aculeus reddish-brown at the base and brown in the male, yellowish-red in the female; the tip reddish-black in both sexes.

Figures 134–141: *A. azerianus* **sp. n.**, male holotype, pedipalp segments. Chela ventral (134), dorsal (135), internal (136) and external (137) views. Pedipalp ventral (138) and dorsal (139) views. Movable (140) and fixed (141) fingers dentition. Trichobothrial pattern indicated by white circles in Figures 135–139.

Figures 142–149: *A. azerianus* **sp. n.**, female paratype, pedipalp segments. Chela ventral (142), dorsal (143), internal (144) and external (145) views. Pedipalp dorsal (146) and ventral (147) views. Movable (148) and fixed (149) fingers dentition. Trichobothrial pattern indicated by white circles in Figures 143–147.

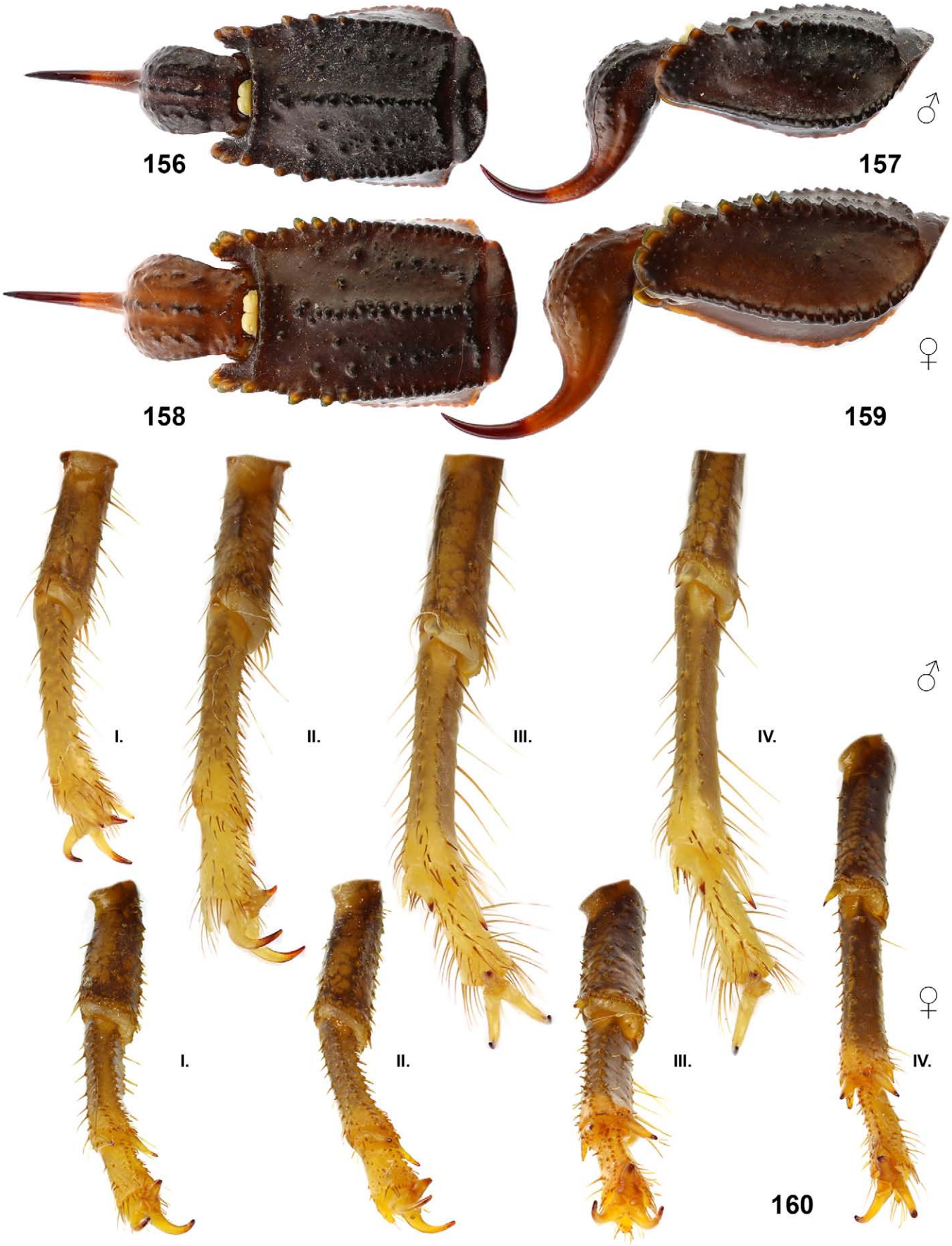
Carapace and mesosoma (Figs. 126–133). *Carapace*. Trapezoidal, slightly wider than long; carinae strong, coarsely granular. Intercarinal area covered moderately densely with coarse granules in male, granules less dense and medium sized in female. Anterior area with large, rounded granules, regions between the posteromedian carinae and between the median eyes smooth. Anterior margin almost straight and crenulate, bearing several stout macrosetae and a row of large, rounded granules. All furrows moderate in depth. Median ocular tubercle located slightly anterior to center of the carapace, the ratio of distance from center of median eyes to anterior margin of carapace, to carapace length 0.44 in male, 0.42 in female. Median eyes separated by a distance equivalent to two ocular diameters. Five pairs of lateral eyes: the first three moderate in size, aligned, and located above an area with moderate granulation; the last two vestigial. *Sternopectinal area*. Sternum typical for the genus (Type 1), triangular and narrow, longer than wide, smooth. Genital operculum longitudinally divided into two semi-oval plates. Pectines long, narrow, and densely setose; in male extending well beyond leg IV coxa-trochanter joint, reaching beyond mid-length of trochanter; in female, slightly surpassing leg IV coxa-trochanter joint. Pectinal tooth count 29–33 in male, 25–27 in female. Each comb with 3 marginal lamellae, 8–9 median lamellae. Basal plate heavily sclerotized, wider than long; anterior margin bearing a strong median indentation, posterior margin is broadly convex. *Tergites*. Tergites I–VI each with three distinct carinae (median and paired submedian), that do not extend beyond the posterior margin; submedian carinae reduced on tergites I–II. Pretergites of tergites I–VI almost smooth. Area between submedian carinae on tergites I–VI covered with granules of various sizes. Posttergites I–VI moderately densely covered with coarse, rounded granules in male, sparsely covered with flattened granules in female. Tergite VII pentacarinate, with median, paired submedian and paired lateral carinae; carinae strong and coarsely granular. Lateral carinae serrate, lateral and submedian pairs not fused. Median carina present on anterior half. Surface of tergite VII smooth in male, smooth with scattered fine granules in female. The sternites very sparsely setose. *Sternites*. Sternites III–VI smooth and lustrous, VI with two weak and weakly granular carinae. Sternite VII with four moderately developed carinae with moderately sized granules. Surface of sternite VII smooth and matte, with a few scattered, minute granules.

Chelicerae (Figs. 130–131). Dentition typical for the genus; surface of manus is smooth with small, rounded granules arranged in longitudinal ridges; anterior part of manus with some irregularly placed protrusions.

Pedipalps (Figs. 134–149). *Trichobothrial pattern*. Type A, orthobothriotaxic; dorsal trichobothria of femur arranged in *β*-configuration with d_2 located on dorsal surface. *Femur*. Moderately slender and straight, pentacarinate; dorsomedian, dorsoexternal, and ventrointernal carinae strong, bearing coarse, rounded granules; ventroexternal carina weak, bearing small, subspinoid granules in anterior portion. Dorsointernal carina also weak, with 9 spaced, coarse, conical, pointed granules. Dorsal intercarinal surface moderately densely covered with granules of various sizes medially, ventral intercarinal surface almost smooth, bearing a row of granules on anterior one-third. *Patella*. Moderately slender, with eight carinae; dorsointernal carina strong and crenulate, bearing 5–6 coarse, conical, pointed granules, along with a well-developed dorsal patellar spur. Dorsal, dorsomedian, and ventromedian carinae strong with coarse, rounded granules. Dorsoexternal and ventroexternal carinae strong, nearly smooth, and somewhat bumpy. Exteriomedian carina moderate and smooth. Ventrointernal carina strong, serratocrenulate, bearing moderate sized, fixed, rounded granules and a weakly developed ventral patellar spur in male; moderate, bearing moderate sized, spaced, rounded granules and a moderately developed ventral patellar spur in female. Dorsal and ventral surfaces nearly smooth, with sparse fine granules between dorsointernal and dorsal carinae, and between ventrointernal and ventromedian carinae. *Chela*. Surface smooth, without carinae; internal surface of manus bearing several scattered minute granules. Manus somewhat thin and wider than patella, chela width/patella width ratio 1.09 in male, 1.04 in female. Fingers moderately elongated, movable finger length/manus length ratio 1.79 in male, 2.11 in female; chela length/manus width ratio 4.41 in male, 4.76 in female and moderately curved. Movable finger with weakly developed scalloping, fixed finger with weakly developed gap. Fixed and movable fingers with 15–17 rows of denticles, with external and internal accessory granules; movable finger also bears three or four distal granules. Trichobothrium *et* located between *est* and *dt*, proximal to *dt*; trichobothrium *est* located between *et* and *db*, proximal to *db*.

Metasoma and telson (Figs. 150–159). *Metasoma*. All segments very sparsely setose, robust. Metasoma I slightly wider than long; metasoma II–V longer than wide, all segments wider than deep. Widths of metasoma I–III gradually increase posteriorly. Dorsal surface of metasoma I–V smooth, lateral surface smooth and rough, with only sparse minute granules mainly on metasoma V. Metasoma II–V finely granulated ventrally, with several coarse granules on segment V. Dorsal furrow moderately wide and deep on metasoma I–V. Metasoma I–V with 10-10-10-8-5 carinae. Lateral inframedian carinae complete and strong, with moderately sized granules on metasoma I; incomplete but present in the posterior three-fourths of metasoma II, bearing 4–5 coarse granules in the posterior quarter; reduced to 2–3 coarse granules in the posterior quarter of metasoma III. Dorsolateral carinae strong and serrate, bearing moderately sized, rounded granules on metasoma I–II; strong and serrate to dentate with coarse, rounded granules on metasoma III–IV, with granule size gradually increasing posteriorly and terminating in two large conical granules; strong and rounded, with coarse, rounded and flattened granules at anterior portion, while the posterior portion smooth on segment V. Lateral supramedian carinae strong and granular with coarse granules on metasoma I–IV. Ventrolateral carinae strong and granular with coarse granules on metasoma I–IV; strong, with granules gradually increasing in size posteriorly on segment V, two large, partially pointed and spaced denticles present

Figures 150–**155**: *A. azerianus* **sp. n.**, metasoma and telson. **Figures 150**, **152**, **154**. Male holotype, ventral (150), dorsal (152), and lateral (154) views. **Figures 151**, **153**, **155**. Female paratype, ventral (151), dorsal (153), and lateral (155) views.



Figures 156–160: *A. azerianus* **sp. n.**, metasoma V and telson (156–159) and tibia, basitarsus and tarsus of right legs I–IV (160). **Figures 156–157**, **160** (top row). Male holotype. **Figures 158–159**, **160** (bottom row). Female paratype.

Figures 161–162: *A. azerianus* **sp**. **n**. from campus of University of Zanjan, male (161) and female (162) paratypes in vivo habitus.

Dimensions (mm)		*A. azerianus* **sp. n.** ♂ holotype	*A. azerianus* **sp. n.** ♀ paratype	*A. caspius* **sp. n.** ♂ holotype	*A. caspius* **sp. n.** ♀ paratopotype
Carapace	L / W	8.29 / 8.60	9.71 / 10.42	7.81 / 8.28	11.29 / 12.60
Mesosoma	L	21.25	22.40	15.24	22.60
Tergite VII	L / W	5.49 / 8.64	5.69 / 10.51	4.32 / 8.45	6.78 / 12.08
Metasoma + telson	L	43.33	49.36	38.71	53.58
Segment I	L / W / D	5.61 / 6.01 / 5.31	6.50 / 6.64 / 5.89	5.24 / 5.58 / 5.03	7.17 / 7.63 / 7.15
Segment II	L / W / D	6.53 / 6.51 / 5.73	7.46 / 6.91 / 6.22	5.77 / 5.94 / 5.32	8.25 / 8.05 / 7.83
Segment III	L / W / D	6.91 / 6.89 / 6.25	7.62 / 7.20 / 6.77	6.07 / 6.44 / 6.00	8.43 / 8.30 / 8.43
Segment IV	L / W / D	8.26 / 6.73 / 6.28	9.09 / 6.90 / 6.85	7.12 / 6.45 / 5.78	9.62 / 8.01 / 8.61
Segment V	L / W / D	8.86 / 6.35 / 4.47	10.14 / 6.49 / 4.88	7.60 / 5.84 / 4.15	10.55 /7.97 / 5.72
Telson	L / W / D	7.25 / 3.06 / 2.61	8.55 / 3.71 / 3.04	6.91 / 2.78 / 2.28	9.56 / 4.60 / 3.34
Pedipalp	L	30.98	35.28	28.77	39.64
Femur	L / W	7.44 / 2.30	8.38 / 2.70	6.83 / 2.14	9.51 / 3.05
Patella	L / W	8.57 / 3.09	9.75 / 3.44	8.15 / 2.96	10.99 / 4.43
Chela	L	14.97	17.15	13.79	19.14
Manus	W / D	3.39 / 3.92	3.60 / 3.97	3.12 / 3.28	4.33 / 4.41
Movable finger	L	10.12	12.21	8.67	12.69
Total	**L**	**72.87**	**81.47**	**61.76**	**87.47**

Table 3. Comparative measurements of types of *A. azerianus* **sp. n.** and *A. caspius* **sp. n.**. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

in male, three apically truncate, spaced denticles in female. Ventral submedian carinae moderate, bearing moderately sized, rounded granules on metasoma I–IV. Ventromedian carina moderate, with moderately sized, rounded granules, not bifurcate, on segment V. Anal arch with two large rounded lobes on distal-lateral margin, inferior lobe twice as large as superior lobe. *Telson*. Glabrous, slender, length/width ratio 2.36 in male, 2.30 in female Vesicle small and somewhat elongated, vesicle width/depth ratio 1.17 in male, 1.22 in female, narrower than segment V. Surface of vesicle glossy and rough. Aculeus long and thin, about as long as vesicle, abruptly curved.

Legs (Fig. 160). Legs long, slender, with dense cover of macrosetae. Basitarsi of legs I–III with bristle combs; basitarsus of leg IV without bristle combs. Proventral and retroventral basitarsal (pedal) spurs present and distinct. Tibial spurs present on legs III and IV. Basitarsus and telotarsus of legs I–IV ventrally with spine-like setae arranged in two rows.

Measurements. See Table 3.

Affinities. The described characters distinguish *A. azerianus* **sp. n.** from all other species of the genus. For differentiation from species of Iran, see the key below. Metasoma II has lateral inframedian carinae incomplete but developed on the posterior three-fourths in *A. azerianus* **sp. n.** has (Figs. 154–155), whereas metasoma II has lateral inframedian carinae absent, represented by only 3–4 denticles on the posterior part in *A. ishtar* Yağmur et al., 2025, *A. kunti* Yağmur, 2023, and *A. turkiyensis* Yağmur, 2021 described from Turkey (fig. 50 in Yağmur, 2023: 14; figs. 6E–F in Yağmur et al., 2025: 1768).

Androctonus barahoeii Kovařík & Yağmur, **sp. n.**

(Figures 163–232, 341, 344, Table 4)

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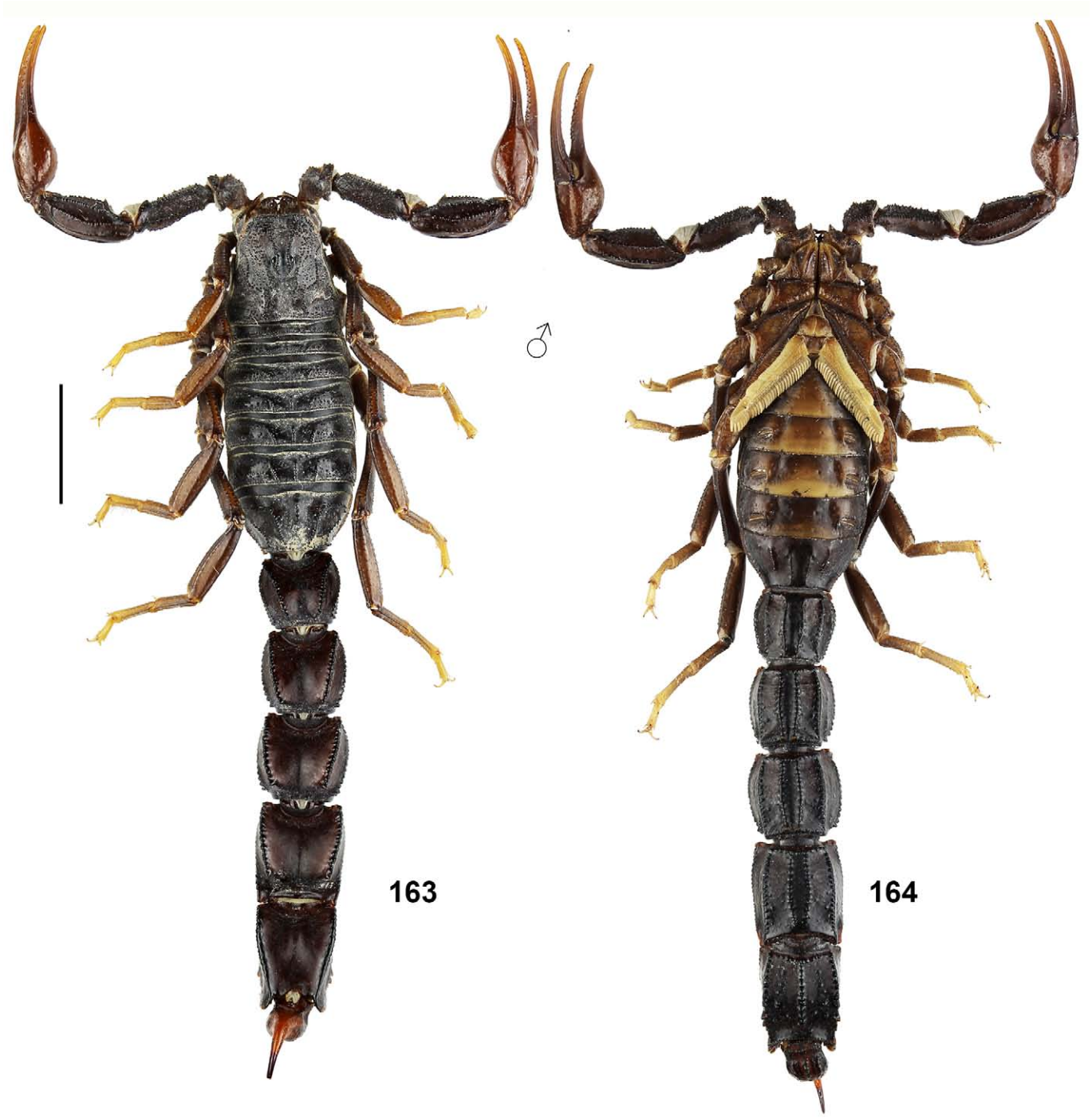
Androctonus crassicauda (in part): Navidpour et al., 2008a 5, figs. 12, 44–45; Navidpour et al, 2008b: 5: 25–28; Navidpour et al, 2008d: 3, figs. 4, 9, 15–18; Pirali-Kheirabadi et al., 2009: 3, figs. 3, 4, 12–15; Navidpour et al, 2010: 3, fig. 4; Navidpour et al, 2012: 3, fig. 6.

Androctonus cf. *crassicauda* (in part): Lowe & Tang, 2024: 3, 8, 44, figs. 11, 214, 216, 248–249.

Androctonus sumericus: Barahoei et al., 2025b: 4–6 (in part), figs. 10–11, 15, S5.

Type locality and type depository. **Iran**, *Lorestan Province*, Koohdasht, Darbe Gonbad Village, 33.70°N 47.15°E, 1310 m a. s. l.; FKCP.

Material examined. **Iran**, *Lorestan Province*, Koohdasht, Darbe Gonbad Village, 33.70°N 47.15°E, 1310 m a. s. l. (Locality No. LO-1361), X.2009, 1♂ (holotype, Figs. 163–164, 188–190, 194–205, Tab. 4), leg. A. Pahlavani, A. Bahreei & M. Bahreei, FKCP. *Bushehr Province*, ca 17km NW. Bandar-e Gonárer, 10 m a. s. l., 29.64°N 50.45°E, 1♂2juvs. (paratypes), 13.-14.X.1998, leg. P. Kabátek, FKCP; Bushehr to Dayer road, Dero Ahmad village, 27.90°N 51.60°E, 4 m a. s. l. (Locality No. Bu-27), XI.2007, 1juv.♂ (paratype), leg. Masihipour, Hayader & Habibzadeh, FKCP; *Chahar Mahal & Bakhtiyari Province*, Lordegan, Aloni village, 31.54°N 51.07°E, 1883



Figures 163–**164**. *A. barahoeii* **sp**. **n**., male holotype, dorsal (163) and ventral (164) views. Scale bar: 10 mm.

m a. s. l. (Locality No. SH-3), XII.2007, 1♀ (paratype), leg. Pirali, FKCP; *Fars Province*, Kazeroon, Farashband, 29.42°N 52.24°E, 814 m a. s. l. (Locality No. Fa-844), IX.2008, 1♂ (paratype), leg. Bahrani, Habibzadeh, Masihipour & Hayader, FKCP. *Ilam Province*, Mehran, 33.089306°N 46.137306°E, 162 m a. s. l., 10.X.2016, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2016:62; Dehloran, 32.702028°N 47.288972°E, 256 m a. s. l., 10.X.2016, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2016:63. *Khoozestan Province*, Jeiugir env., 500 m a. s. l., 32.33°N 48.51°E, 1♀3juvs.♀ (paratypes), 10.-11.X.1998, leg. P. Kabátek, FKCP; Simili env., 300 m a. s. l., 31.69°N 49.40°N, 1♂1♀ (paratypes, Figs. 165–168, 173–187, 206–220, Tab. 4), 11.-12.X.1998, leg. P. Kabátek, FKCP; Choqa Zambil, 70 m a. s. l., 32.01°N 48.52°E, 2juvs. (paratypes), 15.-16.X.1998, leg. P. Kabátek, FKCP; Andimeshk District, Bidrooyeh, Jahangiri village, 32.77°N 48.26°N (Locality No. Bi 813-1), X.2007, 2juvs. (paratypes), leg. Masihipour & Hayader, FKCP; Ahvaz, 31.381278°N 48.593361°E, 22 m a. s. l., 1.V.2016, 1♀ (paratype), leg. M. Moradi, AZMM/Sco-2016:64. *Kohgilouyeh & Boyer Ahmad Province*, Cheram, 30.74°N 50.74°E, 747 m a. s. l. (Locality No.Y-8), III.2008, 1♂ (paratype), leg. Ghafarnia, Bahrani

Dimensions (mm)		*A. barahoeii* sp. n. ♂ holotype	*A. barahoeii* sp. n. ♂ paratype from Simili	*A. barahoeii* sp. n. ♀ paratype from Simili
Carapace	L / W	8.62 / 9.23	8.06 / 7.92	7.88 / 7.68
Mesosoma	L	19.30	15.38	14.98
Tergite VII	L / W	5.59 / 9.80	4.37 / 7.89	5.02 / 8.21
Metasoma + telson	L	43.75	41.12	39.73
Segment I	L / W / D	6.00 / 6.75 / 6.04	5.53 / 6.02 / 5.55	5.16 / 5.65 / 5.20
Segment II	L / W / D	6.94 / 6.95 / 6.33	6.53 / 6.48 / 5.88	6.04 / 5.73 / 5.17
Segment III	L / W / D	7.02 / 7.44 / 7.04	6.79 / 6.99 / 6.49	6.28 / 5.96 / 5.61
Segment IV	L / W / D	8.24 / 7.26 / 6.86	7.88 / 6.82 / 6.21	7.15 / 5.84 / 5.41
Segment V	L / W / D	8.66 / 6.73 / 5.34	8.31 / 6.16 / 4.71	7.96 / 5.72 / 4.11
Telson	L / W / D	6.89 / 3.12 / 2.86	6.08 / 3.21 / 2.85	7.14 / 2.97 / 2.59
Pedipalp	L	29.39	27.25	25.50
Femur	L / W	6.88 / 2.38	6.37 / 2.23	5.85 / 2.22
Patella	L / W	8.40 / 3.29	7.74 / 3.31	7.38 / 3.00
Chela	L	14.11	13.14	12.27
Manus	W / D	3.48 / 3.79	3.59 / 3.74	2.53 / 2.82
Movable finger	L	9.57	9.07	8.72
Total	**L**	**71.67**	**64.56**	**62.59**

Table 4. Comparative measurements of types of *A. barahoeii* **sp. n.**. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

& Habibzadeh, FKCP. *Markazi Province*, Lajrood village, 34.02°N 49.30°E, 1926 m a. s. l. (Locality No. M-102), V.2014, 1♀juv. (paratype), leg. Masihipour, Hayader and Behmam, FKCP; Delijan-Mahalat, 33.87°N 50.47°E, 1610 m a. s. l. (Locality No. M-103), V.2014, 1♂1♀ (paratypes, Figs. 169–172, 191–193, 221–232), leg. Masihipour, Hayader and Behmam, FKCP.

Etymology. The specific epithet honors Hossein Barahoei for his contributions to knowledge of the scorpions of Iran.

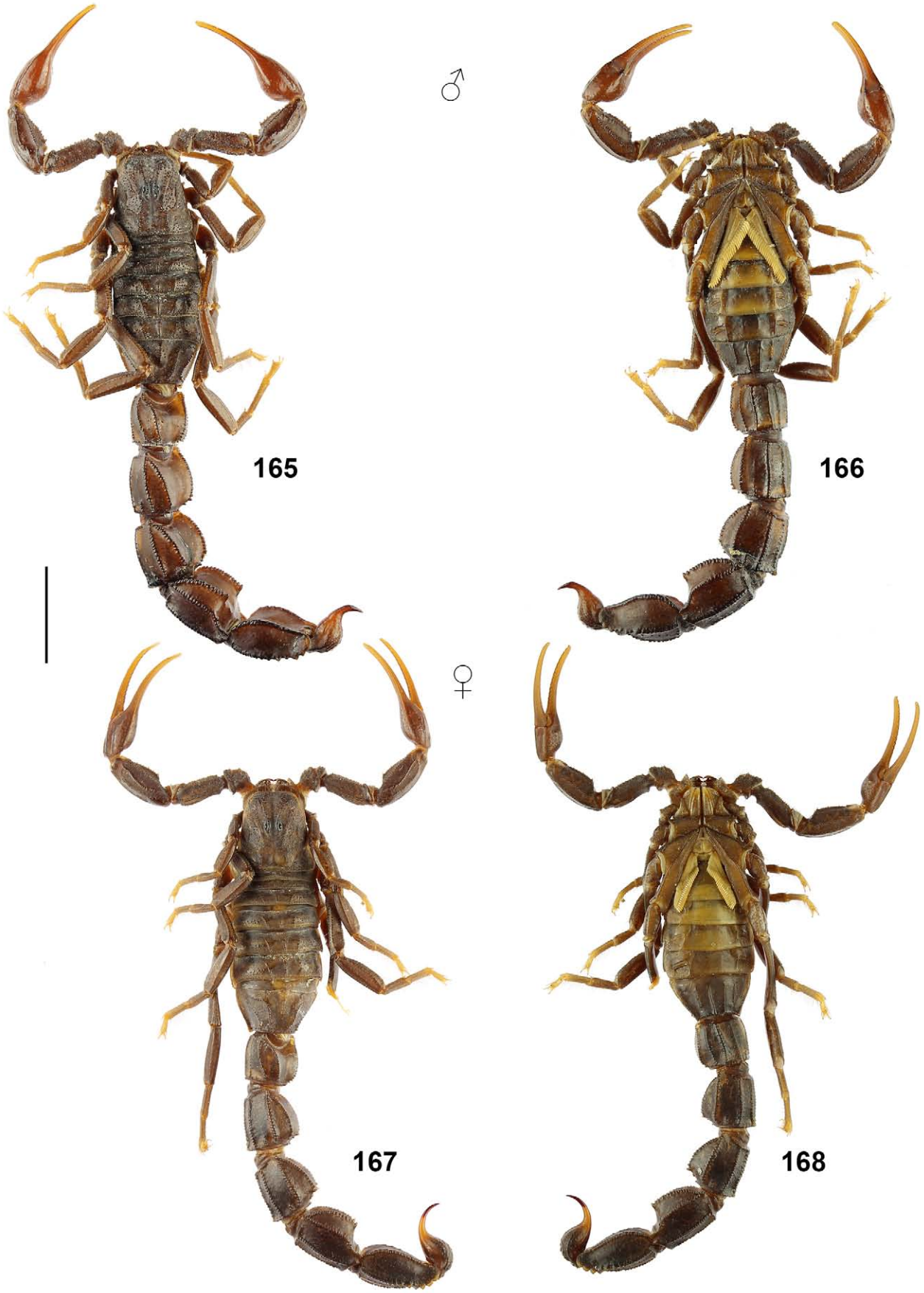
Diagnosis ♂♀. Adults 60–75 mm in length. Base color uniformly blackish-brown to black. Pectinal tooth count 29–33 in males, 20–25 in females. Metasoma II–IV with ventral surfaces granulate, metasoma I–IV laterally and dorsally smooth; metasoma I–V with 10-8-8-8-5 carinae; metasoma II with lateral inframedian carinae absent, represented by only 3–4 denticles on the posterior part. Metasoma IV length/width ratio 1.13–1.23 in both sexes; metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V with enlarged denticles. Sternite V with smooth patch, large in both sexes; sternite VII with 4 developed granulated carinae. Pedipalp chela smooth. Pedipalp fixed and movable fingers with 13–15 rows of denticles, each flanked by external and internal accessory denticles, fingers with basal lobe/notch combination. Fingers elongated, chela narrow with length/width ratio 3.6–4.1 in males, 4.7–4.8 in females. Basitarsi I of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description ♂♀. Adults are 60–75 mm in length, habitus as shown in Figs. 163–168; distribution and positions of trichobothria on pedipalps as shown in Figs. 194–196, 198–199, 202–203.

Coloration (Figs. 163–170). Base color uniformly blackish-brown to black. Tarsi of legs dark yellow, basitarsus and pretarsus brown.

Carapace and mesosoma (Figs. 169–176). Carapace trapezoidal, wider than long, entire surface covered with granules of different sizes, denser in males; carinae typical for the genus, granulose; anterior margin nearly straight, bearing 10–12 symmetrically distributed, stout spiniform macrosetae. Tergites coarsely granulated posteriorly in both sexes; tergite VII granulated, pentacarinate, with paired lateral carinae strong and serratocrenulate; tergites I–VI tricarinate. Pectine marginal tips extend to around end of sternite IV in males, and to half of sternite IV in females. Pectinal tooth count 29–33 in males, 20–25 in females, each comb with 3 marginal lamellae, 6–8 middle lamellae; lamellae and fulcra with numerous dark macrosetae. Sternum standard for the genus. Sternite III smooth in the middle and finely granulate posteriorly, other sternites smooth with several solitary granules on lateral margins; sternite VII with four developed granulated carinae; spiracles very elongate, slit-like; sternite V with large, widely subtriangular, conspicuously pale smooth patch, present also on sternites III–IV.

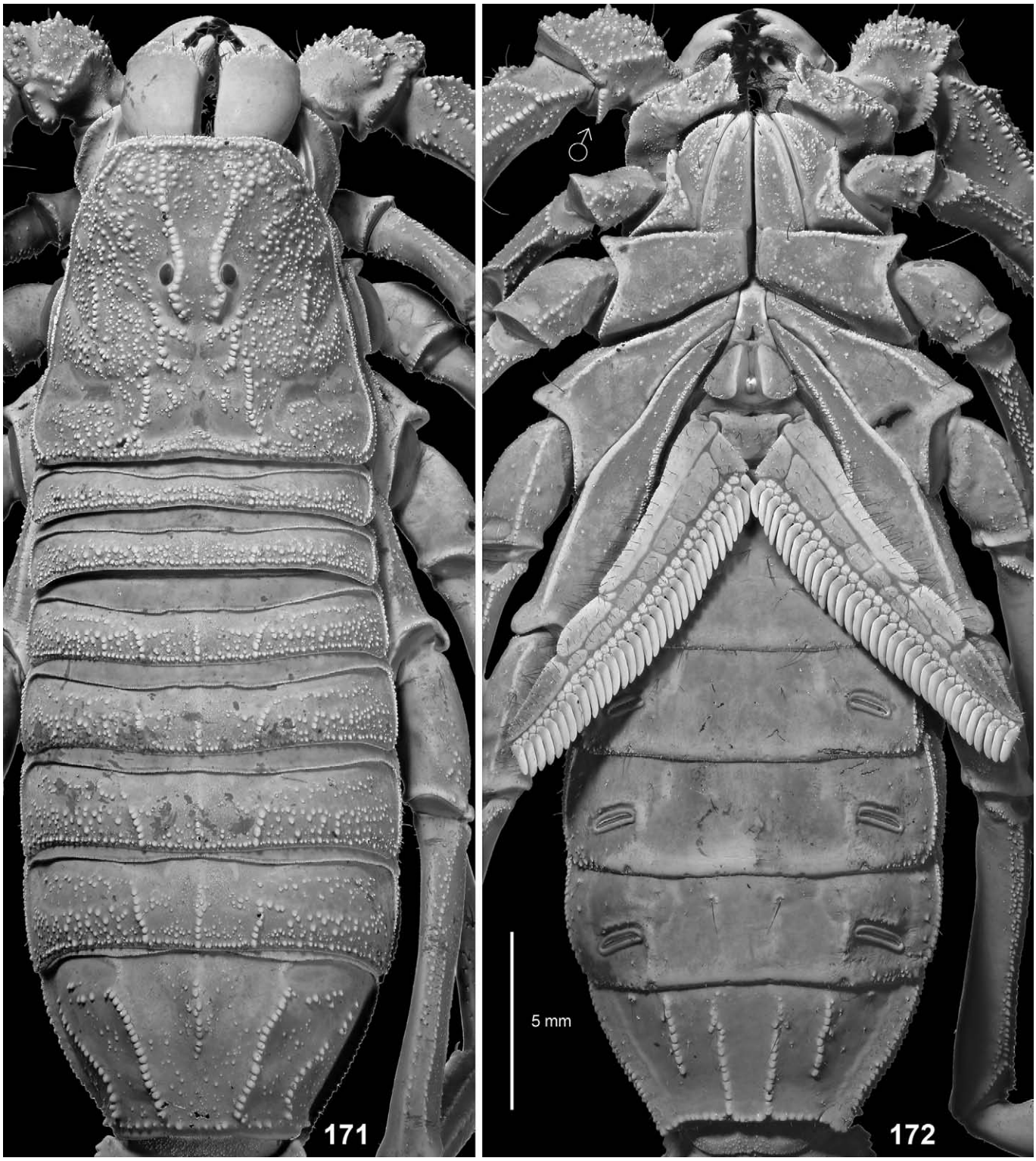
Metasoma and telson (Figs. 181–193). Metasoma very sparsely setose, all segments moderately robust and deep; metasoma I–III wider than long, IV–V longer than wide, all segments wider than deep; metasoma I with 10 granulated



Figures 165–**168**: *A. barahoeii* **sp. n.**, Iran, Khoozestan Province, Simili env. **Figures 165**–**166**. Male paratype, dorsal (165) and ventral (166) views. **Figures 167**–**168**. Female paratype, dorsal (167) and ventral (168) views. Scale bar: 10 mm.

Figures 169–**170**. *A. barahoeii* **sp**. **n**., male paratype from Iran, Markazi Province, Delijan-Mahalat, 33.87°N 50.47°E., Carapace and tergites (169) and sternopectinal area and sternites (170).

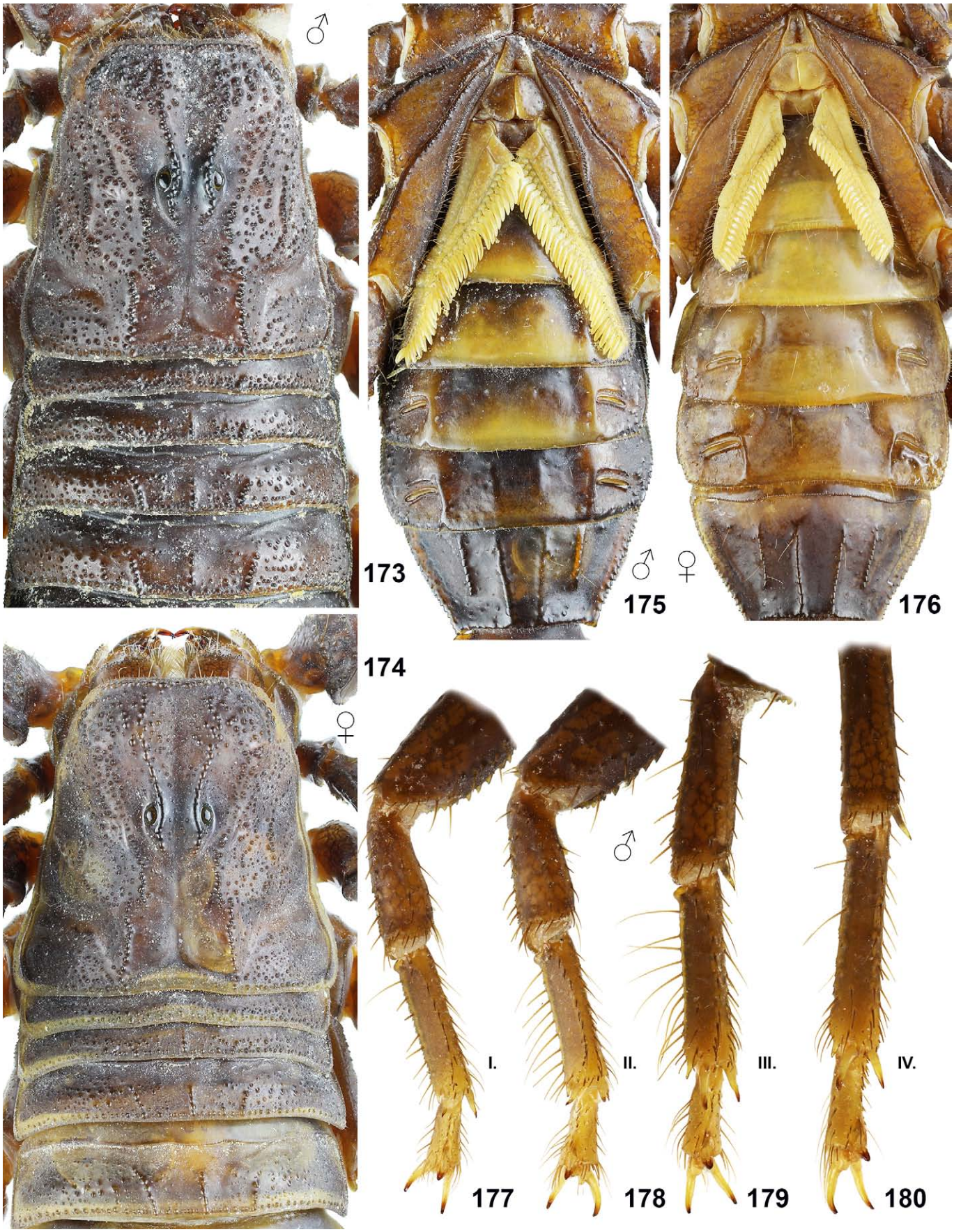
carinae, II–IV with 8 granulated carinae, metasoma II with lateral inframedian carinae absent, represented by only 3–4 denticles on posterior part; metasoma V with 5 carinae; dorsal carinae of metasoma I–IV composed posteriorly of angulate denticles, posterior-most denticle enlarged; metasoma II–V with ventral surfaces granulate, metasoma I–V laterally and dorsally smooth, rarely with several solitary fine granules on lateral surfaces; ventrolateral carinae on metasoma V with



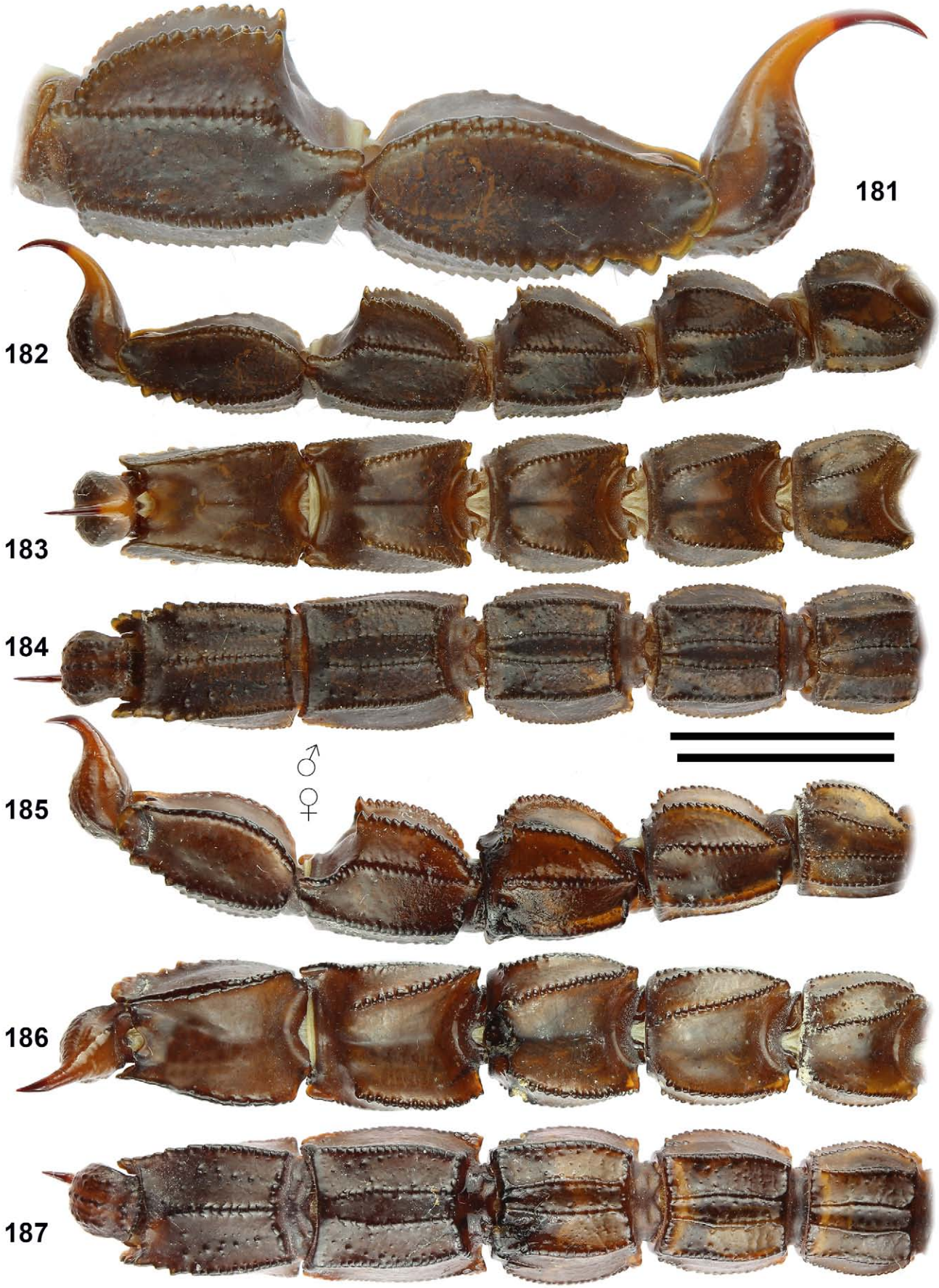
Figures 171–172. *A. barahoeii* **sp. n.**, male paratype from Iran, Markazi Province, Delijan-Mahalat, 33.87°N 50.47°E., carapace and tergites (169) and sternopectinal area and sternites (170) under UV fluorescence.

enlarged denticles. Telson slender, vesicle small and flat, aculeus about as long as vesicle, strongly curved.

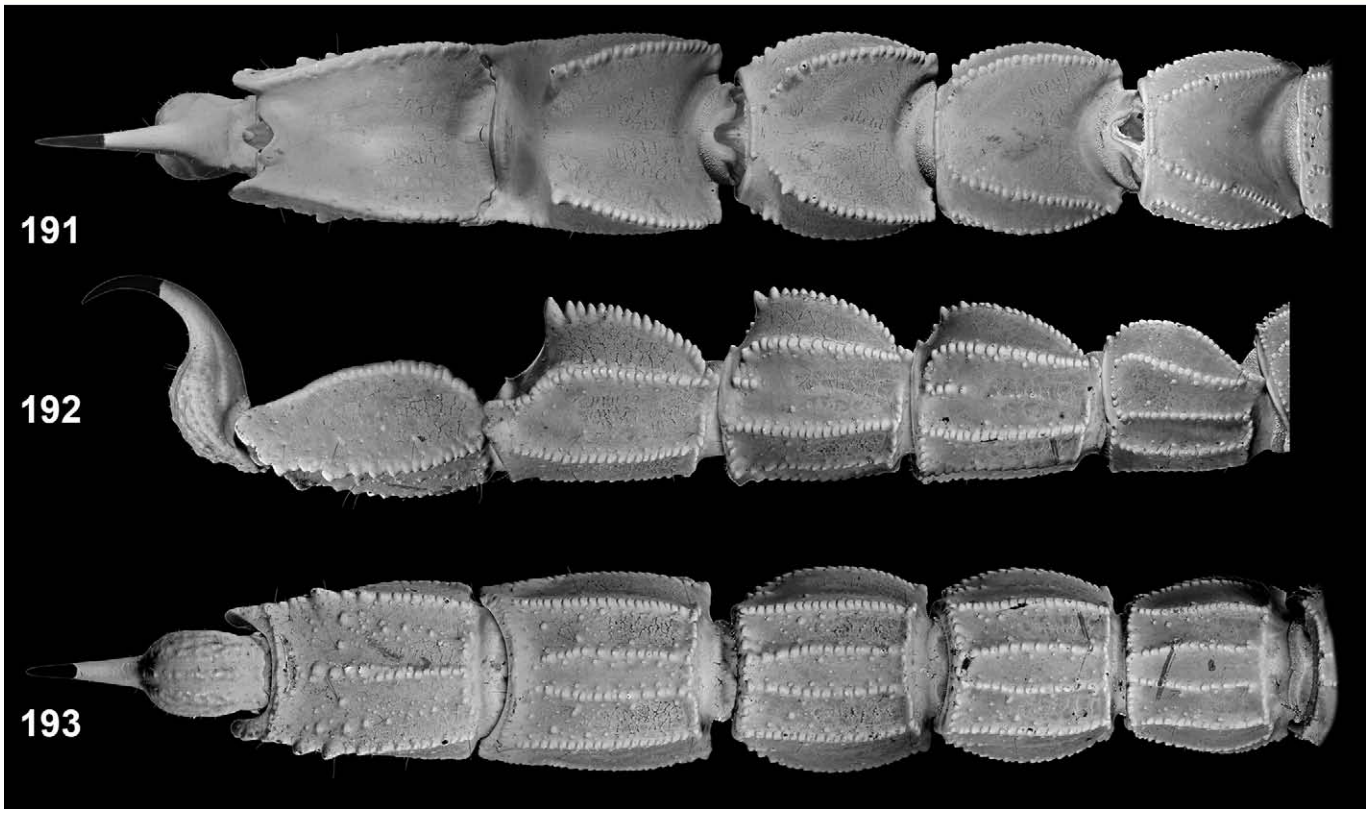
Pedipalps (Figs. 194–232). Pedipalps long and slender, very sparsely setose, orthobothriotaxic type A-β; femur with 4 carinae; patella granulate dorsally and internally, with 8 carinae; chela with traces of carinae indicated, generally smooth but finely granulated in internal surface; movable with 14–15 and fixed fingers with 13–14 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal lobe/notch combination; fingers elongated, chela narrow, length/width ratio 3.6–4.1 in males, 4.7–4.8 in females.



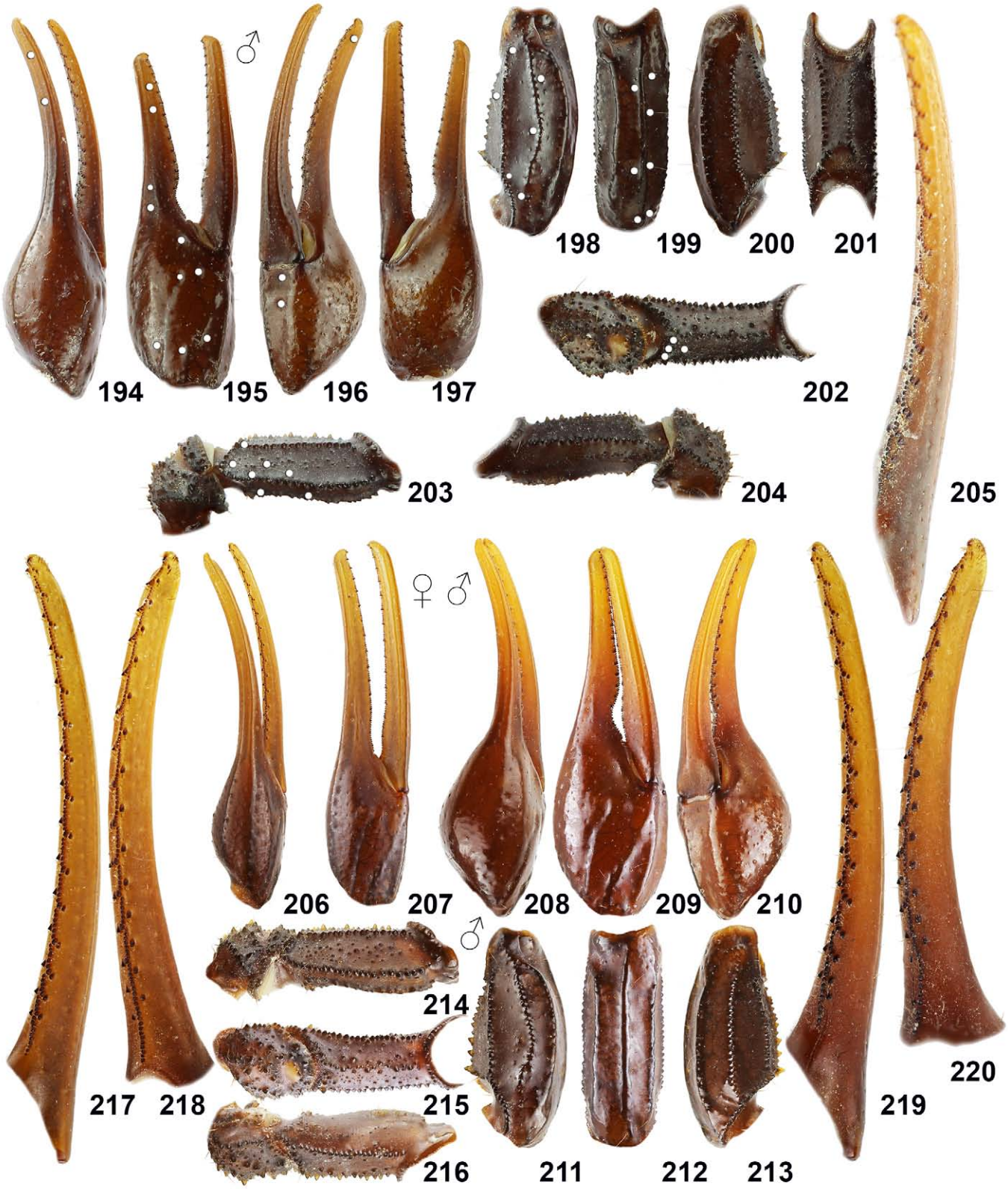
Figures 173–**180**: *A. barahoeii* **sp**. **n**., paratypes male (173, 175, 177–180) and female (174, 176) from Iran, Khoozestan Province, Simili env. **Figures 173**–**174**. Carapace and tergites. **Figures 175**–**176**. Sternopectinal area and sternites. **Figures 177**–**180**. Tibia, basitarsus and tarsus of left legs I–IV.



Figures 181–187. *A. barahoeii* **sp. n.**, paratypes male (181–184) and female (185–187) from Iran, Khoozestan Province, Simili env., metasoma IV–V and telson lateral (181), metasoma and telson lateral (182, 185), dorsal (183, 186), and ventral (184, 187). Scale bar: 10 mm (182–184, 185–187).



Figures 188–**193**: *A. barahoeii* **sp**. **n**. **Figures 188**–**190**. Male holotype, metasoma and telson lateral (188), ventral (189) and dorsal (190) views. **Figures 191**–**193**. Male paratype, from Iran, Markazi Province, Delijan-Mahalat, 33.87°N 50.47°E., metasoma and telson dorsal (191), lateral (192) and ventral (193) views under UV fluorescence. Scale bar: 10 mm (188–190).



Figures 194–220. *A. barahoeii* **sp. n.**, pedipalp segments. Male holotype (194–205), paratypes male (208–220) and female (206–207, 217–218) from Iran, Khoozestan Province, Simili env. Chela dorsal (194, 206, 208), external (195, 207, 209), ventral (196, 210) and internal (197) views. Patella dorsal (198, 211), external (199, 212), ventral (200, 213) and internal (201) views. Femur and trochanter internal (202, 215), dorsal (203, 214), and ventral (204, 216). Movable (205, 217, 219) and fixed (218, 220) fingers dentition. Trichobothrial pattern indicated by white circles in Figures 194–196, 198–199, 202–203.

Figures 221–**232**. *A. barahoeii* **sp. n.**, pedipalp segments under UV fluorescence, male paratype from Iran, Markazi Province, Delijan-Mahalat, 33.87°N 50.47°E. Chela dorsal (221), external (222), ventral (223) and internal (224) views. Patella dorsal (225), external (226), ventral (227) and internal (228) views. Femur dorsal (229), external (230), ventral (231) and internal (232) views.

Figures 233–**236**: *A. caspius* **sp**. **n**. **Figures 233**–**234**. Male holotype, dorsal (233) and ventral (234) views. **Figures 235**–**236**. Female paratopotype, dorsal (235) and ventral (236) views. Scale bar: 10 mm.

Legs (Figs. 177–180). Legs III and IV with long tibial spurs; all legs with retrolateral and prolateral pedal spurs; basitarsi and telotarsi with two rows of macrosetae on ventral surface, and other macrosetae on other surfaces; bristle combs present on legs I–III.
Measurements. See Table 4.

Affinities. The described characters distinguish *A. barahoeii* **sp**. **n**. from all other species of the genus, and are recounted in the key below. Occurrence of the new species is close to the distribution of *A. sumericus* Al-Khazali & Yağmur, 2023 in Iraq. These two species can be distinguished by metasoma V having dense fine granulation on lateral and ventral surfaces in *A. sumericus* Al-Khazali & Yağmur, 2023 (figs. 6A–D in Al-Khazali & Yağmur, 2023: 8), vs. metasomal segments with smooth surfaces (Figs. 188, 192), or rarely with several solitary fine granules (Fig. 341), in *A. barahoeii*.

Androctonus caspius Kovařík, Yağmur, Fet & Lowe, **sp**. **n**.

(Figures 233–299, 342, 344, Table 3)

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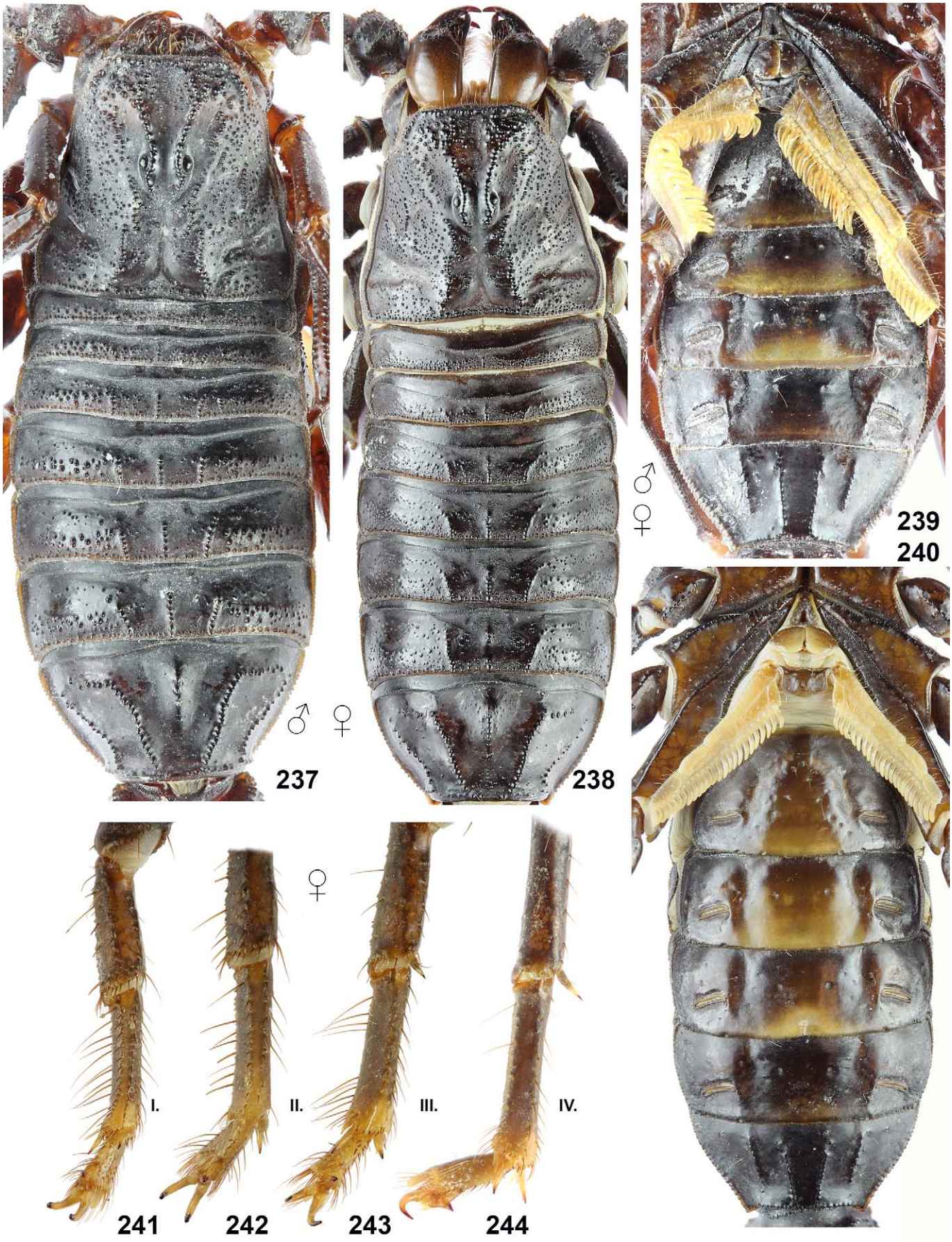
Androctonus crassicauda (in part): Navidpour et al, 2019: 2; Barahoei et al., 2025b: 4–6, fig. S3 (in part).
Androctonus cf. *crassicauda* (in part): Lowe & Tang, 2024: 3, 8, 44, figs. 12, 215, 217, 250–251.

Type locality and type depository. **Iran**, *Alborz Province*, Hive village to Immazadeh Mousa, 36.06°N 50.65°E, 687 m a. s. l.; FKCP.

Material examined. **Iran**, *Alborz Province*, Hive village to Immazadeh Mousa, 36.06°N 50.65°E, 687 m a. s. l. (Locality No. Al-103), VI.2013, 1♂1♀ (holotype and paratopotype, Figs. 233–244, 253–258, 262–287), leg. Rabiei, Barzegar and Fallahpour, FKCP; Hive village, 36.06°N 50.65°E, 1665 m a. s. l. (Locality No. Al-102), VI.2013, 1♀ (paratype), leg. Rabiei, Barzegar and Fallahpour, FKCP; Ateshgah-Baraghan road, 35.93°N 50.96°E, 336 m a. s. l. (Locality No. Al-113), VI.2013, 1♂ (paratype), leg. Rabiei, Barzegar and Fallahpour, FKCP; Karaj County, Fardis, 35.630139°N 50.880028°E, 1160 m a. s. l., 17.VI.2016, 2♀ (paratypes), leg. M. Moradi, AZMM/Sco-2016:58-59; Nazarabad, 35.913611°N 50.447500°E, 1141 m a. s. l., 20.IX.2016, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2016:60; Eshtehard, 35.697972°N 50.374694°E, 1275 m a. s. l., 20.IX.2016, 1♀ (paratype), leg. M. Moradi, AZMM/Sco-2016:61. *Tehran Province*, Varamin, 35.304917°N 51.740167°E, 974 m a. s. l., 8.V.2017, 1♂ (paratype), leg. M. Moradi, AZMM/Sco-2017:29; Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E, 2559 m a. s. l. (Locality No. Teh-105), V.2012, 1♂1♀ (paratypes, Figs. 245–252, 259–261, 288–299), leg. Rabiei, Barzegar and Fallahpour, FKCP.

Etymology. Named according to occurrence relatively near to the Caspian Sea.
Diagnosis ♂♀. Adults 60–90 mm in length. Base color uniformly blackish-brown to black. Pectinal tooth count 31–34 in males, 22–28 in females. Metasoma II–IV with ventral surfaces granulate, metasoma I–V laterally and dorsally smooth. Metasoma I–V with 10-8-8-8-5 carinae; metasoma II with lateral inframedian carinae absent, represented by only 2–4 denticles on posterior part. Metasoma IV length/ width ratio 1.10–1.21 in both sexes. Metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V with enlarged denticles. Sternite V with smooth patch, large in both sexes; sternite VII with 4 granulated carinae. Pedipalp chela smooth. Pedipalp fixed and movable fingers with 15–17 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal lobe/notch combination. Fingers elongated, chela narrow with length/ width ratio 4.4–4.7 in both sexes. Basitarsi of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description ♂♀. Adults 60 mm (males) to 90 mm (females) in length, habitus as shown in Figs. 233–236; distribution and positions of trichobothria on pedipalps as shown in Figs. 262–264, 266–267, 270–271.
Coloration (Figs. 233–236). Base color uniformly blackish-brown to black. Tarsi of legs dark yellow, basitarsus and pretarsus brown.
Carapace and mesosoma (Figs. 237–240, 245–248). Carapace trapezoidal, wider than long, entire surface covered with granules of different sizes, denser in males; carinae typical for the genus, granulose; anterior margin nearly straight, bearing 10–14 symmetrically distributed, stout spiniform macrosetae. Tergites densely granulated posteriorly in both sexes; tergite VII granulated, pentacarinate, with paired lateral carinae strong and serratocrenulate; tergites I–VI tricarinate. Pectine marginal tips extend to around end of sternite IV in males, and to quarter of sternite IV in females. Pectinal tooth count 31–34 in males, 22–28 in females, each comb with 3 marginal lamellae, 6–9 middle lamellae; lamellae and fulcra with numerous dark macrosetae. Sternum standard for the genus. Sternites smooth; sternite VII with four granulated carinae; spiracles very elongate, slit-like; sternite V with large, widely subtriangular, conspicuously pale smooth patch, more developed in males, partly present also on sternites III–IV.
Metasoma and telson (Figs. 253–261). Metasoma very sparsely setose, all segments moderately robust and deep; metasoma I–III wider than long in male, IV–V longer than wide, all segments wider than deep; metasoma I with 10 granulated carinae, II–IV with 8 granulated carinae, metasoma II with lateral inframedian carinae absent, represented by only 2–4 denticles on the posterior part; metasoma V with 5 carinae; dorsal carinae of metasoma I–IV composed posteriorly of angulate denticles, posterior-most denticle enlarged; metasoma II–V with ventral surfaces granulate, metasoma I–IV laterally

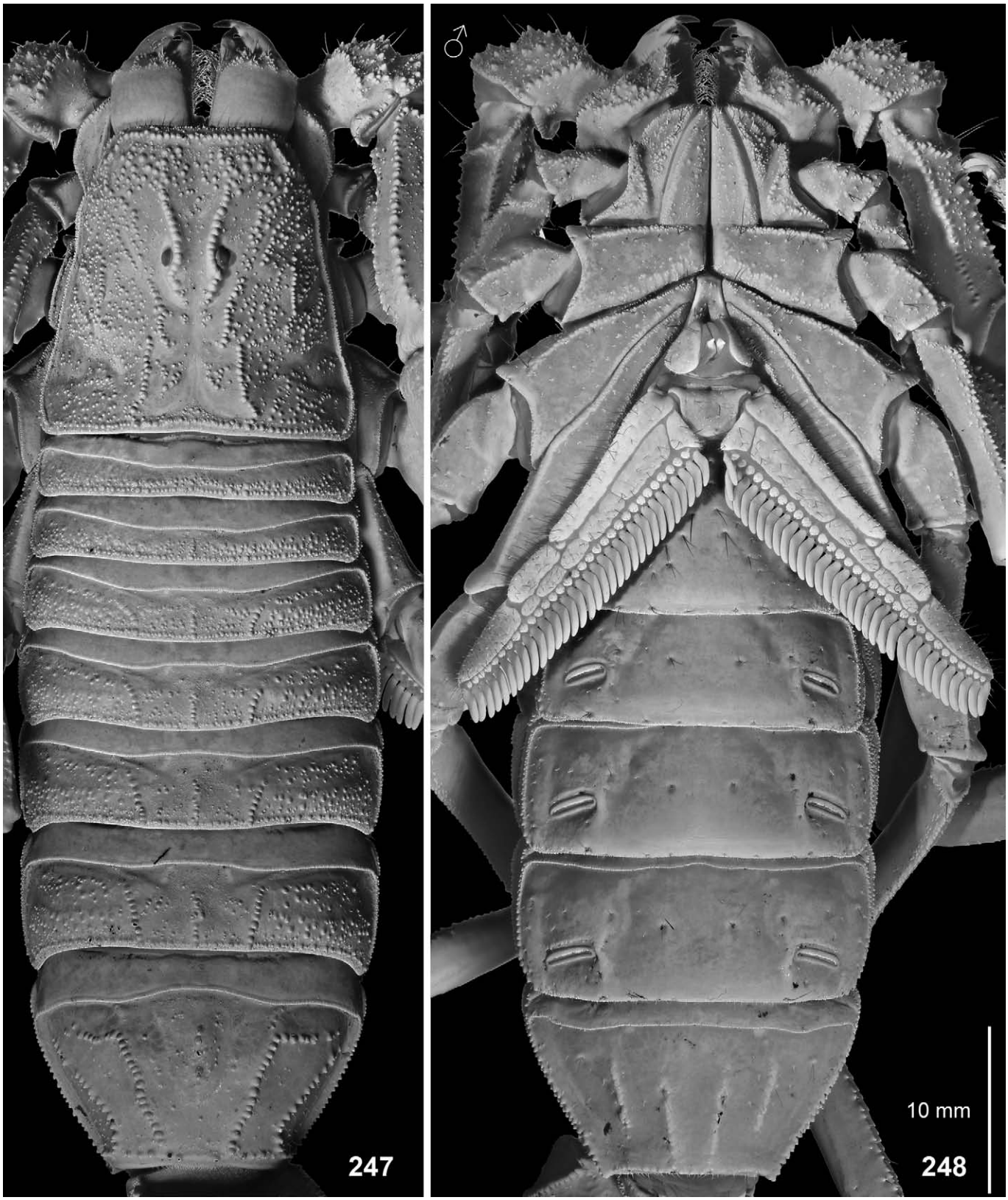


Figures 237–**244**: *A. caspius* **sp**. **n**., male holotype (237, 239, 241–244) and female paratopotype (238, 240). **Figures 237**–**238**. Carapace and tergites. **Figures 239**–**240**. Sternopectinal area and sternites. **Figures 241**–**244**. Tibia, basitarsus and tarsus of left legs I–IV.

Figures 245–**246**. *A. caspius* **sp**. **n**., male paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. Carapace and tergites (245) and sternopectinal area and sternites (246).

and dorsally smooth; metasoma V laterally very sparsely granulate to smooth and dorsally smooth; ventrolateral carinae on metasoma V with enlarged denticles. Telson slender, vesicle small and flat, aculeus about as long as vesicle, strongly curved.

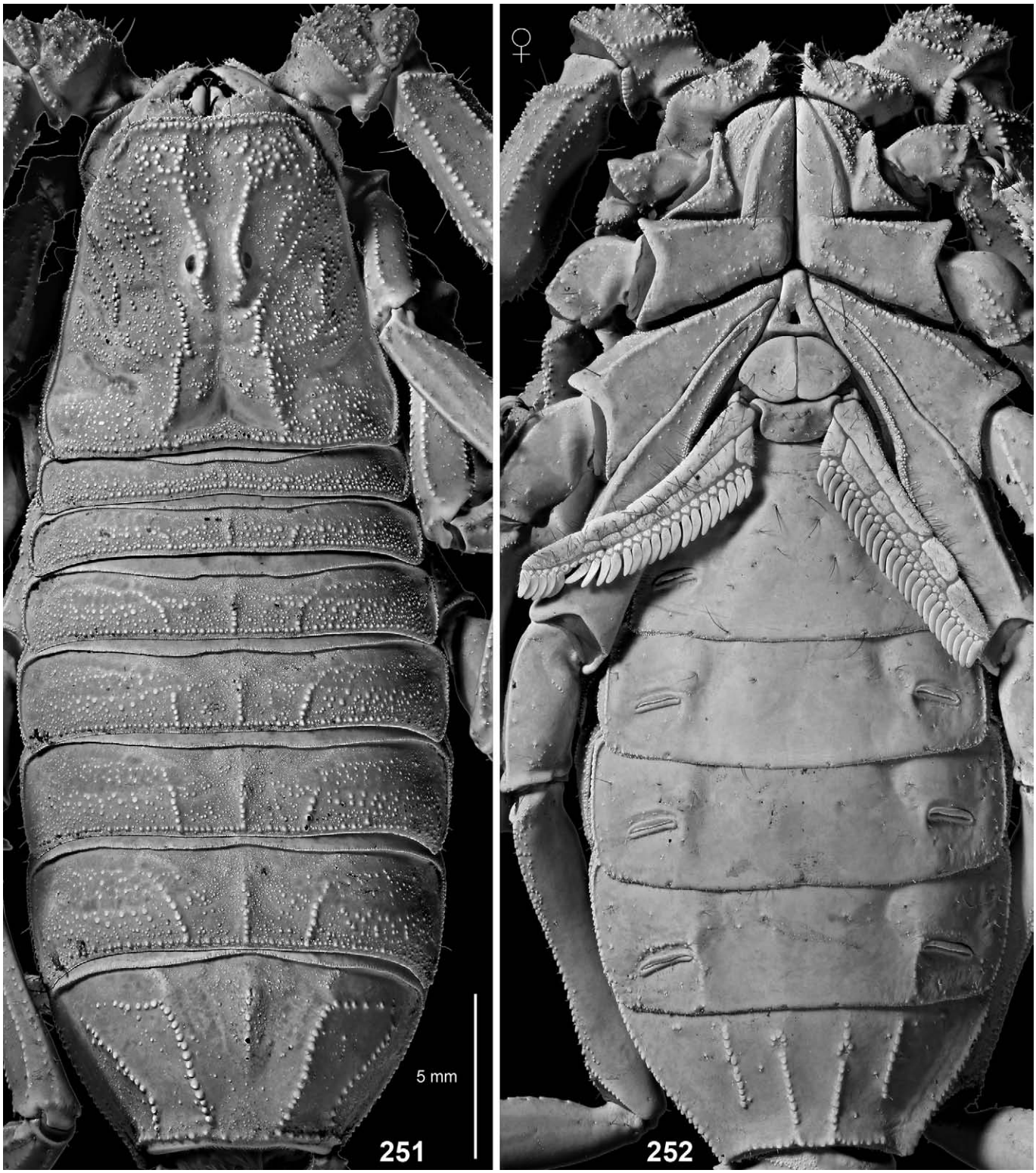
Pedipalps (Figs. 262–299). Pedipalps long and slender, very sparsely setose, orthobothriotaxic type A-β; femur with 4 carinae; patella granulate dorsally and internally, with 7 carinae; chela smooth, with traces of carinae indicated; movable with



Figures 247–**248**. *A. caspius* **sp**. **n**., male paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. Carapace and tergites (247) and sternopectinal area and sternites (248) under UV fluorescence.

Figures 249–**250**. *A. caspius* **sp**. **n**., female paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. Carapace and tergites (249) and sternopectinal area and sternites (250).

15–17 and fixed fingers with 15–16 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal lobe/notch combination; fingers elongated, chela narrow, length/width ratio 4.4–4.7 in both sexes.

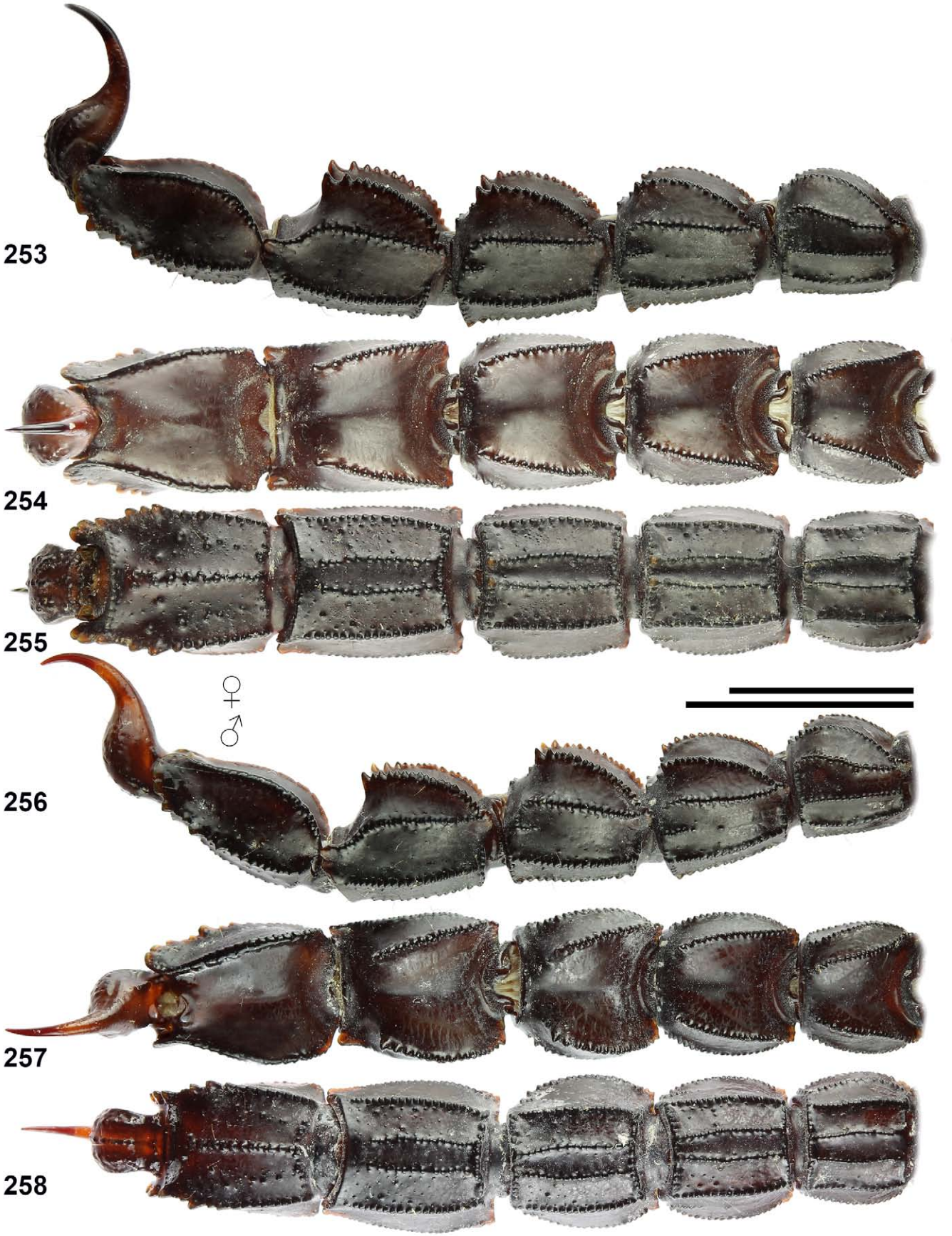


Figures 251–**252**. *A. caspius* **sp**. **n**., female paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. Carapace and tergites (251) and sternopectinal area and sternites (252) under UV fluorescence.

Legs (Figs. 241–244). Leg III–IV with tibial spurs, moderate in length on tibia III, long on tibia IV. All legs with retrolateral and prolateral pedal spurs; basitarsi and telotarsi with two rows of macrosetae on ventral surface, and other macrosetae on other surfaces; bristle combs present on legs I–III.

Measurements. See Table 3.

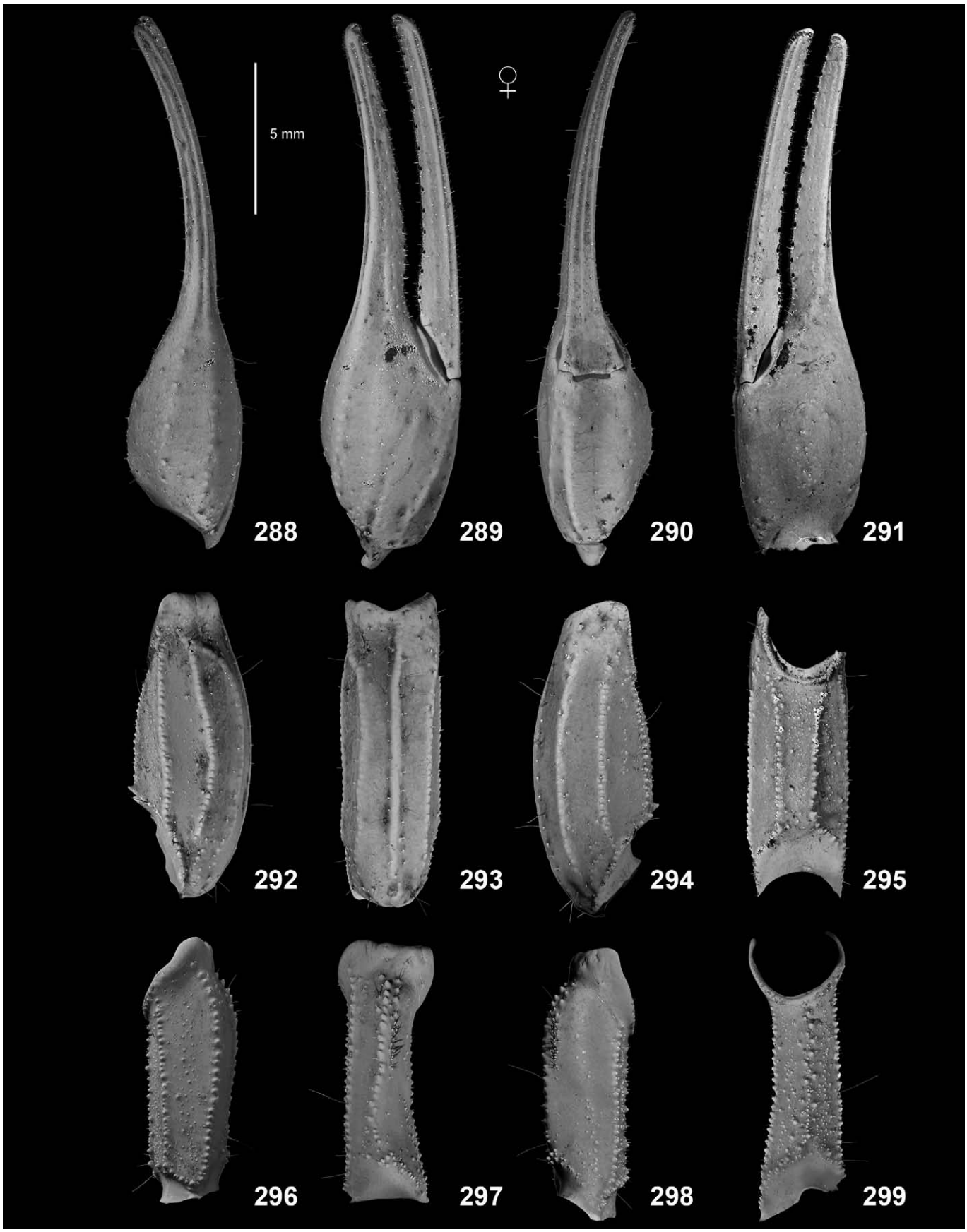
Affinities. The described characters distinguish *A. caspius* **sp**. **n**. from all other species of the genus, and are recounted in the key below.



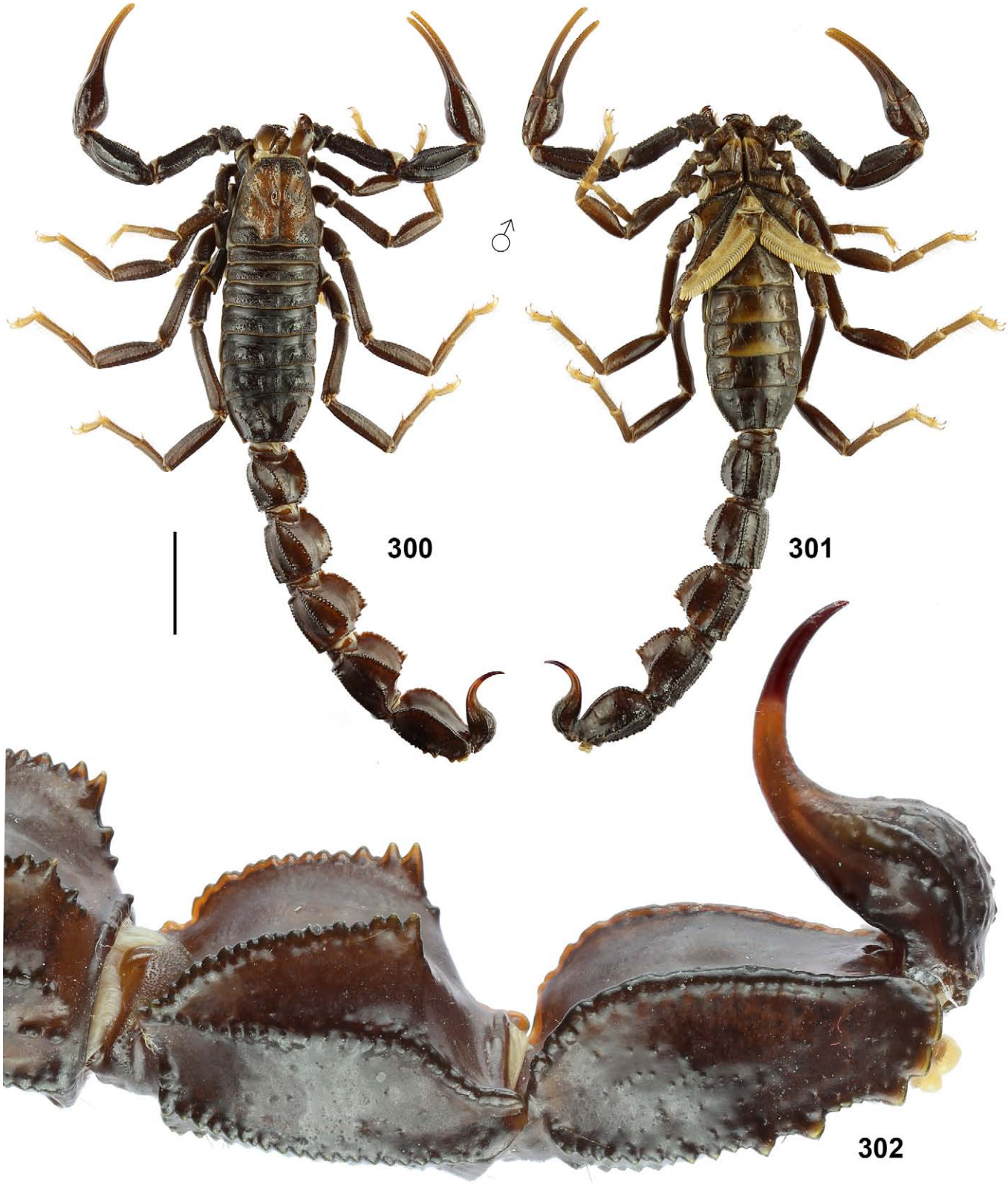
Figures 253–258. *A. caspius* **sp. n.**, male holotype (253–255) and female paratopotype (256–258), metasoma and telson lateral (253, 256), dorsal (254, 257), and ventral (255, 258). Scale bar: 10 mm (253–255, 256–258).

Figures 259–**261**. *A. caspius* **sp**. **n**., female paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E, metasoma and telson dorsal (259), lateral (260), and ventral (261) under UV fluorescence. Scale bar: 5 mm.

Figures 262–**287**. *A. caspius* **sp**. **n**., pedipalp segments. Male holotype (262–274) and female paratopopes (275–287). Chela dorsal (262, 275), external (263, 276), ventral (264, 277) and internal (265, 278) views. Patella dorsal (266, 279), external (267, 280), ventral (268, 281) and internal (269, 282) views. Femur and trochanter internal (270, 283), dorsal (271, 284), and ventral (272, 285). Movable (273, 286) and fixed (274, 287) fingers dentition. Trichobothrial pattern indicated by white circles in Figures 262–264, 266–267, 270–271.



Figures 288–**299**. *A. caspius* **sp**. **n**., pedipalp segments under UV fluorescence, female paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. Chela dorsal (288), external (289), ventral (290) and internal (291) views. Patella dorsal (292), external (293), ventral (294) and internal (295) views. Femur dorsal (296), external (297), ventral (298) and internal (299) views.



Figures 300–302: *A. transcaucasicus* **sp. n.**, male holotype, dorsal (300) and ventral (301) views, metasoma IV–V and telson lateral (302). Scale bar: 10 mm (300–301).

Dimensions (mm)		***A. transcaucasicus* sp. n.** ♂ holotype	***A. transcaucasicus* sp. n.** ♀ paratype
Carapace	L / W	8.75 / 9.06	9.39 / 10.10
Mesosoma	L	16.03	23.26
Tergite VII	L / W	4.69 / 8.92	5.63 / 9.81
Metasoma + telson	L	43.35	42.89
Segment I	L / W / D	5.60 / 6.33 / 5.47	5.34 / 5.93 / 5.67
Segment II	L / W / D	6.71 / 6.81 / 6.15	6.16 / 6.24 / 5.42
Segment III	L / W / D	6.71 / 6.99 / 6.95	6.69 / 6.39 / 5.84
Segment IV	L / W / D	8.07 / 6.94 / 6.77	7.89 / 6.36 / 5.54
Segment V	L / W / D	8.64 / 6.39 / 5.21	8.75 / 5.89 / 4.12
Telson	L / W / D	7.62 / 2.86 / 2.77	8.06 / 3.59 / 2.77
Pedipalp	L	31.79	31.91
Femur	L / W	7.50 / 2.27	7.32 / 2.37
Patella	L / W	9.04 / 3.48	9.13 / 3.39
Chela	L	15.25	15.46
Manus	W / D	4.07 / 3.87	3.33 / 3.77
Movable finger	L	10.53	10.70
Total	**L**	**68.13**	**75.54**

Table 5. Comparative measurements of types of *A. transcaucasicus* **sp. n.**. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

Androctonus transcaucasicus Kovařík, Yağmur, Fet & Lowe, **sp. n.**

(Figures 300–340, 344, Table 5)

http://zoobank.org/urn:lsid:zoobank.org:act:CCD2B5C0-B203-4100-AE31-49F8BA775DDA

Type locality and type depository. **Armenia**, *Syunik Province,* Meghri, 38.88°N 46,25°E, 648 m a. s. l.; FKCP.

Material examined. **Armenia**, *Syunik Province,* Meghri, 38.88°N 46,25°E, 648 m a. s. l., 9-10.VII.2018, 3♂(holotype and paratypes, 1474, 1475, Figs. 300–302, 303–304, 307–310, 316–331), leg. D. Hoferek, FKCP. **Azerbaijan**, Nakhchivan, Central Town, 39.239722°N 45.388889°E, 852 m a. s. l., 25.VIII.2024, 3♂1juv. (paratypes), leg. local collector, AZMM/Sco-2024:88-91. **Iran**, *East Azerbaijan Province*, Marand, 38.401667°N 45.818889°E, 1375 m a. s. l., 1.IX.2018, 1♂ (paratype), 1.IX.2019, 1♂ (paratype), leg, M. Moradi, AZMM/Sco-2018:241, AZMM/Sco-2019:18; Sardasht, 36.150000°N 45.468056°E, 1725 m a. s. l., 21.VI.2018, 1♀ (paratype), leg. M. Moradi, AZMM/Sco-2018:242. *West Azerbaijan Province*, Poldasht, Qlysh Lanmysh Village, 39.326389°N 45.013611°E, 840 m a. s. l., 8.VIII.2016, 6♂4♀ (paratypes, Figs. 305–306, 311, 313–315, 332–340, Tab. 5), leg. S. A. Heydarabad, AZMM/Sco-2016:44-53; Poldasht, Qarqulan Village, 39.332778°N 44.982778°E, 823 m a. s. l., 7.VII.2016, 1♀3juvs. (paratypes), leg. S. A. Heydarabad, AZMM/Sco-2016:54-57.

Etymology. Named after the region of occurrence, Transcaucasia.

Diagnosis ♂♀. Adults 65–78 mm in length. Base color uniformly blackish-brown to black. Pectinal tooth count 31–34 in males, 22–28 in females. Metasoma II–IV with ventral surfaces granulate, metasoma I–IV laterally and dorsally smooth; metasoma I–V with 10-8-8-8-5 carinae; metasoma II with lateral inframedian carinae absent, represented by only 3–4 denticles on the posterior part. Metasoma IV length/width ratio 1.16–1.24 in both sexes. Metasoma III–IV with dorsal carinae composed posteriorly of angulate denticles, posterior-most denticle enlarged. Ventrolateral carinae on metasoma V with enlarged denticles. Sternite V with smooth patch, large in both sexes; sternite VII with 4 granulated carinae. Pedipalp chela smooth. Pedipalp fixed and movable fingers with 15–17 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal lobe/notch combination. Fingers elongated, chela narrow with length/width ratio 3.7 (male) to 4.6 (female). Basitarsi of legs I–III with bristle combs. Telson slender, vesicle small and flat, aculeus about as long as vesicle.

Description ♂♀. Adults 65 mm (males) to 78 mm (females) in length, habitus as shown in Figs. 300–301; distribution and positions of trichobothria on pedipalps as shown in Figs. 319–321, 323–324, 327–328.

Coloration (Figs. 300–301). Base color uniformly blackish-brown to black. Tarsi of legs dark yellow, basitarsus and pretarsus brown.

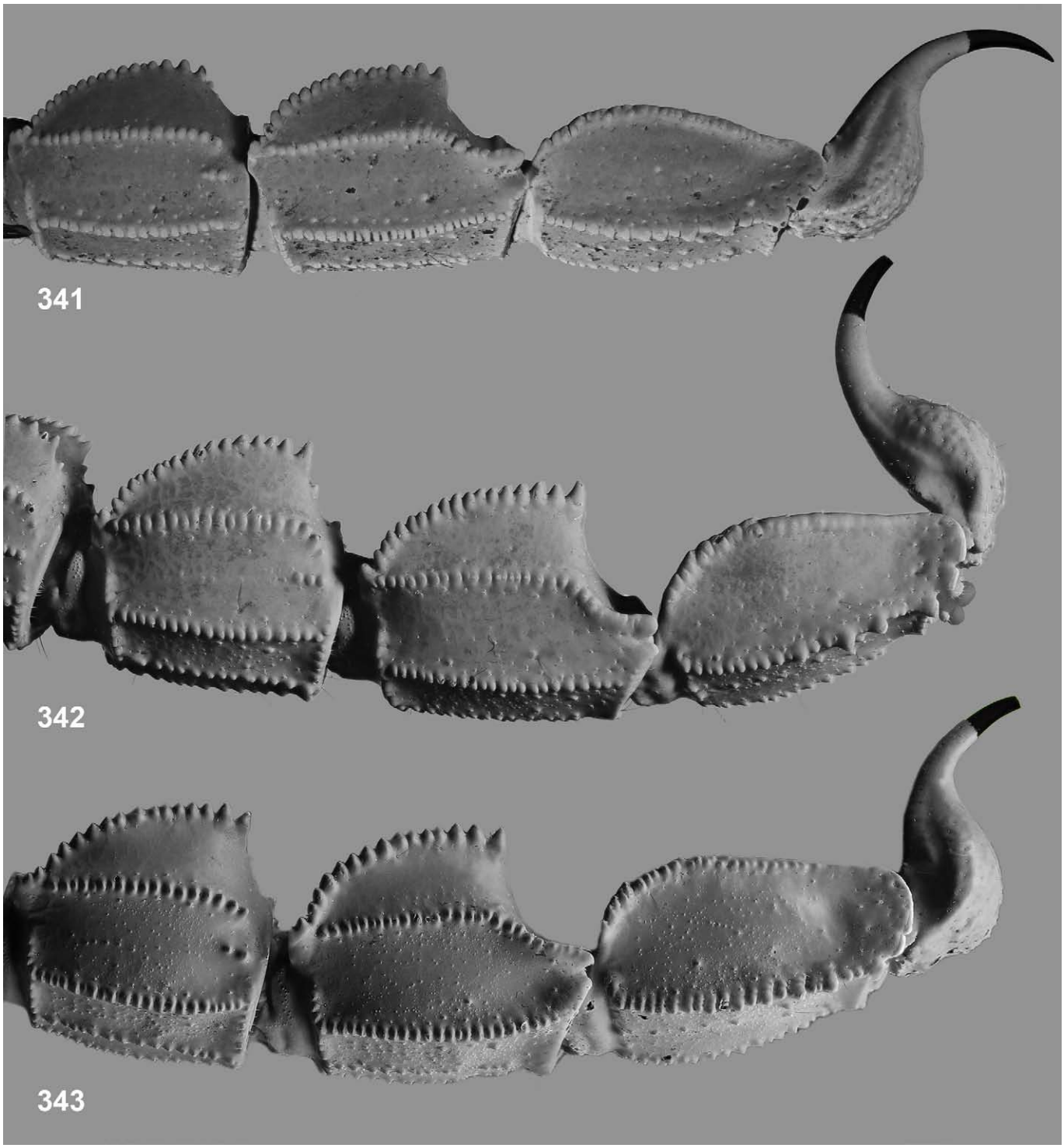
Carapace and mesosoma (Figs. 303–306). Carapace trapezoidal, wider than long, entire surface covered with granules of different sizes, denser in males; carinae typical for the genus, granulose; anterior margin nearly straight, bearing

Figures 303–**312**: *A. transcaucasicus* **sp**. **n**., male holotype (303–304, 307–310), female (305–306, 312) and male (311) paratypes from Iran, West Azerbaijan Province, Poldasht, Qlysh Lanmysh Village, 39.326389°N 45.013611°E. **Figures 303, 305**. Carapace and tergites. **Figures 304**, **306**. Sternopectinal area and sternites. **Figures 307**–**310**. Tibia, basitarsus and tarsus of right legs I–IV.

Figures 313–318. *A. transcaucasicus* **sp. n.**, male holotype (316–318) and female paratype from Iran, West Azerbaijan Province, Poldasht, Qlysh Lanmysh Village, 39.326389°N 45.013611°E (313–315), metasoma and telson lateral (313, 316), dorsal (314, 317), and ventral (315, 318). Scale bar: 10 mm (316–318).

Figures 319–338. *A. transcaucasicus* **sp. n.**, pedipalp segments. Male holotype (319–331) and female paratype from Iran, West Azerbaijan Province, Poldasht, Qlysh Lanmysh Village, 39.326389°N 45.013611°E (332–340). Chela dorsal (319, 332), external (320, 333), ventral (321, 334) and internal (322, 335) views. Patella dorsal (323, 336), external (324), ventral (325, 337) and internal (326) views. Femur and trochanter internal (327, 338), dorsal (328, 339), and ventral (329, 340). Movable (330) and fixed (331) fingers dentition. Trichobothrial pattern indicated by white circles in Figures 319–321, 323–324, 327–328.

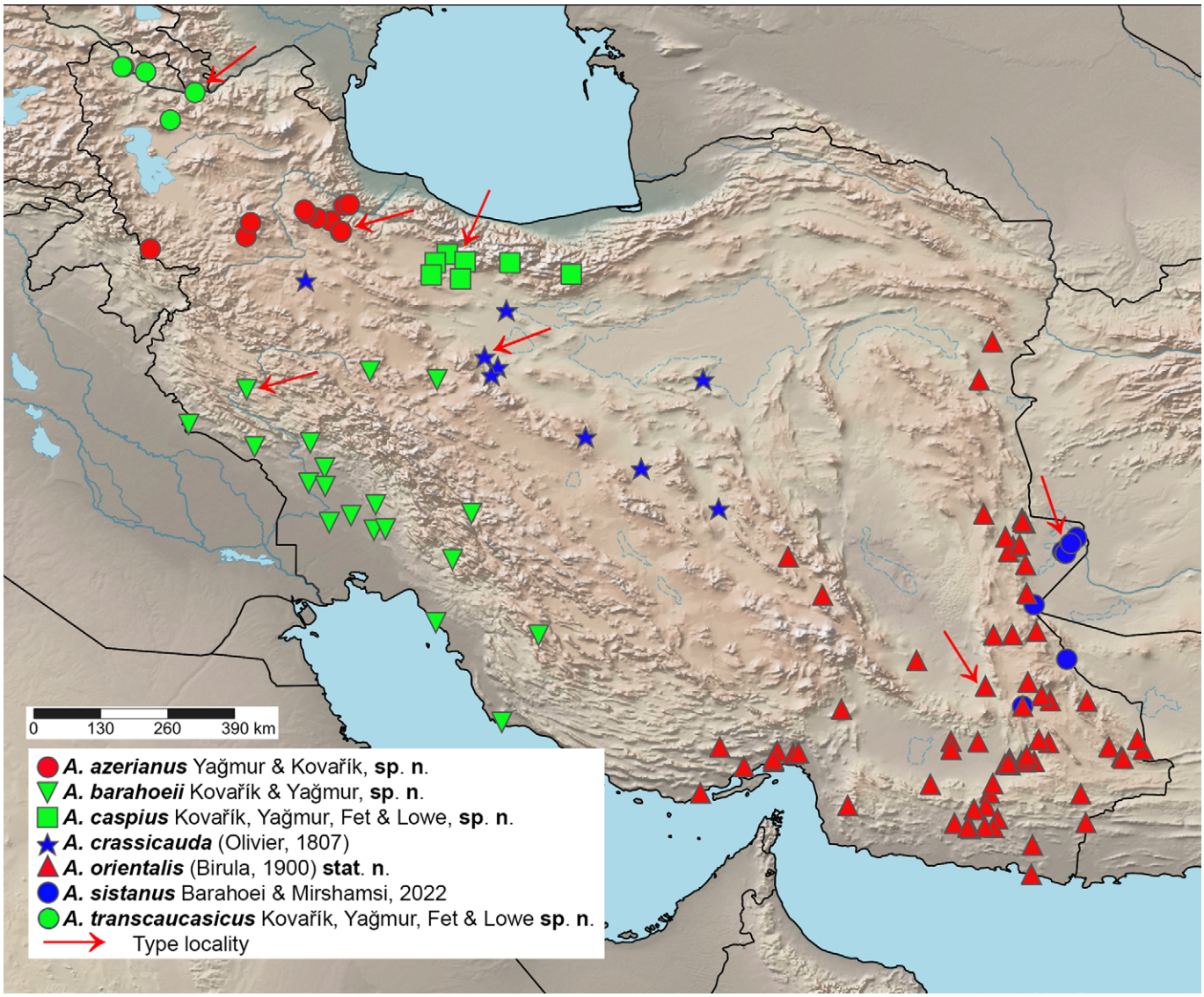
10–14 symmetrically distributed, stout spiniform macrosetae. Tergites densely granulated posteriorly in both sexes; tergite VII granulated, pentacarinate, with paired lateral carinae strong and serratocrenulate; tergites I–VI tricarinate. Pectine marginal tips extend to around end of sternite IV in males, and to quarter of sternite IV in females. Pectinal tooth count 31–34 in males, 22–28 in females, each comb with 3 marginal lamellae, 8–9 middle lamellae; lamellae and fulcra with numerous dark macrosetae. Sternum standard for the genus. Sternite III smooth centrally and finely granulate posteriorly, other sternites smooth; sternite VII with four granulated carinae; spiracles very elongate, slit-like; sternite V with large,



Figures 341–**343**: Comparison metasoma III–V and telson under UV fluorescence. **Figure 341**. *A. barahoei* **sp**. **n**., female paratype from Iran, Markazi Province, Delijan-Mahalat, 33.87°N 50.47°E. **Figure 342**. *A. caspius* **sp**. **n**., female paratype from Iran, Tehran Province, Firooz kooh – Semnan road, Pirdeh, 35.71°N 52.81°E. **Figure 343**. *A. sumericus* Al-Khazali & Yağmur, 2023, male paratype from Iraq.

widely subtriangular, conspicuously pale smooth patch, more developed in males, partly present also on sternites III–IV.

Metasoma and telson (Figs. 311–318). Metasoma very sparsely setose, all segments moderately robust and deep; metasoma I–III wider than long in males, IV–V longer than wide, all segments wider than deep; metasoma I with 10 granulated carinae, II–IV with 8 granulated carinae, metasoma II with lateral inframedian carinae absent, represented by only 3–4 denticles on the posterior part; metasoma V with 5 carinae; dorsal carinae of metasoma I–IV composed posteriorly of angulate denticles, posterior-most denticle enlarged; metasoma II–V with ventral surfaces granulate, metasoma I–IV laterally



Figures 344: Confirmed distribution of genus *Androctonus* in Iran, Armenia and Azerbaijan.

and dorsally smooth; metasoma V laterally partly granulate and dorsally smooth; ventrolateral carinae on metasoma V with enlarged denticles. Telson slender, vesicle small and flat, aculeus about as long as vesicle, strongly curved.

Pedipalps (Figs. 319–340). Pedipalps long and slender, very sparsely setose, orthobothriotaxic type A-β; femur with 4 carinae; patella granulate dorsally and internally, with 7 carinae; chela smooth, with traces of carinae indicated; movable with 15–17 and fixed fingers with 15–16 rows of denticles, each flanked by external and internal accessory denticles; fingers with basal lobe/notch combination; fingers elongated, chela narrow, length/width ratio 3.7 (male) to 4.6 (female).

Legs (Figs. 307–310). Legs III and IV with long tibial spurs; all legs with retrolateral and prolateral pedal spurs; basitarsi and telotarsi with two rows of macrosetae on ventral surface, and other macrosetae on other surfaces; bristle combs present on legs I–III.

Measurements. See Table 5.

Affinities. The described characters distinguish *A. transcaucasicus* **sp. n.** from all other species of the genus, and are recounted in the key below. The new species is also supported by DNA phylogenetic analysis (in preparation). Occurrence of the new species is close to distribution of *A. kunti* Yağmur, 2023 (see Fig. 344 versus fig. 79 in Yağmur, 2023: 21). These two species distinguished by: (i) pedipalp chela smooth in *A. transcaucasicus* **sp. n.** (Figs. 319–322) vs. finely granulated in *A. kunti* (figs. 21–24, 29–32 in Yağmur, 2023: 10–11); and (ii) tibial spurs on legs III–IV strong and enlarged in *A. transcaucasicus* **sp. n.** vs. moderate in *A. kunti*.

Comments on localities and life strategy. *A. crassicauda* (Olivier, 1807) is a xerophilic species. The area around the town of Kashan is at low elevation, arid, and experiences hot climatic conditions during the summer. This region includes grey pebble dunes, calcareous soils, and sand dune habitats. Specimens of *A. crassicauda* were collected only from areas with calcareous soil; no scorpion specimens were found in the

grey pebble dune or sand dune habitats. The collection sites are characterized by hard calcareous soil, very sparse grasses, and scattered bushes. The buthid species *Odontobuthus doriae* (Thorell, 1876) and *Compsobuthus matthiesseni* (Birula, 1905) were also found sympatrically with *A. crassicauda* at the Ab Shirin Village locality.

Specimens of *A. orientalis* (Birula, 1900) **stat**. **n**. were collected from Iranshahr, Sarbaz, Delgan, and Nikshahr regions in Sistan and Baluchestan Province. These regions have a hot, arid climate with low humidity. The habitats included steppe vegetation, sandy soils, and calcareous soils. The scorpion species *Mesobuthus rakhshanii* Barahoei, 2022, *Odontobuthus tirgari* Mirshamsi et al., 2013, *Hemiscorpius acanthocercus* Monod & Lourenço, 2005, *Hemiscorpius lepturus* Peters, 1861, *Hottentotta sistanensis* Kovařík, Yağmur & Moradi, 2018, *Orthochirus persa* (Birula, 1900), and *Sassanidotus gracilis* (Birula, 1900) were also recorded sympatrically with *A. orientalis* (Birula, 1900) **stat**. **n**. in various localities.

Specimens of *A. azerianus* **sp**. **n**. were collected from habitats characterized by sandy and hard calcareous soils, with steppe vegetation often interspersed with thornbushes. Some individuals were observed at the entrances of rodent burrows. The collection localities are at low altitudes, in hot and arid environments. The scorpion species *Hottentotta saulcyi* (Simon, 1880), *H. zagrosensis* Kovařík, 1997, *Odontobuthus doriae* (Thorell, 1876), *Mesobuthus persicus* (Pocock, 1899), and *Scorpio maurus townsendi* (Pocock, 1900) were also found sympatrically with *A. azerianus* **sp**. **n**. in various localities.

Biogeography

Barahoei et al. (2025b) recorded *A. crassicauda* (Olivier, 1807) from Esfahan, Hamadan, Qom, and Yazd Provinces, and suggested that this species is distributed across the central Iranian plains, between the Alborz and Zagros Mountain ranges and the eastern belt of Iran.

Birula (1900) described *A. orientalis* (Birula, 1900) **stat**. **n**. from Sistan and Baluchestan Province and Khorasan Province and later again recorded it from Sistan and Baluchestan Province (Birula, 1903). Barahoei et al. (2025b) also reported this species (under the name *A. rostami*) from Hormozgan, Kerman, Razavi Khorasan, Sistan and Baluchestan, and South Khorasan Provinces, suggesting that it is distributed in the eastern regions of Iran, particularly along the eastern mountainous belt.

A. azerianus **sp**. **n**. and *A. transcaucasicus* **sp**. **n**. were recorded from the northwestern Iranian provinces of East Azerbaijan, West Azerbaijan, and Zanjan in the present study. The distribution of this species is probably restricted by the Aras River to the north, by arid plains in central Iran to the south, and by the Zagros Mountains to the west. Barahoei et al. (2025a) recorded *A. kunti* Yağmur, 2023 and *A. turkiyensis* Yağmur, 2021 from East Azerbaijan Province. We did not detect either of these two species, but the presence of *A. kunti* in northwestern Iran seems plausible due to the absence of any significant geographical barriers. Further studies are necessary to determine the exact distribution ranges of these two species. *Mesobuthus persicus* (Pocock, 1899) is distributed in the Iranian provinces of Ardabil, East Azerbaijan, Hamadan, Kermanshah, Qazvin, West Azerbaijan, and Zanjan (Kovařík et al., 2022). *A. azerianus* **sp**. **n**. appears to be restricted by similar geographical barriers as *M. persicus* and likely shares similar ecological requirements. Therefore, they probably occupy the same distributional range and exhibit a similar distribution pattern.

The records of *A. crassicauda* from Zanjan Province reported by Moradi et al. (2015) and from West Azerbaijan Province reported by Moradi et al. (2018) are herein emended as *A. azerianus* **sp**. **n**., while the records of *A. baluchicus* from Sistan and Baluchistan Province are emended as *A. orientalis* **stat**. **n**.

Key to *Androctonus* species with confirmed occurrence in Iran.

1. Metasoma I–V uniformly blackish to black. 2
– Metasoma I–III yellow and metasoma IV–V and telson black. ..... *A. sistanus*

2 Ventrolateral carinae on metasoma V without enlarged denticles (Figs. 65–68). 3
– Ventrolateral carinae on metasoma V with enlarged denticles (Figs. 156–159). 4

3. Sternite VII finely granulated. ..... *A. crassicauda*
– Sternite VII smooth. ..... *A. orientalis* **stat**. **n**.

4 Metasoma II with lateral inframedian carinae incomplete but developed on the posterior three-fourths (Figs. 154–155). ..... *A. azerianus* **sp**. **n**.
– Metasoma II with lateral inframedian carinae absent, represented by only 2–5 denticles on the posterior part (Figs. 154–155). 5

5. Pedipalp chela internal surface smooth, with only several fine granules (Fig. 291). 6
– Pedipalp chela internal surface densely, finely granulated (Fig. 224). ..... *A. barahoeii* **sp**. **n**.

6. Pedipalp chela length/width ratio 3.7 (male) to 4.6 (female). ..... *A. transcaucasicus* **sp**. **n**.
– Pedipalp chela length/width ratio 4.4–4.7 in both sexes, without sexual dimorphism. ..... *A. caspius* **sp**. **n**.

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References

AL-KHAZALI, A. M. & E.A. YAĞMUR. 2023. *Androctonus sumericus* sp. n., a new scorpion from Dhi Qar Province, Iraq (Scorpiones: Buthidae). *Zoology in the Middle East*, 69(4): 410–419.

BARAHOEI, H., M. FARMANI, M. SHAHI, S. YOUSEFI, M. ABBASI & RAHMANI, F. 2025a. New records of *Androctonus* Ehrenberg, 1828 from East Azarbaijan Province, Iran (Scorpiones: Buthidae). *Iranian Journal of Animal Biosystematics*, 21: 1–7.

BARAHOEI, H., O. MIRSHAMSI, M. AMIRI, A. MOEINADINI & E. RAKHSHANI. 2025b. Integrative taxonomy reveals the existence of a new species of fat-tailed scorpions, *Androctonus* (Buthidae), in Iran. *Turkish Journal of Zoology,* 49(2): 48–74.

BARAHOEI, H., O. MIRSHAMSI, N. SANCHOULI, M. G. MOGHADDAM, C. LEHMANN-GRABER & L. MONOD. 2022. Review of *Androctonus baluchicus* (Pocock, 1900) with description of new species from Iran (Scorpiones: Buthidae). *Arthropoda Selecta*, 31(2): 197–212.

BARAHOEI, H., S. NAVIDPOUR, M. ALIABADIAN, R. SIAHSARVIE & O. MIRSHAMSI 2020. Scorpions of Iran (Arachnida: Scorpiones): Annotated checklist, DELTA database and identification key. *Journal of Insect Biodiversity and Systematics*, 6(4): 375–474.

BIRULA, A. A. 1900. Beitrlige zur Kenntniss der Scorpionenfauna Ost-Persiens. (1. Beitrag). *Bulletin de I' Academie Imperiale des Sciences de St.-Petersbourg*, 12(4): 355–375.

BIRULA, A. A. 1903. Beitrlige zur Kenntniss der Scorpionenfauna Ost-Persiens. (2. Beitrag). *Bulletin de I'Academie Imperiale des Sciences de St.-Petersbourg,* (*5*), 19(2): 67–80.

(BIRULA, A. A.) BYALYNITSKII-BIRULYA, A. A. 1917. Arachnoidea Arthrogastra Caucasica. Pars I. Scorpiones. *Zapiski Kavkazskogo Muzeya* (Memoires du Musee du Caucase), Tiflis: Imprimerie de la Chancellerie du Comite pour la Transcaucasie, A(5), 253 pp. (in Russian; published August 191 7). English translation: Byalynitskii-Birulya, A. A. 1964. *Arthrogastric Arachnids of Caucasia*. I. Scorpions. Jerusalem: Israel Program for Scientific Translations, 170 pp.

FET, V. & G. LOWE. 2000. Family Buthidae C. L. Koch, 1837. Pp. 54–286 *in* Fet, V., W. D. Sissom, G. Lowe & M. E. Braunwalder. 2000. *Catalog of the Scorpions of the World* (*1758–1998*). New York: The New York Entomological Society, 689 pp.

FRANCKE, O. F. 1977. Scorpions of the genus *Diplocentrus* from Oaxaca, Mexico (Scorpionida, Diplocentridae). *Journal of Arachnology*, 4: 145–200.

HABIBI, T. 1971. Liste de scorpions de l'Iran. *Bulletin of the Faculty of Science of Teheran University*, 2 (4): 24–31 (in Persian) and 42–47 (in French).

HEMPRICH, F. W. & C. G. EHRENBERG. 1828. Zoologica II. Arachnoidea. *in: Symbolae Physicae seu Icones et Descriptiones Animalium Everte-bratorum Sepositis Insectis quae ex Itinere per Africam Borealem et Asiam Occidentalem*. Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg, Medicinae et Chirurgiae Doctorum, Studio Novae aut Illustratae Redierunt. Percensuit et Regis Iussu et Impensis Edidit Dr. C.G. Ehrenberg. Decas Prima. Berolini ex Officina Academica, Venditur a Mittlero: plate I *Buthus*; plate II: *Androctonus*.

HJELLE, J. T. 1990. Anatomy and morphology. Pp. 9-63 *in:* Polis, G.A. (ed.), *Biology of Scorpions*. Stanford, CA: Stanford University Press.

KARATAŞ, A., M. M. GARKHELOO & UÇAK, M. 2012. Contribution to the distribution of the scorpions of Iran: (Arachnida: Scorpiones). *Zoology in the Middle East*, 55(1): 111–120.

KOVAŘÍK, F. 1997. Results of the Czech Biological Expedition to Iran. Part 2. Arachnida: Scorpiones, with descriptions of *Iranobuthus krali* gen. n. et sp. n. and *Hottentotta zagrosensis* sp. n. (Buthidae). *Acta Societatis Zoologicae Bohemicae*, 61: 39–52.

KOVAŘÍK, F., V. FET, B. GANTENBEIN, M. R. GRAHAM, E.A. YAĞMUR, F. ŠŤÁHLAVSKÝ, N. M. POVERENNYI & N.E. NOVRUZOV. 2022. A revision of the genus *Mesobuthus* Vachon, 1950, with a description of 14 new species (Scorpiones: Buthidae). *Euscorpius*, 348: 1–189.

KRAEPELIN, K. 1891. Revision der Skorpione. I. Die Familie der Androctonidae. *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, 8: 1–144.

LEVY, G. & P. AMITAI. 1980. Scorpiones. Fauna Palaestina, Arachnida I., Israel Academy of Sciences and Humanities, Jerusalem, 130 pp.

LORIA, S.F. & L. PRENDINI. 2014. Homology of the lateral eyes of Scorpiones: a six-ocellus model. *PLoS ONE* 9(12): e112913. doi:10.1371/journal.pone.0112913.

LOWE, G. & V. FET. 2024. A survey of proximal sensilla associated with denticle subrows on scorpion pedipalp fingers (Arachnida: Scorpiones), with observations on scorpion fluorescence. *Euscorpius*, 382: 1–107.

LOWE, G. & V. TANG. 2024. Clustered setation on the pedipalps of buthid scorpions (Scorpiones: Buthidae). *Euscorpius*, 398: 1–77.

MOHAMMADI-BAVANI, M., J. RAFINEJAD, A. A. HANAFI-BOJD, M. A. OSHAGHI, S. NAVIDPOUR, F. DABIRI, M. BADAKHSHAN, E. GHORBANI & M. BAGHERI. 2017. Spatial distribution of medically important scorpions in North West of Iran. *Journal of Arthropod-Borne Diseases*, 11(3): 371–382.

MORADI, M., E. A. YAĞMUR, P. M. GHARAKHLOO & F. AHMADI. 2015. Scorpion fauna of Zanjan Province, Iran (Arachnida: Scorpiones). *Journal of Applied Biological Sciences*, 9(1): 11–14.

MORADI, M., E. A. YAĞMUR, M. SOLTANABADI & S. M. SARPIRI. 2020. The scorpion fauna (Arachnida: Scorpiones) of the Southern regions of Sistan and Baluchestan Province with notes on the occurrence of *Androctonus baluchicus* (Pocock, 1900) in Iran. *Biharean Biologist*, 14(2): 90–97.

MORADI, M., S. ASADVAND & E. A. YAĞMUR. 2018. The scorpion fauna of West Azerbaijan province in Iran (Arachnida: Scorpiones). *Biharean Biologist*, 12(2): 1–4.

NAVIDPOUR, S., M. EZATKHAH, F. KOVAŘÍK, M. E. SOLEGLAD & V. FET 2011. Scorpions of Iran (Arachnida, Scorpiones). Part VII. Kerman Province. *Euscorpius*, 131: 1–32.

NAVIDPOUR, S., V. FET, F. KOVAŘÍK & M. E. SOLEGLAD 2012. Scorpions of Iran (Arachnida, Scorpiones). Part VIII. Fars Province. *Euscorpius*, 139: 1–29.

NAVIDPOUR, S., F. KOVAŘÍK, M. E. SOLEGLAD & V. FET. 2008a. Scorpions of Iran (Arachnida, Scorpiones). Part I. Khoozestan Province. *Euscorpius*, 65: 1–41.

NAVIDPOUR, S., F. KOVAŘÍK, M. E. SOLEGLAD & V. FET. 2008d. Scorpions of Iran (Arachnida, Scorpiones). Part IV. Kohgilouyeh & Boyer Ahmad Province. *Euscorpius*, 74: 1–24.

NAVIDPOUR, S., F. KOVAŘÍK, M. E. SOLEGLAD & V. FET. 2019. Scorpions of Iran (Arachnida, Scorpiones). Part X. Alborz, Markazi and Tehran Provinces with descriptions of *Orthochirus carinatus* sp. n. (Buthidae). *Euscorpius*, 276: 1–20.

NAVIDPOUR, S., H. H. NAYEBZADEH, M. E. SOLEGLAD, V. FET, F. KOVAŘÍK & M. H. KAYEDI 2010. Scorpions of Iran (Arachnida, Scorpiones). Part VI. Lorestan Province. *Euscorpius*, 99: 1–23.

NAVIDPOUR, S., M. E. SOLEGLAD, V. FET & F. KOVAŘÍK 2013. Scorpions of Iran (Arachnida, Scorpiones). Part IX. Hormozgan Province with descriptions of *Odontobuthus tavighiae* sp. n. (Buthidae). *Euscorpius*, 170: 1–29.

NAVIDPOUR, S., M. E. SOLEGLAD, V. FET & F. KOVAŘÍK 2008b. Scorpions of Iran (Arachnida, Scorpiones). Part II. Bushehr Province. *Euscorpius*, 67: 1–33.

OLIVIER, G. A. 1807. *Voyage dans l'Empire Othoman, l'Egypte et la Perse*. Henri Agasse, Paris, 5.

PEREZ, S. M. 1974. Un inventario preliminar de los escorpiones de la region Paleartica y claves para la identificacion de los generos de la region Paleartica Occidental. *Madrid: Universidad Complutense de Madrid, Facultad de Ciencias, Departamento de Zoologia, Catedra de Artropodos*, 7: 1–45.

PIRALI-KHEIRABADI, K., S. NAVIDPOUR, V. FET, F. KOVAŘÍK & M. E. SOLEGLAD. 2009. Scorpions of Iran (Arachnida, Scorpiones). Part V. Chahar Mahal & Bakhtiyari Province. *Euscorpius*, 78: 1–23.

POCOCK, R.I. 1895. On the Arachnida and Myriapoda obtained by Dr. Anderson's collector during Mr T. Brent's expedition to the Hadramaut, South Arabia, with a supplement upon the scorpions obtained by Dr. Anderson in Egypt and the Eastern Soudan. *Zoological Journal of the Linnean Society,* 25: 292–316.

SIMON, E. 1872. Arachnides de Syrie rapportes par M. Charles Piochard de la Brulerie (Scorpions et Galeodes). *Annales de la Societe Entomologique de France*, (*5*), 2: 247–264.

SISSOM, W. D., G.A. POLIS & D. D. WATT. 1990. Field and laboratory methods. Pp. 215–221 *in:* Polis, G.A. (ed.), *Biology of Scorpions*. Stanford, CA: Stanford University Press.

SOLEGLAD, M. E. & V. FET. 2003. The scorpion sternum: structure and phylogeny (Scorpiones: Orthosterni). *Euscorpius*, 5: 1–34.

STAHNKE, H.L. 1971. Scorpion nomenclature and mensuration. *Entomological News*, 81: 297–316.

VACHON, M. 1948. Etudes sur les Scorpions. III (suite). Description des Scorpions du Nord de I'Afrique. *Archives de l'Institut Pasteur d'Algerie*, 26(3): 288–316.

VACHON, M. 1958. Scorpionidea (Chelicerata) de l'Afghanistan. The 3rd Danish Expedition to Central Asia. (Zoological Results 23). *Videnskabelige meddelelser fra Dansk naturhistorisk forening i Købehavn*, 120: 121–187.

VACHON, M. 1963. De l'utilité, en systématique, d'une nomenclature des dents de chélicères chez les scorpions. *Bulletin du Musèum National d'Histoire Naturelle, Paris*, (2), 35 (2): 161–166.

VACHON, M. 1975. Sur l'utilisation de la trichobothriotaxie du bras des pedipalps des Scorpions (Arachnides) dans le classement des genres de famille des Buthidae Simon. *Compte rendus de l'Academie des Sciences, Paris Ser.D Sciences Naturelles*, 281 (21): 1597–1599.

VACHON, M. 1966. Liste des Scorpions connus en Egypte, Arabie, Israel, Liban, Syrie, Jordanie, Turquie, Irak, Iran. *Toxicon*, 4: 209–218.

VACHON, M. 1974. Etude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum national d'Histoire naturelle Paris*, 140: 857–958.

VACHON, M. 1975. Sur l'utilisation de la trichobothriotaxie du bras des pedipalps des Scorpions (Arachnides) dans le classement des genres de famille des Buthidae Simon. *Compte rendus hebdomadaires des séances de l'Academie des Sciences, Paris Ser.D Sciences Naturelles*, 281 (21): 1597–1599.

VIGNOLI, V., F. KOVAŘÍK & P. CRUCITTI. 2003. Scorpiofauna of Kashan (Esfahan Province, Iran) (Arachnida: Scorpiones). *Euscorpius*, 9: 1–7.

YAĞMUR, E. A. 2021. *Androctonus turkiyensis* sp. n. from the Şanlıurfa Province, Turkey (Scorpiones: Buthidae). *Euscorpius*, 341: 1–18.

YAĞMUR, E. A. 2023. *Androctonus kunti* sp. n. from Iğdır Province, Turkey (Scorpiones: Buthidae). *Euscorpius*, 371: 1–23.

YAĞMUR, E. A., M. AL-SARAIREH, B. ABU AFIFEH. 2025a. Description of *Androctonus ammoneus* sp. n. from Jordan (Scorpiones: Buthidae). *Zoodiversity.* (In Press).

YAĞMUR, E. A., H. S. KACHEL, A. M. AL-KHAZALI, M. A. K. AL-JUBOURI & F. R. ALI. 2025b. *Androctonus ishtar* sp. n. from Dohuk and Nineveh provinces, Iraq (Scorpiones: Buthidae). *Journal of Natural History*, 59(25–28): 1757–1773

YAĞMUR, E. A., M. MORADI, M. LARTI & S. LASHKARI. 2016. First record of *Androctonus robustus* Kovařík & Ahmed, 2013 (Scorpiones: Buthidae) for Iran. *Zoology in the Middle East*, 62: 370–372.