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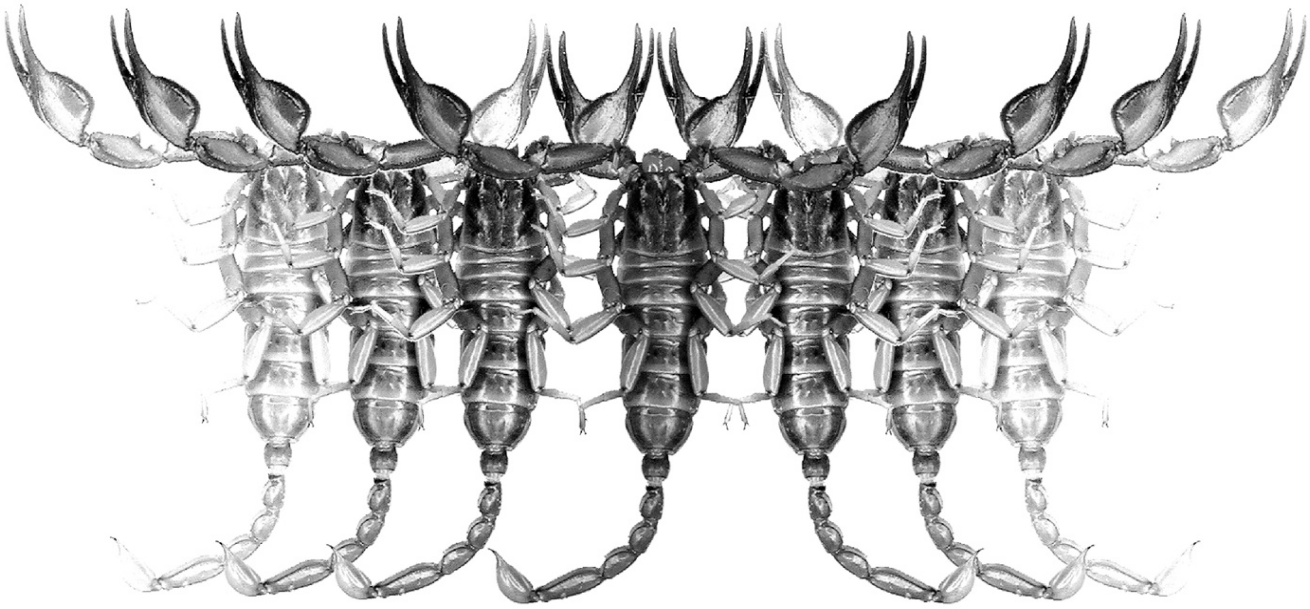

Orthochirus kovariki sp. n. from Takhar Province, Afghanistan (Scorpiones: Buthidae)

Ersen Aydın Yağmur & Faizurrahman Khalili

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Euscorpius

Occasional Publications in Scorpiology

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Euscorpius — Occasional Publications in Scorpiology. 2022, No. 352

Orthochirus kovariki sp. n. from Takhar Province, Afghanistan (Scorpiones: Buthidae)

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http://zoobank.org/urn:lsid:zoobank.org:pub:4B164498-E164-47C0-AEDE-7B8D508FF636

Summary

A new species, *Orthochirus kovariki* **sp**. **n**. is described and illustrated based on both sexes from Takhar Province of Afghanistan. *O. kovariki* **sp**. **n**. appears to be close to *O. feti* Kovařík, 2004, reported from Uzbekistan and Tajikistan; both species have the movable finger of pedipalp without outer denticles. Detailed illustrations of *O. kovariki* **sp**. **n**. are given.

Introduction

The scorpiofauna of Afghanistan is little known due to its mountainous landscape as well as political problems that have occurred in last 40 years. A few studies on scorpion fauna of Afghanistan in last 20 years included Lourenço & Qi (2006), Lourenço (2004), Kovařík (2004), Kovařík & Ahmed (2007), Fet et al. (2018), Lourenço & Duhem (2009), Soleglad et al. (2012), Kovařík et al. (2020, 2022).

Afghanistan is located at the junction of three important large-scale zoogeographical realms: Oriental, African, and Palaearctic (Wagner et al., 2016). The Amu Darya River flows along the northern border of Afghanistan (including the northern edge of Takhar Province) and defines borders of Afghanistan with Uzbekistan and Tajikistan. It is an important zoogeographic barrier; so far, species *Orthochirus feti*, *O. grosseri*, *Olivierus fuscus*, *O. elenae*, *O. kreuzbergi*, *Mesobuthus barszczewskii* and *M. fomichevi*, which are found in Uzbekistan very closely to Afghan border to the north of the Amu Darya, were not recorded south of this river in Afghanistan (Fet et al., 2018; Kovařík et al., 2020, 2022).

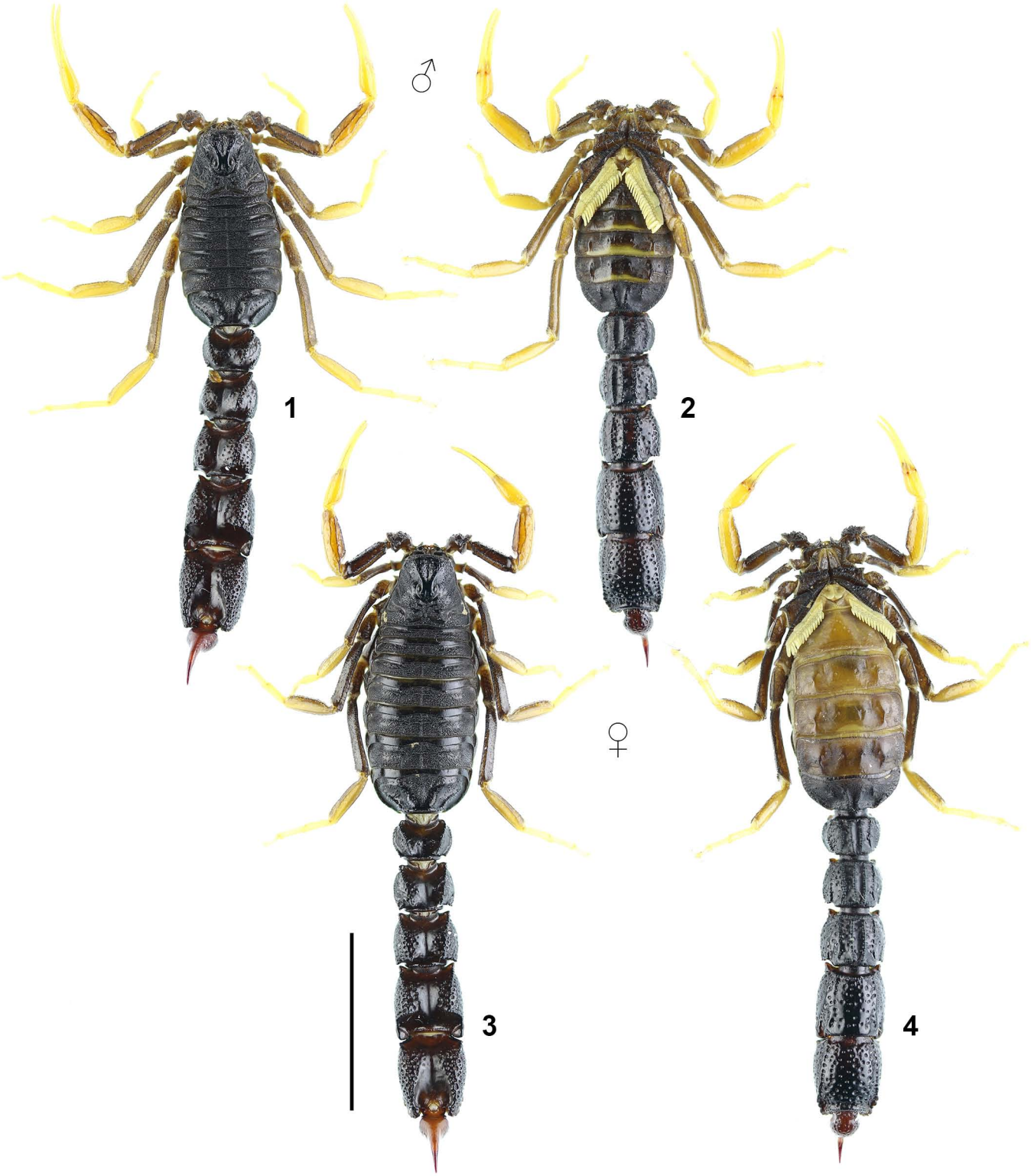
The Takhar Province is located at the Afghanistan's border with Tajikistan, defined by the Amu Darya River. The province includes three valleys of Taloqan, Kochcha, and Bangi Rivers, which all are tributaries of the Amu Darya flowing from south to north. The northern part of the Takhar Province includes lowland steppe, semi-desert, or desert habitats, while its southern part includes mountainous territories.

The scorpiofauna of Afghanistan has 33 reported species (Dupré, 2019; Fet et al., 2018; Kovařík, 2019; Kovařík et al., 2020). Eleven of those belong to genus *Orthochirus*: *O. afghanus* Kovařík, 2004; *O. bicolor* (Pocock, 1897); *O. danielleae* (Lourenço & Vachon, 1997); *O. formozovi* Kovařík, Fet & Yağmur, 2020; *O. heratensis* Kovařík, 2004; *O. jalalabadensis* Kovařík, 2004; *O. monodi* (Lourenço & Vachon, 1997); *O. nordmanni* Kovařík, Fet & Yağmur, 2020; *O. pallidus* (Pocock, 1897); *O. persa* (Birula, 1900); and *O. samrchelsis* Kovařík, 2004 (Dupre, 2019; Kovařík, 2004; Kovařík et al., 2020).

Here, we describe a new species *O. kovariki* **sp**. **n**. from Takhar Province, north of Afghanistan. We compare it especially to closely distributed *O. feti* Kovařík, 2004, which was described from Surkhondaryo Province of Uzbekistan and recently also reported from Khatlon Province of Tajikistan (Kovařík et al., 2020). Both species have the movable finger of pedipalp without outer denticles.

Material & Methods

Specimens of *O. kovariki* **sp**. **n**. were collected from the Takhar Province during the night field trip and specimens were preserved in 70 % alcohol. Identification of specimens was done after Kovařík (2004) and Kovařík et al. (2020). Photographs of *O. kovariki* **sp**. **n**. were taken by Canon EOS 7D manually. Stacking of pictures was made using Helicon Focus software version of 5.3.14. Illustration method under UV illumination after Volschenk (2005). The specimens were deposited in AZMM (Alaşehir Zoological Museum, Manisa Celal Bayar University, Alaşehir, Manisa, Turkey). The trichobothrial nomenclature is after Vachon (1974) and morphological nomenclature after Stahnke (1971) and Hjelle (1990).



Figures 1–**4**: *O. kovariki* **sp**. **n**. **Figures 1**–**2**. Male holotype, dorsal (1) and ventral (2) views. **Figures 3**–**4**. Female paratype, dorsal (3) and ventral (4) views. Scale bar: 10 mm.

		Orthochirus kovariki **sp**. **n**.	*Orthochirus kovariki* **sp**. **n**.
Dimensions (mm)		♂ holotype	♀ paratype
Carapace	L / W	3.45 / 4.45	3.90 / 4.83
Mesosoma	L	7.15	10.47
Tergite VII	L / W	5.25 / 2.03	2.63 / 5.49
Metasoma + telson	L	20.93	20.97
Segment I	L / W / D	2.10 / 3.43 / 2.71	2.50 / 3.14 / 2.28
Segment II	L / W / D	2.96 / 3.46 / 2.60	2.89 / 3.39 / 2.69
Segment III	L / W / D	2.99 / 3.61 / 2.90	2.93 / 3.64 / 2.92
Segment IV	L / W / D	3.60 / 4.04 / 2.92	3.85 / 3.86 / 2.62
Segment V	L / W / D	4.85 / 3.79 / 2.71	4.38 / 3.82 / 2.68
Telson	L / W / D	4.43 / 1.73 / 1.37	3.97 / 1.68 / 1.59
Pedipalp	L	13.18	12.35
Femur	L / W	3.51 / 0.92	3.16 / 0.89
Patella	L / W	4.28 / 1.09	3.72 / 1.25
Chela	L	5.39	5.47
Manus	W / D	1.60 / 1.10 / 1.02	1.81 / 1.03 / 1.06
Movable finger	L	3.79	3.70
Total	**L**	**31.58**	**35.34**

Table 1. Comparative measurements of *Orthochirus kovariki* **sp**. **n**. types. Abbreviations: length (L), width (W, in carapace it corresponds to posterior width), depth (D).

Systematics

Family **Buthidae C. L. Koch, 1837**
***Orthochirus* Karsch, 1892**
***Orthochirus kovariki* sp. n.**
(Figures 1–70, Table 1)
http://zoobank.org/urn:lsid:zoobank.org:act:99019D92-9740-4C51-A75C-BDDC30EABED5

Type locality and type depository. **Afghanistan**, Takhar Province, Taloqan District, Post Khor Region, 36°44'57"N 69°34'48"E, 840 m a. s. l.; AZMM.

Type material examined. **Afghanistan**, Takhar Province, Taloqan District, Post Khor Region, 36°44'57"N 69°34'48"E, 840 m a. s. l., 1♂ (holotype) (AZMM/Sco-2020:5), 2♂3♀ (paratypes) (AZMM/Sco-2020:6-10), 14 May 2020, leg. F. Khalili.

Etymology. The species epithet is a patronym dedicated to František Kovařík, a friend of the first author and Czech arachnologist, who has made great contributions to the knowledge of the genus *Orthochirus* in Asia and the Middle East.

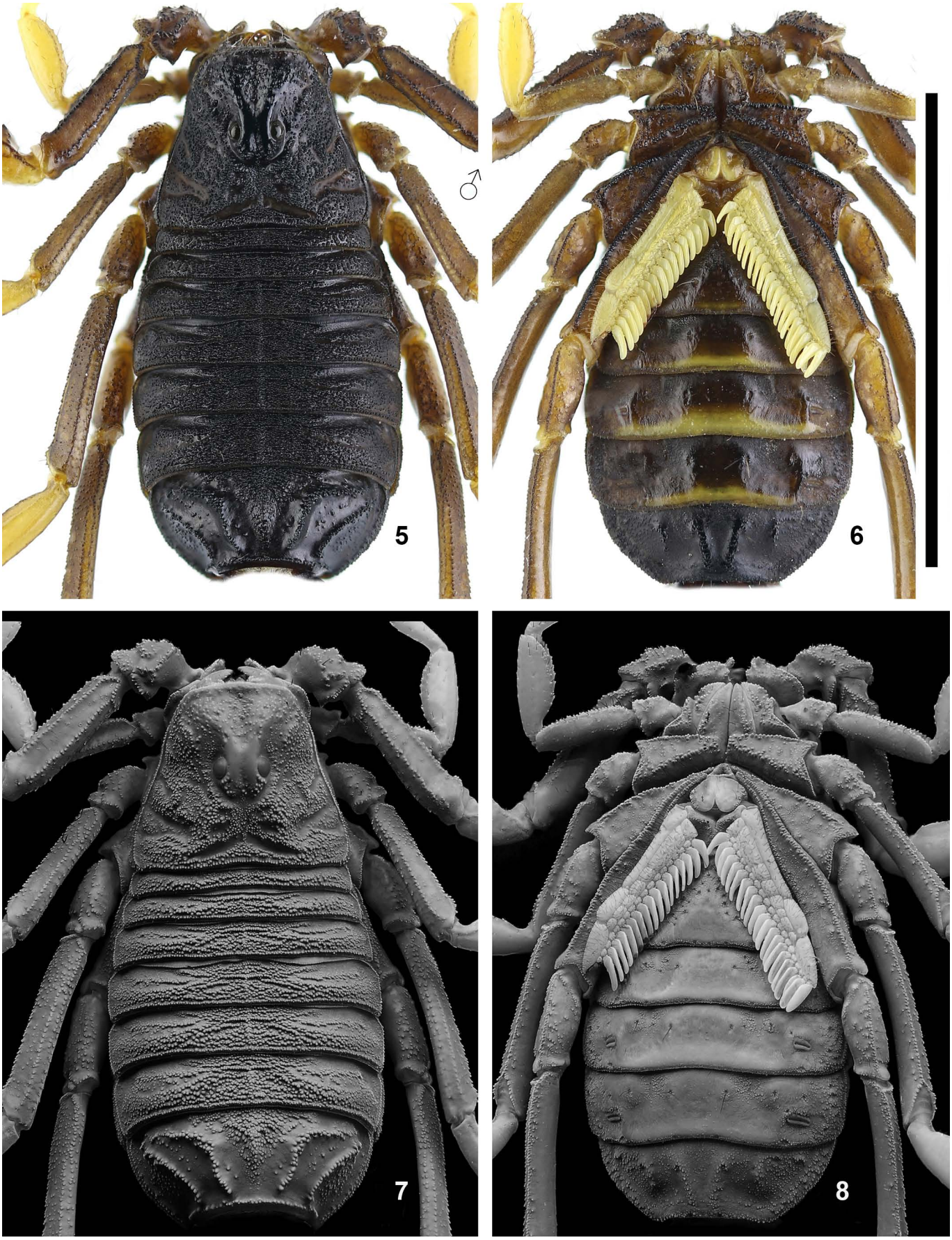
Diagnosis. Small sized scorpion. Total length 31.41–31.58 mm in males and 34.23–35.34 in females. General coloration dark reddish black or black, femur of pedipalp yellowish brown or dark reddish brown, chela yellow. Distal segments of legs are yellow. Trichobothrium d_2 is located on the dorsal surface of pedipalp femur, reduced. Pectinal teeth number 22–23 in males and 15–18 in females. The movable and fixed fingers with 8–9 rows of denticles with internal and without external denticles, and three to five distal denticles. Metasoma I–II with 10 carinae, metasoma III with 6 carinae, metasoma IV–V with 2 dorsolateral carinae and incomplete ventrolateral carinae.

Description. Total length of adults is 31.41–35.34 mm in both sexes. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps are given in Table 1.

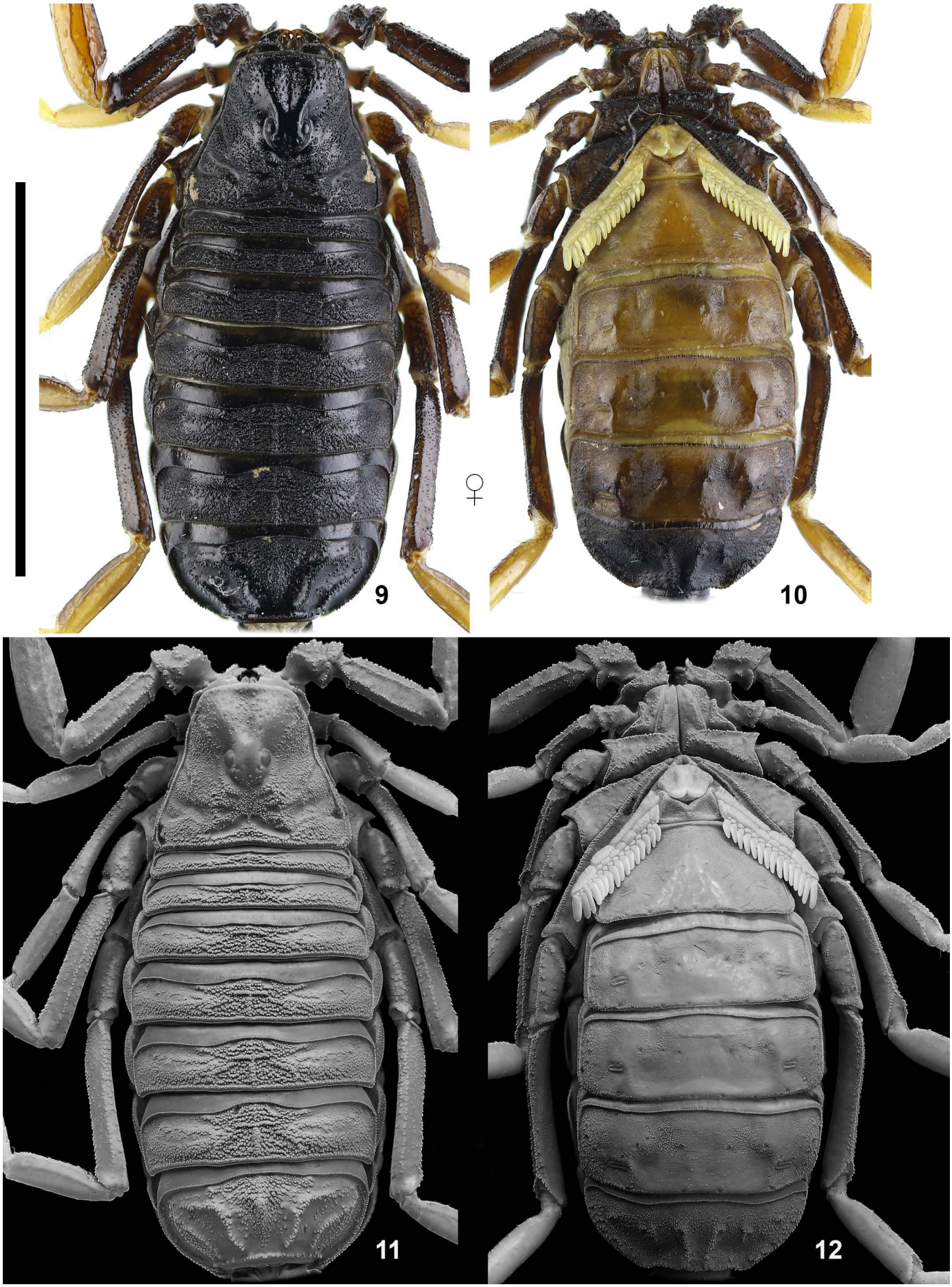
Holotype male.

Coloration (Figs. 1–2). The carapace, mesosoma and metasoma dark reddish black the vesicle reddish black, sting dark reddish brown. Femur of pedipalp yellowish brown, patella of pedipalp light yellowish brown, carinae of femur and patella are darker, chela yellow. Femur of legs yellowish brown and tibia of legs very light yellowish brown, other segments are yellow.

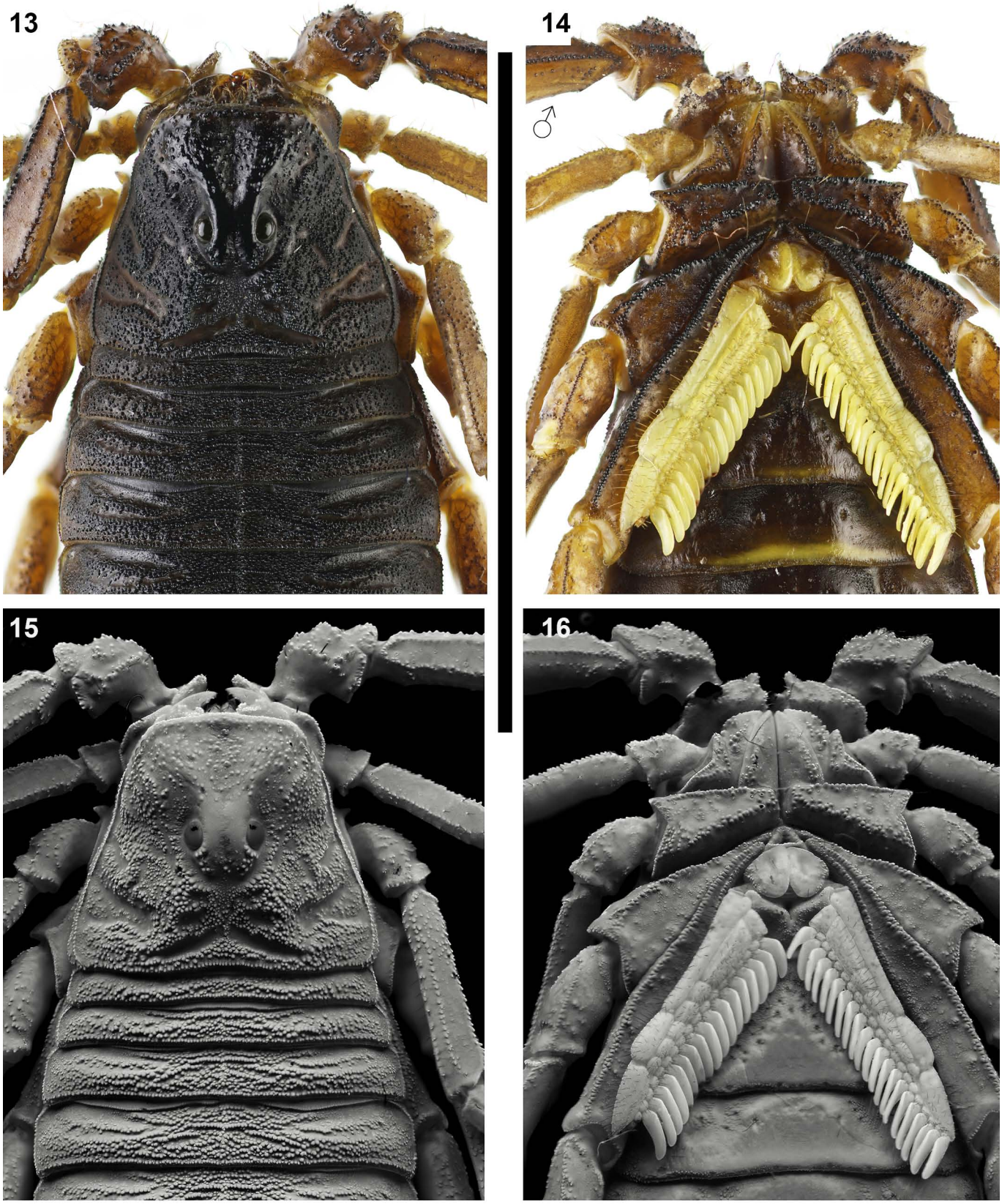
Carapace and mesosoma (Figs. 5–8, 13–16). The carapace is densely granulated, anterior region of carapace with swollen and sparsely granular, the interocular area is smooth. Anterior of carapace is convex. Mesosomal segments I-VI densely granulated, the granules are in the middle of tergite more distinct and bigger and bear a median carina. Mesosomal segment VII with dense granules medially and scattered coarse granules laterally and five granular carinae. Sternites III–V smooth medially and finely granular laterally and with two smooth carinae, sternite VI more granular and with two finely granular carinae, sternite VII with finely granular and four finely granular carinae. Pectinal teeth number 20–21.



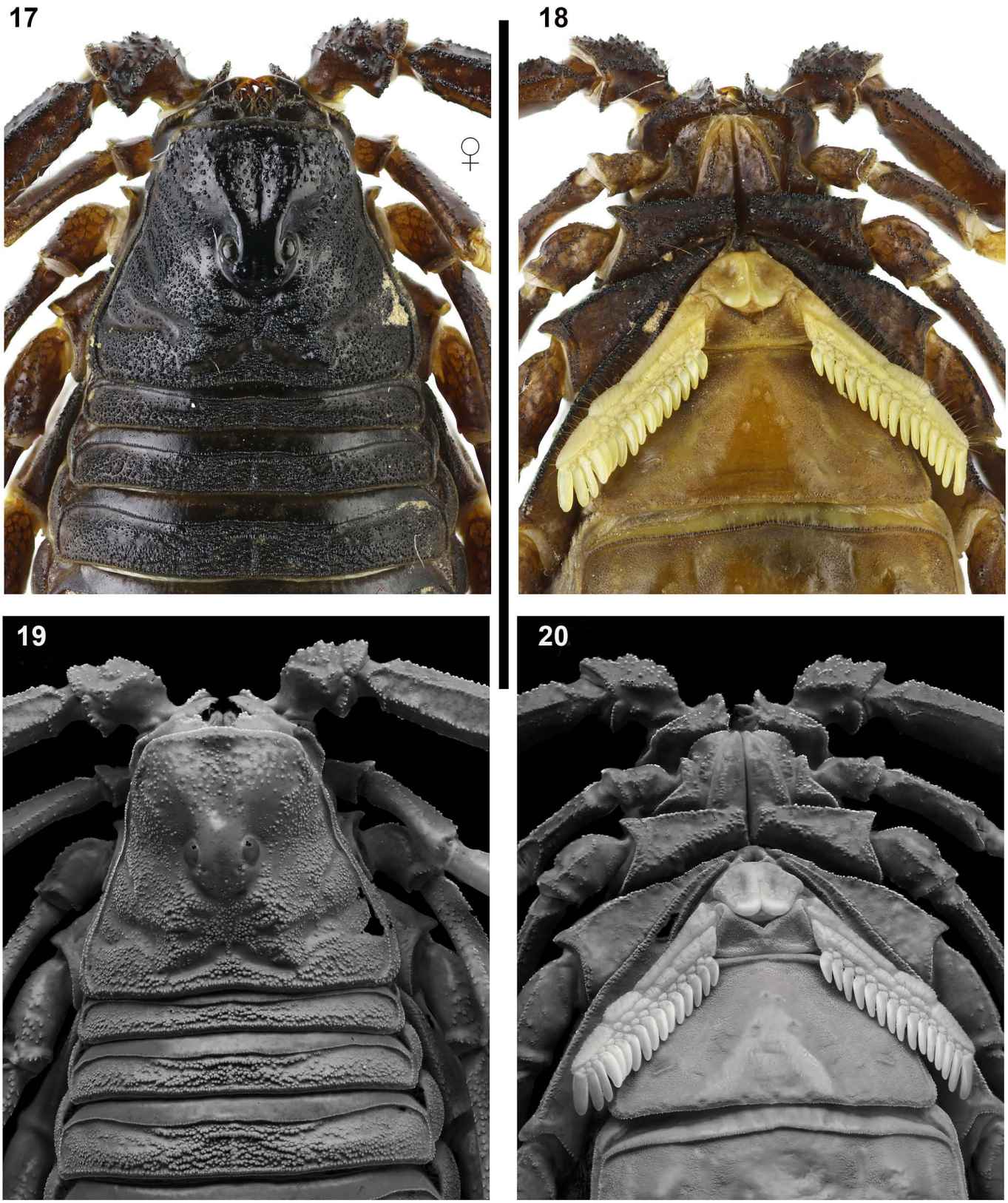
Figures 5–**8**: *O. kovariki* **sp**. **n**., carapace and mesosoma of male holotype. **Figures 5**–**6**: Under white light, dorsal (5) and ventral (6) views. **Figures 7**–**8**: Under UV light, dorsal (7) and ventral (8) views. 10 mm.



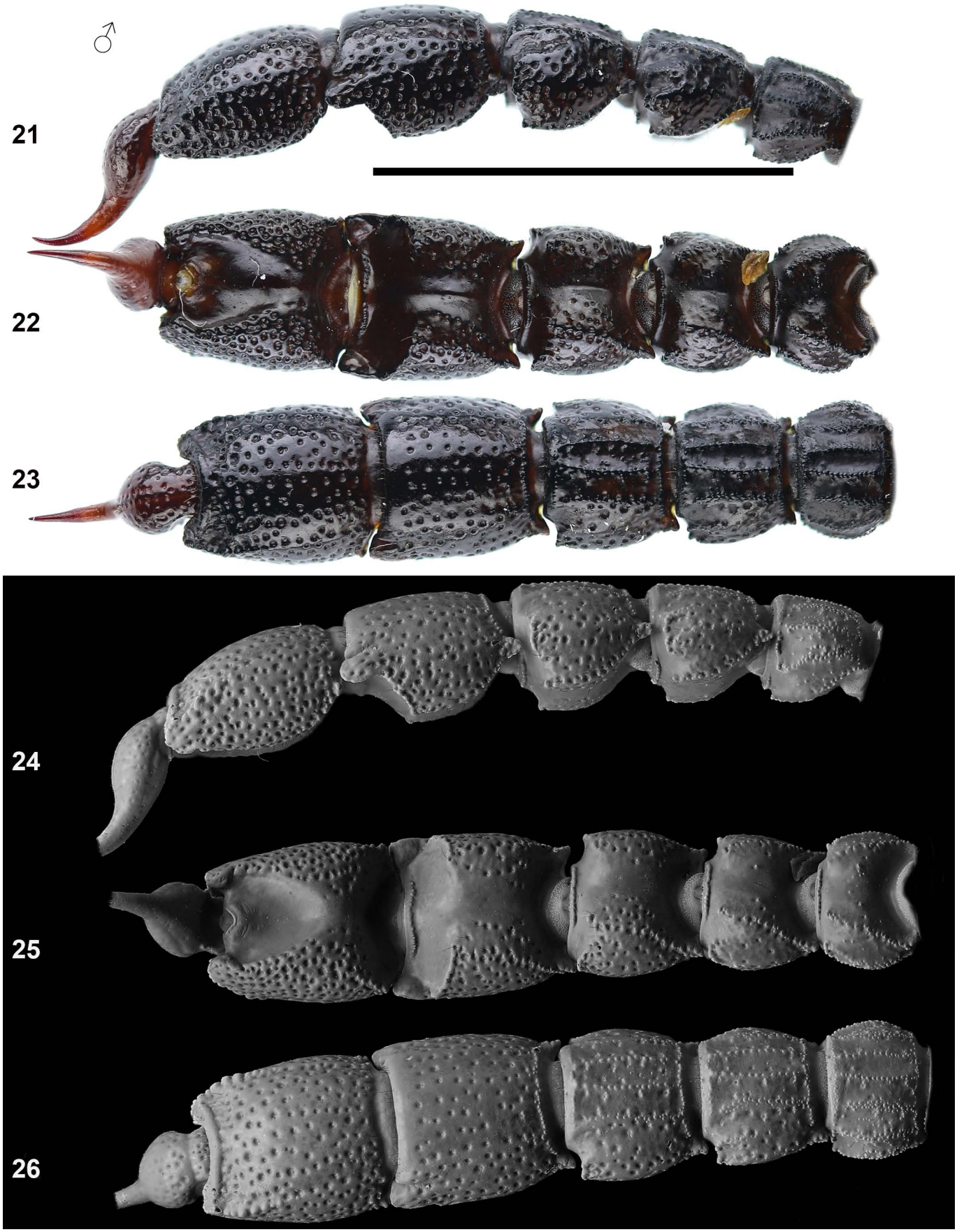
Figures 9–**12** *O. kovariki* **sp**. **n**., carapace and mesosoma of female paratype. **Figures 9**–**10**: Under white light, dorsal (9) and ventral (10) views. **Figures 11**–**12**: Under UV light, dorsal (11) and ventral (12) views. 10 mm.



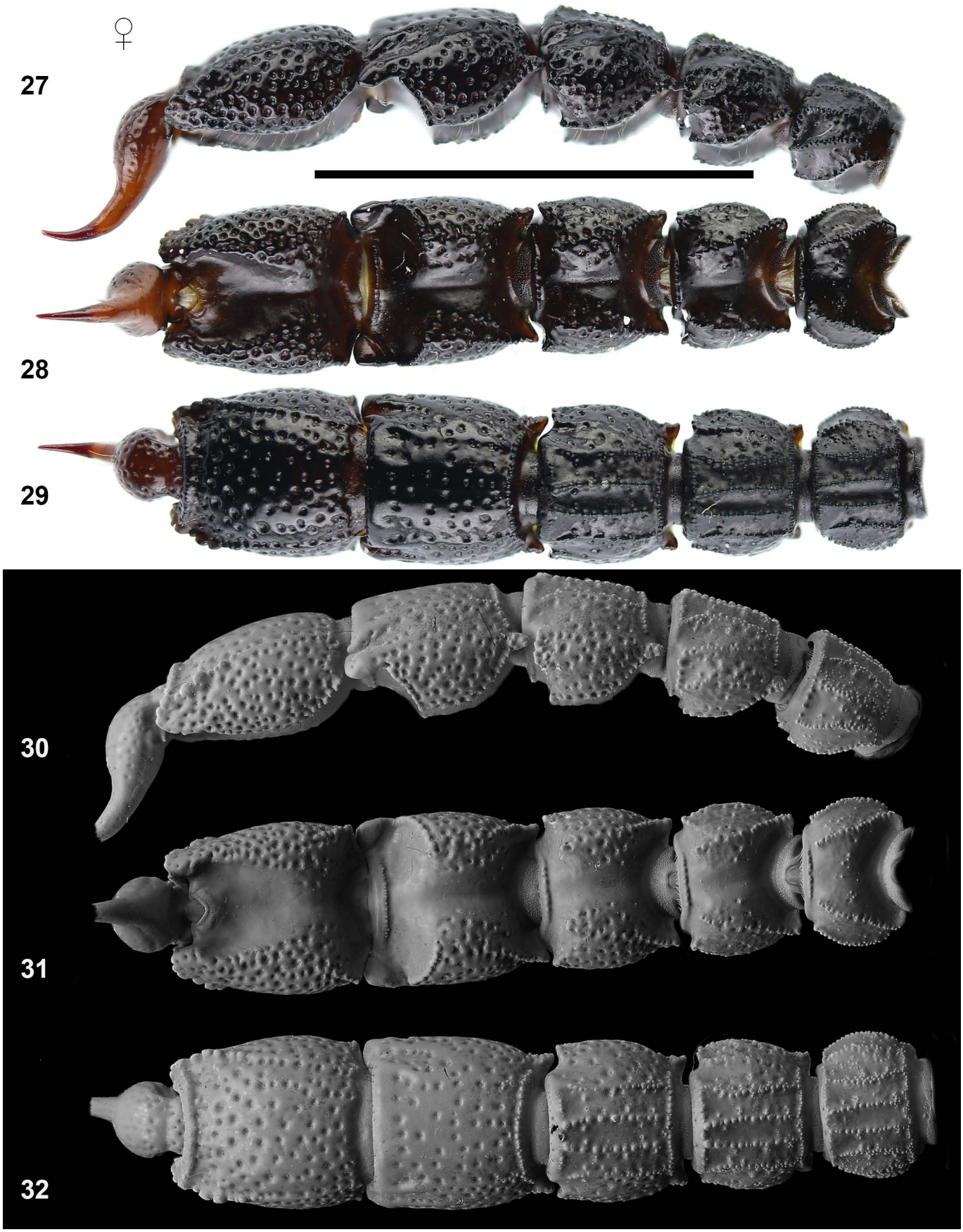
Figures 13–**16**: *O. kovariki* **sp**. **n**., carapace and sternopectinal area of male holotype. **Figures 13**–**16**: Under white light, dorsal (13) and ventral (14) views. **Figures 15**–**16**: Under UV light, dorsal (15) and ventral (16) views.



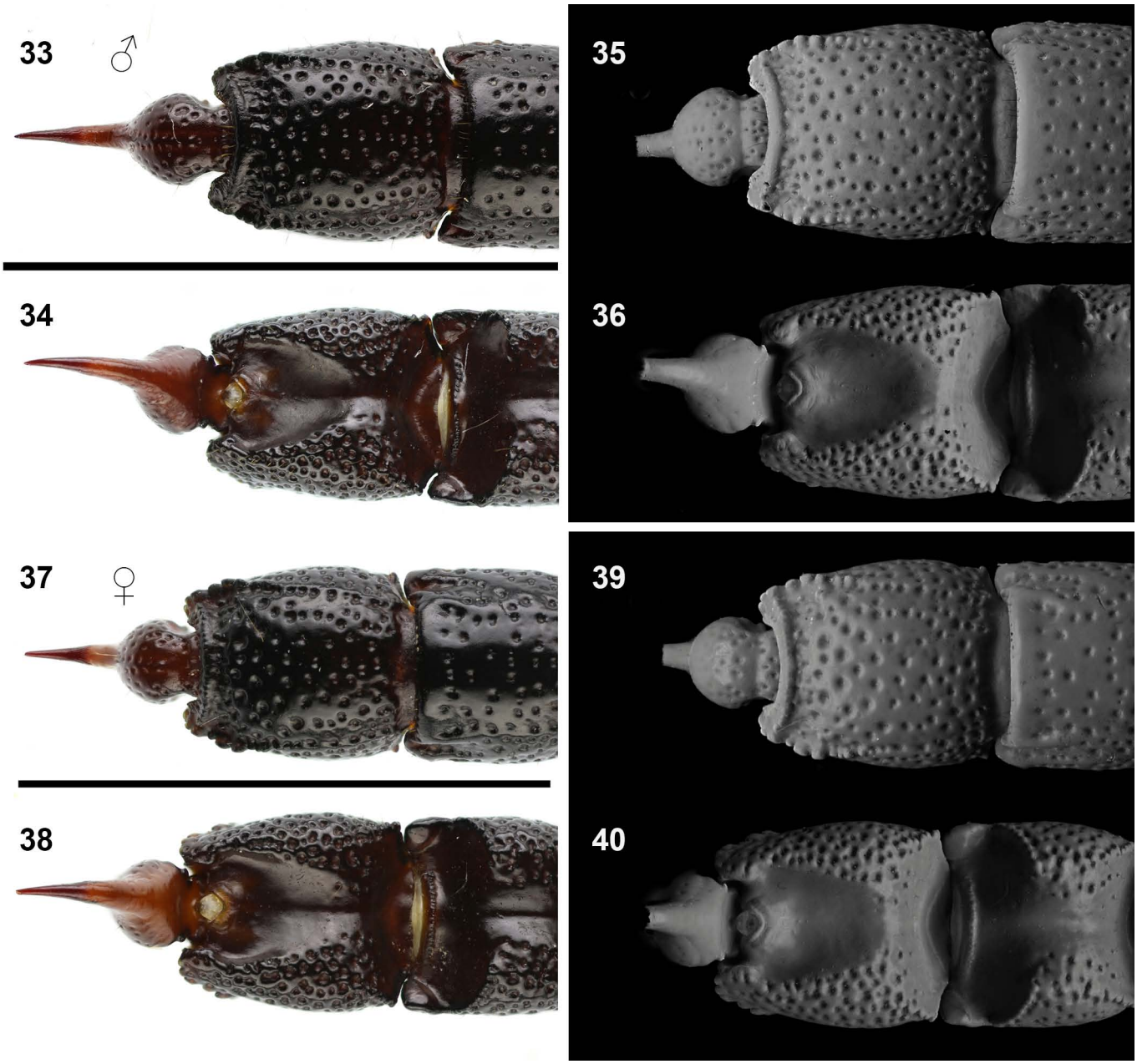
Figures 17–**20**: *O. kovariki* **sp**. **n**., carapace and sternopectinal area of female paratype. **Figures 17**–**18**: Under white light, dorsal (17) and ventral (18) views. **Figures 19**–**20**: Under UV light, dorsal (19) and ventral (20) views. 10 mm.



Figures 21–**26**: *O. kovariki* **sp**. **n**., metasoma and telson of male holotype. **Figures 21**–**23**. Under white light, lateral (21), dorsal (22), and ventral (23) views. **Figures 24**–**26**. Under UV light, lateral (24), dorsal (25), and ventral (26) views. Scale bar: 10 mm.



Figures 27–32: *O. kovariki* **sp. n.**, metasoma and telson of female paratype. **Figures 27–29**. Under white light, lateral (27), dorsal (28), and ventral (29) views. **Figures 30–32**. Under UV light, lateral (30), dorsal (31), and ventral (32) views. Scale bar: 10 mm.

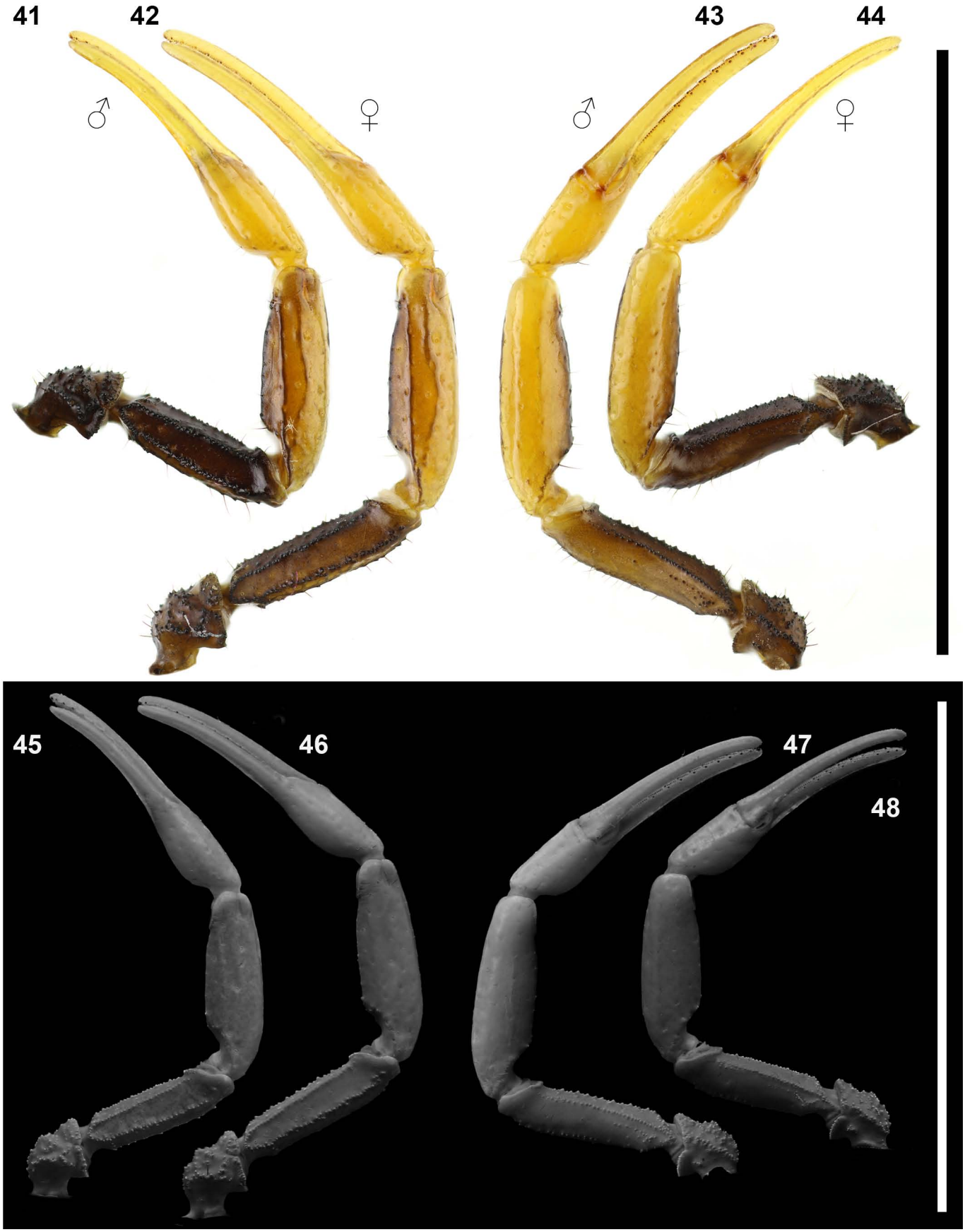


Figures 33–40: *O. kovariki* **sp. n.**, metasoma V and telson under white (33–34, 37–38) and UV (35–36, 39–40) light. **Figures 33–36**: Male holotype, ventral (33, 35) and dorsal (34, 36) views. **Figures 37–40**: Female paratype, ventral (37, 39) and dorsal (38, 40) views. Scale bars: 10 mm (33–36, 37–40).

Metasoma and telson (Figs. 21–26, 33–36). Metasomal segment I with 10 granular carinae, intercarinal area smooth with rough granules, and without punctae. Segment II with 10 sparsely granular carinae, lateral carinae vestigial, intercarinal area rough, without granules and with little number punctae. Segment III with 6 granular carinae, intercarinal area rough, without granules and with punctae. Segment IV–V with inconspicuous dorsal and ventrolateral, intercarinal area smooth and with dense punctae Segment V with small granules that gradually increased posteriorly on the ventrolateral carinae. Telson is elongated, vesicle with weak punctae. The entire metasoma is sparsely hirsute with short setae, telson without setae. Dorsal surface of metasoma smooth. Dorsal of segments I-II with a few coarse granules laterally and, segments V a few small granules mesially.

Pedipalps (Figs. 42–43, 46–47). The femur of pedipalp with five granular carinae. Trichobothrium d_2 of pedipalp femur present on dorsal surface. The patella with seven smooth carinae. The chela is smooth, lustrous, without carinae. The movable and fixed fingers bear eight or nine rows of denticles with internal and without external denticles and three to five distal denticles. The all pedipalps with scattered and distinct setae.

Legs (Figs. 61–64). The femur and patella of the leges bear setae and spines. Tarsomeres of legs I -III bear bristlecombs. The inner sides of all legs with two rows of spines.



Figures 41–**48**: *O. kovariki* **sp**. **n**., pedipalp under white (41–44) and UV (45–48) light. **Figures 41**, **44**–**45**, **48**. Female paratype dorsal (41, 45) and ventral (44, 48) views. **Figures 42**–**43**, **46**–**47**. Male holotype dorsal (42, 46) and ventral (43, 47) views. Scale bars: 10 mm (41–44, 45–48).

Figures 49–60: *O. kovariki* **sp. n.**, pedipalp chela. **Figures 49–54**: Male holotype. Chela ventral (49), dorsal (50), internal (51) and external (52), fixed (53) and movable (54) fingers dentition. **Figures 55–60**: Female paratype. Chela ventral (55), dorsal (56), internal (57) and external (58), fixed (59) and movable (60) fingers dentition. Scale bars: 1 mm (49–52, 53–54, 55–58, 59–60).

Figures 61–**68**. *O. kovariki* **sp**. **n**., right legs I–IV of male holotype (61-64) and female paratype (65-68), retrolateral aspect.

Figures 69–**70**: Habitat of *O. kovariki* **sp**. **n**. Post Khor Region in Takhar Province, Afghanistan.

Paratype female.

Coloration (Figs. 3–4). The carapace and mesosoma black, metasoma dark reddish black, the vesicle dark reddish brown, sting reddish brown. Femur of pedipalp dark reddish brown, patella of pedipalp light yellowish brown, carinae of femur and patella are darker, chela yellow. Femur of legs dark yellowish brown and tibia of legs yellowish brown, other segments are yellow.

Carapace and mesosoma (Figs. 9–12, 17–20). Carapace densely granulated, anterior region of carapace with swollen and sparsely granular and less distinct than in males, the interocular area is smooth. Anterior of carapace is convex. Mesosomal segments I-VI densely granulated, the granules are in the middle of tergite more distinct and bigger, the granules smaller laterally than in males and bear a median carina. Mesosomal segment VII with dense granules medially and scattered coarse granules laterally and five granular carinae. Mesosomal segment VII with dense granules medially and scattered coarse granules laterally and five granular carinae. Sternites III-V smooth medially and finely granular laterally and with two smooth carinae, sternite VI more granular and with two finely granular carinae, sternite VII with finely granular and four finely granular carinae. Females with more dense granules then males in sternites VI-VII. Pectinal teeth number 15–18.

Metasoma and telson (Figs. 27–32, 37–40). Metasomal segment I with 10 granular carinae, intercarinal area smooth with rough granules, and without punctae. Segment II with 10 sparsely granular carinae, lateral carinae vestigial, intercarinal area rough, without granules and with little number punctae. Segment III with 6 granular carinae, intercarinal area rough, without granules and with punctae. Segments IV–V with inconspicuous dorsal and ventrolateral, intercarinal area smooth and with dense punctae. Segment V with small granules that gradually increased posteriorly on the ventrolateral carinae. These granules are bigger than males. Telson is elongated, vesicle with weak punctae. The entire metasoma is sparsely hirsute with short setae, telson without setae. Dorsal surface of metasoma smooth. Dorsal of segments I–II with a few coarse granules laterally and, segments V a few small granules mesially.

Pedipalps (Figs. 41, 44, 45, 48). The femur of pedipalp with five granular carinae. Trichobothrium d_2 of pedipalp femur present on dorsal surface. The patella with seven smooth carinae. The chela is smooth, lustrous, without carinae. The movable and fixed fingers bear eight or nine rows of denticles with internal and without external denticles and three to five distal denticles. All pedipalps with scattered and distinct setae.

Legs (Figs. 65–68). The femur and patella of the legs bear setae and spines. Tarsomeres of legs I–III bear bristlecombs. The inner sides of all legs with two rows of spines.

Affinities. *O. kovariki* **sp**. **n**. differs from all congeneric species found in Afghanistan by having both movable and fixed fingers without external denticles. Compared to the closely distributed *O. feti* (Uzbekistan, Tajikistan) the new species has sparse, short setae, whereas *O. feti* is hirsute with long and dense setae. *O. kovariki* **sp**. **n**. also appears to have lower number of pectinal teeth; out of six available specimens, one male lacks pectines; the holotype male has 20–21 teeth, and the paratype male, 20–20. Three female paratypes have 17-18 (2) and 15-16 (1) teeth. At the same time, a few known specimens of *O. feti* have 20–21 and 22–23 in males, and 18–20 in females.

Ecology. All the specimens found were collected during night-time field studies in open habitats while actively moving on the soil surface. Specimens were found at low altitude. It has been observed that it is distributed in sandy or soft soil lands (Figs. 69–70). Two other buthid species, *Orthochirus formozovi* Kovařík, Fet & Yağmur, 2020, and *Olivierus mischi* (Fet et al., 2018), were detected in same habitat as *Orthochirus kovariki* **sp**. **n**.

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