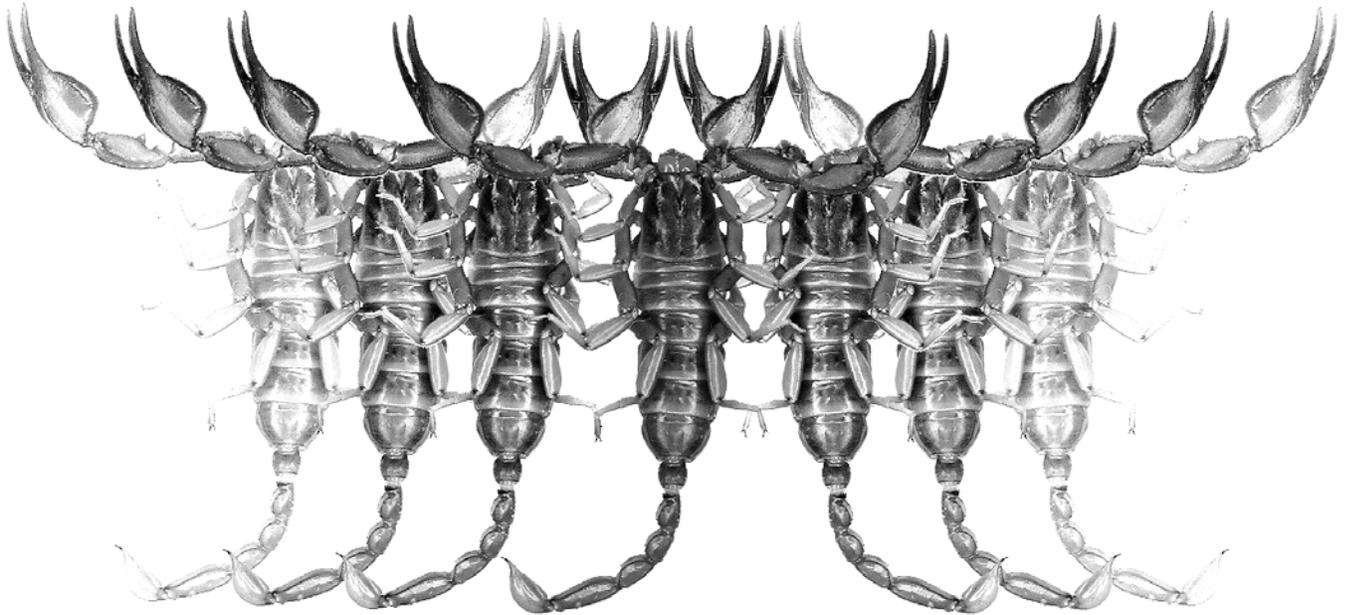


Euscorpilus

Occasional Publications in Scorpiology



**Three New Species of *Scorpiops* Peters, 1861 (Scorpiones:
Euscorpidae: Scorpiopinae) from Pakistan**

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Euscorpius

Occasional Publications in Scorpiology

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Publication date: 30 November 2009

Three new species of *Scorpiops* Peters, 1861 (Scorpiones: Euscorpiidae: Scorpiopinae) from Pakistan

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Summary

Three new species of the genus *Scorpiops* with 17 external trichobothria on the patella and total length of 50–72 mm are described from northern Pakistan and compared with other species of the genus. A key to the species of the genus is provided. In *S. pakistanus* **sp. n.** ventral trichobothria on the patella number 9–10, chela manus is wide and short, and pectinal teeth number 6–8. In *S. pseudomontanus* **sp. n.** ventral trichobothria on the patella number 14–18, chela manus is narrow and long, and pectinal teeth number 6–9. In *S. zubairahmedi* **sp. n.** ventral trichobothria on the patella number 7, chela manus is very narrow and long, and pectinal teeth number 6.

Systematics

Scorpiops Peters, 1861
(Figs. 1–26, Table 1)

Scorpiops Peters, 1861: 510; Kraepelin, 1899: 179 (in part); Vachon, 1980: 143 (in part); Tikader & Bastawade, 1983: 403 (in part); Stockwell, 1989: 120; Sissom, 1990: 114 (in part); Kovařík, 1998: 142 (in part); Fet, 2000: 491 (in part); Kovařík, 2000: 162 (in part); Kovařík, 2001: 85 (in part); Sologlad & Sissom, 2001: 93; Kovařík, 2005: 8; Qi, Zhu & Lourenço, 2005: 2; Kovařík, 2009: 27.

Scorpiops (*Euscorpiops*) Vachon, 1980: 155 (in part).

Euscorpiops: Kovařík, 1998: 141 (in part); Lourenço, 1998: 246 (in part); Fet, 2000: 488 (in part).

Type species: *Scorpiops hardwickei* (Gervais, 1843)

DIAGNOSIS. Ventral edge of cheliceral movable finger with 5–7 denticles. Three pairs of lateral eyes and 17–19 external trichobothria on patella of pedipalps. Ventral surface of patella bears 6–18 trichobothria. Ventral surface of chela bears 3 or 4 trichobothria, of which V_4 , if not absent, is always situated on ventral aspect of chela. Trichobothrium Eb_3 on external surface of chela is between trichobothria Db and Dt .

***Scorpiops pakistanus* Kovařík et Ahmed, sp. n.**
(Figs. 1–12, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **Pakistan**, North-West Frontier Province, Upper Dir; author's collection (FKCP).

TYPE MATERIAL. **Pakistan**, North-West Frontier Province, Upper Dir, 10 August 2009, 1♂ (holotype), 3♂, 1♀, 2 juvs. (paratypes), leg. Yasin, 16 September 2009, 1♂, 1♀, 2♀ imm. (paratypes).

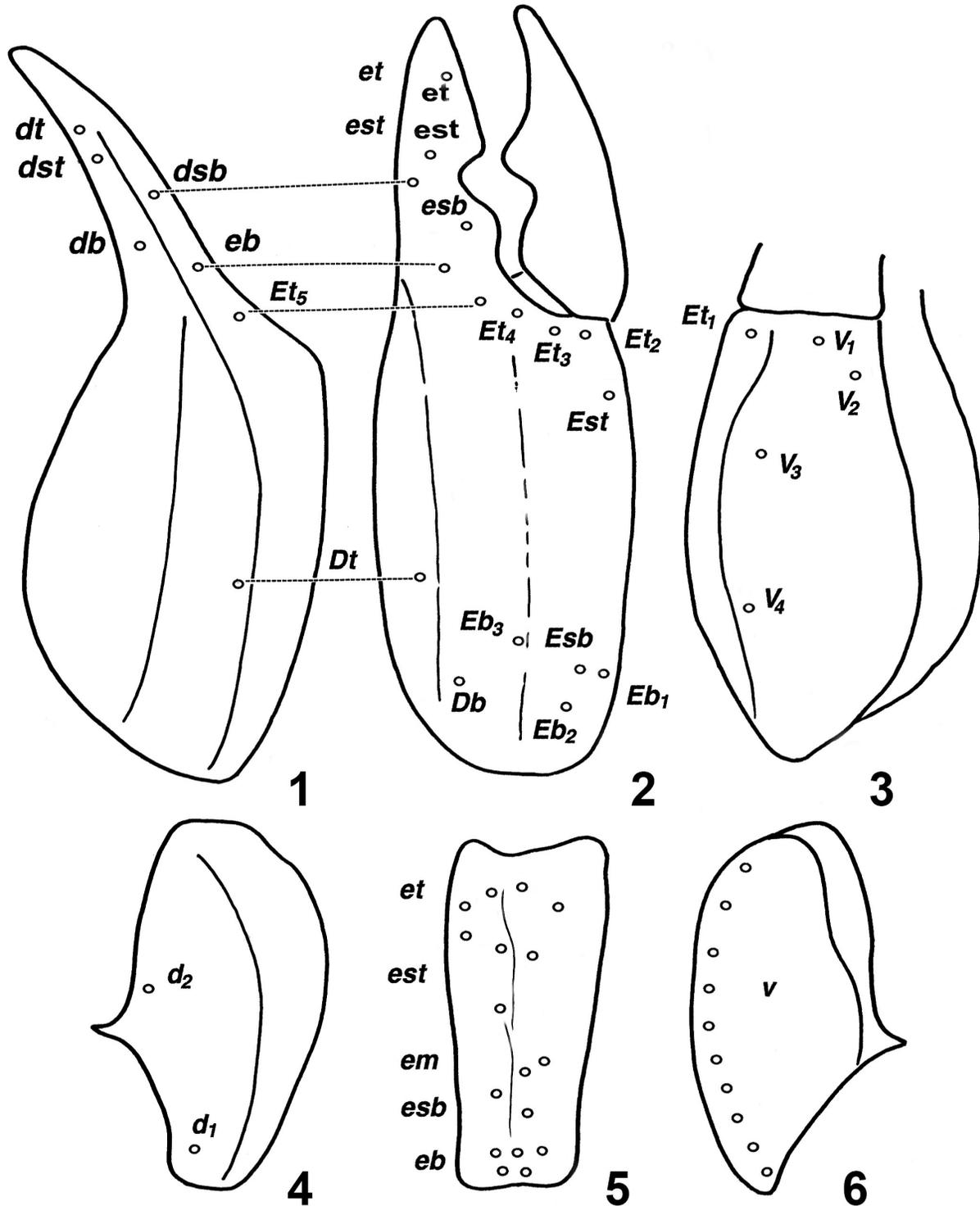
ETYMOLOGY: Named after the country of occurrence.

DIAGNOSIS. Adults 55–72 mm long. Base color uniformly reddish brown, fingers black, legs and telson yellowish brown. Pectinal teeth number 6–8. External trichobothria on patella number 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*); ventral trichobothria on patella number 9 or 10. Male manus of pedipalp in adults broader than in female. Male has fingers of pedipalps strongly flexed (Fig. 9), whereas female has them flexed only slightly (Fig. 12).

DESCRIPTION: The adults are 55–72 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. The base color is uniformly reddish brown, fingers are black, legs and telson are yellowish brown. For habitus see Figs. 7–12.

MESOSOMA AND CARAPACE: The mesosoma bears several pointed (male) or rounded (female) granules; the seventh segment is ventrally smooth, with four obsolete carinae. The entire carapace bears sparse minute granules and lacks carinae. There is a pronounced central depression in the anterior margin of the carapace. Pectinal teeth number 6–8.

METASOMA AND TELSON: The metasoma is dorsally nearly smooth, with only sparse granules. Granules are more numerous on lateral and ventral surfaces between carinae. The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth



Figures 1–6: *Scorpiops pakistanus* Kovařík et Ahmed, **sp. n.**, male paratype. 1. Chela dorsal. 2. Chela external. 3. Manus ventral. 4. Patella dorsal. 5. Patella external. 6. Patella ventral. The first capital letters denote trichobothria situated on the manus, and the first lower-case letters denote those situated on the fixed finger of pedipalp. Figs. 4 to 6 show the distribution of trichobothria on the patella of pedipalp. First letters: *D*, dorsal, *E*, external, *I*, internal, *V*, ventral. Second or second plus third letters: *b*, basal, *sb*, suprabasal, *m*, medial, *st*, subterminal, *t*, terminal, *v*, ventral. Numerals distinguish individual trichobothria of the same classification. Designation and description of trichobothria after Vachon (1974). Morphological terminology after Stahnke (1970).

		<i>Scorpiops pakistanus</i> sp. n.		<i>Scorpiops pseudomontanus</i> sp. n.		<i>Scorpiops zubairahmedi</i> sp. n.
		male	female	male	female	male
		HT	AT	HT	AT	HT
Total	length	71.5	70.8	60.0	59.5	60.0
Carapace	length	10.2	10.1	9.1	8.0	7.8
	width	11.0	10.5	8.9	8.5	7.9
Metasoma and telson	length	35.4	32.3	27.9	23.5	36.2
	segment I					
	length	3.7	3.1	2.9	2.5	3.5
	width	3.7	3.8	2.9	2.6	3.3
	segment II					
	length	4.0	3.7	3.0	2.6	4.1
	width	3.3	3.3	2.6	2.3	2.9
	segment III					
	length	4.5	4.0	3.4	2.8	4.6
	width	3.1	3.0	2.3	2.1	2.8
	segment IV					
	length	5.2	4.9	4.0	3.4	5.3
	width	2.8	2.7	2.2	1.9	2.6
	segment V					
	length	8.2	7.6	6.5	5.4	8.6
	width	2.7	2.6	2.1	1.8	2.3
telson	length	9.0	8.0	7.4	6.5	9.2
Pedipalp femur	length	8.9	9.0	10.9	8.5	7.5
	width	3.8	3.8	3.9	3.3	2.6
patella	length	8.6	8.5	9.1	7.5	7.5
	width	4.4	4.0	4.0	3.5	3.0
chela	length	19.5	18.2	19.3	15.5	14.2
	width	8.0	6.7	6.1	5.3	4.2
finger mov.	length	10.1	9.8	8.9	7.5	7.9
Pectinal teeth		8:8	6:7	7:6	7:7	6:6

Table 1: Measurements (mm) of type specimens of *Scorpiops pakistanus* sp. n., *S. pseudomontanus* sp. n., and *S. zubairahmedi* sp. n.

segment bears seven carinae, all composed of granules some of which are pointed. The ventral carina of the fifth segment posteriorly forks to form the letter Y. The dorsolateral carinae of the third and fourth segments posteriorly terminate in a pronounced denticle. The telson is elongate, smooth, with minute granules.

PEDIPALPS: For position and distribution of trichobothria on the chela and patella of pedipalps see Figs. 1–6. External trichobothria on the patella number 17 (*5 eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) (Fig. 5), and ventral trichobothria on the patella number 10 (Fig. 6) or 9. The femur is granulated, has six granulose carinae, and the patella has five carinae with pronounced internal double tubercles. The entire manus dorsally bears rounded granules, which in the central part are minute and form a longitudinal carina. The movable fingers bear straight double rows of granules with internal and external granules. The male has fingers of pedipalps strongly flexed, whereas in the female they are flexed only slightly (Figs. 9 and 12).

AFFINITIES. The described features distinguish *Scorpiops pakistanus* sp. n. from all other species of the genus. They are recounted in the key below.

Scorpiops pakistanus sp. n. is most similar to *S. petersii*, from which it differs chiefly by the higher

number (9–10) of ventral trichobothria on the patella of pedipalps, marked sexual dimorphism in the shape of pedipalp chela, and lighter color of the legs.

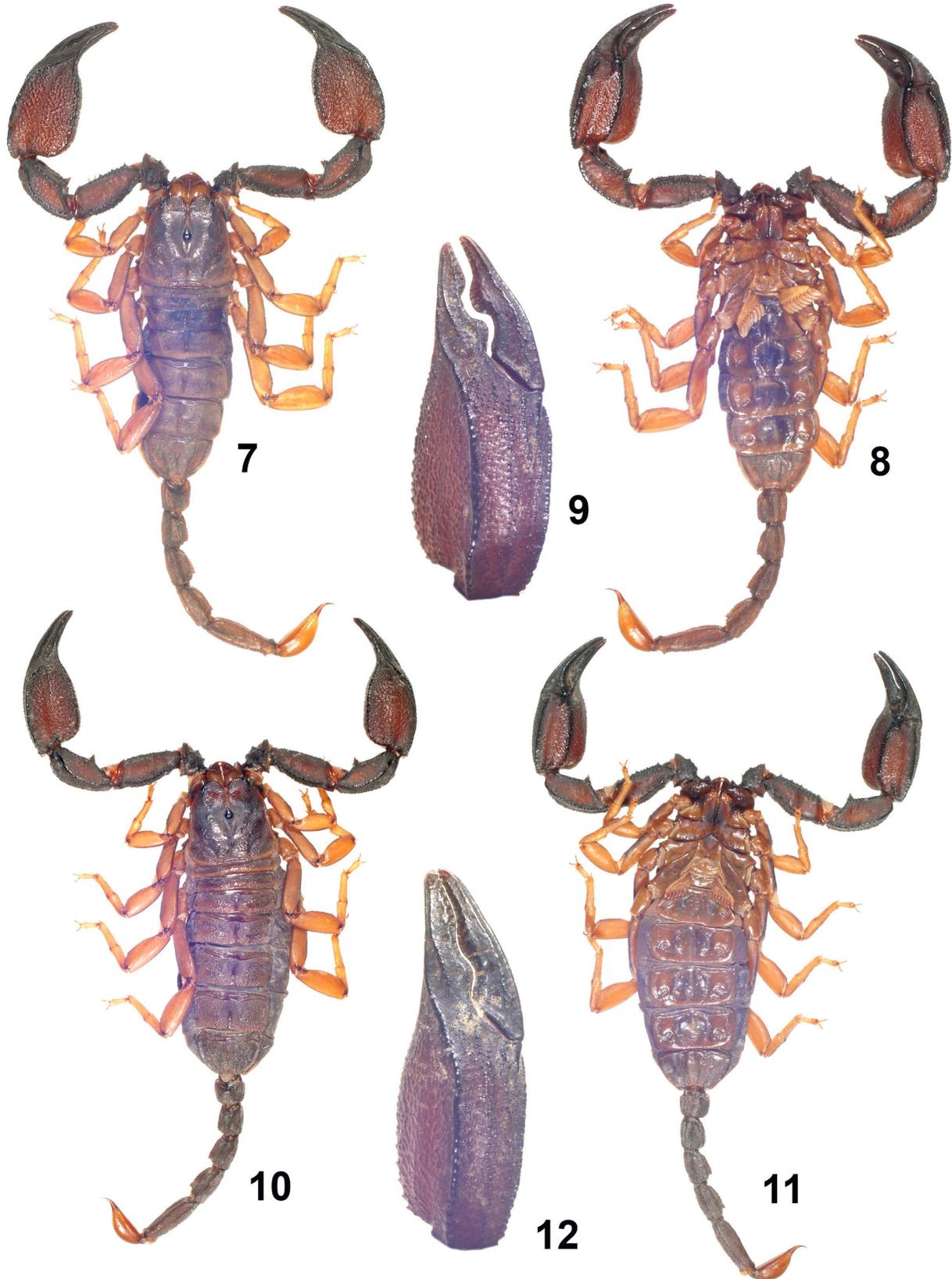
***Scorpiops pseudomontanus* Kovařík et Ahmed, sp. n.**
(Figs. 13–19, 21, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. Pakistan, Gilgit-Baltistan, Gilgit, lower Naltar; author's collection (FKCP).

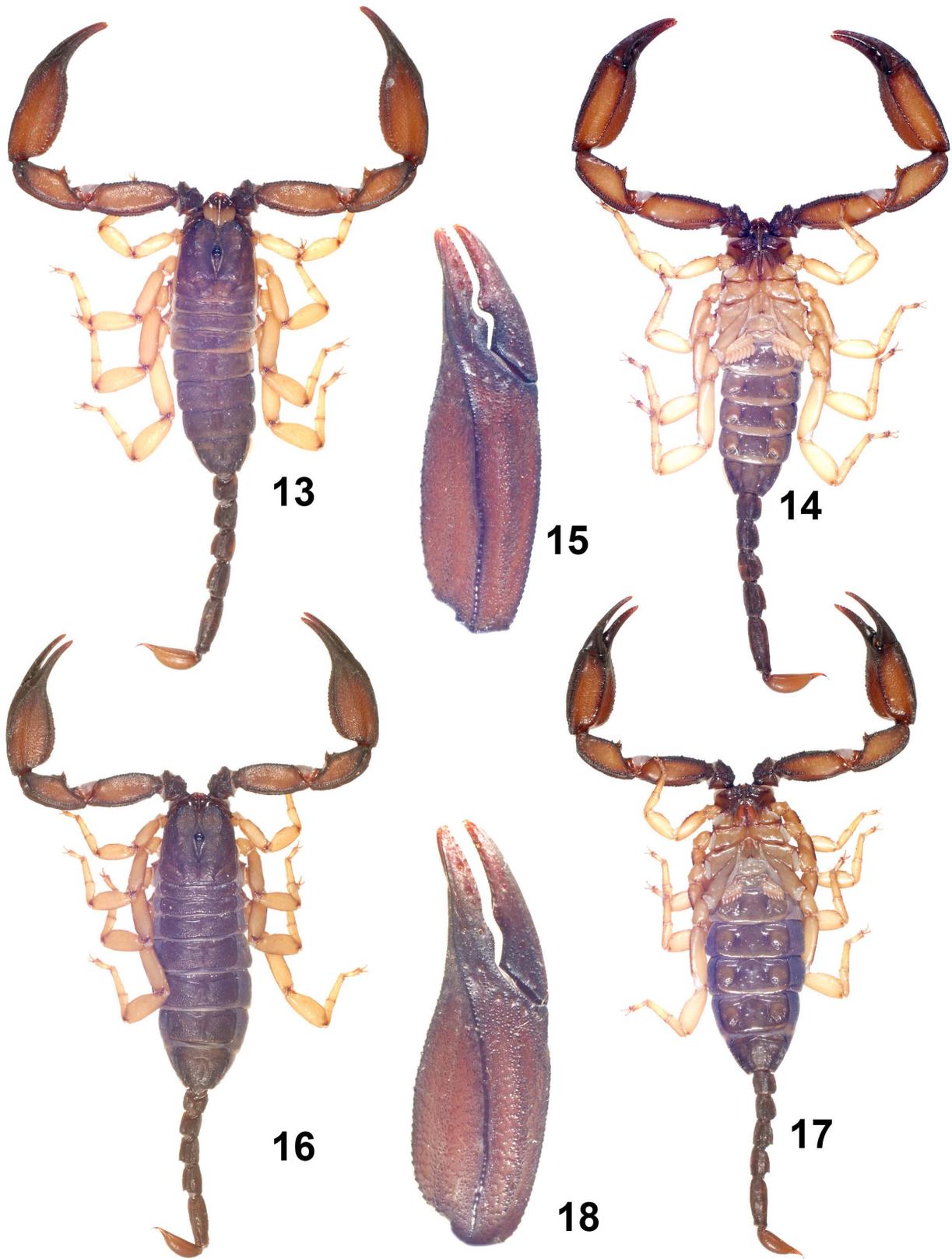
TYPE MATERIAL. Pakistan, Gilgit-Baltistan, Gilgit, lower Naltar, 2009, 1 ♂ (holotype), 5 ♀, 6 juvs., leg. Zubair Ahmed; North-West Frontier Province, Upper Dir, 10 August 2009, 1 ♂, 2 ♀, 2 juvs. (paratypes, Figs. 13–18), leg. Yasin; Azad Jammu and Kashmir, Bagh, 7 October 2009, 2 ♂, 8 ♀, 3 ♂imm., 3 ♀imm., 1 juv. (paratypes).

ETYMOLOGY: Denotes affinity to *Euscorpiops montanus* (Karsch, 1879).

DIAGNOSIS. Adults 50–60 mm long. Base color uniformly reddish brown, fingers black, legs and telson yellowish brown. Pectinal teeth number 6–9. External trichobothria on patella number 17 (*5 eb*, 2 *esb*, 2 *em*, 4



Figures 7–12: *Scorpions pakistanus* Kovařík et Ahmed, sp. n. 7–9. Male holotype, dorsal and ventral view and chela external. 10–12. Female paratype, dorsal and ventral view and chela external.



Figures 13–18: *Scorpiops pseudomontanus* Kovařík et Ahmed, sp. n. 13–15. Male paratype, dorsal and ventral view and chela external. 16–18. Female paratype, dorsal and ventral view and chela external.

est, 4 *et*); ventral trichobothria on patella number 14–18. Both sexes have fingers of pedipalps flexed, but males have them more twisted than females (Figs. 15 and 18).

DESCRIPTION: The adults are 50–60 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. The base color is uniformly reddish brown, fingers are black, legs and telson are yellow to yellowish brown. For habitus see Figs. 13–18.

MESOSOMA AND CARAPACE: The mesosoma bears several granules and primarily in the hind portion one median carina; the seventh segment is ventrally smooth, with four carinae. The entire carapace bears sparse minute granules and lacks carinae. There is a pronounced central depression in the anterior margin of the carapace. Pectinal teeth number 6–9.

METASOMA AND TELSON: The metasoma is smooth, with only sparse granules. The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment bears seven carinae, all composed of granules some of which are pointed. The ventral carina of the fifth segment posteriorly forks to form the letter Y. The dorsolateral carinae of the third and fourth segments posteriorly terminate in a pronounced denticle. The telson is elongate and smooth.

PEDIPALPS: For position and distribution of trichobothria on the patella of pedipalps see Figs. 19 and 21. External trichobothria on the patella number 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) (Fig. 19), and ventral trichobothria on the patella number 14–18 (8 with 14, 33 with 15, 10 with 16, 3 with 17, and 2 with 18) (Fig. 21). The femur is granulated, has six granulate carinae, and the patella has five carinae with pronounced internal double tubercles. The entire manus dorsally bears rounded granules. The movable fingers bear straight double rows of granules with internal and external granules. The male has fingers of pedipalps strongly flexed, whereas in the female they are flexed only slightly.

AFFINITIES. The described features distinguish *Scorpiops pseudomontanus* sp. n. from all other species of the genus. They are recounted in the key below.

Scorpiops pseudomontanus sp. n. is most similar to *Euscorpis montanus* (Karsch, 1879), which it resembles morphologically as well as in the high number of ventral trichobothria on the patella of pedipalps (Fig. 21). However, the new species differs in the position of trichobothrium *Eb*₃ on the external surface of chela between trichobothria *Db* and *Dt*, which is currently a generic-level character as this position of trichobothrium *Eb*₃ is found in all species of *Scorpiops* (Fig. 2), whereas in the species of *Euscorpis* this trichobothrium is situated between trichobothria *Dt* and *Est* (plate I, fig. 2 in Kovařík, 2009: 26).

In the genus *Scorpiops* an equally high number of ventral trichobothria on the patella of pedipalps is present only in *S. demisi* Kovařík, 2005 from India, which however differs from the new species in having 18 external trichobothria on the patella (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 5 *et*).

***Scorpiops zubairahmedi* Kovařík, sp. n.**

(Figs. 20, 22–26, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. Pakistan, Gilgit-Baltistan, Gilgit, lower Naltar; author's collection (FKCP).

TYPE MATERIAL. Pakistan, Gilgit-Baltistan, Gilgit, lower Naltar, 2009, 1 ♂ (holotype), leg. Zubair Ahmed, FKCP. No other material.

ETYMOLOGY: Named in honor of the Pakistani arachnologist Zubair Ahmed, who collected the holotype.

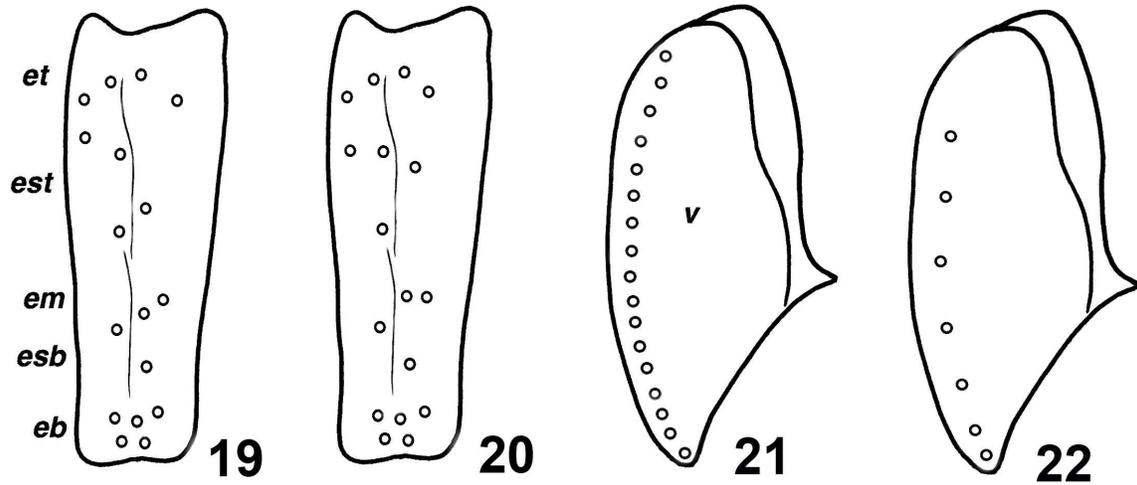
DIAGNOSIS. Adult male holotype 60 mm long. Base color uniformly reddish brown, fingers black, legs and telson yellowish brown. Pectinal teeth number 6. External trichobothria on patella number 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*); ventral trichobothria on patella number 7. Chela length to width ratio = 3.38. Male pedipalp fingers flexed (Fig. 25). Female unknown.

DESCRIPTION: The adult male holotype is 60 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. The base color is uniformly reddish black. For habitus see Figs. 23–25.

MESOSOMA AND CARAPACE: The mesosoma bears several granules and primarily in the hind portion one median carina; the seventh segment is ventrally granulate, with four carinae composed of granules. The entire carapace bears sparse minute granules and lacks carinae. There is a pronounced central depression in the anterior margin of the carapace. Pectinal teeth number 6.

METASOMA AND TELSON: The metasoma is dorsally nearly smooth, with only sparse granules. Granules are more numerous on lateral and ventral surfaces between carinae. The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment bears seven carinae, all composed of granules some of which are pointed. The dorsolateral carinae of the third and fourth segments posteriorly terminate in a pronounced denticle. The telson is very large and bulbous, with minute granules.

PEDIPALPS: For position and distribution of trichobothria on the patella of pedipalps see Figs. 20 and 22. External trichobothria on the patella number 17 (5 *eb*, 2 *esb*, 2 *em*, 4 *est*, 4 *et*) (Fig. 20), and ventral trichobothria on the patella number 7 (Fig. 22). The femur is granulated, has



Figures 19–26: 19 and 21. *Scorpiops pseudomontanus* Kovařík et Ahmed, **sp. n.**, male paratype. 19. Patella external, 21. Patella ventral. 20, 22, 23–26. *Scorpiops zubairahmedi* Kovařík et Ahmed, **sp. n.**, male paratype. 20. Patella external. 22. Patella ventral. 23–26. Dorsal and ventral view and chela external and ventral.

six granulose carinae, and the patella has five carinae manus dorsally bears sparse rounded granules, which in with pronounced internal double tubercles. The entire the central part form a longitudinal carina. The movable

fingers bear straight double rows of granules with internal and external granules. The male pedipalp fingers (Fig. 25) are flexed.

AFFINITIES. The described features distinguish *Scorpiops zubairahmedi* sp. n. from all other species of the genus. They are recounted in the key below.

Scorpiops zubairahmedi sp. n. is most similar to *S. petersii* Pocock, 1893, from which it differs in having a very narrow and long chela manus of pedipalp. Adult male chela length to width ratio is 3.38, whereas in the male of *S. petersii* it is only 2.6–2.8. Another difference is in relative size of the telson, which is larger in the new species.

Key to species of *Scorpiops*

1. External trichobothria on patella number 17 (Fig. 5) 2
– External trichobothria on patella number 18–19 19
2. Ventral trichobothria on manus number 4 (Fig. 3) 3
– Ventral trichobothria on manus number 3
..... *S. irenae* Kovařík, 1994
3. Ventral trichobothria on patella number 6–10 4
– Ventral trichobothria on patella number 14–18 (Fig. 21) *S. pseudomontanus* sp. n.
4. Chela manus narrow and long. Adult male chela length to width ratio higher than 2.6 5
– Chela manus wide and short. Adult male chela length to width ratio lower than 2.5 14
5. Ventral trichobothria on patella number 6–8 9
– Ventral trichobothria on patella number 9–10 6
6. Total length 24–40 mm 7
– Total length 75–87 mm *S. luridus* Zhu, Lourenço et Qi, 2005
7. Ventral trichobothria on patella number 9 8
– Ventral trichobothria on patella number 10
..... *S. pachmarhicus* Bastawade, 1992 and *S. lhasa* Zhi-Yong & Zhu, 2009
8. Male chela length to width ratio 4 : 3
..... *S. oligotrichus* Fage, 1933
– Male chela length to width ratio 6.6 : 3
..... *S. farkaci* Kovařík, 1993
9. Dorsal surface of mesosoma without a carina.....
..... *S. rohtangensis* Mani, 1959
– Dorsal surface of mesosoma with a carina 10
10. Male fingers of pedipalps flexed. Total length 60–70 mm..... 11
– Male fingers of pedipalps straight. Total length 35–58 mm..... 12
11. Chela manus very narrow and long. Adult male chela length to width ratio higher than 3.3
..... *S. zubairahmedi* sp. n.
– Chela manus narrow and long. Adult male chela length to width ratio lower than 2.9..... *S. petersii* Pocock, 1893
12. Male chela length to width ratio higher than 3.5
..... *S. leptochirus* Pocock, 1893
– Male chela length to width ratio lower than 3.2 13
13. Total length 35–41 mm. Male chela length to width ratio higher than female (male about 3.1, female about 2.3)*S. dastychi* Kovařík, 2000
– Total length 45–55 mm. Male chela length to width ratio nearly same as female (about 2.9–3.1).....
..... *S. feti* Kovařík, 2000
14. Pectinal teeth number 12–13
..... *S. margerisonae* Kovařík, 2000
– Pectinal teeth number 4–11 15
15. Ventral trichobothria on patella number 6–8 16
– Ventral trichobothria on patella number 9–10
..... *S. pakistanus* sp. n.
16. Total length more than 65 mm
..... *S. petersii* Pocock, 1893
– Total length less than 65 mm 17
17. Fingers of pedipalps in adults more or less flexed 18
– Fingers of pedipalps straight in both sexes (Fig. 36)
..... *S. jendeki* Kovařík, 1994
18. Male chela length to width ratio 2.3. Fingers of pedipalps are only slightly flexed in the male.....
..... *S. braunwalderi* Kovařík, 2000
– Male chela length to width ratio lower than 2.2. Fingers of pedipalps are very strongly flexed in the male.....
..... *S. hardwickii* (Gervais, 1843) “complex”
19. Ventral trichobothria on patella number 14–15
..... *S. demisi* Kovařík, 2005
– Ventral trichobothria on patella number 10–12
..... *S. lindbergi* Vachon, 1980



Figure 27: Distribution of new *Scorpiops* species.

Discussion

Kraepelin (1894), Tikader & Bastawade (1983), and Kovařík (2000) regarded minor morphological differences within *Scorpiops* as intraspecific variation or sexual dimorphism, and on these grounds placed *Scorpiops solidus* Karsch, 1879 (syn. by Kraepelin, 1894), *S. austerus* Hirst, 1911, *S. pirpanjalus* (Mani, 1959) (= *Chaerilus pirpanjalus* Mani, 1959) (syn. by Tikader & Bastawade, 1983), *S. affinis* Kraepelin, 1898, *S. crassimanus* Pocock, 1899, and *S. insculptus* Pocock, 1900 (syn. by Kovařík, 2000: 175) in the synonymy of *S. hardwickii* (Gervais, 1843), which reduced the *Scorpiops hardwickii* “complex” to *S. hardwickii* and *S. tibetanus* Hirst, 1911. Most of subsequent authors accepted the synonymizations; however, Qi, Zhu & Lourenço (2005) and Lourenço & Qi (2006) used the same minor morphological criteria to describe *S. afghanus* Lourenço et Qi, 2006, *S. atomatus* Qi, Zhu et Lourenço, 2005, *S. langxian* Zhu, Qi et Lourenço, 2005, and *S. pococki* Zhu, Qi et Lourenço, 2005 without comparing the new species to *S. affinis*, *S. austerus*, *S. crassimanus*, *S. pirpanjalus*, *S. solidus* and *S. insculptus*. Under such circumstances the status of species within the *Scorpiops hardwickii* “complex” cannot be resolved before deciding what is to be regarded as intraspecific variation and what as species-level characters. We are therefore presently unable to judge whether the species described in 2005 and 2006 are synonyms of *S. hardwickii*, but if we allow them to stand then we must question the earlier synonymizations and consider also the possibility that some of the species described by Qi, Zhu & Lourenço (2005) and Lourenço & Qi (2006) may be synonyms of taxa which Kraepelin (1894), Tikader & Bastawade (1983) and Kovařík (2000) synonymized on the basis of a different species concept. Because of the present lack of consensus, all the above named taxa appear in the key only as *Scorpiops hardwickii* “complex”. Some of the recently described species are known from only one sex and nothing thus can be said about their sexual dimorphism.

List of taxa of *Scorpiops hardwickii* (Gervais, 1843) “complex”

- Scorpiops affinis* Kraepelin, 1898 (syn. by Kovařík, 2000: 175)
Scorpiops afghanus Lourenço & Qi, 2006
Scorpiops atomatus Qi, Zhu et Lourenço, 2005
Scorpiops austerus Hirst, 1911: 471 (syn. by Tikader & Bastawade, 1983: 418)
Scorpiops crassimanus Pocock, 1899 (syn. by Kovařík, 2000: 175)
Scorpiops hardwickii (Gervais, 1843)
Scorpiops insculptus Pocock, 1900 (syn. by Kovařík, 2000: 175)

- Scorpiops langxian* Zhu, Qi et Lourenço in Qi, Zhu & Lourenço, 2005
Scorpiops pirpanjalus (Mani, 1959) (syn. by Tikader & Bastawade, 1983: 407)
Scorpiops pococki Zhu, Qi et Lourenço in Qi, Zhu & Lourenço, 2005
Scorpiops solidus Karsch, 1879 (syn. by Kraepelin, 1894: 188)
Scorpiops tibetanus Hirst, 1911

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