



Description of male *Orthochirus krishnai* (Scorpiones: Buthidae) from India, with comments on its taxonomic status

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Buthidae is one of the largest and the most widespread scorpion families. In India, buthids are reported from all over the country with the exception of a few north-eastern states (Tikader & Bastawade 1983; Rein 2008); and is represented by 54 species from 11 genera and two subfamilies. Members of this family are small to medium-sized with a triangular or pentagonal sternum. In many genera the metasoma is strong and powerful and the pedipalps are slender, whereas some genera have elongated appendages, especially in males (Rein 2008).

The genus *Orthochirus* Karsch, 1892 consists of small-sized buthids not exceeding 60mm (Kovaøík 2004); Indian forms, however rarely exceed 45mm (Tikader & Bastawade 1983). The genus is characterised by the following set of characters-carapace in lateral view distinctly inclined downwards from the median eyes towards the anterior margin: beta-configuration in arrangement of trichobothria on the dorsal surface of the pedipalp femur; tibial spurs present on the third and fourth legs; metasomal segments I and II lack carinae; segments IV and V ventrally punctuate: telson elongated, aculeus as long as or longer than vesicle (Tikader & Bastawade 1983; Kovaøík 2004).

Currently 29 species are included in the genus *Orthochirus* (Kovaøík 2004; Rein 2008), of which five have been reported from India (Tikader & Bastawade 1983).

Orthochirus krishnai was described by Tikader & Bastawade

in 1983 based on two female specimens (Registration Nos. NZSI 5077/18 & 5078/18) collected in 1972 and 1962 from Rajasthan, western India. Both the specimens are in the National Collections, Zoological Survey of India, Kolkata. Based on the location of d_2 trichobothrium on femur illustrated in Tikader & Bastawade (1983, fig. 361) Kovaøík (2004) considers the species *O. krishnai* as a *nomen dubium*.

The present communication deals with the description of one male specimen of *O. krishnai* collected from Jaisalmer district, Rajasthan with comments on this species

Taxonomy

Family Buthidae Koch, 1837

Subfamily Buthinae Pocock, 1896

Genus *Orthochirus* Karsch, 1892

Orthochirus krishnai Tikader & Bastawade, 1983

1983 *Orthochirus krishnai* Tikader & Bastawade, *Fauna of India. Scorpions, Scorpionida: Arachnida, Volume III*, Zoological Survey of India, 671pp.

Material examined: Male, 10.xi. 2007, (26°78'451"N & 70°69'542"E) Nabh Dongar, Jaisalmer District, Rajasthan, India, coll. Amod Zambre, Kiran Marathe, Tarun Khichi and Karan Khichi, (BNHS-Sc-13). The specimen (in 70% ethanol) is deposited in the collection of the Bombay Natural History Society.

Diagnosis: According to the keys provided in Tikader & Bastawade 1983, *Orthochirus krishnai* can be separated from the similar *O. melanurus* (status unknown) by the presence of a conspicuous yellow triangular spot on the posterior margin of third sternite which is absent in the latter. Femur, patella of legs, and pedipalps dark black or brown and granular in *O. krishnai* while clear yellow in *O. melanurus*. Ventrally metasomal segments I and II with few pits in the former while pits are absent in the latter.

Description: Male of *Orthochirus krishnai* Tikader & Bastawade

Colouration: carapace, mesosoma, and metasoma uniformly black; with shades of tan/yellow on the chela, tibia, and tarsus. Telson with a red vesicle and black aculeus.

Prosoma: Carapace entirely black in colour, heavily yet evenly granular without prominent carinae. Median ocular tubercle smooth with a pair of large median eyes situated anteriorly in a ratio of 1:1. Lateral ocular tubercles granular, provided with five pairs (three large anterior and two small posterior) of contiguous lateral eyes situated in a black depression (depression yellow in females).

Mesosoma: Tergites heavily granular, more granular medially and posteriorly. Tergites III-VII with prominent black median carinae (carinae yellow in colour in females). Pretergal portion with very fine granules, black on anterior surface. Tergite VII with four strongly crenulated carinae. Sternites I-IV yellowish-brown in colour more granular on the lateral sides, each of them provided with a pair of slit-like stigmata for book lungs. Sternite III with prominent yellow triangular spot. Presternal portion yellow and weakly granular. Sternite V entirely black with four smooth carinae. Pectines well developed, three and a half times as long as wide (six times as long as wide in females). Middle lamellae divided into seven

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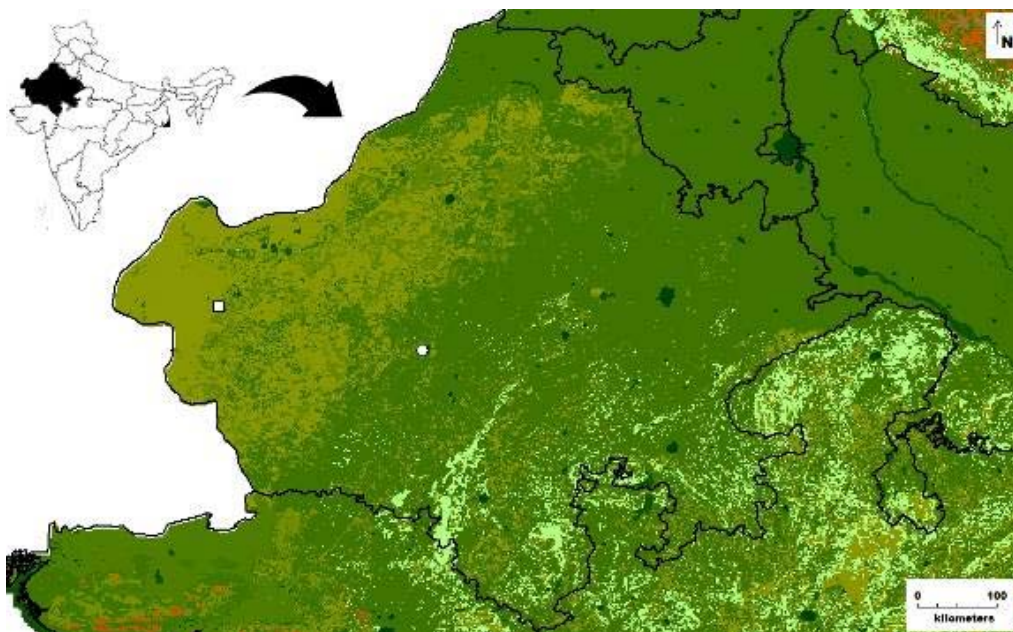
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Map of Rajasthan showing the type locality of *Orthochirus krishnai* Jodhpur (white circle) and Nabh Dongar (white square)

Table 1. Morphometrics of male *Orthochirus krishnai* recorded with a vernier caliper (± 0.01 mm)

Character	<i>Orthochirus krishnai</i>
(BNHS-Sc-13) (in mm)	
Carapace length	4
Carapace anterior width	2.82
Carapace posterior width	4.77
Mesosoma	9.18
Metasoma	18.12
I segment length	2.24
I segment width	3.58
II segment length	2.7
II segment width	3.44
III segment length	3.28
III segment width	4.36
IV segment length	4.88
IV segment width	4.66
V segment length	5.02
V segment width	5.22
Vesicle width	1.45
Vesicle length	3.23
Aculeus length (broken)	1.32
Femur length	4.60
Femur width	0.66
Patella length	4.87
Patella width	1.38
Chela length	5.18
Movable finger	4.40

digits (middle lamellae divided into eight digits in females). Fulcra distinct. Lamellae and fulcra provided with minute red setae. Pectinal teeth 23/23 in number. Basal piece granular. Genital operculum partially separated (united in females).

Metasoma: Black, thick and incrassate. Segment I with all ten carinae, carinae crenulate, intercarinal spaces finely granular and provided with few pits. Segments II and III with dorsal and inferior carinae. Segment IV smooth covered with pits with very weakly developed dorsal and inferior carinae. Segment V densely pitted with weakly developed lateral inferior. Anal rim smooth. Vesicle reddish, pyriform, elongated, smooth and slender covered with few pits. Aculeus short and black (broken in the specimen).

Chelicerae: Chelicera strong, basal segment black in color



Image 1. *Orthochirus krishnai*

(darker on anterior portion while paler on ventral side). Fingers of chelicera dark in color and reddish on dentition.

Pedipalps: Femur and patella of pedipalp dark black (femur darker than patella). Manus yellowish-brown with blackish tint (fig. 354 of Tikader & Bastawade 1983:131) with clear yellow fingers. Dentition non-imbricate and movable finger with nine teeth in the outer row. Trichobothrial pattern Type A on femur, patella and chela as per (fig. 1-6 of Kovarik 2004:5). Coxa, trochanter and femur of leg black in colour. Patella also black in color with a yellow tint to it. Tibia and tarsomere I yellow with a prominently visible black carinae. Tarsomere II clear yellow.

Discussion

Orthochirus krishnai was considered *nomen dubium* by Kovařík (2004) solely on the position of d2 trichobothrium on the dorsal surface of the femur after referring to the illustration provided in Tikader and Bastawade (see fig. 361 1983:132) as he could not study the type material. Kovařík (2004) also suggested

placing *O. krishnai* in the genus *Paraorthochirus* Lourenco & Vachon, 1995 instead of *Orthochirus*. Kovačik (2004) also states that the original description was inadequate but did not elucidate in what aspects the description was lacking.

Navidpour et al. (2008), after studying numerous specimens of *O. iranus*, concluded that the status of trichobothrium d2 is variable (fully developed, reduced, or absent). As presence or absence of d2 was the only character separating *Orthochirus* and *Paraorthochirus*, Navidpour et al. (2008) synonymized the two genera transferring all species from *Paraorthochirus* to *Orthochirus*. In the light of the recent taxonomic changes and the occurrence of a specimen of *O. krishnai*, we consider *O. krishnai* a valid species.

The types described were from Jodhpur District, Rajasthan whereas the present male specimen was collected from Jaisalmer district, Rajasthan, approximately 250km northwest of the type locality, indicating a wide distribution in Rajasthan.

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