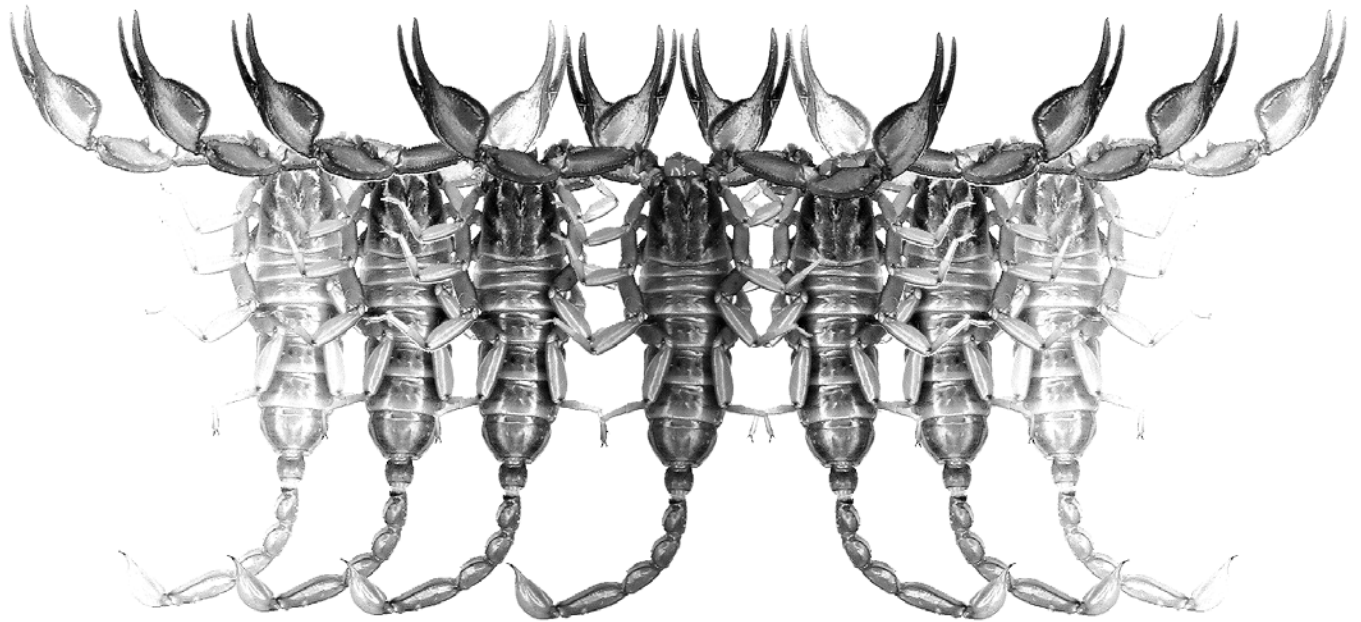


Euscorpium

Occasional Publications in Scorpiology



**A New Species of Scorpion of the Genus *Buthoscorpio*
Werner, 1936 (Scorpiones: Buthidae) from
Andhra Pradesh, India**

**S. M. Maqsood Javed, K. Thulsi Rao, Zeeshan A. Mirza, Rajesh V. Sanap
& Farida Tampal**

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- **NEV**, Library Netherlands Entomological Society, Amsterdam, Netherlands

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A new species of scorpion of the genus *Buthoscorpio* Werner, 1936 (Scorpiones: Buthidae) from Andhra Pradesh, India

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Summary

A new species of scorpion, *Buthoscorpio rayalensis* sp. nov., is described from Andhra Pradesh, India. The new species of scorpion can be differentiated from its congeners in having the following set of morphological characters: anterior edge of carapace exhibiting very broad subtle indentation with a conspicuous epistome present medially, median eyes situated anteriorly in the ratio 1:3.1, interocular area smooth, patella anteriorly smooth and rounded, mesosomal tergites smooth, pectines 17–17, and arrangement of lateral eyes. *Stenochirus jinnahii* Amir, Kamaluddin et Jabbar, 2005 and *S. rahmatii* Amir, Kamaluddin et Jabbar, 2005 are considered Buthidae *incertae sedis* as their generic allocation has been erroneous.

Introduction

With 82 genera and 773 species, the family Buthidae C.L. Koch, 1837 is the largest of the scorpion families being widely distributed around the world, absent only in Antarctica and New Zealand; buthids are found in tropical, subtropical and partly in temperate habitats (Rein 2010). Among buthid genera, the genus *Buthoscorpio* is of particular interest. The genus is characterized by lacking ventrolateral and ventral submedian carinae on metasomal segments and with others reduced; pectines with less than 18 teeth (in previously known species actually with 15); females with unmodified pectinal teeth (Sissom 1990). Members of this genus remain poorly known, as its species are rare. The genus, originally described as *Stenochirus* Karsch, 1891, was given a replacement name *Pocockius* Francke, 1985 due to nomenclatural conflict with a crustacean genus *Stenochirus* Oppel, 1862 (Francke 1985; Fet 1997; Fet & Lowe 2000). However, Fet (1997) indicated that *Buthoscorpio* Werner, 1936 was a junior synonym of *Stenochirus* and an available name, which had priority over *Pocockius* Francke, 1985. Thus, the two known species of the genus were transferred to *Buthoscorpio*. These species have been redescribed and illustrated by Vachon (1961) (*B. politus* from India), Vachon (1982) (*B. sarasinorum* from Sri Lanka), and Tikader & Bas-

tawade (1983) (both *B. politus* and *B. sarasinorum* from India) (Fet & Lowe 2000). In addition, Amir, Kamaluddin & Jabbar (2005) reported the genus *Stenochirus* Karsch, 1891 from Pakistan with description of two new species, *S. jinnahii* Amir, Kamaluddin et Jabbar, 2005 and *S. rahmatii* Amir, Kamaluddin et Jabbar, 2005. Based on Fet's (1997) nomenclatural argument, the species from Pakistan should have been placed in the valid genus *Buthoscorpio*.

In the course of a study on scorpions of India on a broader scale, World Wide Fund for Nature-India (WWF-India) Andhra Pradesh State Office (APSO) initiated faunistic surveys. During these surveys two specimens of the genus *Buthoscorpio* were recorded from Allagadda and Nandyal Towns, Kurnool District, Andhra Pradesh (Fig. 1). These specimens show characters differing from the two known species from India, and are described here as a new species.

As we made comparisons with known species, examination of photographs, diagrams and a close scrutiny of the type description of *Stenochirus jinnahii* Amir, Kamaluddin et Jabbar, 2005 and *S. rahmatii* Amir, Kamaluddin et Jabbar, 2005 revealed that the generic assignment of the two species to *Stenochirus* (i.e. *Buthoscorpio*) has been erroneous. The description of both the species provides details of presence of granular carinae on the pedipalp and the metasomal

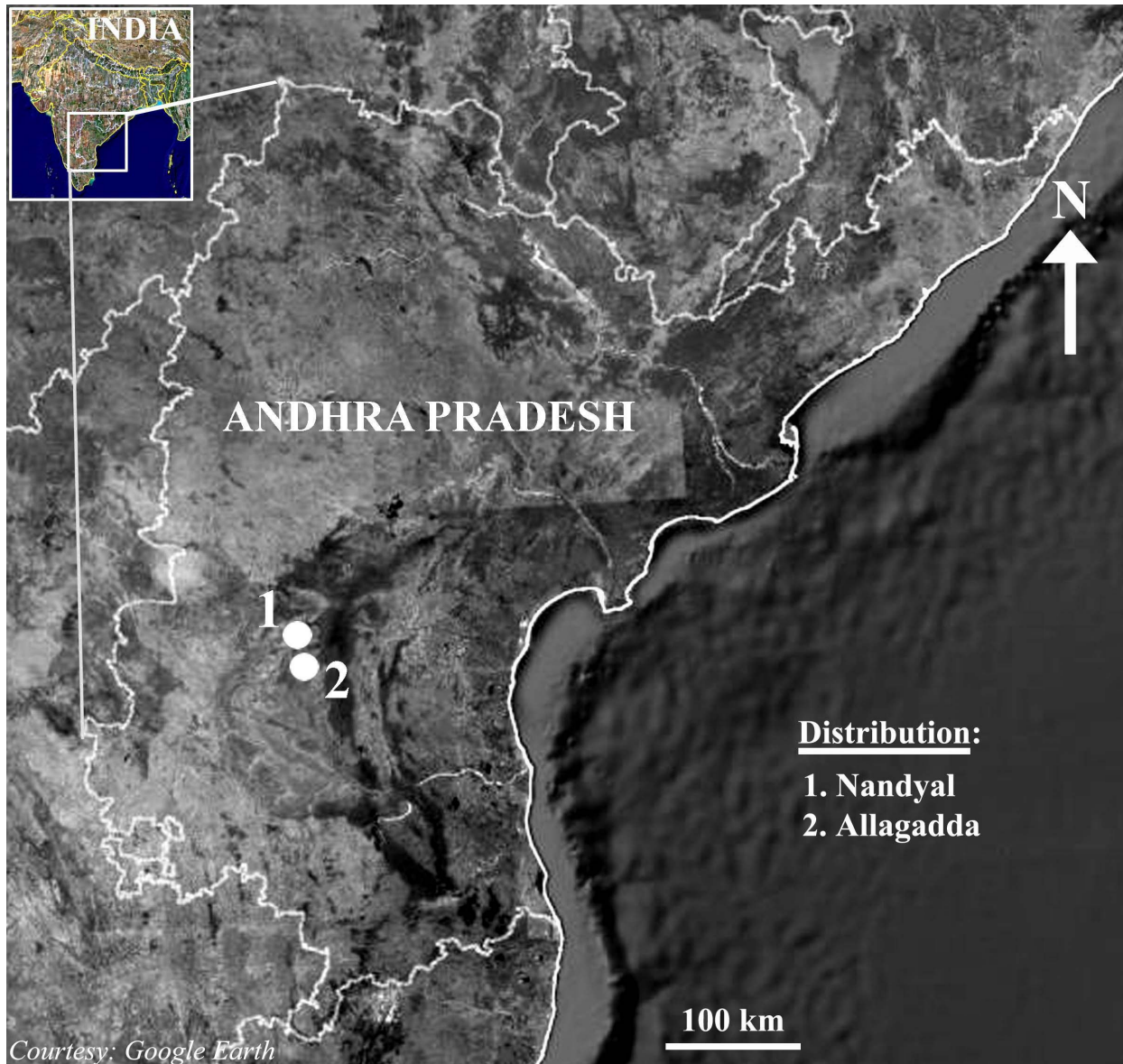


Figure 1: Satellite image showing a map depicting distribution of *Buthoscorpio rayalensis* sp. nov. from Andhra Pradesh.

which is in opposition to the generic character. Additionally, the genus possesses a robust metasoma with a beady gloss being punctuate and lacking carinae except for the dorsal ones, whereas an image in the description of *S. jinnahii* and *S. rahmatii* exhibits a gracile and long metasoma possessing granular carinae. The description of the species is also not clear as the key states that both species possess 29 pectinal teeth whereas the description of *S. jinnahii* states the types possessing 20, and the diagram illustrating the type of *S. rahmatii* shows 16 pectinal teeth. Considering the above discussed characters, we propose that until the types are reassessed, both species from Pakistan, should be considered as Buthidae *incertae sedis*; we do not include

these species in our comparison with the new species of *Buthoscorpio* from India. This leaves the genus being currently represented by two species, namely, *B. politus* (Pocock, 1899) and *B. sarasinorum* (Karsch, 1891), restricted to India and Sri Lanka. In the present communication, we describe a new species belonging to this genus from the plains adjacent to the western border of central Eastern Ghats, Rayalaseema Region, Andhra Pradesh, India.

Material and Methods

Specimens in the field were collected by day search among boulders and rotten logs in a private plantation



Figure 2: Habitat of *Buthoscorpio rayalensis* **sp. nov.** showing a part of the plantation near Allagadda locality. Photo by K. Thulsi Rao.



Figures 3–4: *Buthoscorpio rayalensis* sp. nov., Habitat and habitus. **3 (Top).** Habitat showing a part of the wilderness zone adjacent to the plantation near Allagadda locality. Photo by K. Thulsi Rao. **4 (Bottom).** Female holotype (live) (BNHS SC-43). Dorsolateral aspect (not to scale). Photo by S. M. Maqsood Javed.

and adjacent wilderness zone (Figs. 2–3), later preserved in 70% ethyl alcohol. These were later identified and compared with the descriptions and illustrations provided in Vachon (1961, 1982) and Tikader & Bastawade (1983). Photographs of live specimens were taken with a Canon super macro digital camera, while photos of the preserved material were taken with a same camera mounted on the eye piece of Lawrence & Mayo stereo zoom microscope illuminated from a 100-watt light source; only minor colour corrections were made to the pictures; line diagrams were drawn with the help of the camera lucida attached to the Olympus SZX 12 stereomicroscope. Specimens were examined using a Labomed™ CSM2 stereo binocular microscope and illuminated by an inbuilt halogen light source or by ultraviolet illumination by Arachnid™ A28 to observe the surface morphology. Measurements were taken with the help of Mitutoyo™ Dial caliper. Descriptive terms and abbreviations follow Stahnke (1970) and Sissom (1990). Both specimens were deposited in the collection of the Bombay Natural History Society, Mumbai (BNHS).

Systematics

Order **SCORPIONES** C. L. Koch, 1850
 Superfamily **Buthoidea** C.L. Koch, 1837
 Family **Buthidae** C.L. Koch, 1837
Buthoscorpio Werner, 1936

Buthoscorpio Werner, 1936: 191, Fet, 1997: 246; Fet & Lowe, 2000: 90.

Stenochirus Karsch, 1891: 305–306; Pocock, 1899: 262; Pocock, 1900: 32–33; Vachon, 1961: 790–792; Vachon, 1982: 83–84; Tikader & Bastawade, 1983: 152–163 (preoccupied name).

Pocockius Francke, 1985: 13, 16; Sissom, 1990: 102.

Type species: *Stenochirus sarasinorum* Karsch, 1891

Diagnosis: Patellar trichobothrium d_3 external to dorsomedian carinae, trichobothrial pattern type A, alpha (α); legs III and IV with tibial spur; cheliceral fixed finger with two ventral accessory (*va*) denticles; telson without distinct subaculear tubercle; median denticle rows of chelal fingers distinctly imbricated; metasomal segments lacking ventrolateral and ventral submedian carinae, and with other carinae reduced; pectines with less than 18 teeth, females with unmodified pectinal teeth.

Buthoscorpio rayalensis Javed, Rao, Mirza, Sanap et Tampal, **sp. nov.**
 (Figs. 4–8; Tab. 1)

Type Locality. India, Andhra Pradesh, Kurnool District, Allagadda and Nandyal.

Type Material. India, Andhra Pradesh, 2♀ (one holotype and one paratype), Allagadda Town (15°07' N, 78°30' E) and Nandyal Town (15°28' N, 78°28' E), Kurnool District, 10 February 2010, coll. by S. M. Maqsood Javed, deposited in the collection of the Bombay National History Society (BNHS SC–43 and BNHS SC–44).

Etymology. Named after the region, Rayalaseema, where the specimens collection sites Allagadda and Nandyal are situated.

Diagnosis. A species of moderate size, holotype total length 43.70 mm, overall blackish brown with a beady gloss throughout the body, anterior edge of carapace exhibiting very broad subtle indentation with a conspicuous epistome present medially, median eyes situated anteriorly in the ratio 1:3.1, interocular area smooth, patella anteriorly smooth and rounded, mesosomal tergites smooth, pectinal teeth number 17–17; arrangement of five lateral eyes as in Fig. 6c.

Coloration. The scorpion is overall blackish brown to reddish brown. The carapace is in a shade of dark blackish brown with pale brownish patches and reticulate markings. Chelicerae orangish brown with dark reticulate markings (Fig. 6b). Mesosomal sternites entirely dark brownish with a few diffused pale brownish markings, tergites yellowish brown. Pectines creamish to yellow, genital operculum much darker (Fig. 5b). Pedipalp femur and patella dark brownish with pale orangish patches and reticulate pattern on them. Pedipalp chela orangish with four pale brownish longitudinal lines dorsally and exteriorly. Leg femur and patella dark brownish, rest of the segments pale yellow. Metasoma reddish brown (Figs. 4, 5a, and 5b).

Carapace. Smooth overall except for sparse granulation in the lateral portion. Anterior edge of carapace exhibiting very broad subtle indentation with a conspicuous epistome present medially (Fig. 6d). Carapacial margins smooth. Median eyes situated anteriorly in the ratio 1:3.1 on a slight elevation (Fig. 6a). Carinae absent except for the shallow median anterior and median central furrow continuing up to the posterior carapacial margin. Five pairs of lateral eyes as in Fig. 6c.

Mesosoma. Entirely smooth bearing a single 'T' shaped smooth median carinae (Fig. 6f). Lacking granulation on all except for fine granulation on the median portion of the mesosomal tergite VII. Pectines well developed, with 17–17 teeth, six times wider than long (Figs. 5b, 7a). Basal piece with a distinct median semicircular depression (Figs. 5b, 7a). Sternum sub-pentagonal (Fig. 6e) and of Type 1 as described by Soleglad & Fet (2003).

Chelicerae. Movable and fixed fingers each with two ventral accessory (*va*) denticles (Fig. 6b).

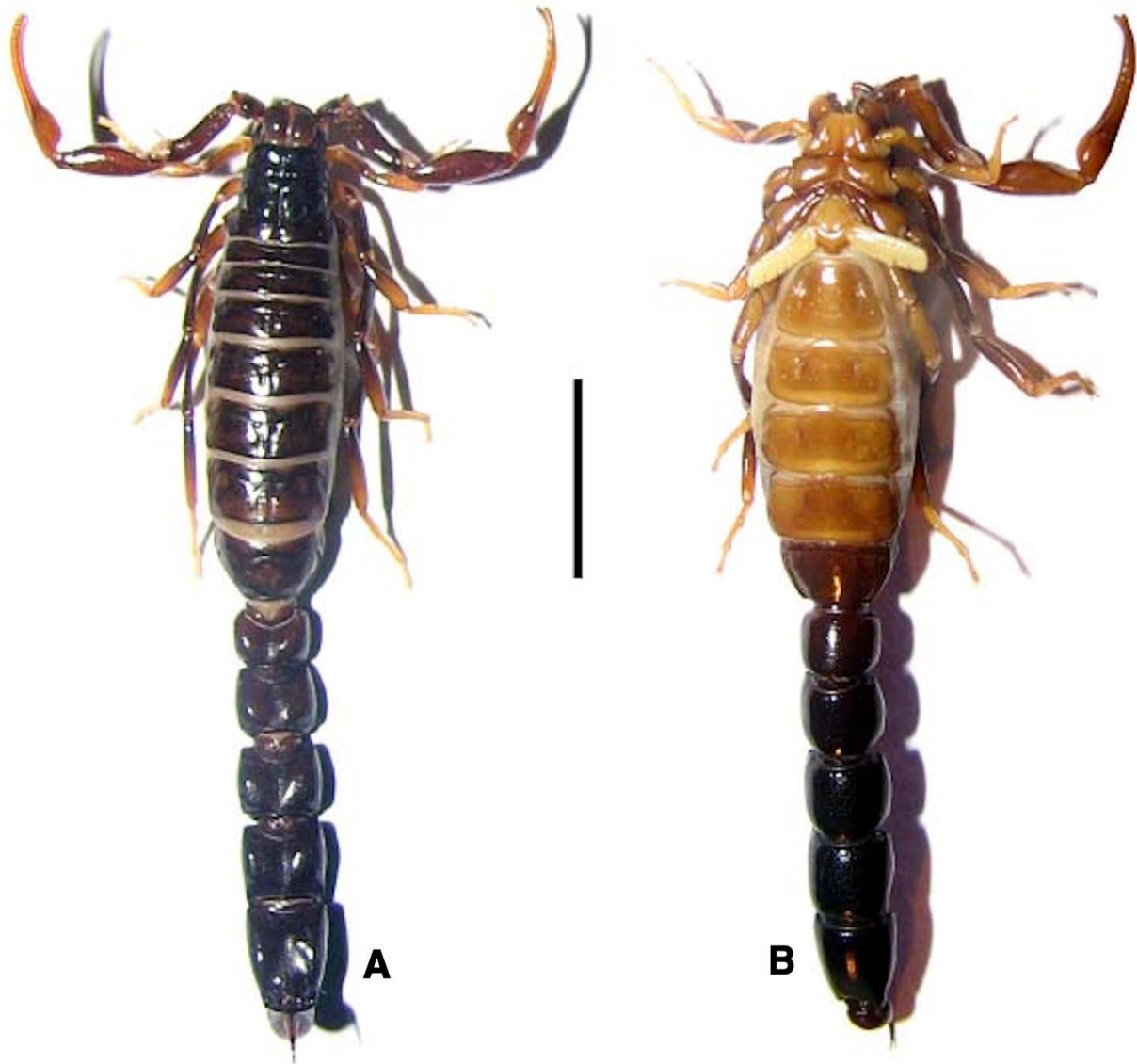


Figure 5: *Buthoscorpio rayalensis* sp. nov., female holotype (BNHS SC-43). **A & B.** Dorsal and ventral aspects (right pedipalp removed in B). (Scale = 10mm).

Pedipalp. Pedipalp femur, patella and chela smooth. Patella anteriorly with a few small or depressed tubercles but overall smooth and rounded. Not crested anteriorly as in *B. politus*. Trichobothrial pattern ortho-bothriotaxic, type A- α , as in Fig. 8a to 8c and 8e to 8g. Movable finger of pedipalp chela with 10 rows of imbricated denticles and two large apical ones (Fig. 8d).

Legs. Finely granular and with smooth carinae. Tibia of leg III and IV furnished with a long and strong tibial spur (Fig. 7b). A pair of pedal spurs, the anterior one bifurcates to form a partly divided third spur. Tarsus ventral surface have a row of paired minute setae.

Metasoma. Dorsal carinae smooth. Intercarinal region granular dorsally. All segments sparsely punct-

uated. Segments I to IV wider than long; segment V longer than wide. Vesicle pyriform, slightly shorter than the carapace and sparsely punctuated (Fig. 7c). Telson lacking subaculear tubercle (Fig. 7c).

Affinities. *Buthoscorpio rayalensis* sp. nov. may be distinguished from the two known congeners on the basis of (differing or non-overlapping character states indicated parenthetically): anterior edge of carapace exhibiting very broad subtle indentation with a conspicuous epistome present medially (vs. absent in *B. politus* and *B. sarasinorum*); median eyes situated anteriorly in the ratio 1:3.1 (vs. 1:1.9 in *B. politus*, vs. 1:2.1 in *B. sarasinorum*); interocular area smooth (vs. inter-

	Holotype Female BNHS SC-43	Paratype Female BNHS SC-44
Body length	43.70	39.88
Carapace Length	4.44	4.92
Carapace Anterior Width	3.18	2.68
Carapace Posterior Width	4.80	3.92
Mesosoma Length	17.28	14.16
Metasoma Length	18.00	16.86
Metasomal Segment I Length	2.84	2.82
Width	3.84	3.30
Metasomal Segment II Length	3.06	3.08
Width	3.76	3.90
Metasomal Segment III Length	3.80	3.28
Width	3.94	4.00
Metasomal Segment IV Length	3.62	3.40
Width	3.96	3.92
Metasomal Segment V Length	4.68	4.28
Width	3.80	3.94
Telson Length	3.98	3.94
Aculeus Length	1.92	1.80
Pedipalp Femur Length	3.54	3.52
Width	0.82	1.12
Pedipalp Patella Length	4.88	5.26
Width (max.)	1.28	1.42
Pedipalp Chela Length	6.80	7.06
Width	1.30	1.18
Movable Finger Length	5.06	5.02
Pectinal Teeth L/R	17/17	17/17

Table 1: Measurements of the types of *Buthoscorpio rayalensis* sp. nov. (in mm).

ocular area of carapace finely granular in *B. sarasinorum*); patella anteriorly smooth and rounded (vs. patella weakly crested in *B. politus*); mesosomal tergites entirely smooth (vs. mesosomal tergites finely granular on median and lateral portion in *B. politus*); basal piece with a deep semicircular depression medially (vs. a shallow depression in *B. politus* and a distinct pointed 'V'-shaped depression medially in the female *B. sarasinorum*) and pectinal teeth number 17–17 (vs. 15–15 in *B. politus* and *B. sarasinorum*).

Natural History. One of the specimens was dug out from a rotting log and the other specimen was found under a boulder. Both specimens were found in a private

plantation site close to a perennial stream (Figs. 2–3). The specimens, on being disturbed, assumed a posture with the metasoma pressed flat to the mesosoma, its small telson folded dorsally in a groove, and the ventral surface of the metasomal segment V forming a “face shield” as observed in species of *Orthochirus* by Fet et al. (2003). This act is perhaps peculiar to this genus, *Orthochirus* and other related genera in association of chemosensory array, analogous to insect antennae as suggested by Fet et al. (2003). A similar behavior has been observed in *B. politus* as well (A. Zambre, pers. comm.).

Comments. Javed et al. (2010) listed 18 species of scorpions from the Indian state of Andhra Pradesh.

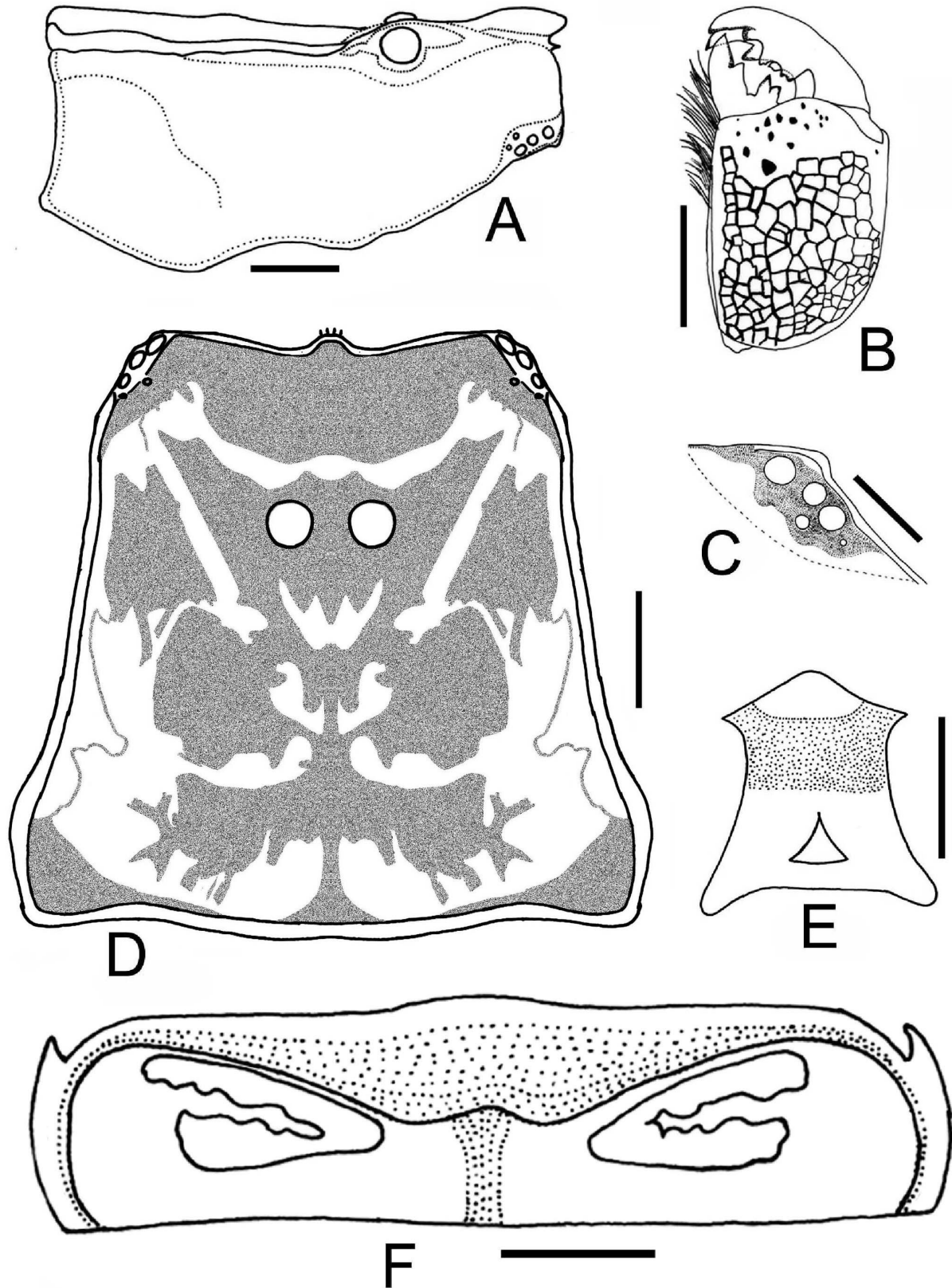


Figure 6: *Buthoscorpio rayalensis* sp. nov., female holotype (BNHS SC-43). **A.** Carapace, lateral aspect. **B.** Chelicera, dorsal aspect. **C.** Lateral ocular tubercle, showing arrangement of lateral eyes. **D.** Carapace, dorsal aspect. **E.** Sternum, ventral aspect. **F.** Mesosomal tergite, dorsal aspect. (scale A, B, D, F = 1 mm & C, E = 0.5 mm).

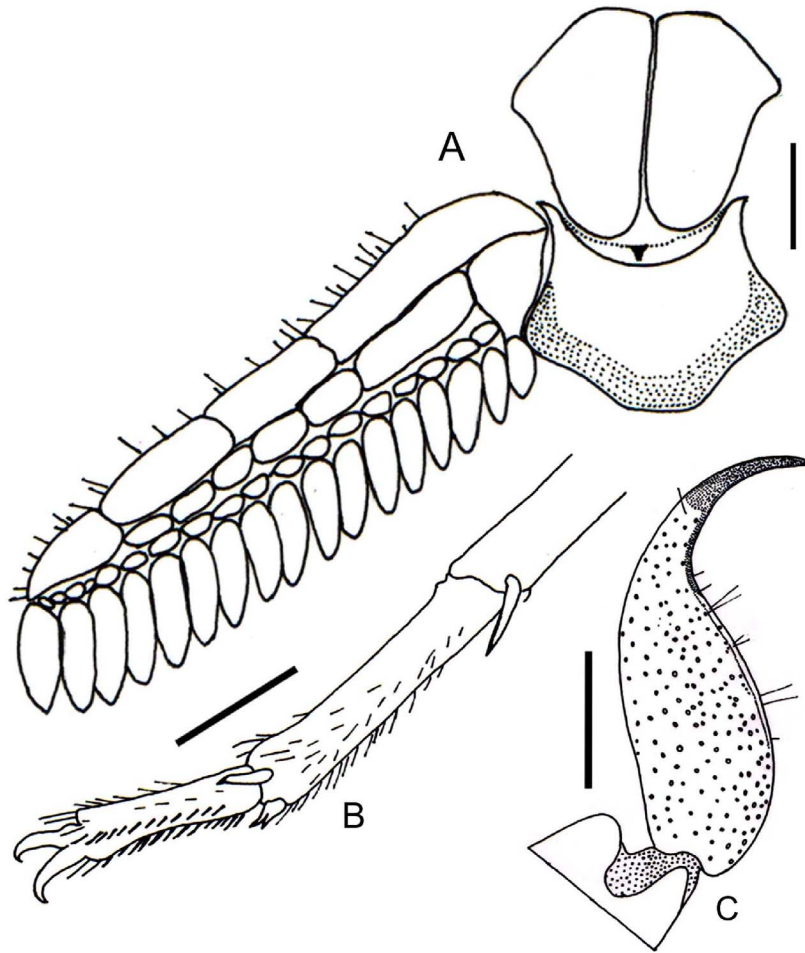


Figure 7: *Buthoscorpio rayalensis* sp. nov., female holotype (BNHS SC-43). **A.** Genital operculum, basal piece and pectines, ventral aspect. **B.** Leg tibia, basitarsus, and tarsus, lateral aspect showing tibial spur, pair of pedal spurs, with anterior spur bifurcated. **C.** Telson, lateral aspect. (scale = 1 mm).

Based on Rao et al. (2005), Javed et al. (2010) listed *Buthoscorpio sarasinorum* as occurring in the state. Previous records of specimens of *B. sarasinorum* from Andhra Pradesh by Rao et al. (2005) might in fact belong to the new species. Pocock (1900) mentioned *B. sarasinorum* distribution as Malabar Coast, India and hills of Ceylon (= Sri Lanka), whereas under a description he provided distribution of *B. sarasinorum* as Peradeniya, Ceylon (=Sri Lanka). Therefore, we presume that *B. sarasinorum* is a Sri Lankan species and its occurrence in India is doubtful and it needs confirmation whether it actually occurs in India. The record of *B. sarasinorum* from Kolkata (= Calcutta), West Bengal by Tikader & Bastawade (1983) needs verification as to whether the species is either *B. politus*, *B. rayalensis* sp. nov. or yet another undescribed species. However, specimens of *B. sarasinorum* deposited in Zoological Survey of India, Kolkata were found missing and not traceable; hence such verification in near future is almost impossible. *B. rayalensis* sp. nov. shares some characters with *B. politus*, and some with *B. sarasinorum*. At the moment, due to lack of specimens, we restrict the new name to its type population until

more specimens including males are found to establish exact status of all species of the genus *Buthoscorpio*. This should promote further activity by zoologists in India as scorpion studies by local researchers are so far quite uncommon and thus many species are poorly known (Mirza & Sanap, 2010).

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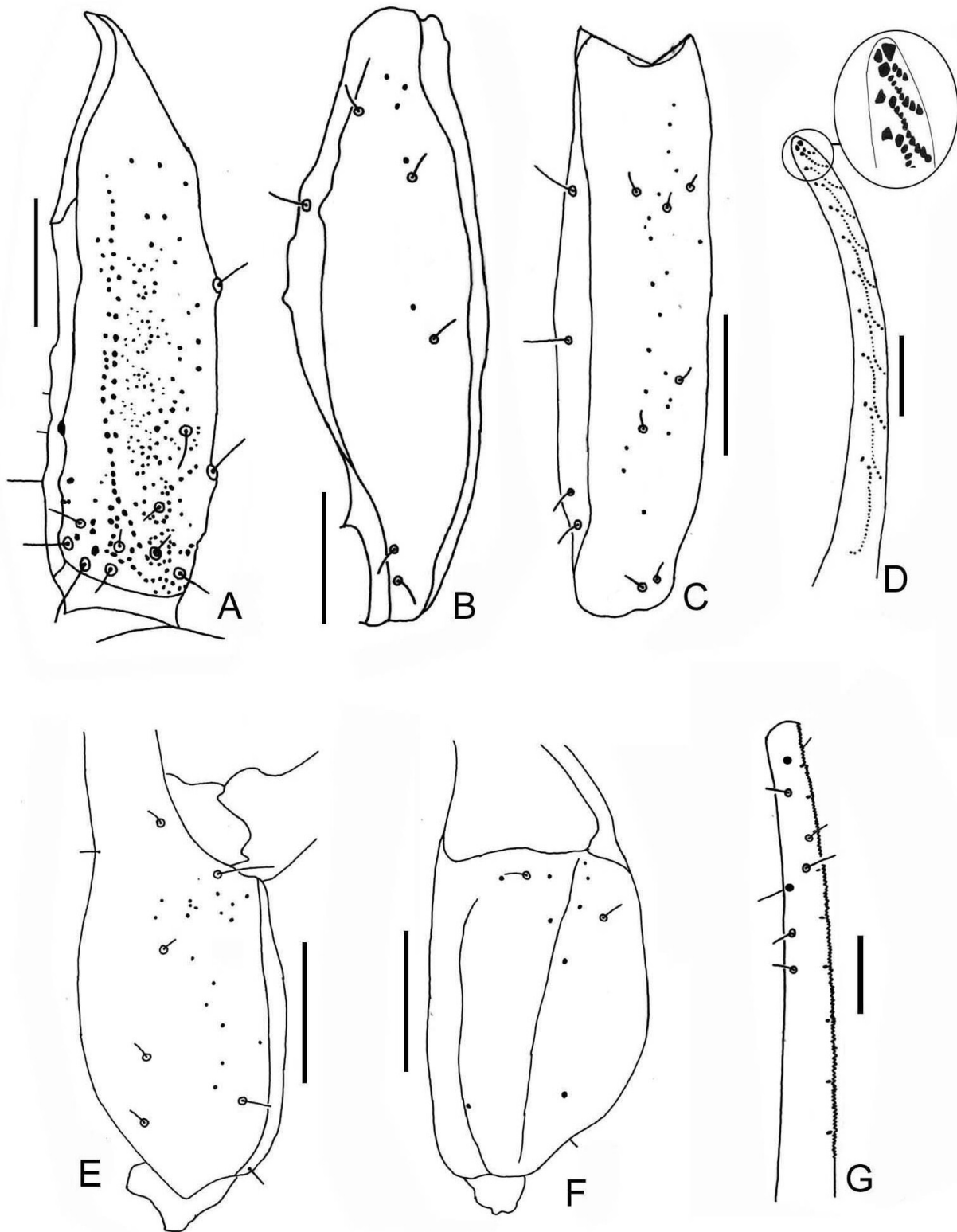


Figure 8: *Buthoscorpio rayalensis* sp. nov., female holotype (BNHS SC-43). A-C & E-G. Trichobothrial pattern. A. Femur, dorsal aspect. B. Patella, dorsal aspect. C. Patella, external aspect. D. Granulation on the dentate margins of the pedipalp chela movable finger. E & F. Chela, dorso-external and ventral aspects. G. Chela, fixed finger dorso-external aspect. (Scale = 1 mm).

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