Pakistan J. Zool., vol. 37(2), pp. 117-121, 2005.

A New Species of the Genus *Compsobuthus* Vachon (Arachnida: Scorpionida: Buthidae) from Pakistan

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Abstract.- A new species of the genus *Compsobuthus* is described from Digri, Sindh, Pakistan with special reference to its male genitalia. This species is compared with its closest allies and the relationship is also briefly discussed using apomorphic characters.

Key word: *Compsobuthus,* Scorpionida, scorpion,

INTRODUCTION

Some important work on the morphology and taxonomy of scorpions has been done in different laboratories of USA (John 1972; Willis, 1973); Mexico (Max, 1969; Lamoral, 1974) and India (Reddy, 1969*a*, *b*, 1970*a, b)*. Most of the important works on phylogeny and male genitalia of scorpions were done by Francke (1979) and Pavlovsky (1924, 1925). Tikadar and Bastawade (1983) studied scorpions, including the genus *Compsobuthus* accommodating the monotypic species *acutecarinatus* (Simon) with reference to its external morphological characters. The present authors collected a series of specimens and compared with the only species and described a new species from Sindh with special reference to its detailed morphology and male genitalia.

MATERIALS AND METHODS

The animals were collected from Digri, Sindh, Pakistan and were killed with the help of formalin and preserved in 70% alcohol. For the study of male genitalia the specimens were dissected out by removing the tergites of mesosoma. After dissection, the aedeagus was mounted on slide and photographed.

0030-9923/2005/0002-0117 $ 4.00/0

RESULTS

Compsobuthus humaae, new species
(Figs. 1-3)

Colouration

Body generally yellow.

Prosoma (Fig. 2A)

Carapace: Entire surface of carapace granular, all carinae granular, ocular tubercles blackish black, anterior margins granular and provided with 28-30 small black setae, antero-lateral margins weakly granular.

Pedipalp (Fig. 2Bi-2Biii)

Manus (Fig. 2Bi) stout, longer than femur, shorter than carapace, almost all carinae strong and granular, outer and anterior side provided with a crenulated crest with 18-20 denticular tubercles, patella (Fig. 2Bii) longer than femur but always shorter than carapace, carinae on outer side smooth, carinae dorsally and ventrally weakly granular, inner or anterior surface provided almost weakly granular crest with 15-sub-denticular tubercles, manus or hand stouter and length of underhand shorter than femur, fixed finger (Fig. 2Biii) almost as long as femur but movable finger shorter than carapace, dentition on the fingers consisting of three rows of imbricated teeth with granules on fixed and movable fingers. Trichobothrial pattern of pedipalp 'B' type.

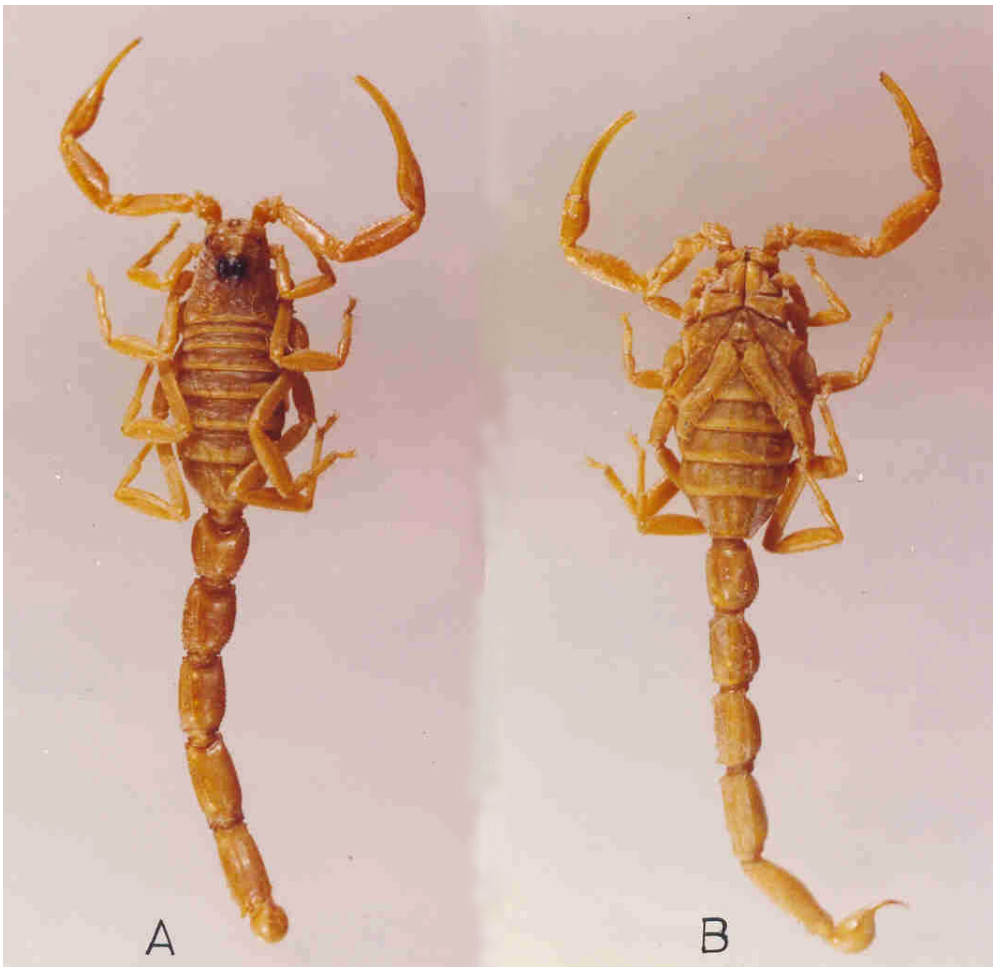

Fig. 1. *Compsobuthus humaae* Vachon; 1A. Entire, dorsal view, 2Bi-2Biii. Same, ventral view.

Legs (Fig. 2C)

Femur weakly granular, patella smooth and carinae crenulated, tibia with one tibial spurs on the legs III and IV, size 0.1 cm; pedal spurs spiny, tarsomere I laterally smooth and provided with a one pair of stout pedal spurs, tarsomere II smooth and clothed sparsely on ventral surface with few yellowish bristles.

Pectin (Fig. 2D)

Pectin well developed and almost four times longer than wide, nine middle lamellae present, fulcra nearly distinct triangular and clothed sparsely, 29-pectinal teeth yellow.

Genital operculum (Fig. 2E)

Genital operculum wider than long and sc1erites slightly divided on posterior portion from which small genital papillae produced in male, sternum triangular and small.

Mesosoma

All tergites more granular on posterior portion of each tergite, sternites I-IV smooth and each provided with slit-like stigmata for book lungs.

Metasoma

Cauda four times as long as carapace, first segment shorter than wide, segments I-IV with dorsal carinae crenulated, dentiform on posterior portion, much more elevated on segment III and IV, dorso-Iateral carinae evenly crenulated, lateral carinae well developed only on posterior portion of segment III-IV.

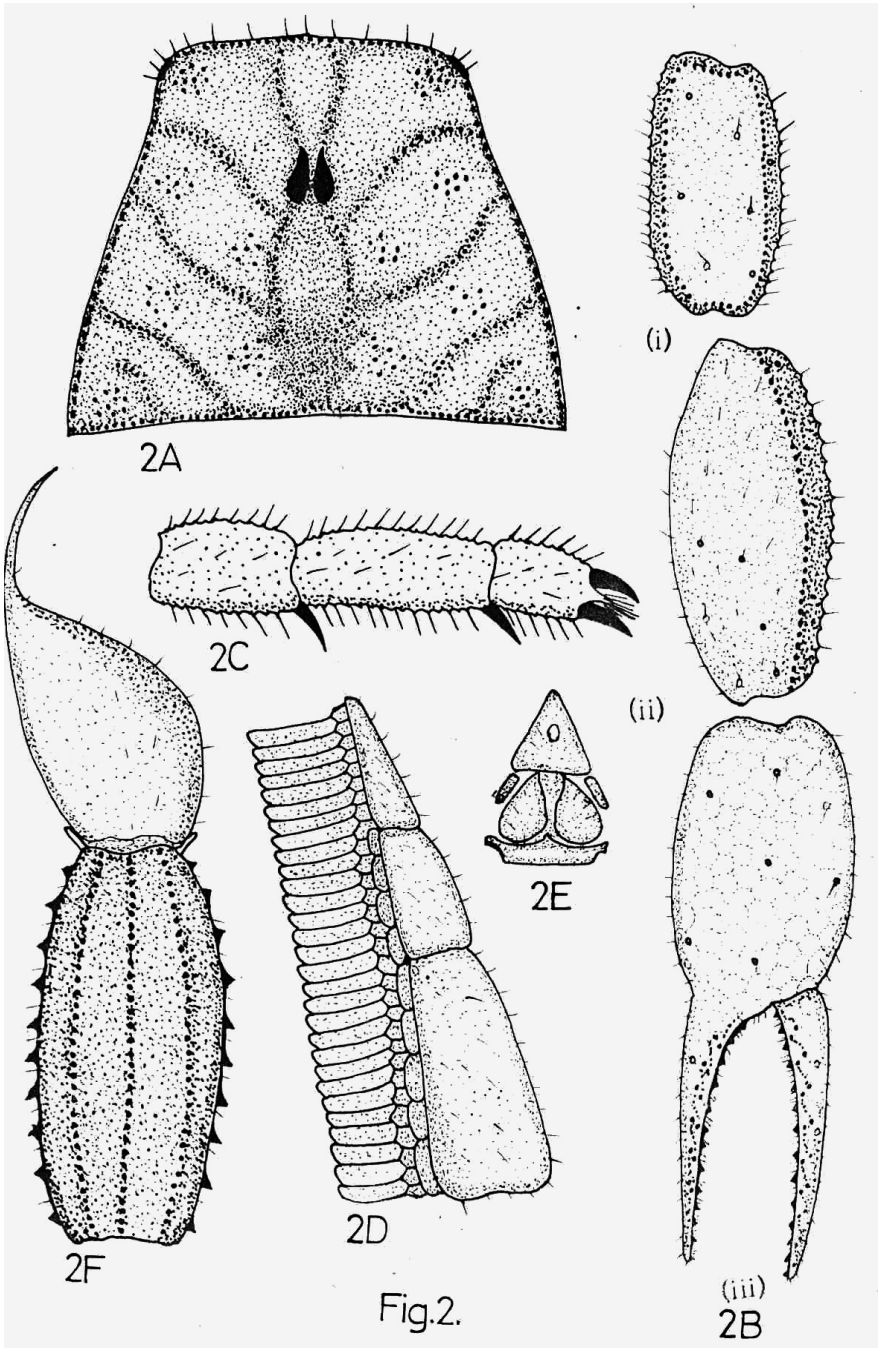

Fig. 2. *Compsobuthus humaae* Vachon; 2A. Prosoma, dorsal view, 2B-2D. Pedipalp. 2Bi. Femur, dorsal view, 2Bii. Patella, dorsal view, 2Biii. Hand dorsal view, 2C. Fourth leg, dorsal view, 2D. Pectin, ventral view, 2E. Genital opereulum, ventral view, 2F. Teslon, lateral view.

Telson (Fig. 2F)

Telson with vesicle not wider or deep as segment V, ventral surface densely granular, ventral median crest not developed, sub-aculeus nodule absent, aculeus- strongly curved, as short as vesicle.

Male genitalia (Fig. 3)

Flagellum 0.7 mm long, elongated and elastic, trunk 0.6 mm long and 0.15 mm wide, cylindrical, basally dilated, pedicel 0.3 mm long and 0.15 mm wide, pedicel very flat, sperm tube tubulus and semisclerotized.

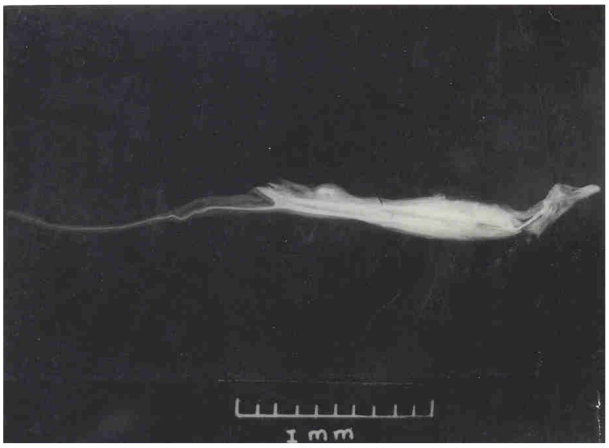

Fig. 3. *Compsobuthus humaae* Vachon: Aedeagus, lateral view.

Table I. Measurement in cm/mm meristic character of the male holotype *Compsobuthus humaae* sp.n.

Characters	Holotype male (cm)
Total length	4.3
Carapace length	0.6
Mesosoma length	1.0
Metasoma length	2.7
I segment length/width	0.48/0.18
II segment length/width	0.5/0.2
III segment length/width	0.55/0.25
IV segment length/width	0.58/0.27
V segment length/width	0.6/0.3
Telson length	0.55
Vesicle length/width	0.35/0.35
Aculeus length	0.2
Pedipalp length	1.8
Femur length/width	0.4/0.2
Patella length/width	0.6/0.25
Chela length/width	0.8/0.25
Fixed finger length	0.45
Movable finger length	0.47
Chelicera, Chela length/width	0.3/0.2
Fixed finger length	0.2
Movable finger length	0.22
Pectinal tooth count	29
Male genitalia	1.6

DISCUSSION

The representatives of the family Buthidae is distributed in Tropical and Sub-tropical areas, mostly in Palaearctic, Ethiopean and Oriental regions (Simon, 1978). This family is isolated from others by its apomorphies like, dorsal arm of movable finger of chelicerae furnished with four minute teeth on inner margin, sternum generally triangular and narrowed infront, third and fourth pairs of legs generally provided with a tibial spur and trichobothrial pattern is A- type.

Material examined

Holotype, male, Pakistan: Digri (Sind), 10.6.85, leg. Huma, lodged at Medical Entomological Museum University of Karachi (MEMUK) No.121; paratypes: 5 males and 5 females, other data same as holotype, lodged at Zoological Museum, University of Karachi (ZMUK).

Comparative note

This new species is most closely related to *Compsobuthus acutecarinatus rugosulus* Pocock in having entire surface covered with fine granules and 16 pectinal teeth present but it can easily be separated from the same in having entire surface granular, 29 pectinal teeth present and by the other characters as noted in the description.

Table II.- Variation in tarsomere II spine counts in *Compsobuthus humaae* sp.n., on each specimen, the spine of the left and right legs of each pair were counted.

Legs	Margin	4	5	6	7	8
I	Prolateral	9	8	4	6	5
	Retrolateral	5	8	4	4	5
II	Prolateral	10	4	5	6	8
	Retrolateral	4	4	5	7	7
III	Prolateral	7	5	6	5	5
	Retrolateral	5	5	6	5	5
IV	Prolateral	9	4	7	8	5
	Retrolateral	6	4	7	7	5

The genus *Compsobuthus* isolated from other genera by its apomorphies like posterior median carina of carapace joining with central median carina and forming a single straight carina which strongly spiniform posteriorly and anterior lateral carinae of 5th caudal segment nearly granular. The present new species *C. humaae* isolated from the only monotypic, type species *C. acutecarinatus* in having its autapomorphies like body yellowish in colour with entire surface of the body smooth, pectin with 26-pectinal teeth and aedeagus elongated, flagellar-shaped, trunk cylindrical basally dilate, pedicel very flat and sperm spine hook-like (Simon, 1978, 1980).

REFERENCES

FRANCKE, O.F., 1979. Description of the male of the *Bothriurus* (*Andibothriurus*) *peruvianus*, Mello–Leitao (Scorpionida: Bothriuridae). *J. Arachnol*, **1**: 215–220.

JOHN, T.H., 1972. Scorpions of Northern California Coast ranges Arachnida and Scorpionida. *Occas. Pap. Calif. Acad. Sci*., **92**: 1-59. Illus, 1972.

LAMORAL, B.H., 1974. New and little known scorpions and solifuges from the Namib Desert, South West Africa. *Madoqua*, **1**: 74–131.

MAX, Y., 1969. Contribution to the study of the African scorpions belonging to the Genus *Buthotus* Vachon 1949 and a study of their variability. *Monit. Zool. Ital*., **2** (Suppl.): 81–149.

PAVLOVSKY, E.N., 1924. On the morphology of the male Genital apparatus in scorpions. *Trans. Soc. Nat. Leningrad*, **53**: 76–86.

PAVLOVSKY, E.N., 1925. On the morphology of male Genital apparatus and to embryology of scorpion. *Ann. Mus. Zool. Acad. Scien. URSS, Leningrad*, **26**: 137–205.

REDDY, R.P.S., 1969a. Contribution to the knowledge to the scorpions of India (2) *Isomachus laeniceps* Pocock, 1893 (Scorpionidae: Ischnurinae). *Bull. Mus. natn. Hist. nat., Paris*, **39**(6): 1066–1067.

REDDY, R.P.S., 1969b. Contribution to the knowledge of the Indian scorpion. *Isomachus nitidus* Pocock, 1900 (Scorpionidae: Ischnurinae) *Bull. Mus. natn. Hist. nat., Paris*, **40**: 518–531.

REDDY, R.P.S., 1970a. Contribution to the scorpions of India 3. *Isomachus punctualatus* Pocock, 1897 (Scorpionidae: Ischnurinae). *Bull. Mus. natn. Hist. nat., Paris*, **40**: 132–140.

REDDY, R.P.S., 1970b. Contribution to our knowledge of the scorpions of India 5. The genus *Isomachus* Pocock, 1983. (Scorpionidae: Ischnuridae). *Bull. Mus. natn. Hist. nat., Paris*, **40**: 759–767.

SIMON, E., 1978. Description de deux noveaux genres de 1, ordre des scorpiones. *Annls. Soc. ent. Fr. Ser*., **5**(8): 399–400.

SIMON, E., 1980. Description de – Genres et Especes de I, ordre des scorpions. *Annls. Soc. ent. Fr. Ser*., **10**: 377–398.

TIKADAR, B.K AND BASTAWADE. D.B., 1983. The fauna of India, scorpions (Scorpionida & Arachnida). *Zool. Surv. India,* **3**: 1–671.

WILLIS, J.G., 1973. Studies of North American Scorpions of genera *Uroctonus* and *Vaejovis* (Scorpionida and Vaejovidae). *Bull. Am. Mus. nat. Hist*., **148**(4): 551–608.

(Received 18 May 2004, revised 18 October 2004)