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Notes on *Isometroides vescus* (Karsch, 1880) (Scorpiones, Buthidae), an endemic element to Australia

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(With 7 figures)

Abstract

The genus *Isometroides*, created by Keyserling in 1885, with *Isometrus vescus* Karsch, 1880 [= *Isometroides vescus* (Karsch, 1880)], as type species by subsequent designation, is described on the basis of one specimen (sex unknown; damaged) from Australia. A redescription of *I. vescus* is provided to clarify and better illustrate certain morphological characters (e.g. trichobothriotaxy). By the presence of certain micro-structures on cuticular punctuations of the metasomal segments, the genus *Isometroides* can be placed in a distinct lineage of micro-buthids.

Introduction

The genus *Isometroides*, created by Keyserling in 1885, with *Isometrus vescus* Karsch, 1880 [= *Isometroides vescus* (Karsch, 1880)], as type species by subsequent designation (Stahnke 1972), was described on the basis of one specimen (sex unknown; damaged) collected in Australia.

In subsequent publications this genus and species have been re-described or merely cited by a number of authors (see references heading the present redescription). The contributions by Main (1956) and in particular by Koch (1977), largely clarified the status of both the genus *Isometroides* and of the species *I. vescus*. Some characters, however, remained insufficiently clear or were poorly illustrated.

In this paper, a redescription of *I. vescus* is provided to clarify and better illustrate certain morphological characters (e.g. trichobothriotaxy). The genus *Isometroides* belongs to a distinct lineage of micro-buthids comprising genera such as *Orthochirus* Karsch, *Paraorthochirus* Lourenço & Vachon, *Afghanorthochirus* Lourenço & Vachon, *Butheoloides* Hirst, *Karasbergia* Hewitt and *Microbuthus* Kraepelin, by the presence of certain particular micro-structures situated on cuticular punctuations of their metasomal segments. The precise function of these micro-structures is not yet known, but they may correspond to some kind of chemoreceptor (Lourenço 2001, 2002).

Diagnosis for the genus *Isometroides*

Isometroides is related to genera such as e. g. *Afghanorthochirus* Lourenço & Vachon, *Butheoloides* Hirst, *Karasbergia* Hewitt, *Microbuthus* Kraepelin, *Orthochirus* Karsch, *Paraorthochirus* Lourenço & Vachon, by the presence of cuticular punctuations in the segments IV-V of the metasoma (Lourenço 2001, 2002). It differs from genera such as *Lychas* C. L. Koch or *Isometrus* Ehrenberg because of the lack of such punctuations.

Redescription

Isometroides vescus (Karsch, 1880) (Figs 1-7)

Isometrus vescus Karsch, 1880: p. 56.

Isometroides angusticaudus Keyserling, 1885: p. 19.

Isometroides vescus: Keyserling 1885: 17; Kraepelin 1891: 86; Kraepelin 1899: 40; Glauert 1925: 113; Werner 1934: 271; Takashima 1945: 78; Main 1956: 158; Koch 1977: 144; Koch 1981: 877; Locket 1990: 77.

TYPE MATERIAL: holotype, one specimen (sex unknown; damaged) deposited in the Zoologisches Museum Berlin (ZMB 3246).

MATERIAL EXAMINED: The present redescription is based on a single female collected on Bungulla, Australia, 15 October 1967, coll. C. Naumann. The specimen is deposited in the Zoologisches Museum Hamburg (ZMH Acc. No. A17/03).

C o l o r a t i o n. Basically yellowish, with the exception of metasomal segments IV-V and telson which are reddish. Prosoma: carapace yellowish, without spots; median and lateral eyes surrounded with black pigment. Mesosoma: yellowish with three vestigial longitudinal brown stripes. Metasoma: segments I to III yellowish, without spots; segments IV-V reddish; aculeus dark-reddish. Venter yellow; pectines, genital operculum, sternum and coxapophysis light yellow. Chelicerae yellowish, without spots; fingers reddish. Pedipalps and legs yellowish without spots.

M o r p h o l o g y. Carapace intensely granular, with small to moderate granules; anterior margin with a median concavity. Carinae and furrows moderate. Median ocular tubercle slightly anterior to the center of the carapace; median eyes separated by more than one ocular diameter. Three pairs of lateral eyes. Sternum sub-triangular. Mesosoma: tergites with moderate granulation, less intense than that of carapace. Three carinae; median one strong in all tergites; the other two vestigial. Tergite VII pentacarinata. Venter: genital operculum divided longitudinally, and formed by two almost oval plates. Pectines: pectinal tooth count 25-25; basal middle lamella of each pecten not dilated. Sternites smooth with moderate slit-like spiracles; VII with four moderate to weak carinae. Metasoma: segments I to III with 10 keels; segments IV-V lustreous with the presence of punctuations; intercarinal spaces weakly granular or smooth. Telson smooth and lustreous with a long but moderately curved aculeus shorter than the vesicle; subaculear tooth absent. Cheliceral dentition charac-

teristic of the family Buthidae (Vachon 1963); movable fingers with two basal teeth, small but well distinct; ventral aspect of both finger and manus with setae. Pedipalps: femur pentacarinat; patella with 6/7 moderately marked carinae; tibia with some keels but feebly crenulate; all faces moderately to weakly granular. Movable fingers with 7 oblique rows of granules, and spinoid accessory granules. Trichobothriotaxy; orthobothriotaxy A- \hat{a} (Vachon 1974, 1975). Legs: tarsus with median fine setae ventrally. Tibial and pedal spurs present on legs III-IV, strong.

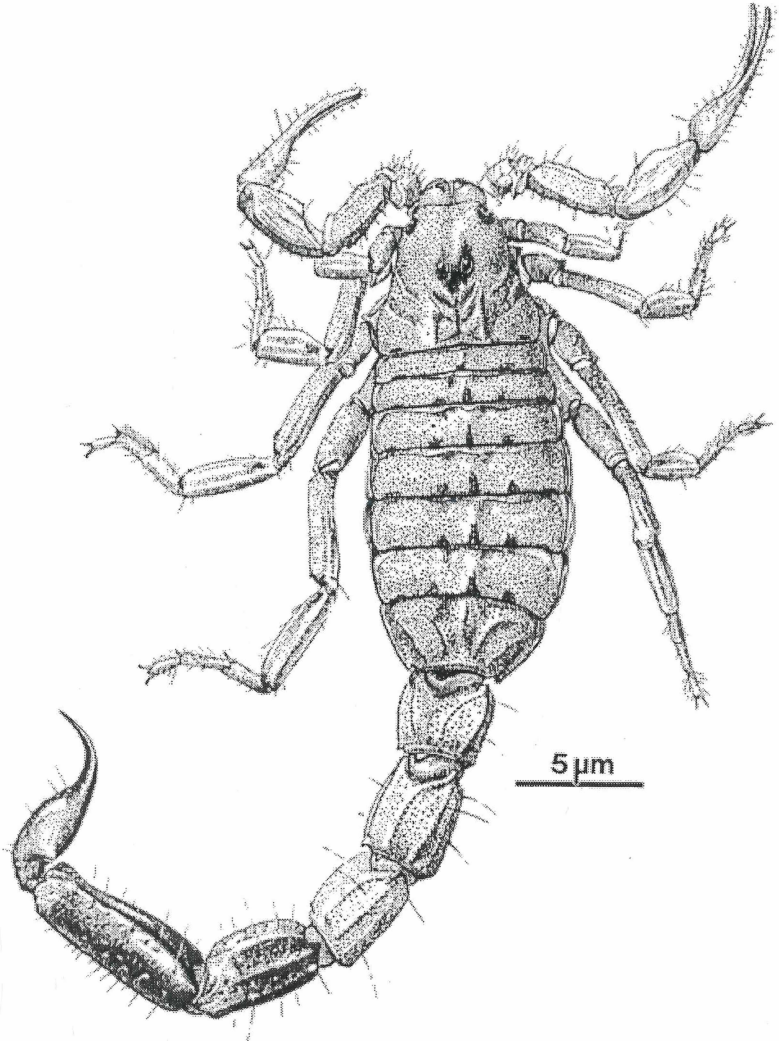
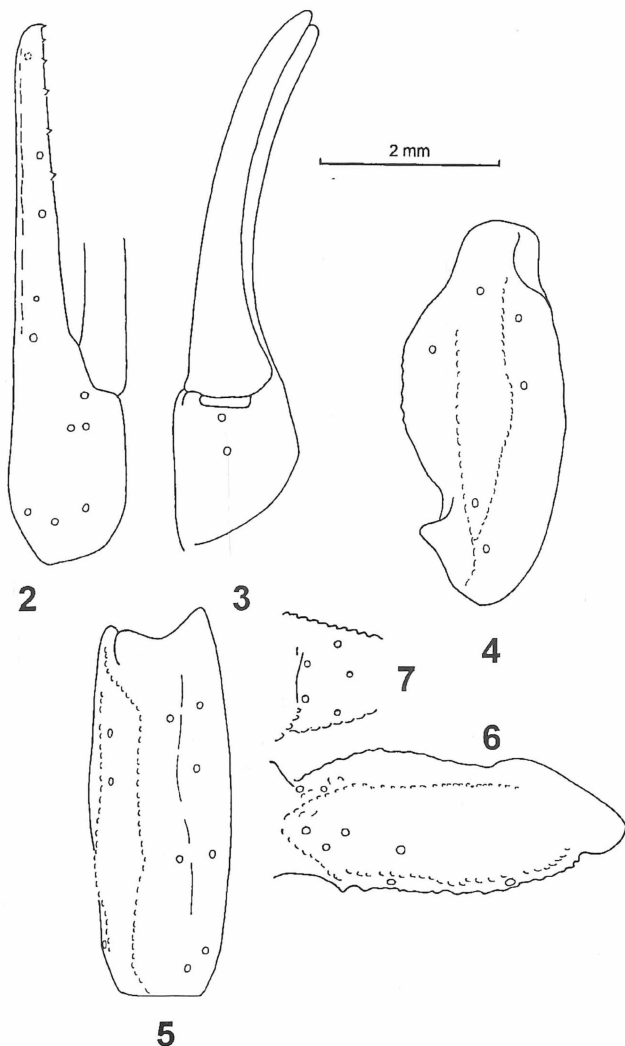


Fig. 1. Habitus of *Isometroides vescus* (Karsch), female.

M e a s u r e m e n t s (in mm, ♀): Total length: 44.0; Carapace: length 5.6, anterior width 3.6, posterior width 6.5; Metasomal segment I: length 3.6, width 3.8; Metasomal segment V: length 7.2, width 3.2, depth 2.7; Vesicle: width 1.7, depth 1.9; Pedipalp: femur length 3.8, femur width 1.4, patella length 4.3, Patella width 1.9, tibia length 6.3, tibia width 1.3, tibia depth 1.4; Movable finger: length 4.5.



Figs 2-7. Trichobothrial pattern in *Isometroides vescus* (Karsch): 2, 3 - tibia, dorso-external and ventral aspects; 4, 5 - patella, dorsal and external aspects; 6, 7 - femur, dorsal and internal aspects.

Description of the micro-structural characters

As already described by Lourenço (2001), the punctuations are situated on the metasomal segments, particularly IV and V, but seem to be absent from the telson. In most genera they are easy to observe, even with the naked eye, but they can be distinguished better with the use of a stereomicroscope.

Observation of a metasomal segment with the use of scanning electron microscopy shows at a magnification of 30-40x the presence of numerous punctuations. At a magnification of 1000x the cellular structure of the cuticle is clearly observable and the punctuations are now represented by cavities with lateral edges; a triangular structure is also observable more or less in the centre of the cavity. At a magnification of 3000x the cavity and its lateral edges can be seen very clearly, while, the triangular structure is well defined and shows a pedicular region which enters the cavity. With a greater magnification, 5000x, this pedicular region is even more clearly defined (for illustrations see Lourenço 2001). The precise functions of these structures still require investigation. It can only be presumed that they may be chemoreceptors. Observations have been carried out under laboratory conditions on the behaviour of several species of micro-buthids which possess metasomal punctuations. While searching for prey these scorpions move their metasoma from left to right and then to left again. This behaviour was not observed in micro-buthids which lack metasomal punctuations.

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