



***Mesobuthus eupeus* (Scorpiones: Buthidae) from Iran: A polytypic species complex**

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Abstract

In the present study a number of scorpions from Iran classified under the name of *Mesobuthus eupeus* (C.L. Koch, 1839) were considered. Currently, *M. eupeus* includes at least 14 described subspecies with no concrete taxonomic position. Here, this species is redescribed based on new specimens collected from Iran. In addition, multivariate statistical analyses were performed to investigate the degree of intraspecific morphological divergence of *M. eupeus* based on six Iranian subspecies. The results of morphological comparisons and univariate and multivariate statistical analyses confirm the high phenotypic variability within this species. The data presented here revealed two distinct groups: I. *M. e. phillipsi* and, II. Including five subspecies namely, *M. e. eupeus*, *M. e. philippovitschi*, *M. e. thersites*, *M. e. afghanus* and *M. e. kirmanensis*. The results of this study clearly confirm the hypothesis that *M. eupeus* is a polytypic species complex and possibly includes more than one valid species. Therefore, according to comparative morphological analysis, *M. e. phillipsi* was raised to the species level.

Key words: taxonomy, scorpions, subspecies, morphology

Introduction

Mesobuthus Vachon, 1950 was erected after the complete revision of the traditional genus *Buthus* Leach, 1815 by Vachon (1950). The genus *Buthus* consisted of several species distributed in Africa and Asia, remained undivided for a long period of time. The genus *Mesobuthus* includes the Asian species of the genus *Buthus*, including *B. eupeus* (Vachon 1952). These are exclusively Old World scorpions and very common in the Palearctic region with the highest species diversity in the Central Asia and Iran (Levy & Amitai 1980; Fet 1988 & 1994). This genus includes at least four species in Iran namely, *M. eupeus*, *M. caucasicus*, *M. vesiculatus* and *M. macmahoni* (Kovařík 1997; Gantenbein *et al.* 2003; Vignoli *et al.* 2003). The genus *Mesobuthus* occupies a variety of habitats from xeric to mesic, from Caspian Sea shoreline and low altitude deserts of the Persian Gulf to the high altitudes of the Alborz and Zagros Mountains (Farzanpay 1987; Navidpour *et al.* 2008a, b, c & d; Pirali-Kheirabadi 2009; Navidpour *et al.* 2010; Mirshamsi 2010; Mirshamsi *et al.* 2010).

The species *M. eupeus* (C.L. Koch, 1839) occurs in the Palearctic region from eastern Anatolia to China (Fet 1994; Karataş & Karataş 2001, 2003; Teruel 2000; Gromov 2001; Qi *et al.* 2004; Shi *et al.* 2007) with a dozen subspecies being recognized mainly based on coloration and superficial ornamentations (Pocock 1889, Birula 1900, 1905 & 1917). The traditional taxonomy of this species, essentially based on coloration and morphosculpture characters, was complicated and puzzling and *M. eupeus* comprises at least 14 taxonomically valid subspecies distributed from Turkey to China, of which five to nine subspecies have been recorded from Iran (Pocock 1889a; Birula 1900, 1905, 1917; Farzanpay, 1987; Fet 1994). However, morphological characters are not precise as for their relationships and taxonomic status. Therefore, some of these are of doubtful validity and complete revision of this species has been proposed by different authors (Kovařík 1997; Gantenbein *et al.* 2003).