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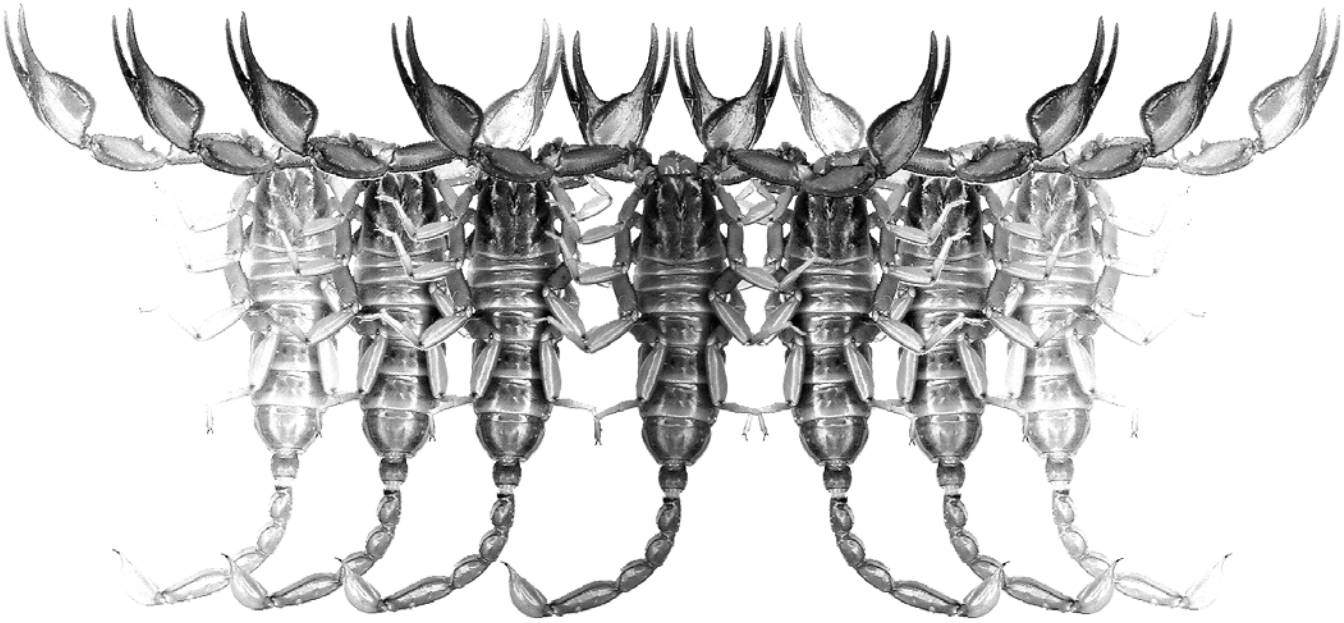

Mesobuthus caucasicus (Nordmann, 1840) (Scorpiones: Buthidae) in Turkey

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August 2005 – No. 25

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- **MNHN**, Museum National d'Histoire Naturelle, Paris, France
- **NMW**, Naturhistorisches Museum Wien, Vienna, Austria
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- **MZUC**, Museo Zoologico "La Specola" dell'Universita de Firenze, Florence, Italy
- **ZISP**, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

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Summary

Although *Mesobuthus caucasicus* was listed from Turkey in the literature, information about this species was confused and needed confirmation. Distribution of *M. caucasicus* is studied and new geographical records are given. As a result of field studies, *M. caucasicus* is confirmed from three certain localities in Turkey. In addition, some bio-ecological information is provided.

Introduction

Turkish scorpiofauna consists of 16 species belonging to the families Buthidae, Euscorpiidae, Iuridae, and Scorpionidae (Pavesi, 1876; Birula, 1898, 1899, 1917; Werner, 1902; Kulczyński, 1903; Schenkel, 1947; Vachon, 1947a, 1947b, 1971; Kinzelbach, 1975, 1980, 1982, 1984; Bonacina, 1980; Francke & Soleglad, 1981; Fet, 1986, 1989; Vachon & Kinzelbach, 1987; Crucitti, 1993, 1999; Lacroix, 1995; Kovařík, 1996; Fet & Braunwalder, 2000; Crucitti & Cicuzza, 2001; Karataş et al., 2004; Fet et al., in press). Buthidae, the richest family in the country, is represented by the genera *Androctonus*, *Buthacus*, *Compsobuthus*, *Hottentotta*, *Leiurus*, and *Mesobuthus*.

The genus *Mesobuthus* Vachon, 1950 currently includes 13 species. It is widespread in the Palaearctic Region from the Balkans to Korea. Four of these species have been recorded in Turkey: *M. caucasicus* (Normann, 1840), *M. eupeus* (C.L. Koch, 1839), *M. gibbosus* (Brullé, 1832), and *M. nigrocinctus* (Ehrenberg, 1828) (Birula, 1917; Kinzelbach, 1975; Vachon & Kinzelbach, 1987; Fet, 1989; Kovařík, 1996, 1998; Fet & Lowe, 2000; Fet et al., 2000; Gantenbein et al., 2000; Karataş, 2003; Karataş & Karataş, 2003; Crucitti & Vignoli, 2002). Of these, the range of *M. gibbosus* (Brullé, 1832) lies in Anatolia (to the west of the Anatolian Diagonal except for the coastal parts of the Black Sea and the Sea of Marmara) and the Balkans. *M. eupeus* is widespread in the Palearctic Region; it ranges from Central Anatolia through Caucasus and Turkestan to China and also found in Iran, Iraq, Afghanistan and Pakistan (Birula, 1917; Vachon, 1951, 1966; Kinzelbach, 1975, 1984; Vachon & Kinzelbach, 1987; Fet, 1989, Kovařík, 1996, 1998; Fet & Braunwalder, 2000; Karataş & Karataş, 2001, 2003). *M. gibbosus* has sympatric distribution with *M. eupeus* in Central Anatolia to the west of the Anatolian Diagonal (Kinzelbach, 1975, 1984; Vachon & Kinzelbach, 1987; Fet, 1989, Kovařík, 1996, 1998; Crucitti, 1999; Fet & Braunwalder, 2000; Crucitti & Vignoli, 2002; Karataş & Karataş, 2001, 2003). *M. nigrocinctus* in Turkey was first recorded from Adıyaman by Crucitti & Vignoli (2002); it also occurs in Gaziantep, Malatya, and Hatay Provinces (Karataş, unpubl.). To the east of the Anatolian Diagonal, *M. caucasicus* is syntopic only with *M. eupeus* in Iğdır, Kars, and Van Provinces (Figure 1). A recently described species *M. cyprius*, separated from *M. gibbosus* on the basis of DNA analysis, is found on Cyprus (Gantenbein et al., 2000).

The species *Mesobuthus caucasicus*, found from Turkey to China, was placed in the monotypic genus *Olivierus* by Farzanpay (1987) depending on the number of granules on movable finger of pedipalp. Later, DNA studies by Gantenbein et al. (2003) demonstrated that the genus *Olivierus* was paraphyletic with respect to genus *Mesobuthus*. Therefore, *Olivierus* was synonymized with *Mesobuthus*. Among six subspecies of *M. caucasicus*, Fet & Lowe (2000) listed the nominotypic subspecies as found in Turkey (see also Kovařík, 1998; Crucitti & Vignoli, 2002).

Presence of *M. caucasicus caucasicus* in Turkey was first reported by Birula (1897, 1917) as *Buthus caucasicus* from Aralık. Birula (1897, 1917) also gave morphological characteristics of the species and geographical distribution of the nominotypic subspecies. Vachon (1947a) listed *M. caucasicus* for the scorpion fauna of Turkey, but the study was not based on any specimen.

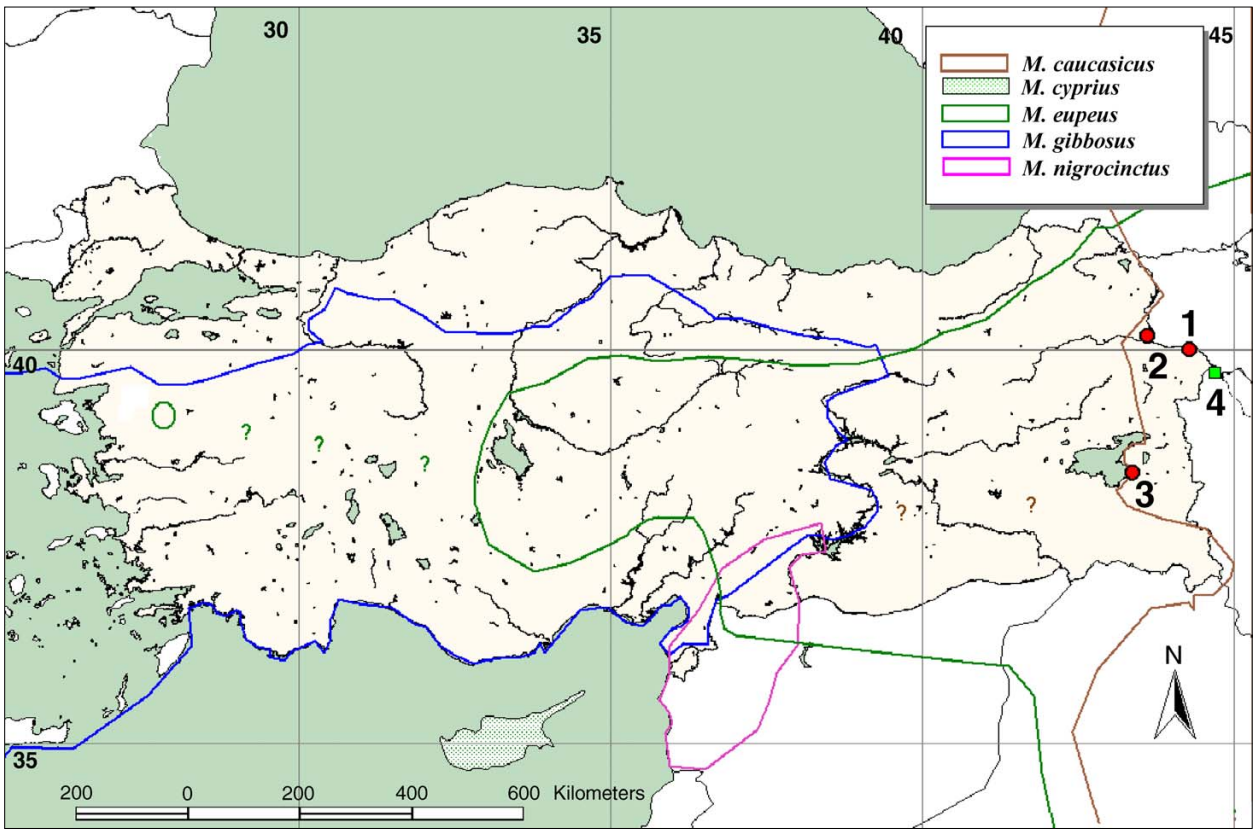


Figure 1: Map of new (circles) and previous (squares) localities of *M. caucasicus* from Turkey and ranges of *Mesobuthus* spp. in Turkey and surrounding area.

He also identified a female from Iğdır Province as *Mesobuthus* sp. Other authors who provided information about *M. caucasicus* in Turkey (Birula, 1898; Vachon, 1947b, 1951; Kinzelbach, 1984; Crucitti, 1999; Fet & Lowe, 2000; Crucitti & Vignoli, 2002) apparently only followed the original information of Birula (1897) and Vachon (1947a). Due to our new data obtained from the field studies, presence of *M. caucasicus* in western Turkey is confirmed with certainty. Below, we provide measurements, drawings and distribution localities for the specimens of *M. caucasicus* from Turkey.

Material and Methods

Scorpions were collected under stones during the day time and placed into 70 % ethanol. Specimens have been deposited in the scorpion collection at Zoology Department of Niğde University (ZDNU). Measurements were made under 0.1 mm accuracy micrometric ocular and drawings were made under the stereomicroscope Olympus SZX9. All measurements are given in millimetres (mm).

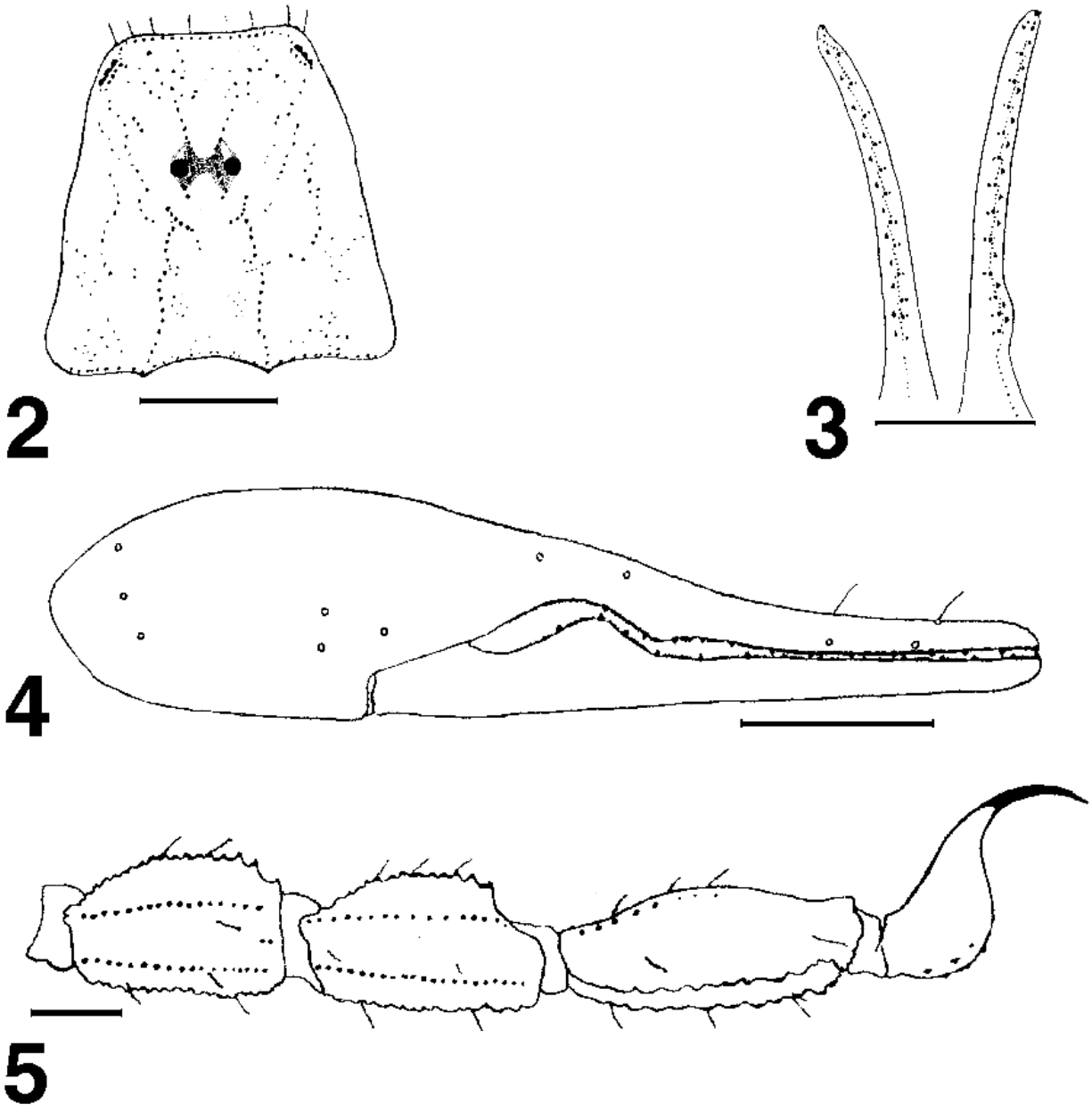
Abbreviations

TL: Total Length; Cal: Carapax Length; CaAw: Carapax Anterior Width; CaPw: Carapax Posterior Width; FemL/W: Femur Length/Width; PatL/W: Patella Length/Width; ChL/W/D: Chela Length/Width/Depth; FfL: Fixed Finger Length; MfL: Movable Finger Length; MesL: Mesosoma Length; TailL: Tail Length; Metasomal Segments L/W/H: Length/Width/Heigth of Metasomal Segments I–V.

Results and Discussion

General features

Morphological characteristics are given here, which are applicable to adult males collected from Van Province (Figs. 2–5). General coloration of body light greenish-yellow (Fig. 6). Metasoma does not increase in width posteriorly. Denticles of the ventrolateral carinae on metasomal segment V somewhat pointed, regularly enlarged posteriorly but not curved outward (Fig. 5). Telson oblong, oval. Lyre-shaped carinal structure be-



Figures 2-5: External morphology of *M. caucasicus* male from Van Province. **2.** Carapace carination; **3**. Dentitition of the fixed finger of pedipalp chela (left) and of the movable finger (right); 4. Right pedipalp chela, lateral (=external) aspect with trichobothrial pattern and scalloping of fingers; 5. Lateral view of metasomal segments III–V and telson. (Scale: 2 mm).

hind the ocular tubercle on carapace not prominent as in *M. eupeus* (Fig. 2). Posterior median carinae are not aligned with central lateral carinae and central median carinae. There are 12 and 13 oblique rows of denticles on pedipalp fixed and movable fingers, respectively (Fig. 3). External accessory denticles are smaller than the inner ones, especially towards fingertips. Basal lobe (scalloping of fingers) is well-developed (Fig. 4). In contrast with *M. eupeus* and *M. gibbosus,* mesosoma of *M. caucasicus* does not have dark stripes. Only the areas between median eyes and around lateral eyes have dark coloration. Basal two-thirds of metasomal segment V are brownish ventrally and laterally. Legs are yellowish.

Metasomal segment I with 10 complete carinae, segments II and III with eight complete and two lateral accessory carinae. These accessory carinae reach to the middle of segment II but it consist of only 2–3 granules on segment III. Segment IV has eight complete carinae and no accessory carinae.

Metasomal segments in *M. caucasicus* are longer than that of *M. eupeus*. Ventral carinae of metasomal segments I–V are of equal size in *M. caucasicus* but

Figure 6: *M. caucasicus* adult male from Van Prov. Dorsal (above) and ventral (below) views.

enlarged posteriorly, especially on II and III metasomal segments, in *M. eupeus*. *M. caucasicus* has more elongated carapace than that of *M. eupeus* because, with regard to posterior width of carapace, length of carapace and anterior width of carapace are shorter than that of *M. caucasicus*. Lyre-shaped carinal structure on the carapace is more prominent in *M. eupeus* than in *M. caucasicus*. Number of oblique rows of denticles on pedipalp fingers is 10–11 in *M. eupeus*, 12–13 in *M. caucasicus*.

The localities from Turkey clarify the southwestern range boundary of *M. caucasicus*. Birula (1897) reported *Buthus caucasicus* from Aralık, the locality currently situated at the junction of Turkey, Armenia, and Iran (Fet, 1989; Fig. 1). Birula (1917) listed four subspecies within the geographic range of *M. caucasicus*. Of these, the distribution of the nominotypic *M. c. caucasicus* included Eastern Transcaucasia, Daghestan, the Terek Region and Northern Persia. Our measurements agree with the dimensions of adult males giving in Birula (1917). According to the key published by Birula (1917) to distinguish the subspecies of *M. caucasicus*, our specimens correspond to the nominotypic subspecies. Fet (1989), in the catalogue of scorpions of the former USSR, listed the nominotypic subspecies from the modern Armenia, Azerbaijan, Georgia, Russia, and Ukraine. Fet & Lowe (2000) listed the nominotypic subspecies from Armenia, Azerbaijan, Georgia, Turkey and Iraq (?), Russia (Chechnya, Daghestan) and Ukraine (Kherson and Odessa Regions).

Presence of *M. caucasicus* in Turkey is now clearly confirmed by morphological characteristics of specimens as given in this study.

Bio-ecological observations

All specimens were taken from very dry habitats under the stones, remote from human dwellings. Iğdır specimens were collected under the stones in the ruins of a house made of concrete.

Kars and Van specimens were observed under the stones in the field covered with steppe vegetation and on the limestone formation. Two adult • • from Karakoyunlu (Iğdır Province) were observed. Each of two females carrying nearly 45 young at first instars on its back in the field on 20.VII.2003 hence they were not taken as field material.

Examined specimens and localities **(Fig. 1):** 1. *Iğdır Province*: Karakoyunlu, Taşburun village (39°58'52" N; 44°14'40" E) (860 m a.s.l.), 20.VII.2003: 2 adult ♀♀; 2. *Kars Province*: Digor, Halimcan village (40°09'24" N; 43°39'32" E) (ca. 1200 m a.s.l.), 21.VII.2003: 1 subadult ♂; 3. *Van Province*: East of Van Lake (38°32' N; 43°.21' E) (ca. 1700 m a.s.l.), 15.VI.2001: 2 adult ♂♂.

Literature record: 4. *Iğdır Province*: Aralık (39°52' N; 44°31' E) (Birula, 1897).

***Morphometric measurements of M. caucasicus*:** Van Province, 2 ♂♂; TL 55.8, 58.9; CaL 5.4, 5.2; CaAw 3, 3.2; CaPw 5.8, 5.5; FemL/W 5/1.6, 4.9/1.6; PatL/W 6.1/2.4, 5.9/2.3; ChL/W/D 10.3/2.6/3.1, 10.3/2.6/3; FfL 5.5, 5.5; MfL 6.6, 6.5; MesL 14.3, 15.3; TailL 34.5, 34.3; Metasomal segments; I, L/W/H 4/3.6/3.1, 3.9/3.4/3; II, 4.1/3.5/3.1, 4.6/3.3/3; III, 4.8/3.4/3.1, 4.9/3.3/3; IV, 5.5/3.2/3, 5.5/3.2/2.9; V, 6/2.9/2.5, 6.3/2.9/2.5, Pectinal tooth counts 25–28 and 27–28. Measurements of the subadult ♂ from Kars and two ♀♀ from Iğdır are not given; pectinal tooth counts of the subadult ♂ from Kars were 29–30. Iğdır females were not taken from the field because they were carrying newborn litters; they were released under the stones.

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