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A NEW SPECIES OF *MESOBUTHUS* VACHON, 1950 (SCORPIONES: BUTHIDAE) FROM CRETE (GREECE)

Eric Ythier

SynTech Research, 613 route du Bois de Loyse, 71570 La Chapelle de Guinchay, France. eythier@syntechresearch.com

Abstract: A new species of scorpion belonging to the genus *Mesobuthus* Vachon, 1950 (family Buthidae C. L. Koch, 1837) is described on the basis of one specimen collected on the Lassithi Plateau, in Crete (Greece). The new species is characterised by a high number of rows of granules on mobile (14 rows) and fixed fingers (13 rows), lateromedian carinae vestigial on metasomal segment IV, an interspace between median carina and each paramedian carina 1.2-1.7 times as wide as the paramedian carina on tergites IV-VI, and a rather high pectinal tooth count with 26-27 teeth in female. This is the second species of the genus *Mesobuthus* reported from Crete.
Key words: Scorpiones, Buthidae, *Mesobuthus*, new species, Greece, Crete.

Una especie nueva de *Mesobuthus* Vachon, 1950 (Scorpiones: Buthidae) de Creta (Grecia)
Resumen: Se describe una especie nueva de escorpión del género *Mesobuthus* Vachon, 1950 (familia Buthidae C. L. Koch, 1837) a partir de un ejemplar recogido en la meseta de Lassithi, en Creta (Grecia). Se caracteriza por un alto número de filas de gránulos en los dedos móviles (14 filas) y fijos (13 filas), carenas lateromediales vestigiales en el segmento metasomal IV, la presencia de un intersticio entre la carena medial y cada carena paramedial 1'2-1'7 veces tan ancho como la carena paramedial de los terguitos IV-VI, y un número bastante alto de dientes pectinales, 26-27 en la hembra. Es la segunda especie del género *Mesobuthus* citada de Creta.
Palabras clave: Scorpiones, Buthidae, *Mesobuthus*, especie nueva, Grecia, Creta.

Taxonomy / Taxonomía: *Mesobuthus gallianoi* **sp. n.**

Introduction

During the last 20 years, *Mesobuthus gibbosus* (Brullé, 1832) has been the subject of several studies mainly focused on its geographical distribution and population genetics, particularly related to insularity (*e.g.* Crucitti, 1993; Crucitti *et al.*, 1998; Fet, 2011; Gantenbein *et al.*, 2000, 2002, 2003; Kaltsas *et al.*, 2006; Kaltsas & Mylonas, 2007; Parmakelis *et al.*, 2006; Stathi, 1998). Its distribution range throughout Anatolia and the Balkan Peninsula is now well known and the species has been reported several times from Crete Island (Greece). However, none of the specimens originating from Crete and presented in such studies were collected from the Lassithi Plateau.

In the present paper, a new species of *Mesobuthus* is described from the Lassithi Plateau, in Crete. The Lassithi Plateau is a large (25 km²) high endorheic plateau, located in the Lassithi district in eastern Crete. It lies at an altitude ranging from 800 to 850 m and is surrounded by the Selena mountain (1559 m) at the north and the Dikti mountain range including Afendi (1588 m) and Louloudaki (1163 m) mountains to the west, Spathi mountain (2148 m) to the south and Katharo (1564 m) and Varsami (1545 m) mountains to the east (fig. 1-2).

It is established that hotspots of species richness are located primarily in regions of complex topography and geology, suggesting that speciation often occurs in mountain areas, where geographic isolation occurs with populations that are completely separated by a physical barrier, such as a mountain range. The mountains surrounding the Lassithi Plateau may have acted as an agent of vicariance preventing migration of populations and separating the new species from the other *Mesobuthus* populations in the island (*M. gibbosus*), leading to allopatric speciation in the isolated population living in the Plateau.

The description of the new species raises to two the number of species belonging to the genus *Mesobuthus* in Crete. Morphological characters distinguishing the new species from *M. gibbosus*, but also from the closely related species *M. cyprius* Gantenbein, Kropf, Largiadèr & Scholl, 2000 from Cyprus, are presented in this paper.

Material and methods

Measurements and illustrations were made using a Motic DM143 digital stereo-microscope together with a Nikon D810 camera and a Wacom Intuos drawing tablet. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations are those developed by Vachon (1974) and the morphological terminology mostly follows Hjelle (1990).

Specimens studied herein are deposited in the following collections: MNHN (Muséum national d'Histoire naturelle, Paris, France) and EYPC (Eric Ythier Private Collection, Romanèche-Thorins, France).

Systematic description

Family BUTHIDAE C. L. Koch, 1837

Genus ***Mesobuthus*** Vachon, 1950

***Mesobuthus gallianoi* sp. n.**
Fig. 3-5.

TYPE MATERIAL. Greece, Crete, South of Lassithi Plateau, near Psychro cave, 850 m altitude, 1 adult female (holotype), deposited in the MNHN, E. Ythier coll., 16/VIII/2010. Comparative material examined: *M. gibbosus*, Greece, Crete, Akrotiri Peninsula, 1 adult female, deposited in the EYPC (EY0125).



Fig. 1. Topographic map of Crete showing the Lassithi Plateau, where the new species was found.
Fig. 2. Lassithi Plateau, Crete. Natural habitat of *Mesobuthus gallianoi* sp. n.

ETYMOLOGY. The specific name honours Mr. Raymond Galliano (Vierzon, France, 1933-2018), great painter and passionate about Greece.

DIAGNOSIS. Total length 51.0 mm for female holotype (see morphometric values after the description). General coloration brownish yellow with five longitudinal blackish stripes and four longitudinal orange stripes on the mesosoma; metasoma and pedipalps yellowish; legs pale yellow. Interspace between median carina and each paramedian carina between 1.2-1.7 times as wide as paramedian carina on tergites IV-VI. Pectinal tooth count 26-27 in female holotype; male unknown. Metasomal segments I-IV with 10 longitudinal carinae, the laterodmedian carinae well marked on segments I-II, moderately marked on III and vestigial on IV; metasomal segment IV length/width ratio 1.56 and length/height ratio 1.79. Chela length/width ratio 4.55; movable and fixed finger with 14 and 13 rows of granules, respectively. Trichobothriotaxy of type A-α.

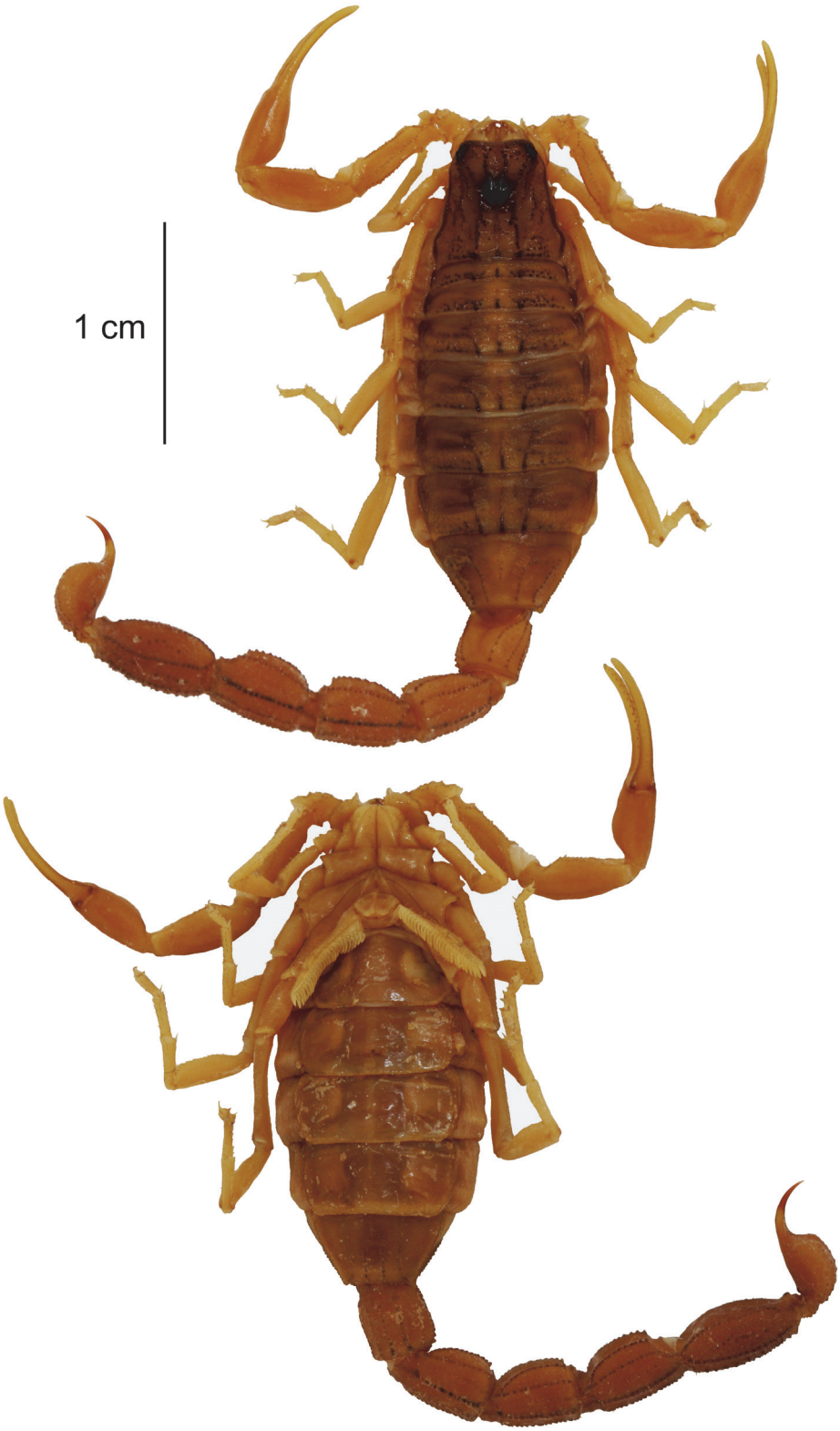


Fig. 3. *Mesobuthus gallianoi* sp. n., female holotype. Habitus, dorsal and ventral aspect.

DESCRIPTION BASED ON FEMALE HOLOTYPE.

Coloration. General coloration brownish yellow. Carapace brownish yellow with lighter zones on the anterior part, from the median ocular tubercle; carinae marked with black pigment, especially on the anterior median, central median and posterior median carinae; eyes surrounded by black pigment. Mesosoma brownish yellow with five longitudinal blackish stripes and four longitudinal orange stripes. Venter brownish yellow. Metasomal segments brownish yellow with black pigment on the carinae. Vesicle brownish yellow, lighter on ventral side; base of aculeus reddish yellow, tip reddish black. Chelicerae pale yellow without reticulation; fingers yellowish; teeth yellowish with the tip reddish yellow. Pedipalps yellowish, the tip of fingers slightly darker. Legs pale yellow with some darker zones on the carinae of femur and patella.

Morphology. Carapace trapezoid-shaped with anterior edge slightly concave; carinae well marked with large granules, especially the anterior median, central median and posterior median carinae; other areas unevenly covered with medium to

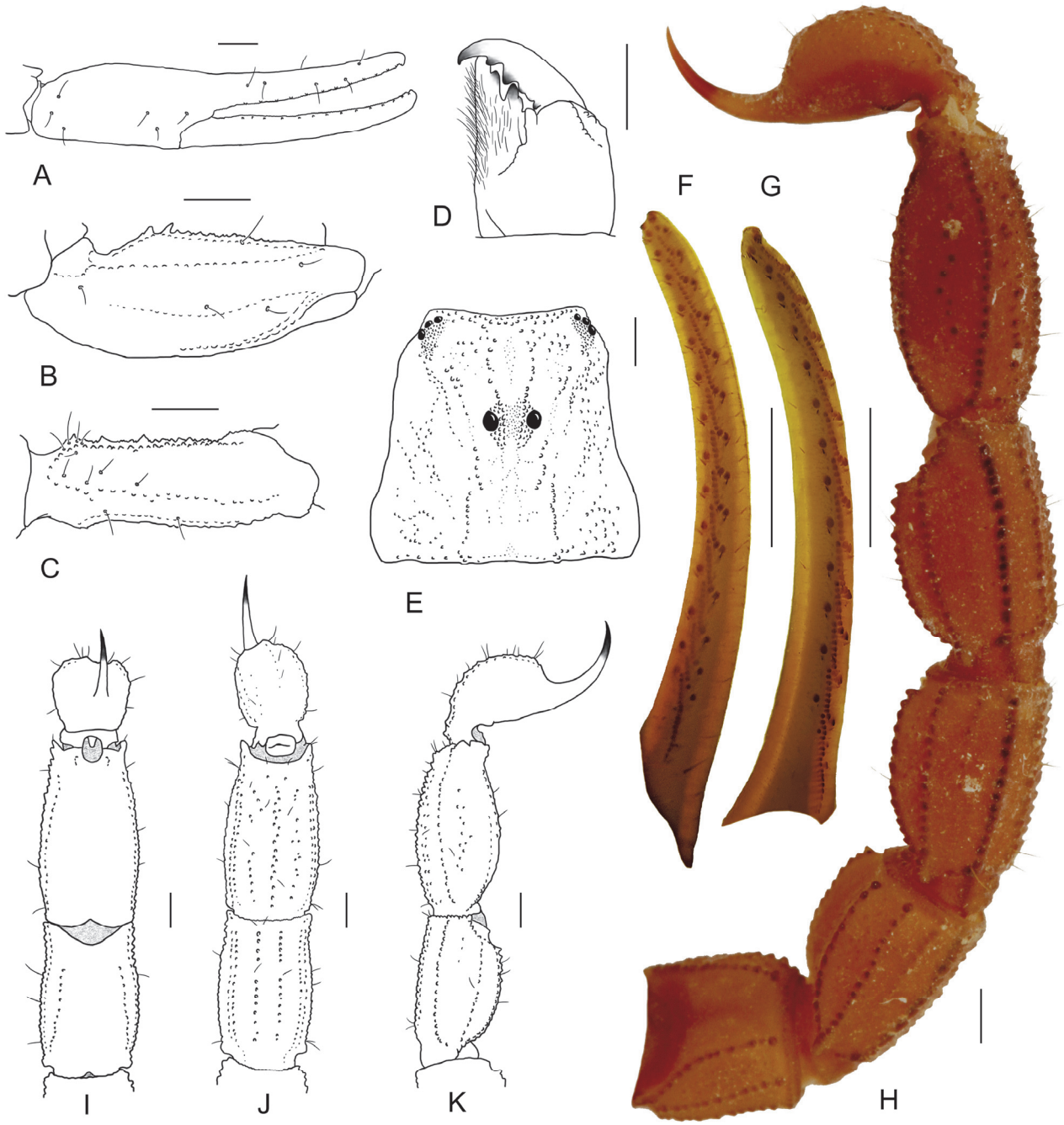


Fig. 4. *Mesobuthus gallianoi* sp. n., female holotype. **A**. Pedipalp chela, external aspect. **B**. Pedipalp patella, dorsal aspect. **C**. Pedipalp femur, dorsal aspect. **D**. Chelicera. **E**. Carapace. **F-G**: Chela movable (**F**) and fixed (**G**) fingers showing rows of granules. **H**. Metasoma, lateral aspect. **I-K**. Metasomal segment IV-V and telson, dorsal (**I**), ventral (**J**) and lateral (**K**) aspects. All scale bars 1 mm.

minute granulation; median ocular tubercle slightly anterior to the centre of carapace; median eyes separated by approximately one ocular diameter; three pairs of lateral eyes. Tergites I to VI with three well marked carinae, one median and two paramedian carinae, the last ones continuing in transverse carinae; tergite VII pentacarinate; all carinae with larges granules, granulation between axial and median carinae minute, larger in posterior transverse areas; interspace between median carina and each paramedian carina between 1.2 (tergite IV), 1.5 (tergite V) and 1.7 (tergite VI) times as wide as paramedian carina. Sternum subtriangular with a deep median depression. Pectinal tooth count 26-27 in female holotype; three marginal lamellae and seven middle lamellae. Sternites I-VI smooth, the VII with very minute granulation on lateral sides and four carinae bearing bigger granules; genital operculum divided longitudinally, each plate more or less suboval in shape. Metasomal segments I-IV with 10 longitudinal carinae formed by rows of granules; lateromedian carinae well marked on segments I-II, moderately marked on III, vestigial on IV and consisting of incomplete rows of small granules; segment V with 5 carinae; intercarinal spaces moderately to weakly granular on ventral and lateral sides, almost smooth dorsally with only minute granulation on margins; segment IV length/width ratio 1.56 and length/height ratio 1.79. Telson elongate and bumpy, granulated on ventral side and smooth dorsally; aculeus long and moderately curved.





Fig. 5. *Mesobuthus gallianoi* sp. n., female holotype, alive.
Fig. 6. *Mesobuthus gibbosus*, female from Greece, alive.

Pedipalp femur with four granulated carinae; patella with height carinae with two internal ones granulated; chela length/width ratio 4.55; movable and fixed finger with 14 and 13 rows of granules, respectively, every with external and internal granules present; movable finger with 5 terminal granules. All legs with two rows of setae on basitarsus and telotarsus ventrally and a pair of pedal spurs on basitarsus; legs III and IV with a tibial spur; numerous setae especially on tibia, basitarsus and telotarsus. Cheliceral dentition characteristic of the family Buthidae (Vachon, 1963); fixed finger with two ventral and four dorsal teeth; movable finger with five dorsal and three ventral teeth. Trichobothriotaxy of type A-α (Vachon, 1974). Morphometric values (in mm) of the female holotype. Total length including telson, 51.0. Carapace: length, 5.4; anterior width, 3.0; posterior width, 5.9. Mesosoma length, 16.0. Metasomal segments. I: length, 3.4; width, 3.3; II: length, 4.5; width, 3.3; III: length, 4.5; width, 3.3; IV: length, 5.0; width, 3.2; depth, 2.8; V: length, 5.8;

width, 3.2; depth, 2.7. Telson: length, 6.4; width, 2.3; depth, 2.2. Pedipalp: femur length, 4.3, width, 1.4; patella length, 4.9, width, 2.2; chela length, 9.1, width, 2.0, depth, 1.9; movable finger length, 5.9.

RELATIONSHIPS. *Mesobuthus gallianoi* sp. n. can be readily distinguished from other species of the genus *Mesobuthus* and, in particular, from *M. gibbosus* (fig. 6) and *M. cyprius*, by the following main features: (i) movable and fixed finger with 14 and 13 rows of granules, respectively (12 rows (rarely 13) on movable finger and 11 rows on fixed finger in *M. gibbosus*, 12 rows on both movable and fixed fingers in *M. cyprius*), (ii) lateromedian carinae vestigial on metasomal segment IV, consisting of incomplete row of small granules (well marked in *M. gibbosus* and *M. cyprius*), (iii) interspace between median carina and each paramedian carina between 1.2 (tergite IV), 1.5 (tergite V) and 1.7 (tergite VI) times as wide as paramedian carina (more than 2 times in *M. gibbosus* and less than 1-1.5 times in *M. cyprius*) and (iv) rather high pectinal tooth count with 26-27 teeth in female (20-23 and 20-27 teeth in females of *M. cyprius* and *M. gibbosus*, respectively).

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