SCORPIONS FROM MANDENA EAST COASTAL RAIN FOREST IN MADAGASCAR, AND DESCRIPTION OF A NEW SPECIES OF GROSPHUS SIMON (SCORPIONES, BUTHIDAE)

Wilson R. Lourenço

Introduction

Although intensive studies on the Malagasy scorpion fauna have been carried since the early 1990s with the publication of several papers, and the description of a relevant number of new genera and species, some areas of the island remained poorly prospected. For some examples refer to the “Fauna of Madagascar” (Lourenço, 1996). This is particularly true for some remnant patchy areas of the East Coastal rain forest such as the one present in the region of Mandena.

A single study dealt with scorpions collected in the region of Mandena (Lourenço, 2000), and revealed the presence of only two species of the family Buthidae C.L. Koch, 1837. In this study, the first species, Tityobuthus manonae Lourenço, 2000 was described as new, whereas the second one was preliminarily associated to Grosphus hirtus Kraepelin, 1900. Recent detailed investigations, however, have showed that in some cases closely related species have similar morphological features (Lourenço, 2003; Lourenço & Goodman, 2003; Lourenço et al., 2004). On this basis some populations, which have been attributed to widely distributed species, such as G. madagascariensis (Gervais, 1843) or G. hirtus, remained undescribed until recently (Lourenço et al., 2004). Nevertheless, problems of faulty species identification remains possible in morphologically similar taxa, particularly those named in the early stages of the taxonomy. This is certainly the case for G. madagascariensis and G. hirtus.

In this chapter, Tityobuthus manonae is recharacterized and the Grosphus population present in Mandena is described as a new species. Most certainly these two species represent endemic elements to the region of Mandena. With continued exploration of portions of the Mandena forest in the coming years, that have not been previously prospected for scorpions, it can be expected that the number of scorpion taxa within this region maybe higher than observed.

Genus Tityobuthus Pocock, 1893

Tityobuthus manonae Lourenço, 2000 (Figs. 1-5, 14)

Madagascar, Toliara Province, Mandena - Fort Dauphin (littoral forest 10 km north of Fort Dauphin), one male (holotype), 6-12/1/1999 (J.-B. Ramanamanjato leg.); deposited in the Muséum d’histoire naturelle, Geneva.

Scorpions of small size, with in average 25 mm in total length. Coloration. Ground colour yellowish, symmetrically marbled with a dark reddish-brown, giving an overall spotted appearance. Prosoma: carapace yellowish, moderately spotted; eyes surrounded by black pigment. Mesosoma: yellowish, with four longitudinal brown stripes, i.e. two central and two lateral ones. Metasoma: segments I to IV yellowish to reddish-yellow. Vesicle as segment V. Venter yellowish, with a number of spots on sternites VI and VII. Chelicerae yellowish, with dark spots on the lateral edges; fingers reddish. Pedipalps: yellowish, with several dark spots on femur and patella; chela less densely spotted; hands yellowish; fingers much darker, reddish-brown, with the extremities yellowish. Legs yellowish, with diffuse fuscous spots. Morphology. Carapace moderately to weakly granular; anterior margin with a weakly to moderately pronounced median concavity. Anterior median supra- ciliary, posterior median carinae and all furrows moderate to weak. Median ocular tubercle distinctly anterior to the center of the carapace; median eyes separated by one ocular diameter. Three pairs of lateral eyes. Sternum subtriangular. Mesosoma: tergites moderately granular. Median carinae moderate to strong on all tergites; confluent vestigial carinae present. Tergite VII pentacarinate. Venter: genital operculum longitudinally divided. Pectines: pectinal tooth count 19-20; basal middle lamellae not dilated; fulcra present. Sternites smooth or with very weak granulations and small,
MATERIAL EXAMINED: Madagascar, Province de Toliara, Grosphus hirtus: Genus tibial spurs present but reduced. Tarsus with numerous fine median setae ventrally. Pedal and
6-12/I/1999 (J.-B. Ramanamanjato leg.); deposited in the Mandena - Fort Dauphin (littoral forest 10 km north of Fort tip. Venter: coxapophysis, sternum, genital operculum and
without spots; aculeus with reddish base and dark-reddish reddish in male, dark-reddish in female. Telson reddish in male, dark-reddish in female, with dark strips on the posterior margins of tergites. Metasoma: all segments yellow in male, dark-reddish in female, with dark variegated pigmentation over the entire surface; fingers and teeth reddish. Pedipalps: reddish to reddish-yellow. Legs yellowish without spots.

Morphology. Carapace moderately to strongly granular; anterior margin almost straight, with a weak median concavity. All carinae weak; furrows moderately developed. Median ocular tubercle anterior to the center of carapace; median eyes separated by a little more than one ocular diameter. Three pairs of lateral eyes. Sternum sub-triangular in shape. Mesosoma: tergites with thin but intense granulation, specially in female. Median carina moderately developed in all tergites. Tergite VII pentacarinate. Venter: genital operculum consisting of two semi-oval plates. Pectines: pectinal tooth count 20-19 in male, 17-15 in female (variation 18 to 20 in males); basal middle lamellae of each pecten not dilated in male, strongly dilated in female, with a semi-oval shape. Stermites smooth, with elongated spiracles; VII with four vestigial carinae and some diffused granulations. Metasoma: segments I and II with ten carinae, crenulate; segments III and IV with eight carinae, crenulate. Segment V with five carinae. Dorsal carinae on segments II to IV with one strong posterior spinoid granule. Intercarinal spaces strongly granular. Telson strongly granular over latero-ventral and ventral surfaces; its dorsal surface smooth; aculeus moderately curved and shorter than the vesicle; subacicular tooth represented by a minute granule. Cheliceral dentition characteristic of the family Buthidae (Vachon, 1963); two distinct basal teeth present on the movable finger; ventral aspect of both fingers and of manus with dense, long setae. Pedipalps: femur pentacarinate; patella with a dorsointernal carina and with 7/8 strong spinoid granules on the internal face; chela smooth, without carinae, only the internal face shows some isolated granules. Fixed and movable fingers with 12-13 oblique rows of granules. Trichobothriotaxy; orthobothriotaxy A-α (alpha) (Vachon, 1974, 1975). Legs: tarsus with numerous fine median setae ventrally. Pedal and tibial spurs present but reduced.

**Genus Grosphus Simon, 1880**

Grosphus mandena sp. n. (Figs. 6-14)


**Material Examined**: Madagascar, Province de Toliara, Mandena - Fort Dauphin (littoral forest 10 km north of Fort Dauphin), 1 male holotype, 9 males and 1 female paratypes, 6-12/I/1999 (J.-B. Ramanamanjato leg.); deposited in the Muséum d’histoire naturelle, Geneva.

**Etymology**: The specific name makes reference to the type locality, Mandena, and is placed in apposition to the generic name.

**Diagnosis**: Scorpions of medium size with a total length of 50 to 53 mm. General coloration yellowish to reddish-yellow. Certain morphological characters indicate that G. mandena sp. n. is close to the G. madagascariensis / G. hirtus group, but it can be readily distinguished from the other species of this group, and in particular from Grosphus simoni Lourenço et al., 2004, by the following characters: (i) a paler coloration overall with the appendages reddish-yellow to yellowish and the presence of a dark inverted triangle on the anterior region of the carapace; (ii) metasomal carinae and granulations less strongly marked; (iii) dorsal carinae of metasomal segments II to IV with one strong posterior spinoid granule; (iv) vesicle more intensely granulated.

**Description** based on male holotype and female paratype.


Morphometric values (in mm) of the male holotype and female paratype of the new species described. Total length, 52.7/51.4. Carapace: length, 6.5/6.6; anterior width, 4.7/4.8; posterior width, 7.1/7.3. Metasomal segment I: length, 4.1/4.1; width, 3.6/3.5. Metasomal segment V: length, 7.2/6.6; width, 3.3/3.2; depth, 3.2/3.2. Vesicle: width, 2.9/2.9; depth, 3.0/3.0. Pedipalp: femur length, 6.0/5.5; width, 1.9/2.2; patella length, 6.9/6.6, width, 2.6/2.7; chela length, 11.9/11.1, width, 3.4/2.7, depth, 2.9/2.4; movable finger length, 7.1/6.8.

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References


Fig. 14. Map of Madagascar showing the location of the East Coastal rain forest in the region of Mandena (K).