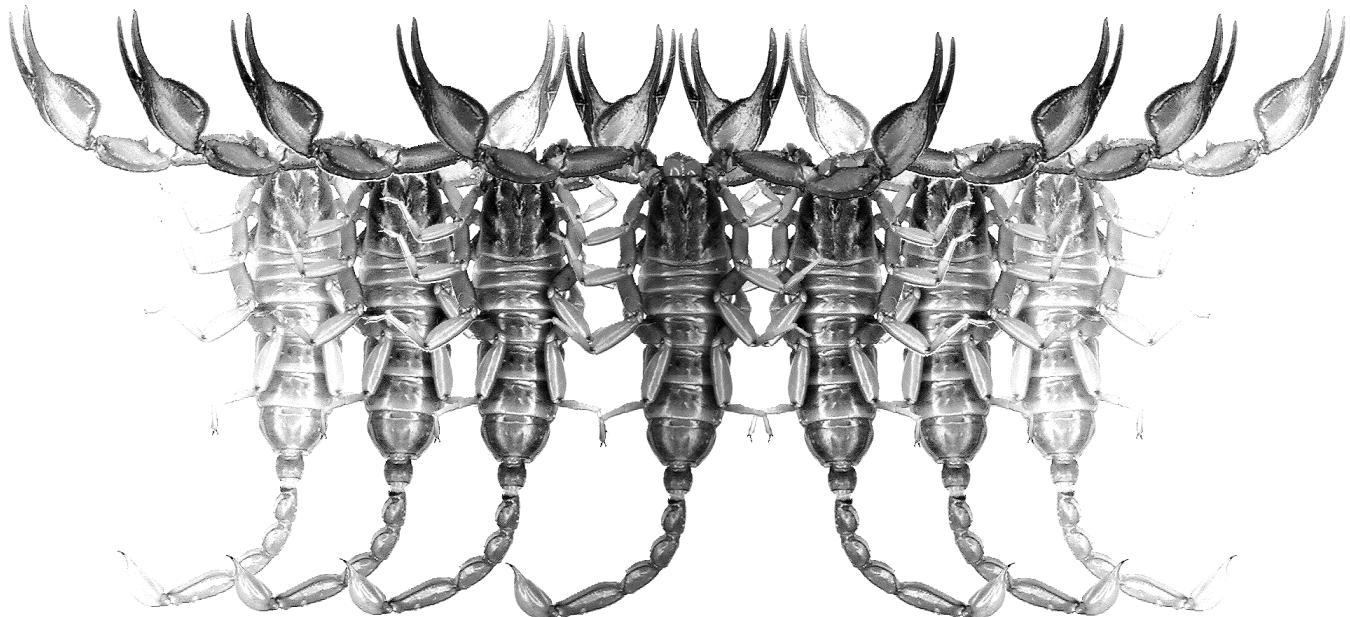


Euscorpius

Occasional Publications in Scorpiology



***Hemiscorpius novaki* sp. n. from Somaliland
(Scorpiones: Hemiscorpiidae)**

František Kovařík & Tomáš Mazuch

August 2011 – No. 126

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Occasional Publications in Scorpiology

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- **MNHN**, Museum National d'Histoire Naturelle, Paris, France
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- **BMNH**, British Museum of Natural History, London, England, UK
- **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
- **OUMNH**, Oxford University Museum of Natural History, Oxford, UK
- **NEV**, Library Netherlands Entomological Society, Amsterdam, Netherlands

***Hemiscorpius novaki* sp. n. from Somaliland (Scorpiones: Hemiscorpiidae)**

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Summary

***Hemiscorpius novaki* sp. n.** from Somaliland is described and compared with other African species of the genus. The new species is characterized chiefly by the total length of 40–46 mm; yellow to yellowish-brown color with pedipalp fingers reddish brown to black, darker than the chela; slightly longer metasoma in the male than in the female. These characters distinguish *H. novaki* sp. n. from *H. somalicus* Lourenço, 2011. The third African species of the genus, *H. tellinii* Borelli, 1904, is known only from the female holotype, which differs from females of *H. novaki* sp. n. in having much less pronounced granulation of dorsal carinae on the first through fourth metasomal segments and in shape of the genital operculum.

Systematics

***Hemiscorpius novaki* Kovařík et Mazuch, sp. n. (Figs. 1–27)**

TYPE LOCALITY AND TYPE REPOSITORY. Somaliland, near Berbera, 10°12'40.3"N 44°52'34.2"E, 436 m a.s.l., FKCP.

TYPE MATERIAL. Somaliland, near Berbera, 10°12'40.3"N 44°52'34.2"E, 436 m a.s.l. (Fig. 24), XI.2010, 1♂ holotype, leg. T. Mazuch and P. Novák; near Berbera, 10°14'25.8"N 45°04'55.4"E, 407 m a.s.l. (Figs. 25–26), 9.VII.2011, 1♀ allotype, leg. F. Kovařík, T. Mazuch and P. Novák; near Berbera, 10°16'01"N 45°06'21.3"E, 367 m a.s.l. (Fig. 27), 10.VII.2011, 1♀ paratype, leg. F. Kovařík, T. Mazuch and P. Novák. The types are deposited in the first author's collection (FKCP).

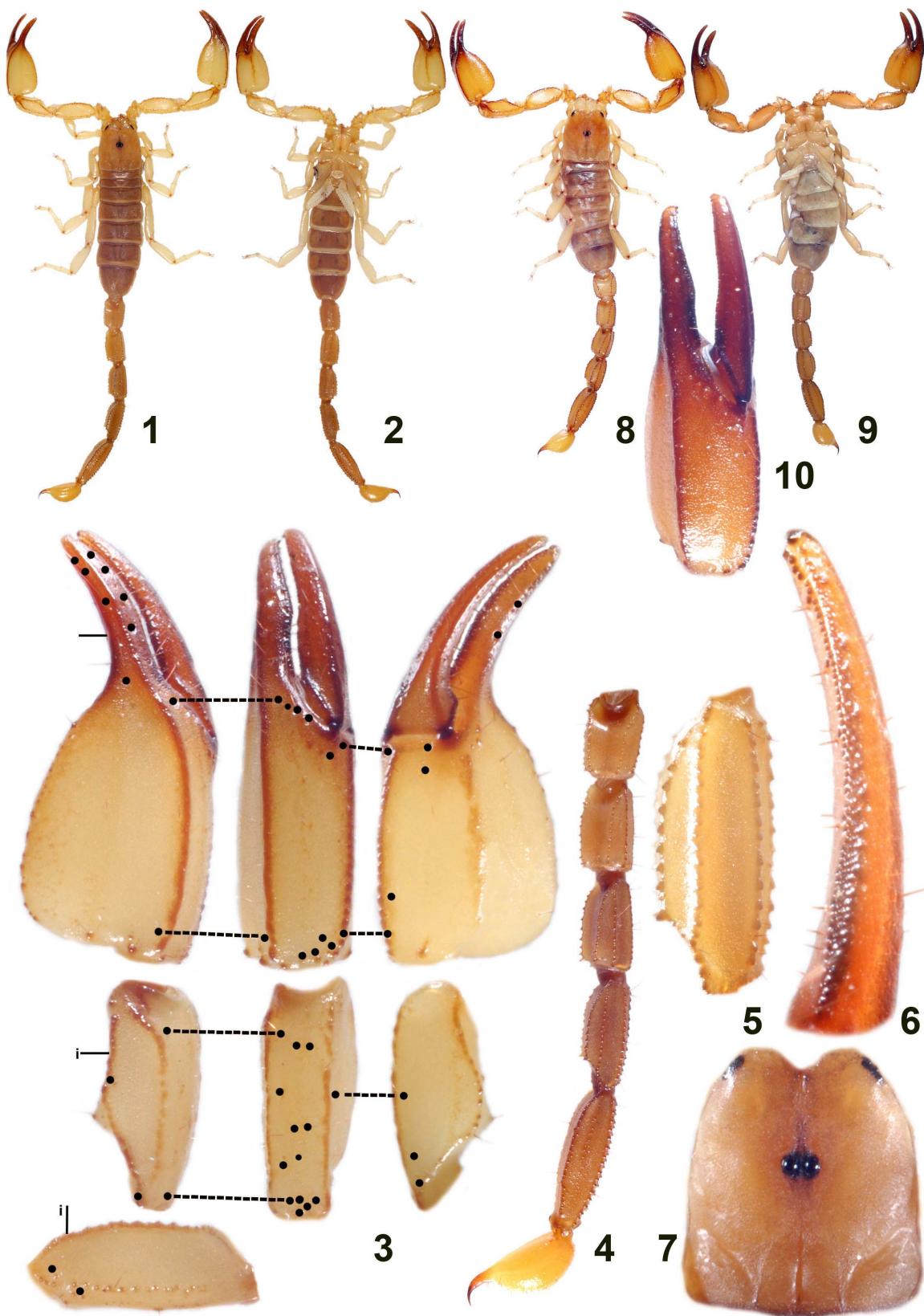
ETYMOLOGY. Named after Pavel Novák (Czech Republic), co-collector of the types and our friend.

DIAGNOSIS. Total length 40–46 mm. Color yellow to yellowish brown, pedipalp fingers reddish brown to black, darker than chela. Male has slightly longer metasoma than female. All metasomal segments longer than wide in both sexes. Dorsal carinae on first to fourth metasomal segments composed of conspicuous denticulate granules that terminate in largest granule/tooth. Telson bulbous, with aculeus shorter than vesicle. Pectinal teeth number 10–11 in females and 12–13 in male. Genital operculum oval in both sexes. Setation formula of tarsomere II of legs: 3/3-4: 4/5: 5/4-6: 5/5.

DESCRIPTION. The adults are 40 to 46 mm long. For habitus see Figs. 1–2 and 8–9. For position and distribution of trichobothria of pedipalps see Fig. 3. The mesosoma is matte in the male and glossy in the female; and the male has a more slender metasoma, slightly longer metasomal segments, and a more slender pedipalp femur than the females. The flexed fingers are similar in both sexes (Figs. 3 and 10).

COLORATION. The base color is yellow to yellowish brown, only around the median and lateral eyes it is black and pedipalp fingers are reddish brown to black. The chelicerae are pale yellow with reddish denticles.

CARAPACE AND MESOSOMA. The carapace (Fig. 7) lacks carinae but has a deep sagittal furrow with a forked, V-shaped furrow on each side in the posterior part. The anteromedial margin of the carapace is strongly concave. Present are a pair of median eyes and three lateral eyes. The distance ratio of the pair of median eyes from the anterior or the posterior margin of the carapace is, respectively, 0.44 or 0.56 in the male and 0.34 or 0.66 in the females (measured from the hind edge of the eyes). The carapace and mesosoma are densely covered by fine granules. The carapace je granulated in central part, anteriorly and posteriorly granulation is replaced by punctation. Tergites I–II lack carinae, whereas tergites III–VI bear a sagittal carina. Tergite VII lacks the sagittal carina except for a row of five or six bigger granules in the midline of the posterior part, but bears numerous bigger granules that form lateral carinae. Sternites I–VI lack carinae and are finely punctate, whereas sternite VII bears two smooth carinae. The pec-



Figures 1–10: *Hemiscorpius novaki* sp. n. 1–7: ♂ holotype in dorsal and ventral views, trichobothrial pattern, metasoma and telson lateral view, fourth metasomal segment in lateral view, movable finger, and carapace. 8–10. ♀ allotype, dorsal and ventral views, and chela external view.

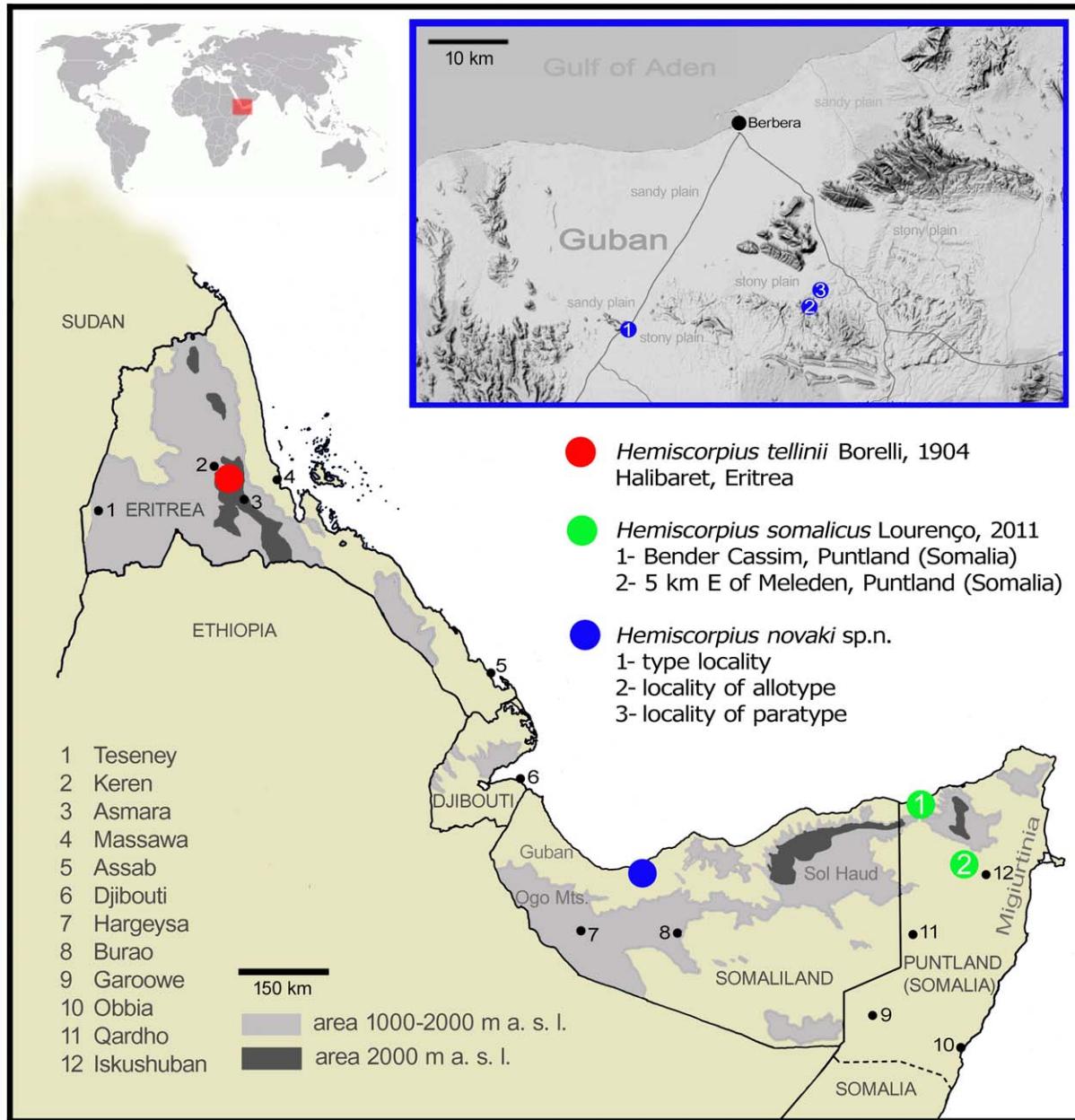
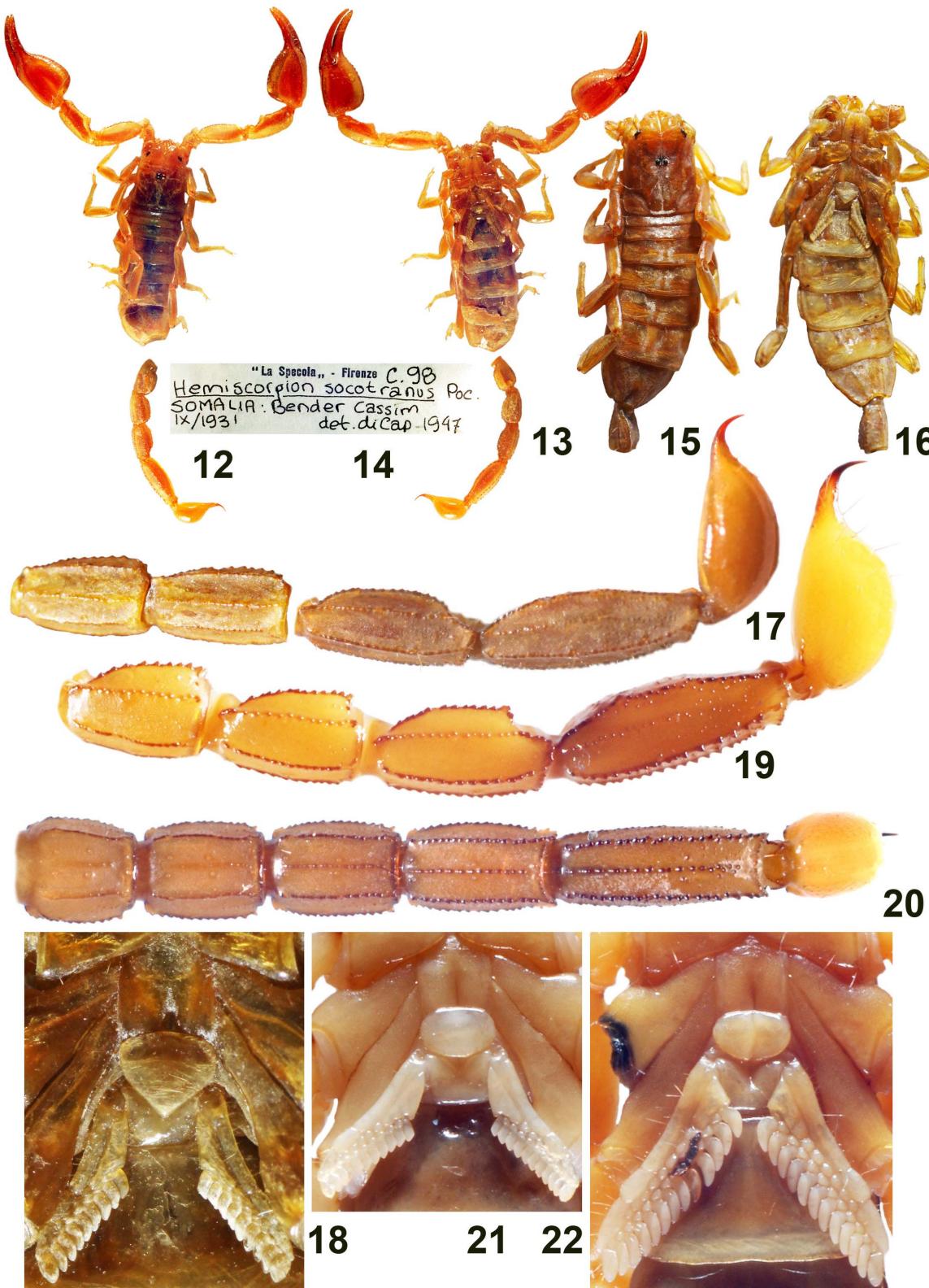


Figure 11: Map of distribution of *Hemiscorpius* in East Africa.

tinal tooth count is 10–11 in the females and 12–13 in the male. The pectinal marginal tips extend the proximal four-fifths of the third sternite in females and one-third the length of the fourth sternite in the male. The pectines have three marginal lamellae and six to nine middle lamellae. The marginal lamellae bear numerous reddish setae, the middle lamellae bear one to three reddish setae; each fulcrum bears three to five reddish setae. The genital operculum is oval in both sexes (Figs. 21–22).

METASOMA AND TELSON (Figs. 4–5 and 19–20). The first to fourth metasomal segments bear seven carinae. The fifth segment bears five carinae, lateral carinae are replaced by an irregular row of bigger granules. Ventral carinae on the first and second segments are smooth. Other carinae are composed of conspicuous denticulate granules, especially dorsal carinae on the first to fourth segments, which terminate in a larger granule. The telson is bulbous, with the aculeus shorter than the ves-



Figures 12–22: 12–14. *Hemiscorpius somalicus* Lourenço, 2011, ♀, MZUF Reg. No. 992, dorsal and ventral views, and label. 15–18. *H. tellinii* Borelli, 1904, ♀ holotype, Eritrea, Halibaret, MRSN Sc. 254, dorsal and ventral views, second to fifth metasomal segment and telson in lateral view, and pectinal area. 19–21. *H. novaki* sp. n., ♀ paratype, second to fifth metasomal segment and telson lateral view, metasoma and telson ventral view, and pectinal area. 22. *H. novaki* sp. n., ♂ holotype, pectinal area.

icle. The ventral and lateral surfaces of the vesicle are granulated and sparsely setose.

PEDIPALPS (Figs. 3 and 10). The femur of pedipalp is finely granulated; the patella is finely granulated and punctate; the chela is densely punctate dorsally, laterally and ventrally, but also has strips of fine granules on the dorsal surface. The femur bears three carinae; the ventroexternal carina is lacking, the other carinae are coarsely granular. The patella bears four coarsely granular carinae. Several granules indicate also ventromedian and internomedian carinae, but these carinae are incomplete. The chela bears four to five carinae, of which internal carinae may be weak and incomplete. The dentate margin of the movable finger is armed with two parallel rows of denticles extending nearly the entire length of the finger, including external and internal granules that appear to indicate five or six subrows (Fig. 6). The dentate margin of the fixed finger is armed with one or two parallel rows of denticles with external and internal granules that appear to indicate five or six subrows.

LEGS. The legs are punctate. The tarsomeres bear short and long setae on the dorsal and ventral surfaces. Tarsomere I has 2/2-3 spiniform setae. The setation formula of tarsomere II is 3/3-4: 4/5: 5/4-6: 5/5.

MEASUREMENTS IN MM. Total length of male holotype 46; carapace length 5.2, width 4.6; metasoma and telson length 25.3; first metasomal segment length 3.3, width 2.4; second metasomal segment length 3.5, width 2.3; third metasomal segment length 3.7, width 2.1; fourth metasomal segment length 4.4, width 2.1; fifth metasomal segment length 5.6, width 1.8; telson length 4.8; telson width 2.0; pedipalp femur length 4.5, width 1.7; pedipalp patella length 4.6, width 2.0; chela length 8.9; manus width 3.6; movable finger length 5.1.

Total length of female allotype 40; carapace length 5.3, width 4.8; metasoma and telson length 20.8; first metasomal segment length 2.5, width 2.4; second metasomal segment length 2.7, width 2.3; third metasomal segment length 2.9, width 2.1; fourth metasomal segment length 3.5, width 2.0; fifth metasomal segment length 4.7, width 1.9; telson length 4.5; telson width 2.0; pedipalp femur length 4.1, width 2.0; pedipalp patella length 4.5, width 1.9; chela length 8.7; manus width 3.8; movable finger length 5.

AFFINITIES. The described features distinguish *H. novaki sp. n.* from all other species of the genus. The new species differs from *H. somalicus* Lourenço, 2011 (Somalia, Puntland) in total length (40 to 46 mm for *H. novaki sp. n.* and about 25 to 30 mm for *H. somalicus*); morphometrically, e.g. the first metasomal segment in the male of *H. novaki sp. n.* is longer than wide, whereas

in the male holotype of *H. somalicus* it is wider than long; and fine granulation of the central part of carapace (absent in *H. somalicus*). *H. tellinii* (Eritrea) is known only from the female holotype (Figs. 15–18), which can be distinguished from females of *H. novaki sp. n.* by granulation of carinae on metasomal segments, shape of the genital operculum and a narrower metasoma. Length to width ratios of the first and fifth metasomal segments are 1.35 and 2.94 in the female holotype of *H. tellinii*, 1.04 and 2.47 in the females of *H. novaki sp. n.*. In *H. novaki* the dorsal carinae on the third and fourth metasomal segments consist of conspicuous conical denticles of which the terminal denticle is always the largest (Figs. 4–5 and 19); this is not found in the female holotype of *H. tellinii* (Fig. 17). The genital operculum of *H. tellinii* is drawn to a sharp point, which is not the case in *H. novaki sp. n.* (Figs. 18 versus 21 and 22).

BIOGEOGRAPHY AND ECOLOGY. The region can be subdivided into several areas with high degrees of endemism. One of them is the area of Puntland, which is also known under the historical name Migiurtinia (or also Mijarten), from where comes *Hemiscorpius somalicus* Lourenço, 2011. This area has produced several endemic species and subspecies of e. g. snakes and lizards (Parker, 1942, 1949) and plants (Thulin ed. 1993, 1995, 1999, 2006). The high degree of endemism is due to the northeasternmost location, which in comparison with surrounding areas has an extremely dry and hot climate. Unfortunately, we have not been able to visit this area. *Hemiscorpius novaki sp. n.* described in this paper is from the vicinity of Berbera in northwestern Somaliland, in an area called Guban whose southern edge lies in a close proximity to the Goolis and Ogo Mountains Range. This low-lying area is also extremely warm and dry, and hosts the scorpions *Butheolus ferrugineus* Kraepelin, 1898 and *Parabuthus granimanus* Pocock, 1895 that reach there from the coastal very warm northern areas in Djibouti and Eritrea, and also *Hottentotta polystictus* (Pocock, 1896) that has been able to adapt to a variety of habitats in the region. *Hemiscorpius novaki sp. n.* was found inland of Berbera in locales of rising elevations, where the landscape begins to change from sandy desert to rocky semidesert (Figs. 24–27). The July temperatures at the locality were ca. 50°C during the day and 35–40°C at night. A co-occurring scorpion species is *Parabuthus granimanus* Pocock, 1895, which is toward the southwest replaced by *Parabuthus heterurus* Pocock, 1897. *Butheolus ferrugineus* Kraepelin, 1898 is in the local rocky semideserts replaced by a hitherto undescribed species of *Butheolus*, which is darker-colored and exhibits a different behavior apparently in relation to the mechanics of motion in rocky terranes. *Butheolus ferrugineus* Kraepelin, 1898, which we found in sandy deserts in a close vicinity of Berbera, exhibits a strong



Figures 23–24: 23 (top). Male holotype of *Hemiscorpius novaki* sp. n. 24 (bottom). Somaliland, near Berbera, 10°12.3667'N 44°52.811'E, 417 m a. s. l. Collection locality of the male holotype of *Hemiscorpius novaki* sp. n.



Figures 25–27: 25–26 (top & middle). Somaliland, near Berbera, 10°14'25.8"N 45°04'55.4"E, 407 m a. s. l. Collection locality of the female allotype of *Hemiscorpius novaki* sp. n. together with a *Compsobuthus* sp. n. 25. Panoramic view of the locality, showing the precise spot of collection of the female allotype of *Hemiscorpius novaki* sp. n. 26. Detail of the locality. Female allotype was collected under the large overturned boulder on the left side of the photo. 27 (bottom). Somaliland, near Berbera, 10°16'01"N 45°06'21.3"E, 367 m a. s. l. Collection locality of the female paratype of *Hemiscorpius novaki* sp. n. together with *Leiurus quinquestriatus* Ehrenberg, 1828 and *Parabuthus granimanus* Pocock, 1895.

escape reflex by rapidly burying itself in the sand. In the rocky semideserts occurs also *Hottentotta polystictus* (Pocock, 1896) together with *Buthus berberensis* Pocock, 1900 and *Leiurus quinquestriatus* Ehrenberg, 1828. These areas of Somaliland, as well as similar habitats in Djibouti and Eritrea, host a variety of endemic animal and plant species. Fairly common in both sandy and rocky habitats is the viper *Echis pyramidum* ssp. (Geoffroy Saint-Hilaire, 1827), whose prey consists dominantly of scorpions.

Guban is separated from Migiurtinia by a belt of mountain ranges (Goolis Mtns., Wagar Range and Warsangli Mtns.) that most likely forms a physiographic barrier delimiting the distribution of *Hemiscorpius somalicus* Lourenço, 2011 and *H. novaki* sp. n., similarly to the distributional limits of e.g. some reptiles (see Parker, 1942, 1949).

DISCUSSION. The genus *Hemiscorpius* Peters, 1861 is represented in Africa by three species known from only a handful of specimens. The oldest known specimen is the holotype of *Hemiscorpius tellinii* Borelli, 1904 (from Halibaret, Eritrea) deposited in the Museo Regionale di Scienze Naturali, Via Giolitti 36, Torino, Italy. Correspondence with curators in 2003 indicated that it could not be located (Kovařík, 2003: 153), and it so remained until the arrival to this museum of Alberto Chiarli, with whom we undertook a revision of the scorpion collection. This is a combination of primarily two collections in original descriptions usually denoted as MZUT. It is an historical collection given in custody to the museum by the University of Turin, and the acronym stands for Museo di Zoologia dell'Università di Torino. The material in this collection is mostly from expeditions conducted early in the 20th century, and it includes the female holotype of *Hemiscorpius tellinii* Borelli, 1904. The second acronym is MRSN, and this collection contains material assembled more recently by the museum staff. The MIZT acronym is "wrong" but often cited in literature, for example as location of the types of *Tityus argentinus* Borelli, 1899. For the future it is advisable to use the coden MRSN for all three collections. Apart from finding the female holotype of *Hemiscorpius tellinii* Borelli, 1904, whose photos are thanks to Alberto Chiarli published in this paper for the first time, it also became possible to locate the syntypes of *Tityus argentinus* Borelli, 1899, which had long been presumed lost (see Fet & Lowe, 2000: 232), and the holotype of *Uroplectes silvestrii* Borelli, 1913 = *Butheoloides silvestrii* (Borelli, 1913) comb. n.

Another important specimen is a female of *Hemiscorpius somalicus* Lourenço, 2011 from Somalia (Puntland), Bender Cassim, IX. 1931, labeled as *Hemiscorpius socotranus* det. Capriacco, 1947, located in MZUF (Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola", via Romana

17, I-50125 Firenze) Reg. no. 992 (see Figs. 12–14, Kovařík, 2003: 149; Kovařík & Whitman, 2005: 115; Lowe, 2010: 22; Lourenço, 2011: 277).

During an expedition to Somaliland conducted in November 2010, the second author and Pavel Novák (both Czech herpetologists) collected an adult male which is here designated the holotype of *Hemiscorpius novaki* sp. n. This paper was preceded by a second expedition to Somaliland in July 2011, in which we both participated and were able to collect two adult females of this species, which in turn made possible a comparison with females of the other two *Hemiscorpius* species known from Africa.

At about the same time, in July 2011, Lourenço (2011: 275) described *Hemiscorpius somalicus* based on a male from Somalia (Puntland), 5 km E of Meleden (Bender Cassim area). Unfortunately, his description does not contain any photographs of the specimen. Lourenço did not study the MZUF female of *H. somalicus* (Figs. 12–14) but only mentioned its existence.

In conclusion, we feel compelled to explain why we intentionally use the name Somaliland (Hargeysa) for the northern territory corresponding to the former British colony (British Somaliland) (see Fig. 11), which we distinguish from Somalia (Mogadisho). Somaliland has its own currency, a functional government with representation in several countries, and its officials contributed to our safe visit.

Acknowledgments

We thank David Hegner, Pavel Novák, and David Vašíček, who participated in the expedition to Ethiopia and Somaliland, and to the government of Somaliland for allowing us to visit the country and providing for our security. We thank Lisa Levi, Elena Gavetti and Alberto Chiarle, who helped in searching for and photographing the holotype of *Hemiscorpius tellinii* and provided historical information on the collection of the Museo Regionale di Scienze Naturali di Torino. Finally, our thanks are due to Graeme Lowe, with whom the first author has been discussing scorpion taxonomy including *Hemiscorpius* for a number of years and who has donated several paratypes to him.

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