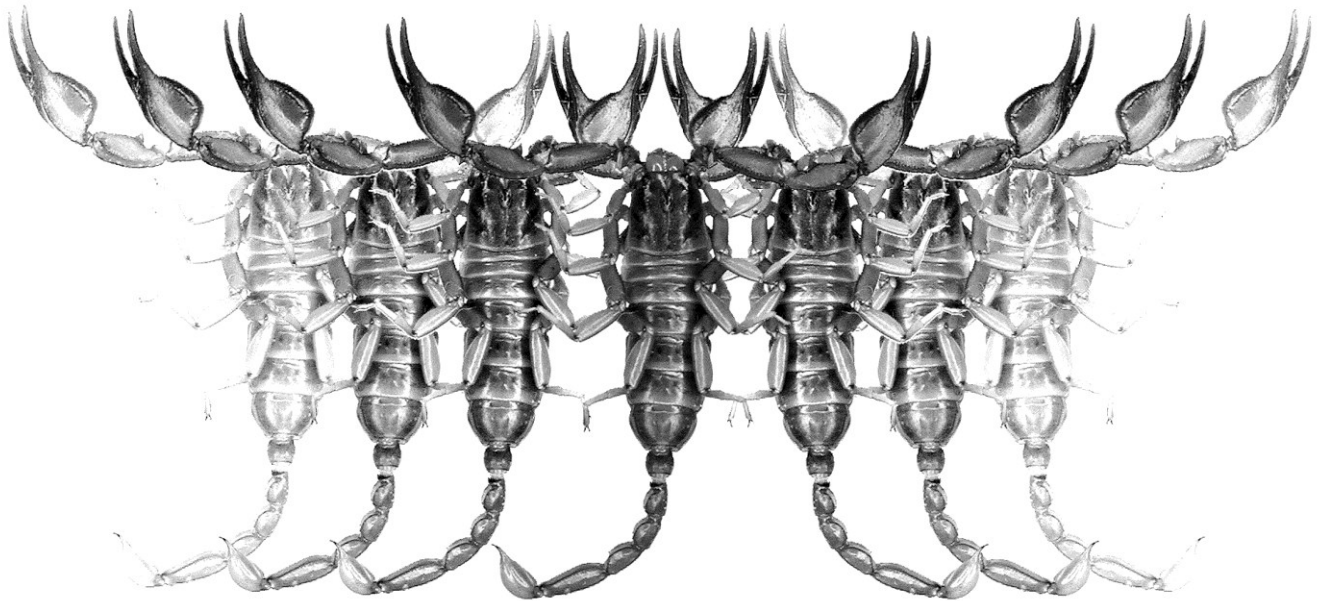


Euscorpius

Occasional Publications in Scorpiology



**Scorpions of Ethiopia (Arachnida: Scorpiones). Part I.
Genus *Butheoloides* Hirst, 1925 (Buthidae), with
Description of a New Species**

František Kovařík

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Euscorpius

Occasional Publications in Scorpiology

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Scorpions of Ethiopia (Arachnida: Scorpiones). Part I. Genus *Butheoloides* Hirst, 1925 (Buthidae), with description of a new species

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<http://zoobank.org/urn:lsid:zoobank.org:pub:CCD601B9-0202-4D71-BC82-2CBD3DE76346>

Summary

A new species *Butheoloides nuer* sp. n. is described from the Gambela State in western Ethiopia. This is the second species assigned to this genus from Ethiopia. The both Ethiopian species *B. nuer* sp. n. and *B. polisi* Lourenço, 1996 are compared and fully illustrated with color photos of habitus and localities. Information is provided on the localities and habitats of both species.

Introduction

Knowledge of scorpion distribution in Ethiopia is important for understanding scorpion distribution in whole Africa. The Central Ethiopian Plateau with high mountains forms distributional limits for many species and genera. Distribution of genus *Hottentotta* Birula, 1908 (see Kovařík & Ojanguren, 2013: 177) can be an example of this. The Central Ethiopian Plateau forms distributional limits of *Hottentotta* species or their complexes. *H. minax* (L. Koch, 1875) occurs from the north Ethiopian localities (which can be regarded as its southern limit) north into Egypt and northwestward; *H. trilineatus* (Peters, 1861) is common from the localities in the south of Ethiopia (which can be regarded as its northern limit) southward all the way to South Africa. *H. trailini* Kovařík, 2013 is morphologically similar to *H. hottentotta* (Fabricius, 1787), which is found to the southwest of the Ethiopian type locality of *H. trailini*. A similar situation exists at the genus level. In Ethiopia, southern limits of distribution of genera *Buthus* Leach, 1815 and *Orthochirus* Karsch, 1892 (Buthidae) meet with the northern limit of distribution of genus *Uroplectes* Peters, 1861 (Buthidae). For genus *Butheoloides* Hirst, 1925, its Ethiopian localities represent the eastern limit of distribution. Ethiopia is essential for understanding the genus *Pandinus* Thorell, 1876 (Scorpionidae). In Ethiopia, there have been already found 10 species of the genus *Pandinus*, and in our travel, we have found a few other so far undescribed species (Kovařík et al., in preparation).

In the years of 2011–2014, I have had an opportunity to participate in the expeditions to Horn of Africa, study scorpions at 68 Ethiopian localities, and publish

several articles (Kovařík, 2011a, 2011b, 2012, 2013, Kovařík et Lowe, 2012, and Kovařík et al., 2013). This paper is the first one in a series of articles concerning distribution of particular genera in Ethiopia.

Methods, Material & Abbreviations

Nomenclature and measurements follow Stahnke (1970), Kovařík (2009), and Kovařík & Ojanguren Affi-lastro (2013), except for trichobothriotaxy (Vachon, 1974), and sternum (Soleglad & Fet, 2003).

Specimens studied herein are preserved in ethanol 80% and deposited in the personal collection of the author. *Depositories*: FKCP (František Kovařík, private collection, Prague, Czech Republic); MNHN (Muséum National d'Histoire Naturelle, Paris, France).

Systematics

Family Buthidae C. L. Koch, 1837

Butheoloides nuer Kovařík, sp. n.

(Figures 1–4, 8–15, 17–28; Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:7783E9DE-6531-4476-A9AE-54D59A82B2CD>

TYPE LOCALITY AND HOLOTYPE DEPOSITORY. Ethiopia, Gambela State, "two breasts" between Gambela and Itang, 08°17'31.9"N 34°23'24.1"E, 468 m a.s.l., FKCP.

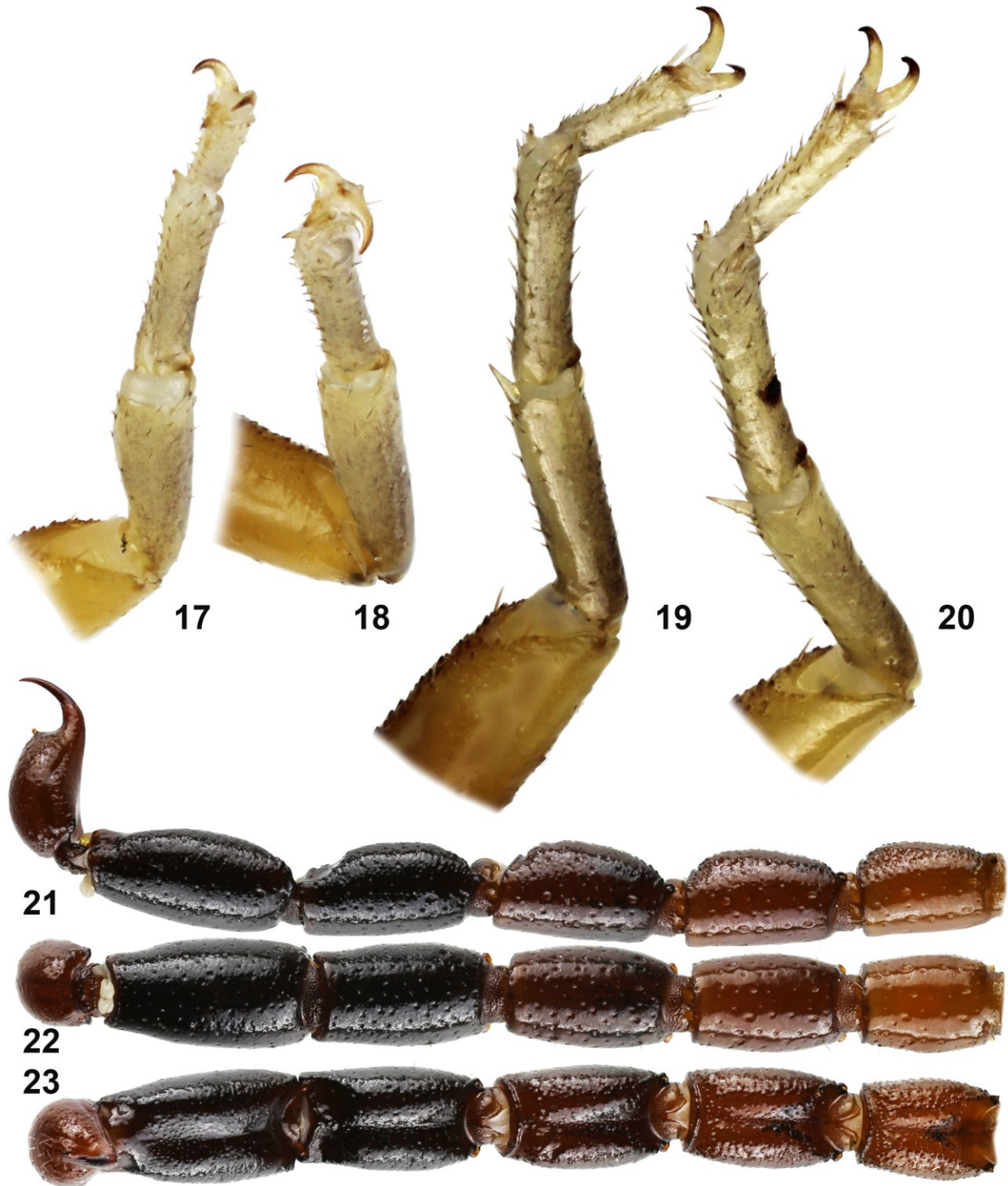
TYPE MATERIAL. Ethiopia, Gambela State, "two breasts" between Gambela and Itang, 08°17'31.9"N 34°23'24.1"E, 468 m a.s.l. (Locality No. 14EB, Figs. 25–27), 11.XI.2014, leg. F. Kovařík, holotype ♂ (FKCP).



Figures 1–7: Figures 1–4. Holotype male of *Butheoloides nuer*, sp. n. Dorsal (1) and ventral (2) views, chelicerae, carapace and tergites I–III (3), sternoplectinal region and sternites III–IV (4). Figures 5–7. Topotype male of *Butheoloides polisi*. Dorsal view (5), chelicerae, carapace and tergites I–III (6), sternoplectinal region and sternite III (7).



Figures 8–16: Figures 8–15. Holotype male of *Butheoloides nuer*, sp. n. Pedipalp chela, dorsal (8), external (9), and ventral (10) views. Pedipalp patella, dorsal (11) and external (12) views. Pedipalp femur, internal (13) and pedipalp trochanter and femur, dorsal views (14). Pedipalp movable finger, dorsal view (15). **Figure 16.** Topotype male of *Butheoloides polisi*, pedipalp movable finger, dorsal view.



Figures 17–23: Holotype male of *Butheoloides nuer*, sp. n. Distal segments of legs I–IV, retrolateral view (17–20). Metasoma and telson, lateral (21), ventral (22), and dorsal (23) views.

ETYMOLOGY. Named after the Nuer people, a Nilotic ethnic group primarily inhabiting the Nile Valley. They are concentrated in South Sudan, with some representatives also found in southwestern Ethiopia after they were pushed by Anywaa from their land. They speak the Nuer language, which belongs to the Nilo-Saharan

family. The type locality of this species is directly on their territory.

DIAGNOSIS (based on a single adult male). Adult size standard for the genus (25.4 mm). Coloration almost black, only metasomal segments I–III, telson and patella

DIMENSIONS (MM)		<i>B.nuer</i> sp.n.	<i>B. polisi</i>	
		(male, holotype)	(male, topotype)	(male, topotype)
Carapace	L / Wp	2.5 / 2.4	2.45 / 2.4	2.5 / 2.3
Mesosoma	L	7.8	7.7	7.1
Tergite VII	L / W	1.83 / 2.6	1.9 / 2.4	1.66 / 2.45
Metasoma + Telson	L	15.1	14.25	14.05
Segment I	L / W / H	2.0 / 1.45 / 1.25	1.9 / 1.46 / 1.25	1.85 / 1.35 / 1.2
Segment II	L / W / H	2.3 / 1.43 / 1.35	2.2 / 1.45 / 1.35	2.2 / 1.36 / 1.25
Segment III	L / W / H	2.45 / 1.45 / 1.35	2.4 / 1.45 / 1.4	2.4 / 1.4 / 1.25
Segment IV	L / W / H	2.6 / 1.45 / 1.35	2.55 / 1.45 / 1.4	2.45 / 1.4 / 1.25
Segment V	L / W / H	2.95 / 1.5 / 1.4	2.75 / 1.55 / 1.4	2.85 / 1.42 / 1.25
Telson	L / W / H	2.8 / 1.2 / 1.05	2.45 / 1.25 / 1.05	2.3 / 1.15 / 1.0
Pedipalp	L	9.3	9	8.65
Femur	L / W	2.2 / 0.68	2.15 / 0.70	2.1 / 0.65
Patela	L / W	2.75 / 0.95	2.7 / 0.93	2.55 / 0.85
Chela	L / W	4.35 / 1.2	4.15 / 1.15	4.0 / 0.95
Movable finger	L	2.55	2.45	2.42
Total	L	25.40	24.40	23.65

Table 1: Comparative measurements of adult males of both Ethiopian species of *Butheoloides*. Abbreviations: length (L), width (W), posterior width (Wp), depth (H).

and femur of pedipalp reddish; legs yellow to orange without dark spots; and chelicerae yellow slightly reticulate in anterior part. Pedipalp movable fingers with 11 principal rows of denticles. Pectines with 15/16 teeth. Ventral and lateral surfaces of metasomal segments smooth and sparsely punctate.

DESCRIPTION. The male holotype is 25.4 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps are given in Table 1. Coloration (Figs. 1–3) base almost black, only metasomal segments I–III, telson and patella and femur of pedipalp uniformly reddish; legs yellow to orange without dark spots; and chelicerae yellow slightly reticulate in anterior part. Manus of chela brown to black, reticulate, fingers yellowish.

CHELICERAE (Fig. 3). With dentition typical for the genus, teeth sharp. Tegument basally smooth and shiny, anteriorly densely granulated.

PEDIPALPS (Figs. 8–14). Femur densely granulated by big granules, with four developed granulate carinae. Patella almost smooth without carinae; only internal surface roughly granulated by big granules. Chela elongate; manus slightly wider than patella (ratio 1.26), with carinae vestigial to absent, smooth; tegument smooth and glossy; fingers long (ratio chela length movable finger length 1.70), subtly curved and with 10 (fixed fingers) and 11 (movable fingers) principal rows of denticles which terminate in two external granules, and each row also has one internal granule. Movable fingers bear an apical row of four denticles and three accessory terminal denticles.

CARAPACE (Fig. 3). Slightly trapezoidal (narrower anteriorly) and slightly longer than wide; anterior margin strongly convex, with some short microsetae. Carination absent. Furrows: lateral centrals, median ocular, central median, posterior laterals, posterior median and posterior marginal fused, wide and deep. Tegument very densely and roughly granulate, with bigger granules in anterior part of carapace. Median eyes very large and raised; five pairs of lateral eyes: three same-sized and aligned along each anterolateral corner, plus two vestigial to absent.

MESOSOMA (Figs. 1–4). Tergites I–VI bear one conspicuous coarsely granular carina; tergite VII with five well-defined carinae (median, submedians and laterals), which are long and serrate to crenulate. All tergites are densely and roughly granulate. Sternum (Fig. 4) standard for the genus: type 1, relatively big, and widely pentagonal in shape. Posterior depression very large, deep, and circular. Pectines standard-sized for the genus (Fig. 4 versus Fig. 7): extending around quarter of leg IV coxa-trochanter, and setose. Tooth count 15/16. Pectines have 3 marginal lamellae and 7–8 middle lamellae. Sternites lack carinae, and surfaces are smooth in the middle and finely granulate in margins.

LEGS (Figs. 17–20). The tarsomeres bear two rows of macrosetae on the ventral surface and several macro-

setae on the other surfaces; bristle combs absent. Femur bears only solitary macrosetae. Femur and patella roughly granulate, with carinae vestigial to absent. Tibial spurs present and long on the third and the fourth legs.

METASOMA AND TELSON (Figs. 21–23). All segments with obsolete ventrolateral carinae and partly granulate dorsolateral carinae. Other carinae absent. Ventral and lateral surfaces of metasomal segments smooth and sparsely punctate. Dorsolateral/dorsal surfaces tuberculate and granulated. Dorsal surfaces with median furrow and granulated mainly in posterior part. Telson very sparsely setose, tuberculate, with a characteristic subaculear tubercle. Vesicle elongate oval. Aculeus shorter than vesicle, strongly curved.

AFFINITIES. The only other member of the genus known from Ethiopia is *B. polisi*, which can be unequivocally separated by (males only): **1**) coloration of mesosoma, carapace, and manus of chela much more dark in *B. nuer sp. n.* (Fig. 3 versus Fig. 6); **2**) patella and femur of pedipalps are reddish in *B. nuer sp. n.* and yellowish in *B. polisi*; **3**) legs yellow to orange without dark spots in *B. nuer sp. n.* (Fig. 1) but femur of all legs bear dark spots in *B. polisi* (Fig. 5); **4**) chelicerae slightly reticulate in anterior part in *B. nuer sp. n.* (Fig. 3) and yellow without reticulation in *B. polisi* (Fig. 6); **5**) Pedipalp movable fingers with 11 principal rows of denticles in *B. nuer sp. n.* (Fig. 15) and 10 principal rows of denticles in *B. polisi* (Fig. 16).

COMMENTS ON LOCALITIES AND LIFE STRATEGY. The holotype was collected under a small stone on a hill on a margin of a large grass steppe (Fig. 25) during the day. We recorded night temperature not exactly on this locality but at a garden of Gambela Baro Hotel Night (08°14'42"N 34°35'31"E, 383 m a.s.l.), where we collected only *Hottentotta* sp. during the night. There we recorded on 11–12 November 2014, shortly after sunset, a temperature of 30.4 °C, which gradually dropped to 25.4 °C (minimum temperature) before sunrise. Humidity during the night varied between 94% and 76%.

Butheoloides polisi Lourenço, 1996

(Figures 5–7, 16, 29–31; Table 1)

Butheoloides polisi Lourenço, 1996: 88 (figs. 1, 3, 4, 6, 7, 9–13); Kovařík, 1998: 105; Fet & Lowe, 2000: 87; Kovařík, 2003: 135.

Butheoloides (Butheoloides) polisi: Lourenço, 2002: 731.

TYPE LOCALITY AND HOLOTYPE DEPOSITORY. Ethiopia, basse vallée de l'Omo, près de Kelam, MNHN.

MATERIAL EXAMINED. Ethiopia, Southern Nationalities and Peoples Region Federal State (SNNPR), Omorate

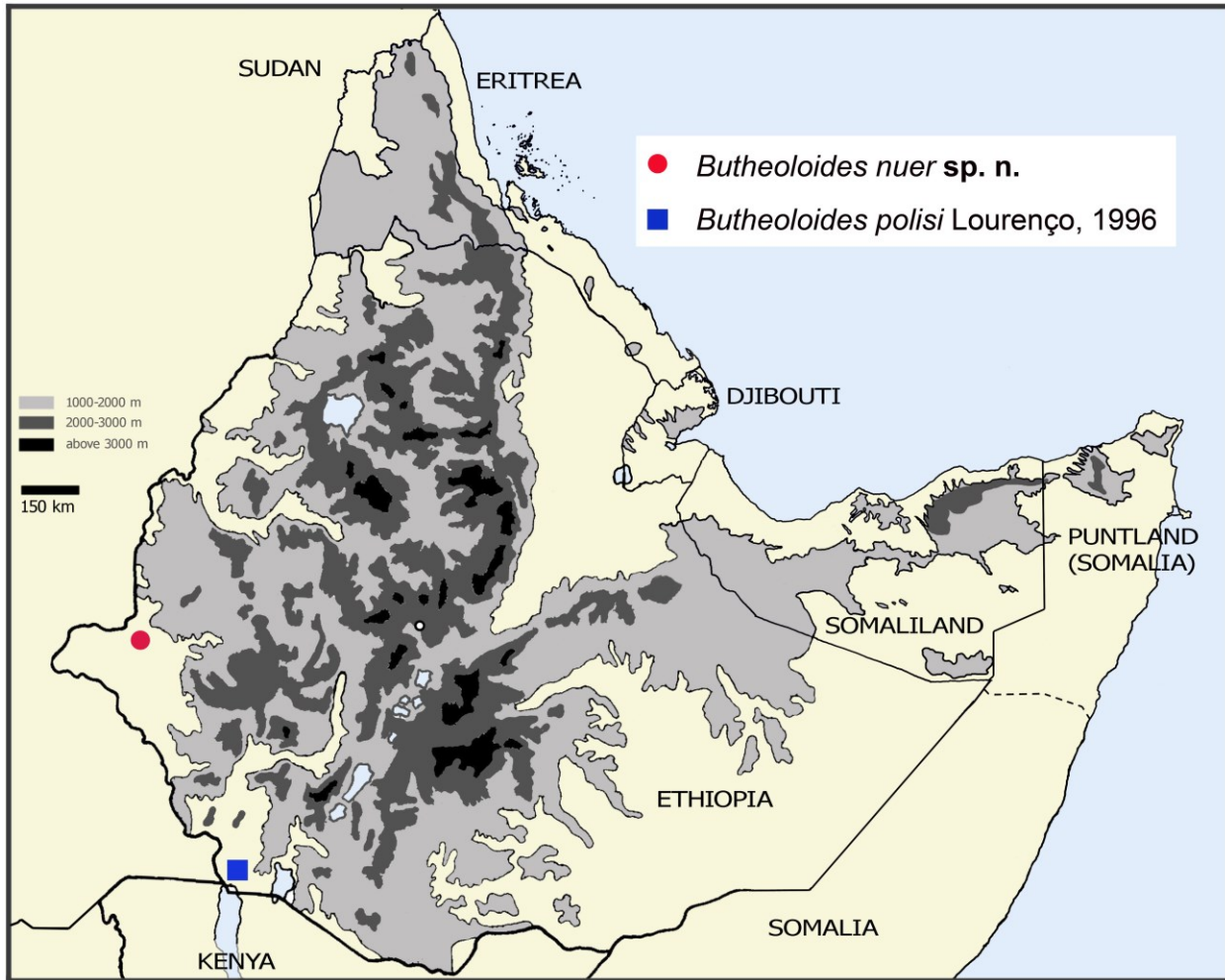


Figure 24: Map showing known distribution of *Butheoloides* in Ethiopia. Both species are known from type localities only.

(Kelem), 04°48'42"N 36°03'16.7"E, 373 m a.s.l. (Locality No. 13EU, Figs. 29–30), 4–5.VII.2013, leg. F. Kovařík et J. Plíšková, 2♂(UV detection), FKCP.

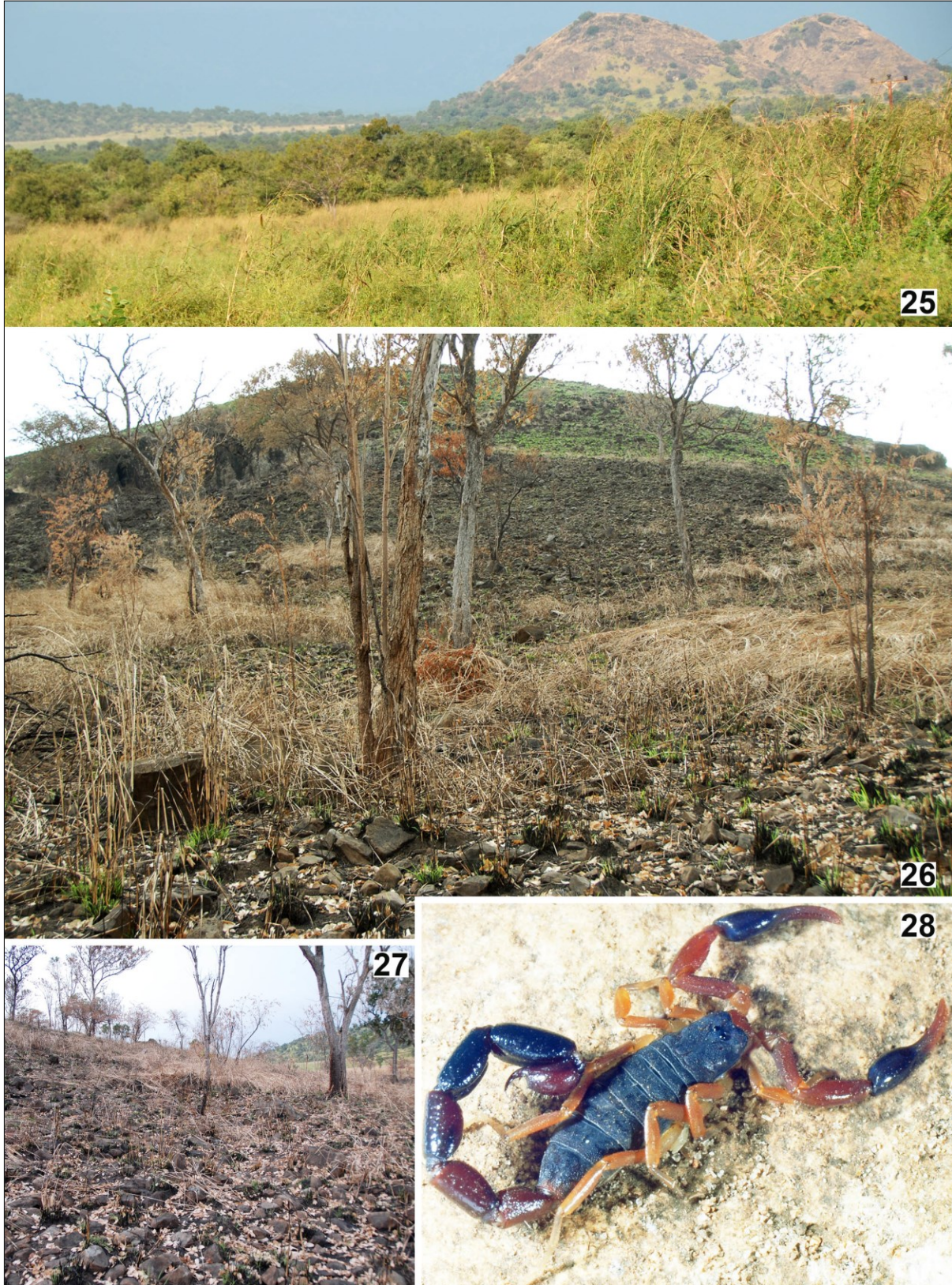
DIAGNOSIS (based on adult males). Adult size standard for the genus (23.6–24.4 mm). Coloration reddish brown with lighter ornaments, metasomal segments I–III, tergite VII and telson are lighter, patella and femur of pedipalp yellowish; legs yellow, femur of all legs bear dark spot; and chelicerae yellow without reticulation. Pedipalp movable fingers with 10 principal rows of denticles. Pectines with 15/16 teeth. Ventral and lateral surfaces of metasomal segments smooth and sparsely punctate.

COMMENTS ON LOCALITIES AND LIFE STRATEGY. This species is based on a male collected 31 July 1969 without photos and information about the locality. We visited the area in July 2013. It is a large territory with substrate consisting of coarse sand and sparse vegetation

of herbs and bushes (Figs. 29–30). During night collecting on 4–5 July 2013 (UV detection), the most common species *Hottentotta trilineatus* and *Parabuthus pallidus* Pocock, 1895 as well as less common *Parabuthus liosoma* (Ehrenberg, 1828) were found on open ground. At the locality we recorded, shortly after sunset (19.00), a temperature of 32 °C, which gradually dropped to 25.8 °C (minimum temperature) before sunrise. Humidity during the night varied between 53% and 34%. *Hottentotta trilineatus* and *Parabuthus pallidus* became active immediately after sunset, whereas the both males of *Butheoloides polisi* were found only at 22:40 h (temperature 27.7 °C).

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Figures 25–28: *Butheoloides nuer*, sp. n. **Figure 25.** View to the "two breasts", the type locality. **Figures 26–27.** The type locality. **Figure 28.** Holotype male at the type locality.



Figures 29–31: *Butheoloides polisi*. **Figures 29–30.** Ethiopia, Southern Nationalities and Peoples Region Federal State (SNNPR), Omorate (Kelem), 04°48'42"N 36°03'16.7"E, 373 m a.s.l. (Locality No. 13EU). **Figure 31.** Topotype male at the locality.

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References

- FET, V. & G. LOWE. 2000. Family Buthidae C. L. Koch, 1837. Pp. 54–286 in Fet, V., W. D. Sissom, G. Lowe & M. E. Braunwalder. *Catalog of the Scorpions of the World (1758–1998)*. New York: The New York Entomological Society, 689 pp.
- KOVAŘÍK F. 1998. *Štíři [Scorpiones]*. Jihlava (Czech Republic): Publishing House "Madagaskar", 176 pp (in Czech).
- KOVAŘÍK, F. 2003. Scorpions of Djibouti, Eritrea, Ethiopia, and Somalia (Arachnida: Scorpiones) with a key and descriptions of three new species. *Acta Societatis Zoologicae Bohemicae*, 67: 133–159.
- KOVAŘÍK, F. 2009. *Illustrated catalog of scorpions. Part I. Introductory remarks; keys to families and genera; subfamily Scorpioninae with keys to Heterometrus and Pandinus species*. Prague: Clairon Production, 170 pp.
- KOVAŘÍK F. 2011a. *Buthus awashensis* sp. n. from Ethiopia (Scorpiones, Buthidae). *Euscorpius*, 128: 1–6.
- KOVAŘÍK, F. 2011b. A review of the subgenus *Pandinus* Thorell, 1876 with descriptions of two new species from Uganda and Ethiopia (Scorpiones, Scorpionidae). *Euscorpius*, 129: 1–18.
- KOVAŘÍK, F. 2012. Review of the subgenus *Pandinurus* Fet, 1997 with descriptions of three new species (Scorpiones, Scorpionidae, *Pandinus*). *Euscorpius*, 141: 1–22.
- KOVAŘÍK, F. 2013. *Pandinus (Pandinus) trailini* sp. n. from Ethiopia (Scorpiones, Scorpionidae) with data on localities and life strategy. *Euscorpius*, 163: 1–14.
- KOVAŘÍK F. & G. LOWE. 2012. Review of the genus *Neobuthus* Hirst, 1911 with description of a new species from Ethiopia (Scorpiones, Buthidae). *Euscorpius*, 138: 1–25.
- KOVAŘÍK, F. G. LOWE, J. PLÍŠKOVÁ & F. ŠTÁHLAVSKÝ 2013. A new scorpion genus, *Gint* gen. n., from the Horn of Africa (Scorpiones, Buthidae). *Euscorpius*, 173: 1–19.
- KOVAŘÍK, F. & A.A. OJANGUREN AFFILASTRO. 2013. *Illustrated catalog of scorpions. Part II. Bothriuridae; Chaerilidae; Buthidae I. Genera Compsobuthus, Hottentotta, Isometrus, Lychas, and Sassanidotus*. Prague: Clairon Production, 400 pp.
- LOURENÇO, W. R. 1996. A propos de deux espèces nouvelles appartenant au genre *Butheoloides* Hirst (Scorpiones, Buthidae). *Revue Arachnologique*, 11 (9): 87–94.
- LOURENÇO, W. R. 2002. Nouvelles considérations sur la systématique et la biogéographie du genre *Butheoloides* Hirst (Scorpiones, Buthidae) avec description d'un nouveau sous-genre et de deux nouvelles espèces. *Revue suisse de Zoologie*, 109 (4): 725–733.
- SOLEGLAD, M.E. & V. FET. 2003. The scorpion sternum: structure and phylogeny (Scorpiones: Orthosterni). *Euscorpius*, 5: 1–34.
- STAHNKE, H.L. 1970. Scorpion nomenclature and mensuration. *Entomological News*, 81: 297–316.
- VACHON, M. 1974. Études des caractères utilisés pour classer les familles et les genres des scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum national d'Histoire naturelle*, 3e série, 140 (Zoologie, 104): 857–958.