Arachnology (2024) **19** (8), 1114–1117

A new *Prosoponoides* Millidge & Russell-Smith, 1992 from Shaanxi Province, China (Araneae: Linyphiidae)

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Abstract

Prosoponoides shaanxi **sp. n.** is described, based on a single male from high altitude in the Qinling Mountains, Shaanxi Province, China. The species is similar to both Oriental *Prosoponoides hamatum* Millidge & Russell-Smith, 1992 and *P. sinense* (Chen, 1991), but it can easily be distinguished by structural details of the palp. *Prosoponoides shaanxi* **sp. n.** is the first species of the genus reported from the Palaearctic Region.

Keywords: dwarf spiders • Palaearctic Region • taxonomy

Introduction

The Oriental genus *Prosoponoides* Millidge & Russell-Smith, 1992 is presently known to contain 19 species (World Spider Catalog 2024). Most of the species have been described from the southern parts of the People's Republic of China, particularly Yunnan Province (see Irfan, Zhang & Peng 2022). A few species are also known from Vietnam, Indonesia and Malaysia.

The taxonomic position of *Prosoponoides* within the Linyphiidae is still unclear. It belongs to the informal group of genera that contains *Dubiaranea* Mello-Leitão, 1943, *Kenocymbium* Millidge & Russell-Smith, 1992, *Ketambea* Millidge & Russell-Smith, 1992, and probably *Thaiphantes* Millidge, 1995 and combines characters of both the subfamilies Linyphiinae and Dubiaraneinae (for details see Millidge & Russell-Smith 1992; Millidge 1995; Tanasevitch 2019, and Chen *et al*. 2020). Thus, the taxonomic placement of these genera requires further study.

Prosoponoides shaanxi sp. n. is the first congener to occur in the Palaearctic Region, coming from the Qinling Mountains, Shaanxi Province, China. It is similar to both Oriental *Prosoponoides sinense* (Chen, 1991) and *P. hamatum* Millidge & Russell-Smith, 1992. The former species was originally described from the southern part of Zhejiang Province, China (Chen 1991) and later recorded from China's Fujian, Hainan and Yunnan provinces (Song, Zhu & Chen 1999; Chen *et al*. 2020; Irfan, Zhang & Peng 2022), as well as from Vietnam (Tu & Li 2006). *Prosoponoides hamatum* is known from northern Sumatra, Indonesia (Millidge & Russell-Smith 1992), as well as from Hainan and Yunnan provinces, China (Chen *et al*. 2020).

The description of the new *Prosoponoides* is the subject of this paper.

Material and methods

This paper is based on the material collected by Prof. Jochen Martens (Mainz, Germany) and Dr Peter Jäger (Frankfurt am Main, Germany) in 1997 from Taibai Shan, Qinling Mountains, Shaanxi Province, China. The holotype is deposited in the Senckenberg Museum, Frankfurt am Main, Germany. It is preserved in 75% ethanol and was studied using an MBS-9 stereo microscope. Drawings were executed with a drawing tube. A Levenhuk C-800 digital camera was used for taking pictures. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. The terminology of copulatory organs mainly follows that of Merrett (1963), as well as that of the authors mentioned in the Abbreviations section below. Abbreviations: APC = anterior projection of convector (= lateral projection of lamella characteristica, *sensu* Tu & Li (2006), = lateral projection of lamella, *sensu* Chen *et al*. (2020) = lateral lamellar projection (i.e. projection of lamella characteristica), *sensu* Irfan, Zhang & Peng (2022)), C = convector, *sensu* Tanasevitch (1998) (= embolic plate, *sensu* Millidge & Russell-Smith (1992), = lamella characteristica, *sensu* Tu & Li (2006) and Irfan, Zhang & Peng (2022), = lamella, *sensu* Chen *et al*. (2020), see Note below), Co = column, *sensu* Saaristo (1971), D = duct, DSA = distal suprategular apophysis, *sensu* Hormiga (2000), E = embolus, MM = median membrane, *sensu* van Helsdingen (1965), MT = median tooth of DSA, PPC = posterior projection of C (= posterior projection of lamella characteristica, *sensu* Tu & Li (2006), = posterior projection of lamella, *sensu* Chen *et al*., 2020, = posterior lamellar projection (i.e. projection of lamella characteristica), *sensu* Irfan, Zhang & Peng (2022)), R = radix, SMF = Senckenberg Museum, Frankfurt am Main, Germany, x = additional sclerite in embolic division.

Note: The convector is a separate, additional and often quite large sclerite in the embolic division as observed in several groups of Linyphiidae. Usually the convector is connected to the radix via membraneous tissue and it performs the role of supporting and protecting the embolus. The main character of this sclerite is that it lacks a sperm duct. The sperm duct runs from the suprategulum, further through the column to enter the radix next to the convector. Such a sclerite is often erroneously termed radix, some authors refer to it as a lamella, embolic plate, lamella characteristica, etc. The former two names have long and widely been used in various spider families to denominate the structures that are clearly not homologous. This has led to the introduction of a special term, convector, to use at least in linyphiids (Tanasevitch 1998). Concerning the term lamella characteristica, this special term was proposed by Kulczyński (1898) for a certain sclerite in the embolic division in the subfamily Micronetinae and it can be applied to this special part of the embolic division in that group alone.

Figs. 1–5: *Prosoponoides shaanxi* sp. n., male holotype. **1** body, lateral view; **2** prosoma, lateral view; **3** abdomen, dorsal view; **4** palp, retrolateral view; **5** same, prolateral view. Scale bar = 0.5 mm.

Araneae Clerck, 1757

Linyphiidae Blackwall, 1859

***Prosoponoides* Millidge & Russell-Smith, 1992**

Type species: *Prosoponoides hamatum* Millidge & Russell-Smith, 1992.

***Prosoponoides shaanxi* sp. n.** (Figs. 1–12)

Type: Holotype ♂ (SMF), CHINA: Shaanxi Province, Qinling Mountains, flanks of Taibai Shan, above Houshenzi, 33°54′56.56″N 107°46′48.55″E, pitfall traps, mixed coniferous/*Rhododendron* forest, 3050 m, 14–15 June 1997, leg. P. Jäger & J. Martens.

Etymology: The specific epithet is a noun in apposition referring to the terra typica, the Shaanxi Province, China.

Diagnosis: *Prosoponoides shaanxi* sp. n. is similar to *Prosoponoides sinense* (Chen, 1991) and *P. hamatum* Millidge & Russell-Smith, 1992. The new species differs from both of these by the claw-shaped distal suprategular apophysis which has a long and thin median tooth (Figs. 6–8; cf. Tu & Li 2006: figs. 9B; and Chen *et al*., 2020: fig. 1B). It also has a longer posterior projection of the convector (Figs. 9–10; cf. Tu & Li 2006: fig. 9D, and Chen *et al*., 2020: fig. 1A) and also differs in the shape of the anterior projection of the convector (Figs. 9–10; cf. Tu & Li 2006: fig. 9B, and Chen *et al*. 2020: fig. 1B). In addition, the new species is distinguished from *P. hamatum* by a thinner and longer embolus, as well as by its much shorter radical part (Figs. 6, 10; cf. Chen *et al*. 2020: fig. 1E).

Description of holotype male: Total length 3.05 (Fig. 1). Carapace unmodified (Fig. 2), 1.30 long, 1.10 wide, pale brown, with dark margin. Chelicera 0.55 long, mastidion absent. Legs yellow to pale brown, its segments with dark rings. Leg I 6.65 long (1.75 + 0.40 + 1.70 + 1.85 + 0.95); leg IV 5.00 long (1.50 + 0.35 + 1.20 + 1.35 + 0.60). Palp (Figs. 4–11): Patella small, spherical. Tibia short, furnished with long and thin spines retrolaterally. Paracymbium small, its proximal part relatively wide, distal part slender and curved. Distal suprategular apophysis long, massive, claw shaped, with long, thin median tooth. Median membrane very long, its distal part widened and embracing distal part of embolus. Embolus long, coiled, its proximal part with wide, transparent, membraneous edge, radix relatively large, flat, elongated. Large, black, strongly sclerotized sclerite of unclear origin attached to embolus by membraneous tissue (x in Figs. 9–10). Abdomen 1.80 long, 1.15 wide, dorsal pattern as in Fig. 3.

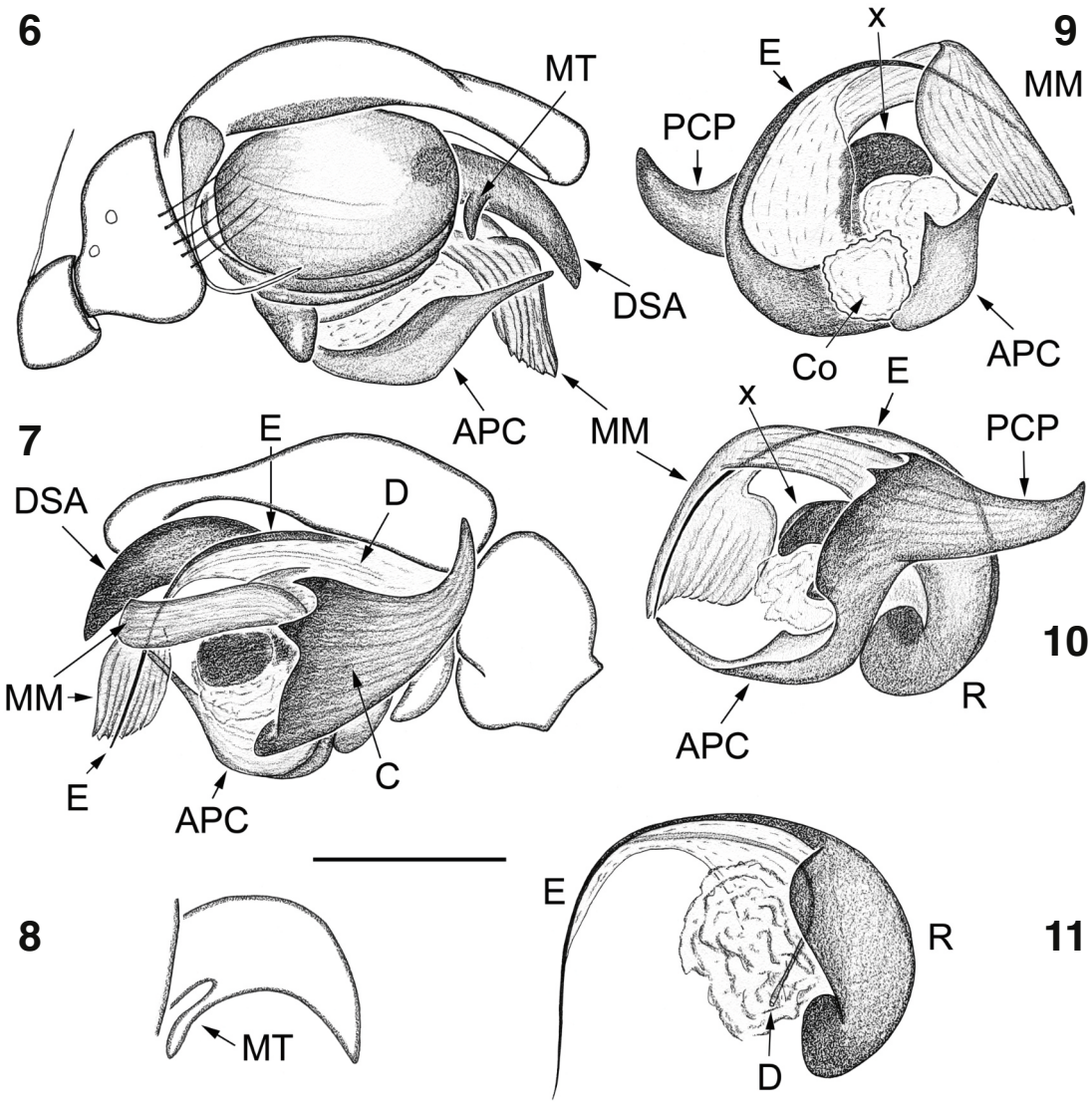
Female unknown.

Remarks: The Qinling Mountains is the northernmost locality of the known distribution area of the genus, clearly located within the Palaearctic Region.

Distribution: Known from the type locality only.

Discussion

There are nine species in the genus *Prosoponoides* described from the female sex alone, of which eight are from China. However, it seems most unlikely that the male



Figs. 6–11: *Prosoponoides shaanxi* sp. n., male holotype, right palp. **6** retrolateral view; **7** prolateral view; **8** distal suprategular apophysis, lateral view; **9** embolic division, lateral view; **10** same, ventrolateral view; **11** embolus, lateral view (x sclerite removed). Scale bar = 0.2 mm.

holotype described below from the highlands of the Palearctic Region can be conspecific to any of those females described from highlands of the Oriental Region, i.e. Yunnan Province, China (Irfan, Zhang & Peng 2022): see Fig. 12. nother sole female-based congener, *P. kaharianum* Millidge & Russell-Smith, 1992 from central Kalimantan and Java, Indonesia (Millidge & Russell-Smith 1992, Tanasevitch 2022) is likewise hardly conspecific to the new species.

Acknowledgements

I am deeply grateful to Peter Jäger and Julia Altmann (both SMF), for offering the opportunity to work on the arachnological collections under their care, special thanks go to anonymous referees for constructive comments on the manuscript.

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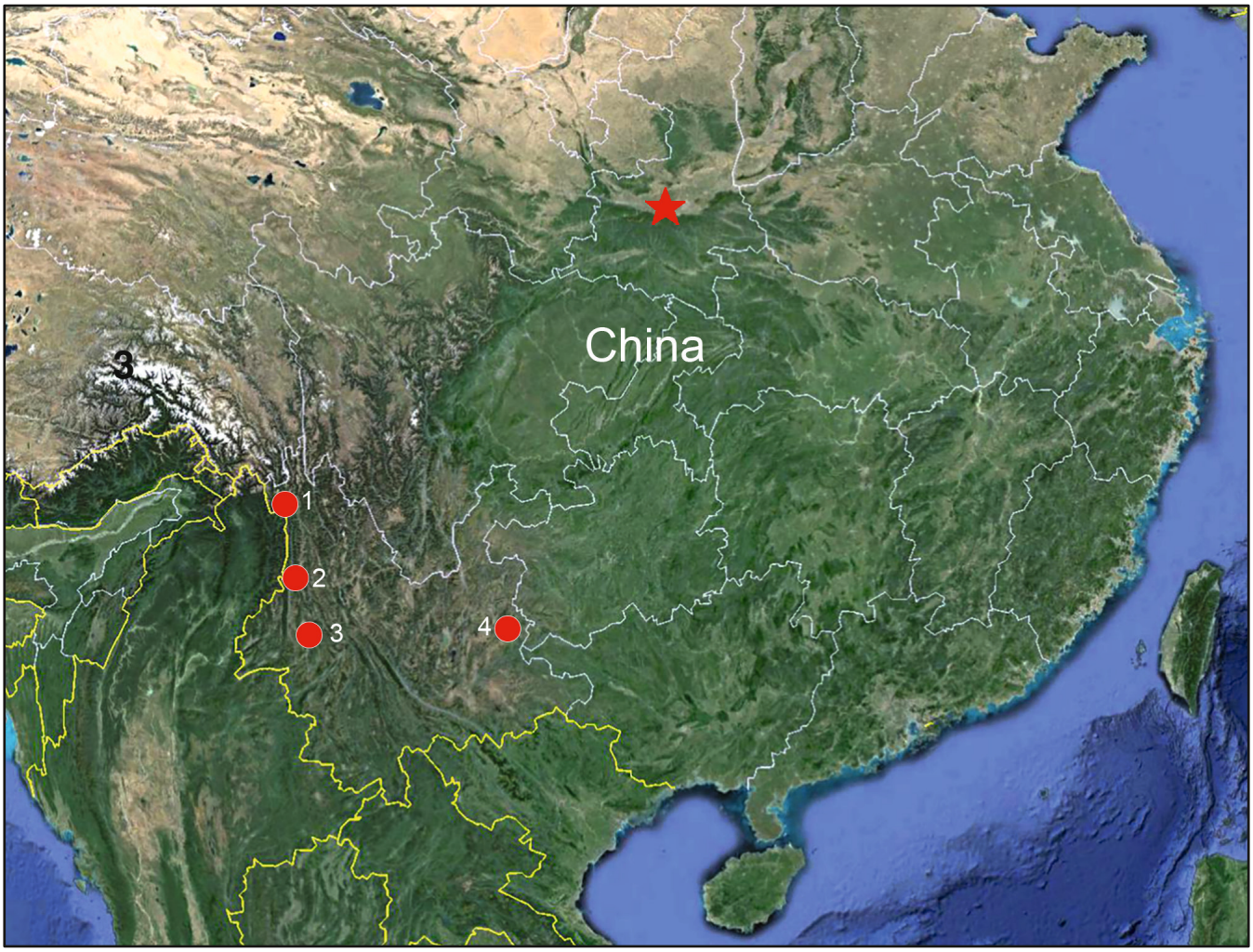

Fig. 12: Locations in China of the *Prosoponoides* species described from females only (yellow circles) and *P. shaanxi* sp. n. (yellow star). **1** *P. dongshaofangense* Irfan, Zhang & Peng, 2022 and *P. yani* Irfan, Zhang & Peng, 2022; **2** *P. longyangense* Irfan, Zhang & Peng, 2022 and *P. pianmaense* Irfan, Zhang & Peng, 2022; **3** *P. bangbieense* Irfan, Zhang & Peng, 2022, *P. ongyangense* Irfan, Zhang & Peng, 2022, *P. yakouense* Irfan, Zhang & Peng, 2022, and *P. yunnanense* Irfan, Zhang & Peng, 2022; **4** *P. guanduense* Irfan, Zhang & Peng, 2022.

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