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A case of disjunct montane linyphiid species (Araneae) in the Palaetropics, with notes on synonymy and the description of a new species

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Abstract: The genus *Enguterothrix* Denis, 1962 contains two very closely related species on different continents: *E. crinipes* Denis, 1962, known from the mountains of the Democratic Republic of the Congo, and *E. simpulum* (Tanasevitch, 2014) comb. nov. (transferred from *Apophygone* Tanasevitch, 2014), which is widespread in the mountains of northern Thailand. *Enguterothrix fuscipalpis* Denis, 1962 is removed from the genus and preliminarily placed in *Micrargus* Dahl, 1886. A new species, *Oedothorax paralegrandi* sp. nov., is described from the Indian Himalayas; it shows close relations to the Afrotropical *O. legrandi* Jocqué, 1985 from the Comoros. The following new synonyms are proposed: *Apophygone* Tanasevitch, 2014 syn. nov. of *Enguterothrix* Denis, 1962; *Enguterothrix tenuipalpis* Holm, 1968 syn. nov. of *Enguterothrix crinipes* Denis, 1962; *Nasoonaria circinata* Zhao & Li, 2014 syn. nov. of *Nasoonaria magna* Tanasevitch, 2014; *Theoa bidentata* Zhao & Li, 2014 syn. nov. of *Theoa elegans* Tanasevitch, 2014.

Keywords: Spiders - Afrotropics - Oriental - Himalayas - distribution - disjunction - synonyms.

INTRODUCTION

Recently, a new genus *Apophygone* Tanasevitch, 2014, with *A. simpulum* Tanasevitch, 2014 as the type species, was described from evergreen mountain forests of northern Thailand (Tanasevitch, 2014). It was stated that the taxonomic position of the genus and its relations within the subfamily Erigoninae is obscure. Later, when working on linyphiids from the Afrotropical region, I noticed strong similarity between *A. simpulum* and two representatives of the genus *Enguterothrix* Denis, 1962 from the Democratic Republic of the Congo. Despite the rather schematic drawings of Denis (1962) and Holm (1968), the similarities became obvious when I examined the type specimens from the Musée royal de l'Afrique centrale in Tervuren (Belgium).

This paper reassesses the validity and status of certain linyphiid taxa from the Afrotropical and Oriental regions, and, besides that, gives the description of a new *Oedothorax* species from the Indian Himalayas. The latter is very closely related to a congener from the Comoro Islands, showing close relations between the faunas of these distant areas.

MATERIAL AND METHODS

This paper is based on material kept by the Musée royal de l'Afrique centrale, Tervuren, Belgium (MRAC), the

Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU), and the Muséum d'histoire naturelle de Genève, Switzerland (MHNG). Specimens preserved in 70% ethanol were studied using a MBS-9 stereomicroscope and a WILD compound microscope. A Levenhuk C-800 digital camera was used for some drawings. Images of multiple focal planes were combined using the Helicon Focus image stacking software, version 5.1. Sample numbers are given in square brackets. The terminology of copulatory organs mainly follows that of Merrett (1963), Hormiga (2000) and Tanasevitch (1998, 2015). The chaetotaxy is given in a formula, e.g., 2.2.1.1, which refers to the number of dorsal spines on tibiae I-IV. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm.

Abbreviations

a.s.l.	Above sea level
C	Convexor
D	Duct
DAC	Distal apophysis of convexor
DSA	Distal suprategular apophysis
E	Embolus complex
EP	Embolus proper
Fe	Femur
Mt	Metatarsus
P	Paracymbium

R Radix
Ti Tibia
TmI Position of trichobothrium on metatarsus I

TAXONOMIC PART

Enguterothrix Denis, 1962

Enguterothrix Denis, 1962: 193; type species *Enguterothrix crinipes* Denis, 1962: 193, figs 33-38; male holotype and female allotype (in MRAC) examined.

Apophygone Tanasevitch, 2014: 395 **syn. nov.**; type species *Apophygone simpulum* Tanasevitch, 2014: 395, figs 8-13, 24-25; male and female paratypes (in ZMMU) examined.

Remarks: The genus *Enguterothrix* was established for two species, *E. crinipes* Denis, 1962 from the Democratic Republic of the Congo (the type species) and *E. fuscipalpis* Denis, 1962 from Uganda (Denis, 1962). Some years later, Holm (1968) described a third species, *E. tenuipalpis* from the vicinity of the type locality of *E. crinipes*. As it will be shown below, *E. fuscipalpis* does not belong to this genus, *E. tenuipalpis* is a synonym, and thus the Afrotropical element of the genus is represented by one species only, i.e. *E. crinipes*.

The monotypic genus *Apophygone* Tanasevitch, 2014 was established for *A. simpulum* Tanasevitch, 2014 from northern Thailand (Tanasevitch, 2014). A comparison of the type specimens of *A. simpulum* and *E. crinipes* clearly showed that they are congeneric, thus *Apophygone* becomes a junior synonym of *Enguterothrix*.

Diagnosis: See Tanasevitch (2014), under the diagnosis of *Apophygone*.

Species included: At present, the genus contains two species: *Enguterothrix crinipes* and *E. simpulum* **comb. nov.** (transferred from *Apophygone*). *Enguterothrix fuscipalpis*, known from Uganda (Denis, 1962), is removed from the genus and preliminarily placed in *Micrargus* Dahl, 1886 (see below).

Distribution: The genus shows a Palaeotropical disjunct montane distribution: one species, *E. crinipes*, occurs on mountains of the Democratic Republic of the Congo, a second, very closely related species, *E. simpulum*, is widespread in the mountains of northern Thailand. This type of disjunction is seen for Linyphiidae for the first time, but it is probably not a unique phenomenon. Further investigations of the Afrotropical and Oriental araneofaunas will likely reveal new examples of this type of distribution. Afro-tropical-Oriental disjunctions are known among other groups of spiders, for example in the sparassid genus *Barylestis* Simon, 1910 (see Jäger, 2008).

Enguterothrix crinipes Denis, 1962

Enguterothrix crinipes Denis, 1962: 193, figs 33-38.

Enguterothrix tenuipalpis Holm, 1968: 13, figs 21-25, **syn. nov.**

Type material examined: MRAC #81008; male holotype of *Enguterothrix crinipes*. – MRAC #81009; female allotype of *E. crinipes*. – MRAC #131644; male holotype of *E. tenuipalpis* Holm, 1968. – MRAC #127152; male paratype of *E. tenuipalpis*. – MRAC #131645; female allotype of *E. tenuipalpis*.

Remarks: *Enguterothrix crinipes* was described on the basis of a male and a female from Lubero, Democratic Republic of the Congo. A study of the holotype of *E. crinipes* has shown that its carapace is obviously deformed, i.e. its head part is flattened from above, and the carapace has been depicted in this way by Denis (1962: fig. 33). The palpal tibia of the specimen has been drawn in a way that makes it look somewhat wider than it actually is (*op. cit.*: fig. 35), and the palp has been sketched very schematically (*op. cit.*: fig. 36), so it is very difficult to understand its structure.

Enguterothrix tenuipalpis was described on the basis of two males and a female from the vicinity of the type locality of *E. crinipes*. In the description of *E. tenuipalpis*, Holm gave the convex shape of the head elevation on the male carapace and the narrower male palpal tibia as distinctions from *E. crinipes*. It is absolutely obvious that Holm did not examine the type of *E. crinipes* but compared his holotype of *E. tenuipalpis* with the schematic and inaccurate drawings of Denis (1962). Actually, the carapace of the *E. crinipes* holotype, when straightened, would have exactly the same shape as that of the male type of *E. tenuipalpis*. The shape of the palpal tibia of the male type of *E. tenuipalpis*, when observed from the same angle, is also identical to that of the *E. crinipes* holotype. A detailed comparison of the palp structure of the male types of both nominal species revealed that they are nearly identical.

The illustrations of the epigyne of both nominal species are very similar (Denis, 1962: fig. 38 cf. Holm, 1968: fig. 25), but when re-examining the epigynes of the allotypes, i.e. #81009 (*E. crinipes*) and #131.645 (*E. tenuipalpis*), I noticed a difference: the seminal ducts in the allotype of *E. crinipes* are almost parallel to each other, while in the allotype of *E. tenuipalpis* they are diverging at a slight angle. This difference in the direction of the ducts may be attributed to individual variability. Similar intraspecific variation in epigynes was found in the Thai congener *E. simpulum* (Tanasevitch, 2014) **comb. nov.** (see Tanasevitch, 2014: figs 24-25; under *Apophygone*). All of this evidence shows that *E. tenuipalpis* and *E. crinipes* are the same species, and the first name therefore becomes a junior synonym of the second.

Distribution: The species is known from three localities in Lubero, North-Kivu Province, Democratic Republic of the Congo: in the mountains of Kabatsiro (2080 m a.s.l.), Burega (2100 m a.s.l.) and Bukristu (2000 m a.s.l.).

***Enguterothrix simpulum* (Tanasevitch, 2014)
comb. nov.**

Apophygone simpulum Tanasevitch, 2014: 395, figs 8-13, 24-25.

Type material examined: ZMMU; 5 male and 7 female paratypes of *Apophygone simpulum* from Khao Yai National Park, Thailand.

Remarks: A comparison of type specimens of *Enguterothrix crinipes* and *E. simpulum* revealed that these two species not only belong to the same genus, but are extremely close to each other, slightly differing only in the shape of the male carapace, as well as in small details of the female genitals. The head elevation of the carapace in the male holotype of *E. crinipes* is slightly larger than in *E. simpulum* males, while eye size in the latter is significantly larger. The palps of both species seem to be nearly identical. The epigynes in both species are also very similar, but small differences can be observed in the shape of the epigynal plate: in *A. simpulum* it is somewhat higher but narrower.

Distribution: The species is widespread in northern and northeastern Thailand (see Tanasevitch, 2014).

***Micrargus fuscipalpis* (Denis, 1962) comb. nov.
Fig. 1**

Enguterothrix fuscipalpis Denis, 1962: 197, figs 39-40.

Type material examined: MRAC #114994; female holotype of *Enguterothrix fuscipalpis*.

Remarks: *Enguterothrix fuscipalpis* was described on the basis of two females from Uganda (Denis, 1962) and was incorrectly placed in this genus. The holotype (the paratype was not seen) does not belong to *Enguterothrix*, which is supported by a different formula of chaetotaxy and by a dissimilar epigyne conformation. Moreover, I could not find any other *Enguterothrix* specimens among the Afrotropical linyphiids that I have seen so far, therefore I preliminarily place this species in *Micrargus*. The transfer is supported by the same chaetotaxy (2.2.1.1), lack of the trichobothrium on metatarsus IV, similar value of the TmI (0.35), as well as the similar epigyne conformation, namely, the presence of a large epigynal cavity (see Fig. 1). The discovery of the corresponding male will throw more light on the systematic position of this species within the linyphiids.



Fig. 1. *Micrargus fuscipalpis* (Denis, 1962) comb. nov., female holotype. Abdomen, ventral view.

***Oedothorax* Bertkau in Förster & Bertkau, 1883**

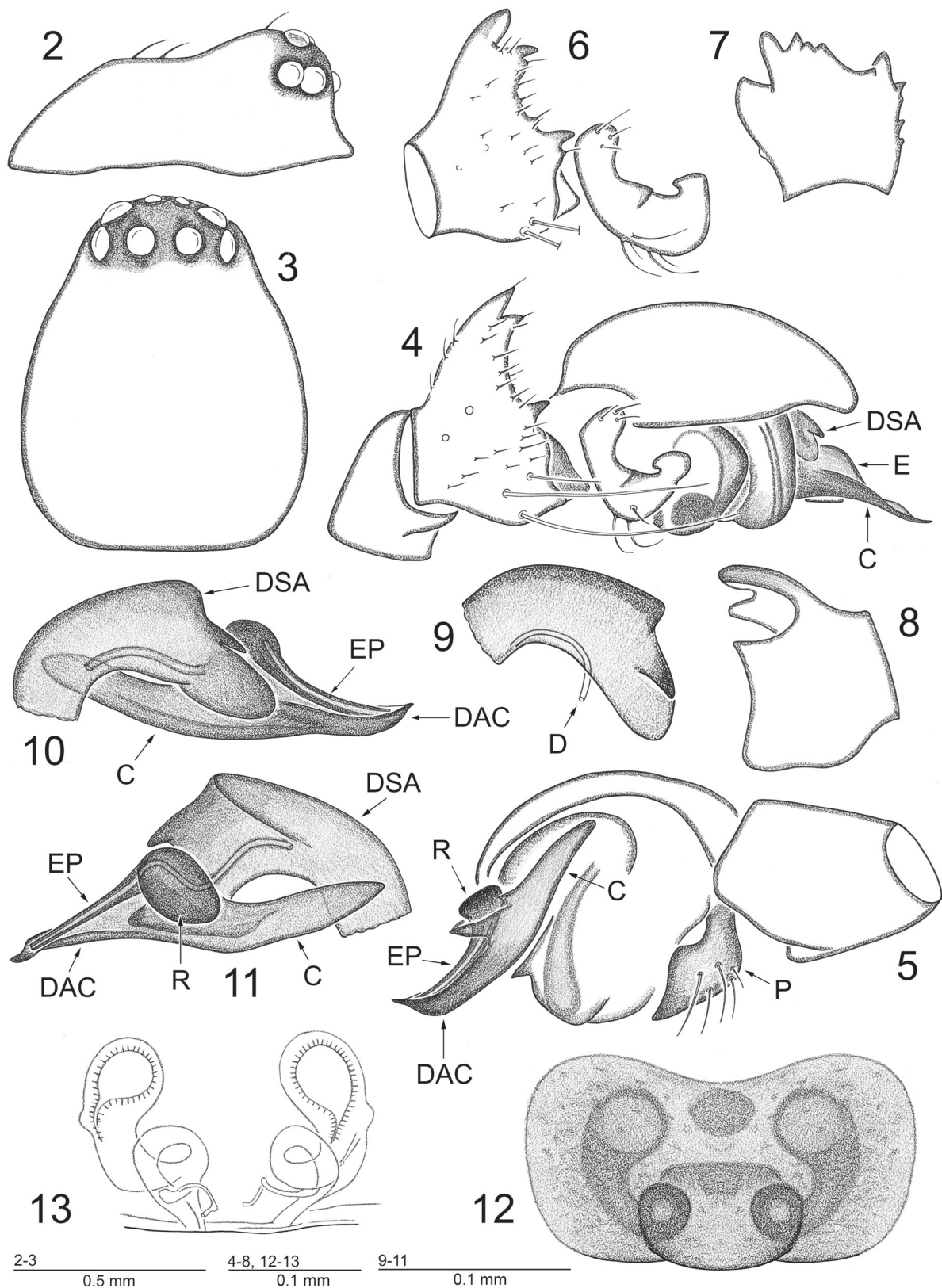
The genus has an almost cosmopolitan distribution and is represented in the Palaearctic by 44 species, in the Afrotropics by 10, in the Oriental by nine, and in the Nearctic by seven species (based mostly on the World Spider Catalogue, 2016). A single record of an *Oedothorax* species from the Neotropics, i.e. *O. fuegianus* (Simon, 1902), which was described from Argentina on the basis on a single female (Simon, 1902), is regarded as a misidentification (see Miller, 2007).

In the following, I present a new *Oedothorax* species from the Indian Himalayas. This species is very similar to an Afrotropical congener, known from the Comoros, and, like *Enguterothrix simpulum* (see above), demonstrates close relations between Afrotropical and Oriental linyphiid faunas.

***Oedothorax paralegrandi* sp. nov.
Figs 2-13**

Holotype: MHNG; male; INDIA, Himachal Pradesh, Dalhousie, 1950 m a.s.l., in soil; 20.X.1988, leg. S. Vit [27/88].

Paratypes: MHNG; 2 females collected together with the holotype. – MHNG; 2 females; Dalhousie, 1950 m a.s.l., in soil, 20.X.1988; S. Vit [26/88].



Figs 2-13. *Oedothorax paralegrandi* sp. nov., male holotype (2-11) and female paratype (12-13). (2-3) Carapace, lateral and dorsal views, respectively. (4-5) Right palp, retro- and prolateral views, respectively. (6) Palpal tibia and paracymbium, proximal-retrolateral view. (7-8) Palpal tibia, dorsal and prolateral views, respectively. (9) Distal suprategular apophysis. (10-11) Distal suprategular apophysis and embolic division, retro- and prolateral views, respectively. (12) Epigyne, ventral view. (13) Cleared epigyne, dorsal view.

Diagnosis: The new species is very similar to the Afrotropical *Oedothorax legrandi* Jocqué, 1985, known from the Comoros (Jocqué, 1985), but differs clearly by the arrangement of numerous small tubercles on the male palpal tibia, as well as by the straight and narrow main body of the convector in the male. The female differs by the larger size of its receptacula.

Etymology: The species name refers to the close relationship between the new species and *Oedothorax legrandi*.

Description:

Male (holotype): Total length 1.98. Carapace 0.85 long, 0.70 wide, greyish dark brown, unmodified (Figs 2-3). Eyes enlarged. Chelicerae 0.25 long, unmodified. Legs pale brown. Leg I 3.18 long (0.88+0.25+0.70+0.80+0.55), IV 3.42 long (0.90+0.25+0.87+0.90+0.50). Chaetotaxy 2.2.1.1, length of spines 1.5-2 diameters of segment. All metatarsi with a trichobothrium. TmI 0.58. Palp (Figs 4-11): Palpal tibia short, with numerous small tubercles of different sizes. Paracymbium small, L-shaped, carrying short curved spines in distal part. Distal suprategular apophysis very short, rounded apically, with a pointed tooth-shaped apophysis. Convector narrow, elongated, almost straight, distal apophysis long, pointed apically, somewhat bent distad, forming a gutter embracing tip of embolus. Lateral extension of convector absent. Embolus with small, rounded radix and relatively long embolus. Abdomen 1.13 long, 0.83 wide, grey, with sparse hair cover.

Female: Total length 2.25. Carapace 1.00 long, 0.80 wide, unmodified, pale brown, with a narrow dark margin. Chelicerae 0.38 long, unmodified. Leg I 3.45 long (0.93+0.28+0.88+0.83+0.53), IV 3.74 long (1.03+0.28+0.98+0.95+0.50). TmI 0.58. Abdomen 1.25 long, 0.80 wide, with sparse hair cover. Epigyne (Figs 12-13): ventral plate wide but narrow, seminal ducts thick, gradually expanding, making a loop and running into relatively large receptacula. Body and leg coloration, as well as chaetotaxy, as in male.

Taxonomic remarks: The new species is very similar to the only known Afrotropical congener, *O. legrandi*, described from the Comoro Islands (Jocqué, 1985). Similarities are found in the unmodified carapace, as well as in all elements of the male palp, i.e., in the poorly modified palpal tibia carrying numerous small tubercles; in the same shape of the paracymbium bearing short, curved spines distally; in the shape of the distal apophysis of the convector acting as a sheath for the relatively long embolus proper.

Distribution: At present this species is only known from a single locality in the highlands of the Indian Himalayas.

***Nasoonaria magna* Tanasevitch, 2014**

Nasoonaria magna Tanasevitch, 2014: 406, figs 52-57.

Nasoonaria circinata Zhao & Li, 2014: 32, figs 58-61, **syn. nov.**

Remarks: *Nasoonaria circinata* Zhao & Li, 2014, was described from specimens of both sexes from Xishuangbanna, Yunnan, People's Republic of China, the territory bordering Myanmar and Laos (Zhao & Li, 2014). *Nasoonaria magna* is based on a male from the Khao Yai National Park, Nakhon Ratchasima Province, Thailand (Tanasevitch, 2014). A comparison of the *N. magna* holotype with splendid figures and photos of *N. circinata*, published by Zhao & Li (2014: figs 58-61), does not leave any doubt that these two names refer to the same species. In addition, I subsequently found in the MHNG a *Nasoonaria* female from the type locality of *N. magna*. Judging from the drawings and photos of Zhao & Li (2014: figs 60A-C), this is a female of *N. magna*.

The description of *N. magna* was published on 2.XII.2014 in the journal "Arthropoda Selecta", volume 23, number 4, and on the same day a pdf of the paper was placed on the Internet for free access (see <http://arthropodaselecta.britishspiders.org.uk/index.php?idxtype=vol&idxvalue=23>). The description of *N. circinata* was published two days later, on 4.XII.2014 in ZooKeys, number 460 (see <http://zookeys.pensoft.net/articles.php?id=4296>), thus the name *N. magna* has priority over *N. circinata*.

***Theoa elegans* Tanasevitch, 2014**

Theoa elegans Tanasevitch, 2014: 412, figs 72-79.

Theoa bidentata Zhao & Li, 2014: 48, figs 96-99, **syn. nov.**

Remarks: *Theoa bidentata* Zhao & Li, 2014 was described from specimens of both sexes from Xishuangbanna, Yunnan, People's Republic of China, and according to the detailed figures and photos provided by Zhao & Li (2014) it is conspecific with *T. elegans* Tanasevitch, 2014, known from a male from Doi Tung, Chiang Rai Province, situated in the extreme north of Thailand (Tanasevitch, 2014). As in the case of *N. circinata* (see above), the description of *T. elegans* was published two days earlier than that of *T. bidentata*. Therefore *T. elegans* has priority over *T. bidentata*.

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