

***NEPHILA HIRTA*, A NEW SYNONYM OF  
*EUSTALA FUSCOVITTATA* (ARANEAE, ARANEIDAE)**

**Matjaž Kuntner**<sup>1</sup>: Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., and Department of Biological Sciences, George Washington University, Washington, D.C. 20052 USA

**Herbert W. Levi**: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138 USA

**ABSTRACT.** *Nephila ?hirta* Taczanowski 1873 was described from French Guiana, but is currently listed under *Nephilengys* L. Koch. It is here redescribed and transferred from Nephilinae (Tetragnathidae)\* to the araneid genus *Eustala* Simon, and proposed as a junior synonym of *E. fuscovittata* (Keyserling 1864). *Eustala* appears to be the most speciose American araneid genus and is in need of revision.

**Keywords:** *Nephila*, *Nephilengys*, Nephilinae, Tetragnathidae, Araneidae, taxonomy, French Guiana

Taczanowski (1873) described *Nephila ?hirta* from Cayenne, French Guiana. Roewer (1942) placed the species in *Nephilengys* L. Koch 1872, where it currently remains (Platnick 2005), *contra* Bonnet (1958) who retained it in *Nephila* Leach 1815. Taczanowski's description of both sexes is sufficient to establish that the species is neither a nephiline nor a tetragnathid\* [NB: the male syntype is immature]. Our examination of the types confirmed the need for a taxonomic transfer.

Museum abbreviations: ANSP = Academy of Natural Sciences, Philadelphia, U.S.A.; BMNH = Natural History Museum, London, UK; CAS = California Academy of Sciences, San Francisco, USA; MCZ = Museum of Comparative Zoology, Cambridge, Massachusetts, USA; PAN = Muzeum i Instytut Zoologii, Polska Akademia Nauk (Polish Academy of Sciences), Warsaw, Poland; USNM = Smithsonian Institution, Washington, DC, USA.

**TAXONOMY**

Family Araneidae Simon 1895

Genus *Eustala* Simon 1895

*Eustala* Simon 1895: 795; Levi 1977: 96; Levi 2002: 532, 550.

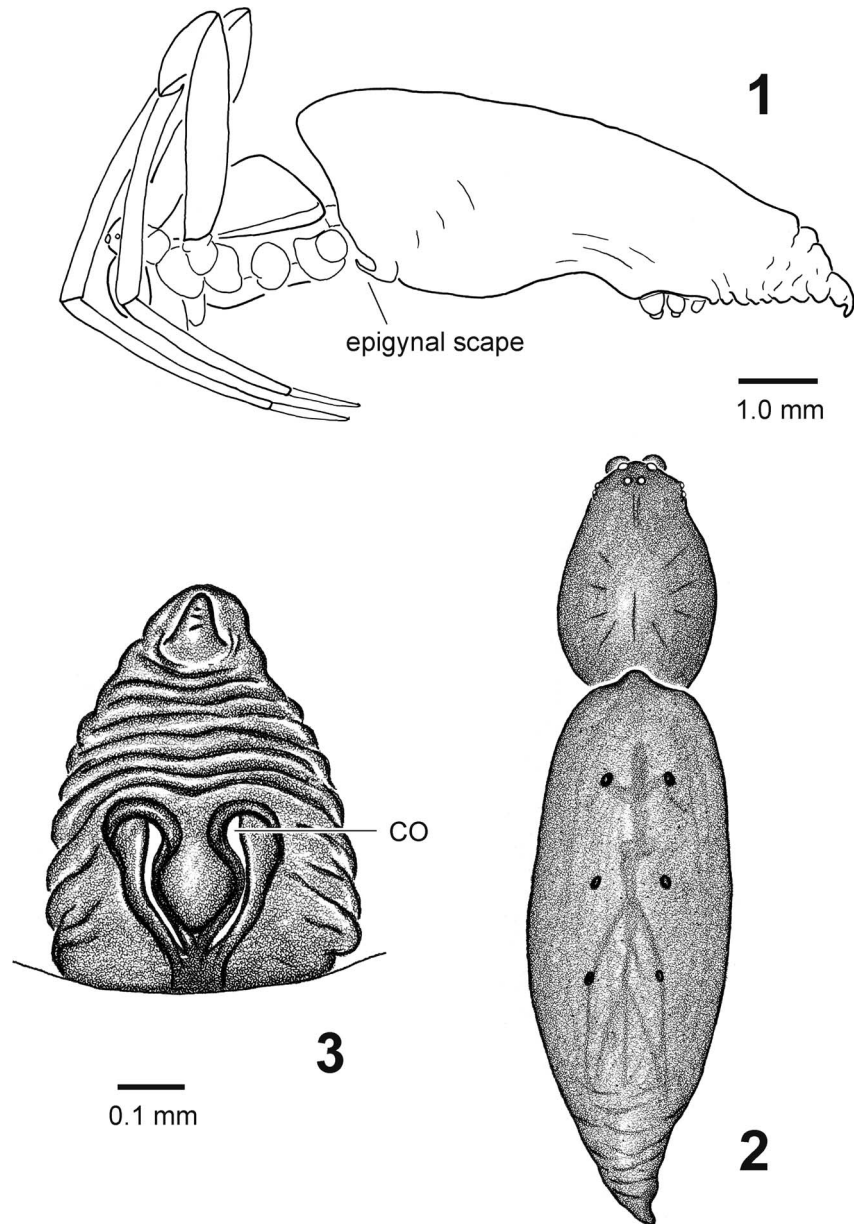
<sup>1</sup> Current address: Institute of Biology, Slovenian Academy of Sciences and Arts, Novi trg 2, P.O. Box 306, SI-1001 Ljubljana, Slovenia. E-mail: kuntner@gmail.com

**Type species.**—*Epeira anastera* Walckenaer 1842 by original designation.

**Diagnosis.**—Simon (1895) diagnosed *Eustala* by the anteriorly projecting epigynal scape, among other features (Simon 1895: 796): “*Uncus vulvae brevis et acutus antice directus.*” Levi (1977) revised the 13 species north of Mexico including the type species, *E. anastera* (Walckenaer). He confirmed Simon's epigynal diagnosis (Levi 1977: figs. 118, 138, 140; see also Figs 1, 3) and added the diagnostic feature of the male palp, notably a protruding white cone-shaped median apophysis (Levi 1977: figs. 126, 147, 232-m). The type species is also illustrated in Levi (2002: figs. 13–15).

**Systematics.**—Simon (1895) placed *Eustala* in the group Mangoreae within Argiopininae (equivalent to Araneidae). In a cladistic study by Scharff & Coddington (1997), *Eustala* is sister to the doublet *Wixia* O.P.-Cambridge 1882 plus *Acacesia* Simon 1895 within the subfamily Araneinae, but that relationship depended on a single homoplasious synapomorphy. Their study used genera as terminals and so did not include genus-level autapomorphies, but *Eustala* has two (the anteriorly-directed scape and cone shaped median apophysis) that would likely plot as synapomorphies of the genus.

**Diversity.**—For the 89 currently deemed valid *Eustala* species (all American) more



Figures 1–3.—*Eustala fuscovittata* (Keyserling), female from Cayenne, French Guiana (syntype of *Nephila hirta* Taczanowski): 1. Lateral view (note the epigynal scape projecting anteriorly); 2. Dorsal view; 3. Epigynum, ventral view. CO = copulatory opening.

than 100 names are available (Platnick 2005). *Eustala* seems to be the most speciose neotropical araneid genus (H.W.L. pers. obs.). It is in need of revision. For example, a recent inventory of spiders of southern Guyana found four sympatric species in a single rain

forest hectare (Kuntner pers. obs., specimens in USNM). Although likely to be new, none of these can be currently identified without original descriptions and type specimen examination. A further impediment in *Eustala* taxonomy is the difficulty to diagnose species

morphologically, and the potential for apparent hybridization (H.W.L. pers. obs.).

*Eustala fuscovittata* (Keyserling 1864)  
Figs. 1–3

*Epeira fusco-vittata* Keyserling 1864: 129, pl. 6, figs. 7–8; Keyserling 1893: 251, pl. 13, fig. 187.  
*Nephila ?hirta* Taczanowski 1873: 149. NEW SYNONYMY.

*Cyclosa thorelli* McCook 1894: 228, pl. 19, fig. 11.  
Synonymy by F.O.P.-Cambridge 1904.

*Epeira caudata* Banks 1898: 255, pl. 15, fig. 5.  
Synonymy by F.O.P.-Cambridge 1904.

*Eustala fuscovittata*: F.O.P.-Cambridge 1904: 505, pl. 48, figs 3–4, ♀ ♂; Grasshoff 1970: 216, fig. 2a–c, ♀ ♂.

*Nephilengys hirta*: Roewer 1942: 934; Platnick 2005.

*Eustala fusco-vittata*: Chickering 1955: 398, figs. 1–5, ♀ ♂.

*Nephila hirta*: Bonnet 1958: 3073.

**Types and comments.**—*Epeira fusco-vittata*: female holotype from Santa Fé de Bogota, N.-Granada [Bogota, Colombia, 04°15'N, 74°11'W] (BMNH), examined by H.W.L.

*Nephila ?hirta*: 1 female, penultimate male, juvenile syntypes from Cayenne [04°56'N, 52°20'W] and Saint Laurent de Maroni [05°30'N, 54°02'W], French Guiana (PAN), examined. The original handwritten label reads: “*Nephila hirta* Taczanowski, Cayenne—Guyane française, leg. K. Yelski, detm. WT. Taczanowski”. A newer typed label reads: “PAN, *Nephila hirta* Taczanowski, ♀ PARALLECTOTYPES = *Eustala*, design. Levi 1970. GUYANE FRANC. Cayenne, K. Jelski”. With the latter label H.W.L. indicated the need of the transfer to *Eustala*. The syntypes are poorly preserved with most legs missing or softly attached. The female genital morphology of the only adult syntype (Figs 1–3) justifies synonymy with the widespread American *E. fuscovittata*.

*Cyclosa thorelli*: female holotype from Key West, Florida, USA [24°33'N, 81°46'W] (from Marx collection, thus locality uncertain) (ANSP).

*Epeira caudata*: female holotype from Tepic, Baja California, Mexico (CAS, probably destroyed). Locality uncertain, as there does not seem to be a Tepic in Baja California.

**Description.**—Female syntype of *Nephila hirta* (Figs 1–3). Habitus elongate, pale yellow (in alcohol). Total length 9.9 mm. Pro-

soma oval, with narrow cephalic region, highest in posterior thoracic region (Figs 1–2). Prosoma 3.1 mm long, 2.1 mm wide. Lateral eyes widely separated from the medians, almost juxtaposed. Posterior median eyes separated by one diameter. Posterior median eyes with a fully median canoe tapetum as in all poorly preserved specimens, not displaced [Scharff & Coddington (1997) report displacement as araneid feature in freshly preserved specimens]. Chelicerae narrow, with four promarginal and three retromarginal teeth, cheliceral furrow denticulate. Sternum longer than wide: 1.3 mm long, 0.9 mm wide, with slight paired elevations adjacent to first and third coxae. The two preserved legs with numerous tibial and metatarsal and few femoral spines. Leg I 13.1 mm long (femur 3.3 mm; patella 1.6 mm; tibia 3.1 mm; metatarsus 3.1 mm; tarsus 1.0 mm). Opisthosoma elongate, cylindrical, extends beyond spinnerets (Figs. 1–2). Opisthosoma 7.3 mm long, 2.8 mm wide. Posterior median spinnerets with an extensive aciniform spigot field. Epigynum with a wrinkled, anteriorly projecting scape and ventral, conspicuous copulatory openings (Figs. 1, 3). *Male*: For descriptions, see Keyserling (1893), O.P.-Cambridge (1904), Chickering (1955) and Grasshoff (1970).

Malgorzata Adamczewska kindly loaned the specimens. We thank Jonathan Coddington, Jeremy Miller and Ingi Agnarsson for comments on the manuscript. Useful comments by Mark Harvey, Paula Cushing, Dan Mott, Nikolaj Scharff and an anonymous reviewer improved the paper. The first author acknowledges the support of the U.S. National Science Foundation (grant DEB-9712353 to G. Hormiga and J. Coddington), the Ministry of Science of the Republic of Slovenia, the George Washington University, the Smithsonian Institution and the Research Center of the Slovenian Academy of Sciences and Arts (ZRC SAZU).

**Note added in proof.**—Since the acceptance of this paper, Kuntner (2005, 2006a, b) has presented phylogenetic analyses, which dispute the tetragnathid placement of nephilines, and elevate the clade (*Clitaetra* (*Herennia*(*Nephila*+*Nephilengys*)) to family rank, Nephilidae (see also Kuntner, 2006c). Accordingly, Platnick's (2006) catalogue lists *Nephilengys hirta* in Nephilidae.

## LITERATURE CITED

- Banks, N. 1898. Arachnida from Baja California and other parts of Mexico. Proceedings of the California Academy of Sciences. Third series. Zoology 1:205–308.
- Bonnet, P. 1958. Bibliographia Araneorum, Vol. 2. Part 4, (N-S). Les Frères Douladoure, Toulouse. Pp. 3027–4230.
- Chickering, A.M. 1955. The genus *Eustala* (Araneae, Argiopidae) in Central America. Bulletin of the Museum of Comparative Zoology 112: 391–518.
- Grasshoff, M. 1970. Die Tribus Mangorini. I. Die Gattungen *Eustala*, *Larinia* s. str., *Larinopa* n. gen. (Arachnida: Araneae: Araneidae-Araneinae). Senckenbergiana Biologica 51:209–234.
- Keyserling, E. 1864. Beschreibungen neuer und wenig bekannter Arten aus der Familie Orbitelae Latr. oder Epeiridae Sund. Sitzungsberichten der Isis zu Dresden 1863:63–98, 119–154.
- Keyserling, E. 1893. Die Spinnen Amerikas. 4. Epeiridae. Volume 4: 209–377. Bauer & Raspe, Nürnberg.
- Kuntner, M. 2005. A revision of *Herennia* (Araneae: Nephilidae: Nephilinae), the Australasian ‘coin spiders’. Invertebrate Systematics 19:391–436.
- Kuntner, M. 2006a. Phylogenetic systematics of the Gondwanan nephilid spider lineage Clitaetrinae (Araneae, Nephilidae). Zoologica Scripta 35:19–62.
- Kuntner, M. 2006b. A monograph of *Nephilengys*, the pantropical ‘hermit spiders’ (Araneae, Nephilidae, Nephilinae). Systematic Entomology 32: DOI: 10.1111/j.1365-3113.2006.00348.x
- Kuntner, M. 2006c. Nephilidae.com: A web resource for Nephilid spiders (Araneae, Araneidea, Nephilidae), version 1.2. Available at <http://www.nephilidae.com/>.
- Levi, H.W. 1977. The American orb-weaver genera *Cyclosa*, *Metazygia* and *Eustala* north of Mexico (Araneae, Araneidae). Bulletin of the Museum of Comparative Zoology 148:61–127.
- Levi, H.W. 2002. Keys to the genera of araneid orb-weavers (Araneae, Araneidae) of the Americas. Journal of Arachnology 30:527–562.
- McCook, H.C. 1894. American Spiders and their Spinningwork, Volume 3, with Descriptions of Orbweaving Species and Plates. Academy of Natural Sciences of Philadelphia. 285 pp.
- Pickard-Cambridge, F.O. 1904. Arachnida—Araneida and Opiliones. In Biologia Centrali-Americana, Zoology. Volume 2: 465–560. Taylor & Francis, London.
- Platnick, N.I. 2005. The World Spider Catalog, Version 5.0. American Museum of Natural History, New York. Online at <http://research.amnh.org/entomology/spiders/catalog/>.
- Platnick, N.I. 2006. The World Spider Catalog, Version 7.0. American Museum of Natural History, New York. Online at <http://research.amnh.org/entomology/spiders/catalog/>.
- Roewer, C.F. 1942. Katalog der Araneae von 1758 bis 1940, bzw. 1954. Vol. 1. P. Budy, Bremen. 1040 pp.
- Scharff, N. & J.A. Coddington. 1997. A phylogenetic analysis of the orb-weaving spider family Araneidae (Arachnida, Araneae). Zoological Journal of the Linnean Society 120:355–434.
- Simon, E. 1895. Histoire naturelle des araignées. Volume 1:761–1084. Encyclopédie Roret, Paris.
- Taczanowski, L. 1873. Les aranéides de la Guyane française. Horae Societatis Entomologicae Rossicae 9:113–150, 261–286.
- Walckenaer, C.A. 1842. Aptères. Histoire naturelle des Insectes, Volume 2. Roret, Paris. 549 pp.

*Manuscript received 17 January 2005, revised 14 September 2005.*