

“THE END OF AN ENIGMA”, A NEW SUBTRIBE AND NOMENCLATURAL NOVELTIES IN ASCLEPIADEAE (APOCYNACEAE: ASCLEPIADOIDEAE)

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Summary: Keller, H. A. & S. Liede-Schumann. 2017. “The end of an enigma”, new subtribe and nomenclatural novelties in Asclepiadeae (Apocynaceae: Asclepiadoideae). *Bonplandia* 26(2): 133-136.

A new name, *Topea* H. A. Keller, is proposed for the genus *Aenigma* H. A. Keller (Apocynaceae) because there is a preexisting phonetic homonym. In addition, based on molecular phylogenetic studies, the new, monogeneric subtribe *Topeinae* H. A. Keller & Liede, endemic to the southern cone of South America, is here described within the tribe Asclepiadeae.

Key words: Nomenclature, phylogeny, taxonomy, *Topea*, *Topeinae*.

Resumen: Keller, H. A. & S. Liede-Schumann. 2017. “El fin de un enigma”, una nueva subtribu y novedades nomenclaturales en Asclepiadeae (Apocynaceae: Asclepiadoideae). *Bonplandia* 26(2): 133-136.

Se propone *Topea* H. A. Keller como nuevo nombre para el género *Aenigma* H. A. Keller (Apocynaceae) por prexistir un homónimo fonético. Además, sobre la base de estudios de filogenia molecular se describe dentro de la tribu Asclepiadeae a la nueva subtribu monogénica *Topeinae* H. A. Keller & Liede, endémica del Cono Sur de América del Sur.

Palabras clave: Filogenia, nomenclatura, taxonomía, *Topea*, *Topeinae*.

Introduction

The genus *Aenigma* H. A. Keller (Apocynaceae: Asclepiadoideae), recently described on the basis of herbarium material collected in the north of Misiones Province (Argentina) and in the Dep. Amambay (Paraguay), consists of two species of twining plants that grow associated with wetlands in the subtropical forest (Keller, 2017). *Aenigma*, however, has been found to constitute an illegitimate generic name because it represents a phonetic homonym of a genus of red algae, *Enigma* Weber-van Bosse (1932). This circumstance, overlooked when

describing *Aenigma*, requires to coin a new name for the genus and to establish two combinations for the species described under the genus up to the present.

The pendent pollinia clearly identify the genus as a member of Asclepiadeae. Of this tribe, three major lineages are found in the Americas, *Asclepias* L. (Asclepiadinae), *Cynanchum* L. (Cynanchinae), and the Metastelmatinae-Orthosiinae-Oxypetalinae-Gonolobinae clade (MOOG-clade sensu Rapini et al., 2003; Liede-Schumann et al., 2005), comprising at present seven subtribes. The morphological discussion in Keller (2017) could clearly rule out Asclepiadinae

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and Cynanchinae as subtribal affiliation, but did not allow to assign the genus to one of the subtribes of the MOOG clade with certainty. For this reason, molecular analyses were conducted to resolve the enigma of the phylogenetic and taxonomical position of the new genus.

Methods

The chloroplast DNA regions *trnT-L* and *trnL-F* intergenic spacers, as well as the *trnL* and *rps16* introns were obtained from both species following the standard procedures described in Liede-Schumann et al. (2013). For vouchers and Genbank numbers, see Table 1. These new sequences were then added to “Metastelma DS1” of Liede-Schumann et al. (2014; M15210 in study 12788 of TreeBase (<http://treebase.org/treebase-web/search/study/summary.html?id=12788>)), which was aimed to provide a taxonomically broad sampling of Asclepiadoideae with emphasis on New World taxa. The resulting dataset was analyzed with Bayesian Inference (BI) and Maximum Likelihood (ML) using the settings described in Liede-Schumann et al. (2014).

Phylogeny

Phylogenetic analysis confirmed the impression gained by morphological observation that the new genus does not fall into any of the described New World subtribes of Asclepiadeae. Instead, the two species form a fully supported monophyletic group, unresolved with *Metastelmatinae* and a likewise unresolved group of *Tassadiinae-Gonolobinae-Oxypetalinae s.l.* (including *Funastrum*) (Fig. 1). Thus, the two species not only constitute a good genus, but also represent an independent subclade within the Asclepiadeae phylogeny.

Therefore, we here propose a new subtribe for this clade, increasing the number of New World subtribes in the MOOG lineage to eight. Of these eight subtribes, four are monogeneric. Of these, *Topeinae* with only two known species is the smallest, with *Pentacyphinae* counting three species (Meve & Liede-Schumann, 2015), *Diplolepineae* 14 species (Hechem et al., 2011), and *Tassadiinae* more than 30 species (Liede-Schumann, unpubl.).

Taxonomic and nomenclatural treatment

***Topeinae* H. A. Keller & Liede, subtrib. nov.**

Typus: *Topea* H. A. Keller

Twining plants with leaves oblong-lanceolate to lanceolate; basis deeply cordate to auriculate. Inflorescences sciadioidal (umbelliform), pendulous, present all the year. Corolla lobes with vibratile trichomes on the adaxial side. Gynostegial corona of five flattened, basally fused staminal lobes. Caudicles sigmoidal; each flank of the corpusculum basally extended into a hyaline appendix. Follicles solitary, pendulous, fusiform, with long pointed apex.

Nomenclatural Type: *Topea patens* (H. A. Keller) H. A. Keller

***Topea* H. A. Keller, nom. nov.:** *Aenigma* H. A. Keller, Lilloa 54(1): 59, 2017, *nom. illeg.*, non *Enigma* Weber-van Bosse (1932), Rhodophyceae.

Type species: *Topea patens* (H. A. Keller) H. A. Keller

***Topea patens* (H. A. Keller) H. A. Keller, comb. nov.:** *Aenigma patens* H. A. Keller, Lilloa. 54(1): 60. 2017.

Holotypus: H. A. Keller & L. J. Rojas 13539 (CTES).

Table 1. Sequences newly obtained for this paper.

Tabla 1. Nuevas secuencias recientemente obtenidas para este documento.

Species	Voucher	<i>trnT-L</i> intergenic spacer	<i>trnL</i> intron and <i>trnL-F</i> intergenic spacer	<i>rps16</i> intron
<i>Topea micrantha</i>	Keller & Rojas 13591 (CTES)	LT960581	LT960579	LT960577
<i>Topea patens</i>	Keller & Rojas 13539 (CTES)	LT960582	LT960580	LT960578

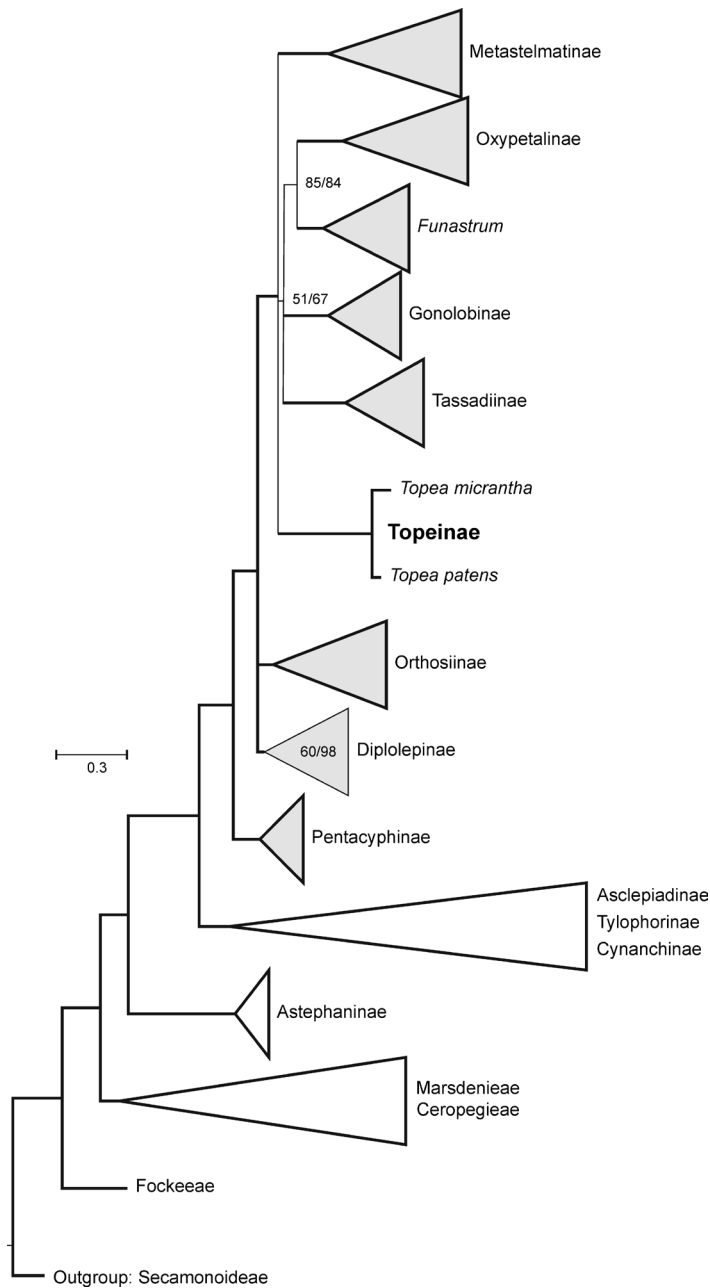


Fig. 1. Position of *Topea patens* and *T. micrantha* in the subfamily Asclepiadoideae. Except for these two taxa, this tree is identical to Fig. 1 in Liede-Schumann *et al.* (2014; M15210 in study 12788 of TreeBase). Recognized tribes and subtribes without new accessions are summarized by triangles and those restricted to the New World are shaded grey. Numbers indicate Maximum Likelihood bootstrap support (BSML)/Bayesian Posterior Probability (PP); groups with BSML > 95 and PP = 1.0 are indicated by bold lines.

Fig. 1. Posición de *Topea patens* y *T. micrantha* en la subfamilia Asclepiadoideae. (A excepción de estos dos taxones, este árbol es idéntico al de la Fig. 1 en Liede-Schumann *et al.* (2014; M15210 en el estudio 12788 de TreeBase). Las tribus reconocidas y las subtribus sin nuevas accesiones se condensan en los triángulos y las restringidas al Nuevo Mundo están sombreadas en gris. Los números indican Maximum Likelihood bootstrap support (BSML)/Bayesian Posterior Probability (PP), los grupos con BSML > 95 y PP = 1.0 se indican mediante líneas gruesas).

Topea micrantha (H. A. Keller) H. A. Keller, **comb. nov.**: *Aenigma micrantha* H. A. Keller, Lilloa 54(1): 64. 2017.

Holotypus: H. A. Keller & L. J. Rojas 13591 (CTES).

Etymology: The Guarani expression *Topea* mean “eyelash”; it was insinuated by an interlocutor *Mbya Guarani* from Misiones Province when appreciating the vibratile trichomes of the corolla of *Topea patens*.

Bibliography

- HECHEM, V., C. I. CALVIÑO & C. EZCURRA. 2011. Molecular phylogeny of *Diplolepis* (Apocynaceae-Asclepiadoideae) and allied genera, and taxonomic implications. *Taxon* 60: 638-648.
- KELLER, H. A. 2017. *Aenigma*, un género sudamericano de Apocynaceae (Asclepiadoideae) con tricomas vibrátiles en la corola. *Lilloa* 54: 58-73.
- LIEDE-SCHUMANN, S., A. RAPINI, D. J. GOYDER & M. W. CHASE. 2005. Phylogenetics of the New World subtribes of Asclepiadeae (Apocynaceae-Asclepiadoideae): Metastelmatinae, Oxypetalinae, and Gonolobinae. *Syst. Bot.* 30: 184-200.
- LIEDE-SCHUMANN, S., M. NIKOLAUS, U. C. SOARES E SILVA, A. RAPINI, R. D. MANGELSDORFF & U. MEVE. 2014. Phylogenetics and biogeography of the genus *Metastelma* (Apocynaceae-Asclepiadoideae-Asclepiadeae: Metastelmatinae). *Syst. Bot.* 39: 594-612.
- MEVE, U. & S. LIEDE-SCHUMANN. 2015. Taxonomy of the Andean genus *Pentacyphus* (Apocynaceae: Asclepiadeae-Pentacyphinae). *Plant Syst. Evol.* 301: 997-1004.
- RAPINI, A., M. W. CHASE, D. J. GOYDER & J. GRIFFITHS. 2003. Asclepiadeae classification: evaluating the phylogenetic relationships of New World Asclepiadoideae (Apocynaceae). *Taxon* 52: 33-50.
- WEBER-VAN BOSSE, A. 1932. *Algues*. *Mém. Mus. Roy. Hist. Nat. Belgique, Hors Sér.* 6(1): 27, V plates.

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