Taiwania 64(3): 217-220, 2019
DOI: 10.6165/tai.2019.64.217

Cynanchum brevipedunculatum, a new species of Apocynaceae from Yunnan, China

Jian-Yong SHEN*, Xing-Da MA, Wen-Guang WANG, Ji-Pu SHI

Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Xishuangbanna 666303, Yunnan, China.
**Corresponding author's email: shenjianyong@xtbg.ac.cn; Phone number: +86 15393816057; Fax: +86 0691-8715464*

(Manuscript received 23 January 2019; accepted 21 May 2019; online published 14 June 2019)

ABSTRACT: *Cynanchum brevipedunculatum* (Apocynaceae), a new species from Menghai, Yunnan, China, is described and illustrated. It is compared with two morphologically similar species, *Cynanchum decipiens* and *C. longipedunculatum*. *Cynanchum brevipedunculatum* differs from the preceeding species in having much bigger leaves, adaxially sparsely strigillose, abaxially glabrous or sparsely strigillose on veins, shorter peduncle and the very distinctive bowl-shaped corona. A comprehensive morphological description of *C. brevipedunculatum* is provided, together with photographs, and a conservation assessment for this rare vine species.

KEY WORDS: Apocynaceae, Asclepiadeae, China, *Cynanchum brevipedunculatum*, Xishuangbanna, Yunnan.

INTRODUCTION

Apocynaceae subfamily Asclepiadoideae is one of the most derived plant groups, comprising about 164 genera with around 3000 species (Endress *et al.*, 2014). The species of the subfamily are characterized by the presence of a pollinarium, enabling the plants to adopt a more efficient and specific pollination mechanism mediated by animals (Endress & Bruyns, 2000). For a long time, the relationships of *Cynanchum* L. and *Vincetoxicum* Wolf were not resolved and the two genera were merged or split depending on the preference of the author (Liede, 1999). In the Old World, the exclusion of *Vincetoxicum* Wolf as a relative of *Tylophora* R. Br. rather than of *Cynanchum* L. was suggested by Liede (1996), a result confirmed by all subsequent studies (e.g., Rapini *et al.*, 2007; Fishbein *et al.*, 2018).

Cynanchum was placed in subtribe Cynanchinae of tribe Asclepiadeae (Endress *et al.*, 2014). Morphologically, the circumscription of *Cynanchum* has always been rather vague (Liede & Kunze, 2002; Liede & Täuber, 2002; Khanum *et al.*, 2016). Typical *Cynanchum* species are twiners with basally cordate leaves and prophylls (a pair of smaller and sometimes differently shaped leaves on extremely reduced short shoots; Liede & Meve, 2013). Latex is white, cream or yellow, but never transparent. Inflorescences are bostrychoid or sciadioidal, but not branched, bearing flowers of 5–10 mm diameter. The corolla lobes are nearly free, and are smooth or papillose adaxially; the gynostegial corona is extremely variable and complex, usually with a basal ringshaped portion of fused staminal and interstaminal parts, often with long appendages and inner ligules (Khanum *et al.*, 2016).

In Flora of China (Li *et al.*, 1995) recorded 57 species of *Cynanchum*, 21 species are now considered to belong to *Vincetoxicum*. Khanum *et al.* (2016) advocated the inclusion of several further genera (including *Adelostemma*, *Graphistemma*, *Holostemma*, *Metaplexis*, *Raphistemma* and *Sichuania* within China) within *Cynanchum* which would bring the number of species in China to 44. Phylogenetic study (Liede *et al.*, 2012; Liede & Meve 2018) revealed that *Biondia*, *Blyttia*, *Diplostigma*, *Goydera*, *Pleurostelma*, *Rhyncharrhena* and *Tylophora* should all be incorporated into *Vincetoxicum*. In this circumscription, *Vincetoxicum* contains 70 species in China (Jiang *et al.* 2018), and is the most species-rich Apocynaceae genus in China.

During extensive botanical studies in Xishuangbanna Prefecture in Yunnan, the authors collected an unknown species in Menghai. This species is similar to *Cynanchum decipiens* and *C. longipedunculatum*, but has much bigger leaves, adaxially sparsely strigillose, abaxially glabrous or sparsely strigillose on the veins, and with a shorter peduncle. After literature review as well as morphological examination, the conclusion was made that this plant represents a new species.

TAXONOMIC TREATMENT

Cynanchum brevipedunculatum J. Y. Shen, ***sp. nov.***
短梗豹藥藤 Fig. 1 & Tab. 1

***Type*: CHINA,** Yunnan, Menghai, Bada, Hesong village, roadside, climbing on the tree, 21°50′N, 100°7′E, alt. 1905 m, 18 Nov. 2018, *Shen Jian-Yong 1352* (holotype: HITBC; isotype: HIB, TAI).

Diagnosis: *C. brevipedunculatum* can be distinguished from its closest morphological matches *C. decipiens* and *C. longipedunculatum*, by several morphological features (Table 1), *C. brevipedunculatum* has bigger (compared to 5–8 × 2–4 cm in *C. decipiens* and ca. 5.6 ×

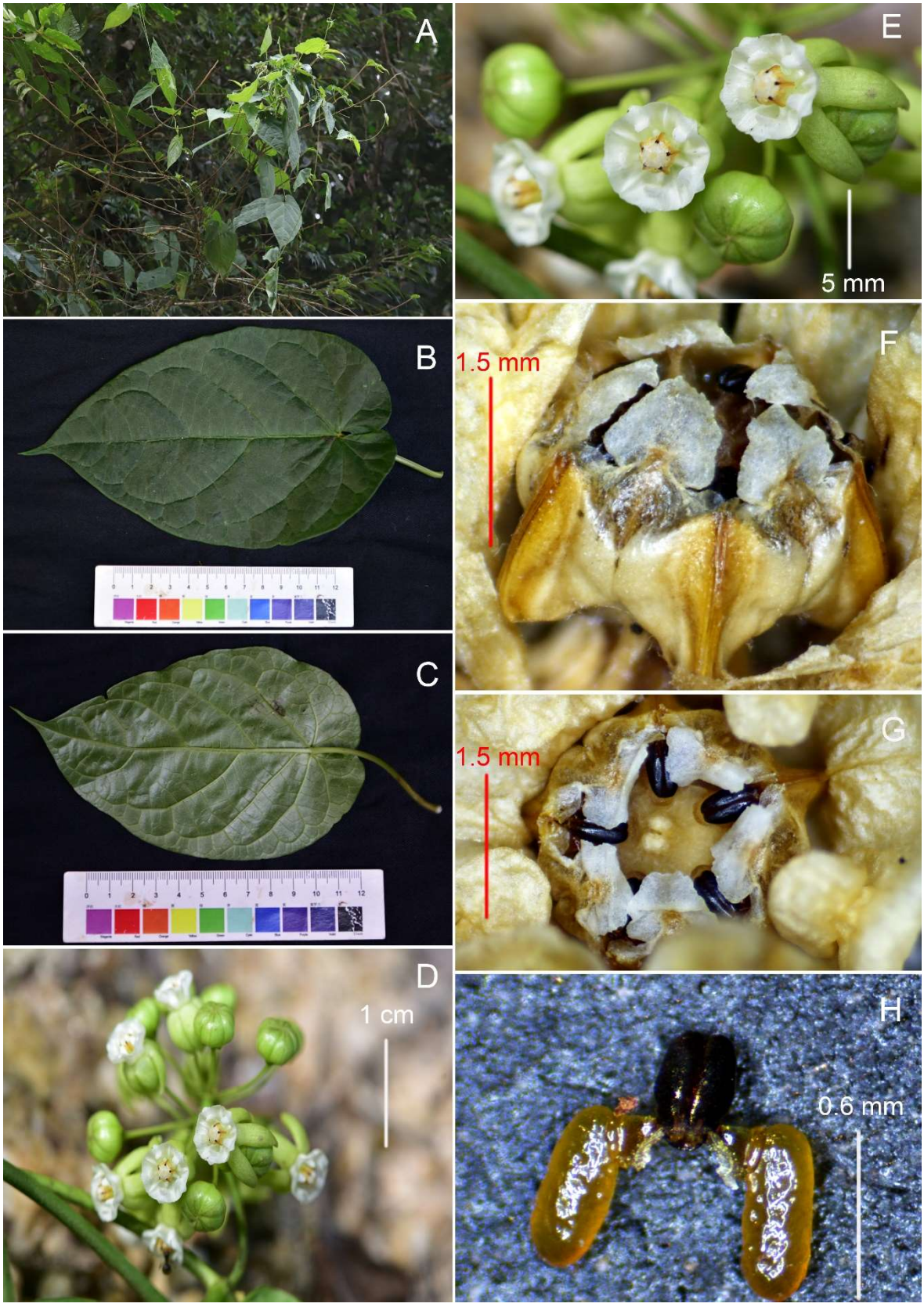

Fig. 1. ***Cynanchum brevipedunculatum*** J. Y. Shen. **A**. Habit. **B-C**. Adaxial and abaxial leaf surface. **D-E**. Inflorescences and flowers. **F**. Gynostegium in side view. **G**. Gynostegium in top view. **H**. Pollinarium.

Table 1. Morphological comparison of ***Cynanchum brevipedunculatum***, ***C. decipiens*** and ***C. longipedunculatum***.

Characters	***C. brevipedunculatum***	***C. decipiens***	***C. longipedunculatum***
Leaf shape	ovate	ovate or ovate-lanceolate	lanceolate
Leaf size (cm)	12–20 × 6–11	5–8 × 2–4	ca. 5.6 × 2.3
Leaf surface	adaxially sparsely strigillose, abaxially glabrous or sparsely strigillose on veins	adaxially and abaxially sparsely puberulent	adaxially puberulent, abaxially with trichomes along veins
Peduncle (cm)	1.8–2.2	4–10	6–9
Corolla	planar to reflexed, green	reflexed, white to reddish	erect to rotate, white
Corona	longer than gynostegium, bowl-shaped, broadly expanded, margin very shallowly 5-lobed, interior with 5 ligules (fleshy appendages)	shorter than gynostegium, cup-shaped, margin shallowly 5-lobed, interior with 5 ligules (fleshy appendages)	longer than gynostegium, cup-shaped, shallowly 5-lobed, interior with 5 ligules (fleshy appendages)

2.3 cm in *C. longipedunculatum*) leaves (12–20 × 6–11 cm), adaxially sparsely strigillose and abaxially glabrous or sparsely strigillose on the veins, and with a shorter (compared to 4–10 cm in *C. decipiens* and 6–9 cm in *C. longipedunculatum*) peduncle (1.8–2.2 cm).

Plants twining, to 4 m high. Branchlets grey-brown, terete, pubescent along a single line. **Latex** white. **Stipules** two per node, leaflike, 11–18 × 5–12 mm. **Leaves** opposite; petiole 3.5–7 cm, sparsely puberulent, with a group of adaxial glands; leaf blade ovate, 12–20 × 6–11 cm, papery, adaxially sparsely strigillose, abaxially glabrous or sparsely strigillose on veins, base deep cordate, lobes usually overlapping, sinus 1.8–3.5 cm deep, apex acuminate, basal veins seven or nine, palmate, secondary veins three to five pairs, pinnate, tertiary veins reticulate, slightly prominent adaxially, flat abaxially. **Inflorescences** two per node, umbel-like, peduncle 1.8–2.2 cm, pubescent along a single line, ca. 20-flowered, basal bracts triangular, glabrous, ca. 0.5 mm long, pedicels 8–15 mm long, pubescent. Flower buds subsphaeroidal, ca. 4–5 mm in diam. **Calyx** basally fused, abaxially pubescent, adaxially glabrous, margin ciliolate, free sepal limbs ovate, ca. 1.5 × 1.2 mm, apex subacute. **Corolla** pale green, reflexed at anthesis, lobes oblong, ca. 5 × 2 mm, apically acute, glabrous outside, inside white puberulent when young, glabrescent. **Corolla tube** ca. 1mm long. **Corona** white, bowl-shaped, much expanded, 3–3.5 mm width, higher than gynostegium, somewhat fleshy, margin shallowly 5-lobed, interior with 5 ovate, fleshy appendages. **Anther appendages** triangular to rounded, entire, incurved. **Gynostegium** sessile, 2–2.5 mm long, ca. 2 mm diam. **Pollinarium**: corpusculum ca. 0.4 mm long, margins of the corpuscular cleft straight, caudicles basally inserted on the corpusculum, ca. 0.1 mm long, flattened, straight, thickened at the insertion of the pollinium; pollinia laterally attached to the caudicles, 0.6 mm long, ovate to round in cross-section, oblong. **Style-head,** raised, 2-lobed, 0.2 mm high, Fruits and seeds not seen.

***Distribution & habitat*:** Currently known only from the type locality and found growing beside the road, not in a protected area, at ca. 1900 m high elevation.

***Phenology*:** Flowers were observed in November.

***Etymology*:** The peduncle of this species is short (1.8–2.2 cm), thus the specific epithet "brevipedunculatum*"* was chosen. Chinese name is "短梗豹藥藤" (duǎn gěng bào yào téng), which means the plant is poisonous and has short peduncle.

***Conservation assessment*:** There is only one known population of *C. brevipedunculatum* in Menghai, Xishuangbanna, Yunnan. All the surrounding forests were surveyed carefully, but no additional populations were identified. Within the single population in Menghai, only two individual plants were observed. Based on the limited population size and restricted distribution of *C. brevipedunculatum,* according to IUCN (2012), this new species should be assessed as Critically Endangered (CR; criteria B1ab (i, v) + 2ab (i, v), D).

***Features and affinities*:** Morphological similarities suggest a relationship among *Cynanchum brevipedunculatum*, *C. decipiens* (Guizhou, Hunan, Sichuan and Yunnan provinces, China) and *C. longipedunculatum* (Sichuan or Hubei province, China); however, *C. longipedunculatum* is known only from the type, which lacks detailed data. *Cynanchum brevipedunculatum* exhibits morphological similiarity to *C. decipiens* and *C. longipedunculatum*, both of which have unifarious stem indumentum, trichomes on the adaxial side of the corolla, cupular corona, and 5 ovate, fleshy appendages inserted into the adaxial face of the corona. The coronas of *C. brevipedunculatum* and *C. longipedunculatum* are longer than the style-head, while the corona of *C. decipiens* is shorter than the style-head. *Cynanchum brevipedunculatum* has ovate, big leaves, while *C. decipiens* and *C. longipedunculatum* display more or less triangular, much smaller leaves. Leaves of *C. brevipedunculatum* are adaxially sparsely strigillose, abaxially glabrous or sparsely strigillose on veins, while they are sparsely puberulent in *C. decipiens* and adaxially puberulent in *C. longipedunculatum*, of which the abaxial veins bear trichomes. *Cynanchum decipiens* and *C. longipedunculatum* have a much longer peduncle than *C. brevipedunculatum.* (Table 1)

ACKNOWLEDGMENTS

This study was supported by the STS Program of the Chinese Academy of Sciences (KFJ-3W-No1), the Conservation and application of National strategic tropical plant resources: theory and practice fund (2017XTBG-F05) and Science & Technology Basic Resources Investigation Program of China: Survey and Germplasm Conservation of Plant Species with Extremely Small Population in South-west China (2017FY100100).

LITERATURE CITED

Endress, M.E., S. Liede, and U. Meve 2014. An updated classification for Apocynaceae. Phytotaxa **159(3):** 175-194.

Endress, M.E. and P.V. Bruyns 2000. A revised classification of the Apocynaceae. Bot. Rev. **66(1):**1-56.

Fishbein, M., T. Livshultz, S.C.K. Straub, A.O. Simões, J. Boutte, A. McDonnell and A. Foote 2018. Evolution on the backbone: Apocynaceae phylogenomics and new perspectives on growth forms, flowers, and fruits. Am. J. Bot. **105(3):** 495-513.

IUCN 2012. IUCN Red List Categories and Criteria: Version 3.1. 2nd ed. Gland, Switzerland and Cambridge, UK.

Jiang, L. Q., Y.Y. Li, X.X. Zhu, Y.H. Wang and H. Peng 2018. *Vincetoxicum xinpingense* (Asclepiadeae, Asclepiadoideae, Apocynaceae), a new species from Yunnan Province, China. Phytotaxa **361(1):** 56-64.

Khanum, R., S. Surveswaran, U. Meve and S. Liede 2016. *Cynanchum* (Apocynaceae: Asclepiadoideae): a pantropical Asclepiadoid genus revisited. Taxon **65(3):** 467-486.

Li P.T., M.G. Gilbert and W.D. Stevens 1995. *Cynanchum.* In: Wu Z.Y. & Raven P.H. (eds.), Flora of China, vol. 16: 205-223. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis.

Liede, S. 1996. *Cynanchum-Rhodostegiella-Vincetoxicum-Tylophora*: new considerations on an old problem. Taxon **45:** 193-211.

Liede, S. 1999. The genera *Cynanchum* and *Vincetoxicum* (Apocynaceae-Asclepiadoideae) in Malesia. Blumea **44:** 471-495.

Liede, S., H.H. Kong, U. Meve and M. Thiv 2012. *Vincetoxicum* and *Tylophora* (Apocynaceae: Asclepiadoideae: Asclepiadeae) - two sides of the same medal: Independent shifts from tropical to temperate habitats. Taxon **61:** 803-825.

Liede, S. and H. Kunze 2002. *Cynanchum* and the Cynanchinae (Apocynaceae - Asclepiadoideae) - A molecular, anatomical and latex triterpenoid study. Organisms Diversity Evol. **2(3):** 239-269.

Liede, S. and U. Meve 2013. The Orthosiinae revisited (Apocynaceae, Asclepiadoideae, Asclepiadeae). Ann. Missouri Bot. Gard. **99(1):** 44-81.

Liede, S. and U. Meve 2018. *Vincetoxicum* (Apocynaceae—Asclepiadoideae) expanded to include Tylophora and allies. Phytotaxa **369(3)**: 129-184.

Liede, S. and A. Täuber 2002. Circumscription of the genus *Cynanchum* (Apocynaceae – Asclepiadoideae). Syst. Bot. **27:** 789-801.

Rapini, A., C.V.D. Berg and S. Liede 2007. Diversification of Asclepiadoideae (Apocynaceae) in the New World. Ann. Missouri Bot. Gard. **94(2):** 407-422.