



Vincetoxicum gongshanense (Apocynaceae), a new species from Yunnan, China

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ABSTRACT: *Vincetoxicum gongshanense* Wen B. Xu & J. Y. Shen (Apocynaceae), a new species from Gongshan County, Yunnan, China, is described and illustrated. It is similar to *V. silvestre* (Tsiang) Meve & Liede, *V. kerrii* (Craib) A. Kidyoo and *V. biondioides* (W. T. Wang) C. Y. Wu & D. Z. Li, but can be distinguished by the leathery leaves, five basal veins, ovate-triangular sepals, yellow corolla, lanceolate corolla lobes, wide triangular corona and reniform pollinia. Photographs, line drawing, distribution, comparison with related species, and a parallel conservation assessment are provided for this species.

KEY WORDS: Apocynaceae, *Vincetoxicum biondioides*, *Vincetoxicum kerrii*, *Vincetoxicum silvestre*, Yunnan, China, *Tylophora*.

INTRODUCTION

The genus *Vincetoxicum* Wolf is distributed in Asia, especially in mountain ranges, and most of the known species occur in China and Japan (Liede, 1996). For a long time, the relationship between *Vincetoxicum*, *Cynanchum* L. and *Tylophora* Wolf in Apocynaceae family has caused great controversy. Some scholars (e.g. Hooker, 1883; Tsiang and Li, 1977; Yamazaki, 1993; Gilbert *et al.*, 1995; Li *et al.*, 1995) once preferred to put the genus *Vincetoxicum* and the closely related genus *Cynanchum* into one genus, based on the continuity of corona structure between *Vincetoxicum* and *Cynanchum*, but Liede (1996) proposed an alternative hypothesis, namely, *Vincetoxicum* is more similar to *Tylophora* than to *Cynanchum*, according to cladistic analysis of morphological and chemical characters. This assumption is increasingly supported by subsequent molecular systematics research (Civeyrel *et al.*, 1998; Sennblad and Bremer, 2000, 2002; Fishbein *et al.*, 2018). Other scholars, further advocated merging *Tylophora* and other small genera into the genus *Vincetoxicum* (Liede-Schumann *et al.*, 2012; Liede-Schumann *et al.*, 2016; Liede-Schumann and Meve, 2018; Endress *et al.*, 2019). The typical characteristics of the expanded genus *Vincetoxicum* are shrubs, erect herbs or herbaceous twiners with translucent latex, linear to ovate leaves, yellowish cream or purplish brown corolla with long flexuous trichomes on the tube, carnosely gynostegial corona of separate staminal lobes or of a ring of connate staminal and laminar interstaminal parts, erect, horizontal or ascending caudicles (Endress *et al.*, 2019).

Therefore, the expanded *Vincetoxicum* includes about 150 species (Liede-Schumann and Meve, 2018), of which nearly 90 species are hitherto known from China (Zhang *et al.*, 2022). Moreover, in recent years, new species of *Vincetoxicum* (Yamashiro *et al.*, 2004; Kidyoo, 2016, 2020;

Jiang *et al.*, 2018; Shah *et al.*, 2018, 2021; Zeng *et al.*, 2021; Ye *et al.*, 2022; Zhang *et al.*, 2022) and *Tylophora* (Meve and Liede, 1996; Tseng *et al.*, 2011; Murugan and Kamble, 2012; Stevens *et al.*, 2016; Rasingam *et al.*, 2018) have been reported continuously, which indicates that more field investigation is needed to fully understand the exact number of *Vincetoxicum* s.l. (sensu lato) species.

In 2022, during a plant resource survey in Gongshan County, Yunnan Province, China, we discovered a special vine plant of the genus *Vincetoxicum*. After consulting relevant literature (Li *et al.*, 1995; Tsiang and Li, 1977; etc), as well as comprehensive morphological character analysis, we finally confirmed that the species is new to botanical science and thus describe and illustrate it herein.

MATERIALS AND METHODS

The fresh specimens and photographs of *Vincetoxicum* species were collected and taken in the wild in 2022 from Yunnan Province, Gongshan County, Bingzhongluo Town, Wengli Village. Photographs were taken with a Nikon D850 digital camera. The collection and production of specimens followed the conventional procedure for plant specimens (Maden, 2004). The specimens were examined in Wuhan Botanical Garden, Chinese Academy of Sciences, and deposited at Herbarium of Wuhan Botanical Garden, CAS (HIB, acronyms according to Thiers, 2015) as well as Herbarium of Xishuangbanna Tropical Botanical Garden, CAS (HITBC). We also logged into the China Virtual Herbarium (<http://www.cvh.ac.cn/>) and JSTOR Global Plants (<https://plants.jstor.org/>), all specimens of the genus *Vincetoxicum* from China were examined.

All description of morphological characteristics of new species, as well as similar species, referred to Endress *et al.* (2019) and Pham *et al.* (2021). The microstructure of

Table 1. Morphological comparison of *V. gongshanense*, *V. silvestre*, *V. kerrii* and *V. biondioides* (Li et al., 1995; Tsiang and Li, 1977)

Characters	<i>V. gongshanense</i>	<i>V. silvestre</i>	<i>V. kerrii</i>	<i>V. biondioides</i>
Leaves	leathery	leathery	membranous	papery
Lateral veins	basal veins 5, lateral veins 5–7 pairs	basal veins 3, lateral veins ca. 4 pairs	4–8 pairs	obscure
Sepals	ovate-triangular, 1 mm long	oblong, ciliate, 1.5 mm long	lanceolate, 1.5 mm long	ovate, 1.2–2 × 0.8–1.3 mm
Corolla colour	yellow	purple, occasionally pale yellow	green yellow, less often purplish to white	yellow-green
Corolla lobes	lanceolate, ca. 3mm long	ovate, 2.5–3.5mm long	oblong, to 6 mm long	ovate, 4–5 × 2.5–3 mm
Corona	wide triangular	ovate, pouched	ovoid	triangular-ovate
Pollinia	reniform	globose	globose	ovoid

pollinarium was observed and photographed using a Nikon SMZ25 stereomicroscope. Conservation status was performed using standards from the International Union for the Conservation of Nature (IUCN Standards and Petitions Committee, 2022).

TAXONOMIC TREATMENT

Vincetoxicum gongshanense Wen B.Xu & J.Y.Shen, *sp. nov.* 貢山娃兒藤 **Figs. 1, 2**

Type: CHINA, Yunnan Province, Gongshan County, Bingzhongluo Town, Wengli Village, at forest edge, climbing on trees, 28.051445°N, 98.599816°E, alt. 1560 m, 24 April 2022, Xu & Shen 220245 (holotype: HIB! isotype: HITBC!).

Diagnosis: *Vincetoxicum gongshanense* is morphologically similar to *V. silvestre*, *V. kerrii* and *V. biondioides* by the habit of vines and linear lanceolate leaves, but can be distinguished by the leathery leaves, five basal veins, ovate-triangular sepals, yellow corolla, lanceolate corolla lobes, wide triangular corona and reniform pollinia. (Table 1)

Description: Lianas to 2 m. latex white. **Stem** green, terete, densely covered with pubescence when young, sparsely covered with pubescence when old. Internodes 3.5–9.5 cm long, 0.7–0.9 mm in diam.; nodes swollen, 1.1–1.9 mm in diam. **Leaves** opposite, simple, 3.8–7.0 cm long; petiole 3–5 mm long, 0.35–0.50 mm in diam., curved, sparsely pubescent; leaves blade linear-lanceolate, leathery, 3.5–6.5 × 0.6–0.9 cm, base rounded, apex acute, adaxial surface dark green, shiny, abaxial surface pale green; margins entire, revolute, glabrous on both surfaces, or margin only pubescent; basal veins usually 5, lateral veins 5–7 pairs, distinct on abaxial surface, adaxial surface vague, glabrous except for puberulous on adaxial midvein. **Inflorescences** axillary, cymules lax, usually bostrychoid, rachis occasionally branched, 3–8 flowers, 2.5–3.5 cm long; peduncles terete, pale green, 15–24 mm long, ca. 0.35 mm in diam., sparsely pubescent; pedicels terete, pale red, 6–9 mm long, ca. 0.2 mm in diam., pubescent; floral bracts lanceolate, usually pale red, 0.4–0.7 mm long, base 0.15–0.2 mm wide, pubescent. **Sepals** free, ovate-triangular, pale red, ca. 1 mm long, 0.4 mm wide at base, apex acute, pubescent outside, subglabrous inside. **Corolla** yellow, rotate, 7–9 mm in diam.; lobes lanceolate, apex twisted to

the right, 2.5–3.2 × 0.8–1.2 mm, usually recurved, glabrous abaxial, densely pubescent adaxial; **Corona** wide-triangular, yellow, glabrous, fleshy, swollen, ca. 0.3 mm high, 0.7 mm wide at base; **Gynostegium** sessile, ca. 1 mm high and in diam.; anther appendages as long as gynostegium, oblong, apex retuse, yellow; style-head flat, ca. 0.8 mm in diam. Pollinaria of two pollinia, each pollinium connected with a corpusculum by a caudicle, pollinium horizontal to corpusculum, reniform; corpusculum chestnut-coloured, oblong, longitudinally grooved, ca. 0.2 × 0.07 mm; caudicles erect, dull yellow, 60 × 10 μm; pollinia transparent, reniform, 0.1 × 0.05 mm; ovaries bifid, glabrous. **Follicles** and seeds not seen.

Distribution & habitat: At present, *Vincetoxicum gongshanense* has only been found at the type locality with over 10 individuals, which are relatively rare, growing at the forest edge at an altitude of about 1560 meters, climbing on trees.

Phenology: Flowers were observed in April at the type locality.

Etymology: The epithet “gongshanense” is derived from the type locality Gongshan County, Yunnan, China. The Chinese name is “貢山娃兒藤”.

Conservation status: At present, only one population of the species has been discovered with a few individuals. According to Guidelines for using the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Committee, 2022), *V. gongshanense* is assessed as data deficient (DD).

Remarks: *Vincetoxicum gongshanense* differs from *V. silvestre* in pinnate basal veins (*vs.* basal veins), ovate-triangular sepals (*vs.* oblong, ciliate sepals), yellow corolla (*vs.* purple corolla, occasionally pale yellow), lanceolate corolla lobes (*vs.* ovate corolla lobes), wide triangular corona (*vs.* ovate corona) and reniform pollinia (*vs.* globose pollinia); differs from *V. kerrii* in leathery leaves (*vs.* membranous leaves), ovate-triangular sepals (*vs.* lanceolate sepals), lanceolate corolla lobes (*vs.* oblong corolla lobes), wide triangular corona (*vs.* ovate corona) and reniform pollinia (*vs.* globose pollinia); and differs from *V. biondioides* in leathery leaves (*vs.* papery leaves), obvious lateral veins (*vs.* obscure lateral veins), lanceolate corolla lobes (*vs.* ovate corolla lobes) and reniform pollinia (*vs.* ovoid pollinia).

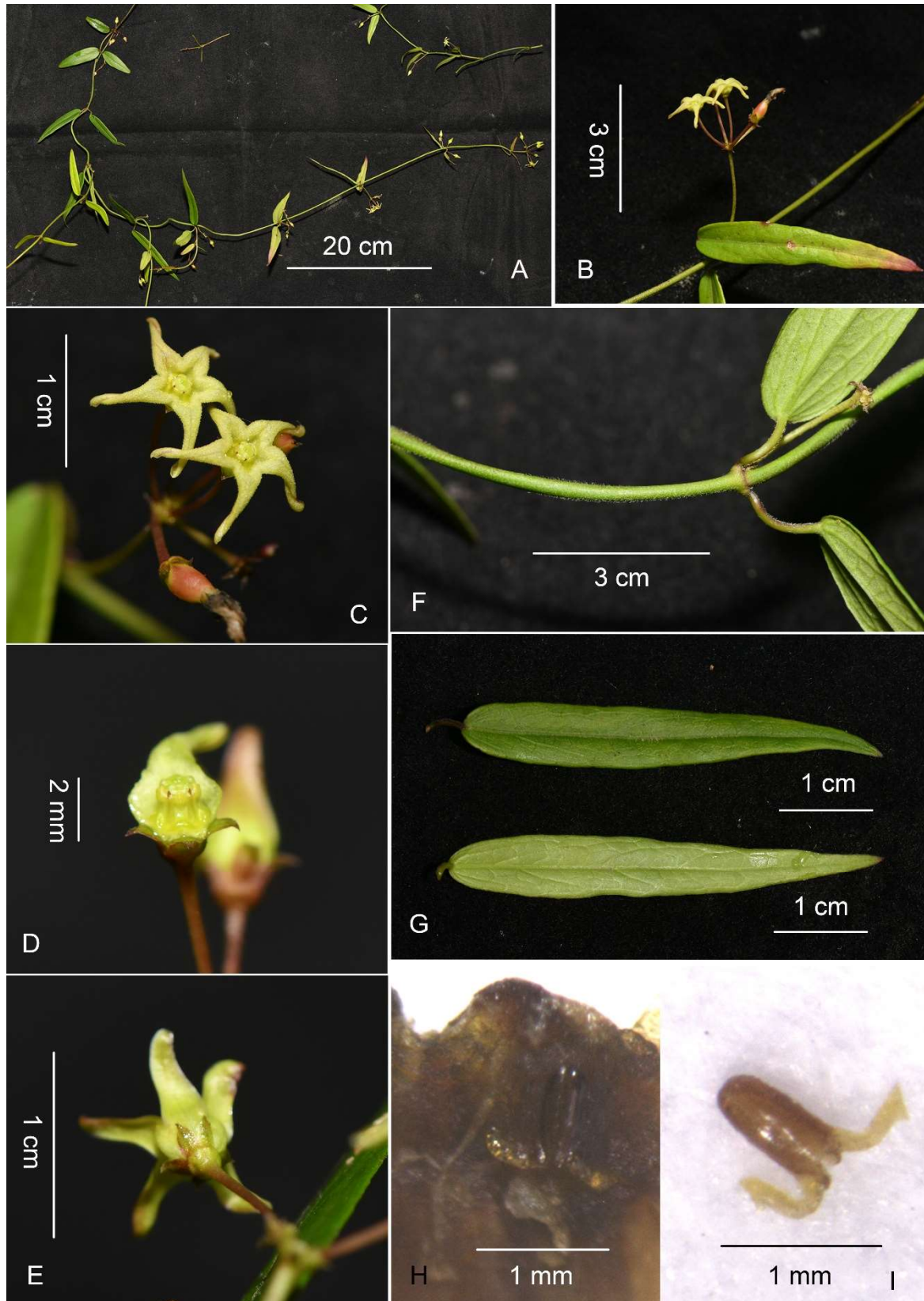


Fig. 1. *Vincetoxicum gongshanense* Wen B. Xu & J. Y. Shen. **A.** Flowering plant. **B.** Inflorescence in lateral view. **C.** Flower in ventral view. **D.** Gynostegium in lateral view. **E.** Sepals. **F.** Branchlets showing dense pubescence. **G.** Leaves showing adaxial (above) and abaxial (below) surface. **H.** Style-head in lateral view showing attached pollinarium **I.** Pollinarium. Photos by Jian-Yong Shen & Wen-Bin Xu.

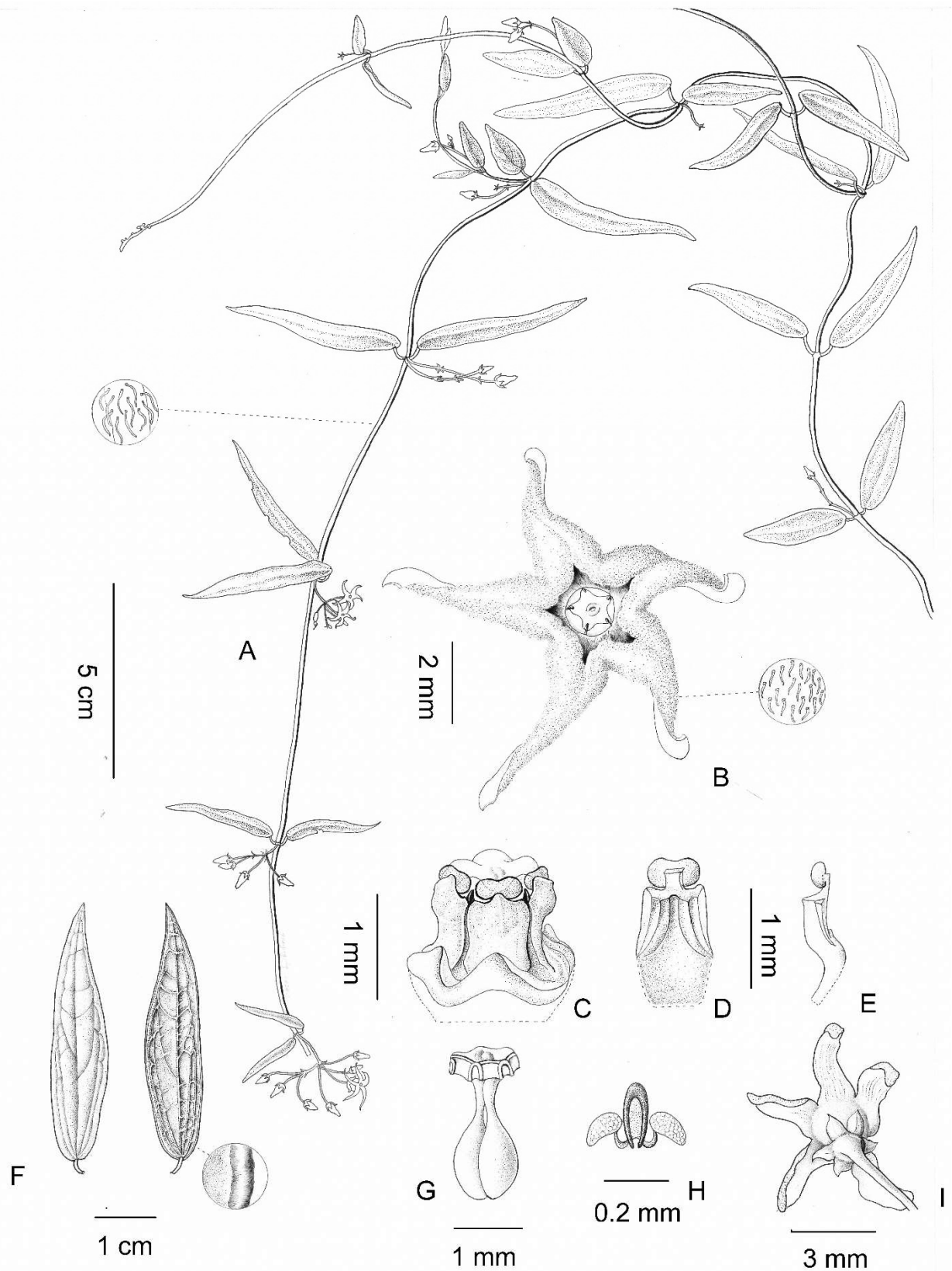


Fig. 2. *Vincetoxicum gongshanense* Wen B. Xu & J. Y. Shen. **A.** Section of trailing plant in habit. **B.** Flower in ventral view. **C.** Gynostegium in lateral view. **D.** Anther in ventral view. **E.** Anther and corona in lateral view. **F.** Leaves showing abaxial (right) and adaxial (left) surface. **G.** Styles and style-head in lateral view. **H.** Pollinia. **I.** Sepals in abaxial view. Drawn by Jing-Jing Yan.



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