



Hoya yingjiangensis (Apocynaceae, Asclepiadoideae), a new campanulate-flowered species from Yunnan, China

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Abstract

Hoya yingjiangensis (Apocynaceae, Asclepiadoideae) from Yunnan Province, China, is described and illustrated. This species possesses a large campanulate corolla, but is distinguished from all the other species of *Hoya* with similar corollas by the peduncle annual, deciduous, and the inflorescence single-flowered. The provisional IUCN assessment of 'Data Deficient' for *H. yingjiangensis* is provided.

Key words: annual deciduous, *Hoya collettii*, IUCN, single flower

Introduction

Hoya R. Brown (1810: 459) (Apocynaceae, Asclepiadoideae) is a large, complicated, Old World genus, with the identities of many species still remaining unclear (Forster *et al.* 1998). Numerous workers have contributed to our understanding of the morphology and phylogeny of the genus (e.g., Wanntorp *et al.* 2006a, 2006b, 2011; Wanntorp & Forster 2007; Wanntorp 2009; Rodda & Simonsson 2010; Trần *et al.* 2011; Wanntorp & Meve 2011). Generally, *Hoya* is recognized by the inflorescence pseudo-umbelliform, composed of one to many flowers, corollas fleshy, pentamerous, coronas staminal, lobes often spreading horizontally and generally with an inner tip appressed to the anthers and a variable outer part with revolute lateral margins, pollinia usually with a conspicuous, pellucid germination zone on their outer margin (but not so in *Hoya* section *Eriostemma* Schlechter [1913: 106]), and seeds fusiform, lacking prominent wings (Hooker 1883; Tsiang & Li 1977; Li *et al.* 1995; Wanntorp 2009). Over 500 names have been published in *Hoya* to date (IPNI 2015), while the number of taxa has been estimated to range between 200 and 300 (Kleijn & Van Donkellar 2001; Wanntorp *et al.* 2014). The genus is most diverse in Indochina and the Malesian region—particularly in Indonesia, the Philippines, and Papua New Guinea—with outliers in broader mainland Asia, Australia, and the Western Pacific (Tsiang & Li 1977; Li *et al.* 1995; Wanntorp *et al.* 2014).

Our understanding of *Hoya* in China has changed considerably over the past few decades. In 1977, Tsiang & Li enumerated 22 species, three varieties, and two forms. In 1995, Li *et al.* recognized thirty-two species and one variety. Since then, *Hoya mekongensis* M.G. Gilbert & P.T. Li (1995: 10) has been treated as a synonym of *H. yuennanensis* Hand.-Mazz. (1936: 1001) (Rodda 2012) and six new species have been described: *H. baishaensis* S.Y. He & P.T. Li (2009c: 155), *H. bawanglingensis* S.Y. He & P.T. Li (2009b: 357), *H. daimenglongensis* S.Y. He & P.T. Li (2012: 170), *H. jianfenglingensis* S.Y. He & P.T. Li (2011a: 343), *H. ledongensis* S.Y. He & P.T. Li (2011b: 161), and *H. persicinicoronaria* S.Y. He & P.T. Li (2009a: 475). Currently, in China, the genus is represented by around 39 species (including two introduced species that were widely cultivated for horticulture) and one variety. Most of them are distributed in the southwestern province and the southeastern coast, including Hainan Province, southern Fujian Province, and Taiwan Province (Tsiang & Li 1977; Li *et al.* 1995). Yunnan Province, located at the southern margin of Himalaya, as well as the northern margin of rainforest, harbors 23 species of *Hoya*, of which four are endemic (Tsiang & Li 1977, 1983; Li *et al.* 1995; He *et al.* 2012).

Recently, a handsome *Hoya* collected by Mr. Wu from Yingjiang Xian, Yunnan Province, China, on the China–Myanmar border, was brought to the first author for identification. It exhibited shining, large, campanulate corollas to 3 cm diam., a character not previously reported from any species in China (Tsiang & Li 1977, 1983; Li *et al.* 1995). We investigated regional revisions of *Hoya* and other literature, which mentioned species with large campanulate corollas (Collett & Hemsley 1890; Schlechter 1913; Tsiang 1936; Pendleton 1951; Li 1994; Pham 2003; Newman *et al.* 2007; Rodda *et al.* 2009) and also communicated with Dr. M. Rodda from Singapore Botanical Gardens, who is currently preparing revisions of *Hoya* from Borneo, Myanmar, Philippines and Vietnam, Papua New Guinea, Brunei, Singapore and other Asian countries. This revealed that the large campanulate corolla is a rather rare character in the genus and species possessing this character are mainly restricted to peninsular Malaysia, Sumatra, Java, Borneo, Brunei, and Singapore. So far the only known species in mainland Southeast Asia is *H. collettii* (Collett & Hemsley 1890: 88; Schlechter 1913: 126), described based on materials from Shan hills in Myanmar and still only known from the type locality. The newly collected *Hoya* from Yingjiang Xian is readily distinguished from *H. collettii* by the characters articulated below and is described and illustrated here as a new species.

Taxonomy

Hoya yingjiangensis J.F. Zhang, L. Bai, N.H. Xia & Z.Q. Peng, *sp. nov.* (Figs. 1, 2)

Similar to H. collettii in that the habit is shrubby and the whole plant glabrous, lamina are succulent, peduncles are short, corollas are broad and campanulate, and sepals are elliptic and concave, but differs in that: 1) internodes are 4–7 cm long (versus shorter than 2 cm in *H. collettii*), 2) leaf blades are oblanceolate with bases cuneate (versus linear oblong with bases rounded in *H. collettii*), 3) flowers are borne one per peduncle (versus flowers numerous per peduncle in *H. collettii*).

Type—CHINA. Yunnan Province: Dehong Dai Zu Jingpozu Zizhizhou, Yingjiang Xian, epiphytes on canopy of big trees in montane rainforest, on the China–Myanmar border, elev. 1600 m, 9 August 2014, *L.W. Wu 20140901* (holotype, IBSC!)

Shrubby epiphyte, forming a highly branched clump, sap milky-white. **Stems** pendulous, up to 1.2 m long, 5–6 mm diam., glabrous, bark dark green when young, turning pale brown with conspicuous black spots when mature, adventitious root not present; internodes 4–7 cm long. **Leaves** opposite, petiole grooved, 6–8 mm × 1–1.5 mm, glabrous, green; lamina oblanceolate, 6–10 × 2.1–2.5 cm, fleshy, succulent, base cuneate, usually decurrent to petiole, apex caudate, glabrous on both sides, green adaxially, greyish green and flecked with irregular small black spots abaxially; when fresh, lateral veins inconspicuous on both sides, mid-vein ribbed abaxially, when dry, lateral veins prominently impressed, pinnate, secondary veins 3–4 on each side, basal most run near the lamina margin, upper most held at an acute angle to mid vein, anastomosing along the lamina margin. **Inflorescence** interpetiolar, consisting of a single flower, bracts interpetiolar, subulate, to 2 mm long, peduncles to 1.5 mm long, dark green, annual deciduous; bracteole borne opposite the bract, broadly triangular, 0.5 × 0.25 mm, glabrous, green; pedicel positively geotropic, to 2 cm long, glabrous, pale green; calyx with five sepals, sepals elliptic, 6–7 × 3–4 mm, deep concave on the upper part, apex obtuse, glabrous on both sides, creamy white to pale green; corolla campanulate, 1.5–1.6 cm tall, 2.2–3 cm diam., glabrous throughout externally, internally lanate in the middle, hairs inconspicuous on the margin, creamy yellow, corolla tube ca. 1.5 × 1.4–1.6 cm, lobes broadly triangular, 10–11 × 7–8 mm, revolute, apices acute; gynostegium ca. 6.5 mm tall, corona lobes five, adnate vertically to gynostegium, fleshy, corona column short, 2 mm long, 4 mm diam. at apex, 2.5 mm diam. at base, glabrous, corona staminal ca. 9 × 8–9 mm, corona lobes very thick, 5 mm tall, apically oblong, concave, short, ca. 8 × 6.5 mm, inner process acuminate, terminating in an erect, acute tip 4 mm taller than the anthers; outer process acute, margin revolute, longitudinally grooved basally; pollinarium erect, ca. 1290 µm long, pollina oblong, compressed, with round apex and base, and prominent pellucid margin, ca. 970 × 460 µm, corpusculum ca. 450 × 250 µm, translator 220–245 µm long; ovary bi-carpellate, conical, 4–5 mm long, each carpel ca. 1.2 mm wide at base, light green. **Fruit** and seeds unknown. All measurements from type material prior to pressing.

Etymology—The specific epithet is derived from the name of type locality of the new species, Yingjiang Xian in Yunnan Province, China.

Distribution, habitat and phenology—*Hoya yingjiangensis* is only known from Yingjiang Xian in Yunnan, where it grows as an epiphyte in the canopy of large rainforest trees as tall as 20 m, in tropical montane forest at 1600 m elevation. This species flowers from Mid-August to late-September. According to local people, fruiting starts in late September.

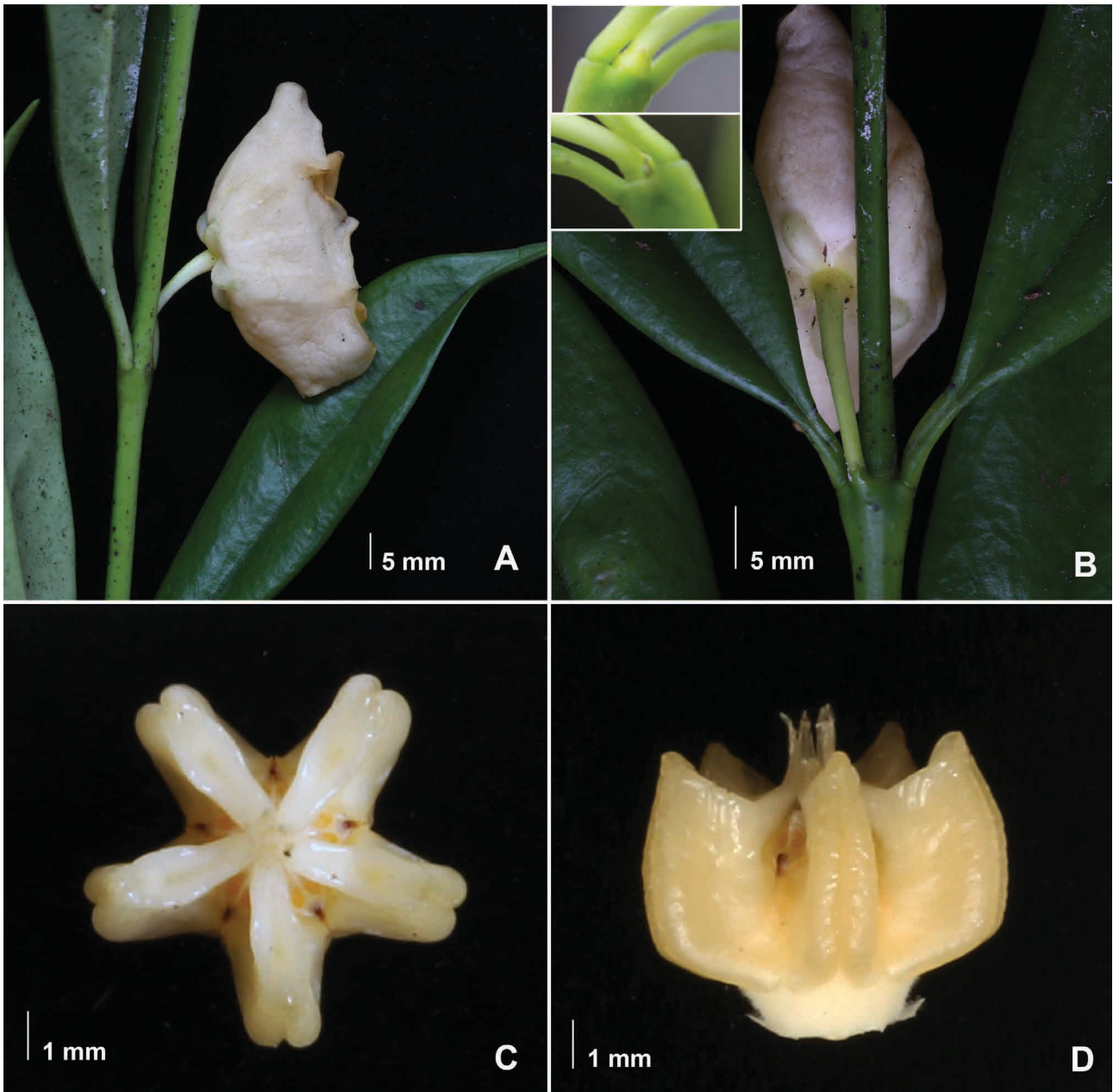


FIGURE 1. *Hoya yingjiangensis* J.F. Zhang, L. Bai, N.H. Xia & Z.Q. Peng: A. Inflorescence, composed of a single flower (side view). B. Inflorescence (basal view (inset [top]: bract, interpetiolar; inset [bottom]: bracteole, borne opposite the bract)). C. Corona (apical view). D. Corona (side view). Photograph: Jingfeng Zhang, based on the type collection before pressing.

IUCN assessment:—*Hoya yingjiangensis* is currently known only from the type locality. No specimens of this species were encountered during an extensive examination of herbarium material at herbaria HITBC, IBSC, KUN, and PE. The IUCN status is proposed as “DD” (Data Deficient), according to the IUCN (2012) guidelines.

Notes:—Depending on the species, the number of flowers in a pseudo-umbel of *Hoya* can vary from only one to several dozens (Hooker 1883; Tsiang & Li 1977; Li *et al.* 1995; Lamb *et al.* 2014) and the peduncles from annual to perennial. Perennial peduncles are more common. They remain persistent after abscission of flowers or fruits and are able to produce flowers in succession for several years. The region of pedicel attachment is characterized by pedicel scars after abscission of flowers or fruits and in some species this region can grow up to 9 cm long after producing dozens of individual flowers (Lamb *et al.* 2014). Annual peduncles abscise after flowering or fruiting. The pseudo-umbel of *H. yingjiangensis* consists of only a single flower. Its peduncles belong to the annual deciduous type and are extremely reduced.

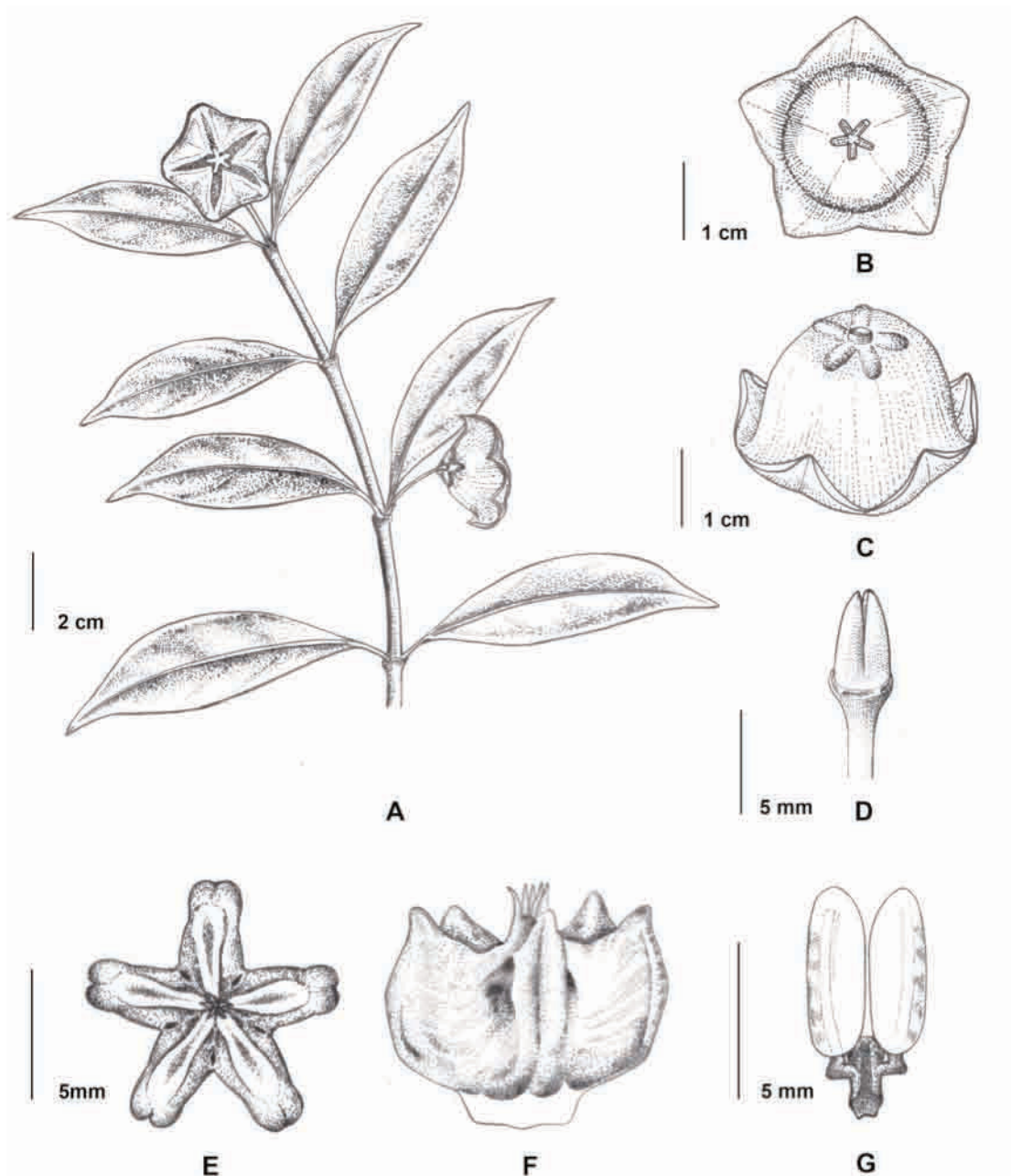


FIGURE 2. Line drawing of *Hoya yingjiangensis* J.F. Zhang, L. Bai, N.H. Xia & Z.Q. Peng: A. Branch with inflorescences. B. Corolla (apical view). C. Corolla (side view). D. Ovaries (side view). E. Corona (apical view). F. Corona (side view). G. Pollinarium. Drawn by Dinghan Cui from the living plant at South China Botanic Gardens, introduced from the type locality.

TABLE 1. Morphological comparison of *Hoya yingjiangensis* and *H. collettii* (the characters of *H. collettii* are based on the protologue by Collett & Hemsley (1890) and measurement of the specimen *Collett 833* [K], which belongs to original material of this species.)

Characters	<i>Hoya yingjiangensis</i>	<i>Hoya collettii</i>
Stem internodes	4–7 cm long	< 2 cm long
Leaf blade	ob lanceolate; 6–10 × 2.1–2.5 cm	linear oblong or linear lanceolate; 7.5–11.3 × 1.4 cm
Leaf base	cuneate, usually decurrent	rounded
Inflorescence	pseudo-umbel consisting of only one flower	pseudo-umbel consisting of several flowers
Corolla	creamy yellow, campanulate, 2.2–3 cm diam.	yellow, campanulate, ca. 1.9 cm diam.
Corolla inside	lanate in the middle, hairs inconspicuous on the margin	glabrous, slightly papillate

Hoya yingjiangensis is mostly similar to *H. collettii*. A comparison of morphology of the two species is provided in Table 1. Both species were collected from rather high elevations (Collett & Hemsley 1890). The type locality of *H. yingjiangensis* is less than 200 km north of that of *H. collettii*. *Hoya yingjiangensis* is the only species in this region that also exhibits large campanulate corollas. However, it is immediately distinguishable in that the pseudo-umbel consists of only a single flower.

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