**Article**

**Hoya longlingensis and H. sichuanensis (Apocynaceae), Two New Species from Southwestern China†**

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**Abstract:** Hoya longlingensis (E.F. Huang) and H. sichuanensis E.F. Huang are two new species of
Apocynaceae from Southwestern China that are described in this study. Morphologically, the two
species resemble H. tamdaoensis Rodda & T.B. Tran and H. lyi H. Lév., respectively. However, H.
longlingensis differs from H. tamdaoensis by its elliptic leaves, mid-vein of leaf blades raised adaxially
and depressed abaxially, lateral veins 2–4-paired, corolla yellow-green, outer angles of corona convex
and spreading outside obviously. While H. sichuanensis differs from H. lyi by its obovate leaves,
leaf apex rounded and base cuneate, petioles 1–3.5 cm long and ca. 3 mm in diameter, calyx lobes
triangular, and corona whitish.

**Keywords:** Apocynaceae; Asclepiodoideae; China; Hoya longlingensis; H. sichuanensis; Marsdenieae

1. Introduction

Hoya R. Br. is a large genus in the tribe Marsdenieae, subfamily Asclepiodoideae of
Apocynaceae [1], with more than 300 species distributed from China and Southeast Asia to
Oceania [1,2], and 32 species were recorded in *Flora of China* [2]. In the past decade, multiple
new species or newly recorded species of this genus have been discovered in Southwestern
China resulting from extensive field investigations conducted [3–11]. Many new species
of this genus were reported from the adjacent areas of China [12–20]. We collected two
unidentified Chinese Hoya species in Sichuan and Yunnan provinces during our recent
expeditions in 2018 and 2021. After detailed morphological comparisons among congeneric
species recorded from China and adjacent areas, it was concluded that the two species were
new to science, thus they were formally described below.

2. Materials and Methods

In addition to the field work conducted in China, the present study also included
investigations of Hoya material from herbaria CDRI, E, IBSC, KUN, P, and PE. Herbarium
abbreviations cited here follow the Index Herbariorum [21]. Morphological characters
of leaves, inflorescences, and flowers of relevant Hoya species were photographed and
measured (Figures 1–3).
Figure 1. *Hoya longlingensis* (E.F. Huang). (A) Habit; (B) Leaves; (C,D) Inflorescence; (E) Flower (top view); (F) Flower (bottom view); (G) Corona (top view); (H) Pollinarium; (I) Corona (side view); (J) Pedicel, calyx, and ovaries; (K,L) Ovaries.
Figure 2. *Hoya sichuanensis* (E.F. Huang). (A,B) Habit; (C) Leaves; (D,E) Inflorescence; (F) Flower (top view); (G) Flower (bottom view); (H) Pedicel, calyx, and ovaries; (I) Calyx lobe; (J) Corona (left: top view; right: side view); (K) Pollinarium; (L) Ovaries.
3. Results and Discussion

**Taxonomic Treatments**

*Hoya longlingensis* E.F. Huang, sp.nov.

**Type:** China, Yunnan Province, Longling Hsien, Longjiang Town, Santaishan Village, near the roadside, under forests, 24°50′04″ N, 98°45′48″ E, at an elevation of 2136 m, 7 April 2021, E.F. Huang 202104070013 (Holotype: IBSC).

**Diagnosis:** The species is morphologically similar to *Hoya tamdaoensis* Rodda & T.B. Tran, but differs by its elliptic-shaped leaves, mid-vein of leaf blades raised adaxially and
depressed abaxially, lateral veins of leaf blades 2–4-paired, corolla yellow-green, outer angles of corona convex and spreading outward obviously.

**Description.** Epiphytic lianas. Stems 1–2 m long, 1.2–2 mm in diameter, usually 2–6 branched, pubescent, sometimes rooting on stems. Leaves opposite; lamina elliptic, 3.5–7.5 × 2–3 mm, fleshy, wine-red when young, dark green adaxially and yellow-green abaxially when mature, base cuneate to rounded, apex acuminate or with a short caudate, margin entire, pubescent adaxially, glabrous and densely glandular abaxially; mid-vein obviously on both surfaces, raised adaxially, depressed abaxially, secondary veins 2–4 pairs or sometimes invisible on both surfaces, sometimes anastomosing near the margin; petioles recurved, 7–15 mm long, 1.5–2 mm in diameter, pubescent. Inflorescences axillary pseudumbels, 3–15-flowered; peduncle much longer than pedicels, 8–12 cm long, 1.3–1.6 mm in diameter, green to dark green; pedicels 1.8–2.2 cm long and 0.9–1.1 mm in diameter, green, subglabrous. Calyx lobes ovate-triangular, 1.6–1.9 × 1.2–1.5 mm, margin entire, apex acute or acuminate, subglabrous or sparsely pubescent. Corolla rotate, flat, yellow-green, 1.7–2.2 cm in diameter, densely pubescent adaxially, glabrous abaxially, lobes oblong to narrowly triangular, 5.1–5.7 mm long and 1–1.5 mm wide, margin recurved, apex acute to rounded, revolute. Corona yellow-green to slightly white, ca. 9 mm in diameter, lobes 5, stellate spreading, fleshy, 3.7–4.2 long and 2.3–2.7 mm wide, sub-rough in top view, inner and outer angles convex and spreading outside obviously. Pollinia clavate, ca. 0.75 × 0.3 mm, base cuneate, apex truncate, narrowing towards the base, sterile edge all along the outer edge of the pollinium, translator arms attached at the centre of the corpusculum. Ovaries 2, attached to each other below the lower 3/4, oblong, ca. 2 mm long, ca. 0.8 mm wide, green, glabrous. Follicles and seeds unknown.

**Distribution and Habit.** *Hoya longlingensis* is known only from its type locality, Longling Hsien, Yunnan Province, China (Figure 4). It is an epiphytic liana that occurs in broad-leaved evergreen forests at an elevation of 2136 m. It is usually epiphytic on stems of the Fagaceae species at a height of over 10 m.

![Figure 4. Distribution of *Hoya longlingensis* (blue square) and *H. sichuanensis* (red circular).](image)

**Etymology.** *Hoya longlingensis* is named after its type locality, found in Longling Hsien in the Yunnan Province, China.

**Taxonomic discussion.** *Hoya longlingensis* E.F. Haung is morphologically similar to *H. tamdaoensis* Rodda & T.B. Tran, a species reported recently from Vietnam [18]. Both *H. longlingensis* and *H. tamdaoensis* exhibit leaves wine-red when young, leaf apex usually caudate, petioles recurved, peduncle up to 10 cm long, corolla rotate and flat, ca. 2 cm
in diameter, densely pubescent adaxially and glabrous abaxially, and margin recurved. However, *H. longlingensis* is an epiphytic liana and twining usually on the stems of other trees (Figure 1A), in contrast *H. tamdaoensis* is a lithophytic climber [18]. Additionally, *H. longlingensis* can be distinguished from *H. tamdaoensis* further by its lamina elliptic (Figure 1A,B) (vs. oblong-lanceolate) and densely glandular abaxially (Figure 1B) (vs. not glandular), mid-vein raised adaxially and depressed abaxially (Figure 1B) (vs. depressed adaxially and raised abaxially), secondary veins 2–4 pairs (Figure 1B) (vs. 4–7 pairs), the calyx lobes ovate-triangular (Figure 1F) (vs. broadly triangular), corolla yellow/green (Figure 1C–F) (vs. white), and the outer angles of the corona convex and spreading outwards obviously (Figure 1G,I) (vs. not spreading outwards).

*Hoya sichuanensis* E.F. Huang, sp.nov.

**Type:** China. Sichuan Province, Ya-an Hsien, Yucheng District, Daxing Town, Gaojia Village, on stone slopes near roadsides, 29°59'37" N, 103°01'59" E, at an elevation of 780 m, 3 October 2018, E.F. Huang 201810030003 (Holotype: IBSC).

**Diagnosis:** *Hoya sichuanensis* (E.F. Huang) is morphologically similar to *Hoya lyi* Levl., but differs by its lamina usually obovate, apex rounded and base cuneate, petioles 1–3.5 cm long and 2.8–3.1 mm in diameter, calyx lobes triangular, and corona white.

**Description:** Lithophytic climber. Stems up to 3–5 m in length, 2–3 mm in diameter, pubescent, internodes usually shorter than leaves, conspicuously rooting along stems. Leaves opposite; lamina obovate or rarely oblong, 6–14.5 × 3–4.5 mm, fleshy, dark green adaxially, yellow-green abaxially, base cuneate or rarely rounded, apex rounded or rarely obtuse, margin entire, pubescent on both surfaces or sometimes subglabrous on mature leaves; mid-vein obviously on both surfaces, lateral veins 4–5 pairs or sometimes invisible on both surfaces; petioles recurved, 1–3.5 cm long, 2.8–3.1 mm in diameter. Inflorescences axillary pseudumbels, 5 to many-flowered, globose when many-flowered; peduncle longer than pedicels, 4–6 cm long, pubescent, brown; pedicels 2.5–3.2 cm long, 0.8–1.2 mm in diameter, green to yellow-green or slightly white, subglabrous. Calyx lobes triangular, 1.6–1.9 × 1.4–1.7 mm, margin entire, sparsely pubescent. Corolla rotate, white to yellow-white or green-white, 2.0–2.3 cm in diameter, densely pubescent adaxially, glabrous abaxially, lobes triangular, 7.5–8.5 mm long and 6.6–7.2 mm wide, margin recurved, apex rounded, revolute. Corona white, 6.8–7.3 mm in diameter, 2.9–3.2 mm high, lobes 5, stellate spreading, 2.8–3.1 × 2.9–3.2 mm, fleshy, broadly ovate in top view, outer angle sub-truncate to broadly rounded, inner end acuminate, the inner tips red or slightly rosy. Pollinia oblong, ca. 0.8 × 0.25 mm, base cuneate, apex truncate, narrowing towards the base at the lower half part, sterile edge all along the outer edge of the pollinium, translator arms attached at the centre of the corpusculum. Ovaries 2, attached to each other below the lower 2/3, oblong, ca. 2 mm long, ca. 0.7 mm wide, light green, glabrous. Follicles and seeds unknown.

**Distribution and habit.** *Hoya sichuanensis* is known from multiple wild populations in the Rainy Zone of West China, which is located along the west brim of the Sichuan Basin, in Sichuan Province, China (Figure 4). It can be found usually climbing on the slopes or cliffs near roadsides, at the elevation of 600–1000 m.

**Etymology.** *Hoya sichuanensis* is named after its type locality, Sichuan Province, China.

**Paratype.** China. Sichuan Province, Pengzhou, Danjingshan, 31°5'30.44" N, 103°50'8.37" E, on the cliff near roadsides, at an elevation of 832 m, 8 September 2021, E.F. Huang 202109080021 (IBSC).

**Taxonomic discussion.** *Hoya sichuanensis* is morphologically similar to *H. lyi* Levl., a species widely distributed in China, Laos, and Vietnam [22]. Both *H. sichuanensis* and *H. lyi* exhibit the following traits: rooting stems, many-flowered axillary pseudumbels, corolla rotate, usually white in color, densely pubescent adaxially and glabrous abaxially, margin recurved, corona broadly ovate in top view, outer angle sub-truncate to broadly rounded, inner end acuminate. However, *H. sichuanensis* can be distinguished from the latter in having lamina usually obovate in shape (Figure 2A–C) (vs. oval to elliptic or oblong; Figure 3A,B), apex rounded and base cuneate or rarely rounded (Figure 2A–C) (vs. an apex that is usually acute and a base that is rounded; Figure 3A,B), petioles 1–3.5 cm...
long and approximately 3 mm in diameter (Figure 2C) (vs. 3–10 mm long and 1–1.5 mm in diameter; Figure 3A), calyx lobes triangular and approximately 1.6 mm wide at the base (Figure 2G–I) (vs. narrowly triangular; Figure 3E), corona white in color (Figure 2B,D–F,J) (vs. ivory white with a purple centre; Figure 3D,E,G).

**A key to the *Hoya* species mentioned above:**

1 Epiphytic liana ................................................................. 2

1 Lithophytic climber .......................................................... 3

2 Lamina elliptic, apex acuminate or with a short caudate; Corolla yellow-green; Corona yellow-green to slightly white ................................................................. *H. longlingensis*

2 Lamina oval to elliptic or oblong, apex usually acute; Corolla white; Corona ivory white with purple centre ................................................................. *H. lyi*

3 Lamina obovate or rarely oblong, base cuneate or rarely rounded, apex rounded or rarely obtuse; Corona lobes broadly ovate in top view, outer process apex sub-truncate to broadly rounded ................................................................. *H. sichuanensis*

3 Lamina oblong-lanceolate, base attenuate-rounded, apex caudate; Corona lobes rhombic in top view, outer process apex rounded ................................................................. *H. tamdaoensis*

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