



Ceropegia polytricha, a new species of Apocynaceae from Yunnan, China

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ABSTRACT: *Ceropegia polytricha*, a new species from Yimen, Yunnan, China, is described and illustrated. The species is presently placed in *Ceropegia* sect. *Chionopegia*. Morphologically, it is similar to *C. dolichophylla* and *C. sinoerecta* in its tubular corolla with a trichome ring at the throat of the dilated part, narrowly triangular corolla lobes, and interstaminal lobes that form a shallow basal cup and are divided into pairs of narrowly triangular teeth at the apex, but clearly differs in its densely pilose stems and leaf blades, and longer corolla lobes. A comparison table of related species is provided.

KEY WORDS: *Ceropegia dolichophylla*, *Ceropegia* sect. *Chionopegia*, *Ceropegia sinoerecta*, morphology, distribution, Yimen.

INTRODUCTION

Traditionally, the genus *Ceropegia* L. was recognized as comprising approximately 200 species, divided into 21 sections by Huber (1957), with a distribution primarily in Africa, extending into tropical Asia and Oceania (Li *et al.*, 1995; Albers and Meve, 2002). However, molecular phylogenetic studies by Meve and Liede (2002, 2004, 2007) revealed that the stapeliads (formerly considered a distinct group) are nested within *Ceropegia*. Recent phylogenetic analyses (Bruyns *et al.*, 2017) have expanded the genus to include over 700 species across 63 sections, incorporating the traditionally recognized *Brachystelma* R. Br. species and succulent stapeliads. However, a recent study proposes an alternative approach: excluding the monophyletic stapeliads (comprising 31 genera and 357 species) from an expanded *Ceropegia* while retaining the polyphyletic *Brachystelma* (Gilbert, 2020). In China, 24 *Ceropegia* species have been documented, comprising 17 traditional *Ceropegia* species, 2 former *Brachystelma* species, and 5 newly described species attributable to the traditional *Ceropegia* lineage (Li *et al.*, 1995; Wu *et al.*, 2019; Ma *et al.*, 2022a, 2022b, 2023; Xie *et al.*, 2023; Luo *et al.*, 2023, 2024). Among these, four species are classified under *C.* sect. *Tiloris* H. Huber, while the remaining 20 species fall within *C.* sect. *Chionopegia* H. Huber.

Ceropegia sect. *Chionopegia*, established by Huber (1957), is predominantly distributed in the Himalayan region, spanning from Pakistan and India eastward to China. Key diagnostic characters include fleshy roots (lacking tubers), stems that typically die back to subterranean roots during dry seasons, and well-developed, papery, non-succulent leaves. A total of 37 *Ceropegia* species are classified within this section (Bruyns *et al.*, 2017; Kidyoo and Paliyavuth, 2017; Kambale and Yadav, 2019; Murugesan *et al.*, 2019; Kidyoo, 2021; Murugesan and Mao, 2021; Kishor *et al.*,

2022; Luo *et al.*, 2023, 2024).

During botanical explorations in the Luzhi River valley, Yunnan Province, southwestern China, an unknown *Ceropegia* species was collected. This species belongs to *C.* sect. *Chionopegia* and morphologically resembles *C. dolichophylla* Schltr. and *C. sinoerecta* M. G. Gilbert & P. T. Li in its tubular corolla with a trichome ring at the throat of the dilated part, narrowly triangular corolla lobes, and interstaminal lobes that form a shallow basal cup and are divided into pairs of narrowly triangular teeth at the apex. Following a comprehensive literature review and detailed morphological examination, we confirm that this specimen represents a new species, which we formally describe herein.

TAXONOMIC TREATMENT

Ceropegia polytricha X. D. Ma & J. Y. Shen, *sp. nov.*

Figs. 1 & 2 A–C

Type: CHINA, Yunnan Province, Yimen County, Luzhi Town, Zhela Village, twining around branches in the thickets, 24°31'N, 101°58'E, alt. 2318 m, 2 September 2024, Xing-da Ma & Yi-qiang Yin 4263 (holotype: HITBC0135779).

Diagnosis: *Ceropegia polytricha* can be easily distinguished from *C. dolichophylla* in having densely pilose stems (vs. glabrous), broadly lanceolate and densely pilose leaf blades (vs. linear-lanceolate, adaxially sparsely pubescent, abaxially glabrous), longer corolla lobes (2.5–2.7 cm vs. 1–2.2 cm). It can be distinguished from *C. sinoerecta* by having twining stems (vs. erect), densely pilose and larger leaf blades (5.5–8 × 1.8–3 cm vs. adaxially densely puberulent, abaxially sparsely pubescent on veins only, 2–5 × 0.6–1.6 cm), longer corolla lobes (2.5–2.7 cm vs. 1.4–1.5 cm).

Perennial, twining herbs. Roots 7–21, fleshy, fusiform, 6–23 cm long, 4–5 mm in diameter. Stem slender, terete, greenish or pale reddish-brown, usually

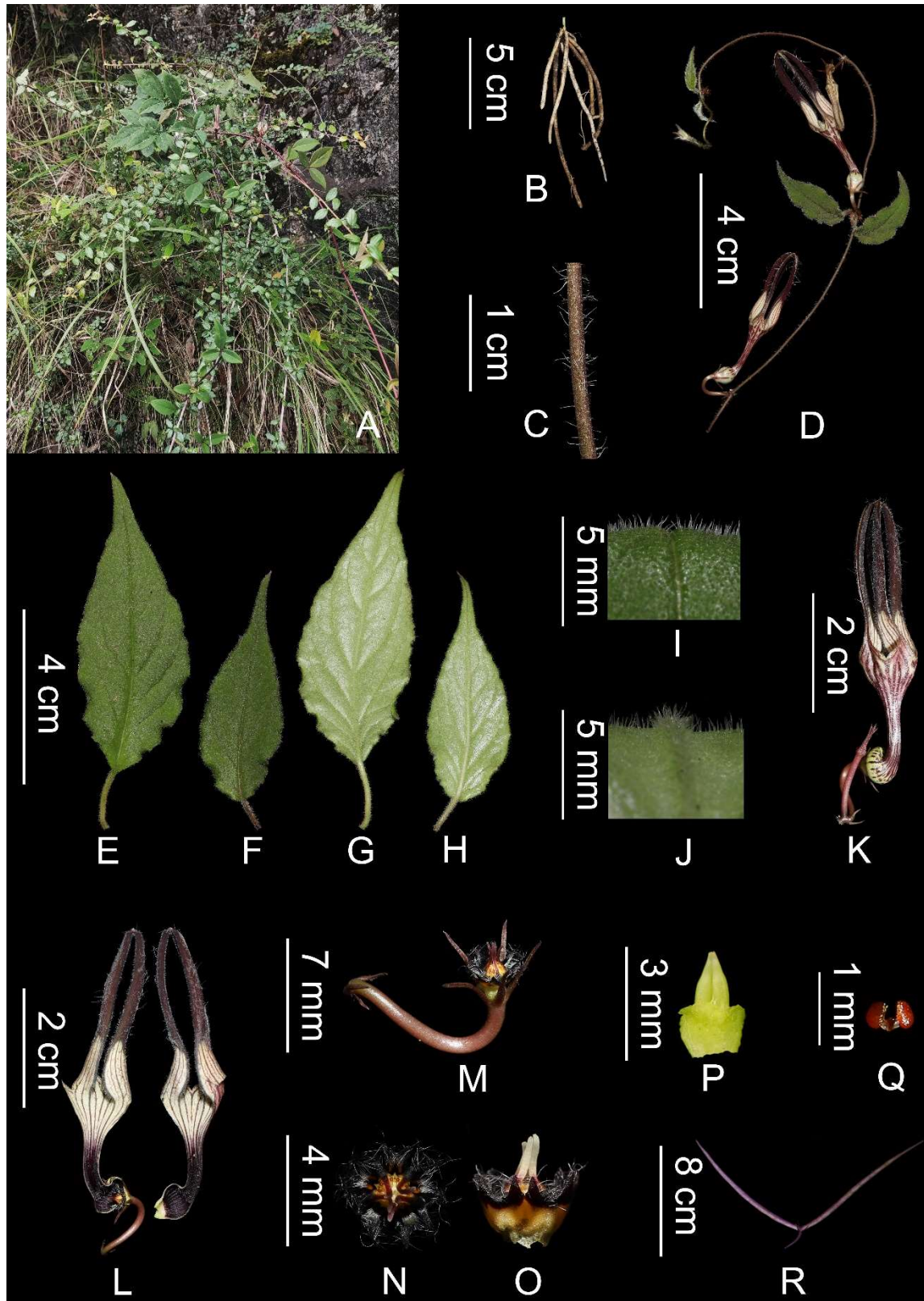
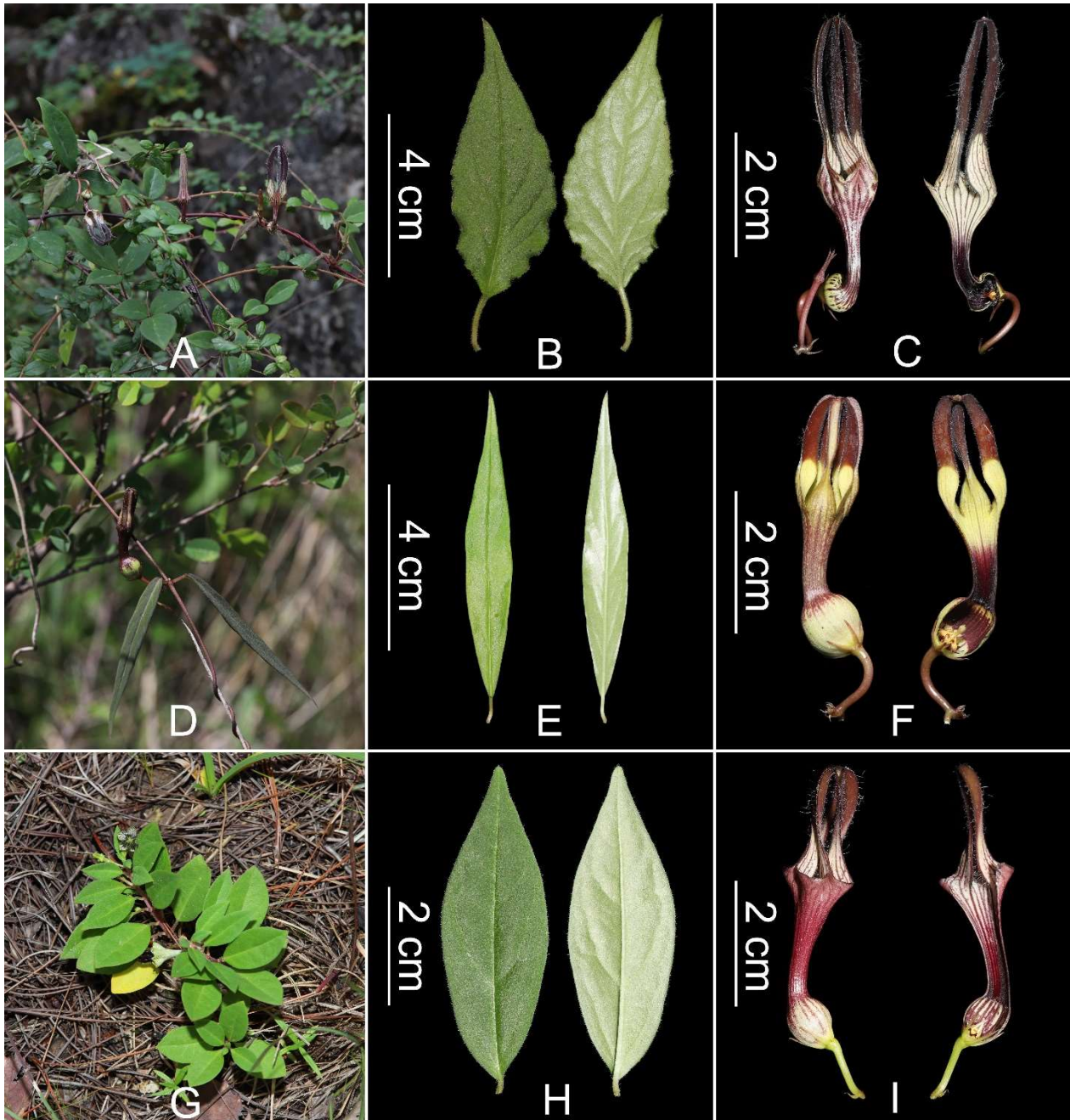


Fig. 1. *Ceropegia polytricha*. **A.** Habitat. **B.** Roots. **C.** Stem showing the pilose. **D.** Branch. **E–H.** Adaxial and abaxial leaf surfaces. **I–J.** Adaxial and abaxial leaf surfaces enlarged showing the pilose. **K.** Inflorescence. **L.** Longitudinal section of the flower. **M.** Inflorescence with corolla removed. **N.** View of the gynostegium from the top. **O.** Side view of the gynostegium. **P.** Ovary. **Q.** Pollinarium. **R.** Follicle.

**Table 1.** Comparison of *C. polytricha*, *C. dolichophylla* and *C. sinoerecta*.

Characters	<i>C. polytricha</i>	<i>C. dolichophylla</i>	<i>C. sinoerecta</i>
Stem	twining, densely pilose	twining, glabrous	Erect, uniformly finely puberulent
Leaf shape	broadly lanceolate	linear-lanceolate	elliptic
Leaf size	5.5–8 × 1.8–3 cm	5–12 × 0.5–2 cm	2–5 × 0.6–1.6 cm
Leaf apex	caudate-acuminate	acuminate	acute
Leaf margin	slightly undulate	entire	entire
Leaf surface	densely pilose	adaxially sparsely pubescent, abaxially glabrous	adaxially densely puberulent, abaxially sparsely pubescent on veins only
Corolla lobes length	2.5–2.7 cm	1–2.2 cm	1.4–1.5 cm

**Fig. 2.** Morphological comparisons of the habit, leaf and flower of *Ceropegia polytricha* (A–C), *C. dolichophylla* (D–F) and *C. sinoerecta* (G–I).



branched, up to 2.5 m long, 1–2 mm in diameter, internodes 4–8 cm long, densely pilose. Leaves opposite; petioles terete, 0.9–1.5 cm long, ca. 1.5 mm in diameter, greenish or pale reddish-brown, densely pilose, adaxially decurrently grooved; leaf blades broadly lanceolate, 5.5–8 × 1.8–3 cm, papery, densely pilose, adaxially green, abaxially pale green, base broadly cuneate, apex caudate-acuminate, margin slightly undulate; midvein adaxially flat or slightly depressed, abaxially prominent, lateral veins 5–6 pairs, obliquely ascending, reticulate near margin, adaxially slightly depressed, abaxially slightly convex. Inflorescence one per node, extra-axillary, 1–3-flowered cymes; peduncle ca. 1 mm long, ca. 1 mm in diameter, sparsely pilose; bracts 2–3, subulate, 1–3 mm long, pale reddish-brown, apex acuminate, sparsely pilose; pedicel ca. 1 cm long, ca. 1 mm in diameter, pale reddish-brown, glabrous. Sepals 5, subulate, ca. 4 × 1 mm, apex acuminate, pale reddish-brown, margin ciliate. Corolla tubular, 4.7–5.2 cm long, strongly curved; tube 2.3–2.6 cm long, dilated at base, ca. 5 mm long, ca. 5 mm in diameter, then narrowing into a tube of ca. 2 mm in diameter and gradually widening upwards, mouth 7–9 mm in diameter, exterior yellowish-green with reddish-brown stripes and bands, glabrous, interior maroon or reddish brown except throat, throat yellowish-green with reddish-brown stripes, with a ring of trichomes at the throat of dilated part; lobes narrowly triangular, 25–27 × 7–8 mm, slightly narrowed in the middle, strongly revolute along the midrib, exterior yellowish-green with reddish-brown stripes, glabrous, interior reddish-brown in the middle and upper part, yellowish-green with reddish-brown stripes in the lower part, densely pilose, apically connate. Corona biseriata; interstaminal lobes 5, ca. 2.2 mm long, joined to form a shallow cup at base, ca. 3 mm in diameter, yellow, divided into pairs of narrowly triangular teeth at apex, dark red-brown, covered with white trichomes; staminal lobes 5, linear-lanceolate, ca. 2.5 mm long, ca. 0.4 mm in diameter, translucent, proximal part incumbent upon dorsal surface of stamens, reddish, distal part connivent-erect, white, apex rounded, glabrous. Pollinia brownish, ovoid, ca. 0.3 × 0.15 mm, attached to brownish corpusculum by short translator arms. Ovary conical, ca. 1.2 mm long, 0.4 mm wide in the middle, glabrous. Follicles in pairs, cylindrical, 8–10 cm long, ca. 4 mm wide in the middle, yellowish-green or reddish brown, glabrous.

Phenology: Flowers and follicles were observed in September.

Etymology: The name “*polytricha*” is derived from Greek *poly-* (“many”) and *-tricha* (“hairy”), meaning “densely hairy”. This epithet refers to the stems, leaves, peduncles, corolla lobes, and interstaminal corona lobes of the species, which are densely pilose.

Distribution and habitat: This new species is currently known only from Zhela Village, Luzhi Town, Yimen County, Yunnan Province, China, where it twines around branches in dense thickets.

Conservation assessment: During the three comprehensive surveys of the Luzhi River valley in Yunnan Province, China from 2022 to 2024, we identified only a single population of *Ceropegia polytricha*, which was sporadically distributed around thickets near farmlands and roads. Local villagers frequently cultivate crops and graze livestock in these areas, inevitably causing habitat degradation for this newly discovered species. Based on the IUCN Red List Categories and Criteria (version 16, IUCN Standards and Petitions Committee, 2024), this species should be assessed as “Critically Endangered (CR)”.

Note: *Ceropegia polytricha* shares morphological similarities with *C. dolichophylla* (Fig. 2 D–F) and *C. sinoerecta* (Fig. 2 G–I) in possessing a tubular corolla tube adorned with a ring of trichomes at the throat of the dilated part, narrowly triangular corolla lobes, and interstaminal lobes that are fused into a shallow cup at the base and further divided into paired, narrowly triangular teeth at the apex. However, consistent diagnostic differences exist between these species (Table 1). Among *Ceropegia* sect. *Chionopegia* species in China, *C. polytricha* is unique due to its densely pilose stems and leaves, as well as its distinctive leaf and corolla lobe morphology.

In order to facilitate identification, we provide a diagnostic dichotomous key of the 24 species of *Ceropegia* known from China.

Identification key to species of *Ceropegia* in China

1. Corolla campanulate to subrotate, lobes stellately spreading 2
 - Corolla tubular with a dilated base and funnellform lobes, lobes connate at the tip 3
2. Plants to 15 cm tall; inflorescence racemelike, many flowered *C.edulissima*
 - Plants to 50 cm tall; inflorescence umbellate, few flowered *C. kerrii*
3. Tuber well developed, up to 3 cm in diameter 4
 - Tuber absent 5
4. Leaf blade apex acuminate; corolla length up to 1.5 cm ... *C. aridicola*
 - Leaf blade apex acute; corolla length ca. 1 cm *C. jinshaensis*
5. Interstaminal corona lobes entire 6
 - Interstaminal corona lobes 2-toothed 7
6. Corolla lobes linear *C. pubescens*
 - Corolla lobes spatulate *C. hookeri*
7. Leaf blade glabrous on both surfaces 8
 - Leaf blade pubescent on both surfaces; or only adaxially and abaxially along the midvein; or along the midvein only 10
8. Leaf blade base cuneate and slightly decurrent *C. eshanensis*
 - Leaf blade base rounded to cordate 9
9. Corolla lobes nearly linear with spatulate tips, ca. 2 cm long *C. trichantha*
 - Corolla lobes spatulate, ca. 1 cm long *C. angustilimba*
10. Leaf blade pubescent on the midvein and glabrous elsewhere *C. teniana*
 - Leaf blade pubescent on both surfaces, or adaxially pubescent and abaxially along midvein 11
11. Erect or prostrate herbs, ca. 20 cm in height *C. sinoerecta*
 - Twining vines, usually exceeding 1 m in height 12
12. Corolla tube internally glabrous 13
 - Corolla tube internally villous at dilated base 17
13. Corolla tube externally pubescent *C. jilongensis*
 - Corolla tube externally glabrous 14
14. Corolla lobes glabrous *C. muliensis*
 - Corolla lobes with long-ciliate margins 15



15. Leaf blade base subcordate; peduncle glabrous *C. driophila*
– Leaf blade base rounded to broadly cuneate; peduncle hirsute 16
16. Stem glabrous; corolla lobes ovate *C. salicifolia*
– Stem villous; corolla lobes linear-lanceolate *C. monticola*
17. Corolla tube villous throughout entire dilated base *C. mairei*
– Corolla tube with a ring of trichomes at the throat of dilated part 18
18. Corolla throat distinctly narrower than inflated base *C. luzhiensis*
– Corolla throat equal to or wider than inflated base 19
19. Corolla lobes ca. 5 mm long, 1/4 as long as the corolla tube *C. exigua*
– Corolla lobes more than 10 mm long, more than 1/2 as long as the corolla tube 20
20. Leaf blade ovate, oblong, or broadly lanceolate, 2–4 times as long as broad 21
– Leaf blade linear-lanceolate or linear, 7–10 times as long as broad 24
21. Leaf blade densely pubescent on both surfaces; peduncle extremely short; corolla lobes ca. 1 cm long 22
– Leaf blade adaxially pubescent and abaxially along midvein; peduncle 5–35 mm long; corolla lobes more than 2 cm long 23
22. Leaf blade broadly lanceolate, ca. 3 times as long as broad; corolla lobes longer than corolla tube *C. polytricha*
– Leaf blade ovate, ca. 1.5 times as long as broad; corolla lobes shorter than corolla tube *C. christenseniana*
23. Leaf blade broadly lanceolate, ca. 4 times as long as broad; corolla lobes oblong *C. longifolia*
– Leaf blade ovate, 1.5–2 times as long as broad; corolla lobes linear *C. sunhangiana*
24. Corolla lobes abruptly narrowed above or near middle *C. stenophylla*
– Corolla lobes gradually narrow from base to apex *C. dolichophylla*

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