

Didymocarpus dissectus sp. nov. (Gesneriaceae) from Fujian, eastern China

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A new species of Gesneriaceae, *Didymocarpus dissectus* Fang Wen, Y. L. Qiu & Y. G. Wei, from Fujian province, China, is described and illustrated. It is similar to *D. heucherifolius* in flower shape, but can be easily distinguished by leaf blade shape, split extent of calyx and equal calyx lobes, indumentum of corolla and number of staminodes.

Didymocarpus Wall. (Gesneriaceae) has been considered to consist of about 180 species (Wang et al. 1998), but the genus is difficult to circumscribe. For example, two species, *Didymocarpus heucherifolius* Hand.-Mazz. and *D. cortusifolius* (Hance) W. T. Wang, look very similar in habit, especially in vegetative organs, with the exception of flower color. The latter, however, is a closer relative to the genus *Gyrocheilos* W. T. Wang and to *Allocheilos guangxiensis* H. Q. Wen, Y. G. Wei & S. H. Zhong than to *D. heucherifolius* (Möller et al. 2011). The genus has recently decreased in number of species, since e.g. *D. bonii* Pellegr., *D. hancei* Hemsl., *D. mollifolius* W. T. Wang and *D. niveolanosus* D. Fang & W. T. Wang have been transferred to *Petrocodon* Hance. Thus, at present *Didymocarpus* should contain between 70 and 80 species (Vitek et al. 2000, Weber et al. 2000, 2011a). However, China has 31 species and three varieties distributed in south and southwest China on basis of the restricted conception of *Didymocarpus* s.l., divided into two sections; sect. *Didymocarpus* and sect. *Heteroboaea* Benth. (Wang 1990, Wang et al. 1998, Li et al. 2004).

In 2012, two of the authors found some peculiar Gesneriaceae plants growing on a rocky slope near a steam in a limestone gorge close to Fuzhou city, Fujian province, China. After consulting relevant literature (Kiew et al. 1988, Weber 1989, Wang 1990, Kiew 1995, Wang et al. 1998, Vitek et al. 2000, Weber et al. 2000, Li et al. 2004, Skog et al. 2005, Wei et al. 2010, Möller et al. 2011) and herbarium specimens of *Didymocarpus* (Weber et al. 2000), 'World checklist of Gesneriaceae' (Skog et al. 2005) and 'The genera of Gesneriaceae' (Weber et al. 2007), we found the gross morphology of these newly discovered plants to be similar to *D. heucherifolius* Hand.-Mazz. However, they differ significantly from the latter by several non-overlapping

or distinct characters referring to the leaf blade, calyx, corolla and staminodes. Therefore, the population obviously represents an undescribed new taxon. We describe and illustrate it here and compare the distinguishing characteristics between *Didymocarpus dissectus* sp. nov. and *D. heucherifolius*.

Didymocarpus dissectus Fang Wen, Y. L. Qiu, Jie Huang & Y. G. Wei sp. nov. (Fig. 1, 2)

Differs from D. heucherifolius in leaf blade margin irregularly and distinctly 3- or 4-lobed in distal 1/3–1/2, lobes irregularly and distinctly 2- or 3-lobed in distal 1/3–1/2, lobelet oblong-triangular or spatulate, apex acute, basal veins 6–7 or more, calyx 5-parted to the base and lobes equal, corolla glabrous, and staminodes 2.

Type: China. Fujian province, Fuzhou, Rixixiang. Endemic to Fujian province, China, on moist limestone rock face in evergreen broad-leaved forest, located in the subtropical monsoon region, 26°21'05"N, 119°16'14"E, 104 m a.s.l., 6 May 2011, Yan-Lian Qiu and Jie Huang, CSJT110506 (holotype: IBK, isotype: BJFU).

Etymology

The epithet *dissectus* refers to the margin of the leaf blade being obviously dissected.

Description

Perennial acaulescent herb. Rhizome inconspicuously compressed, rounded to cylindrical, 1.1–3.5 cm long, 0.6–1.0 cm in diameter. Leaves basal, 8–10 or more; petiole 2.5–7.0 cm, 0.18–0.40 cm in diameter, densely villous; leaf blade chartaceous, ovate-triangular, elliptical-triangular to

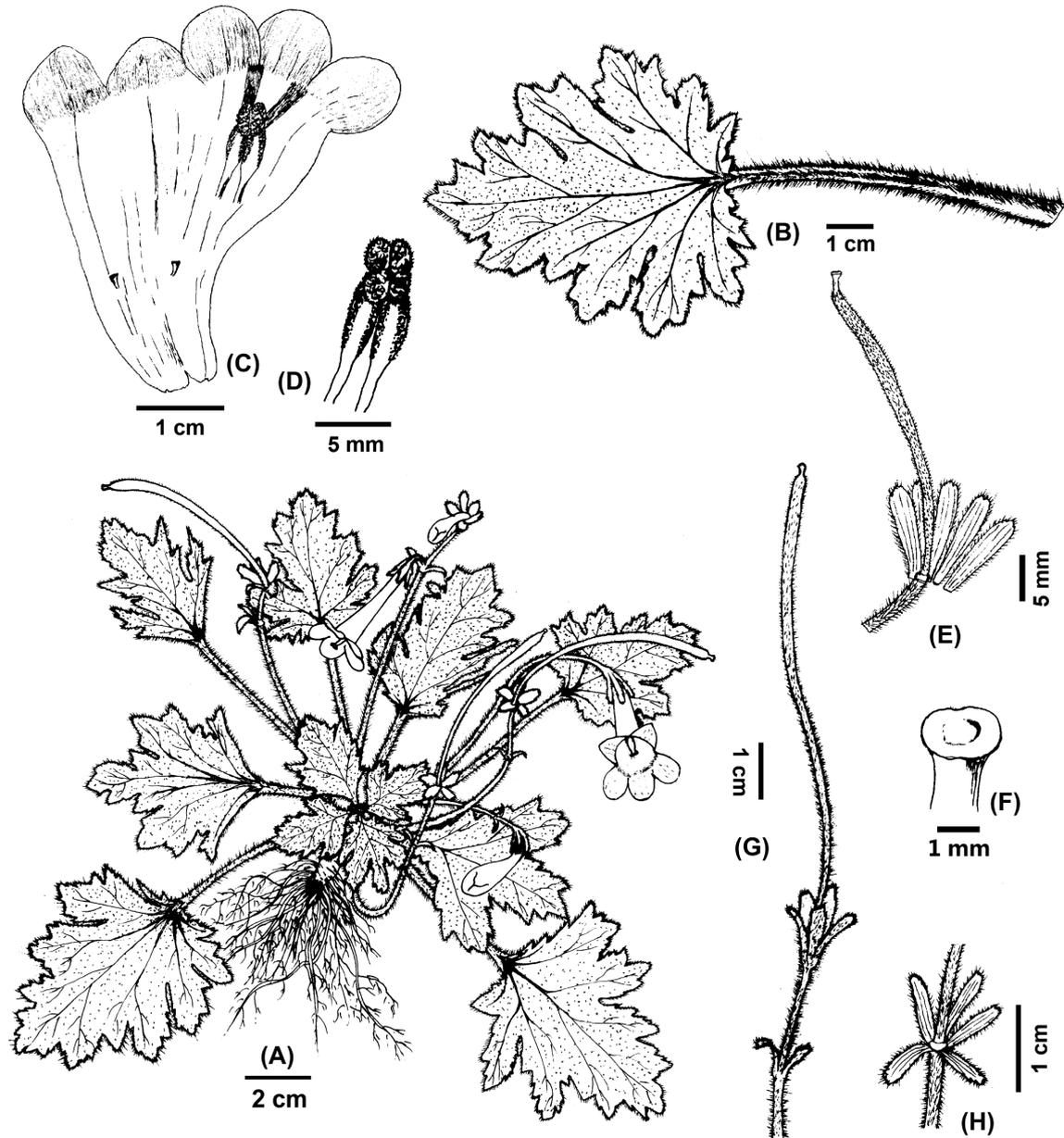


Figure 1. *Didymocarpus dissectus* sp. nov. (A) habit, (B) top view of leaf, (C) corolla opened with stamens and staminodes, (D) stamen, (E) pistil, ovary, style and opened calyx lobes, (F) stigma, (G) young capsule, (H) calyx lobes and disc of young capsule. Drawn by Mr Qi Wei, from the holotype.

broadly ovate, 4.5–8.0 × 3.7–6.8 cm, adaxially and abaxially pilose, eglandular, with margin irregularly and distinctly 3- or 4-lobed in distal 1/3–1/2 and lobes irregularly and distinctly 2- or 3-lobed in distal 1/3–1/2, lobelet oblong-triangular or spatulate, ciliate, truncate or slightly cordate at base, acute at apex; basal veins 6–7 or more, lateral veins 2 or 3 on each side of midrib. Cymes axillary, lax, 3–8, (1–)2–4 or slightly more-flowered; peduncle slender, (4.5–)6.0–10.0 cm long, 2.0–2.5 mm in diameter, spreading villous and glandular-pubescent; bracts 2, opposite, lanceolate to linear-ovate, 7.0–9.0 × 2.5–3.2 mm, with entire margin, ciliate. Pedicel 0.8–1.6 cm, villous, eglandular. Calyx 5-parted to the base; lobes equal, oblanceolate or broadly oblanceolate, 8–12 × 2.5–3.5 mm, villous outside, glabrous

inside, with entire margin but with apex 3–4-denticulate on each side. Corolla 2.6–3.8 cm long; orifice 1.2–1.6 cm in diameter, dark pink to fuchsia; white throat inside with two brightly yellow strips, outside and inside glabrous; tube infundibuliform-tubular, 2.2–2.8 × 0.8–1.1 cm; limb distinctly 2-lipped, adaxial lip 2-parted to the base; lobes 5–6 mm long, ca 10 mm in diameter at base, obliquely liguliform or triangular; lip 3-parted to the base, partitions rounded or oblong, 9–10 × 0.8–1.0 mm. Stamens 2, adnate to ca 1.9–2.1 cm above the corolla base; anthers compressed-semicircular, 4.0–4.5 × 1.6–1.8 mm, slightly constricted at the middle, white bearded; filaments 8–9 mm long, straight, the upper 2/3 of filaments pale brown, swollen-flaky, with glands, the lower 1/3 of filaments white,

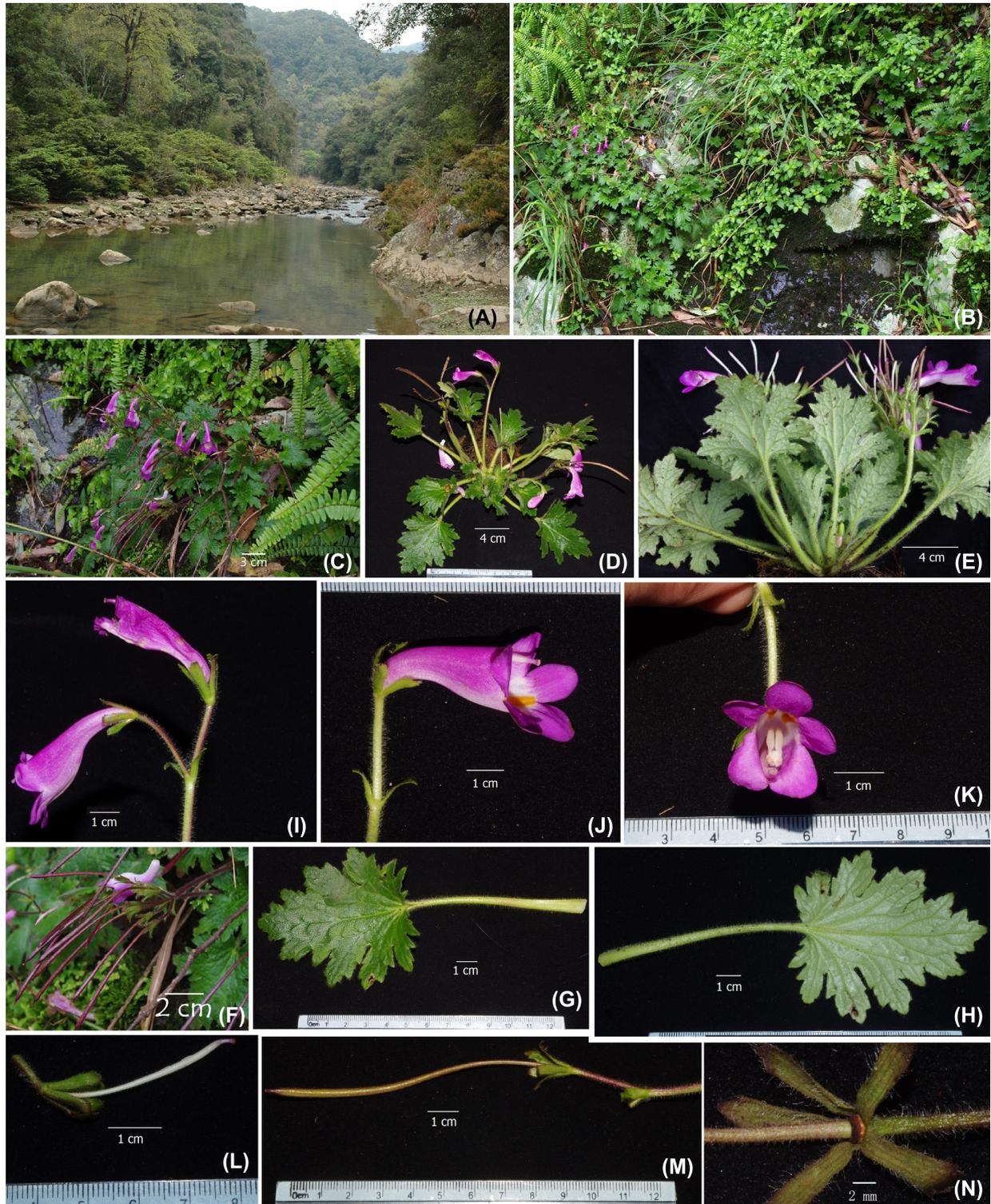


Figure 2. *Didymocarpus dissectus* sp. nov. (A) type locality, (B) habitat, (C) mature plants, (D) habit, (E) plant for showing petioles and abaxial leaf blade surfaces, (F) capsules, (G) adaxial leaf blade surface, (H) abaxial leaf blade surfaces, (I) cyme, (J) lateral view of corolla, (K) frontal view of corolla, (L) pistil and calyx, (M) extending capsule, (N) disc and calyx lobes.

cylindrical, glabrous; staminodes 2, adnate to 1.2–1.3 cm above the corolla base, ca 2 mm long, with narrow base, gradually swollen to apex, apex compressed capitate, brightly brown, glabrous. Disc annular, ca 1 mm high. Pistil 6.5–8.5 cm long; ovary white, ca 6.2–8.2 cm long, cylindrical,

with narrow base, gradually swollen to style, suddenly constrictive, puberulent; style purplish-red, ca 3 mm long, glabrous. Stigma 1, translucent, depressed-globose, undivided, centrally sunken. Capsule when young purplish-red, linear-cylindrical, puberulent, 8–10 cm long.

Table 1. Comparison of the diagnostic characters of *Didymocarpus dissectus* sp. nov. and *D. heucherifolius*.

Characters	<i>D. dissectus</i>	<i>D. heucherifolius</i>
Leaf blade margin	irregularly and distinctly 3- or 4-lobed in distal 1/3–1/2, lobes irregularly and distinctly 2- or 3-lobed in distal 1/3–1/2, lobelet oblong-triangular or spatulate; ciliate	multi-lobed, with lobules triangular, margin irregularly denticulate to serrate; not ciliate
Leaf blade apex	acute	rounded
Basal veins and lateral veins of leaf blade	basal veins 6–7 or more, lateral veins 2 or 3 on each side of midrib	basal veins 4 or 5; lateral veins 3 or 4 on each side of midrib
Bracts	lanceolate to linear-ovate	elliptic
Calyx	5-parted to the base, lobes equal, villous outside, margin entire but apex 3–4-denticulate on each side	base slightly united, calyx tube ca 2 mm long, lobes unequal, puberulent to glandular puberulent outside, margin sparsely denticulate
Corolla indumentum	glabrous outside and inside	puberulent outside, glabrous inside
Staminodes	2	3



Figure 3. *Didymocarpus heucherifolius*. (A) habitat, (B) habit, cymes and calyx lobes, (C) vertical view of corolla, (D) frontal view of corolla, (E) mature capsules, (F) buds, (G) lateral view of corolla, (H) pistil and buds.

Distribution, ecology and conservation status

Didymocarpus dissectus grows only on outcrops of shaded moist limestone slopes under subtropical evergreen broad-leaved forests in a gorge in Fujian province (Fuzhou city), 70–110 m a.s.l. Before the authors confirmed this species as new to science, it was known as *D. heucherifolius* for many years. However, *D. heucherifolius* is a widespread species, distributed in south Anhui, west Fujian, northeast Guangdong, southeast Hubei, Jiangxi and west Zhejiang (Wang et al. 1998). We have visited the locus classicus of this new species many times. All plants, no more than 1000 individuals, are clustered together in a fairly narrow range in a gorge near Fuzhou city. We propose that *D. dissectus* should be provisionally considered as ‘Critically Endangered’ (CR, B2a + E) according to the IUCN red list criteria (IUCN 2001).

Phenology

Flowering occurs in May and the fruiting period occurs in June and July.

Similar species and notes

Didymocarpus dissectus is closely related to *D. heucherifolius*, but can be easily distinguished by its dissected leaf blade margins, basal veins of leaf blade 6–7 or more, bracts lanceolate to linear-ovate, calyx 5-parted to the base and lobes equal, corolla glabrous, and staminodes 2. A morphological comparison between the two species is given in Table 1 and Fig. 1–3.

Actually, the generic belonging of *D. heucherifolius* is remain dubious. It belongs to *Didymocarpus* sect. *Heteroboaea* Benth. in the sense adopted by ‘Flora of China’ (Wang et al. 1998), but this section was transferred to *Henckelia* Spreng., and renamed as *Henckelia* sect. *Heteroboaea* (Benth.) A. Weber & B. L. Burtt by Weber et al. (2000). Because of the different and special characters of *D. heucherifolius*, it should be excluded from *Didymocarpus*, but it has not yet been transferred to any other genus in the most recent revisions. In addition, there are other problematic species within *Didymocarpus*, including *D. cortusifolius* (Hance) W. T. Wang, *D. niveolanosus* D. Fang & W. T. Wang (Petro), *D. reniformis* W. T. Wang, *D. salviiflorus* Chun, *D. sinoprimuminus* W. T. Wang, *D. subpalmatinervis* W. T. Wang and *D. yuenlingensis* W. T. Wang. Weber et al. (2000) and Vitek et al. (2000) argued that they should be transferred to *Chirita* Buch.-Ham. ex D. Don. Unfortunately, *Chirita* was canceled in 2011 (Wang et al. 2011, Weber et al. 2011b).

Thus, the systematic position and phylogeny of those above-mentioned taxa are still unclear and confused, as they should be excluded from *Didymocarpus*. However, until

botanists find a proper genus to place them in, they are still temporarily retained in *Didymocarpus*.

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