
A New Species of *Viola* (Violaceae) from Guangdong, China

Dong Anqiang

South China Botanical Garden, Chinese Academy of Sciences, Guangzhou, Guangdong 510650, People's Republic of China, and Graduate University of Chinese Academy of Sciences, Beijing, 100049, People's Republic of China

Zhou Jinsong

College of Chinese Medicine, Guangzhou University of Chinese Medicine, Guangzhou, Guangdong 510006, People's Republic of China. Author for correspondence: zhoujins@gzhtcm.edu.cn

Gong Qin

Beijing Normal University–Hong Kong Baptist University United International College, Zhuhai, Guangdong 519085, People's Republic of China

Xing Fuwu

South China Botanical Garden, Chinese Academy of Sciences, Guangzhou, Guangdong 510650, People's Republic of China

ABSTRACT. A new species of *Viola* L. from Guangdong Province, China, *V. guangzhouensis* A. Q. Dong, J. S. Zhou & F. W. Xing, is described and illustrated here. The new taxon represents a fifth species in *Viola* sect. *Diffusae* (W. Becker) Ching J. Wang, and a taxonomic key to distinguish these taxa in China is included. *Viola guangzhouensis* is distinct from the sympatric *V. diffusa* Gingins by having obviously aerial stems, brownish purple stolons, and a bearded anterior petal. The new species is a narrow endemic, collected only from Dalingshan in Guangzhou, Guangdong Province, and is assessed as Critically Endangered (CR).

Key words: China, Guangdong, IUCN Red List, section *Diffusae*, *Viola*, Violaceae.

During fieldwork in March 2007 for the investigation of the flora in the mountainous region of Dalingshan in Guangdong Province, China, we found a distinctive population of violets along a forest margin at altitudes of 710–750 m. Individuals were found growing in watery rocky crevices and bearing both flowers and fruits. The purplish flowers were very conspicuous against the rock surfaces. This violet is similar to *Viola diffusa* Gingins in having a slightly 2-lobed stigma, long stolons with rosulate leaves at the apex, purplish flowers, a short corolla spur, and pubescent leaf blades. The new species differs in its obviously aerial stems, brownish purple stolons, the

more narrowly triangular, cordate, acute leaves, and the bearded anterior petal. After careful study, we believe that this represents an undescribed species in *Viola* L.

Viola guangzhouensis A. Q. Dong, J. S. Zhou & F. W. Xing, sp. nov. TYPE: China. Guangdong: Guangzhou city, Conghua Co., Dalingshan, watery rocky crevices along forest margin, 710 m, 2 Apr. 2007, *An-qiang Dong 1104* (holotype, IBSC). Figure 1.

Haec species *Violae diffusae* Gingins affinis, sed ab ea caulibus aeriis manifestis 5–25 cm longis, stolonibus fusco-purpureis, foliis ovato-triangularis vel anguste triangularis atque petalo antico barbato differt.

Perennial herb to 10–30 cm tall, caulescent; rhizome usually obliquely ascending, 1–1.5 mm diam., brownish purple, short, stout, nodes congested, with numerous white adventitious rootlets; stems solitary or several and fasciculate, erect, slender, glabrous, 5–25 cm, 0.8–2 mm diam., leafy; stolons with an apical rosette of leaves, usually producing adventitious roots. Basal leaves numerous, rosulate, petiole 1–3 cm; blades narrowly ovate to ovate, 1–2 × 0.5–1 cm, base cordate, apex acute, margins obtusely dentate, both surfaces white puberulent, usually withering early; cauline leaves few, petiole 1.5–4 cm, conspicuously winged, usually white puber-

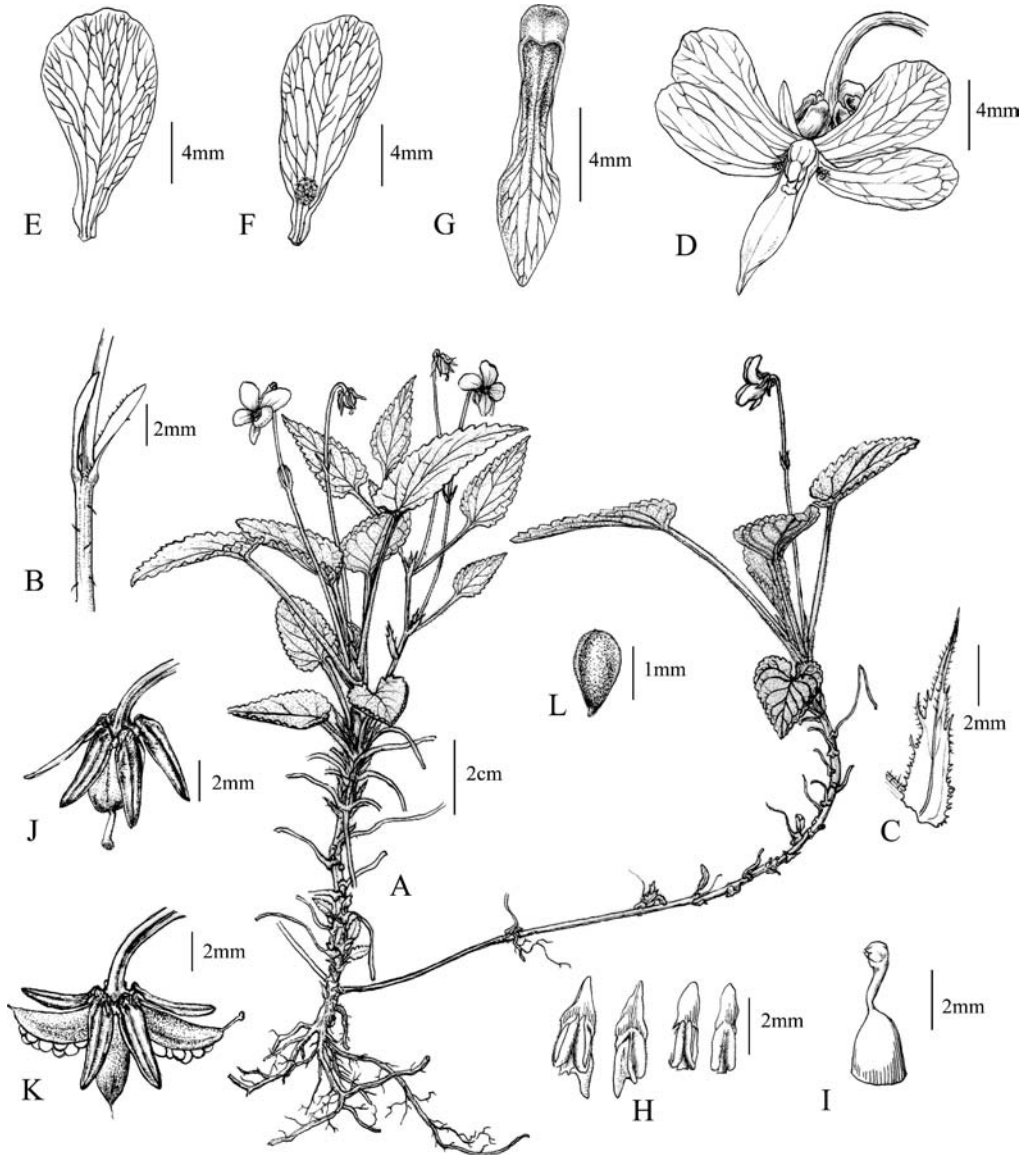


Figure 1. *Viola guangzhouensis* A. Q. Dong, J. S. Zhou & F. W. Xing. —A. Habit. —B. Bracteole. —C. Stipule. —D. Flower in front view. —E. Upper petal. —F. Lateral petal. —G. Anterior petal. —H. Stamens. —I. Pistil. —J. Capsule. —K. Exposed capsule. —L. Seed. A–I from the holotype *An-qiang Dong 1104* (IBSC); J–L from the paratype *An-qiang Dong 2257* (IBSC).

lent, blades ovate-triangular to narrowly triangular, 2–5 × 0.8–2 cm, base cordate, apex acute, margins obtusely dentate and ciliate, both surfaces densely white puberulent when young, later glabrescent between veins, but densely puberulent along veins and margins; stipules linear-lanceolate, 6–8 mm, margins remotely denticulate or fimbriate-dentate, apex acuminate, cauline stipules free, basal stipules adnate 1/3 to petiole bases. Flowers solitary in axils of cauline leaves, white to purplish white, with purple striations, 15–18 mm diam.; pedicels 6–10 cm, usu-

ally exceeding leaves, slender; 2-bracteolate at upper portion, bracteoles opposite, linear, 5–7 mm. Sepals lanceolate to ovate-lanceolate, 5–6 × 1.5–1.8 mm, apex acuminate, basal auricles short, margin narrowly membranous; upper petals narrowly obovate, 12–14 × ca. 7 mm, lateral petals oblong, 11–13 × ca. 5 mm, bearded, anterior petal shorter, spatulate, ca. 12 mm (spur included), bearded; spur shallowly saccate, 1.3–1.5 × ca. 1.5 mm; stamens 5, 3–4.2 × ca. 1.5 mm, nectaries of 2 anterior stamens short, subtriangular, ca. 1.5 × 0.8 mm; ovary glabrous; styles clavate, base

Table 1. Morphological comparison of *Viola guangzhouensis* and *V. diffusa*.

Characters	<i>V. guangzhouensis</i>	<i>V. diffusa</i>
Flower	lateral and anterior petals bearded	lateral petals glabrous or shortly bearded, anterior petal glabrous
Leaf blade	ovate-triangular to narrowly triangular, base cordate, apex acute	ovate or ovate-oblong, cuneate or shallowly cordate, apex obtuse
Stolon	brownish purple, nodes dense and with remains of stipules	slender, green
Aerial stem	solitary or several, fasciculate, erect, slender, glabrous, 5–25 cm long	absent

geniculate, 2.2–2.6 mm, gradually thickened at upper portion; stigmas thickly margined on lateral sides, slightly raised at central part, shortly beaked at the apex. Capsule ellipsoid, glabrous, 5–6 mm diam., glabrous; seeds ovoid, ca. 1.5 × 1 mm, glabrous.

Distribution and habitat. *Viola guangzhouensis* is a narrow endemic of southern China, found only in the type locality, Dalingshan, Guangzhou city, Guangdong Province, China. It is not common there, and is mostly found growing in watery rocky crevices.

IUCN Red List category. During the investigation, the first author found fewer than 20 populations, encompassing about 350 individuals in an area of approximately 1000 m². According to IUCN Red List categories and criteria (IUCN, 2001), this species should be categorized as Critically Endangered (CR). Fortunately, the type locality has been established as an exceptionally well-preserved forest park since 1995.

Phenology. *Viola guangzhouensis* was observed in flower from March to May.

Discussion. *Viola* is the largest genus in the family Violaceae, with 525 to 600 species in the world

(Clausen, 1964; Ballard et al., 1999). Becker (1925) divided the genus *Viola* into 14 sections; the most complicated of these, section *Viola* L., includes 17 subsections. *Viola guangzhouensis* is a member of section *Diffusae* (W. Becker) Ching J. Wang, which was formerly treated as subsection *Diffusae* under section *Viola* L. by Becker (1925), based on its slightly 2-lobed stigma and stolons topped by rosettes of leaves, but is distinguished by its evident, aerial stems. This section is comprised of about four species that are distributed in southern and southeastern Asia (Becker, 1925; Wang, 1991), and one new taxa was added recently (Zhou et al., 2008). Five species are currently accepted in section *Diffusae* and are presented in a key below. *Viola diffusa*, which is quite common in the type locality of *V. guangzhouensis*, is the closest relative of *V. guangzhouensis*. The two species have similar purplish flowers, accumbent stolons, and leaf petioles with conspicuous wings, but *V. guangzhouensis* is distinguished by its obviously vertical aerial stems and bearded anterior petal. The morphological characters of the two species are compared in Table 1.

KEY TO THE SPECIES OF *VIOLA* SECT. *DIFFUSAE* IN CHINA

- 1a. Plant with aerial stems *V. guangzhouensis*
- 1b. Plant lacking stems.
 - 2a. Flowers 30–35 mm across *V. nanlingensis* J. S. Zhou & F. W. Xing
 - 2b. Flowers < 20 mm across.
 - 3a. Flowers < 15 mm across.
 - 4a. Leaves cuneate or shallowly cordate at base; lateral petals usually bearded *V. diffusa*
 - 4b. Leaves cordate at base; lateral petals usually beardless *V. tenuis* Benth
 - 3b. Flowers 15–20 mm across.
 - 5a. Leaves ovate; lateral petals beardless *V. nagasawae* Makino & Hayata var. *nagasawae*
 - 5b. Leaves triangular-ovate; lateral petals bearded *V. nagasawae* var. *pricei* (W. Becker) J. C. Wang & T. C. Huang

Paratypes. CHINA. **Guangdong:** Guangzhou city, Conghua Co., Dalingshan, watery rocky crevices along forest margin, 750 m, 27 Apr. 2007, *An-qiang Dong 1130* (IBSC); 750 m, 29 May 2007, *An-qiang Dong 1157* (IBSC), *An-qiang Dong 2257* (IBSC).

Acknowledgments. This study was supported by the National Natural Science Foundation of China (grant

numbers 30470137 and 30870153). We express our thanks to Kevin Thiele, Harvey Eugene Ballard Jr., and an anonymous reviewer for their invaluable comments on the paper. We are grateful for the assistance of our colleagues Jian-yue Dai, Xi-long Zheng, and Xia-lan Cheng in the field. The line drawings were prepared by Yun-xiao Liu.

Literature Cited

- Ballard, H. E., K. J. Sytsma & R. R. Kowal. 1999. Shrinking the violets: Phylogenetic relationships of infrageneric groups in *Viola* (Violaceae) based on internal transcribed spacer DNA sequences. *Syst. Bot.* 23(4): 439–458.
- Becker, W. 1925. *Viola* L. Pp. 363–376 in A. Engler & K. Prantl (editors), *Die natürlichen Pflanzenfamilien*, 21. Wilhelm Engelmann, Leipzig.
- Clausen, J. 1964. Cytotaxonomy and distributional ecology of western North American violets. *Madroño* 17: 173–204.
- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Wang, Q. R. 1991. *Viola* L. Pp. 8–129 in Q. R. Wang (editor), *Flora Reipublicae Popularis Sinicae*, Vol. 51. Science Press, Beijing [in Chinese].
- Zhou, J. S., Q. Gong & F. W. Xing. 2008. *Viola nanlingensis* (Violaceae), a new species from Guangdong, southern China. *Ann. Bot. Fenn.* 45: 233–236.