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Primulina beiliuensis var. *fimbribracteata* (Gesneriaceae), a New Variety in A Limestone Cave from Northern Guangdong, China

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ABSTRACT: *Primulina beiliuensis* var. *fimbribracteata* F. Wen & B.D. Lai, a new variety of Gesneriaceae from a limestone cave in Shaoguan, Guangdong, China, is described and illustrated in this report. This new species is similar to *P. beiliuensis* B. Pan & S.X. Huang var. *beiliuensis*, but easily differs from the type variety in several morphological characters, both vegetative and reproductive.

KEY WORDS: Cave flora, Gesneriaceae, new variety, Northern Guangdong, *Primulina*, *P. beiliuensis* var. *fimbribracteata*.

INTRODUCTION

Recently, the limestone areas of northern Guangdong province, indeed the whole Guangdong province, China, have been becoming one of hot spots for *primulina* (gesneriaceae) study. Many new taxa were discovered and published in last few year, for example *P. lutvittata* Fang Wen & Y.G. Wei (Wen *et al.*, 2014), *P. huaijiensis* Z.L. Ning & J. Wang (Ning *et al.*, 2014), *P. mabaensis* K.F. Chung & W.B. Xu (Chung *et al.*, 2013), *P. qingyuanensis* Z.L. Ning & Ming Kang (Ning *et al.*, 2014), *P. dongguanica* F. Wen, Y. G. Wei & R. Q. Luo (Wen & Wei, 2014), *P. yangchunensis* Y.L. Zheng & Y.F. Deng (Zheng & Deng, 2014) and some informally described species (Wei *et al.*, 2010), *etc*.

During a botanical survey in 2011 for limestone caves flora of Northern Guangdong, a new taxon of *Primulina* was discovered. This new taxon looks similar to *P. beiliuensis* B. Pan & S.X. Huang which is endemic to Beiliu City, Guangxi and was formally described and published recently (Pan *et al.*, 2013). But the habitat of *P. beiliuensis* is not located in limestone cave but only on the limestone cliffs under subtropical evergreen broad-leaved forest. In spite of two taxa look similar, but the new taxon from cave in Guangdong had been started to appear obviously differentiation.

As a precaution, we carried out fieldworks for many times, and carefully studied on the specimens and living plants of this new taxon and *P. beiliuensis*. Except for *P. beiliuensis*, we compared with all described species of *Primulina* in local flora (Wang *et al.*, 1990, 1998), relevant monographs (Li & Wang, 2004; Wei *et al.*, 2010) and some newest literature (e.g. Nguyen & Kiew, 2000; Wang *et al.*, 2011; Weber *et al.*, 2011; Xu *et al.*, 2012; Cai *et al.*, 2013; Jiang & Li, 2013; Zhao *et al.*, 2013; Liang *et al.*, 2014) , we confirmed it should be considered as a new variety of type variety, *P. beiliuensis*. It is described, illustrated and compared here.

TAXONOMIC TREATMENT

Primulina beiliuensis B. Pan & S.X. Huang var. ***fimbribracteata*** F. Wen & B.D. Lai, ***var. nov.***
齒苞報春苣苔 Figs. 1 & 2

Type: China, Guangdong Prov., Shaoguan City, in a limestone cave, N 24°30′–E 113°20′, 07 April, 2012, F. Wen & B.M. Wang 120407-01 (holotype IBK).

Morphologically similar to *Primulina beiliuensis* B. Pan & S.X. Huang, but easily differs in having pinkish-purple or reddish-purple bracts ovate-cordate or cordate, apex obtuse, margin clearly crenate from the base to the top; Calyx lobes 7.5–8.5 × 2–2.5 mm; Corolla bigger, 6.5–7 cm long and corolla tube 4.5–5 cm long; stamens adnate to c. 1.3 cm above the base of the corolla tube; filaments 10–12 mm long; pistil 3.8–4 cm long.

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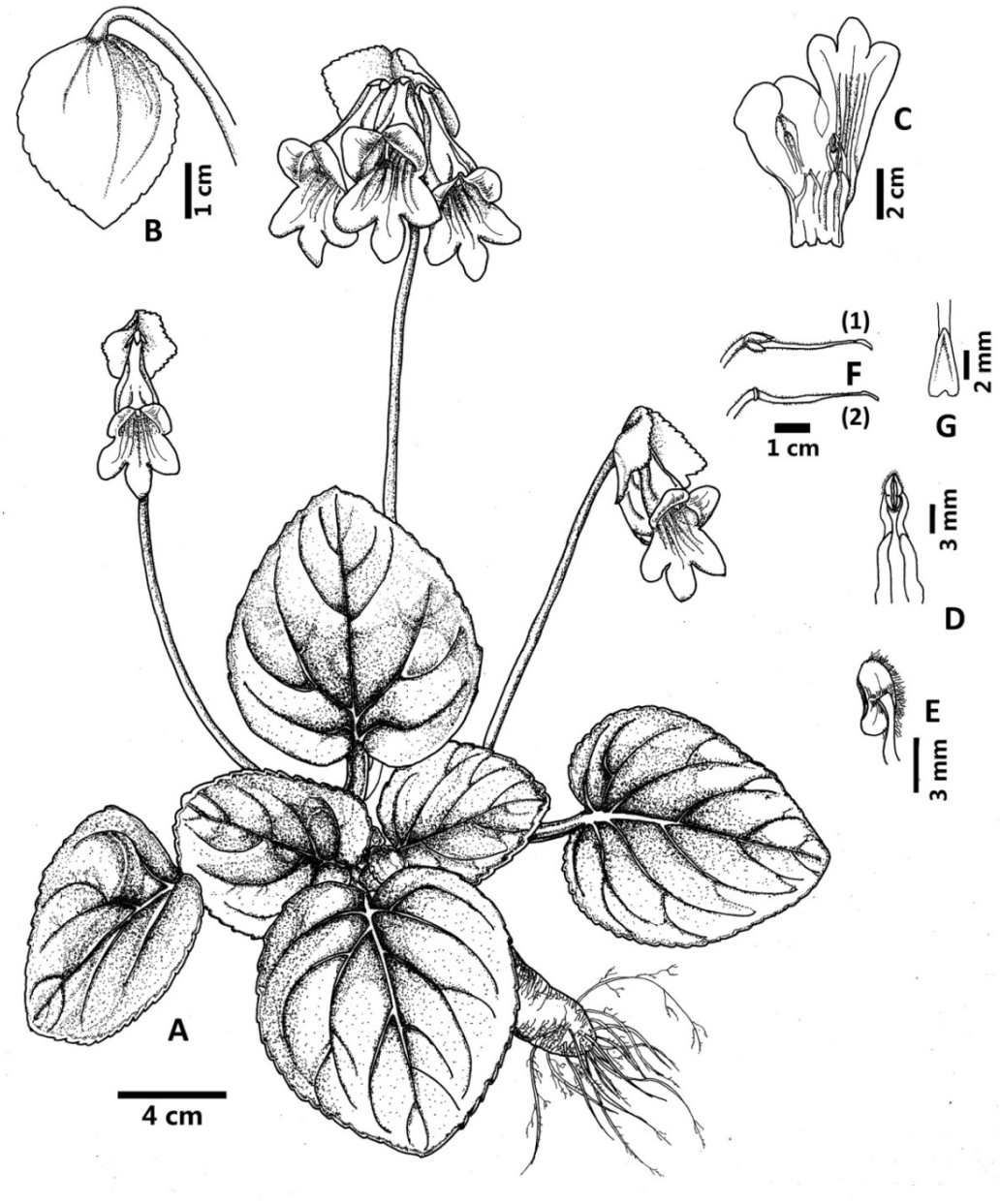


Fig. 1. *Primulina beiliuensis* var. *fimbribracteata*. A: Habit. B: Bracts crenate. C: Corolla opened with stamens and staminodes. D: Stamens. E: Anthers for showing beards. F: (1) Pistil with calyx lobes; (2) Pistil without calyx lobes for showing disc. G: Stigma. Drawn by B. D. Lai.

Perennial herbs. Rhozime nearly cylindered, 3–5 cm long, 1.5–1.7 cm in diam. Leaves 4–6, all basal; petiole compressed, 3–6 cm long, 7–10 mm in diame.; leaf blade nearly carnose, broadly ovate, 9–11 × 7–10.5 cm, apex subacute, base cordate, margin shallowly obtuse-dentate or shallowly undulate-serrate, both surfaces with appressed pubescence, lateral veins 4–5 on each side. Cymes axillary, c. 4, no branched, 16–25 cm long, (1-)2–4 (6) on one cyme; peduncle 15–20 cm long, reddish-purple, tenacious, erectly purple-pubescent; bracts 2, big, opposite, pinkish-purple or reddish-purple, ovate-cordate or cordate, apex obtuse, base cordate, 2.8–4 × 2.5–3 cm, margin clearly crenate from the base to the top, outside sparsely purple-pubescent, inside glabrous; pedicel 1.5–2 cm long, densely glandular-pubescent hairs. Calyx 5-parted to the base, lobes laceolate, 7.5–8.5× 2–2.5 mm, outside purple-pubescent, inside pubescent. Corolla bluish-purple, inside with two obviously yellow stripes, 6.5–7 cm long, outside pubescent, inside pubescent; tube thicker infundibuliform,

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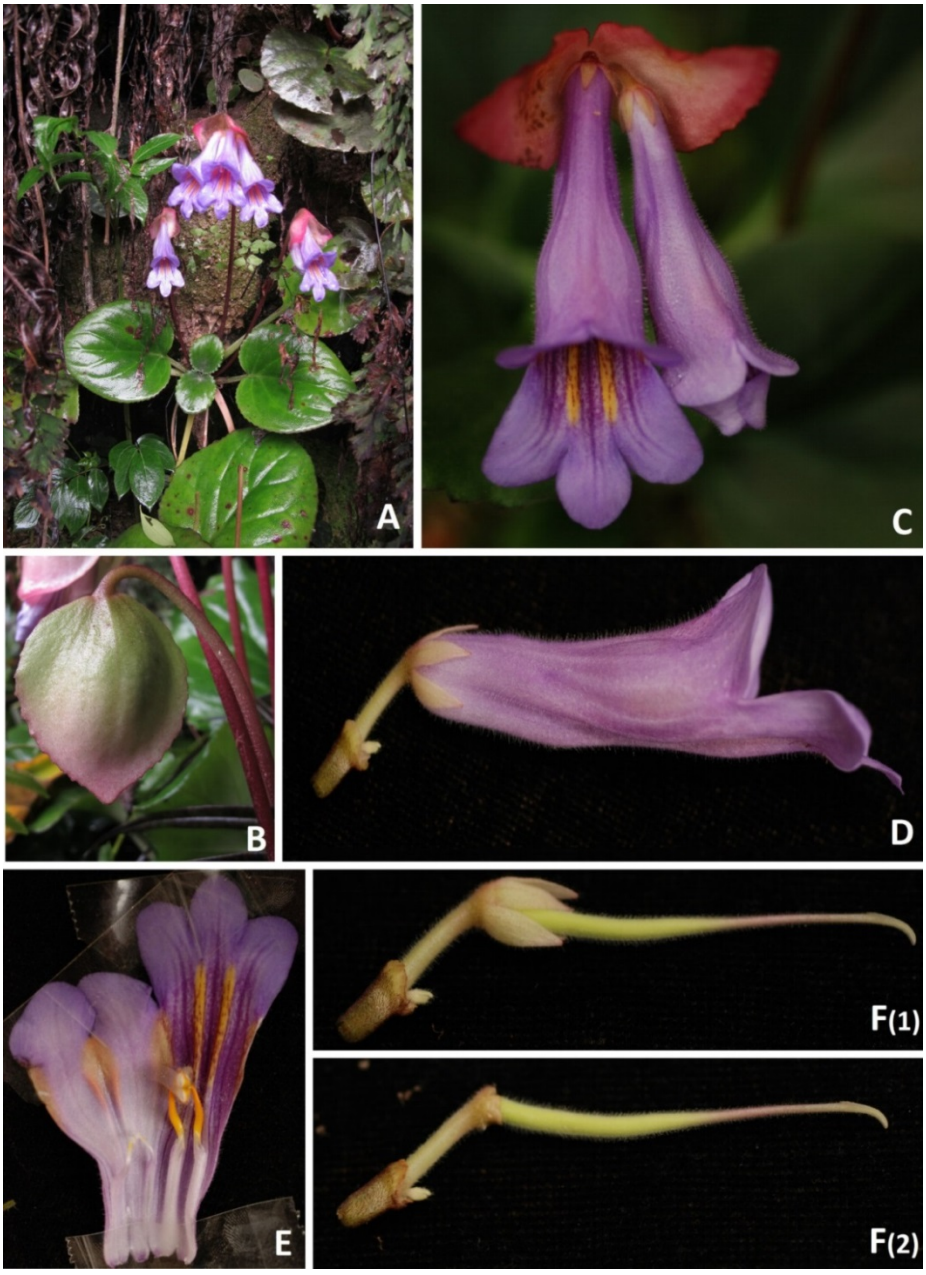


Fig. 2. Photographs of *Primulina beiliuensis* var. *fimbribracteata*. A: Habit. B: Bracts crenate.C: Cymes, top view of corolla and bracts. D: Lateral view of corolla. E; Opened corolla for showing stamens and staminodes. F: (1) Pedicel and pistil with calyx lobes; (2): Pedicel and pistil without calyx lobes.

4.5–5 cm long, c. 1.7 cm in diam. at orifice; limb distinctly 2-lipped, adaxial lip 2-lobed, lobes rounded, inside with yellowish brown spots, c. 10 mm long, abaxial 3-lobed, lateral ones ovate, central one oblong, c. 2 cm long, inside densely purplish brown spots and 2 longitudinally yellow folds. Stamens 2, adnate to c. 1.3 cm above the base of the corolla tube; filaments geniculate from the middle, orange, 10–12 mm long, with sparsely short glandulous hairs. Anthers elliptical, c. 6 mm long, back densely white lanate; staminodes 3, lateral ones adnate c. 15 mm above the base of the corolla tube, c. 6.5 mm long, apex capitate, the central one adnate to the base of corolla tube, c. 5 mm long. Disc annular, c. 2 mm high. Pistil with densely short glandulous hairs and pubescence, 3.8–4 cm long; ovary 10–12 mm long; stigma linguiform, 2-parted. Capsule no seen. Flowering from April to May.

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Table 1. Comparison of salient characters of *Primulina beiliuensis* var. *fimbribracteata* and *P. beiliuensis* var. *beiliuensis*

Character	*P. beiliuensis* var. *fimbribracteata*	*P. beiliuensis* var. *beiliuensis*
Petiole	Slimmer, 3–6 cm long, 7–10 mm in diam.	Thicker, 3–5 cm long, 1–1.5 cm in diam.
Leaf blades	Bigger, 9–11 × 7–10.5 cm	Smaller, 4.5–9 × 4.5–7.5 cm
Peduncle	15–20 cm long, tenacious, reddish-purple	9–17 cm long, slender, green,
Bracts	pinkish-purple or reddish-purple, ovate-cordate or cordate, apex obtuse, base cordate, 2.8–4 × 2.5–3 cm, margin clearly crenate from the base to the top, outside sparsely purple-pubescent, inside glabrous	Green or green-white, ovate, broadly ovate or rounded-ovate, apex acute, base nearly cordate to cuneate, 3.5–4.5 × 2.5–3 cm, margin shallowly obtuse-dentate or shallowly undulate-serrate, outside densely purple-pubescent, inside white-pubescent
Pedicel	1.5–2 cm long, densely white glandular-pubescent hairs	2–3 cm long, densely purple-pubescent
Calyx lobes	7.5–8.5 × 2–2.5 mm	4.5–6 × c. 2 mm
Corolla size	Bigger, 6.5–7 cm long; tube 4.5—5 cm long, c. 1.7 cm in diam. at orifice	Smaller, 3–4 cm long; 2–3 cm long, c. 1.5 cm in diam. at orifice
Stamens	adnate to c. 1.3 cm above the base of the corolla tube; filaments 10–12 mm long	adnate to c. 0.7 cm above the base of the corolla tube; filaments 6–8 mm long
Staminodes	lateral ones adnate c. 15 mm above the base of the corolla tube,	lateral ones adnate c. 8 mm above the base of the corolla tube,
Pistil	3.8–4 cm long; ovary 10–12 mm long	2.5–3.2 cm long; ovary 8–10 mm long

Distribution: Only known from the type locality, the limestone cave in Shaoguang City, Northern Guangdong (Fig. 3).



Fig 3. Distribution of *Primulina beiliuensis* var. *fimbribracteata* (A) and *P. beiliuensis* var. *beiliuensis* (B).

Habitat: This new variety grows on the damp surface of rocks or tufa in a large limestone cave, c. 180 m elevation.

IUCN Red List Category: Due to strictly limiting in a limestone cave, where is near roadside, the only one of population is so easily influenced by local people's activities that the number of individuals will be sharply reduced. But the number of this population is more than 5, 000. Hence we assess it as endangered degree (EN) using the IUCN categories and criteria (IUCN 2001).

Etymology: The specific epithet is derived from its large cordate bracts margins with obviously crenate.

Phenology: Flowering April to May.

Note: *Primulina beiliuensis* B. Pan & S.X. Huang var. *fimbribracteata* F. Wen & B.D. Lai is morphologically close to *P. beiliuensis* B. Pan & S.X. Huang var. *beiliuensis*, but differs in having some characters, e.g. slenderer petioles, bigger leaf blades, reddish purple peduncles, pinkish-purple or reddish-purple bracts in ovate-cordate or cordate shape and its margin clearly crenate from the base to the top, bigger calyx lobes and corolla, *etc*. A comparison of the salient characters of *P. beiliuensis* var. *fimbribracteata* and *P. beiliuensis* var. *beiliuensis* is shown in Table 1.

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LITERATURE CITED

Cai X.-Z., R.-Y. Yi, L. Zhou, R.-P. Kuang and K.-M. Liu. 2013. *Primulina jianghuaensis* sp. nov. (Gesneriaceae) from a limestone cave in southern Hunan, China. Nord. J. Bot. **32**: 70–74.

臺灣大學學術期刊資料庫

Chung, K.-F., H.-Y. Huang, C.-I. Peng and W.-B. Xu. 2013. *Primulina mabaensis* (Gesneriaceae), a new species from a limestone cave of northern Guangdong, China. Phytotaxa **92**: 40–48.

Jiang N. and H. Li. 2013. *Primulina debaoensis* sp. nov. (Gesneriaceae) from a limestone cave in Guangxi, China. Nord. J. Bot. **31**: 631–634.

Liang H.-L., D.-X. Kong, Y.-C. Shi, B. Zhao and F. Wen. 2014. *Primulina tsoongii* sp. nov. (Gesneriaceae) from a limestone area in north Guangxi, China. Nord. J. Bot. **32**: 75–79.

Nguyen, T. H. and R. Kiew. 2000. New and interesting plants from Ha Long Bay, Vietnam. Gard. Bull. Singap. **52**: 185–202.

Ning, Z.-L., G.-F. Li, J. Wang, J.-S. Smith, H. Rasolonjatovo and M. Kang. 2014. *Primulina huaijiensis* (Gesneriaceae), a new species from Guangdong, China. Ann. Bot. Fennici. **50**: 119–122.

Ning, Z.-L., J. Wang, J.-S. Smith and M. Kang. 2014. *Primulina qingyuanensis* (Gesneriaceae), a new species from limestone areas in Guangdong, China. Phytotaxa **137**: 48–52.

Pan, B., F. Wen, B. Zhao, T. Deng, W.-B. Xu and S.-X. Huang. 2013. *Primulina beiliuensis* B. Pan & S.X. Huang, a new species of Gesneriaceae from limestone areas in Guangxi, China. Guihaia **33**: 591–598.

Wang, W.-T, K.-Y Pan and Z.-Y. Li. 1990. Gesneriaceae. In: Wang W.T., (eds). Flora Reipublicae Popularis Sinicae 69. Science Press, Beijing.

Wang, W.-T., K.-Y. Pan and Z.-Y. Li. 1998. Gesneriaceae. In: Wu, Z.-Y. and P.-H. Raven (eds), Flora of China 18: 328–333. Science Press, Beijing and Botanical Garden Press, St. Louis, Missouri.

Wang, Y.-Z., R.-B. Mao, Y. Liu, J.-M. Li, Y. Dong, Z.-Y. Li and J. F. Smith. 2011. Phylogenetic reconstruction of *Chirita* and allies (Gesneriaceae) with taxonomic treatments. J. Syst. Evol. **49**: 50–64.

Wei Y.-G., F. Wen, M. Möller, A. Monro, Q. Zhang, Q. Gao, H.-F. Mou, S.-H. Zhong and C. Cui. 2010. *Chirita*. In: Gesneriaceae of South China: 457-490. Guangxi Science and Technology Publishing House, Nanning, pp 278–490.

Weber, A., D.-J. Middleton, A. Forrest, R. Kiew, C.-L. Lim, A.-R. Rafidah, S. Sontag, P. Triboun, Y.-G. Wei, T.-L. Yao and M. Möller. 2011. Molecular systematics and remodelling of *Chirita* and associated genera (Gesneriaceae). Taxon **60**: 1–24.

Wen, F., B. Zhao, G.-Y. Liang and Y.-G. Wei. 2014. *Primulina lutvittata* (Gesneriaceae), a new species from a limestone cave in Guangdong, China. Ann. Bot. Fennici. **50**: 87–90.

Wen F. and Y.-G. Wei. 2014. *Primulina dongguanica* F. Wen, Y. G. Wei & R. Q. Luo (Gesneriaceae), a new species from South China. Candollea **69**: 9–19.

Wen F., F. Wang and Y.-G. Wei. 2012. *Primulina yangshuoensis*, a New Species of Gesneriaceae from Guangxi, China. Taiwania, **57**: 55–61.

Xu W.-B, Q. Zhang, F. Wen, W.-B. Liao, B. Pan, H. Chang and K.-F. Chung. 2012. Nine new combinations and one new name of *Primulina* (Gesneriaceae) from South China. Phytotaxa **64**: 18.

Zhao B., B. Pan, Y. Zhang and F. Wen. 2013. *Primulina guizhongensis* (Gesneriaceae), a new species from Guangxi, China. Phytotaxa **109**: 27–35.

Zheng Y.-L. and Y.-F. Deng. 2014. A new species of *Primulina* (Gesneriaceae) from Guangdong, China. Phytotaxa **163**: 48–53.

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摘要：本文報導了中國廣東苦苣苔科（Gesneriaceae）一個新變種—齒苞報春苣苔（*Primulina beiliuensis* B. Pan & S.X. Huang var. *fimbribracteata* F. Wen & B.D. Lai）。該變種與其原變種北流報春苣苔（*P. beiliuensis* B. Pan & S.X. Huang）相近，但本變種無論在營養器官或生殖器官方面都有諸多明顯的性狀可以易於使其與原變種相區別。

關鍵詞：洞穴植物區系、苦苣苔科、新變種、廣東北部、報春苣苔屬、齒苞報春苣苔。

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