

Billolivia kyi (Gesneriaceae), a new species from Vietnam

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Received 16 Feb. 2015, final version received 28 June 2015, accepted 29 June 2015

Luu H.T., Pham H.N., Tran G., Ngo T.T.D., Dinh N.L. & Ton T.M. 2015: *Billolivia kyi* (Gesneriaceae), a new species from Vietnam. — *Ann. Bot. Fennici* 52: 362–364.

Billolivia kyi Luu & G. Tran (Gesneriaceae) is described as a new species from the Bidoup-Nui Ba National Park, Vietnam. It is distinct from its closest morphological match *B. poilanei* in having long petioles, coarsely dentate leaf margins, sparsely pubescent pedicels, ovate calyx lobes not persistent on fruits, and large fruits with persistent connate part of the calyx. *Billolivia kyi* differs from all other known *Billolivia* species in having dark red to purple flowers with a yellow patch on the corolla throat, and adaxially sparsely but abaxially densely pubescent laminae.

Billolivia (Gesneriaceae) was established by Middleton *et al.* (2014a). In February and November 2014, we found two *Billolivia* populations with purple flower buds in the Bidoup-Nui Ba National Park (Lam Dong Province) and the adjacent forest in Son Thai Commune, Khanh Hoa Province, Vietnam. During our subsequent surveys of the park's population we observed many flowering individuals in January 2015. The plants differed morphologically from all hitherto described species of *Billolivia*, hence we describe here a new species.

Billolivia kyi Luu & G. Tran, *sp. nova* (Fig. 1)

TYPE: Vietnam. Lam Dong Province: Lac Duong District, Da Chais Commune, Bidoup-Nui Ba National Park, Hon Giao ridge, approximate coordinates 12°11'08"N, 108°42'56"E, 14 Jan. 2015 *Luu Hong Truong & Pham Huu Nhan Luu 1118* (holotype SGN; isotypes SGN!, VNMN!).

ETYMOLOGY. Named to honor Prof. Van Ky Le, who worked as lecturer of dendrology and forestry at Nong Lam University in Ho Chi Minh City during 1955–1991, for his great contribution in the training of many foresters in the country.

Terrestrial herb; stems erect, up to 20 cm long, 1 cm in diameter, densely pubescent with brown multicellular uniseriate hairs to 3 mm long. Leaves alternate; leaf petioles 8–19 cm long, densely pubescent with brown multicellular uniseriate hairs to 7 mm long; lamina ovate, elliptic to obovate, slightly unequal, 9–16 cm long, 5–9.5 cm wide, base round to cordate, sometimes oblique, apex obtuse to acute, margin coarsely dentate, secondary venation 10–13 pairs of veins on each side of midrib, adaxial lamina dark green, sparsely pubescent with brown multicellular uniseriate hairs to 3.5 mm long, margin ciliate, abaxial lamina lightly purple when young, pale green when mature, with dense

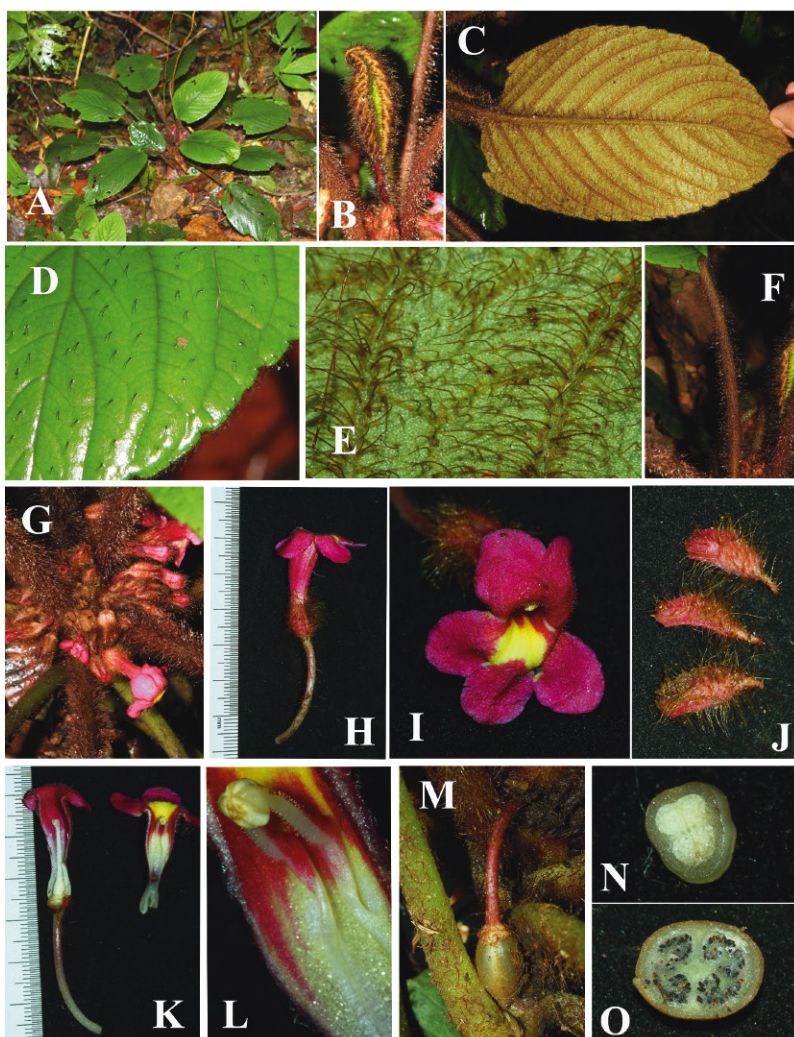


Fig. 1. *Billolivia kyi* (from Luu Hong Truong & Pham Huu Nhan Luu 1118). —

A: Habit and habitat. — **B:** Young leaf. — **C:** Abaxial lamina. — **D:** Hairs on adaxial surface of lamina. — **E:** Hairs on abaxial surface of lamina. — **F:** Leaf petiole. — **G:** Inflorescence. — **H:** Flower, side view. — **I:** Flower, dorsal view. — **J:** Individual calyx lobes. — **K:** Longitudinal section of flower and corolla. — **L:** Stamens. — **M:** Fruit. — **N:** Cross section of ovary. — **O:** Cross section of fruit. Photos by Hong Truong Luu and Le Xuan Bach Nguyen.

appressed brown multicellular uniseriate hairs to 7 mm long. Inflorescences axillary, 2–8-flowered; peduncle 0.5–1.0 cm long, brownish pink, sparsely pubescent; bracts green, ovate, to 15 × 7 mm, apex acute, densely pubescent on outer surface; pedicels pinkish white, 2.5–3.5 cm long, sparsely pubescent. Calyx of 5 lobes almost divided to base with connate part < 2 mm long; lobes 9–11 mm long, 3.5–4 mm wide, ovate, concave, with apex acute and margins ciliate, brownish purple and densely long brown pubescent outside, white and glabrous inside. Corolla 29–33 mm long, composed of a narrow tube which slightly flares towards oblique mouth and a 2-lipped limb with lobes recurved; tube 27–29 mm long, contracted just below middle,

then slightly flaring towards mouth, outside glabrous and white at base, pubescent above, inside glabrous, white at base, white or light yellow at middle, dark red to purple towards throat; throat dark red to purple with a yellow patch in the middle, with shortly stalked glands; upper lip 2-lobed, lobes 10–11 × 9–10 mm, orbicular, apices rounded; lower lip 3-lobed, lobes orbicular, lateral lobes 9–10 × 8–9 mm, lower lobe 7–8 × 7–8 mm; all lobes uniformly dark red to purple, outside sparsely pubescent with brown multicellular uniseriate hairs on, inside shortly stalked glands. Stamens inserted at 15–17 mm from corolla base; filaments slightly curved, ca. 5–6 mm long, white with long red patch, sparsely glandular hairy. Disc bowl-shaped,

5-lobed at apex, 1.5 mm high, 6.5 mm in diameter. Ovary ovate, 5.0–5.5 mm long, 2.5 mm in diameter at base, glabrous with glandular hairy apex; style 12–13 mm long, densely glandular hairs; stigma lobes 1.2 mm long. Fruits ellipsoid, translucent, 14–16 mm long, 9–10 mm in diameter, with pubescent apex and with persistent connate part of calyx. Seeds ovoid, 0.6×0.3 mm.

Prior to this paper, the genus was known to have seven species, all quite locally endemic to southern Vietnam (Middleton *et al.* 2014a, 2014b, Vũ *et al.* 2015). Although the colour of flowers is not known for *B. poilanei*, that species appears to be similar to *B. kyi* in having an adaxially and abaxially hairy lamina, calyx with lobes divided to the base, and ellipsoid fruits. However, *B. poilanei* differs in having short petioles, minutely crenate to almost entire leaf margins, densely long pubescent pedicels, broadly ovate calyx lobes, and small fruits with persistent calyx lobes. *Billolivia kyi* is distinct from all other known *Billolivia* species in having dark red to purple flowers with a yellow patch on the corolla throat, and adaxially and abaxially pubescent laminae.

Billolivia kyi is found at two close sites. It grows on humid soils along streams in submontane tropical evergreen closed forests at 1500–2000 m a.s.l.

The species of *Billolivia* can be distinguished by the following key (modified from Middleton *et al.* 2014b):

1. Calyx divided into 5 lobes almost to base 2
1. Calyx connate into a tube at base for at least 4 mm, margin 5-lobed 5
2. Calyx lobes at least 3.5 mm wide 3
2. Calyx lobes at most 2.5 mm wide 4
3. Petioles < 5 cm long, leaf margins minutely dentate or crenate, often appearing entire, calyx lobes 4.8–5.8 mm wide *B. poilanei*
3. Petioles > 7 cm long, leaf margins coarsely dentate, calyx lobes 3.5–4 mm wide *B. kyi*
4. Leaf abaxially with hairs only on veins or with only occasional hairs on lamina; corolla 12–15 mm long; unfertilised ovary glabrous *B. minutiflora*

4. Leaf abaxially with pubescence throughout; corolla 18–25 mm long; unfertilised ovary pubescent at apex ... *B. vietnamensis*
5. Corolla throat with purple lines in tube and onto lobes 6
5. Corolla throat without purple lines in tube and onto lobes 7
6. Calyx lobes 3.5–4 mm wide, corolla tube about 15 mm long *B. moelleri*
6. Calyx lobes 1.5–2 mm wide, corolla tube 20–22 mm long *B. tichii*
7. Calyx fused into a tube for 7–9 mm; corolla lobe tips pink or red; leaf lamina margins coarsely dentate; petioles 9–18 cm long *B. longipetiolata*
7. Calyx fused into a tube for 4–6 mm; corolla lobe tips violet; leaf margins minutely dentate or appearing entire; petioles 6–12.5 cm long *B. violacea*

Acknowledgements

This work is financed mainly by the project TN3/T09 within the Vietnam National Key Programme KHCN-TN3/11-15 (Tay Nguyen Programme No. 3). The field trip in February 2014 was funded by project no. 535/HD-KHCN granted by Khanh Hoa Provincial Department of Science and Technology to Tran Gioi. The subsequent survey in January 2015 was additionally funded by Columbia University's Earth Clinic programme, Project UR005892. We thank several students of Prof. Le Van Ky, who do not want to be named here, for financing printing the figure in this paper in colour. We are grateful to the managers and staff of the Bidoup-Nui Ba National Park, Son Thai Forest Protection Station, Khanh Hoa Department of Forestry and Southern Institute of Ecology, especially to Mr. Le Van Huong and Mr. Do Van Ngoc, for their kind support and cooperation. Ms. Nguyen Thi Luan is thanked for her careful preparation of the collected specimens.

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