A new species of *Billolivia* (Gesneriaceae) from Vietnam

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ABSTRACT. The new species *Billolivia moelleri* D.J.Middleton from Núi Chúa National Park in Ninh Thuận Province in Vietnam is described. A provisional IUCN conservation assessment and a new key to the species of *Billolivia* are provided.

Keywords. *Billolivia*, Gesneriaceae, new species, Vietnam

Introduction

The genus *Billolivia* D.J.Middleton, containing five species new to science, was only recently described (Middleton et al., 2014). These five species are known from a relatively small area in the southern Annamite mountains in the provinces of Bình Phước and Lâm Đồng in Vietnam. Although one of the collections was made in 1933, all of the other material from which these species were described was collected within the last 20 years and most of it within the last 10 years. However, the collecting density in the region remains fairly low. As the known species of *Billolivia* are all quite locally endemic the likelihood that new species in the genus will be discovered as forested areas in the region are better explored is high. A collection made in November 2013 in Núi Chúa National Park in Ninh Thuận province has already proven to be a new species in the genus and is here described. A provisional IUCN conservation assessment following the guidelines in IUCN (2012) is suggested.

Billolivia moelleri D.J.Middleton **sp. nov.**
Similar to *Billolivia violacea* D.J.Middleton & H.J.Atkins in the violet corolla lobe tips and the presence of a calyx tube but differing in the leaf margins being more coarsely dentate, in the dark purple lines in the corolla, and in the corolla being smaller overall. It also shows similarities to *Billolivia vietnamensis* D.J.Middleton & Luu in the overall corolla size and in the purple lines in the corolla but that species has the calyx divided to the base and the corolla lobes are white.
TYPE: Vietnam, Ninh Thuận Prov., Ninh Hải Dist., Vĩnh Hải Commune, Núi Chúa National Park, trek from Kiền Kiền village to Núi Chúa peak, 758 m, 11°44'27.4"N

109°07’41.9”E, 2 November 2013, *Jana Leong-Škorničková, Nguyễn Quốc Bình, Aung Thame & Edward Ong JLS-2623* (holotype SING [including flowers and fruits in spirit]; isotypes E, K, MO, P, VNMN). (Fig. 1, 2)

Caulescent herb to 30 cm tall; stems with long brown hairs to 4.5 mm long. ***Leaves*** alternate, internodes up to 2.9 cm long but generally around 1 cm long; *petioles* 6.5–11.2 cm long, densely covered in a mixture of long brown spreading hairs to 6 mm long and shorter appressed brown hairs; *lamina* elliptic to obovate, 7.6–14.5 × 3.1–6.2 cm, 2.1–3 times as long as wide, base cuneate to somewhat truncate, apex short acuminate, margin dentate to crenate, more coarsely so towards apex, secondary venation 8–12 veins on each side of midrib with weaker intersecondaries between, tertiary venation alternate percurrent, adaxial lamina with sparse long hairs throughout, margin ciliate, abaxial lamina with shorter hairs to 1 mm long between the veins and both short and long hairs to 4.5 mm long on midrib and venation. ***Inflorescences*** subsessile, c. 8-flowered; bracts at base, narrowly triangular, 0.6–1 × 1.5–1.7 mm, apex acute; pedicels 28–33 mm long, densely long pubescent. ***Calyx*** 14–15 mm long, of a short tube and 5 lobes, somewhat 2-lipped with the three upper lobes close and parallel and the two lower lobes diverging, outside densely covered in long eglandular hairs to 5 mm long, inside glabrous except for few minute papillae; tube 4–5.5 mm long; lobes deltoid, apices acute, 9–10 × 1.5–2 mm. ***Corolla*** c. 25 mm long, composed of a narrow tube which slightly curves downwards in lower half and slightly flares towards mouth, and a 2-lipped limb, white with purple lines from inside tube and onto lobes, ventral surface of throat and tube with 2 yellow stripes in line with lobe sinuses, upper halves of lobes violet; *tube* c. 15 mm long; *upper lip* 2-lobed, c. 11 mm long, sinus between lobes c. 4 mm, lobes 4 × 6 mm; *lower lip* 3-lobed, c.13 mm long, lobes obovate, apices rounded, lateral lobes c. 9 × 7 mm, medial lobe c. 10 × 9 mm; corolla outside glabrous at base of tube, with short hairs on tube above this and then with short and long hairs on upper part of tube and outside of lobes, inside glabrous in tube and with short glandular hairs on inside of lobes. ***Stamens*** inserted at c. 9 mm from corolla base; *filaments* c. 7 mm long, narrow at base, widening around middle and curved and twisting at this point, with short stalked glands in upper half; 2 fertile *anthers* c. 2 x 1.8 mm, thecae ± parallel, 2 anthers fused by tips; *lateral staminodes* c. 2 mm long; *medial staminode* c. 1 mm long. ***Disc*** annular, 0.2 mm high. ***Ovary*** c. 5 mm long, glabrous at base of ovary and glandular pubescent in upper half; *style* c. 11 mm long, glandular pubescent throughout with hairs of widely varying lengths; *stigma* 2-lobed, lobes c. 1.1 mm long. ***Fruit*** an ellipsoid berry, pale green or with a pink tinge, 10–12.5 mm long, 4–6 mm wide, pubescent distally. ***Seeds*** numerous, unappendaged, c. 0.6 x 0.4 mm.

Distribution. Vietnam. Only known from the type collection from Núi Chúa National Park.

Habitat. Understorey of lower montane broadleaved evergreen forest, usually growing on steep slopes and in moist gulleys.

Fig. 1. *Billolivia moelleri* D.J.Middleton. **A.** Habit. **B.** Flowers. From *Leong-Škorničková et al. JLS-2623.* (Photos: Jana Leong-Škorničková)

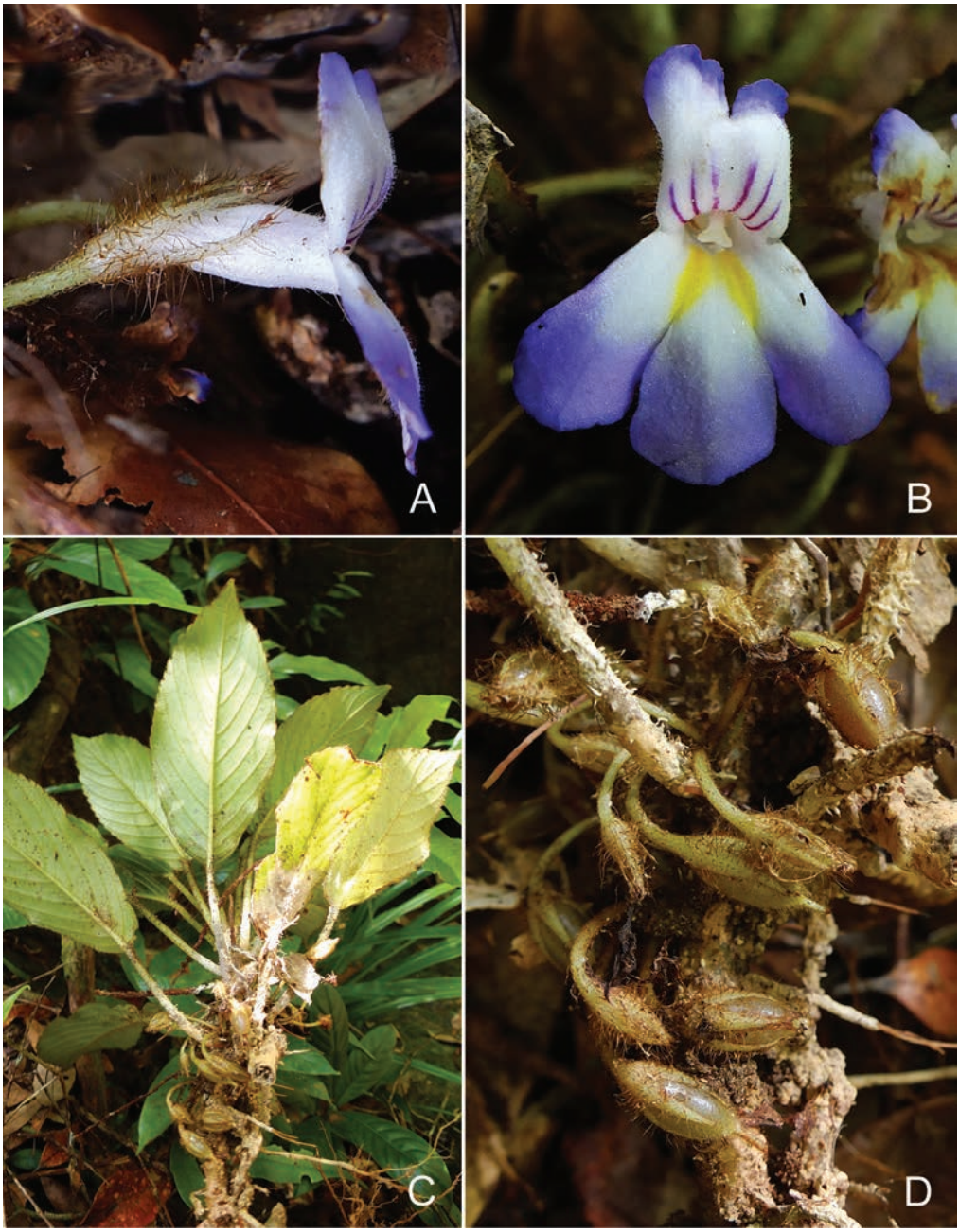

Fig. 2. *Billolivia moelleri* D.J.Middleton. **A.** Detail of flower (side view). **B.** Detail of flower (front view). **C.** Stem with fruits and leaves, adaxial view. **D.** Detail of fruits. From *Leong-Škorničková et al. JLS-2623.* (Photos: Jana Leong-Škorničková)

Etymology. The species is named in honour of Dr Michael Möller of the Royal Botanic Garden Edinburgh for his contribution to our understanding of the Gesneriaceae in Asia, including as a co-author on the paper in which the genus *Billolivia* was first described.

Provisional IUCN Conservation Assessment. Vulnerable VU D2. This species is only known from the type locality where the plant is not commonly encountered. It is difficult to estimate the population size or the exact Area of Occupancy but it is likely to be around 20 km^2 as the altitude at which the species is found restricts the available vegetation in the National Park. Within the Park itself though there are no immediately discernible threats to qualify it as threatened under the B category.

Key to *Billolivia* species

1a. Calyx divided into 5 lobes almost to base; corolla lobes white or white with purple veining at base with tips white, corolla tube 8–18 mm long (unknown in *B. poilanei*); leaf laminas minutely dentate or crenate, often appearing entire 2
1b. Calyx connate into a tube at base for at least 4 mm, margin 5-lobed; corolla lobes white at base, tips brightly coloured pink, red or violet, corolla tube 15–28 mm long; leaf laminas minutely or conspicuously dentate 4

2a. Calyx lobes > 4 mm wide .....*B. poilanei*
2b. Calyx lobes < 2.5 mm wide 3

3a. Leaf abaxially with hairs only on veins or with only occasional hairs on lamina; corolla 12–15 mm long; unfertilised ovary glabrous ..... *B. minutiflora*
3b. Leaf abaxially with pubescence throughout; corolla 18–25 mm long; unfertilised ovary pubescent at apex ..... *B. vietnamensis*

4a. Corolla tube c. 15 mm long, inside of throat white with purple lines in tube and onto lobes ..... *B. moelleri*
4b. Corolla tube 20–28 mm long, inside of throat white with no coloured lines 5

5a. 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*
5b. 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*

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