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广西报春苣苔属一新种——泡叶报春苣苔

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摘要: 报道了分布于广西石灰岩山地及岩溶洞穴的苦苣苔科 Gesneriaceae 报春苣苔属 *Primulina* Hance 一新种——泡叶报春苣苔 *P. bullata* S. N. Lu & Fang Wen。泡叶报春苣苔与荔波报春苣苔 *P. liboensis* (W. T. Wang & D. Y. Chen) Mich. Möller & A. Weber 和桂林报春苣苔 *P. guelinensis* (W. T. Wang) Y. Z. Wang 相近, 以叶两面均具直立柔毛, 叶上面呈显著泡状, 具较多花序, (1)2~9 条, 花序梗较长, (4.0)8.5~15 cm, 苞片线形或线状披针形, 大小为 7 mm×1 mm, 花大, 长 4.2~5.3 cm, 粉紫色, 退化雄蕊较长, 13~15 mm, 花期在 11 月而区别。

关键词: 报春苣苔属; 广西; 苦苣苔科; 泡叶报春苣苔; 新分类群

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Primulina bullata, a new species of *Primulina* (Gesneriaceae) from Guangxi

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Abstract: A new species, *Primulina bullata* S. N. Lu & Fang Wen, which grows in limestone hills and limestone caves from Guangxi is described and illustrated. It is similar to *P. liboensis* (W. T. Wang & D. Y. Chen) Mich. Möller & A. Weber and *P. guelinensis* (W. T. Wang) Y. Z. Wang, but differs above-mentioned two relatives by having erect pubescence on both leaf blade surfaces, upper surface of leaf blade with distinctly rounded, bullate projections, (1)2-9 or more cymes, longer peduncle, (4.0)8.5-15 cm, linear or linear-lanceolate bracts, ca. 7 mm×1 mm, larger flower, 4.2-5.3 cm long, purplish-pink corolla, staminodes longer, 13-15 mm long, flowering time in November.

Key words: *Primulina*; Guangxi; Gesneriaceae; *P. bullata*; new species

原唇柱苣苔属 *Chirita* Buch.-Ham. ex D. Don 是一个以我国华南、西南为分布中心的苦苣苔科 Gesneriaceae 大属, 我国分布有 3 个组, 即唇柱苣苔组 sect. *Gibbosaccus*, 麻叶唇柱苣苔组 sect. *Chirita* 和钩序唇柱苣苔组 sect. *Microchirita* (王文采, 1990; 王文采等, 1998; 李振宇等, 2004; 韦毅刚等, 2010)。然而在 2011

年对该属的修订中, 原唇柱苣苔组以及文采苣苔属 *Wentsaiboea* D. Fang & D. H. Qin (仅其中的 2 个种文采苣苔 *W. renifolia* D. Fang & D. H. Qin 和罗城文采苣苔 *W. luochengensis* Yan Liu & W. B. Xu) (Liu et al., 2010) 以及唇柱苣苔组的近缘类群——小花苣苔属 *Chiritopsis* W. T. Wang 被并入我国的一个特有单

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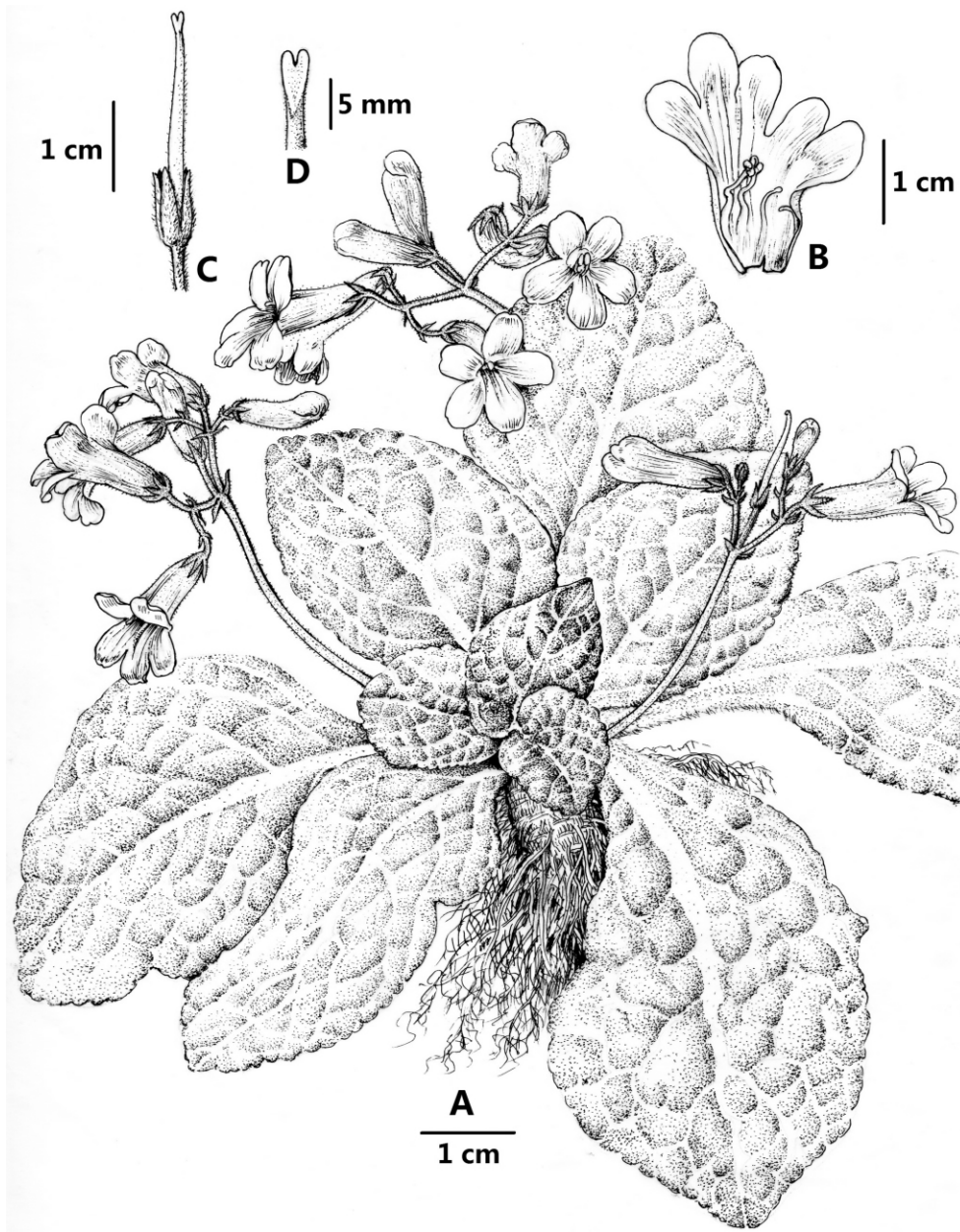


图 1 泡叶报春苣苔 (新种) A. 开花植株; B. 花冠展开, 示雄蕊与退化雄蕊; C. 雌蕊与花萼; D. 柱头。(林文宏 绘)

Fig. 1 *Primulina bullata* S. N. Lu & Fang Wen, sp. nov. A. Habit in flowering; B. Corolla opened with stamens and staminodes; C. Pistil and calyx; D. stigma. (Drawn by LIN Wen-Hong)

型属——报春苣苔属 *Primulina* Hance 内, 钩序唇柱苣苔组被提升为钩序苣苔属 *Microchirita* (C. B. Clarke) Y. Z. Wang, 而原麻叶唇柱苣苔组中大部分的种以及另一个单型属, 密序苣苔属 *Hemiboeopsis* W. T. Wang 被并入汉克丽亚花属汉克丽亚花组 *Henckelia* Spreng. sect. *Henckelia* 中, 少数种则并入一个重新恢复的属——*Damrongia* Kerr ex Craib 之中, 而原唇柱苣苔属中的 sect. *Liebigia* 也被提升为属, 即 *Liebigia* Endl. (Wang *et al.*, 2011;

Weber *et al.*, 2011)。

广西是原唇柱苣苔属唇柱苣苔组, 如今的报春苣苔属的主要分布中心, 但该属除了少数种, 如蚂蝗七 *Primulina fimbrispala* (Hand. -Mazz.) Y. Z. Wang、牛耳朵 *P. eburnea* (Hance) Y. Z. Wang、神农架报春苣苔 *P. tenuituba* (W. T. Wang) Y. Z. Wang 等之外, 绝大部分为狭域分布的物种, 常仅见于一两个石灰岩山地山头或岩溶洞穴。作者近几年关注于广西石灰岩山地以及石灰岩岩溶洞穴的苦苣苔科植



图 2 泡叶报春苣苔 A. 生境; B. 开花植株; C. 花正面观; D. 花序; E. 花与雌蕊; F. 花冠解剖。

Fig. 2 *Primulina bullata* S. N. Lu & Fang Wen, sp. nov. A. Habitat; B. Plants with flowers; C. Frontal view of flowers; D. Cyme; E. Flower and pistil; F. Corolla opened.

表 1 新种泡叶报春苣苔、荔波报春苣苔和桂林报春苣苔的区别特征比较

Table 1 Detailed comparison between *Primulina bullata* sp. nov., *P. liboensis* and *P. guelinensis*

Characters	<i>P. bullata</i>	<i>P. liboensis</i>	<i>P. guelinensis</i>
Leaves blade shape	Obliquely ovate, elliptic to broadly oblong-ovate	Inconspicuous obliquely elliptic to ovate	Narrowly elliptic to rhombic-elliptic or ovate
Leaves blade size (cm)	(5)11–13.5×(3.5)7–9.5	4–10×2–4.5	2.5–7.5×1.4–4 or larger
Hairs on both leaf blade surfaces	Short puce strigose	Sparsely glandular-puberulence	Densely puberulent, eglandular
Upper surface of leaf blade	Distinctly bullate	Inconspicuously bullate	Smooth
Cymes	(1)2–9 or more	ca. 2	1–4
Peduncle length(cm)	(4.0)8.5–15	ca. 12	1.5–6
Hairs on the peduncle	With erect white pubescence	With purple pubescence	Densely spreading puberulent
Bracts shape and size	Linear or linear-lanceolate, ca. 7 mm×1 mm	Linear-ovate, 13–20 mm×3.5–5.0 mm	Linear to narrowly elliptic or narrowly triangular, 2–14 mm×0.3–1.5 mm
Corolla color	Purplish-pink	Bluish-purple	Purple
Corolla size	4.2–5.3 cm long	ca. 2.7 cm long	4–6 cm long
Hairs on the corolla	Outside sparsely short purplish red strigose along the back of corolla, glabrous inside	Outside puberulent, inside puberulent on limb	Outside puberulent, inside puberulent only on adaxial lip
Filaments	Glabrous	Glandular-puberulent	Glabrous
Staminodes	2, 13–15 mm long	2, ca. 3 mm long	2, 5.5–7 mm long
Flowering time	November	May	March to April

物的研究,在对这一特殊的,分布于极为狭窄的区域的该类群植物进行详细的野外考察过程中,在广西境内的石灰岩山地林下、岩溶洞穴分别采集到许多该科植物的标本,其中部分当时被鉴定为未详知种。在对这些植物进行充分和长时间的野外定点观察和生物学性状调查,我们发现其中分布于靖西县(百色市)一个报春苣苔属物种在相关的苦苣苔科植物文献与专著中(王文采,1990;Wang *et al.*,1998;李振宇等,2004;韦毅刚等,2010;Liu *et al.*,2010,2011;Xu *et al.*,2010;Tang & Wen,2011;Weber *et al.*,2011;Wu *et al.*,2011;Xu *et al.*,2010,2011)均无记载,是未被描述的新分类群。

泡叶报春苣苔 新种 图 1

Primulina bullata S. N. Lu & Fang Wen, sp. nov. Fig. 1 & 2.

It differs from *Primulina liboensis* (W. T. Wang & D. Y. Chen) Mich. Möller & A. Weber and *P. guei-linensis* (W. T. Wang) Y. Z. Wang (Table 1) having erect pubescence on both leaf blade surfaces, upper surface of leaf blade with distinctly rounded, bullate projections, (1) 2–9 or more cymes, longer peduncle, (4.0) 8.5–15 cm, linear or linear-lanceolate bracts, ca. 7 mm × 1 mm, larger flower, 4.2–5.3 cm long, purplish-pink, staminodes longer, 13–15 mm long, late flowering time in Nov.

Perennial herbs. Rhizome subterete, 1.5–3.5 cm long or longer, 1.0–1.5 cm in diameter. Leaves 6–12 or more, all basal, three leaves verticillate; petiole compressed, cross section semi-elliptic, 2–7.5 cm long, 0.6–1.1 cm wide, short puce strigose on both surfaces; blades dark-green, coriaceous or stiffly chartaceous, obliquely ovate, elliptic to broadly oblong-ovate, left-right asymmetric or symmetric, (5) 11–13.5 cm × (3.5) 7–9.5 cm, upper surface distinctly bullate, cuneate at base, commonly symmetric, occasionally oblique, margin with 15–25 crenation on each side, acuminate, obtuse or round at apex, with erect pubescence on both surfaces, margins with tricholoma, pubescence 0.5–1 mm long, all veins commonly silvery white, lateral veins 4–5 on each side, impressed adaxially and prominent abaxially. Cymes axillary, (1) 2–9 or more, 1–2-branched, (1) 3–9 or more flowers on one cyme; peduncle (4.0) 8.5–15 cm long, slender, (1.5) 1.9–2.2

mm in diameter, erect white-pubescent; bracts 2, opposite, purplish green, linear or linear-lanceolate, ca. 7 × 1 mm, margin entire, obtuse at apex, appressed purple-pubescent outside, glabrous inside. Bracteoles 2, opposite, shape, hairs and colour the same as bracts but apex acute. Pedicel 6–11 mm long, calyx 5-parted near to the base, lobe narrowly lanceolate-linear, 8–11 × 2–2.5 mm, margin entire, acute at apex, appressed white pubescent outside, glabrous inside. Corolla 4.2–5.3 cm long, nearly glabrous outside, but sparsely short purplish red strigose along the back of corolla, glabrous inside; tube funnel-formed, purplish-pink, 2.5–3.0 cm long, 0.8–1.2 cm in diameter in medium, 1.2–1.5 cm in diameter at the orifice; throat with two yellow lines; limb distinctly 2-lipped, purple or purplish pink, adaxial lip 2-lobed to or over the middle, lobes ovate or nearly orbicular, 0.9–1.1 cm × ca. 0.9 cm, obtuse at apex, with two deep purple lines inside; abaxial lip 3-lobed over the middle, two lateral lobes inapparently obliquely ovate or oval, the central one oblong, 12.5–15 mm × 10.5–12 mm, rounded at apex. Stamens 2, adnate to 1.2–1.5 cm above the base of the corolla tube; filaments geniculate near the base, 1.3–1.5 cm long, glabrous; anthers subreniform, slightly contracted in the middle, 3.5–4.5 mm long, glabrous. Staminodes 3, lateral ones 6.5–8.0 mm long, glabrous, adnate to 12–15 mm above the base of the corolla tube, middle one ca. 0.5 mm long, adnate to ca. 3–4 mm above the base of the corolla tube. Disc annular, 1.0–1.5 mm high, margin repand or entire. Pistil 2.8–2.9 cm long, ovary linear, ca. 2.3 cm long, ca. 1.4–2.0 mm in diameter, glandular-pubescent; style ca. 5–6 mm long, nearly glabrous; stigma obtrapeziform, ca. 2 mm long, apex 2-lobed. Capsule not seen. Flowering in Nov.

China (中国), Guangxi (广西): Jingxi County (靖西县), Hurun Town (湖润镇), From Da'ai village to Dongba village (从达爱村到东巴村途中), on the moist rock face near to road and at the entrance of limestone caves, rare, 526 m a. s. l., 09 Oct. 2010, Fang Wen & S. N. Lu WFBCJT11110901 (holotype: IBK; isotype: BJFC).

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pGADT7-*EcoRI*-139-*OsRUS2.1* cDNA-879-*Bam*HI, pGADT7-*EcoRI*-880-*OsRUS2.1* cDNA-1317-*Bam* 和 pGADT7-*EcoRI*-1-*OsRUS2.1* cDNA-1317-*Bam*HI 四种猎物蛋白表达载体,这些工作将为下一步研究 *OsRUS1* 和 *OsRUS2* 是否具有相互作用以及通过什么区域互作奠定基础。由于某些蛋白的表达可能对酵母细胞产生毒害作用,使其不能在选择培养基上生长;以及一些蛋白含有酸性氨基酸区域或者能够与酵母宿主转录激活因子结合,从而直接激活报告基因的表达。因此在筛选前需验证诱饵载体的毒性与自身激活作用,用以排除假阳性和假阴性的相互作用。本研究采用含上述重组猎物表达载体的 Y187 摇菌培养, OD_{600} 全部能在 19 h 以内达到 0.8,说明表达的 *OsRUS2.1* 及其片段对酵母的生长无毒性;对 *LacZ* 和 *MEL1* 报告基因活性染色表明, *OsRUS2.1* 及其片段也不能激活酵母的转录系统。综上所述,构建的四个 *OsRUS2.1* 猎物蛋白表达载体表达的融合蛋白对宿主菌 Y187 无毒性,且无自激活作用,可应用于后续的酵母双杂交实验。

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本种与荔波报春苣苔 *Primulina liboensis* (W. T. Wang & D. Y. Chen) Mich. Möller & A. Weber 和桂林报春苣苔 *P. guelinensis* (W. T. Wang) Y. Z. Wang 在亲缘关系上相接近,但叶两面均具直立柔毛,叶上面呈显著泡状,具较多花序,(1)2~9 条,花序梗较长,(4.0)8.5~15 cm,苞片线形或线状披针形,大小为 7 mm×1 mm,花大,长 4.2~5.3 cm,粉紫色,退化雄蕊较长,13~15 mm,花期 11 月,可以区别(表 1)。

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