



Globba ruiliensis, a new species of Zingiberaceae from Yunnan, China

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ABSTRACT: *Globba ruiliensis*, a new species of Zingiberaceae from Ruili City, Yunnan Province, China, is described and illustrated. This new species is similar to *G. multiflora*, but clearly differs in its oblong or ovate-lanceolate leaves, 18–25 × 6–12 cm, adaxially strigose along veins, lateral staminodes are nearly equal to corolla lobes, 7–8 mm long, ovate-oblong, apex rounded, yellow to orange labellum, and verrucose ovary and fruit. A comparison table of related species is provided.

KEY WORDS: *Globba multiflora*, *Globba sessiliflora*, *Globba racemosa*, *Haplanthera*, *Mantisia*, Ruili.

INTRODUCTION

The genus *Globba* L. is one of the largest genus of the family Zingiberaceae and comprises about 110 species, distributed in Sri Lanka, India, Southeast Asia and Australia (Williams *et al.*, 2004; Sangvirojjanapat *et al.*, 2019; Joe *et al.*, 2019). Up to now seven *Globba* species and one variety have been recorded in China, and three are endemic species of China (Zhu, 1984; Wu and Larsen, 2000; Qian, 2001; Li *et al.*, 2009). In the past, botanists usually used the number of anther appendages (none, two or four) as the main character to delimit the infrageneric taxa of *Globba* (Horaninow, 1862; Schumann, 1904; Larsen, 1972; Sangvirojjanapat *et al.*, 2019), based on morphology and phylogenetic studies recently, the genus *Globba* was classified into three subgenera: *Mantisia* (Sims) K. J. Williams, *Ceratanthera* (Horan.) K. J. Williams and *Globba* (Williams *et al.*, 2004).

During systematic botanical researches in Yunnan Tongbiguan Provincial Natural Reserve in southwest of China, we found an unknown species of *Globba*. This species belongs to subgenus *Mantisia* and sect. *Haplanthera* (anther without appendages), and is morphologically similar to *G. multiflora*, *G. sessiliflora* and *G. racemosa*. After literature review as well as morphological examination, we confirm that it represents a new species and report it herein.

TAXONOMIC TREATMENT

Globba ruiliensis X. D. Ma, W. G. Wang & J. Y. Shen, *sp. nov.* 瑞麗舞花薑 Fig. 1

Type: CHINA, Yunnan Province, Ruili City, Nongdao Town, Dengga Village, 23°57'N, 97°33'E, alt. 854 m, 21 October 2019, Jian-Yong Shen, Wen-Guang Wang & Xing-Da Ma 1666 (holotype: HITBC!; isotypes: HIB!, HITBC!, KUN!).

Diagnosis: This new species is morphologically

similar to *G. multiflora*, but clearly differs in its oblong or ovate-lanceolate leaves, 18–25 × 6–12 cm, adaxially strigose along veins (vs. oblong-lanceolate leaves, 20–30 × 3–6 cm, adaxially glabrous), lateral staminodes are nearly equal to corolla lobes, 7–8 mm long, ovate-oblong, apex rounded (vs. lateral staminodes are smaller than corolla lobes, ca. 4 mm long, lanceolate, apex acuminate), yellow to orange labellum (vs. mostly purple labellum, only yellow towards the sinus), and verrucose ovary and fruit (vs. smooth ovary and fruit).

Perennial herb, 80–140 cm tall. Rhizome fleshy, short, and slender. Roots ca. 5 mm in diam., fleshy. Leafy shoots erect, or slightly slanting, base expanded. Bladeless sheaths 1–3, slightly purplish red, densely hairy externally. Leaves 6–10, subsessile or shortly petiolate; sheath densely hairy externally; ligule ca. 2 mm long, apex bilobed, margin ciliate; lamina 18–25 × 6–12 cm, oblong or ovate-lanceolate, adaxially green, strigose along veins, abaxially light green, densely hairy, base broadly cuneate to rounded, apex caudate, margin slightly undulate. Thyrses 10–35 cm long, erect, often with 2–4 bulblets at lower portion of inflorescence; bulblets 2.5–3 × 0.8–1.2 cm, conical, green or yellowish-green, scales persistent, densely hairy externally, margin ciliate; peduncle 3–15 cm long, hirsute; sterile bracts 6–12 × 3–5 mm, lanceolate, green, densely hairy externally, margin ciliate, caducous or persistent outside the bulblets; rachis hirsute, 7–25 cm long; fertile bracts 4–10 × 2–5 mm, lanceolate, greenish, densely hairy externally, margin ciliate, caducous; cincinni 0.5–1 cm long, spirally arranged on the rachis, hirsute, 1–3 florets; bracteoles 1–3, 4–6 × 2–3 mm, lanceolate, membranous, yellowish-green, densely hairy externally, margin ciliate, caducous. Flower 4.2–4.8 cm long, subsessile, yellow to orange; calyx 7–9 mm long, tubular, glabrous, apex 3-lobed, lobes ca. 2 mm long, pouched at the tip; corolla tube 1.8–2.2 cm long, densely hairy externally, slightly curved at the middle; dorsal corolla lobe 8–9 × 3–4 mm, cucullate, reflexed, slightly hairy externally, pouched at

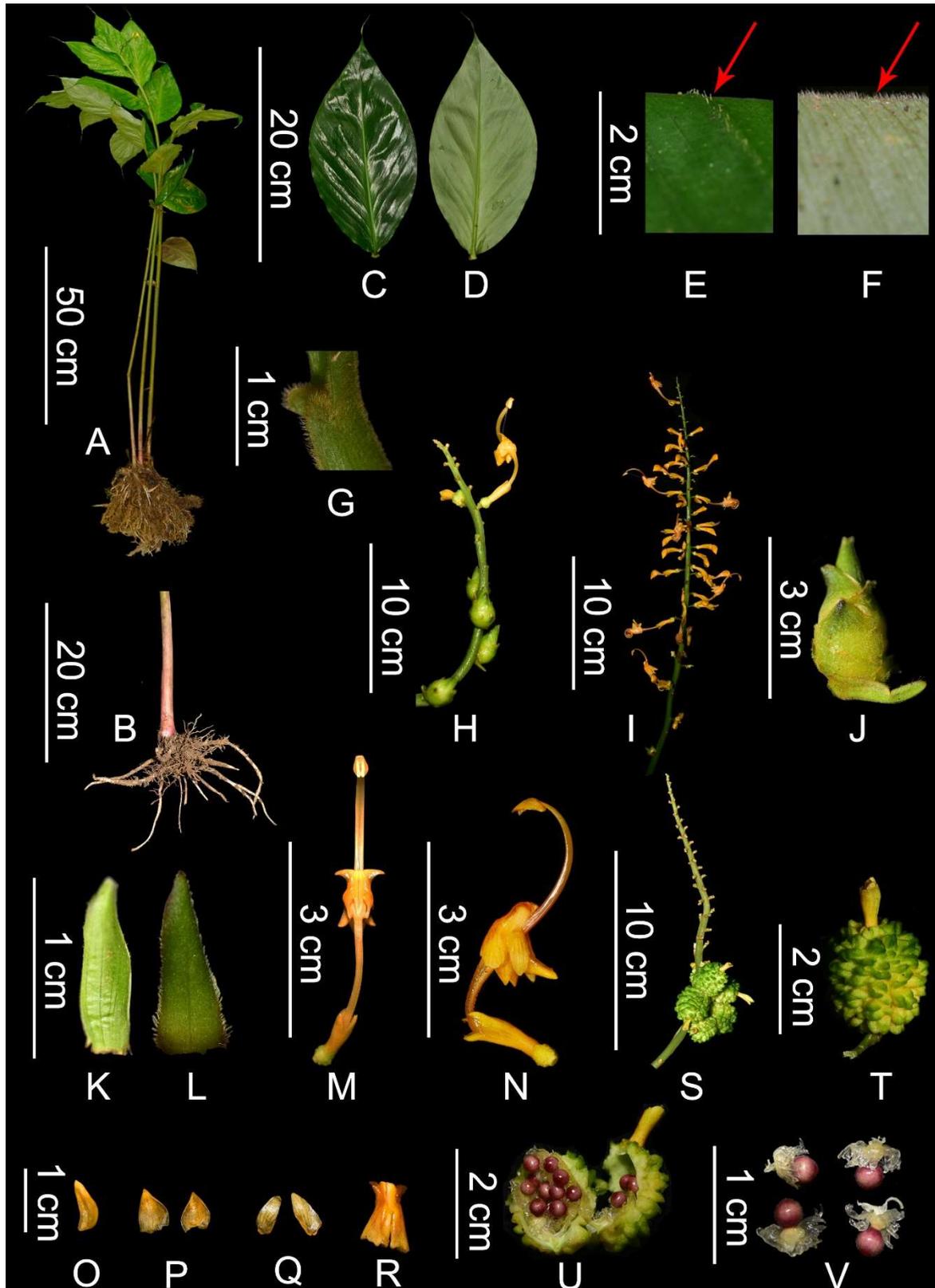


Fig. 1. *Globba ruliensis*. **A:** Plants. **B:** Roots and leafy shoots. **C–D:** Adaxial and abaxial leaves surface. **E–F:** Adaxial and abaxial leaves surface enlarged showing the hair. **G:** Ligule. **H–I:** Inflorescence. **J:** Bulblet. **K–L:** Adaxial and abaxial bracts surface. **M:** Front view of the open flower. **N:** Side view of the flower. **O:** Dorsal corolla lobe. **P:** Lateral corolla lobes. **Q:** Lateral staminodes. **R:** Labellum. **S:** Infructescence. **T:** Fruit. **U:** Longitudinal section of fruit. **V:** Seeds.

**Table 1.** Comparison of *G. ruiensis*, *G. multiflora*, *G. sessiliflora* and *G. racemosa*.

Characters	<i>G. ruiensis</i>	<i>G. multiflora</i>	<i>G. sessiliflora</i>	<i>G. racemosa</i>
Leaf shape and size	Oblong or ovate-lanceolate, 18–25 × 6–12 cm	Oblong-lanceolate, 20–30 × 3–6 cm	Oblong-lanceolate, 5–20 × 2–5 cm	Oblong or ovate-lanceolate, 12–20 × 4–5 cm
Leaf surface	Adaxially strigose along veins, abaxially densely hairy	Adaxially glabrous, abaxially densely hairy	Adaxially sparsely pubescent, abaxially densely pubescent	Slightly pilose along veins on both surfaces or glabrous
Bulblets	Conical, green or yellowish-green	Conical, pale green	Conical, pale green	Absent
Lateral staminodes	Subequal to corolla lobes, 7–8 mm long, ovate-oblong, apex rounded	Smaller than corolla lobes, ca. 4 mm long, lanceolate, apex acuminate	Much longer than corolla lobes, ca. 16 mm long, linear, apex acuminate	Subequal to corolla lobes, ca. 5 mm long, lanceolate, apex acuminate
Labellum	Slightly longer than corolla lobes, obcuneate, yellow to orange, apex 2-lobed, basal appendages 2	Longer than corolla lobes, obovate-oblong, mostly purple, only yellow towards the sinus, apex 2-lobed, basal appendages 2	Much longer than corolla lobes, linear, orange-yellow, without appendage at the base, apex emarginate	Slightly longer than corolla lobes, obcuneate, yellow, without appendage at the base, apex 2-lobed,
Ovary	Verrucose	Smooth	Slightly warted	Smooth
Fruit	Verrucose	Smooth	Slightly warted	Smooth

the tip; lateral corolla lobes 6–7 × 4–5 mm, ovate, reflexed, slightly hairy externally, apex acute; lateral staminodes 7–8 × 3–4 mm, ovate-oblong, reflexed, glabrous, apex rounded; labellum ca. 1 × 0.8 cm, glabrous, obcuneate, reflexed, apex 2-lobed, lobes semioval or slightly flabellate, ca. 4 mm in diam., basal appendages 2, appendages triangular, ca. 2 mm long; stamen 1.6–2 cm long, glabrous, filaments 1.2–1.7 cm long, arching, anthers 3–4 mm long, elliptic, non-appendaged, apex acute; style 3.8–4.4 cm long, translucent, filiform, passes through the filament, stigma infundibuliform, glabrous; ovary 4–5 mm long, ca. 2.5 mm in diam., oblong, green, verrucose, unilocular, ovules many, creamy white, white pubescent. Fruit globose, ca. 2 cm in diam., verrucose, with persistent calyx. Seeds globose, ca. 2.5 mm in diam., white pubescent, arillate.

Phenology: Flowers and fruits were observed in October.

Etymology: This new species is named for the type locality, Ruili City.

Distribution and habitat: This new species is currently known from Yunnan Tongbiguan Provincial Nature Reserve, Dehong Prefecture, Yunnan Province, China, growing in wet valleys at 800–1000 m elevation.

Conservation assessment: The Yunnan Tongbiguan Provincial Natural Reserve was surveyed seven times from 2017 to 2019, during the study, we found three populations of *Globba ruiensis*, one population close to Dengga Village, Nongdao Town, Ruili City, other populations close to the Moli falls, Ruili City, they were sporadically distributed in wet valleys and with about 200 individuals were observed. The local villagers often graze their animals and cut firewood in the forest, inevitably damaging to the habitat of this new species. According to the IUCN Red List Categories and Criteria version 14 (IUCN, 2019), the new species should be assessed as ‘Endangered’ (EN).

Features and affinities: *Globba ruiensis* is morphologically similar to *G. multiflora* (India, Myanmar, Nepal, Indonesia, Bangladesh), but clearly differs in its oblong or ovate-lanceolate leaves, 18–25 × 6–12 cm, adaxially strigose along veins (vs. oblong-lanceolate leaves, 20–30 × 3–6 cm, adaxially glabrous), lateral staminodes are nearly equal to corolla lobes, 7–8 mm long, ovate-oblong, apex rounded (vs. lateral staminodes are smaller than corolla lobes, ca. 4 mm long, lanceolate, apex acuminate), yellow to orange labellum (vs. mostly purple labellum, only yellow towards the sinus), and verrucose ovary and fruit (vs. smooth ovary and fruit). The new species is also similar to *G. sessiliflora* (India and Myanmar) and *G. racemosa* (China, Bhutan, India, Myanmar, Nepal, Thailand, etc). It’s easily distinguished from *G. sessiliflora* by its oblong or ovate-lanceolate leaves, 18–25 × 6–12 cm, adaxially strigose along veins (vs. oblong-lanceolate leaves, 5–20 × 2–5 cm, adaxially sparsely pubescent), lateral staminodes are nearly equal to corolla lobes, 7–8 mm long, ovate-oblong, apex rounded (vs. lateral staminodes are much longer than corolla lobes, ca. 16 mm long, linear, apex acuminate), and labella are slightly longer than corolla lobes, obcuneate, apex 2-lobed, basal appendages 2 (vs. labella are much longer than corolla lobes, linear, without appendage at the base, apex emarginate). It differs from *G. racemosa* in its leaves 6–12 cm in width, adaxially strigose along veins, abaxially densely hairy (vs. leaves 4–5 cm in width, slightly pilose along veins on both surfaces or glabrous), bulblets were found at the lower portion of the inflorescence (vs. bulblets absence), verrucose ovaries and fruits (vs. smooth ovaries and fruits). A comparison with three related species is provided (Table 1).

Additional specimens examined: CHINA. Yunnan Province: Ruili City, Moli falls, 24°6'N, 97°59'E, alt. 932 m, 20 October 2019, Jian-Yong Shen, Wen-Guang Wang & Xing-Da Ma 1653 (HITBC!); Yingjiang City, Tongbiguan Township, bordering a rubber plantation, alt. 600 m, 4 August 1983, Shao-Quan Tong & Cong-Jin Liao 24856 (PE!).



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