

A new species of *Liparis* (Malaxideae: Orchidaceae) from Guangdong, China, based on morphological and molecular evidence

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Liparis nanlingensis H. Z. Tian & F. W. Xing, sp. nov.

南岭羊耳蒜 (S4-2, Fig. 1)

Type: **China, Guangdong:** Jigongkeng, Ruyuan, Nanling National Nature Reserve, on the trunk of *Castanopsis lamontii* Hance, alt. 1480 m, 2006-04-17. *H. Z. Tian 517* (holotype, IBSC).

Latin diagnosis: Species *L. krameri* Franch. & Sav., *L. sasakii* Hayata, *L. truncatae* F. Maek. ex T. Hashim. affinis, sed labiis valde longitudinalibus concavis, purpureo-rubris praeter bases in utroque latere virides, striis rubro-violaceis absentibus, callis quadratis, caudis minoribus differt.

Morphological description: Epiphyte. Pseudobulb ovoid, ca. 5 mm in diam., enclosed by white membranous sheaths. Leaves 2, blade ovate, ca. 1.5–2.5 × 1–1.5 cm, acute, margin entire, lateral veins obvious on surface, base contracted and narrowed into the petiole; petiole ca. 1–1.2 × 0.4 cm, edge pale, enclosed by 2–3 sheaths. Inflorescence 4–6 cm long, winged, 6–25-flowered, floral bract lanceolate, ca. 1 mm long. Flowers purplish red; pedicel and ovary purplish, pedicel ca. 3.5 mm long; dorsal sepal linear-lanceolate, 6 × 2 mm, apex acute, margin revolute; lateral sepals falcate, 5 × 1.5 mm, basal margin revolute; petals filiform, 5 × 0.5 mm, obtuse; lip broad oblong, 5 × 3 mm, reflexed and narrowed in the basal part, purplish red, green sides at the base, longitudinal concave in the middle, apex papillose and cuspidate with a tail ca. 0.2 mm long, basal quadrate callus ca. 1 mm long. Column terete, slightly arcuate, purplish red, ca. 2.2 mm long, slightly winged on each side; anther cap green or purplish, ca. 0.6 mm long; pollinia 4 in two pairs, yellow, waxy, ovoid, ca. 0.5 mm

long. Capsule subglobose, ca. 5 mm long. Flowering, April; fruiting, August.

Distribution: The new species was found at only one site on the trunk of *Castanopsis lamontii* Hance. Less than 100 individuals were found during the past 6 years' investigation of orchids in the reserve. According to the IUCN (2008), the new species should be treated as "Critically Endangered".

Notes: Morphological studies indicated that *Liparis nanlingensis* is distinct from other *Liparis* species in flower morphology (S4-1). Results of the internal transcribed spacer regions of 18S-26S nuclear ribosomal DNA (ITS) and *trnL* with *trnL-trnF* spacer in plastid DNA suggest the new species is close to but distinct from *L. krameri* Franch. & Sav. and *L. truncata* F. Maek. ex T. Hashim.

Additional specimens examined:

China, Guangdong: Jigongkeng, Ruyuan, Nanling National Nature Reserve, on the trunk of *Castanopsis lamontii* Hance, alt. 1480 m, 2009-09-19, *H. Z. Tian 1004* (HSNU).

Online supplementary data:

S4-1. Doc. 1. Additional statements.

S4-2. Fig. 1. *Liparis nanlingensis* H. Z. Tian & F. W. Xing (drawn by Ms. Yun-Xiao LIU).

S4-3. Fig. 2. Bayesian consensus tree based on nuclear ITS region (844 bp).

S4-4. Fig. 3. Bayesian consensus tree based on chloroplast *trnL* with *trnL-trnF* spacer (1266 bp).

S4-5. Doc. 2. Materials, methods and results with phylogenetic analyses.

S4-6. Doc. 3. Additional references.

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A new *Arisaema* species from Guangxi and first report of *A. austroyunnanense* from Hainan, China

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Arisaema guangxiense G. W. Hu & H. Li, sp. nov.

广西南星 (S5-1. Fig. 1, S5-2. Fig. 2)

(Section *Fimbriata* (Engler) H. Li)

Type: **China, Guangxi Zhuang Autonomous Region:** Jingxi County, Renzhuang, rock crevices on limestone hill, in shrubs, alt. 650 m (the collected plants of HGW-Z-00826 were cultivated in Kunming Botanical Garden), 2011-07-26,

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G. W. Hu & Y. Tan HGW-00778 (holotype, KUN!; isotype, KUN!).

Latin diagnosis: Haec species *A. austroyunnanensi* H. Li similis, sed planta nana, alt. ca. 20 cm, pseudocaudice petiolo pedunculo et tubo spathae punctis atropurpureis, limbo spathae ad basem piece frustro albo transverso, floribus neutis ad appendicem spadiceis terminalibus 3–6 mm longis differt.

Morphological description: Deciduous herb to 20 cm tall. Tuber subglobose, 0.5–2 cm in diameter. Cataphylls dark purple, mottled with snakeskin pattern. Pseudostem 6.5–7.5 cm long. Leaf 1, petiole 15–16 cm long, similar to cataphyll in color, free part 8–10 cm; leaf blade 3-foliolate, central leaflet ovate-oblong to rhombic-elliptic, 6–8.5 × 3–5.5 cm, base attenuate, apex acuminate, with a 1–3 mm arista at tip, lateral leaflets similar to central one, but asymmetrical at base, 5.5–9.5 × 2.5–3.5 cm. Peduncle approximately as long as petiole; spathe ca. 5 cm long, tube funnel-shaped, ca. 2 cm long, 7 mm thick, greenish longitudinally purple-dotted, base white, mouth-margins obliquely truncate, limb ovate, apex acuminate, 2.5–3.5 × 1.1 cm, green, with a white traverse patch at base, spadix male only seen, ca. 1 cm long; male flowers sparse, synandria of (1–)2(–3) stamens, shortly stipitate to subsessile, thecae whitish with purple top, dehiscent by a rounded pore, pollen white; spadix-appendix sessile, 2–2.5 cm long, basal 3/5 part dark purple, with scattered, ca. 2 mm long, subulate neuters, upper 2/5 part exerted out of the spathe tube, yellow-green, covered with 3–6 mm long, filiform, bristly projections.

Distribution and ecology: *Arisaema guangxiense* is found in southwestern Guangxi Zhuang Autonomous Region at Jingxi and Longan counties, growing in groups in humus soil in rock crevices on limestone hills at altitudes from 300 to 720 m. Sometimes two shoots grow up from one big tuber and become two individuals in the coming year.

Chromosome number: $2n = 26$ (S5-2, Fig. 2).

Notes: *Arisaema guangxiense* belongs to *Arisaema* section *Fimbriata*. It resembles *A. austroyunnanense*, but obviously differs by its shorter plant height, only to 20 cm tall; pseudostem, petiole

dark purple mottled with snakeskin pattern; spathe tube greenish longitudinally dotted dark purple; projections on the upper part of spadix-appendix filiform, 3–6 mm long.

Additional specimens examined:

China. Guangxi Zhuang Autonomous Region: Longan County, in crevices on limestone hill, in sparse forest, alt. 300 m, 2008-05-13, *Joint Expedition on Plants in Guangxi of CAS 0332* (PE); Jingxi County, Baonian Valley, on hill top, alt. 720 m, 2008-05-16, *Joint Expedition on Plants in Guangxi of CAS 0663* (IBK).

Arisaema austroyunnanense H. Li, *Acta Phytotax. Sin.* 15 (2): 105. 1977 (“*austro-yunnanense*”).

(S5-3, Fig. 3)

(Section *Fimbriata* (Engler) H. Li)

Type: **China. Yunnan:** Jinghong, Xiaomengyang, alt. 780 m, 1958-05-22, *Yunnan University 1420* (holotype, YUKU!).

Distribution: South Yunnan (Jinghong, Simao), Vietnam. First report in Hainan.

Notes: We observed an abscission layer between pseudostem and tuber in *Arisaema austroyunnanense* H. Li from Hainan (S5-3, Fig. 3: H) and separated its overground part from the tuber very easily. This phenomenon disclosed why most specimens of this species lack tuber (Gusman & Gusman, 2002; Li et al., 1977, 2010).

Additional specimens examined:

China. Hainan: Ledong County, Jianfengling, under rainforest, alt. 900 m, 2009-05-28. *G. W. Hu 24593* (KUN).

Online supplementary data:

S5-1, Fig. 1. *Arisaema guangxiense* G. W. Hu & H. Li.

S5-2, Fig. 2. Somatic chromosome of *Arisaema guangxiense* G. W. Hu & H. Li.

S5-3, Fig. 3. *Arisaema austroyunnanense* H. Li from Hainan.

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Elsholtzia lamprophylla (Lamiaceae): A new species from Sichuan, southwest China

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Elsholtzia lamprophylla C. L. Xiang & E. D. Liu, sp. nov.

亮叶香薷 (S6-1, Fig. 1, S6-2, Fig. 2)

(Series *Fruticosae* C. Y. Wu & S. C. Huang)

Type: **China. Sichuan:** Xiangcheng County, Ranwu, Xiaranwu Village, 28°46′02″N, 99°52′11″E, riverside, in thickets, alt. 2819 m, 2010-08-03, *E. D. Liu, C. L. Xiang & X. Nong 2697* (holotype, KUN!; isotypes, K!, KUN!, MO!, PE!).

Latin diagnosis: Species affinis *E. glabrae*, sed foliis ovalibus 0.8–2.0 cm longis, 0.3–0.9 cm latis, basi anguste cuneatis, venis lateralibus 3–5 jugatis, floribus flavis extus floccosis differt; in *E.*

glabra foliis rhombico-lanceolatis (6–15 cm longis, 2–4.6 cm latis), basi cuneato-decurrentibus, venis lateralibus 7–8 jugatis et floribus albis pubescentibus.

Morphological description: Shrubs, 0.8–1.0 m tall. Stems 3–7 mm in diam., glabrous, bark peeling off longitudinally; branchlets puberulent, purplish red when young, getting brown when old. Leaves aromatic when kneaded; petiole 0.8–1.5 mm long, puberulent; blades oval, 0.8–2.0 × 0.3–0.9 cm, adaxially sparsely golden glandular and simple-haired, abaxially densely golden-glandular, base narrowly cuneate, margin dentate with small teeth, apex acute, midrib prominent abaxially, lateral veins 3–5 pairs. Spikes terminal, 2–9 cm long, puberulent and sparsely dotted with golden glands. Verticillasters 3–6-flowered, gray puberulent, densely golden-glandular. Bractlets lanceolate to linear-lanceolate, 0.2–0.3 cm long, puberulent, sparsely golden-glandular. Peduncle and pedicel inconspicuous, ca. 0.5 mm

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