

Arisaema linearifolium (Araceae), a new species from northern Yunnan, China

Jian-Tao Yin¹ & Guy Gusman^{2,*}

¹ Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Menglun, Mengla 666303, Xishuangbanna, Yunnan, People's Republic of China

² Université Libre de Bruxelles (ULB), 1050 Bruxelles, Belgium (*corresponding author's e-mail: ggusman@ulb.ac.be)

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Arisaema linearifolium G. Gusman & J.T. Yin, a member of the section *Sinarisaema*, is described as a new species native to northern Yunnan, China. Its morphological characters are discussed and compared with those of morphologically similar species.

Key words: Araceae, *Arisaema* sect. *Sinarisaema*, new species, taxonomy

In 2006, J. Lemmens, a Belgian specialist in alpine flora, came across a puzzling small *Arisaema* species while visiting the northwest plateau of Yunnan, not far from Lugu Lake. He took photographs of these plants flowering in the wild and sent them to one of us (G.G.). This plant immediately appeared to be different from all other known species of *Arisaema* sect. *Sinarisaema* (Gusman & Gusman 2006), especially by the very narrow linear leaflets, the short peduncle, and the purple extremity of the spadix appendage.

In order to describe the plant, it was thus essential to find it again in the wild, collect herbarium material and gather more information especially about its ecology. This was done by one of us (J.-T. Y.) who went twice to the area of Lugu Lake, in June 2007 and June 2008. This study in the field confirms that the plant indeed represents a new species in the section *Sinarisaema*.

Arisaema linearifolium G. Gusman & J.T. Yin, *sp. nova* (Figs. 1 and 2)

Pseudocaule pedunculoque brevissimo A. echinato affine sed foliis linearibus et spadice appendice apice imberbi purpureaque differt.

TYPE: China. Yunnan, Lijiang Prefecture, Ninglang County, in open pine forest, alt. 2950 m, 24 May 2008. Yin Jian-Tao 1047 (holotype HITBC 126883, female inflorescence; isotypes HITBC 126889, 126895, 126901, male inflorescence).

Terrestrial and perennial deciduous herb, to 30 cm tall. Subterranean stem a depressed globose tuber, white, 3 cm in diam. and 2 cm high, with many raised tubercles. Roots thick, fleshy and white, to 16 cm long and 2 mm thick. Pseudostem from 2–3 cm long (male specimen) to 14 cm long (female specimen), ca. 1 cm in diam., glossy green, with longitudinal stripes of carmine spots. Cataphylls 3, lanceolate, white, purple at apex, to

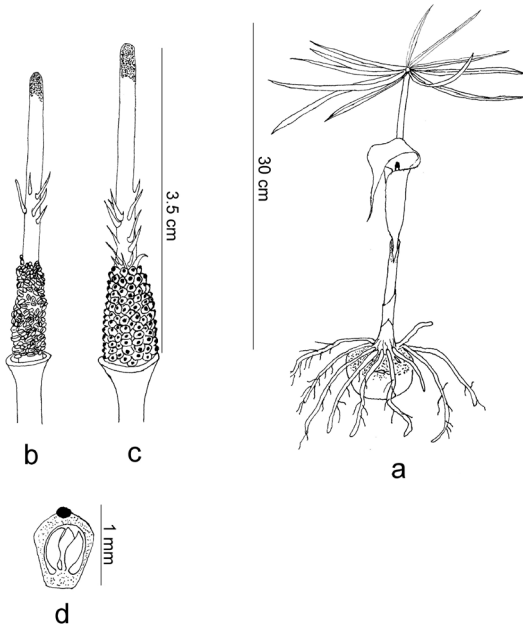


Fig. 1. *Arisaema linearifolium* (from the holotype and isotypes, drawn by Jian-Tao Yin). — **a:** Flowering plant with tuber. — **b:** Male spadix. — **c:** Female spadix. — **d:** Close-up of ovules.

12 cm long. Leaf solitary. Petiole cylindrical, ca. 15 cm long, similar in colour and pattern of markings to the pseudostem. Leaf blade radiate, with 9–13 segments; leaflets green, sessile, linear, with a deeply impressed midvein, ca. 11 cm long and 2 mm wide; margins entire; apex acute, not aristate. Inflorescence emerging when leaf unfolds and

held below leaf. Peduncle shorter than petiole, ca. 4 cm long and 2 mm wide. Spathe pale green with a few narrow, white, longitudinal stripes; spathe-tube subcylindrical, ca. 3.5 cm long and 1 cm wide; throat margin slightly recurved and ciliate; spathe-limb curved over mouth, lanceolate, ca. 3.5 cm long and 1.6 cm wide; spathe tip acuminate, ending in a tail, green or sometimes brownish, 3 cm long or more. Spadix either male or female. Male fertile part cylindrical, 1.5 cm long, 2 mm wide, stamens densely arranged, 2–4-anded; anthers dark purple, dehiscent by terminal oblong pores; pollen pink. Female fertile part 1.2 cm long, 6 mm wide, pistils densely arranged; ovaries ovoid, pale green, each ovary containing 3–5 spindle-shaped ovules; stigma sessile, whitish, surrounded by a dark purple annulus. Spadix-appendix sessile, cylindrical, just exerted from spathe-tube, 2.3 cm long, 1.5 mm wide, pale green, ending in rounded apex, dark purple or purple-dotted; lower part pale green and fluted, with some projections above fertile part, upcurved, pale green, sometimes purple at apex, ca. 2–4 mm long.

DISTRIBUTION AND HABITAT. China, Yunnan, Lijiang Prefecture, Ninglang County. *Arisaema linearifolium* thrives in open mixed forest, often along roadsides below *Pinus yunnanensis*, *Quercus pannosa*, and *Berberis* sp. It seems to be local and occurs in rocky lands together with *Cyclosorus* sp., *Fragaria* sp. and *Gentiana* sp., around 3000 m altitude.



Fig. 2. Two specimens of *Arisaema linearifolium* flowering in the wild (photographed by J. Lemmens).

Table 1. Comparison among *A. linearifolium* and the three morphologically closest species in *Arisaema* sect. *Sinarisaema* found in Yunnan.

<i>Arisaema</i>	<i>linearifolium</i>	<i>echinatum</i>	<i>echinoides</i>	<i>ciliatum</i> var. <i>ciliatum</i>
Tuber stoloniferous	no	no	yes	yes
Number of leaflets per blade	9–13	7–11	7–9	9–20
Leaflet length/width ratio	ca. 50	5–10	5–10	5–10
Spathe mouth-margin	ciliate	entire	entire	ciliate
Spadix appendage	sessile	stipitate & truncate	stipitate & truncate	stipitate
	apex smooth	apex echinate	apex echinate	apex dentate
Pollen	pink	cream	cream	cream

At first glance and though it is a much smaller plant, this species resembles *A. echinatum* (Schott 1832) and *A. echinoides* (Li 2000) by its overall appearance, particularly in having an inflorescence held well below the foliage and just above soil level, due to a pseudostem and a peduncle much shorter than the petiole. However *A. linearifolium* differs from the former species by several remarkable characters, the most striking being the linear shape of the leaflets whose width does not exceed 3 mm. This gives a value around 50 for the ratio of length to width of the leaflets, a character unique among all species of sect. *Sinarisaema*.

Other remarkable characters are found in the green spadix-appendix, which becomes abruptly purple or heavily purple-dotted at apex, and in the pink colour of the pollen. The presence of cilia on the mouth-margins of the spathe is a feature shared with *A. ciliatum* var. *ciliatum* (Li *et al.* 1977), but *A. linearifolium* lacks the typical conical spines at the apex of the spadix-appendix of *A. ciliatum* var. *ciliatum*, and, furthermore, *A. ciliatum* is stoloniferous.

More than 50 specimens of *A. linearifolium* were checked in the wild in order to warrant the

stability of the morphological characters of the new species; Table 1 lists the main characters that separate the four above-mentioned species, which all occur in Yunnan, at altitudes between 2500 and 4000 m a.s.l.

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