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# Materia Revisionis Arisaemarum: I. *Arisaema jiufushanense*, a new species of *Arisaema* section *Clavata* (Araceae) from Southeast China

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## ABSTRACT

*Arisaema jiufushanense* Z.X. Ma & Shan Si Chen, a new species from Fujian Province is described. The new species belongs to *Arisaema* sect. *Clavata* and morphologically resembles *A. silvestrii* and *A. heterocephalum* but differs in a combination of morphological characters. The new species is endemic to Southeast China, with only a small population presently known.

## KEY WORDS

Aroid; East Asia Flora; Fujian Province; Mt. Jiufushan; Sanming.

## INTRODUCTION

The genus *Arisaema* comprises of 199 species (Ma & Li 2017), primarily found in temperate to tropical regions spanning from East Asia to East Africa in the Old World and eastern North America to central Mexico in the New World, and it is famed for its highest diversity in the Himalayas-Hengduan Mountains (Li 1980). Recent molecular phylogenetic results suggest that the genus can be divided into 15 sections (Ohi-Toma et al. 2016), including *Arisaema* sect. *Clavata* (Engl.) H. Ohashi & J. Murata (Ohashi & Murata 1980, Murata et al. 2013).

*Arisaema* sect. *Clavata* is a small section endemic to E Asia, only includes 6 species. The section displays an interestingly disjunctive distribution pattern across the Asian Continent to S Japanese Archipelago, since half of the members are distributed and endemic to the continental E Asia (*A. clavatum* Buchet, *A. hunanense* Hand.-Mazz. and *A. silvestrii* Pamp.), while the other half to the Pacific islands extending to Taiwan Island (*A. ilanense* J.C. Wang), Ryukyu Islands (*A. heterocephalum* Koidz.), and Izu Islands (*A. negishii* Makino). Recent phylogenetic approaches and morphological evidences suggest *A. sect. Clavata* is a highly natural group and is readily recognized by a combination of morphological characters, namely 1) quincuncial phyllotaxy, 2) the occurrence of vertical accessory buds on subterranean stem, 3) pedate leaf blade, 4) paradioecious spadix, and 5) sessile and claviform to flagellate spadix-appendix, with short and acute neuters at base.

During field trips to central Fujian in 2019, we came across with a new species resembling *A. silvestrii* and *A. heterocephalum*. Following the continuous observation during the following 5 years, and herbarium examination, we confirmed it as a novelty to taxonomy.

### TAXONOMIC ACCOUNT

***Arisaema jiufushanense*** Z.X. Ma & Shan Si Chen, *sp. nov.* Type: China. Fujian Province (福建省), Sanming (三明市), Youxi (尤溪县), Mt. Jiufushan (九阜山), understory of subtropical evergreen forests in shady river valley, alt. 280m, 24 Feb 2024, *Yuer Wang* 68 (holotype BAZI!, ♂; isotypes A!, ♂, BAZI!, ♀, ♂, on sheet & in spirit, ♂, CSH!, ♂, NPH!, ♂). **Figure 1 (A-C), Figure 2 (A-D), Figure 3(A-C) & Figure 4 (A-G).**

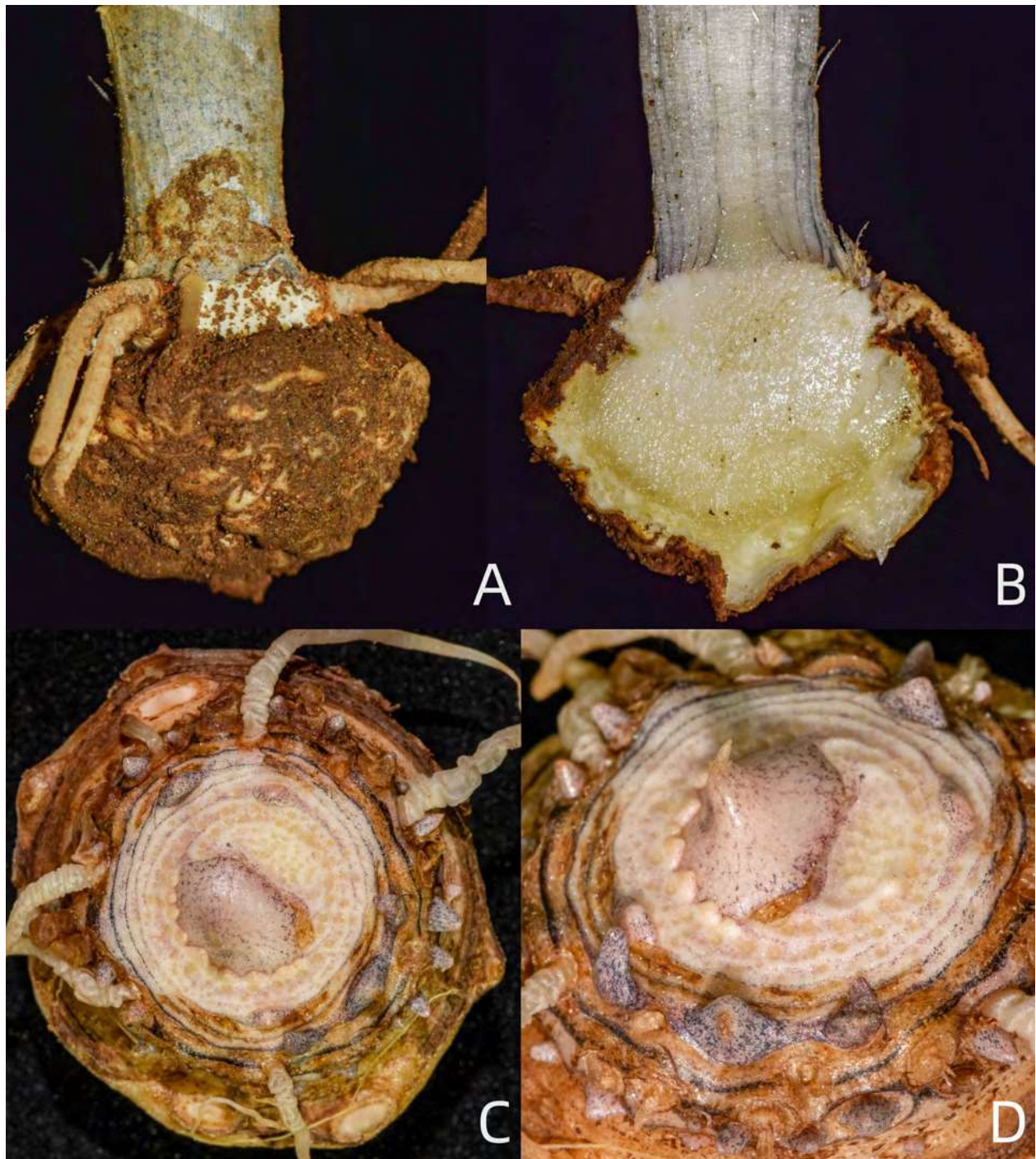
**Diagnosis** — *A. jiufushanense* differs from *A. silvestrii* in having a commonly not deflecting subterranean stem; a caulescent and upright pseudostem, ca.  $\frac{2}{3}$  above the ground, to 40 cm in length; pedate leaves with more leaflets (11-17); a cylindric to slightly funnelform spathe-tube, with an abaxial surface glossily white; an expending to moderately auriculate spathe mouth; and a slenderly claviforme spadix-appendix, somehow rugose at apex. *A. jiufushanense* differs from *A. heterocephalum* in having leaves with less leaflets (11-17), a green spathe with a glossily white abaxial surface, an always slender-cylindric spadix appendix that never capitate at apex, and a continental Asia distribution.

**Description** — *Perennial geophyte*, seasonally dormant, paradioecious, plants up to ca. 80 cm tall. *Subterranean stem* tuberous, creamy white both outside and inside, depressed globose, often not deflecting, to ca. 4 cm in diam., rarely bearing tubercles; *accessory buds* purple mottled, scale-like, 2-4 grouped. *Eophyll* 5-foliolate with petiole to 7 cm long. Cataphylls 3, membranous. *Foliage leaves* 2; petiole sheath glossily mottled purplish brown, ligulate at apex, forming a caulescent and upright pseudostem, ca.  $\frac{2}{3}$  above the ground, to 40 cm long, 0.5-1.4 cm in diam.; free part of petiole 25-43 cm long; leaf blade pedate, 11-17-foliolate; rachis 5.0-14.0 cm long between central and outermost leaflets; leaflets green, waxy, thickly membranous, oblanceolate, base sessile, broadly cuneate, apex acute; central leaflet usually largest, sometimes smaller than the adjacent leaflets, 3.5-4.5 cm × 10.5-33 cm, outermost leaflets small, 1.0-2.0 cm × 3.5-7.0 cm; primary veins and lateral veins raised abaxially, lateral veins forms brochidodromous collective veins near leaf edge. *Inflorescence* solitary, higher than leaves in male, lower than leaves in female, without obvious odor. Peduncle mottled purplish brown, glossy, 6.5-16 cm in length, ca. 0.5 cm in diam., always proportionally longer in male than female. *Spathe* green, waxy and thickly membranous; tube cylindric to long funnelform, 7.5-11.0 cm in length, 1.2-2.3 cm in diam. in the narrowest point, abaxial surface glaucous, green with very obscure deep green strips, white at base; adaxial surface nearly glossily creamy; mouth greenish, 3.4-4.6 cm in width, auriculate, auricle 0.3-0.6 cm in width; limb bending forward and flat, long triangular to acuminate-ovate, 8.0-10.5 cm in length, adaxially olive green to purplish, somehow glaucous, abaxially glossily green, transferring to creamy to the tube at base. *Spadix* paradioecious, to 12 cm in length. *Female zone* cylindric, somehow pyramidoid, to 2.5 cm in length, 0.9 cm in diam.; gynoeceum densely arranged; ovary glossy green, barrel-shaped, 1-loculous; placentation basal; style very short; stigma white, puberulent. *Male zone* cylindric, somehow pyramidoid, to 1.5 cm in length; androeceum lax, basally broadly stipitate; anthers dark purple; thecae globose, dehiscing by a short slit resulting in an apical pore. *Spadix-appendix* slenderly claviform, to 9.5 cm in length, 0.3 cm in diam.; proximal part sessile: female



**Figure 1:** Habitat of *Arisaema jiufushanense* Z.X. Ma & Shan Si Chen. A. Plants in the natural habitat, front a male individual (holotype), back a female individual; B. Male individual in type locality; C. Inflorescences from the type collection. Photos: Z.X. Ma.



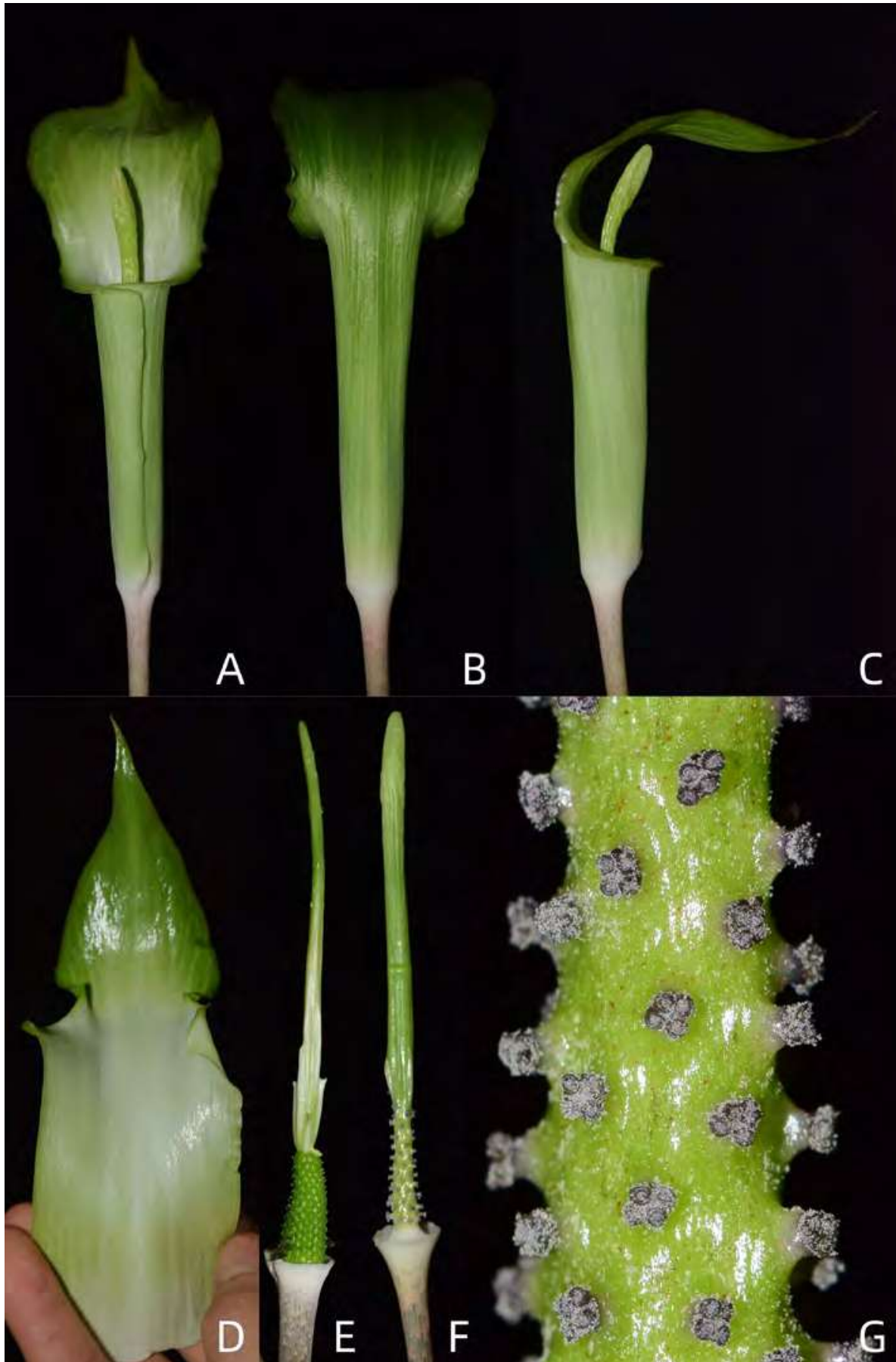


**Figure 2:** Stem Morphology of *Arisaema jiufushanense* Z.X. Ma & Shan Si Chen. A. Tuber surface; B. Cross section of tuber; C. Dormant tuber displaying a quincuncial phyllotaxy and accessory buds; D. Terminal and accessory buds in details. Photos A-B: Z.X. Ma; C-D: Zirui Guo.





**Figure 3:** Foliar Morphology of *Arisaema jiufushanense* Z.X. Ma & Shan Si Chen. A. Outermost leaflets; B. Upper section of pseudostem; C. Seedling cluster, note the 5-foliate eophyll. Photos: Z.X. Ma



**Figure 4:** Inflorescence of *Arisaema jiufushanense* Z.X. Ma & Shan Si Chen. A. Front view of male inflorescence; B. Back view of inflorescence; C. Side view of inflorescence; D. adaxial spathe surface; E. Female spadix; F. Male spadix; G. Androecia with dehiscent thecae covered with gray pollen grains. Photos: Z.X. Ma

appendix surrounded with flaky neuters, to 0.1 cm wide, often obscure and highly fused with appendix; male appendix with obscure neuters and only showing raised veins derived from the fused neuters; distal part greenish white, erect or forecurved, very slightly clavate to the apex, slightly rugose with obscure reticulate venations. Mature infructescence unknown. Anthesis Feb.-Mar.

**Eponymy** —The epithet of this species, “jiufushanense,” is derived and latinized from name of the type locality, Mt. Jiufushan.

**Distribution and Habitat**— *Arisaema jiufushanense* is only known from its type locality for now. However, occasional witness has been reported from the vicinity of Sanming (no specimen collected). *A. jiufushanense* is an inhabitant of the subtropical evergreen forests in stream valley, which is dominated by *Adina pilulifera* (Lam.) Franch. ex Drake, *Camptotheca acuminata* Decne., *Castanopsis fissa* Rehder & E.H. Wilson, *Meliiodendron xylocarpum* Hand.-Mazz., *Prunus campanulata* Maxim., *Quercus glauca* Thunb., *Quercus myrsinifolia* Blume, etc.

**Conservation** —The habitat of *Arisaema jiufushanense* is under the threat of human disturbance, especially tourism and traditional medicinal collection. According to our investigation, only 16 mature plants were found in the type locality, and another ca. 40 seedlings were found, several of which were brought to cultivation, though it is difficult to rule out the possibility that there are more plants in the adjacent area. Thus, we suggest this species is potentially endangered.

**Vernacular Names** — 九阜山南星 [jiu fu shan nan xing] (name in Putonghua); 捞狭锅 [lao xia guo] (name in Youxihua).

#### **Additional Material Examined (paratypes) —**

China. Fujian Province (福建省), Sanming (三明市), Youxi (尤溪县), Mt. Jiufushan (九阜山), understory of subtropical evergreen forests in shady river valley, alt. 280m, Mar. 2019, Zhengxu Ma s.n. (BAZI!, in spirit, ♂ inflorescence); *Ibid.*, Feb. 2022, Shansi Chen s.n. (BAZI!, ♀ inflorescence and juvenile infructescence).

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