

Asplenium cornutissimum (Aspleniaceae), a new species from karst caves in Guangxi, China

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Abstract. *Asplenium cornutissimum*, a new species from Guangxi, southern China, is described, illustrated, and compared to three similar species: *A. pulcherrimum*, *A. coenobiale*, and *A. tenuifolium*. So far, the new species is known only from the limestone region in southern Guangxi, from 750–825 m. It grows exclusively in karst caves.

Key Words: Fern, karst cave, China, Aspleniaceae, new species.

Asplenium L. (Aspleniaceae) and its putative segregates consist of about 700 species (Kramer & Viane, 1990), of which 110 have been recorded in China (Wu, 1999). Many grow only on limestone, often in crevices. In the subtropical and subtropical regions of southwest China's Guizhou, Guangxi, Yunnan Provinces, and North Vietnam, a group of *Asplenium* species with small finely dissected leaves and ebeneous petioles are common in rocky crevices in regions of karst topography. These species include *Asplenium coenobiale* Hance, *A. pulcherrimum* (Baker) Ching ex Tardieu, and *A. fuscipes* Baker (Tardieu-Blot, 1932; Wu, 1999; Zhang, 2006). Recent botanical expeditions to the limestone areas of Guangxi have revealed a new species of this group, found only in the karst caves, which we describe herein.

Asplenium cornutissimum X. C. Zhang & R. H. Jiang, **sp. nov.** Type: China. Guangxi: Jingxi County, Dizhou, 23°00' 17.68" N, 106°21'04.90" E, growing in karst cave, 750 m, 26 Aug 2009, R. H. Jiang & W. B. Xu 091623 (holotype: IBK; isotype: PE). (Fig. 1)

Species insignis, affine *A. pulcherrimo*, a quo differt statura graciliore, petiolis rufo-castaneis, lamina oblong-elliptica, minus divisis, pagina frondis texture tenuiter herbacea, in sicco vivo viridi, segmentis ultimis dimorphis, bifidis vel simplicibus, fertilibus late falcatibus, indusiis membranaceis, hyalinis, oblong-ovatis, margine undulatis vel dentatis.

Plants slender. Rhizomes erect, the apices densely scaly; scales basifixed, narrowly lanceolate, 2.6–3.5 × 0.3–0.5 mm, black brown, clathrate, concolorous, subtentire or with minute glandular hairs, apex hair-pointed. Leaf clustered; petioles 0.7–4 cm long, base 0.2–0.4 mm diam., 1/4–1/3 the length of the laminae, rufo-castaneous, with scattered minute glandular hairs, the base with scattered black brown fibrous scales, adaxial side grooved; laminae oblong-elliptic, widest medially, 3.5–11.5 × 1–3.2 cm, apex acuminate, finely dissected, 3-pinnate, ultimate pinnule bifid; pinnae 8–17 pairs, ovate or broadly ovate, medial pinnae 0.6–2 × 0.4–1.3 cm, shortly stalked, 2-pinnate, basal 1 or 2 pairs of pinnae greatly reduced to half the size of upper pinnae, sterile or bearing 1–2 sori; pinnule 2 or 3 pairs, pinnate, anadromous, basal acroscopic pinnule the largest, broadly ovate or elliptic, stalked; secondary pinnule bifid or simple; ultimate segments sterile or fertile,

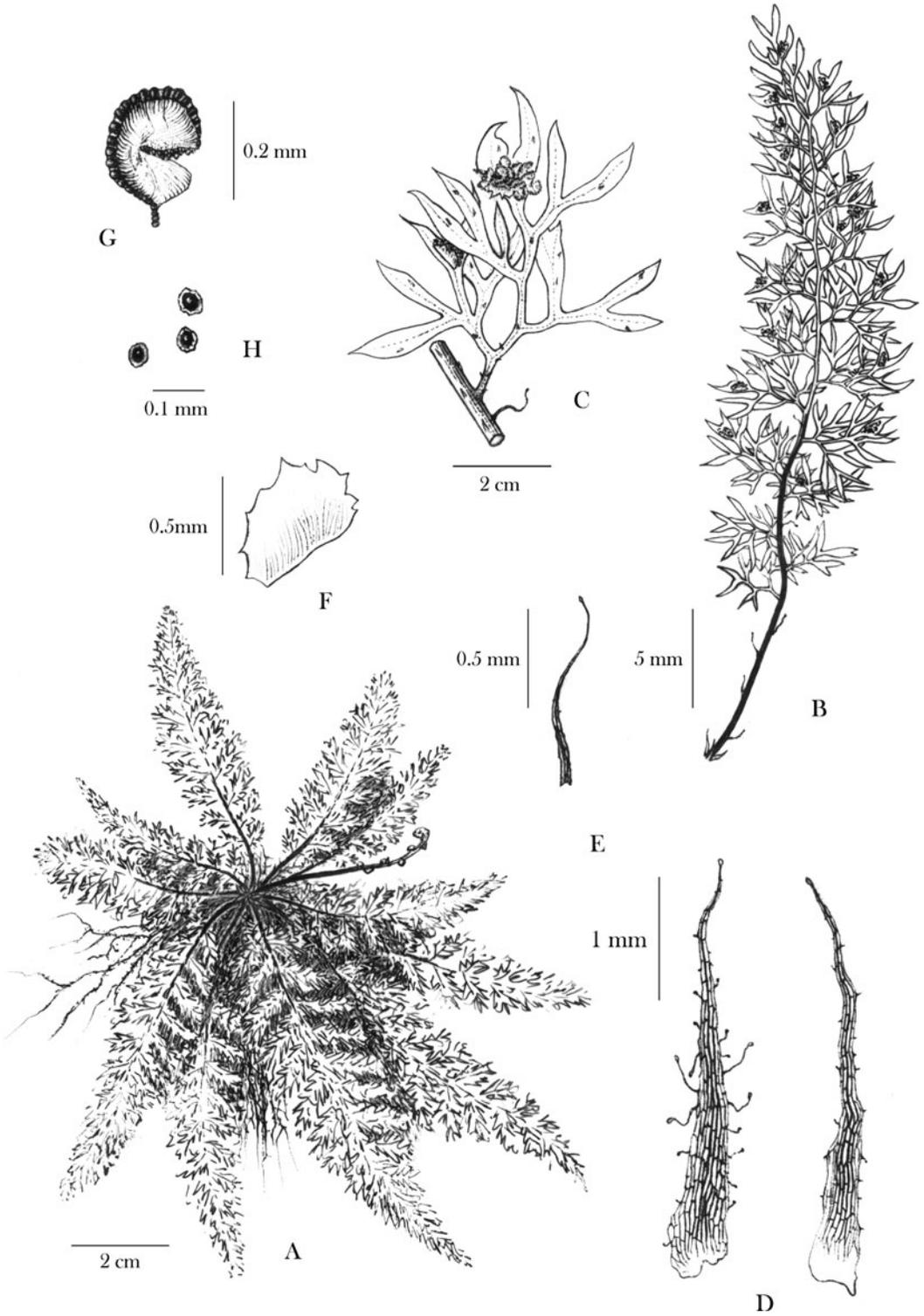


FIG. 1. *Asplenium cornutissimum*. A. Habit. B. Frond. C. Pinna. D Scales from base of petiole. E. Scale from rachis. F Indusium. G. Sporangium. H. Spores. (From the holotype.)

TABLE I
COMPARISON OF THREE CHINESE SPECIES OF *ASPLENIUM*.

Character	<i>A. cornutissimum</i>	<i>A. pulcherrimum</i>	<i>A. coenobiale</i>
Rhizome scales	concolorous, margin with glandular hairs	bicolorous, with a narrow brown margin, subentire	bicolorous, with a narrow brown margin, subentire
Petioles	slender, 0.2–0.4 mm in diam., rufo-castaneous, 1/4–1/3 the length of the laminae	robust, 0.5–0.8 mm in diam., ebenous, 1–3 times the length of the laminae	robust, 0.5–1.8 mm in diam., ebenous, 1–3 times the length of the laminae
Laminae	3-pinnate, oblong-elliptic, widest medially; texture thin-herbaceous; grass-green when dry	3 or 4-pinnate, triangular to long triangular, widest at base; texture herbaceous; brown when dry	2 or 3-pinnate, triangular to long triangular, widest at base; texture thick-herbaceous, dark-brown when dry
Pinnules	pinnules 1 or 2-pinnate; fertile segments bifid, obviously enlarged, margin slightly toothed	pinnules 1 or 2-pinnate; fertile segments not bifid, slightly enlarged, margin entire	pinnules 1 or 2-pinnatilobate to pinnatifid; fertile segments not bifid, not enlarged, margin entire
Sori	few pinnules fertile, sori scattered, normally on acroscopic pinnules, 1 or 2 on one pinnule	pinnules partly fertile, sori regularly arranged, 1–3 sori on one pinnule	almost all pinnules fertile, sori regularly arranged, 2 or 3 sori on one pinnule
Indusia	oblong-ovate, margin undulate or toothed	oblong-elliptic, margin subentire	oblong-elliptic, margin entire

linear-falcate, 1–2.5 × 0.2–0.5 mm, apex sharply acute, margin entire, each segment with one midvein, ended below the sharp-pointed apex; fertile segments much wider than sterile ones, the base enlarged into a flap, margin of the flap entire or toothed; laminae thin-herbaceous, grass-green when dry; rachis below middle castaneous, distally grass-green, glabrous or with scattered minute glandular hairs, shallowly grooved on adaxial side, abaxial side of pinnule-rachis with scattered minute, brown glandular hairs; sori elliptic, 0.6–0.8 mm long, scattered on pinnules, normally on the acroscopic base of the enlarged segment; indusia oblong-ovate, membranous, hyaline, margin undulate or dentate; spores brown, ellipsoidal, monolete, 28.6–40.5 × 22.5–34.5 μm, reticulate.

Distribution and ecology.—*Asplenium cornutissimum* is found in karst caves in Jingxi County, Guangxi, China. The populations are small, and so far known from only two karst caves in the same region.

Etymology.—The specific epithet refers the ultimate segments of lamina, which are forked like a horn.

Additional specimen examined. CHINA. Guangxi: Jingxi, Dizhou, in karst cave, 23°06'59.51"N, 106°17'19.99"E, 825 m, 27 Aug 2009, R. H. Jiang & W. B. Xu 091670 (IBK).

This new species resembles *Asplenium pulcherrimum* (Baker) Ching ex Tardieu and *A. coenobiale* Hance but differs by the following characters: laminae oblong-elliptic, widest medially, and 3-pinnate; rhizome scales narrowly lanceolate; petioles very short and rufo-castaneous; and margins of the indusia undulate to toothed (Table I). The identification of *A. pulcherrimum* and *A. coenobiale* can sometimes be difficult, but generally the former has more finely divided laminae. This new species also resembles small forms of *A. tenuifolium* D. Don because of the division and color of the laminae. *Asplenium tenuifolium*, however, differs by ovate-lanceolate, entire rhizome scales, and green petioles and rachises (sometimes in large plants, the lower part of petioles are brown). *Asplenium tenuifolium* is distributed from the East Himalayas (type from Nepal) to Southeast Asia and is typically epiphytic in humid evergreen broadleaf forests from 1200–2400 m.

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