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Piper magen (Piperaceae), a new species from Yunnan, China

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Abstract

Piper magen (Piperaceae) *sp. nov.* from Yunnan Province, China, is here described and illustrated. This species is similar to *P. nudibaccatum*, but the former can be distinguished by the following combination of characteristics: woody climbers with well-developed longitudinal ridges, these with obtuse, corky wings; leaves dimorph, mature leaves green at adult stage, elliptic or ovate with oblique leaf base, veins 7–9, pinnate, but leaves cordate, heterochromous at juvenile stage, with veins zone greyish white on the adaxial surface, veins 5–7, palmate; male spikes with sterile apical region ca. 1–3 mm long, glabrous, pale green; stamens 3; filaments very short and flat (with stereoscope); bracts suborbicular with dense, brownish red dots visible on adaxial surface, with dense cilium on abaxial surfaces (with stereoscope); stigmas 3 or 4, linear, reflexed, sparsely velutinous.

Key words: *Piper*, IUCN Red List, Yunnan Province, New species

Introduction

Piper Linnaeus (1753: 28) is the largest genus in the Piperaceae family, variously estimated to include 1000–2000 species (Cheng *et al*. 1999, Hao *et al.*, 2015, Junior *et al*. 2015, Shi *et al.*, 2017). The genus (and family) is mainly distributed in tropical regions, and approximately 60 species are found in China (Cheng *et al*. 1999). The genus *Piper* is a potential source of drugs based on the use of some species in traditional medicine (Wang *et al.* 2014); nearly half of the indigenous Chinese species are used medicinally (Li *et al.* 2006, Zheng & Xing 2009, Liu *et al.* 2013, Wang *et al.* 2014). The name *Piper magen* (ined.) was first proposed by B.Q. Cheng (Cheng 1991), who indicated it was an edible spice plant used by local people in Xishuangbanna, Yunnan Province. There were no holotypes designated (a male and a female specimen). No description or illustration was provided. As a consequence, the name actually is a *nomen nudum* and was invalidly published (Cheng 1991, Cheng & Yu 1995).

During several botanical surveys focusing on pipers in southern Yunnan, China, from 2012 to 2016, specimens of a young and dioecious plant were found and collected. After consulting relevant literature (Tseng 1979, Cheng *et al.* 1999, Gilbert & Xia 1999, Suwanphakdee & Chantaranothai 2011, Suwanphakdee & Chantaranothai 2014, Hao *et al.* 2015, Junior *et al*. 2015, Mathew *et al.* 2016, Suwanphakdee *et al.* 2016), we concluded it did not match morphologically any of the existing species. It concerns a woody climber with obtuse corky wings borne along longitudinal ridges; the male spikes possess a sterile apical region; and leaves at juvenile stage are heterochromous with the zone of the veins greyish white on the adaxial surface. Because of these distinctive morphological features, it is here described and illustrated as a new species.

Taxonomic treatment

Piper magen B. Q. Cheng ex C. L. Long & Jun Yang, *sp. nov.* (Fig. 1 and Fig. 2)

Similar to *P. nudibaccatum* Y.Q. Tseng (1979: 37), but distinguished by the following features: woody climbers, the longitudinal ridges of the stem with obtuse, corky wings; leaves at juvenile stage cordate, heterochromous, with veins zone greyish white on the adaxial

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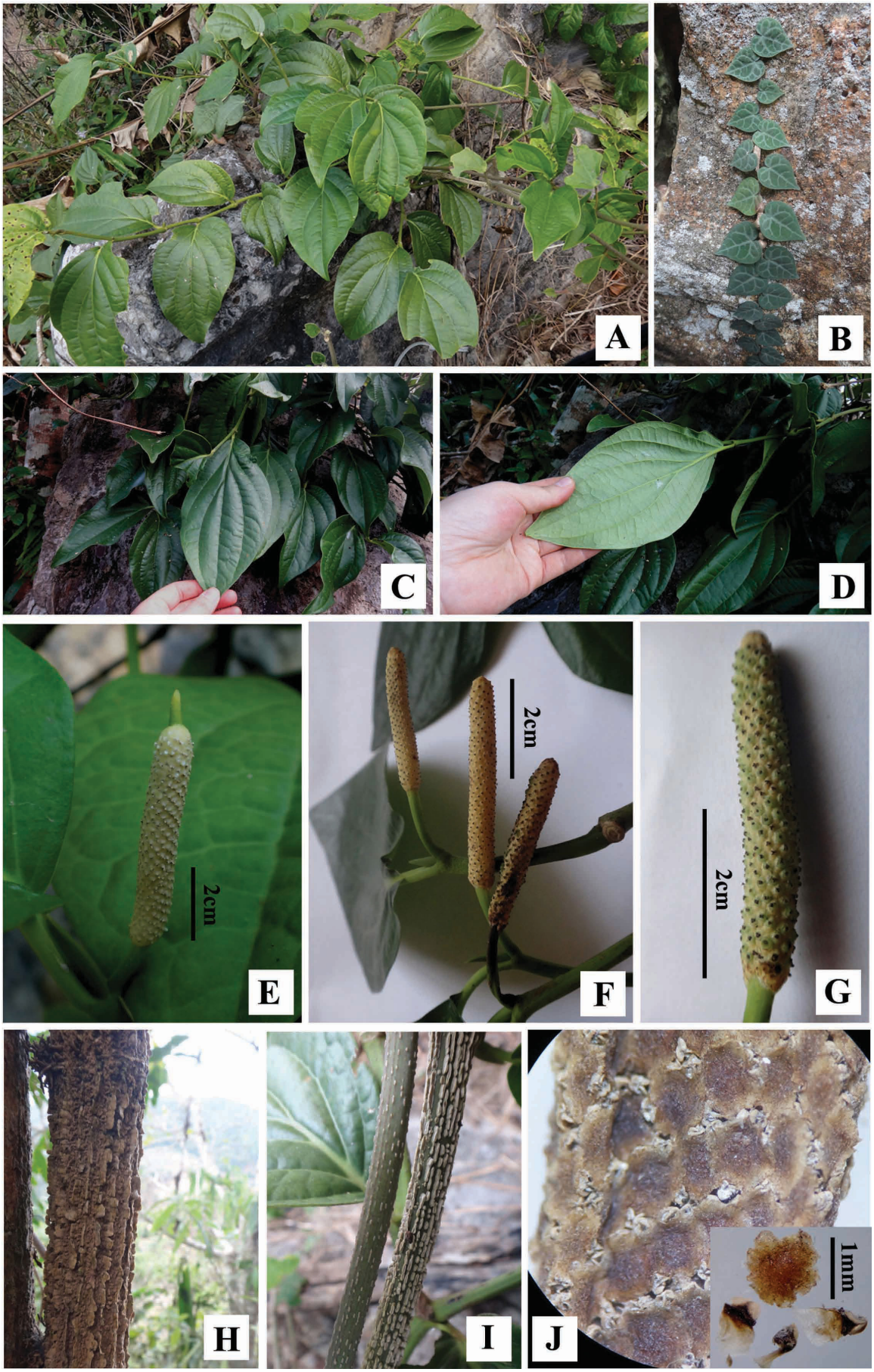

FIGURE 1. *Piper magen*. A. Habit; B. Juvenile; C. Adaxial surface of adult leaf; D. Abaxial surface of adult leaf; E. Male spike; F. Female spike; G. Infructescence; H. Woody stem; I. Young stem; J. Floral bracts and stamens; Photographed by J. Yang.

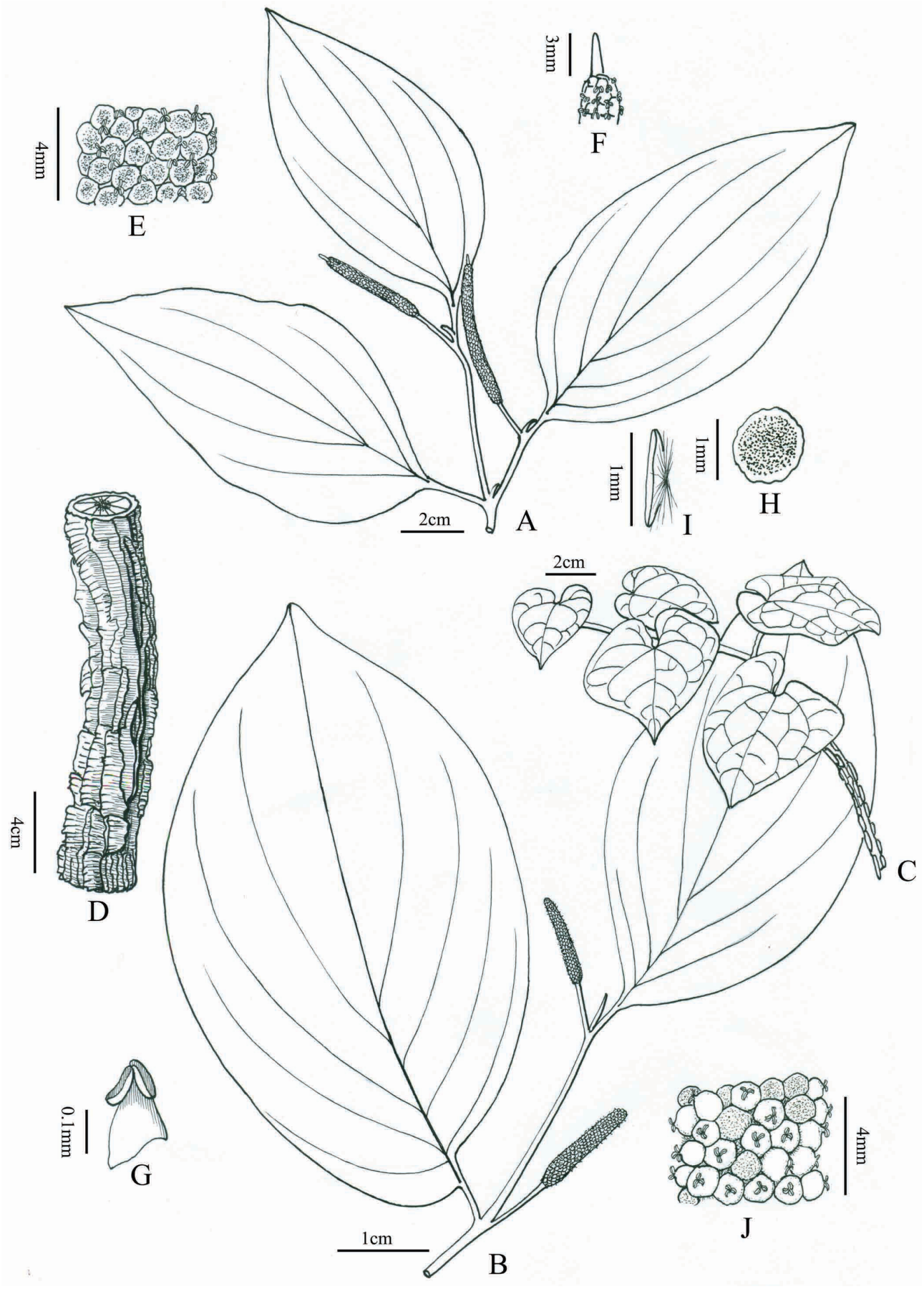

FIGURE 2. *Piper magen*. A. Branch with male inflorescence; B. Branch with infructescence; C. Juvenile; D. Woody stem; E–F. A portion of the male inflorescence; G. Stamen; H. Floral bract frontal view; I. Floral bract lateral view; J. A portion of the infructescence; Drawn by L. Wang. Illustration based on the holotype *J. Yang YJ-190* (female), and the paratypes *J. Yang YJ-008* (male) and *J. Yang YJ-042* (male).

surface; male spikes with sterile apical region; stamens 3; filaments very short or inconspicuous, flat, ca. 0.1–0.2 mm long; bracts with dense brownish red dots visible on the adaxial surface and with dense cilium on abaxial surfaces (with stereoscope); stigmas 3 or 4, linear, reflexed, sparsely velutinous.

Type:—CHINA. Yunnan: Mengyuan Village, Guanglei Township, Mengla County, climbing on rocks in tropical montane rainforest, 21°45′N, 101°22′E, elev. 1511 m, 5 March 2016, *J. Yang YJ-190* (flowering: female)(holotype KUN!; isotype KUN!).

Woody climbers, more than 3 m high, dioecious. Young stems herbaceous, puberulous, brown when dry, internodes striated, rooting at nodes, tuberculate; older stems woody, glabrous, with numerous longitudinal ridges, each with obtuse, corky wings. Leaves dimorph, cordate, heterochromous at juvenile stage, 3–7 × 3–5.5 cm, with dots; veins 5–7, palmate, major veins zone greyish white on adaxial surface, veins green, puberulous on abaxial surface; petioles 0.5–2 cm long, puberulous; mature leaves green, elliptic to ovate at adult stage, 9–18 × 4–10 cm, membranous to papery, glabrous, base asymmetrical, with one side rounded, 2–3 mm longer that the other side, cuneate, apex acuminate to long-acuminate; major veins 7–9, pinnate, apical pair veins separating from each side of midvein ca.1–4 cm from base; reticulate veins abaxially prominent; petioles 1–2 cm long, glabrous, sheaths nearly half of petiole length or longer. Spikes leaf-opposed; peduncle ca.1–2 cm long, glabrous, as long as or slightly longer than petiole; bracts suborbicular, ca. 1 mm in diam., nearly sessile, margin irregular, with dense, brownish red dots visible on adaxial surface and with dense cilium on abaxial surfaces (with stereoscope). Male spikes 3.5–8 cm × ca. 3 mm, with sterile apical region ca.1–3 mm long; stamens 3/flower; filaments very short or inconspicuous, flat ca. 0.1–0.2 mm long (with stereoscope); anthers reniform. Female spikes 2–5 cm × ca. 5 mm; stigmas 3 or 4/flower, linear, reflexed, sparsely velutinous. Drupes globose, partly immersed in rachis, glabrous.

Distribution:—Only two populations are known of this species, which are apparently restricted to the area of Mengla County, southern Yunnan, China (Fig. 3).

Ecology and Habitat:—This species climbs on rocks, at elevations of ca. 1500 m, in dry shade in tropical, montane rainforests.

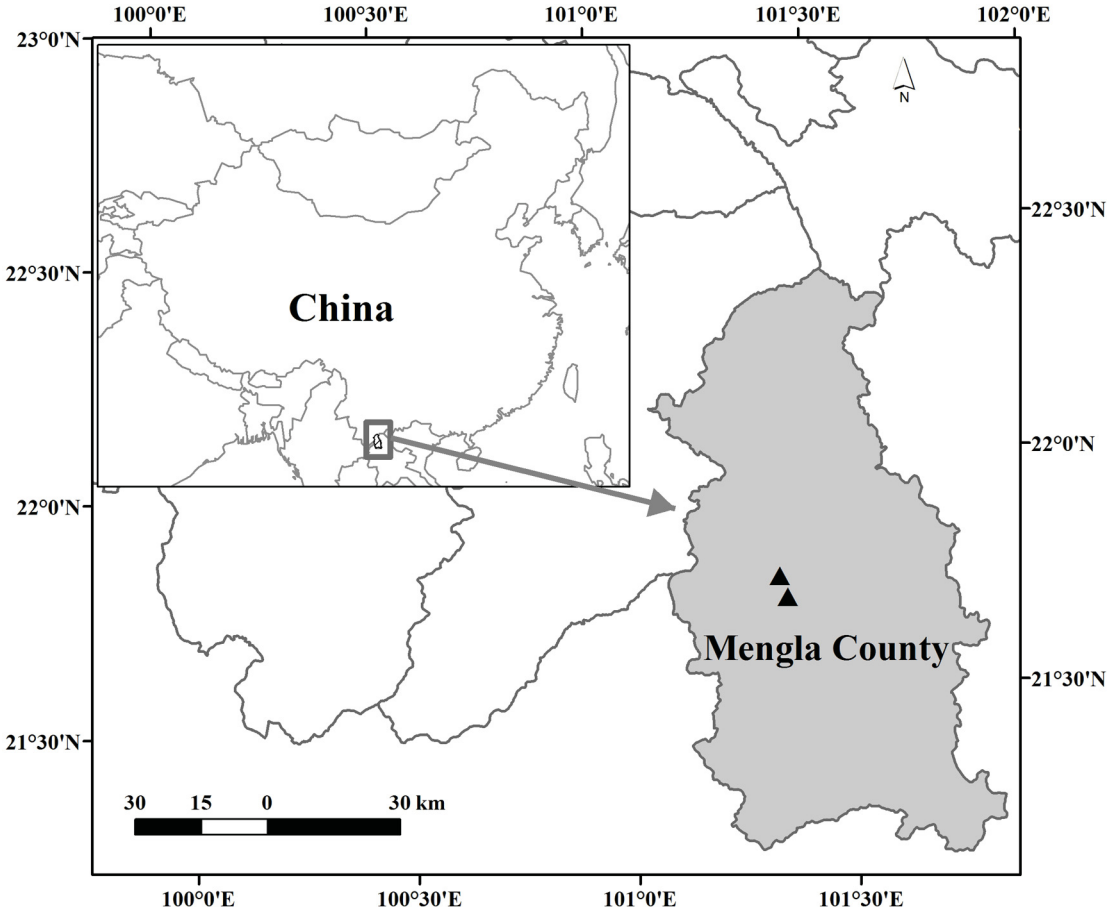

FIGURE 3. Distribution of *Piper magen* in Mengla County, China.

Phenology:—Flowering from April to June; fruiting from July to September.

Etymology:—The epithet refers to the old stem with numbing or spicy taste.

IUCN Red List Category:—*Piper magen* is known only from Mengyuan Village, Guanglei Township, Mengla County, southern Yunnan Province, China. It is distributed in two localities separated by approximately 30 km. The habitats are close to villages and the local people like eating this plant (stem and leaves) as a favorite spice. Less than 20 individuals were found in each population and almost all of them are juvenile. This new species was evaluated as Critically Endangered [CR B1b (iii)] because of its limited distribution and threatened habitat, according to the IUCN Red List Categories and Criteria (IUCN 2012).

Taxonomic relationships:—The species that is morphologically similar to this new species is *P. nudibaccatum*, which can also be found in Yunnan Province (Tseng 1979, Cheng *et al.* 1999, Gilbert & Xia 1999). After comparing with specimens of *P. nudibaccatum* and descriptions in the literature (Tseng 1979, Cheng *et al.* 1999, Gilbert & Xia 1999), we determined that *P. magen* can be clearly differentiated on the basis of several characteristics, as described in the diagnosis above and summarized in Table 1.

Additional specimen examined:—CHINA. Yunnan: Mengyuan Village, Guanglei Township, Mengla County, climbing on rocks near the village, 21°42′N, 101°22′E, elev. 920 m, 21 December 2014, *J. Yang YJ-042* (male) (KUN!); 28 July 2012, *J. Yang YJ-008* (male) (KUN!). Both specimens were collected at the same place, about 30 km from the type locality.

TABLE 1. Morphological comparisons between *Piper magen* and *P. nudibaccatum.*

Character	*P. magen*	*P. nudibaccatum*
Stems	Young internodes striated, tuberculate; woody stems with longitudinal ridges, these with obtuse corky wings	Ridged, ± tuberculate at all stages
Leaves	Dimorph at juvenile and adult stages	Homophyllous at all stages
Juvenile leaves	Cordate, 3–7 × 3–5.5 cm, glandular; veins 5–7, all basal, heterochromous, veins zone greyish white on adaxial surface, veins green, puberulous on abaxial surface	Same as adult leaves
Adult leaves	Elliptic to ovate, 9–18 × 4–10 cm, membranous to papery, green when dry, without dots	Elliptic or ovate-oblong, 10–19 × 3.5–9 cm, papery, glaucous when dry, finely dotted
Leaf base	Not equilateral, with one side, rounded, much longer that the other side, cuneate at adult stage; leaves base symmetric at juvenile stage	Base symmetric or nearly so at all stages
Male spikes	With sterile apical region ca. 1–3 mm long	Lacking sterile apical region
stamens	Stamens 3; filaments very short or inconspicuous, flat ca. 0.1–0.2 mm long	Stamens 2; filaments short, ca. 0.5 mm long
Female spikes and flowers	Spikes 2–5 cm × ca. 5 mm; stigmas 3 or 4, sparsely velutinous	Spikes 6–8 cm × ca. 4 mm; stigmas 4 or 5, densely pubescent
Bracts	Suborbicular, ca. 1 mm in diam., nearly sessile, margin irregular, with dense, brownish red dots visible on adaxial surface and with dense cilium on abaxial surfaces	Suborbicular to obovate, ca. 0.8 mm wide, without dots, base tapered, peltate, stalk short, pubescent

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