



Hemiboea angustifolia (Gesneriaceae), a new species endemic to a tropical limestone area of Guangxi, China

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Abstract

Hemiboea angustifolia, a new species of Gesneriaceae from Guangxi, China, is described and illustrated. The new species is morphologically similar to *H. cavaleriei* var. *paucinervis* and *H. longgangensis*, both found in southwestern Guangxi, China. A description of *H. angustifolia*, together with illustrations, a distribution map, habitat description, conservation assessment and a diagnostic comparison with *H. longgangensis*, *H. cavaleriei* var. *cavalerieri* and *H. cavaleriei* var. *paucinervis* are presented.

Key words: Gesneriaceae, Guangxi, *Hemiboea angustifolia*, new species, taxonomy

Introduction

Hemiboea Clarke is a medium-sized genus of Gesneriaceae mostly occurring in China. Three taxa can also be found in neighboring countries, namely *H. cavaleriei* var. *paucinervis* W.T.Wang & Z.Y.Li (in Li 1983) and *H. subcapitata* Clarke (1888: sub tab. 1798) in northern Vietnam (Li & Wang 2004), and *H. bicornuta* (Hayata 1913: 154) Ohwi (1936: 662) in Iriomote-Shima of Ryukyu, Japan (Li 1996). The subtropical and tropical areas of Guangxi, Guangdong, Yunnan and Guizhou are the most diverse regions in this genus (Li 1983, 1987). Recently, a Chinese endemic genus, *Metabriggsia* Wang (1983: 1), was revised and merged with *Hemiboea* (Weber *et al.* 2011). The two species of *Metabriggsia*, *M. ovalifolia* (1983: 2) and *M. purpureotincta* Wang (1983: 3), were combined to *Hemiboea ovalifolia* (W.T.Wang) A.Weber & Mich.Möller and *H. purpureotincta* (W.T.Wang) A.Weber & Mich.Möller (in Weber *et al.* 2011). Thus, this genus comprises at least 27 species and five varieties in China (Li & Wang 2004, Xu *et al.* 2010).

During the course of a floristic investigation in 2005, we collected a rare unknown species of *Hemiboea* from a limestone area in Daxin County, Guangxi, which is different from all known species in having glabrous, lanceolate leaves and few yellowish white flowers in a single cyme. It belongs to *H.* section *Subcapitatae* Clarke (1888: sub tab. 1798). After consulting national floras and relevant literature (Li 1987, Wang 1990, Wang *et al.* 1998, Li & Wang 2004, Wei *et al.* 2010), as well as herbarium specimens, we concluded that our specimens represent a new species, which is described and illustrated here.

Taxonomic Treatment

Hemiboea angustifolia F.Wen & Y.G.Wei, *sp. nov.* (Fig. 1 & Fig. 2 A–F)

Haec species H. cavaleriei var. *cavaleriei*, *H. cavaleriei* var. *paucinervi* et *H. longgangensi* affinis, a quibus foliis anguste lanceolatis vel lanceolatis, floribus majoribus, 4.8–5.4 cm longis, corollae tubis 3.6–4.0 cm longis, orificio

1.4–1.6 cm diametro, ovario (circa 13 mm longo) longiore, disco circa 2.2 mm alto, stigmatate capitato, depresso differt.

Type:—CHINA. Guangxi: Daxin County, Encheng Town, growing on the damp stones at the entrance of a medium-sized karst caves where spring runs out from the opening, at evergreen broadleaf forest margins, mostly on soils of limestone crevices somewhat rich in alkaline, altitude 162–170 m, 21 November 2008, *F. Wen & W.X. Tang 08112101* (holotype IBK!, isotypes PE!).

Perennial herb. Stems ascending, 40–80 cm high, 5–7 mm in diameter, rounded, glabrous, simple, with 10–12 nodes or more. Leaves opposite, ca 20, the lower ones commonly caducous; petiole 1–2 cm long, glabrous; leaf blade subcarnose or thinly leathery, thickly herbaceous when dry, narrowly lanceolate to lanceolate, 10.5–16.5 × 1.5–4.4 cm, apex acute or acuminate, base narrowly cuneate, zygomorphic or slightly oblique, margin entire, glabrous on both sides, lateral veins 5–7 on each side of midrib. Cymes subterminal or terminal, 3- or more-flowered, peduncle 1.0–1.5 cm long, glabrous; involucre nearly spheroidal or cordate, 1.8–2.3 cm in diameter, whitish green or pale yellowish green, glabrous. Pedicel ca 2.2–3.5 mm long, glabrous. Calyx white or pale green, 5-parted from the base, lobes equal, lanceolate to narrowly triangular, 7.8–8.8 × 0.30–0.35 mm, glabrous. Corolla outside greyish-white or waxy-white, adaxial light purple, inside brownish yellow, 4.8–5.4 cm long, adaxial outside glandular-puberulent, abaxial outside extremely short pubescent to nearly glabrous, inside glabrous; tube 3.6–4.0 cm long, 1.4–1.6 cm in diameter at the orifice, ca 4.8–5.2 mm in diameter at the base, inside with a ring of hairs adnate to 8.0–8.5 mm above the corolla base; limb distinctly 2-lipped, adaxial lip 2-lobed, lobes oblate, 5.2–6.5 × 8.8–9.3 mm; abaxial lip 3-lobed towards the middle, lateral two lobes rotund, 5.1–5.7 × 5.7–6.3 mm, central lobe oblate or oblate-oval, ca 5.7 × 9.2 mm. Stamens 2, adnate to ca 18.5–19.2 mm above the corolla base; filaments linear, geniculate from the middle, linear, glabrous; anthers slightly elliptic, glabrous, 3.2–3.5 × 2.8–3.0 mm. Staminodes 2, glabrous, adnate to 17.0–18.1 mm above the corolla base, 5.7–6.0 mm long with adherent capitate apex. Disc ring-like, ca 2.2 mm high, margin repand, glabrous. Pistil 2.5–2.7 cm long; ovary linear, ca 13 mm long, 2.5–2.7 mm in diameter, glabrous; style ca 12–14 mm long; stigma capitate, middle slightly depressed, ca 1.6 mm in diameter. Capsule linear, ca 3.0–3.5 cm long, 3.5–4.0 mm in diameter, glabrous, slightly curved. Flowering in November, fruiting in December.

Distribution:—CHINA (Endemic to Daxin County, SW Guangxi Autonomous Region) (see Map. 1).

Habitat & Ecology:—*Hemiboea angustifolia* has been only found in Encheng Town, Daxin County, Guangxi, China. The climatic type of type locality belongs tropical monsoon climate, the rainfall averages 1326 mm/year, and mean annual temperature was 21.3 °. The vegetation type of this region is special evergreen tropical seasonal rain forest on limestone hills.

Etymology:—The specific epithet refers to the narrow and linear leaves of this new taxon. The morphology of the blade is obviously different from other species in this genus.

Conservation status:—According to the detailed information from our careful field investigation surrounding the type area for five times in two years, the population size of this new species is fewer than 100 individuals, all at one site. They grow on the bottom of limestone cliff in a karst gorge. According to IUCN red list categories (IUCN 2001, Pullin 2004), we therefore assess *Hemiboea angustifolia* as Critically Endangered, CR B2ab (i, iii, v) + C2a (ii).

Vernacular name:—CHINA: pizhenye banshuojutai.

Additional specimens examined (paratype):—CHINA. Guangxi: Daxin County, Encheng Town, same locality as type, 21 November 2010, *F. Wen & W.X. Tang 10112112* (IBK!).

Hemiboea angustifolia is a member of *H.* sect. *Subcapitatae* and is similar to *H. cavaleriei* var. *cavaleriei*, *H. cavaleriei* var. *paucinervis* and *H. longgangensis*, but differs by narrowly lanceolate to lanceolate, larger greyish-white or waxy-white flowers (4.8–5.4 cm long; tube 3.6–4.0 cm long, 1.4–1.6 cm in diameter at the orifice, 4.8–5.2 mm in diameter at the base), longer pistil and ovary, higher disc and capitate stigma slightly depressed in the middle. The morphology of these taxa, one as a variety, is summarized in Table 1.

TABLE 1. Morphological comparison between *Hemiboea angustifolia*, *H. longgangensis*, *H. cavaleriei* var. *cavaleriei* and *H. cavaleriei* var. *paucinervis*.

Characters	<i>H. angustifolia</i>	<i>H. longgangensis</i>	<i>H. cavaleriei</i> var. <i>cavaleriei</i>	<i>H. cavaleriei</i> var. <i>paucinervis</i>
Leaf blade shape	narrowly lanceolate to lanceolate	narrowly elliptic-lanceolate	oblong lanceolate, ovate lanceolate or elliptic	elliptic to ovate or broadly lanceolate, sometimes falcate; margin entire or sparsely serrate
Leaf blade size	10.5–16.5 × 1.5–4.4 cm	6–13.5 × 2–4 cm	5–20 × 2–8 cm	5–20 × 2–8 cm
Pubescence of leaf blade	glabrous on both sides	adaxially sparsely pubescent, abaxially glabrous	adaxially sparsely pubescent, abaxially glabrous, only sparsely pubescent on the veins	adaxially usually glabrous, rarely sparsely pubescent
Peduncle	1.0–1.5 cm long, outside glabrous	1–2 cm long, outside glandular pubescent	0.5–6.5 cm long, glabrous	0.5–6.5(–10.0) cm long, outside glabrous
Leaf lateral veins	5–7 on each side of midrib	5–6 on each side of midrib	6–14 on each side of midrib	4–8(–9) on each side of midrib
Involucre	1.8–2.3 cm in diameter, glabrous	ca. 1 cm in diam., outside sparsely glandular-pubescent	1.0–2.5 cm in diam., apex cuspidate, outside glabrous	1.0–2.5 cm in diam., outside glabrous
Corolla size	4.8–5.4 cm long; tube 3.6–4.0 cm long, 1.4–1.6 cm in diameter at the orifice, 4.8–5.2 mm in diameter at the base	ca. 2.4–3.0 cm long; tube ca. 2.4 cm, ca. 1 cm in diameter at the orifice, ca. 4 mm in diameter at the base	3.0–4.8 cm long; tube 2.3–3.3 cm, 1.3–1.5 cm in diameter at the orifice, 6–8 mm in diameter at the base	3.0–4.8 cm long; tube 2.3–3.3 cm, 1.3–1.5 cm in diameter at the orifice, 6–8 mm in diameter at the base
Corolla lobes	adaxial lip lobes oblate, 5.2–6.5 × 8.8–9.3 mm; abaxial lateral two lobes rounded, 5.7–6.3 × 5.1–5.7 mm, central oblate or oblate-oval, ca. 5.7 × 9.2 mm	adaxial lip lobes ovate, ca. 3.5 mm, abaxial lip lobes broadly ovate, ca. 6 mm	adaxial lip lobes semicircular, 6–10 mm, abaxial lip lobes broadly ovate, 7–15 mm	adaxial lip lobes semicircular, 6–10 mm, abaxial lip lobes broadly ovate, 7–15 mm
Hair ring in the corolla	adnate to 8.0–8.5 mm above the corolla base	adnate to ca. 3.5 mm above the corolla base	adnate to 4.0–6.0 mm above the corolla base	adnate to 4.0–6.0 mm above the corolla base
Stamens	adnate to 18.5–19.2 mm above the corolla base; anthers slightly elliptic	adnate to ca. 9 mm above the corolla base; anthers elliptic	adnate to 10–15 mm above the corolla base, narrowly linear, anthers elliptic	adnate to 10–15 mm above the corolla base; anthers nearly rotund
Staminodes	2, glabrous, adnate to 17.0–18.1 mm above the corolla base, 5.7–6.0 mm long with adherent capitate apex	3, glabrous, laterally adnate to ca. 12 mm above the corolla base, ca. 7 mm long, the central one linear, ca. 1.2 mm long	3, lateral 5–7 mm long, apex capitate, the central one (if existent) small, ca. 2 mm long, apex truncate	2, rarely 3, lateral 5–7 mm long, apex capitate, the central one (if existent) small, ca. 2 mm long, apex truncate
Pistil	3.5–3.7 cm long, glabrous	ca. 1.8 cm long, sparsely glandular puberulent	1.7–2.5 cm long, glabrous,	1.7–2.5 cm long, glabrous,
Disc	ca. 2.2 mm high	ca. 0.9 mm high	1.0–1.2 mm high	1.0–1.2 mm high
Ovary	ca. 13 mm long, glabrous	6–8 mm long, sparsely glandular puberulent	linear	ca. 6 mm long, glabrous
Stigma	capitate, slightly depressed in the middle	slightly swollen, truncate	obtuse	Obtuse
Capsule	linear, ca 3.0–3.5 cm long, glabrous, slightly curved	linear lanceolate, 2.0–2.5 cm long	linear lanceolate, curved, 1.5–2.5 cm long	linear lanceolate, curved, 1.5–2.5 cm long



FIGURE 1. *Hemiboea angustifolia*. **A)** habit; **B)** corolla opened with stamens and staminodes; **C)** stamens; **D)** pistil with opened calyx; **E)** stigma; **F)** transverse section of ovary. Drawn from *F.Wen & W.X.Tang 08112101*.

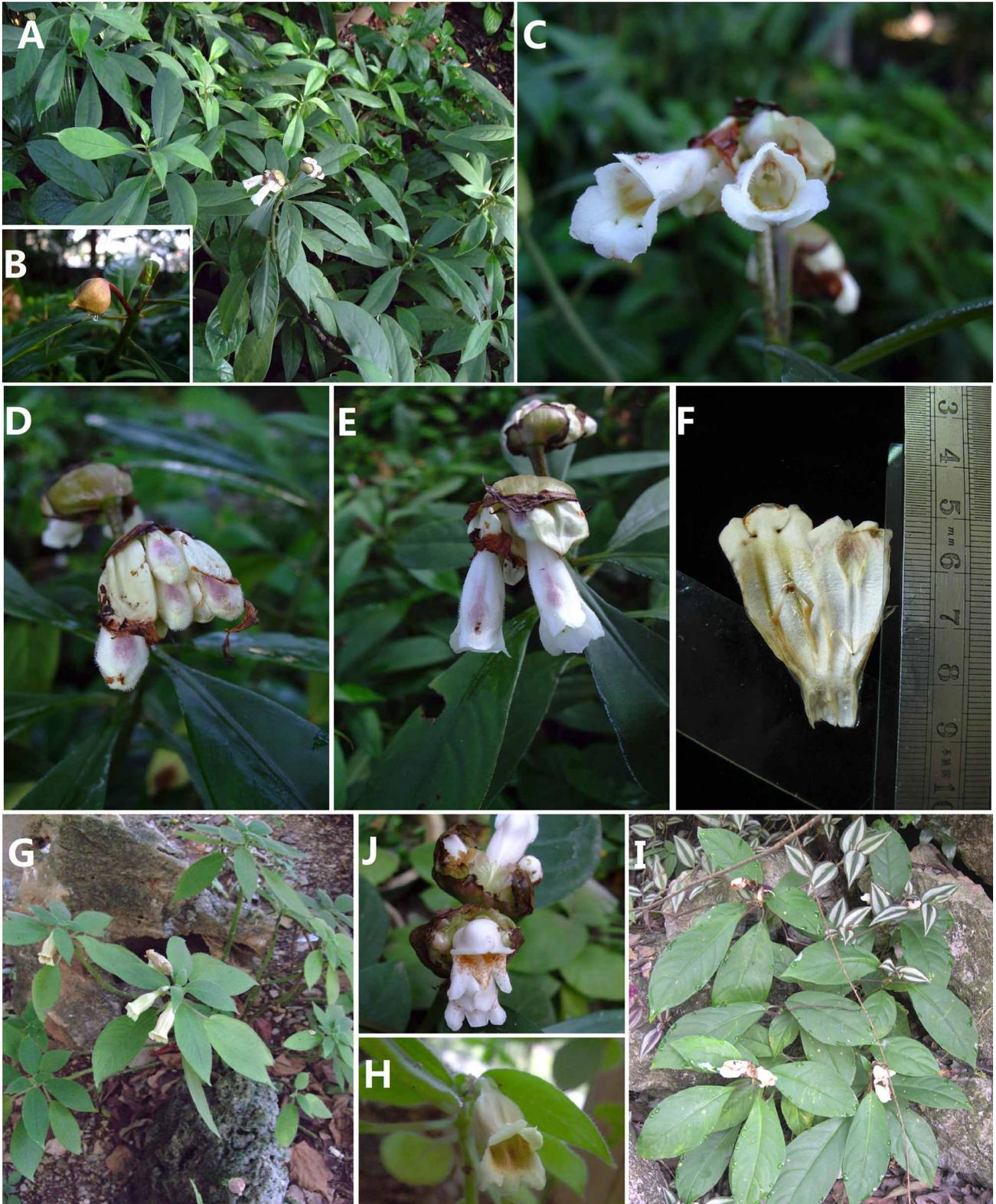
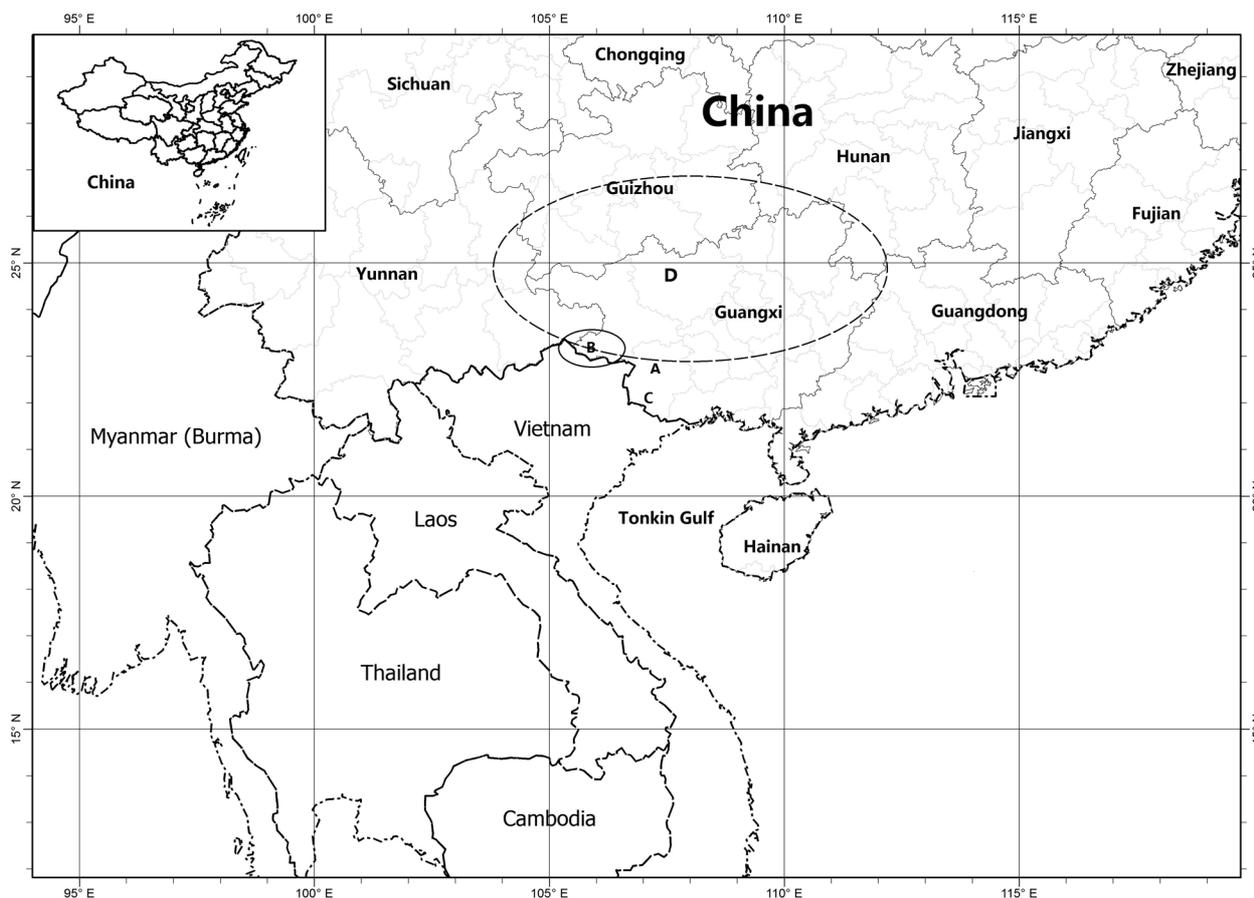


FIGURE 2. A–F) *Hemiboea angustifolia*. A) Habit; B) Involucre; C) Flowers; D) Buds; E) Top view of cyme; F) Opened flower. G–H) *Hemiboea longgangensis*. G) Habit; H) Flower. I–J) *Hemiboea cavaleriei* var. *paucinervis*. I) Habit; J) Involucre and flowers.



MAP 1. Distribution of *Hemiboea angustifolia* and related taxa. **A)** Known distribution of *H. angustifolia*; **B)** Oval area, distribution of *H. cavaleriei* var. *paucinervis*; **C)** Known distribution of *H. longgangensis*; **D)** Oval dotted line area, distribution of *H. cavaleriei* var. *cavaleriei*

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