

## *Hemiboea sinovietnamica* sp. nov. (Gesneriaceae) from a limestone area along the boundary of Sino-Vietnam

Wei-Bin Xu, Yu-Song Huang, Ri-Cheng Peng and Xue-Ying Zhuang

W.-B. Xu and X.-Y. Zhuang (xyzhuang@scau.edu.cn), College of Forestry, South China Agricultural Univ., CN-510642 Guangzhou, PR China. – WBX, Y.-S. Huang and R.-C. Peng, Guangxi Inst. of Botany, Guangxi Zhuangzu Autonomous Region and the Chinese Academy of Sciences, CN-541006 Guilin, PR China. RCP also at: College of Life Sciences, Guangxi Normal Univ., CN-541004 Guilin, China.

*Hemiboea sinovietnamica* W. B. Xu & X. Y. Zhuang, a new species of Gesneriaceae from a limestone area along the boundary of Sino-Vietnam, is described and illustrated. The new species is similar to *H. longgangensis* Z. Y. Li with its yellowish corolla, but differs in having leaf blades glabrous on both sides, involucre trigonous, 2–3 cm in diameter, glabrous outside, glabrous cymes, a white calyx that is glabrous outside, and glabrous pistil and capsule.

The genus *Hemiboea* Clarke (Gesneriaceae), endemic to eastern Asia, comprises 24 species and 5 varieties in China (Li and Wang 2004). Recently, two new species and one new variety were found in Guangxi (Xu et al. 2010, Huang et al. 2011, Wen et al. 2011). In addition, the Chinese endemic genus *Metabriggsia* Wang was recently revised and merged with *Hemiboea* based on molecular and morphological evidence (Weber et al. 2011), and two species were transferred to *Hemiboea*. Thus, the genus *Hemiboea* comprises at least 28 species and six varieties in China.

In recent years, many botanical novelties have been reported from limestone areas along the boundary of Sino-Vietnam, a well-known biodiversity hotspot. A large number of new species have been reported from this region, in the following families: Begoniaceae (Liu et al. 2005, Peng et al. 2008a, 2008b), Balsaminaceae (Yu et al. 2007, 2009, Bi et al. 2010), Gesneriaceae (Xu et al. 2008, 2009, Pan et al. 2010), Berberidaceae (Wu et al. 2009) and Rubiaceae (Mou et al. 2010). During our survey of a limestone area along the boundary of Sino-Vietnam, we collected a rare plant of *Hemiboea* Clarke (Gesneriaceae). Based on detailed examination of morphological and anatomical features (Li 1983, 1987, Wei et al. 1995, Weitzman et al. 1997, Wang et al. 1998, Li and Liu 2004, Li and Wang 2004, Xu et al. 2010, Huang et al. 2011, Wen et al. 2011), we conclude that it is a new species as described and illustrated here.

***Hemiboea sinovietnamica* W. B. Xu & X. Y. Zhuang sp. nov. (Fig. 1, 2, A–E)**

*Species H. longgangensi* Z. Y. Li *similis*, a qua foliis utrinque glabris, involucre trigono, 2–3 cm in diam., extus glabro, cymis

*glabris, calyce albo, extus glabro, pistillo glabro, capsula glabra differt.*

**Type:** China. Guangxi, Jingxi County, Bangliang Natural Reserve, growing in evergreen broad-leaved forest on slopes of limestone hills, 650 m a.s.l., 10 Nov 2008, W. B. Xu 08444 (holotype: IBK, isotypes: PE, IBK).

### Etymology

The specific epithet is derived from the type locality, the Sino-Vietnam boundary.

### Description

Perennial herb. Stems ascendent, 25–45 cm tall, 2.5–5.0 mm in diameter, subtetragonal, glabrous, simple, with 4–6 nodes. Leaves opposite, 8–12; petiole 1.0–3.5 cm long, glabrous; leaf blade subcarnose, herbaceous when dry, elliptic to elliptic-lanceolate, 8.0–17.5 × 2.5–8.0 cm, acuminate at apex, cuneate at base, slightly oblique, with entire margin (rarely shallowly repand or shallowly repand-serrate), glabrous on both sides; lateral veins 7–10 on each side of midrib. Cymes subterminal, 2–3-flowered; peduncle 1.0–2.5 cm long, glabrous; involucre trigonous, 2–3 cm in diameter, green, glabrous outside. Pedicel ca 2–3 mm long, glabrous. Calyx 8–12 mm long, white, 5-lobed from the base; lobes equal, linear-lanceolate, 8–12 × 2–3 mm, glabrous outside. Corolla yellowish, 3.5–5.0 cm long, glandular-puberulent outside, purple-spotted inside; tube 2.5–4.0 cm long, ca 4–5 mm in diameter at the base, ca 1.2–1.7 cm in diameter at the mouth, inside with a ring of hairs adnate to 5–6 mm above the corolla tube base; limb distinctly 2-lipped; adaxial lip 7–9 mm long, 2-lobed with lobes broadly ovate, ca 4 × 8 mm; abaxial lip 8–12 mm long,

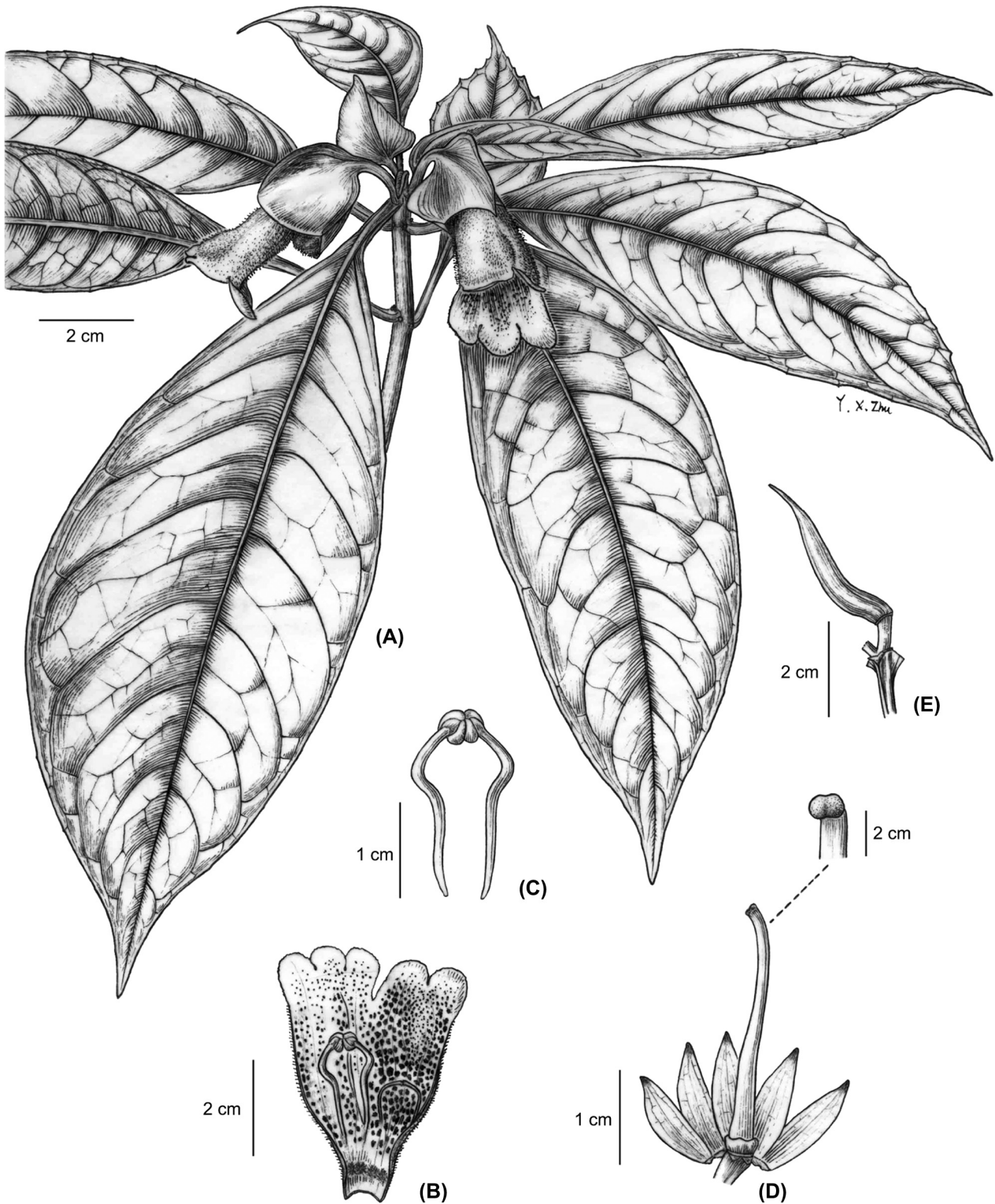


Figure 1. *Hemiboea sinovietnamica* sp. nov. (A) flowering branch, (B) corolla opened showing stamens and staminodes, (C) stamens, (D) calyx opened showing pistil and disc, (E) capsule. Drawn by Y. X. Zhu from W. B. Xu 08444.

3-lobed to the middle with lobes broadly ovate, ca  $7 \times 5$  mm. Stamens 2, adnate to 1.0–1.4 cm above the corolla tube base; filaments geniculate at above the middle, linear, glabrous; anthers subrotund, ca 1.5 mm long. Staminodes 3, glabrous, adnate to 1.2–1.4 cm above the corolla tube

base, the middle one ca 2 mm long, linear, not capitate at apex, lateral ones 8–10 mm long, with slightly capitate apex. Disc ring-like, ca 1.0–1.5 mm high, with margin repand, glabrous. Pistil ca 2 cm long; ovary linear, ca 10 mm long, 1.5 mm in diameter, glabrous; style ca 9 mm long; stigma





Figure 2. *Hemiboea sinovietnamica* sp. nov.: (A) habit, (B) flower side view, (C) involucre, (D) calyx opened showing pistil and disc, (E) capsule. *Hemiboea longgangensis*: (F) habit, (G) flower.





Figure 3. Distribution of *Hemiboea sinovietnamica* sp. nov. (■) and *H. longgangensis* (●) in Guangxi, China.

capitate, truncate at apex. Capsule linear-lanceolate, ca 2.0–2.5 cm long, 3–4 mm in diameter, glabrous, slightly curved. Flowering in October to November, fruiting in November to December.

#### Distribution and ecology

*Hemiboea sinovietnamica* is only known from a limestone area along the Sino-Vietnam boundary (Fig. 3), and only four populations were found by the authors in 2008. However, the locality is now protected as Bangliang Natural Reserve. *Hemiboea sinovietnamica* grows in evergreen broad-leaved forest on slopes of limestone hills, between 600 and 750 m a.s.l., associated with *Cephalomappa sinensis*, *Garcinia bracteata*, *Cleidion bracteosum*, *Ficus glaberrima*, *Acer tonkinense*, *Bridelia fordii*, *Oreocnide serrulata*, *Ficus tinctoria* subsp. *gibbosa*, *Lysionotus longipedunculatus*, *Elatostema ramosum*, *Liparis viridiflora*, *Impatiens morsei*, *Neottopteris antrophyoides*, *Rhaphidophora decursiva*, *Tetrastigma kwangsiense*, *Hoya villosa*.

#### Similar species

With its yellowish corolla, *Hemiboea sinovietnamica* is similar to *H. longgangensis* Z. Y. Li (Fig. 2F, G). The latter has only been found in a limestone area in Longgang Natural

Table 1. Morphological comparison between *Hemiboea sinovietnamica* sp. nov. and *H. longgangensis*.

	<i>H. sinovietnamica</i>	<i>H. longgangensis</i>
Leaf blade	glabrous on both sides	pubescent on both sides
Petiole (cm)	1.0–3.5	slim, 1.0–5.5
Cymes	glabrous	glandular-pubescent
Involucre	trigonous, 2–3 cm in diameter, outside glabrous	spheroidal, 1 cm in diameter, outside sparsely glandular-pubescent
Calyx	white, glabrous outside	greenish, sparsely glandular-pubescent outside
Pistil	glabrous	sparsely glandular-pubescent
Capsule	glabrous	sparsely glandular-pubescent

Reserve in Longzhou County, Chongzuo City, Guangxi, China (Fig. 3), and grows in evergreen broad-leaved forest on slopes of limestone hills, at altitudes between 100 and 250 m a.s.l. A morphological comparison of the two species is given in Table 1. A white or pink corolla is common in *Hemiboea* species, whereas a yellowish corolla is very rare and the yellow-flowering species may be identified as in the key below.

#### A key to species of *Hemiboea* with yellowish or yellow green corolla

1. Cymes 2–3-flowered; corolla yellowish outside ..... 2
  - Cymes 3–12 (21)-flowered; corolla yellow green outside ..... 3
2. Leaf blades glabrous on both sides; involucre trigonous, glabrous outside; pistil and capsule glabrous ..... *H. sinovietnamica*
  - Leaf blades pubescent on both sides; involucre spheroidal, sparsely glandular-pubescent outside; pistil and capsule sparsely glandular-pubescent ..... *H. longgangensis*
3. Leaf blade sparsely pubescent on both sides; involucre glabrous outside; pistil and capsule glabrous ..... *H. cavaleriei*
  - Leaf blade densely pubescent on both sides; involucre sparsely glandular-pubescent outside; pistil and capsule sparsely glandular-pubescent ... *H. flaccida*

#### Additional specimens examined (paratypes)

China. Guangxi, Jingxi, Bangliang Natural Reserve, 2 Oct 2007, W. B. Xu et al. 07099 (IBK). The same locality, 12 Nov 2008, W. B. Xu 08450 (IBK).

**Acknowledgements** – The authors are grateful to Prof. Fa-Nan Wei (IBK) for his help in preparing the paper, and to Mr Yun-Xi Zhu (IBK) for the handsome drawing. This study was supported by Knowledge Innovation Project of the Chinese Academy of Sciences, Grant no. KSCX2-YW-Z-0912 and Fundamental Research Fund of Guangxi Institute of Botany (GZY 09004).

#### References

- Bi, H. Y. et al. 2010. *Impatiens pingxiangensis* sp. nov. (Balsaminaceae) from the limestone areas in Guangxi, China. – Nord. J. Bot. 28: 304–308.
- Huang, Y. S. et al. 2011. A new variety of *Hemiboea* (Gesneriaceae) from limestone areas in Guangxi, China. – Taiwania 56: 240–243.
- Li, Z. Y. 1983. Taxa nova *Hemiboeae* (Gesneriaceae). – Acta Phytotax. Sin. 21: 194–203, in Chinese.
- Li, Z. Y. 1987. A study of the genus *Hemiboea* (Gesneriaceae). – Acta Phytotax. Sin. 25: 220–230, in Chinese.
- Li, Z. Y. and Liu, Y. 2004. *Hemiboea rubribracteata* Z. Y. Li & Yan Liu, a new species of *Hemiboea* (Gesneriaceae) from Guangxi, China. – Acta Phytotax. Sin. 42: 537–540, in Chinese.
- Li, Z. Y. and Wang, Y. Z. 2004. Plants of Gesneriaceae in China. Henan Sci. Technol. Publ. House, pp. 123–153, in Chinese.

- Liu, Y. et al. 2005. *Begonia picturata* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. – Bot. Bull. Acad. Sin. 46: 367–376.
- Mou, F. J. et al. 2010. *Rubovietnamia nonggangensis* (Rubiaceae), a new species from China. – Bot. Stud. 51: 119–126.
- Pan, B. et al. 2010. *Chiritopsis longzhouensis*, a new species of Gesneriaceae from limestone areas in Guangxi, China. – Taiwaniana 55: 370–372.
- Peng, C. I. et al. 2008a. *Begonia aurantiflora* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. – Bot. Stud. 49: 83–92.
- Peng, C. I. et al. 2008b. Two new species of *Begonia* (sect. *Coelocentrum*, Begoniaceae) from limestone areas in Guangxi, China: *B. arachnoidea* and *B. subcoriacea*. – Bot. Stud. 49: 405–418.
- Wang, W. T. et al. 1998. Gesneriaceae. – In: Wu, Z. H. and Raven, P. H. (eds), Flora of China. Vol. 18. Science Press, Miss. Bot. Gard. Press, pp. 244–401.
- Weber, A. et al. 2011. Inclusion of *Metabriggsia* into *Hemiboea* (Gesneriaceae). – Phytotaxa 23: 37–48.
- Wei, Y. G. et al. 1995. Two new species from Guangxi. – Guihaia 15: 216–219, in Chinese.
- Weitzman, A. L. et al. 1997. New taxa, new combination, and notes on Chinese Gesneriaceae. – Novon 7: 423–435.
- Wen, F. et al. 2011. *Hemiboea angustifolia* (Gesneriaceae), a new species endemic to a tropical limestone area of Guangxi, China. – Phytotaxa 30: 53–59.
- Wu, J. Y. et al. 2009. A new species of *Mahonia* Nutt. (Berberidaceae) from China. – Bot. Stud. 50: 487–492.
- Xu, W. B. et al. 2008. *Lagarosolen jingxiensis* Yan Liu, H. S. Gao & W. B. Xu, a new species of Gesneriaceae from Guangxi, China. – J. Trop. Subtrop. Bot. 16: 274–276.
- Xu, W. B. et al. 2009. *Chiritopsis jingxiensis*, a new species of Gesneriaceae in karst cave from Guangxi, China. – Novon 19: 559–561.
- Xu, W. B. et al. 2010. *Hemiboea purpurea* sp. nov. (Gesneriaceae) from a limestone area in Guangxi, China. – Nord. J. Bot. 28: 313–315.
- Yu, S. X. et al. 2007. *Impatiens angulata* (Balsaminaceae), a new species from Guangxi, China. – Nord. J. Bot. 25: 27–30.
- Yu, S. X. et al. 2009. *Impatiens lobulifera* (Balsaminaceae), a new species from limestone areas in Guangxi, China. – Bot. Stud. 50: 365–370.