

## *Chirita grandibracteata* (Gesneriaceae), a new species from Yunnan, China

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Received 18 Jan. 2008, revised version received 22 Feb. 2008, accepted 28 Feb. 2008

Li, J. M. & Möller, M. 2009: *Chirita grandibracteata* (Gesneriaceae), a new species from Yunnan, China. — *Ann. Bot. Fennici* 46: 125–129.

A new species of Gesneriaceae, *Chirita grandibracteata* J.M. Li & M. Möller *sp. nova* (Gesneriaceae), collected in Hekou county, Yunnan province, is described and illustrated. It is most similar, and probably most closely related, to *C. eburnea* Hance. The new species differs from the latter by having large round leaves with appressed hairs, two rows of dense long hairs on the adaxial border of the two anther-thecae, a triangular stigma lobed for more than half of its length and with an acute or acuminate apex, three glabrous staminodes, and fruits 2.8 cm long.

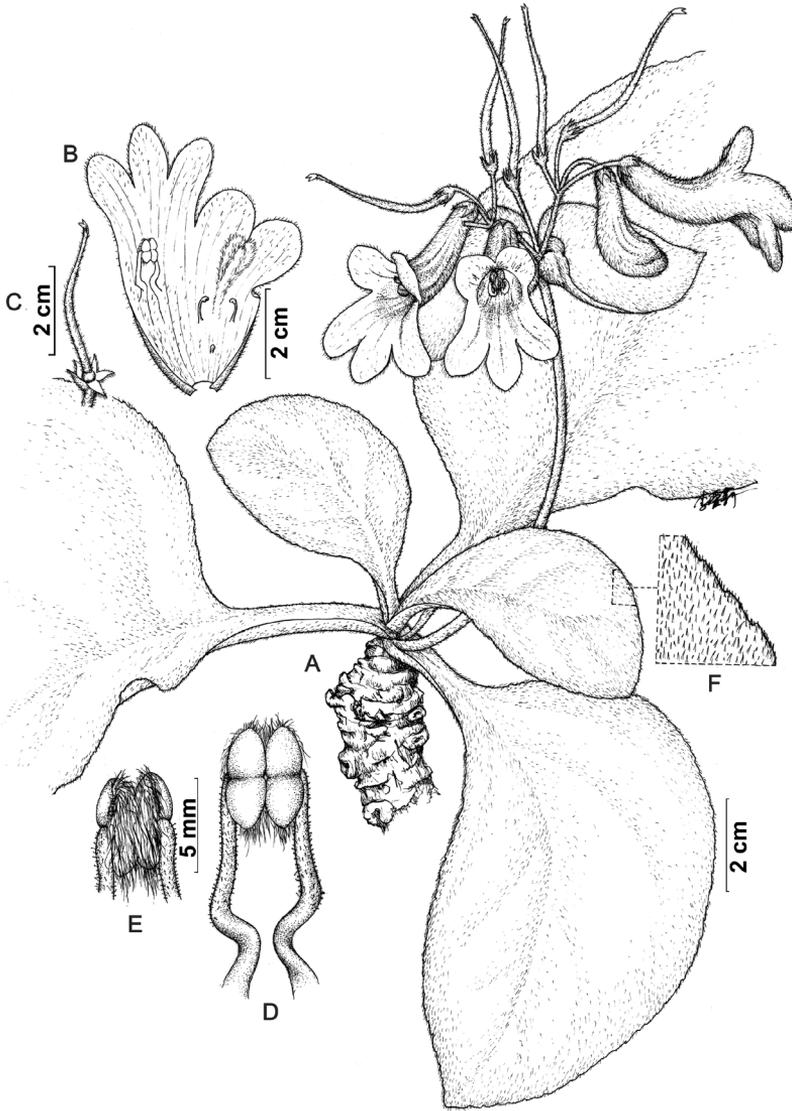
Key words: *Chirita*, new species, *Chirita* sect. *Gibbosaccus*, taxonomy.

The genus *Chirita* (Gesneriaceae, subfamily Didymocarpoideae, tribe Didymocarpeae) is one of the most diverse genera in the family with over 150 species, and a distribution from Sri Lanka and India, eastward through Nepal into China, and southeastern Asia through to Sumatra, Java and Borneo. Despite this wide distribution, most species are narrow endemics and their population sizes at each locality are small (Wen *et al.* 1998, Li & Wang 2004, Wei *et al.* 2004, Li & Wang 2007).

The most comprehensive revision of *Chirita* was done by Wood (1974) who recognized three sections: (1) sect. *Chirita*, (2) sect. *Gibbosaccus*, and (3) sect. *Microchirita*. A fourth section, (4) sect. *Liebigia*, was re-established recently by Hilliard (2003) for the accommodation of *C. asperifolia* (Blume) B.L. Burt and allied species.

*Chirita grandibracteata* J.M. Li & M. Möller described here belongs to sect. *Gibbosaccus*, which is the largest section of *Chirita*, and which is characterized by having a stout rhizome, leaves crowded in terminal rosettes, pronounced gibbose corollas, and free calyx lobes.

*Chirita grandibracteata* is readily identified by the combination of large, round, denticulate leaves with appressed stiff hairs, large and fused bracts, two rows of long dense hairs on the adaxial border of the two anther-thecae, a triangular stigma lobed for more than half of its length and with an acute or acuminate apex, three glabrous staminodes, and 2.8 cm long fruit. It is most similar, and molecularly most closely related, to *C. eburnea* Hance (J.-M. Li unpubl. data). The differences between *C. grandibracteata* and *C. eburnea* are given in Table 1.



**Fig. 1.** *Chirita grandibracteata* (from the holotype, drawn by A. L. Li). — **A:** Flowering plant. — **B:** Dissected corolla. — **C:** Calyx and pistil. — **D:** Anther pair, front view. — **E:** Anther pair, back view. — **F:** Detail of leaf indumentum.

***Chirita grandibracteata*** J.M. Li & M. Möller, *sp. nova* (Fig. 1)

*Species nova* *C. eburneae* proxima sed ab ea antheris longe crinitis, stigmatibus bipartito triangulari ad apicem acuto usque acuminato, staminodiis 3 glabratis et fructu 2.8 cm longo recedens.

**TYPE:** China, Yunnan, Hekou county, Xiao Nanxi town, wet or moist rocky slope in shaded hill forest, 22°33'N, 103°28', 28.VII.2007 *Li Jia-Mei* 077281 (holotype HEAC); *ibid.*, 15. VI.2006 *James F. Smith, Wang Yin-Zheng & Li Jia-Mei* 06156 (paratype PE).

Acaulescent, rosulate and strongly perennial herb; rhizome 2–3 cm thick, vertical, woody, heavily marked with leaf scars, with long fibrous roots. Leaves clustered at the apex of the rhizome; blade orbicular to elliptical, from 4 × 3 cm to 30 × 25 cm, 2 mm thick, fleshy, irregularly serrate, apex obtuse, base broadly cuneate, upper and lower surface densely covered with straight, pointed, appressed papillose-hispid hairs, especially on the veins and round the margins, lateral veins 3–5 on each side of midrib ascending, not paired, flattened, pale and inconspicuous on the upper surface, prominent on the lower

surface; petiole up to 1 cm wide, 1–10 cm long, sparsely hairy, flattened and green on the upper surface but hemispherical and sometimes red on the lower one. Inflorescences axillary with pair-flowered cymes, scapiform, 2–4 on each plant, each 3–10-flowered, peduncle stout, 10–20 cm long, with dense white hairs; pedicels up to 2 cm long, with densely long glandular and short eglandular hairs; bracts paired, entire, broadly to narrowly ovate, from  $2 \times 1.5$  cm to  $4 \times 3$  cm, base often fused and purplish red, upper bright green, apex obtuse or acute, both surfaces with dense white eglandular hairs. Calyx divided to the base, 5-lobed, entire, purplish red, lobes narrowly triangular,  $6 \times 2$  mm, outer surface with dense long glandular and short eglandular hairs, inner surface eglandular hairy only at the apex. Corolla white with light purple stripes, fleshy, 4.5–5.3 cm long, 2 cm wide across the mouth; tube 3.5–4 cm long, almost straight, not or only slightly gibbous, outside densely hairy, inside densely hairy below the insertion of the filaments; lobes violet-blue, deep orange stripes between adaxial and abaxial lobes and between abaxial lobes in the throat, a purplish red patch with densely glandular hairs on the roof of the

mouth inside, adaxial lobes 2-sect., 1.2 cm long, forming a subgaleate upper lip, abaxial lobes 3-sect., oblong, spreading, central longer up to 2 cm. Filaments inserted at 1.8 cm from the base of the corolla, 1 cm long, geniculate about 0.4 cm above the point of attachment, with dense glandular hairs only above geniculate part, glabrous below this; anthers 0.4 cm long, 2.5 mm across, fused face to face, two rows of dense long hairs on the adaxial border of each anther-theca; staminodes 3, glabrous, central ca. 1 mm long, tip slightly swollen, inserted 5 mm from the base of the corolla, laterals ca. 1 cm long, inserted 1.2 cm from the base of the corolla, turgid and curved at the tip. Disc an emarginate or obscurely lobed ring, 1.1 mm deep, glabrous. Gynoecium densely glandular and eglandular pubescent, ca. 3 cm long, 1.2 mm wide at the base, narrowing to 1 mm below the stigma; stigma triangular, 1.5 mm long, 2-lobed to more than half length, apex acute or acuminate. Capsule elongate, purplish red, straight or slightly curved, 2.8 cm long, 0.15 cm wide, densely hairy; calyx persistent. Flowering May–July, fruiting June–September.

It is not surprising that this new species has not been discovered earlier as no extensive field

**Table 1.** Comparison of morphological characteristics of *C. eburnea* and *C. grandibracteata*.

Characters	<i>C. eburnea</i>	<i>C. grandibracteata</i>
Leaves	whorled, elliptical to narrowly elliptical, $3 \times 1.2$ – $15 \times 6$ cm, 1 mm thick, usually erect hairs	not whorled, orbicular to elliptical, $4 \times 3$ – $30 \times 25$ cm, 2 mm thick, appressed hairs
Bracts	free, both surfaces with dense white glandular hairs	base often purplish red and fused, both surfaces with dense white eglandular hairs
Sepals	from $7 \times 1.6$ mm to $9 \times 2.2$ mm, green or light red, not persistent	$6 \times 2$ mm, purplish red, persistent
Corolla	purple or light purple, not fleshy	white with light purple stripes, fleshy
Corolla mouth	a yellow patch with sparse glandular hairs on the roof of the mouth inside	a purplish red patch with dense glandular hairs on the roof of the mouth inside
Corolla tube	pubescent above, the anthers inside	densely pubescent below, the insertion of filaments inside
Filaments	with dense glandular hairs	with dense glandular hairs only above geniculation, glabrous below geniculation
Anthers	sparse short hairs on the adaxial anther	two rows of dense long hairs on the adaxial border of two anther-thecae
Staminodes	2, with a tuft of hairs at the tip	3, glabrous
Stigma	2-lobed not beyond middle, lobes elliptic, apex rounded or obtuse	2-lobed to beyond middle, lobes triangular, apex acute or acuminate
Fruit	4–8 cm long, ca. 2 cm wide	2.8 cm long, 1.5 cm wide

surveys have previously been carried out in this border region between China and Vietnam. In preparation for a revision of *Chirita* in China, one of the authors (LJM) had the opportunity to visit the locality and collect the present species in the field on three occasions over the past four years. During the first field trip to Hekou, Yunnan province, in September 2004, only fruiting plants were found. At first sight the plants were thought to be an undescribed species of *Chirita* on the basis of the round, unusually large, slightly toothed leaves with appressed papillose-hispid hairs and with a dried peduncle with large bracts fused at the base. Though plant material of the new species has been grown in the greenhouses at the Institute of Botany, Chinese Academy of Sciences, Beijing from September 2004 to July 2007, no flowering occurred. The densely, unusually appressed papillose-hispid hairs on the leaves, observed in the field, remained stable during the years in cultivation.

In an attempt to confirm that this plant was indeed a new species, further field collections were made and flowering plants examined. Our examination of the material and critical comparison with other *Chirita* species revealed significant differences also in floral morphology. The large bracts of *C. grandibracteata*, also found in *C. eburnea* Hance, *C. sinensis* Lindl., *C. lutea* Yan Liu & Y.G. Wei, *C. minutimaculata* D. Fang & W.T. Wang, and *C. lungzhouensis* W.T. Wang, enclose the flowers until late in development like two hemispheres (Wood 1974). Although *C. grandibracteata* is very similar to *C. eburnea* and other species which possess these large bracts, those of the new species are the largest and thickest and are often fused at the base. This fusion of the bracts is unusual in *Chirita*. Furthermore, *C. grandibracteata* has two rows of dense long hairs on the adaxial edge of the two anther-thecae which are also seen in *C. fordii* var. *dolichotricha* W.T. Wang. Although *C. eburnea* has a great variation in mature fruit length between and within populations, carrying between 4 cm to 8 cm (Wood 1974, Li & Wang 2004, J.-M. Li, pers. obs.), *C. grandibracteata* has a considerably shorter fruit.

In addition, *C. grandibracteata* is confined to a low altitude valley in southern Yunnan, whereas *C. eburnea* has a broader geographical

distribution, ranging from low to high elevation and from central to southern China, including eight provinces, i.e. Zhejiang, Hubei, Sichuan, Hunan, Guizhou, Guangdong, Guangxi and Yunnan (Li & Wang 2004, Shui & Chen 2004). Limestone in tropical China occurs mainly in Yunnan and Guangxi provinces of southern and central China (Zhu *et al.* 2003). Due the great diversity of edaphic conditions and topography, vegetation types on limestone are extremely diverse and rich in endemic taxa. *Chirita grandibracteata* is only found in the lower regions of wet or moist rocky slopes in shaded hill forests in Hekou county, Yunnan province, south China, near the border to Vietnam. The region has a typical subtropical monsoon climate with an annual mean temperature of 22.6 °C. The soil is mainly brown, coarse in texture, and composed of loamy limestone with pH of ca. 5 and ca. 4% organic matter (Chen & Li 1997).

In addition to field and herbarium studies, we carried out a molecular phylogenetic analysis of DNA sequences to determine the new species status. Our results show that *C. grandibracteata* belongs to sect. *Gibbosaccus* and is closely related to *C. eburnea* (LJM unpubl. data).

## Acknowledgements

We thank Madam Li Ai-Li in the Institute of Botany, the CAS (PE) for preparing the illustration. We are also grateful to Robert Mill (E) for correcting the Latin description, and to Prof. Zhu Chang-Shan of the College of Life Sciences, Henan Agricultural University for helpful suggestions and discussion, and especially to Prof. Li Zhen-Yu of the Institute of Botany, the CAS (PE) for his critical comments that greatly improved the manuscript. This study was supported by Doctors' Foundation of Henan Agricultural University.

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