Nordic Journal of Botany 000: 000–000, 0000
doi: 10.1111/j.1756-1051.2011.01083.x,

Subject Editor: Henrik Ærenlund Pedersen. Accepted 17 January 2011

Chirita tiandengensis (Gesneriaceae) sp. nov. from Guangxi, China

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Chirita tiandengensis Fang Wen & Hui Tang, a new species of *Chirita* from Guangxi, China, is described and illustrated. The new species is similar to *C. napoensis* Z. Y. Li, *C. lunglinensis* W. T. Wang and *C. obtusidentata* W. T. Wang, but differs by leaf blades ovate-lanceolate, both surfaces sparsely strigulose; cymes 5- or 8-flowered, bracts narrowly lanceolate, 6–8 × 1.5–2.0 mm; larger flowers (3.8–4.6 cm long), pink corolla, infundibuliform-tubular tube; backside of anthers puberulous, filaments straight; staminodes glabrous, fused on the capitate top; stigma bipartite to the base with narrowly lanceolate lobes.

A new species of *Chirita* Buch.-Ham. ex D. Don was found by Hui Tang during a floristic investigation in Tiandeng County, Guangxi in 2005. We considered it different from all known species and varieties of *Chirita* (Wood 1974, Wang 1981, 1985, Wang et al. 1990, Wang et al. 1998, Nguyan and Kiew 2000, Burtt 2002, Li and Wang 2004, Li et al. 2006, Wei et al. 2007, Xu et al. 2008, Wen et al. 2009, 2010, Li and Möller 2009, Huang et al. 2010a, b) and concluded that it represents a new species. Yan and Li (2003) studied the pollen morphology of fourteen species of the genus, and found differences in size, colpus characteristics and ornamentation among species and sections of *Chirita* congruent with the traditional taxonomy of the genus.

Materials and Methods

Material of the new species was examined under an Olympus CX41 microscope with 4–100 × oil magnifications. Pollen samples were observed by scanning electron microscope (SEM, Quanta200) at Inst. of Microbiology, Chinese Acad. Sci. (IMCAS). Based on our observations of morphology and palynology, *C. tiandengensis* is described and illustrated as a new species.

Chirita tiandengensis Fang Wen & Hui Tang sp. nov. (sect. *Gibbosaccus*) (Fig. 1–3)

Species nova C. napoensi, C. lunglinensi et C. obtusidentatae affinis, sed foliis ovato-lanceolatis, utrinque sparse strigosis, bracteis anguste lanceolatis, 6–8 × 1.5–2.0 mm, floribus majoribus, 3.8–4.6 cm longis, corolla rosea, tubo infundibuliformi–tubuloso, antheris dorsalibus puberulis, staminodiis glabris, apice conjunctis, stigmatibus bipartitis, lobis anguste lanceolatis differt.

Type: China. Guangxi, Tiandeng County, Longming Town. Growing on some crevices in a piece of cliff of a limestone hill, under evergreen bushes, 458 m a.s.l. 16 Apr 2008, Hui Tang and Fang Wen C08041601, C08062001 (holotype: IBK, isotypes: IBK).

Perennial acaulescent herb. Rhizome prostrate, 1.0–2.5 cm long, 0.4–0.5 cm in diameter, sometimes with buds at nodes. Leaves 5–8, basal; leaf blade thick papery, ovate-lanceolate, left-right asymmetric, 4–10 × 2.0–4.5 cm, acute at apex, cuneate at base, margin obtusely dentate, crenate, denticulate to sinuous, rarely entire, both surfaces sparsely strigulose, also along the margin, lateral veins 3–6 on each side, midvein generally fishbone-like silvery; petiole flat, 2–4 cm long and 1.5–3.0 mm in diameter, densely strigulose. Cymes 2–3, 1–2(–3)-branched, 5–8-flowered; peduncle 9.0–14.5 cm long, densely puberulous; bracts 2, opposite, narrowly lanceolate, 6–8 × 1.5–2.0 mm, outer puberulous, inner glabrous, entire; bracteoles 2, narrowly lanceolate, 3–4 × 0.8–1.1 mm, the outer puberulous, the inner glabrous, entire; pedicles 6.5–9.5 mm long. Sepals 5-parted to the base, narrowly lanceolate, 5–8 mm long and 0.8–1.2 mm wide, densely strigulose. Corolla pink, large, 3.8–4.6 cm long, pubescent from base to orifice outside; tube infundibuliform-tubular, 2.5–3.0 cm long, orifice 1.6–1.8 cm in diameter; adaxial lip ca 1 cm long, 2-lobed to the middle, abaxial lip ca 1.2 cm long, 3-lobed to the middle, with all five lobes orbicular-ovate. Stamens 2, connate to their anthers,

1. habit with matured capsule,
2. habit in flowering,
3. dissection of a flower for showing stamens and staminodes,
4. anthers,
5. pistil,
6. stigma,
7. capsule.

Figure 1. *Chirita tiandengensis* sp. nov. (1) habit with mature capsule, (2) habit in flowering period, (3) dissection of a flower showing stamens and staminodes, (4) anthers, (5) pistil, (6) stigma, (7) capsule.

Figure 2. *Chirita tiandengensis* sp. nov. (A) flowering plants, (B) flower face view, (C) bud side face view, (D) habit, (E) plant.

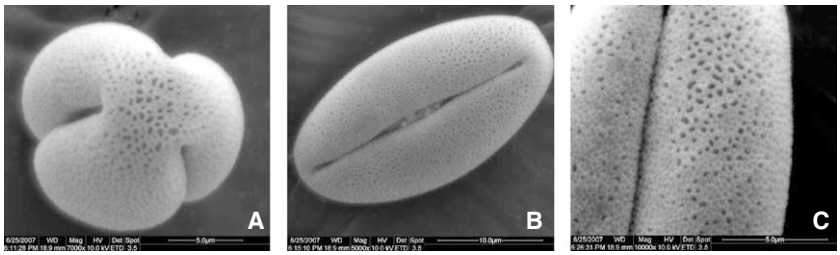

Figure 3. Scanning electron micrographs of *Chirita tiandengensis* sp. nov. (A) optical section of equatorial face SEM (5000 ×), (B) equatorial face, SEM (7000 ×), (C) ornamental detail, SEM (10 000 ×).

Figure 4. The differences among *Chirita tiandengensis* sp. nov., *C. napoensis*, *C. lunglinensis* and *C. obtusidentata*. (A) *C. tiandengensis* (A-1) flowering plants, (A-2) plants in the field, (A-3) flower face and lateral view, (A-4) bracts. (B) *C. napoensis* (B-1) plants in the field, (B-2) flower face view, (B-3) bracts. (C) *C. lunglinensis* (C-1) plants in the field, (C-2) flower face view, (C-3) bracts. (D) *C. obtusidentata* (D-1) plants in the field, (D-2) flowers and cymes face view, (D-3) bracts.

Table 1. Morphological comparison between *Chirita tiandengensis* sp. nov. and its close relatives *C. napoensis*, *C. lunglinensis* and *C. obtusidentata*.

Characteristics	*C. tiandengensis*	*C. napoensis*	*C. lunglinensis*	*C. obtusidentata*
Leaf blade shape and size (cm)	ovate-lanceolate, 4–10 × 2.0–4.5	broadly elliptic to oblong, 2.5–4.2 × ca 1.3	elliptic to ovate, seldom broadly ovate, 2.6–10.0(–12.0) × 1.6–5.7 (–11.5)	elliptic to broadly ovate or obovate, 2.7–13.0 × 1.9–7.0
Blade margin	obtusely dentate, crenate, denticulate to sinuous, rarely entire	crenate to repand-crenate	crenate to denticulate	obtusely dentate to crenate or denticulate
Hairs on blades	both surfaces sparsely strigulose	densely appressed white pilose, eglandular	adaxially appressed pubescent and pilose, eglandular, abaxially appressed pilose	puberulent and eglandular
Bracts (mm)	2, opposite, narrowly lanceolate, 6–8 × 1.5–2.0	2, free, narrowly oblong, 1.5–3.5 × ca 0.3	2, free, elliptic to broadly ovate, 6–38 × 4–27	2, free, ovate to oblong or nearly orbicular, 4–11 × 2.7–7.0
Cymes	5- or 8-flowered	1- or 2-flowered	2-8-flowered	1-12-flowered or more
Flower size (cm)	3.8–4.6	ca 1.4	3.0–3.8	ca 3.5
Corolla colour	pink	blue-purple	white to purple–blue	purple
Corolla tube shape and size	infundibuliform-tubular, 2.5–3.9 × 1.6–1.8 cm	subcampanulate, ca 8.5 × 4.0 mm	narrowly funnelform, ca 2.8 × 1.0–1.2 cm	almost tubular, 2.5–2.7 cm × 8–9 mm
Anther	puberulous	glabrous	bearded	abaxially bearded
Stamens filament	1.1–1.2 cm long, glabrous, the part close to anther, ca 2 mm long, puberulous	ca 4 mm, glabrous	ca 1.3 cm, sparsely glandular puberulent	1.1–1.4 cm, sparsely glandular puberulent
Staminodes	2, glabrous, fused at the top	2, respective, ca 0.7 mm	2, respective, 6–7 mm	2, respective, 4–7 mm
Stigma	bipartite, lobes narrowly lanceolate, ca 1.2 mm long, pubescent outside	narrowly oblong, ca 1.2 mm, undivided	cuneate, ca 3 mm, 2-lobed	linear, 2–3 mm, 2-lobed

adnate to corolla tube ca 1.25 cm above its base; filaments linear, 1.1–1.2 cm long, glabrous, the part close to anther, ca 2 mm long, puberulous; anthers fused by thrir entire adaxial surfaces, oblong, ca 1.85 mm long, puberulous on the back. Staminodes 2, glabrous, fused on the capitate top, adnate to corolla tube 10 mm above its base, ca 1.1 cm long. Pistil ca 3.75 cm long; ovary linear, 2.1–2.2 cm long, 1.7–1.8 mm in diameter, pubescent; style ca 1.4 cm long, pubescent; stigma bipartite, lobes narrowly lanceolate, ca 1.2 mm long, pubescent outside. Pollen grain oblong-sphaeroidal in side view, trilobate circular in polar view, 3-colporate, 25.5–26.7 × 13.8–14.6 μm; ornamentation microreticulate with mesh irregular in size. Capsule linear, pubescent, ca 5 cm long, stigma remaining on the mature fruit. Flowering in Apr–May, fruiting in Aug–Sep.

Ecology, conservation and etymology

Chirita tiandengensis grows in the crevices on a limestone hill, under subtropical evergreen broadleaf bushes, 458 m a.s.l. After many times carefully investigating the regions near the type locality, we concluded that there is only one population of *Chirita tiandengensis*. According to IUCN red list categories (IUCN 2001, Pullin 2004), we therefore assess *Chirita tiandengensis* as 'Critically Endangered' (CR D + E).

The specific epithet commemorates Tiandeng County, the type locality for the new species.

Similar species

Chirita tiandengnsis Fang Wen & Hui Tang is similar to *C. napoensis* Z. Y. Li, *C. lunglinensis* W. T. Wang and *C. obtusidentata* W. T. Wang, but differs by its ovate-lanceolate leaf blades, 5- or 8-flowered cymes, larger flowers (3.8–4.6 cm long), pink corolla, infundibuliform-tubular corolla tube, puberulous backside of anthers, straight filaments, stigma that is bipartite to the base with narrowly lanceolate lobes. The differences between the four species is shown in Fig. 4. A comparison of the morphology of *Chirita tiandengensis* and three other species is provided in Table 1.

Acknowledgements – We thank Prof. Yi-Gag Wei (IBK) for checking the specimens and reviewing the Latin diagnosis, Mr Xian-Gui Zhou (IBK) for preparing the drawing, Alex K. Monro (Nat. Hist. Mus. UK) and Chia-Cheng Liu (Hong Kong) for comments on the manuscript. This work was supported by funds from the Western Program for Fostering Personal Ability of Chinese Acad. Sci. [2009 (24)], Sci. Technol. Found. of Guangxi (0992028-10) and Sci. Technol. Innovation Progr. of Guangxi Acad. Sci.

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