

**CHIONOGRAPHIS NANLINGENSIS (MELANTHIACEAE),  
A NEW SPECIES FROM CHINA**

LEI WU<sup>1</sup>, YI TONG<sup>2</sup>, RUI-YA YAN<sup>3</sup> AND QUAN-RU LIU<sup>3\*</sup>

<sup>1</sup>College of Forestry, Central South University of Forestry and Technology, Changsha 410004, China.

<sup>2</sup>South China Botanical Garden, The Chinese Academy of Sciences, 723Xingke Road, Tianhe District, Guangzhou 510650, P. R. China

<sup>3</sup>College of Life Sciences, Beijing Normal University, CN-100875 Beijing, P.R. China

\*Corresponding author's email: liuquanru@sohu.com

**Abstract**

*Chionographis nanlingensis* (Melanthiaceae), a new species from northern Guangdong, China, is described and illustrated, and its affinity is also discussed. In addition, a distribution map and a key to species of *Chionographis* are provided.

**Key words:** New species, Melanthiaceae, *Chionographis*, China.

**Introduction**

*Chionographis* Maximowicz is a small genus of family Liliaceae (Engler, 1888; Hutchinson, 1934; Chen, 1980; Maki & Masuda, 1993; Chen & Tamura, 2000), but recently it is placed in the family Melanthiaceae (Tamura, 1998; Anon., 2009; Huang *et al.*, 2011). Four species, *C. japonica* (Willd.) Maximowicz (from Japan), *C. koidzumiana* Ohwi (from Japan), *C. chinensis* Krause (from China) and *C. merrilliana* Hara (from China), were recognized by Hara (1968). *Chionographis merrilliana* was reduced to the synonymy of *C. chinensis* (Chen, 1980). Tanaka (2003) raised *Chionographis japonica* Maxim. var. *hisauchiana* Okuyama to the species rank as *C. hisauchiana* (Okuyama) N. Tanaka. Three new species, viz. *C. shiwandashanensis* Y. F. Huang from China (Huang *et al.*, 2011), *C. cordifolia* N. Tanaka from Japan (Tanaka, 2013) and *C. actinomorpha* Aver. et N. Tanaka from Vietnam and Laos (Averyanov and Tanaka, 2014), were described. Therefore, the species number of this genus rose up to eight, and all are restricted to East and Southeast Asia, chiefly in South China and Japan (Hara, 1968; Chen, 1980; Tanaka, 1985; Chen & Tamura, 2000; Tanaka, 2003, 2013; Huang *et al.*, 2011; Averyanov & Tanaka, 2014).

The genus *Chionographis* is closely related to *Chamaelirium* Willdenow, a monotypic genus from eastern north American (Frederick, 2002) in sharing the characters of perennial herbs with similar rosulate leaves and a terminal spike-like inflorescence with many small white flowers (Chen, 1980; Chen & Tamura, 2000; Frederick, 2002), and similar distinctive tetraporate pollen grains and basic chromosome numbers (Frederick, 2002). Therefore, the two genera are often arranged together in tribe. It was stated that *Chionographis* can be distinguished from *Chamaelirium* by several characters, such as its zygomorphic flowers (vs. actinomorphic), unequal tepals (vs. equal), polycentric chromosomes (vs. monocentric), and the sexual attributes (plants usually hermaphrodite or gynodioecious vs. dioecious) (Tanaka & Tanaka, 1977, 1980; Tanaka, 1985; Tanaka, 2003). However, the distinctions seem not to be quite clear since the discoveries of the special species, *C. shiwandashanensis* and *C. actinomorpha*. Unlike other *Chionographis* species, these two species has 6 regular tepals and 6 regular stamens (Huang *et al.*, 2011), and its flowers look like actinomorphic form, which suggests that the relationship between the two genera needs a further study.

During a botanical survey of Nanling National Nature Reserve in 2013, a new species of *Chionographis*, also having nearly actinomorphic flowers and regular tepals, was collected, it is now described and illustrated below.

*Chionographis nanlingensis* L. Wu, Y. Tong & Q. R. Liu, sp. nov.

**Type:** China. Guangdong: Ruyuan County, Nanling National Nature Reserve, under dense forests on hill slopes, alt. 300 m, 12 Apr., 2013 (fl.), L. Wu and Y. Tong 3187 (holotype: BNU; isotypes: BNU & IBSC). (Figs. 1 and 3. A-D)

**Diagnosis:** this species is similar to *C. shiwandashanensis* and *C. koidzumiana*, but differs from the former mainly by tepals 3, 8-12 mm long (vs. 6, 5-8 mm long), stamens nearly 2 whorls, filaments of outer whorl 1.0-1.3 mm long, inserted between tepals, inner whorl a little shorter, inserted at base of tepals (vs. inserted at base of tepals, 0.6-1.2 mm, regular), and differs from the latter by bractlike leaves elliptic to oblong-elliptic (vs. linear to lanceolate), flower nearly actinomorphic (vs. Zygomorphic), tepals usually 3, regular (vs. 6, lower 2 or 3 very short or reduced).

**Perennial herbs, hermaphroditic:** Rhizome short, glabrous, with many fibrous roots. Leaves basal, rosulate, petiolate, oblong-elliptic to elliptic, evergreen, 1.5-4.5(5.5) cm long, 1.0-2.5 cm wide, margin entire or minutely undulate, glabrous, apex acute or rounded, sometimes mucronulate, base rounded to cuneate, parallel-veined. Scape arising from center of leaf rosette, erect, 15-30 cm long, with 6-18 small, ovate to oblong-elliptic, bractlike leaves. Inflorescence a terminal spike, 9-15 cm long, many flowered, usually elongate after anthesis; bract absent. Flowers sessile, nearly actinomorphic, small. Tepals usually 3, rarely 4, white, filiform, 8-12 mm long, regular. Stamens 6, nearly 2 whorls; filaments free, outer whorl 1.0-1.3 mm long, inserted between tepals, inner whorl a little shorter, inserted at base of tepals; anthers basifixed, subcordate-ovate to subglobose, extrorse; Styles 3, short-linear. Capsule sub-obovoid, 3-4 × ca. 1.5 mm, 3-loculed.

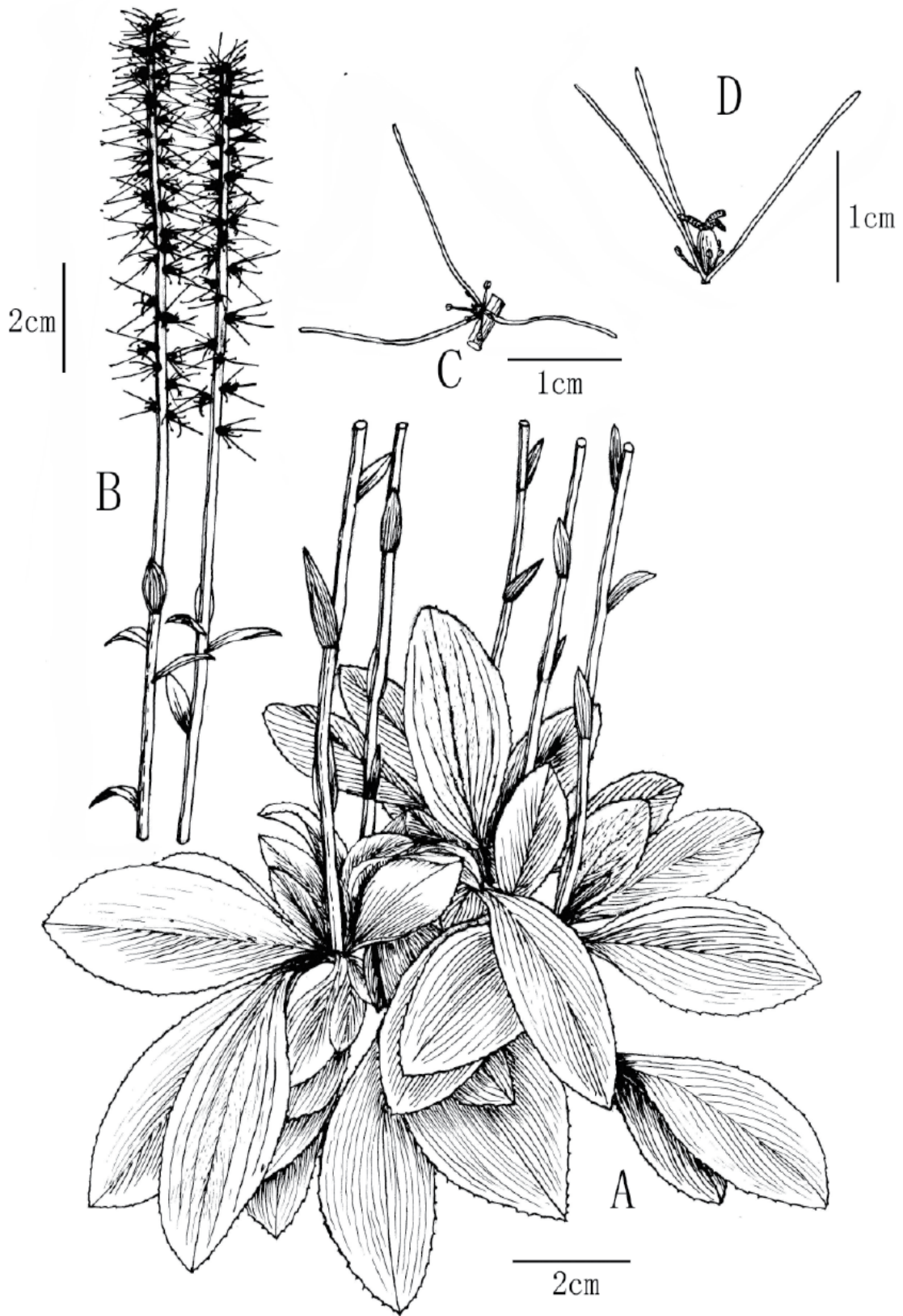


Fig. 1. *Chionographis nanlingensis*. A. Habit, B. Spike, C. Flower front view, D. Flower side view. (From the holotype L. Wu and Y. Tong 3187).

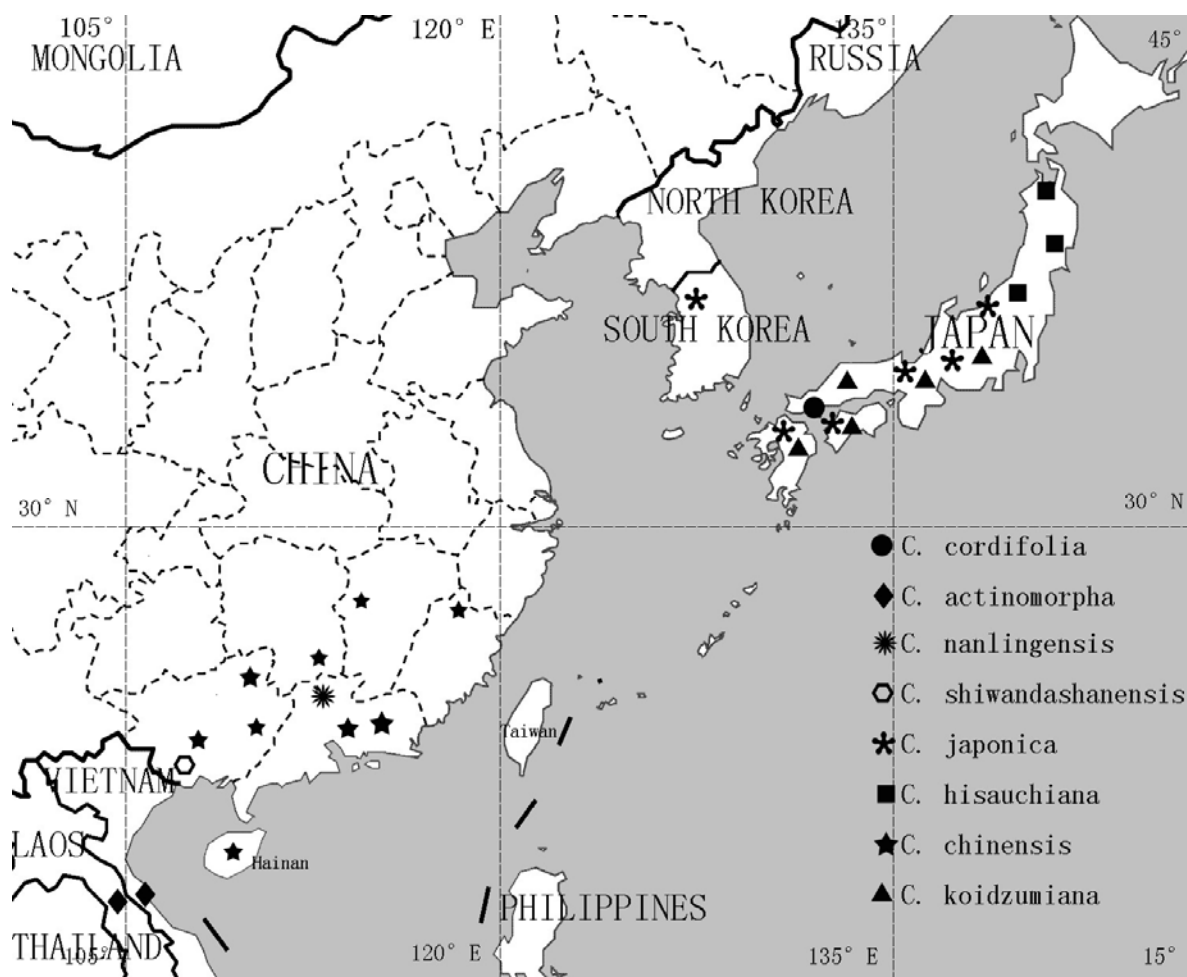


Fig. 2. Geographical distribution of *Chionographis*.

**Distribution:** *Chionographis nanlingensis* is currently known only from Nanling National Nature Reserve, northern Guangdong, China (Fig. 2). It grows well under forest on mossy place or in moist rock along roadsides, at altitudes from 300 to 500 m.

**Etymology:** The specific epithet refers to its type locality, Nanling National Nature Reserve.

#### Discussion

Nanling Mountains, located in the transit zone between southern subtropics and middle subtropics, is one of the 14 crucial areas with the international significance of terrestrial biodiversity in China (Chen, 1993; Chen *et al.*, 2012), comprises of large well preserved evergreen and untouched conifer forest (Xu, 1993; Wang, 2013). Recently, many new taxa have been found in this area (Zhou & Xing, 2007; Tian & Xing, 2008; Zhou *et al.*, 2008; Hu, 2009; Dong *et al.*, 2009; Chen *et al.*, 2011).

The specimens of *Chionographis nanlingensis* from this area were previously misidentified as a rather widespread *C. chinensis* (Fig. 3F), but it is easily distinguished from the latter by flowers nearly actinomorphic, tepals usually 3, rarely 4, filiform, regular

(vs. flowers zygomorphic, tepals upper 3 or 4; lower 2 or 3, sometimes absent).

*Chionographis nanlingensis* is similar to *C. shiwandashanensis* in their actinomorphic flowers and regular tepals, but differs by tepals 3, rarely 4 (vs. 6), stamens nearly 2 whorls (vs. one whorls), filaments unequal (vs. regular). It is also morphologically similar to *C. koidzumiana* in sharing filiform tepals, but differs by bractlike leaves elliptic to oblong-elliptic (vs. linear to lanceolate), flowers nearly actinomorphic (vs. zygomorphic), tepals 3, rarely 4, filiform (vs. 6, lower 2 or 3 very short or reduced). The morphological differences among *C. nanlingensis* and its related species are presented in Table 1. The following key is provided to the species of *Chionographis*.

**Additional specimens examined (Paratypes):** China. Guangdong, Ruyuan county, Daqiao town, 9 Jun (fr), 1933, X. P. Gao 52831 (IBSC); the same country, 23 Apr, 1934, X. B. Guo 80308 (IBSC); Ruyuan county, Baimakeng, 29 May (fr), 1973, Yue73 00357 (IBSC); Ruyuan county, 7 Jun (fr), 1973, Yue73 00623 (IBSC); the same locality as type, 12 Apr, 2013 (fl), Y. Tong and L. Wu 13041243 (IBSC), 14 Apr, 2013 (fl), L. Wu and Y. Tong 3243 (BUN).



Fig. 3. *Chionographis nanlingensis* (from holotype and paratype). A: Habit, B & C: Flowers, D: Pistil and stamen; *C. shiwandashanensis*. E: Flowers; *C. chinensis*. F: Flowers. (photographed by L. Wu).

**Table 1. Morphology differences among *C. nanlingensis*, *C. shiwandashanensis* and *C. koidzumiana*.**

Character	<i>C. koidzumiana</i>	<i>C. nanlingensis</i>	<i>C. shiwandashanensis</i>
Leaf blade	Elliptic or ovate somewhat obtuse, 0.8-7 × 0.6-3 cm	Round to elliptic, 1-4 × 0.8-2 cm	Spatulate to obovate, 2.5-12 × 0.8-3.5 cm
Petiole	0.6-6 cm long, slender	0.5-2 cm long	Sessile
Bractlike leaves	Linear to lanceolate	Elliptic to oblong-elliptic	Oblong-elliptic to oblong
Flower	Zygomorphic	Nearly actinomorphic	Actinomorphic
Tepals	Tepals 6, filiform, lower 2 or 3 very short or reduced	3, rarely 4, filiform, regular	Tepals 6, filiform, regular
Filaments	Unequal	Unequal	Regular

**Key to *Chionographis* Maximowicz**

1. Flowers actinomorphic or sub-actinomorphic, tepals filiform, regular ..... 2
1. Flowers zygomorphic, tepals spatulate-linear or filiform, unequal ..... 4
2. Tepals 3, rarely 4, filaments unequal ..... *C. Nanlingensis*
2. Tepals 6, filaments equal ..... 3
3. Tepals spatulate-linear, filaments little short than tepals ..... *C. actinomorpha*
3. Tepals filiform, filaments much short than tepals ..... *C. shiwandashanensis*
4. Anthers 2-celled ..... 5
4. Anthers confluent at the top into one cell ..... 6
5. Flowers with lower 2 tepals vestigial, with 1 or both often absent; 2n=24 ..... *C. japonica*
5. Flowers with lower 2 tepals shorter than upper ones but always present; 2n=42 or 44 ..... *C. hisauchiana*
6. Tepals spatulate-linear ..... 7
6. Tepals filiform ..... *C. koidzumiana*
7. Leaf blade cordate or subcordate leaf-blades ..... *C. cordifolia*
7. Leaf blade spatulate to elliptic ..... *C. chinensis*

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