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中国杜鹃花科一新记录属及铁线莲属一新种*

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摘要: 报道杜鹃花科仙女越橘属 (*Andromeda*) 在中国东北吉林省的新分布记录, 该属为单型属, 广布于北美北部、欧洲北部和东亚北部, 但以前中国境内未有记录。本文提供了本属的形态描述和植物野外生境照片。另外, 还描述了产自云南西双版纳的铁线莲属一新种易武铁线莲 *Clematis peii*, 并绘图。该新种隶属于威灵仙组 (sect. *Clematis*) 并与 *C. chingii* 近缘, 不同点在于, 该新种为三出复叶, 小叶片近全缘, 花药较长 (约3 mm), 且药隔显著凸出, 并讨论了该新种与 sect. *Clematis* 中其它具有三出复叶的种类在形态上的区别。

关键词: 中国; 仙女越橘属; 杜鹃花科; 新记录属; 铁线莲属; 毛茛科; 新种
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A Newly Recorded Genus of Ericaceae and *Clematis peii* sp. nov. (Ranunculaceae) from China*

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Abstract: *Andromeda* is recorded for the first time in north-eastern China near the border between China and DPR Korea. This monotypic genus is widely distributed in Northern America, Europe, and Northern Asia but has not been reported in China before. The genus and species, *A. polifolia*, is described, and the pictures of the plant and its habitats are presented. Also in this paper, a new species, *Clematis peii* from Xishuangbanna, southern Yunnan, China, is described and illustrated. The new species belongs to sect. *Clematis* and is closely related to *C. chingii*, but differs in its ternate leaves with nearly entire leaf margin and long anthers (nearly 3 mm long) with protruding connectives. Other close allies with ternate leaves were also compared in this study.

Key words: China; *Andromeda*; Ericaceae; New record; *Clematis*; Ranunculaceae; New species

The Ericaceae (the heath family or the heather family) are a cosmopolitan family (Lens *et al.*, 2007) with *ca.* 125 genera and 4000 species, many of which, e.g., *Rhododendron* L., *Cassiope* D. Don, *Enkianthus* Lour. and *Lyonia* Nutt., are ornamentals (Fang *et al.*, 2005). Some species of the family provide blue berries (*Vaccinium* L.), carving woods (*Rhododendron*), and toxic or pharmaceutical chem-

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icals (*Rhododendron*, *Pieris*, D. Don, *Craibiodendron* W. W. Smith, *Gaultheria* L.). Most of the plants in Ericaceae are calcifuge (lime-hating) that occur in acidic soils.

The taxonomy of Ericaceae has been disputed during its taxonomic history (Drude, 1889; Cox, 1948; Watson, 1965; Stevens, 1971). Recently, based on molecular and morphological evidence, Kron *et al*. (2002) classified the family into eight subfamilies and 20 tribes. The herbaceous plants previously separated as Pyrolaceae and Monotropaceae were included in Ericaceae. Epacridaceae and Empetraceae were also included into the family. In this taxonomic framework, there are 22 genera and more than 800 species of Ericaceae currently reported in China (Fang *et al*., 2005), most of which are found in SW China.

When investigating the plant flora of Laolike wetland, Antu Co. in eastern Jilin Province, NE China, the authors found a delicate shrubby species thickly clusted in the moss hummocks on alpine boggy area. The plants of this species have pink nodding urceolate flowers forming terminal umbelliform corymbs. From morphology, this species obviously belongs to Ericaceae and is superficially similar to *Chamaedaphne calyculata* (L.) Moench. After comprehensive observation of the specimens, we identified this plant to the species known as bog-rosemary, *Andromeda polifolia* L., which is newly recorded genus and species of Ericaceae from China. According to specimens, field observation and literatures, this newly recorded genus and species are described here.

Andromeda L. in Sp. Pl. **1**: 393. 1753.
仙女越橘属

Type: *Andromeda polifolia* L.

Description: Evergreen shrubs ascending or sometimes spreading, rarely branched; young twigs glaucous. Leaves alternately arranged; dark green above; blade linear to narrowly elliptic or oblong, coriaceous, margins entire, revolute, abaxial surface glabrous or densely hairy, hairs erect; venation reticulodromous. Inflorescences terminal, umbelliform corymbs, 2–8-flowered, rarely solitary; bracts glaucous. Sepals 5, connate; petals 5, connate for nearly their entire lengths, pink, corolla globose-urceolate, lobes short; stamens 10, not extending out of the corolla tube; filaments straight, flattened, hairy, without spurs; anthers with 2 awns, dehiscent by apical pores; pistil 5-carpellate; ovary 5-locular; stigma subcapitate. Fruits capsular, 5-valved, with unthickened sutures, obovoid to subglobose, dry. Seeds many, ovoid or ellipsoid; testa multi-layered. $x=12$.

Species one.

Distribution: northern North America, northern Europe, northern Asia.

The name "*Andromeda*" is derived from Linnaeus by the habit of the plant, which is always fixed on turfy hillock in the midst of the swamps, as Andromeda (in Greek mythology) was chained to a rock in the sea.

Andromeda polifolia L. in Sp. Pl. **1**: 393. 1753. Fig. 1 **仙女越橘**

Type: Herb. Linn. No. 163 (LAPP) (Lectotype designated by Javis and McClintock, 1990).

Description: Evergreen shrubs 5–30 (–80) cm tall, without multicellular hairs; rootstocks creeping, sometimes horizontal. Leaf blades white-glaucous or, sometimes, green abaxially, (1-) 2–5 cm ×1–8 mm. Pedicels recurved or sometimes erect, often reddish, 6–20 mm. Sepals valvate in bud, soon wide-spreading, whitish to reddish, 1–1.8 mm, apex blunt to acute, calyx saucer-shaped; petals short-spreading or recurved, hairy adaxially, minutely papillate on margins, corolla 5–8×3.5–7 mm, without stomata; nectariferous tissue at ovary base; ovary depressed-globose; placentae attached next to summit of columella; style ± equaling corolla tube. Capsules 5-locular, 4–8×4–5 mm, deeply depressed apically obscuring style base, conspicuously glaucous when young, glabrous or hairy at base. Seeds brown, ca. 1 mm; testa smooth, lustrous. $2n=48$. Flowering in May to July, fruiting in July to August.

Fig. 1　*Andromeda polifolia* L. and its habitat. A, B. plants in flower; C. habitat-moss hummocks on alpine boggy area

Distribution: This species is distributed in acidic wetlands, often in moss hummocks on swampy alpine meadows and bogs in cold peat-accumulating areas of northern North America, northern Europe, and northern Asia.

Additional specimens examined:

US. Alaska: *A. R. Batten & C. G. Batten CB*5 (ALA);

UK. British Isle: North Somerset, *Thomas Clark* 917 (BIRM); Cardiganshire, *M. H. Bigwood* A57 (ABS);

China. Jilin: Antu County, Laolike wetland, ca. 1 400 m, 2011-06-29, *P. Peng* 2011016 (BJFC).

Note: According to Fabijan (2009), the twigs and leaves are used in Russia for tanning leather. The poison andromedotoxin, was first isolated from *Andromeda polifolia* and later found to be common in other genera of Ericaceae. This chemical causes low blood pressure, breathing difficulty, vomiting, diarrhea, cramps, and potentially death. A single ingestion of "mad honey" causes poisonings in Europe and Turkey each year (Özhan *et al.*, 2004).

From morphology, *Andromeda* is very similar to *Chamaedaphne* Moench, but differs from the latter genus by its linear to narrowly elliptic leaves, and stamens without awns. Whereas, *Chamaedaphne* has elliptic, lanceolate, oblanceolate, oblong, or obovate leaves and anthers apically narrowed, forming hollow awns (tubules).

According to the recent classification of Ericaceae, the genus *Andromeda* belongs to tribe Andromedeae Klotzsch in subfamily Vaccinioideae Arn. (Kron *et al.*, 2002). This tribe contains only two genera, *Andromeda* and *Zenobia* D. Don. Although there are few distinctive synapomorphies shared by

these two genera, the monophyly of this small clade was strongly supported by the molecular analyses. One possible synapomorphy of the tribe may be lack of multicellular hairs on the leaves according to Kron *et al*. (2002).

Within the species, there are two varieties in *Andromeda polifolia*, var. *polifolia* and var. *latifolia* Aiton. According to Fabijan (2009), two varieties are keyed by the following characters:

Key to two varieties of *A. polifolia*

1. Leaf blades (1-) 2–4 cm, abaxial surface white-glaucous (sometimes green), glabrous; corollas 5(-7) mm; corymbs 2–3(–4)-flowered, sometimes flowers solitary, erect or lax, on erect or ascending branchlets; pedicels 10–20 mm ····· 1a ***Andromeda polifolia* var. *polifolia***
1. Leaf blades (2-) 3–5 cm, abaxial surface not glaucous, white-hairy to white-velutinous; corollas 6(–8) mm; corymbs (2-)4–8-flowered, nodding, on curved branchlets; pedicels seldom more than 6–8 mm
····· 1b ***Andromeda polifolia* var. *latifolia***

The plants recorded in China belong to *Andromeda polifolia* var. *polifolia*, based on its morphological characters.

Distribution of *Andromeda* is circumboreal and circumpolar (Jacquemart, 1998). It expands its area from Scandinavia, Northern Europe, Siberia, Mongolia, Korea, Japan to Alaska, Newfoundland, Greenland, and northern United States (Poyarkova, 1952; Lee, 2003; Park, 2007; Fabijan, 2009). So, it is not surprising to discover this species on Chinese side near the border of China and Korea.

Clematis L. comprises 280–350 species of woody climbers, perennial herbs and subshrubs with a cosmopolitan distribution (Tamura, 1987, 1992, 1995; Johnson, 1997; Grey-Wilson, 2000; Wang and Li, 2005). Some species of *Clematis* are of horticultural interest (e.g., *C. montana* Buch.-Ham. ex DC., *C. patens* Morr. et Decne., *C. ranunculoides*, and *C. alpina* L.), and some others have been considered pharmaceutically important (e.g., *C. chinensis* Osbeck, *C. terniflora* DC., and *C. armandii* Franch.).

Clematis shows a considerable diversity in temperate regions of the Northern Hemisphere especially in eastern Asia with ca. 150 species reported in China, ca. 90 of them being endemic to the country (Wang and Bartholomew, 2001). In comparison, species diversity of *Clematis* in tropical areas is relatively low.

Taxonomy of *Clematis* has been extensively studied (De Candolle, 1818; Spach, 1839; Kuntze, 1885; Prantl, 1888; Tamura, 1955, 1956, 1987, 1995; Snoeijer, 1992; Johnson, 1997; Grey-Wilson, 2000; Wang and Li, 2005), however, it has been notoriously difficult because species of this genus are morphologically highly variable (Johnson, 1997; Brandenburg, 2000; Grey-Wilson, 2000; Wang and Li, 2005). Classifications of the genus (e.g. Prantl, 1888; Tamura, 1995; Johnson, 1997; Grey-Wilson, 2000; Wang and Li, 2005) differ from each other due to the complexity of the genus and the different characters emphasized in each system. Further more, many tropical *Clematis* were poorly studied due to the insufficient investigations and limited materials. During a comprehensive taxonomic revision on *Clematis*, we carefully studied all the *Clematis* specimens from herbaria worldwide. A new species collected in Xishuangbanna, the tropical area of Yunnan Province, China, is described here as a result of this taxonomic revisionary work.

Clematis peii L. Xie, W. J. Yang & L. Q. Li, sp. nov. Figs. 2, 3 **易武铁线莲**

Type: China: Yiwu, Manpi, Mengla Co., Xishuangbanna, Yunnan Province, 8 Sept. 1959, S. J. Pei 59-9998 (Holotype: KUN; isotype: KUN).

Diagnosis: Species nova *Clematidi chingii* W. T. Wang arcte affinis, sed foliis haud pinnatis, marginis fere integeris, antheris majoribus 3 mm longis, connectivis apice 0.3 mm longis productis differt.

Description: Woody vine. Branches shallowly 10-sulcate, appressed-puberulous. Leaves ternate; leaflets or papery, ovate or broadly ovate, 5–7 × 3.4–4.5 cm, at apex acute, at base rounded or slightly

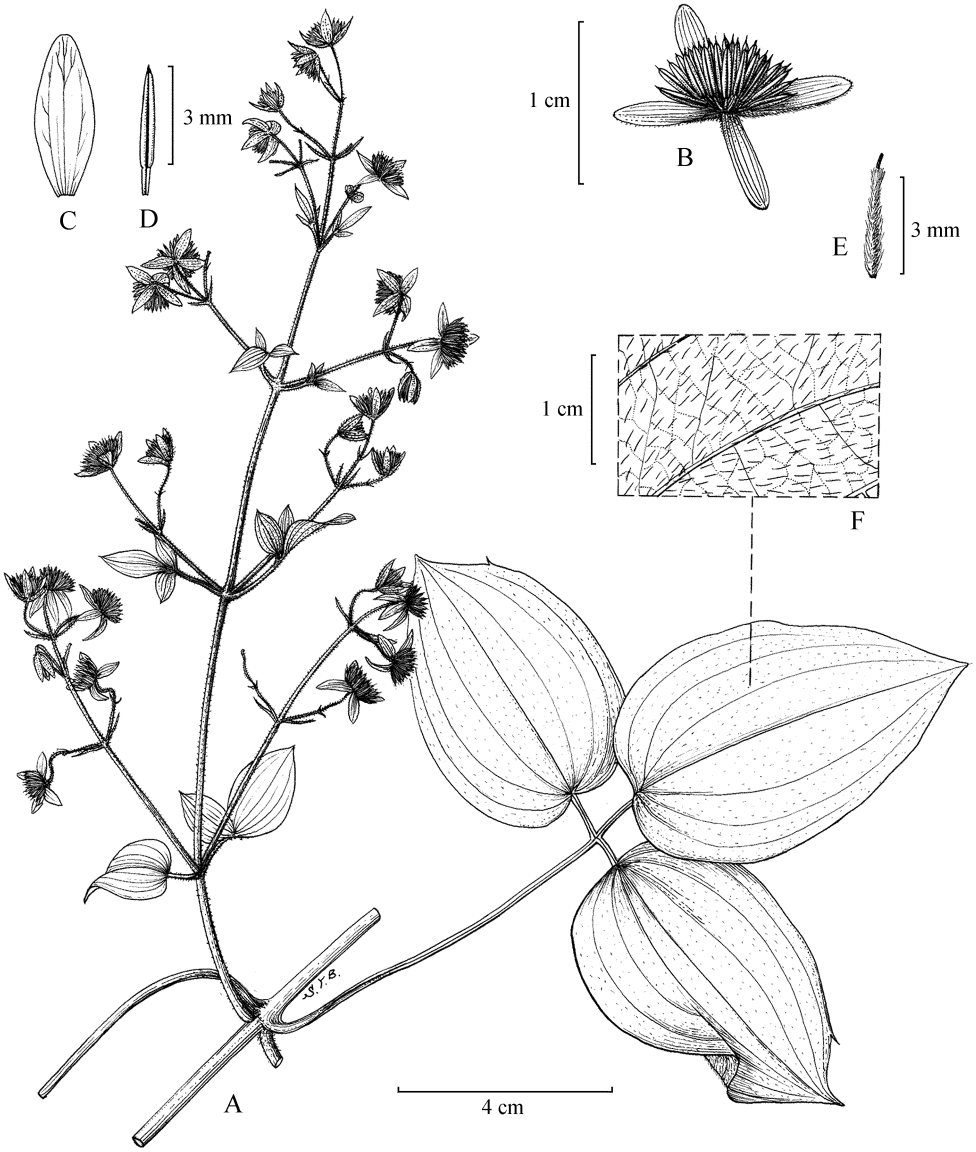

Fig. 2　**Clematis peii** L. Xie, W. J. Yang et L. Q. Li sp. nov.

A. flowering branch, B. flower, C. sepal, D. stamen, E. carpel, F. adaxial surface of leaf. Drawn from the isotype

cordate, at margin nearly entire or rarely 1–2 denticulate, abaxially densely puberulous, adaxially pubescent with long hairs (ca. 1 mm long), veins abaxially prominent and reticulate; petioles 5–7 cm long. Cymes axillary, many-flowered, panicle-like; peduncles 3–10 cm long, puberulous; bracts petiolate, linear to narrowly elliptic, sometimes leaf-like, ternate, 0.5–1.5 (2.5) cm long. Flower 1.0–1.5 cm in diam.; pedicel 0.6–1.8 cm long, densely puberulous. Sepals 4, rarely 5, yellowish white, narrowly oblong, 5–6 × 2 mm, at apex rounded or obtuse, inside glabrous, outside densely appressed-puberulous. Stamens ca. 20–25, ca. 5 mm long, glabrous; anthers narrowly oblong to linear, ca. 3 mm long, apex minutely apiculate (ca. 0.3 mm). Ovaries densely puberulous; styles ca. 4 mm long, densely villous. Achenes not seen. Flowering in September.

Distribution and habitat: Endemic to Xishuangbanna, southern Yunnan, China. In forests or on lime-stones; 1 000 m.

Etymology: The specific epithet is named after

the collector, Prof. Pei Sheng-ji, in memory of his contribution to Chinese ethnic botany and plant collection in the tropical areas of Yunnan.

Note: According to its glabrous filaments and white spreading sepals, the *C. peii* belongs to sect. *Clematis* (sensu Wang, 2003; Wang and Li, 2005). It is closely related to *C. chingii* in morphology but is easily distinguished from the latter by its nearly entire leaf margin, long anthers (usually longer than filaments), and protruding connectives, whereas *C. chingii* usually has pinnate leaves with dentate margin, shorter anthers with obtuse apex. There are two other widely distributed species in sect. *Clematis* (sensu Wang, 2003; Wang and Li, 2005) with ternate leaves, *C. meyeniana* Walp. and *C. finetiana* Lévl & Vant., that similar to the new species. The new species is also easily distinguished from them by its indumentum on the stems and leaves. Diagnostic characters for *C. peii*, *C. chingii*, *C. meyeniana*, and *C. finetiana* are compared in Table 1.

Fig. 3 Holotype of *Clematis peii* L. Xie, W. J. Yang et L. Q. Li sp. nov

Table 1 A comparison of *Clematis peii*, *C. chingii*, *C. meyeniana* and *C. finetiana*

Character	*C. peii*	*C. chingii*	*C. meyeniana*	*C. finetiana*
Hair on the stem	densely puberulous	densely puberulous	puberulous, glabrescent	only near nodes puberulous
Leaf	ternate	ternate or pinnate	ternate, seldom simple	ternate
Leaf margin	nearly entire or rarely 1–2 denticulate	few-dentate, seldom entire	entire	entire
Leaf blade	papery	papery	subcoriaceous or papery	subcoriaceous or coriaceous
Shape of the leaf blade	ovate or broadly ovate	ovate, broadly ovate, or elliptic	ovate, elliptic-ovate, or narrowly ovate	ovate-lanceolate, narrowly ovate, or ovate
Abaxial leaf blade	densely puberulous, basal veins prominent	densely puberulous, basal veins prominent	near base sparsely puberulous, glabrescent, basal veins prominent	glabrous, basal veins slightly prominent
Adaxial leaf blade	strigose	strigose	near base sparsely puberulous, glabrescent	glabrous
Inflorescence	cymes axillary and terminal, many flowered, panicle-like	cymes axillary and terminal, 3–10-many flowered, often panicle-like	cymes axillary and terminal, many flowered, often panicle-like	cymes axillary and terminal, 1–5 (–9) flowered, often raceme-like
Sepals	4, white, elliptic-oblong, oblong, or obovate-oblong	4, white, elliptic-oblong, oblong, or obovate-oblong	4, white, narrowly oblong or lanceolate	4–6, white, narrowly oblong, obovate-oblong, or narrowly lanceolate
Anthers	3 mm long,	1.5 mm long	linear or narrowly oblong, 3–5.5 mm long	linear or narrowly oblong, 4–6.5 mm long
Connectives	minutely apiculate	not protruding, apex obtuse	minutely apiculate	minutely apiculate
Filaments	1–1.8 mm long	4–5 mm long	2–5 mm long	3–5.5 mm long
Distribution	endemic to southern Yunnan Prov. China	Guangxi and Yunnan, China	Southern China to Laos, N. Myanmar, Thailand, Vietnam.	Southern China

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