Ann. Bot. Fennici 47: 397–402 ISSN 0003-3847 (print) ISSN 1797-2442 (online)
Helsinki 29 October 2010

New taxa of *Rhododendron* (Ericaceae) from China

Xiang Chen[1], Laurie Consaul[2], Jiayong Huang[3] & Xun Chen[4,*]

[1)] *South China Botanical Garden, Chinese Academy of Sciences, 510650, Guangzhou, China; Graduate School of Chinese Academy of Sciences, 100049, Beijing, China; Institute of Biology, Guizhou Academy of Sciences, 550009, Guiyang, China*
[2)] *Research Division, Botany, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, ON K1P 6P4, Canada*
[3)] *Research Division, Management Committee for Baili Rhododendron Nature Reserve of Guizhou, 551500, Dafang, China*
[4)] *Guizhou Academy of Sciences, 550001, Guiyang, China; South China Botanical Garden, Chinese Academy of Sciences, 510650, Guangzhou, China (*corresponding author's e-mail: chenxunke1956@163.com)*

Received 16 Mar. 2009, revised version received 26 Apr. 2010, accepted 29 June 2009

Chen, X., Consaul, L., Huang, J. & Chen, X. 2010: New taxa of *Rhododendron* (Ericaceae) from China. — *Ann. Bot. Fennici* 47: 397–402.

Two new species, *Rhododendron pudiense* Xiang Chen & Jiayong Huang and *R. jiulongshanense* Xiang Chen & Jiayong Huang, and one new variety, *R. delavayi* var. *adenostylum* Xiang Chen & X. Chen (Ericaceae), from Guizhou Province, China are described and illustrated. *Rhododendron pudiense* is close to *R. paradoxum* and *R. denudatum*, from which it differs by having oblanceolate or elliptic leaves with a two-layered indumentum, a more floriferous inflorescence, a glandular and tomentose pedicel and calyx, a pinkish white corolla, fewer stamens, and a densely white shiny pubescent ovary. *Rhododendron jiulongshanense* differs from the most morphologically similar species *R. glanduliferum* and *R. magniflorum* by having usually glabrous branchlets, oblong-elliptic or long obovate leaves, a more floriferous inflorescence, a much smaller calyx, and a mid-sized narrowly tubular-campanulate corolla. *Rhododendron delavayi* var. *adenostylum* differs from *R. delavayi* var. *delavayi* by having a glandular style.

Key words: angiosperms, floristics, new taxa, *Rhododendron*, taxonomy

Plants of the genus *Rhododendron* (Ericaceae) are well known globally because of their beautiful flowers and highly appreciated horticultural value. Worldwide, experts recognize nine subgenera, which include about 1000 species that are distributed mainly in Asia, Europe, and North America. In China, there are 571 species, 409 of them endemic (Fang *et al*. 2005). The southwest–central region of China, including the Guizhou Province, is possibly the region of the geographic origin of the genus (Fang & Ming 1995).

The Baili *Rhododendron* Nature Reserve contains one of the largest natural *Rhododendron* communities in the world. The Nature Reserve is located in a highland in northwest Guizhou, and is characterized by an assemblage of *Rhododendron* plants covering 125.8 km^2 and including six

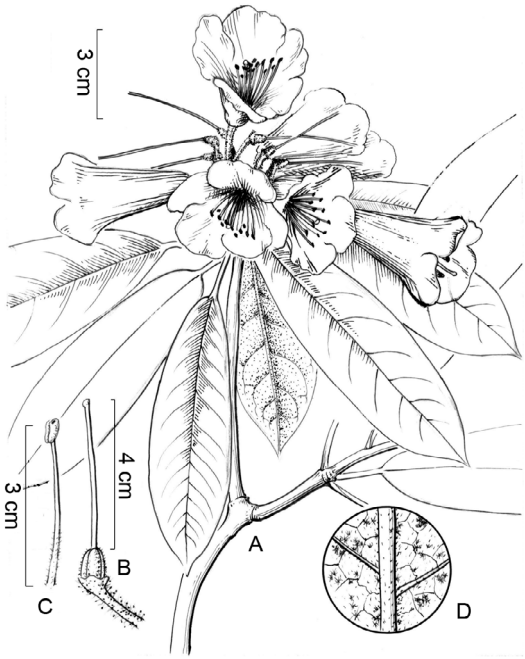

Fig. 1. *Rhododendron pudiense* (drawn by H. Xie from the holotype). — **A**: Flowering branch. — **B**: Gynoecium. — **C**: Androecium. — **D**: Enlarged part of leaf blade abaxial surface.

subgenera, six sections, seven subsections and approximately 35 species. During the years 2007 and 2008, as a result of an intensive taxonomic survey of the genus in the Nature Reserve, we found that three taxa were undescribed based on careful examination of specimens and relevant literature (Ming 1984, Fang & Ming 1986, Hu 1988, Zhang & Chen 1990, Hu & Fang 1994, Chen & Wu 2003, Chen & Xie 2005, Yang *et al.* 2006, He & Zhao 2007).

Rhododendron pudiense Xiang Chen & Jiayong Huang, *sp. nova* (Fig. 1)

(*R.* subgen. *Hymenanthes* sect. *Ponticum* subsect. *Taliensia*)

Arbor parva, ca. 7 m alta; ramuli dense ramoso-pubenti. Folia oblanceolata vel elliptica, 9–14 cm longa, 2.5–4.5 cm lata, supra glabra, infra indumento bistrato, strato superiore floccoso trichomatum ramossorum, strato inferiore trichomatum persistentium adpressorum. Inflorescentia racemoso-umbellata, floribus 10–14; pedicelli dense glandulosi et tomentosi; calyx ca. 1 mm longus, glandulosus et tomentosus; corolla tubuloso-campanulata vel oblique campanulata, alba, 3.5–4 cm longa; stamina (8)–10, filamentis prope basin puberulis; ovarium dense albopubescens; stylus glaber.

Type: China. Guizhou: Baili Rhododendron Nature Reserve, Pudi, 27°13′N, 105°51′E, alt. 1650 m, mountainside, in thickets dominated by *R. delavayi* and *R. stamineum*, 21.IV.2008 *Xiang Chen 08019* (holotype HGAS).

Small evergreen trees, about 7 m tall; bark brown, smooth; young shoots densely yellowish brown branched-hairy. Petiole grooved, 1–2 cm, with same hairs as young shoots when young; leaf blade oblanceolate or elliptic, 9–14 × 2.5–4.5 cm; base cuneate or slightly obtuse, slightly oblique; margin slightly undulate; apex acute or shortly acuminate; adaxial surface green, slightly rugulose, glabrous; abaxial surface pale yellowish green, with indumentum 2-layered, upper layer yellow-brown, loose, floccose, hairs branched, ± deciduous, denser along veins, lower layer pale yellowish green, thin, appressed, shiny, persistent; midrib grooved adaxially, prominent abaxially; lateral veins 16–20-paired, grooved adaxially, raised abaxially. Inflorescence racemose-umbellate, 10–14-flowered; rachis ca. 10 mm, densely pale yellowish white tomentose. Pedicel reddish green, 8–13 mm, densely pale brown glandular-hairy and ± pale yellowish white tomentose; calyx undulate, about 1 mm, glandular and tomentose, lobes 5; corolla tubular-campanulate or obliquely campanulate, white, slightly pale pinkish, 3.5–4 cm long, 2.7–4 cm wide when flattened, lobes 5, only slightly spreading, suborbicular, about 1.5 cm, slightly emarginate, tube both outside and inside glabrous, with deep purple-red spots, without nectar pouches; stamens (8–)10, white, unequal, 2.5–3.5 cm, filaments puberulent towards base, anthers brownish, 1.5–2 mm; ovary conoid, 3–4.5 mm, densely white shiny pubescent; style greenish white, 3.9–4.3 cm, glabrous; stigma brownish, about 1 mm wide. Capsule cylindric, about 2 cm, puberulent. Flowers in April; fruits in August–October.

This species is close to *R. paradoxum* and also similar to *R. denudatum*, but differs by

having oblanceolate or elliptic leaves with a two-layered indumentum, a more floriferous inflorescence, a glandular and tomentose pedicel and calyx, a pinkish white corolla, fewer stamens, and a densely white shiny pubescent ovary (Table 1). *Rhododendron paradoxum* is not known to us in the wild; the type was raised from seeds collected in the wild in Western Sichuan (Fang *et al*. 2005). Dr. D. F. Chamberlain considers that *R. paradoxum* might be a hybrid from *R. wasonii* (Hu & Fang 1994). However, there is no character showing that *R. pudiense* appears to be a hybrid in the Nature Reserve. After intensive surveying of the reserve, we found only one population, including one large tree surrounded by a few seedlings, of *R. pudiense*. One of the authors (JH) has collected seeds and begun a propagation experiment to determine the ideal habitat and thereby increase the possibility of preserving and enlarging the population if required in the future.

Rhododendron jiulongshanense Xiang Chen & Jiayong Huang *sp. nova* (Fig. 2)

(*R.* subgen. *Hymenanthes* sect. *Ponticum* subsect. *Fortunea*)

Frutex vel arbor parva, 3–5 m alta, semper-virens; ramuli saepe glabri. Folia oblanceolato-elliptica vel longe obovata, 15–25 cm longa, 4–8.5 cm lata, apice acuto vel obtuso, basi obtuso vel rotundato, supra glabra, infra glabra; petiolus saepe glaber. Inflorescentia racemoso-umbellata, floribus 10–12; corolla anguste tubuloso-campanulata, alba, 7–8.5 cm longa, lobis 7; stamina 16–17, 5–6 cm longa, filamentis glabris; ovarium dense glanduloso-pilosum longum; stylus 6.5–7.5 cm longus, glandulosus.

Table 1. Comparison of *Rhododendron pudiense*, *R. paradoxum* and *R. denudatum.*

Characters	*R. pudiense*	*R. paradoxum*	*R. denudatum*
Vegetative form	small trees, ca. 7 m tall	small shrubs, 1–2 m tall	shrubs or small trees, 3–6 m tall
Young shoots and petiole	densely yellowish brown branched-hairy	densely whitish tomentose	whitish or yellowish stellate tomentose
Leaf blade shape	oblanceolate or elliptic, base cuneate or slightly obtuse, slightly oblique, apex acute or shortly acuminate	oblong-elliptic, base broadly obtuse or rounded, apex obtuse or subrounded, ± beaked	elliptic-lanceolate to ovate-lanceolate base broadly cuneate or unequally rounded, apex apiculate or acuminate
Leaf blade surface and vestiture layers	slightly rugulose, 2-layered	slightly rugulose, 1-layered	distinctly rugose, 2-layered
Lateral veins	16–20	11–12	14–18
Flowers	10–14	8–10	8–12
Pedicel	densely pale brown glandular-hairy and ± pale yellowish white tomentose	densely tawny tomentose only	densely yellowish tomentose only
Calyx	lobes equal, ca. 1 mm, glandular and tomentose	lobes unequal, 1–3 mm, tomentose only	lobes equal, ca. 1 mm, tomentose only
Corolla	tubular-campanulate or obliquely campanulate, white, slightly pinkish	obliquely campanulate, white	campanulate, rose
Stamens	(8–)10, filaments puberulent towards base	10, filaments pubescent at base	10–13, filaments glabrous or glabrescent
Ovary	densely white shiny pubescent	densely brown appressed fasciculate-tomentose	densely yellowish tomentose
Distribution	NW Guizhou, 1650 m	W Sichuan	NW Guizhou, SW Sichuan, E Yunnan, 2000–3300 m

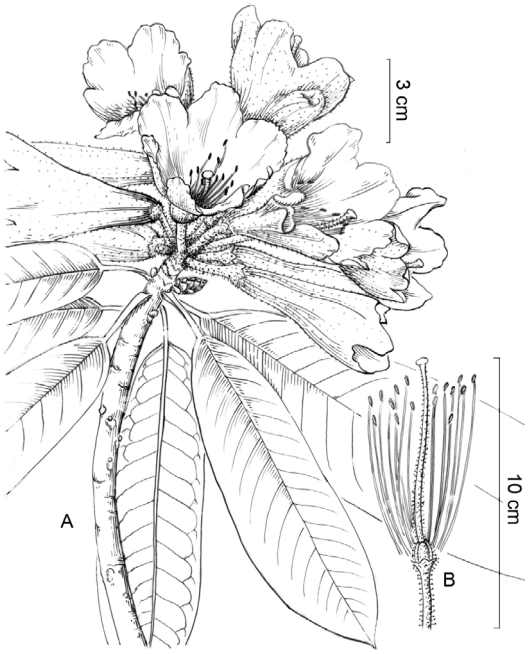

Fig. 2. *Rhododendron jiulongshanense* (drawn by H. Xie from the holotype). — **A**: Flowering branch. — **B**: Androecium and gynoecium.

TYPE: China. Guizhou: Baili Rhododendron Nature Reserve, Baina, Jiulongshan, 27°18´N, 105°52´E, alt. 1955 m, slope, in thickets dominated by *Symplocos sumuntia*, 26.VI.2008 *Xiang Chen 08031* (holotype HGAS). — PARATYPE: China. Guizhou: Baili Rhododendron Nature Reserve, Pudi, 27°14´N, 105°53´E, alt. 1820 m, mountain summits, in thickets dominated by *R. siderophyllum* and *R. liliiflorum*, 21.IV.2008 *Xiang Chen 08014* (HGAS).

Evergreen shrubs or small trees, 3–5 m tall; young shoots usually glabrous, occasionally glandular-setose. Petiole 27–45 mm, glabrous or sometimes sparsely glandular-setose when young; leaf blade leathery, oblong-elliptic or long obovate, 15–25 × 4–8.5 cm; base obtuse to rounded, sometimes slightly cordulate; margin revolute; apex acute or obtuse; both surfaces glabrous; abaxial surface pale green; adaxial surface green, midrib prominent abaxially, grooved adaxially; lateral veins 18–23-paired, grooved adaxially, raised abaxially. Inflorescence racemose-umbellate, 10–12-flowered, rachis 35–45 mm, densely shortly glandular-hairy. Pedicel 2.5–3 cm, densely long glandular-hairy; calyx 0.8–1 mm, glandular, margin undulate; corolla narrowly tubular-campanulate, fragrant, white, 7–8.5 cm, with a basal reddish yellow blotch, long glandular-hairy outside the tube, inside glabrous; lobes 7, suborbicular, ca. 2 cm, slightly emarginate; stamens 16–17, unequal, 5–6 cm, filaments glabrous, anthers yellowish white, big, 5–6 mm; ovary conoid, 6–7 mm, densely long glandular-hairy; style greenish white, 6.5–7.5 cm, glandular-hairy below middle, glandular above middle, stigma greenish, ca. 5 mm wide. Capsule cylindric, ca. 25 mm. Flowers in June–July; fruits in September–November.

This species is most similar to *R. glanduliferum* and *R. magniflorum*, but is distinguished by having usually glabrous branchlets, oblong-elliptic or long obovate leaves, a more florifer-

Table 2. Comparison of *Rhododendron jiulongshanense, R. glanduliferum* and *R. magniflorum.*

Characters	*R. jiulongshanense*	*R. glanduliferum*	*R. magniflorum*
Young shoots and petiole	usually glabrous, occasionally glandular-setose	glandular-setose	densely glandular-setose
Leaf blade	oblong-elliptic or long obovate, 15–25 × 4–8.5 cm; base obtuse to rounded, sometimes slightly cordulate; apex acute or obtuse	oblong-lanceolate to oblanceolate, 10–19 × 3.8–4.5 cm; base cuneate; apex acuminate	oblong, 22–25 × 7.5–8.8 cm; base broadly cuneate or rounded, unequal; apex obtuse
Flowers	10–12	5–6(–8)	9–12
Calyx	0.8–1 mm, lobes undulate	ca. 3 mm, lobes suborbicular	3–4 mm, lobes triangular-ovate
Corolla	narrowly tubular-campanulate, 7–8.5 cm, lobes 7	funnelform-campanulate, 5–6 cm, lobes 7–8	tubular-funnelform, 9.5–10 cm, lobes 5
Stamens	16–17, 5–6 cm	14–16, 3–4.5 cm	16, 3.6–6.1 cm
Style and stigma	6.5–7.5 cm, ca. 5 mm	ca. 5 cm, ca. 4 mm	7.7–8 cm, ca. 5 mm
Distribution	NW Guizhou, 1820–2000 m	NE Yunnan, 2300–2400 m	SW Guizhou, 1750 m

ous inflorescence, a much smaller calyx, and a mid-sized narrowly tubular-campanulate corolla (Table 2).

Rhododendron jiulongshanense is scattered throughout the reserve and there were about 120 mature individuals found during the 2007–2008 field research. In light of the factors threatening its survival, seeds of *R. jiulongshanense* are included in the propagation experiment mentioned above for the previous species.

Rhododendron delavayi Franchet var. ***adenostylum*** Xiang Chen & X. Chen *var. nova* (Fig. 3)

(*R.* subgen. *Hymenanthes* sect. *Ponticum* subsect. *Arborea*)

A var. delavayi stylis ab apice usque ad basim glandulosis abhorret.

TYPE: China. Guizhou: Baili Rhododendron Nature Reserve, Baina, alt. 1720 m, slope, in *Rhododendron* thicket, 22.IV.1984 *Y. K. Li 11679* (holotype HGAS).

Small trees, ca. 5 m tall; leaf blade abaxial surface with indumentum spongy, fawn; pedicel glandular only; corolla crimson; filaments glabrous; style glandular to tip, denser at base.

The specimen was collected in the nature reserve 25 years ago and originally identified as *R. delavayi*, which is one of the dominant species in that area. *Rhododendron delavayi* var. *adenostylum*, however, is quite rare or might even be destroyed from the wild, because we have not found it again in the area since the original collection was made.

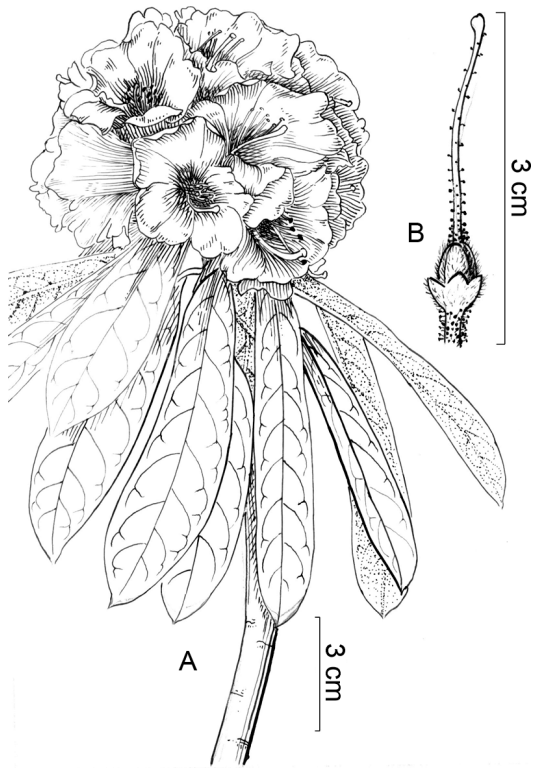

Fig. 3. *Rhododendron delavayi* var. *adenostylum* (drawn by H. Xie from the holotype). — **A**: Flowering branch. — **B**: Gynoecium.

Acknowledgments

Financial support from the Ministry of Science and Technology of the P. R. of China (2007GB2F200289) and the Science and Technology Department of Guizhou Province (2007-6005 and 2007-6019-5) for the present project is gratefully acknowledged. We appreciate Prof. Nianhe Xia, South China Botanical Garden, CAS, for additional help with the present paper. We thank Mr. Hua Xie for preparing the original line drawings. We also appreciate Mr. Baoshan Huo, Mr. Zhongxin Nie, Mr. Yunsong He, and other colleagues for supporting or joining the field work.

References

Chen, X. & Xie, H. 2005: [A new subspecies and a new record of *Rhododendron* in Guizhou]. — *Guizhou Science* 23(3): 54–55. [In Chinese].

Chen, X. & Wu, H. M. 2003: [*Rhododendron species from Guizhou, P. R. China*]. — The Science and Technology Press of Guizhou, Guiyang. [In Chinese].

Fang, R. Z. & Ming, T. L. 1986: [*Rhododendron*]. — In: Wu, Z. Y. (ed.), *Flora Yunnanica* 4: 338–557. Science Press, Beijing. [In Chinese].

Fang, R. Z. & Ming, T. L. 1995: [The floristic study on the genus *Rhododendron*]. — *Acta Botanica Yunnanica* 17: 359–379. [In Chinese].

Fang, M. Y., Fang, R. C., He, M. Y., Hu, L. Z., Yang, H. B. & Chamberlain, D. F. 2005: *Rhododendron*. — In: Wu, Z. Y., Raven, P. H. & Hong, D. Y. (eds.), *Flora of China* 14: 260–455. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis.

He, M. Y. & Zhao, Z. J. 2007: [*Rhododendron*]. — In: Gao, B. C. (ed.), *Flora Sichuanica* 117: 102–234. Sichuan Press Group and Sichuan Press, Chengdu. [In Chinese].

Hu, L. Ch. & Fang, M. Y. 1994: *Flora Reipublicae Popularis Sinicae* 57(2). — Science Press, Beijing. [In Chinese].

Hu, W. K. 1988: Materiae ad floram *Rhododendri* Sinici. — *Acta Phytotaxonomica Sinica* 26: 301–305. [In Chinese].

Ming, T. L. 1984: [A revision of subgenus *Hymenanthes* (*Rhododendron* L.) in Yunnan-Xizang]. — *Acta Botanica Yunnanica* 6(2): 141–171. [In Chinese].

Yang, C. H., Li, G. Y., Deng, L. X., Chen, J. Y. & Jiang,Y. L. 2006: [A study on *Rhododendron* species and ornamental characteristics in Baili Dujuan Nature Reserve of Guizhou]. — *Journal of West China Forestry Science* 35(4): 14–18, 39. [In Chinese].

Zhang, X. S. & Chen, X. 1990: [*Rhododendron*]. — In: The Editorial Committee (eds.), [*Flora of Guizhou* 3]: 195–233. The People's Press of Guizhou, Guiyang. [In Chinese].