

GLEICHENIACEAE

里白科 li bai ke

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Plants terrestrial, often forming thickets. Rhizomes long creeping, protostelic, with scales or multicellular hairs. Fronds monomorphic, evergreen, erect, scrambling, or climbing, vernation circinate; stipe not articulate, distant, cylindrical, apex forked, with dormant bud; apical bud covered with hairs or scales; rachis simple to several times pseudodichotomously branched [or pinnate], with stellate hairs and/or ciliate scales when young, these persistent or glabrescent; pinnules pectinately pinnatisect; lobes elliptic or lanceolate, apex obtuse or acute; veins free, forked; lamina papery or subleathery, frequently glaucous abaxially. Sori in 1(–3) lines on both sides of lobe costules, orbicular, exindusiate; sporangia 2–10[–16], sessile, turbinate, with a mid-transverse annulus; spores tetrahedral or reniform, without perispore, smooth.

Three to five genera depending on concepts of authors and over 150 species: tropical and subtropical areas; three genera and 15 species (six endemic) in China.

Most species in the Gleicheniaceae are characteristic of very mineral-poor soils.

Ching Ren-chang, Fu Shu-hsia, Wang Chu-hao & Shing Gung-hsia. 1959. Gleicheniaceae. In: Ching Ren-chang, ed., *Fl. Reipubl. Popularis Sin.* 2: 116–132, 346–350.

- 1a. Veins 2- or 3-forked with (3 or) 4–6 veinlets in each group; rhizome with hairs only; fronds dichotomously divided with a pair of lateral pinnules at most dichotomies; sporangia 5–18 per sorus 1. *Dicranopteris*
1b. Veins 1-forked with 2 veinlets in each group; rhizome with scales; fronds without lateral pinnules at dichotomies; sporangia 2–5(or 6) per sorus.
2a. Rachis undivided, producing successive pairs of 2- or 3-pinnatifid pinnae; penultimate axes of frond without lamina; spores tetrahedral 2. *Diplazium*
2b. Rachis pseudodichotomous; penultimate (and often lower) axes with well-developed lamina; spores ellipsoid 3. *Sticherus*

1. DICRANOPTERIS Bernhardt, Neues J. Bot. 1(2): 38. 1805.

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Hicriopteris C. Presl.

Rhizomes slender, long creeping, covered with multicellular hairs. Fronds distant, erect or somewhat scandent; rachis often several times dichotomously branched with dormant buds in dichotomies, with normal pinnules only at apex, each dichotomy usually with a pair of lateral pinnae, these shallowly to more usually deeply pectinately pinnatifid; dormant apical buds covered with stiff hairs, usually subtended by stipulelike bracts; ultimate pinnae deeply pectinately pinnatifid, lanceolate or broadly lanceolate, sessile; lobes horizontally spreading, margin entire or rarely crenate, often narrowly revolute; most veins 2- or 3-forked with (3 or) 4–6 veinlets. Sori orbicular, exindusiate, in 1(–3) line on each side of costule; sporangia 6–18, sessile; spores tetrahedral [or ellipsoid], without perispore, smooth.

About ten species: mainly in tropical and subtropical areas; five species (two endemic) in China.

- 1a. Rachis 1(or 2) times dichotomously branched, without lateral pinnae; sporangia 12–18 per sorus 1. *D. splendida*
1b. Rachis 1–8 times dichotomously branched, most dichotomies with a pair of lateral pinnae; sporangia 5–8(–15) per sorus.
2a. Sori in 2 or 3 irregular lines on each side of costule; ultimate pinna lobes 8–10 mm wide 2. *D. ampla*
2b. Sori in 1 line on each side of costule; ultimate pinna lobes 2–6 mm wide.
3a. Ultimate pinna lobes broader, 4–6 mm wide; apical buds with subtending bracts fugacious, so buds often apparently ebracteate 3. *D. taiwanensis*
3b. Ultimate pinna lobes narrower, 2–4.5 mm wide; apical buds with subtending bracts more persistent.
4a. Plants up to 4 m tall; ultimate pinnae 35–40 × 9–15 cm; lobes 3–8 cm 4. *D. gigantea*
4b. Plants ca. 1 m tall; ultimate pinnae 15–25(–35) × 4–8(–10) cm; lobes 1.5–5 cm 5. *D. pedata*

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1. *Dicranopteris splendida* (Handel-Mazzetti) Tagawa, Acta Phytotax. Geobot. 8: 164. 1939.

大羽芒萁 da yu mang qi

Gleichenia splendida Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 61: 81. 1924.

Plants 0.7–1 m tall. Rhizomes creeping, ca. 2 mm in diam., covered with brown hairs. Stipe brown, cylindrical, 20–30 cm, ca. 2 mm wide, glabrous; rachis 1 (or 2) times dichotomously branched (apical buds degenerate); apical bud ovate, covered with dense brown hairs; bracts ovate, margin crenate; rachis without lateral pinnae at dichotomy; ultimate pinnae oblong-lanceolate, 15–25 × 5–7 cm, apex attenuate; lobes 35–50 on each side, lanceolate, 30–40 × 6–8 mm, margin entire, apex obtuse or emarginate; lamina papery, glaucous abaxially, dark green adaxially, glabrous; costae prominent on both surfaces; veins 4 or 5 in each group. Sori in 1 line on each side of costule; sporangia 12–18.

Forests, forest margins; 2000–2800 m. NW Yunnan (Qiujiang) [Myanmar].

Images of *Dicranopteris splendida* from Thailand (http://rbgweb2.rbge.org.uk/thaifers/factsheets/index.php?q=Dicranopteris_splendida.xml; accessed 4 Jul 2012) do not match this species.

2. *Dicranopteris ampla* Ching & P. S. Chiu, Acta Phytotax. Sin. 8: 161. 1959.

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Plants 1–2 m tall. Rhizomes creeping, 2–4 mm in diam., woody, covered with brown multicellular hairs. Stipe dark brown, ca. 80 cm, 3.5–5 mm wide, glabrous; rachis 3 or 4 times dichotomously branched; apical buds ovate; bracts ovate, 17–20 mm, margin irregularly toothed, apex obtuse; rachis with a pair of lateral pinnae at each dichotomy; lateral pinnae deeply pinnatifid, oblong-lanceolate, 15–22 × 4.5–13 cm; ultimate pinnae lanceolate or oblong, 20–40 × 8–15 cm, base asymmetrically attenuate, apex acuminate, not subtended by lateral pinnae; lobes lanceolate or linear-lanceolate, 5–10 × 0.8–1 cm, with a pair of lateral stipulelike pinnules at base, margin entire or crenate and sometimes pinnatifid, apex obtuse or emarginate; pinnules linear, 6–10 × 0.7–1 cm, margin undulate or crenate; lamina thinly leathery, gray-green abaxially, dark green adaxially, glabrous; costae prominent adaxially; veins 5–7 in each group. Sori in 1–3 irregular lines on each side of costule; sporangia 7–15.

• Thickets, forests; 700–1900 m. SW Guangdong, W Guangxi, Guizhou, S Hainan, S Xizang, S Yunnan.

Collections of *Dicranopteris ampla* with the lobes crenate, sometimes pinnatifid, were recognized as a form (*D. ampla* f. *irregularis* B. Y. Ding & X. F. Jin, Acta Bot. Yunnan. 30: 9. 2008). Ching (Icon. Filic. Sin. 4: t. 153. 1937) initially identified material of *D. ampla* as *D. splendida*.

3. *Dicranopteris taiwanensis* Ching & P. S. Chiu, Fl. Reipubl. Popularis Sin. 2: 346. 1959.

台湾芒萁 tai wan mang qi

Dicranopteris linearis (N. L. Burman) Underwood var. *montana* Holttum.

Plants ca. 1 m tall. Rhizomes not seen. Stipe dark brown, ca. 35 cm, ca. 3 mm wide, glabrous; rachis 2 or more times dichotomously branched; apical buds ovate, small, covered with brown hairs, subtending bracts small and fugacious, so buds often apparently ebracteate; rachis with a pair of lateral pinnae at each dichotomy; first pair of lateral pinnae obliquely spreading, broadly lanceolate, 7–9 × 3–4 cm, base and apex attenuate; second pair smaller, ca. 4 × 1.5 cm; ultimate pinnae lanceolate or oblong-lanceolate, 15–25 × 4–7 cm, base attenuate, apex acuminate, subtended by lateral pinnae; lobes 25–40 on each side, lanceolate or linear-lanceolate, 3–3.5 × 0.4–0.6 cm, margin entire, apex obtuse or emarginate; lamina papery, glaucous abaxially, green adaxially, glabrous; costae prominent abaxially; veins 4 or 5 in each group. Sori in 1 line on each side of costule; sporangia 6–8.

Broad-leaved forests, forest margins; 1000–1700 m. Taiwan [India, Indonesia, Malaysia, Sri Lanka].

Dicranopteris taiwanensis was reported as the only species in *Dicranopteris* that has apical buds covered only by hairs, not by bracts. Further field studies (Ralf Knapp, pers. comm.) have shown that there are bracts though these are small and fugacious. This removes the main distinction from *D. linearis* var. *montana* and extends the distribution outside Taiwan.

4. *Dicranopteris gigantea* Ching, Fl. Reipubl. Popularis Sin. 2: 346. 1959.

乔芒萁 qiao mang qi

Plants 3–4 m tall. Rhizomes not seen. Stipes dark brown, cylindrical, 1–2 m, ca. 5 mm wide, glabrous; rachis 2 or 3 times dichotomously branched; apical buds ovate, ca. 2 mm, covered with dense brown hairs; bracts ovate-oblong, 6–10 mm, margin entire or rarely crenate, apex obtuse; rachis with a pair of lateral pinnules at each dichotomy; lateral pinnules oblong, 17–25 × 6–7 cm; lobes 30–40 on each side; ultimate pinnae lanceolate, 35–40 × 9–15 cm, base slightly attenuate, apex long caudate; lobes 50–60 on each side, linear, 3–8 × 0.4–0.45 cm, margin entire, apex obtuse, bilobate, or emarginate; lamina papery, bluish green abaxially, green adaxially, glabrous; costae prominent adaxially; veins inconspicuous, 4 or 5 in each group. Sori in 1 line on each side of costule; sporangia 5–8.

• Forests; 100–300 m. Hainan, Yunnan (Hekou, Mengzi).

5. *Dicranopteris pedata* (Houttuyn) Nakaike, Enum. Pterid. Jap., Filic. 114. 1975.

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Polypodium pedatum Houttuyn, Nat. Hist. 14: 174. 1783; *Dicranopteris dichotoma* (Thunberg) Bernhardt; *D. linearis* (N. L. Burman) Underwood; *D. linearis* var. *alternans* (Mettenius) Holttum; *D. linearis* var. *subpectinata* (Christ) Holttum; *D. linearis* var. *tetraphylla* (Rosenstock) Nakai; *D. subpectinata* (Christ) C. M. Kuo; *D. tetraphylla* (Rosenstock) C. M. Kuo; *D. warburgii* (Christ) Nakai; *Gleichenia dichotoma* (Thunberg) Hooker; *G. dichotoma* var. *alternans* Mettenius; *G. linearis* (N. L. Burman) C. B. Clarke; *G. linearis* var. *tetraphylla* Rosenstock; *G. subpectinata* Christ; *G. warburgii* Christ; *Mertensia dichotoma* (Thunberg) Willdenow; *M. linearis* (N. L. Burman) Fritsch (1901), not Greene (1897); *P. dichotomum* Thunberg (1784), not Houttuyn (1783); *P. lineare* N. L. Burman.

Plants 0.5–2(–3) m tall. Rhizomes creeping, 2–3 mm in diam., covered with dense dark brown or brown hairs. Stipe stramineous, 0.3–1(–2) m, 2–6 mm wide, glabrous; rachis 1–3(–5) times dichotomously branched, basal internode 10–15 cm, covered with dark brown hairs, glabrescent, second internode 3–5 cm; apical buds ca. 2 mm, covered with dense brown hairs; bracts ovate to ovate-oblong, 5–10 mm, margin irregularly crenate, rarely entire; rachises with a pair of lateral stipulelike pinnae at each dichotomy; lower lateral pinnules broadly lanceolate, 10–25 × 4–7 cm, upper ones smaller, 4–10 × 2–4 cm; ultimate pinnae lanceolate or broadly lanceolate, 15–25(–35) × 4–8(–10) cm, base attenuate, apex caudate; lobes 15–50 on each side, linear-lanceolate or lanceolate, 10–50 × 2–4 mm, margin entire, apex emarginate or obtuse; lamina papery, glaucous abaxially, yellowish green or green adaxially, with sparse brown hairs on costae and veins abaxially; costae prominent on both surfaces; veins 3–5 in each group. Sori in 1 line on each side of costule; sporangia 5–8.

Thickets, forests, valleys, by rivers, hillsides; below 100–2200 m. Anhui, Fujian, Gansu (Wenxian), Guangdong, Guangxi, Guizhou, Hai-

nan, Hubei, Hunan, Jiangsu, Jiangxi, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Nepal, Singapore, Sri Lanka, Thailand, Vietnam; Australia].

Dicranopteris pedata cannot be distinguished from *D. linearis* with any clear discriminative characters. The Japanese form is easily included in the range of variable forms of so-called *D. linearis*, and no infraspecific taxa are recognized under that variable species in the present treatment.

Dicranopteris linearis is widely distributed in tropical areas of S Asia and is sometimes an invasive weed. It is very variable, and Holttum (Fl. Males., Ser. 2, 1: 33–36. 1959) recognized thirteen varieties, four of which have been reported in Taiwan: *D. linearis* var. *linearis*, *D. linearis* var. *montana* (here treated under *D. taiwanensis*), *D. linearis* var. *subpectinata*, and *D. linearis* var. *tetraphylla*. These were separated by the presence or absence of hairs on the pinnules, rachis dichotomies equal or unequal, presence or absence of lateral pinnae subtending the ultimate pinnae, and dimensions of the pinnae (Fl. Taiwan, ed. 2, 1: 92–94. 1994); however, we believe that these vary too continuously to justify the recognition of distinct taxa.

The status of *Gleichenia linearis* var. *longicauda* Christ (Bull. Herb. Boissier 7: 19. 1899), described from Yunnan, is uncertain.

2. DIPLOPTERYGIUM (Diels) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 47. 1950.

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Gleichenia sect. *Diplopterygium* Diels in Engler & Prantl, Nat. Pflanzenfam. 1(4): 353. 1900.

Rhizomes long creeping, branched, with protosteles, covered with scales; scales brown, lanceolate, margin entire or ciliate. Fronds distant; rachis undivided, producing 1 to several successive pairs of pinnae; stipe and rachis with lanceolate scales and stellate hairs when young, these glabrescent or persistent; dormant apical bud with dense brown scales, outer bracts pinnatifid, leaflike; primary pinnae opposite, 2(or 3)-pinnatifid, spreading or drooping; ultimate pinnules many, obliquely or horizontally spreading, deeply pectinately pinnatifid to costa, lanceolate in outline, sessile or shortly stalked at base, apex acuminate; lobes linear to narrowly oblong-lanceolate, margin entire and slightly reflexed, apex emarginate; veins once forked with a pair in each group, spreading to lobe margins. Sori in single lines on either side of costule; sporangia 2–4; spore tetrahedral, without perispore.

About 20 species: tropical and subtropical areas, mainly distributed in tropical Asia; nine species (four endemic) in China.

The FRPS account of the Gleicheniaceae treated all species of *Diplopterygium* as members of the genus *Hicriopteris* C. Presl, but Holttum (Reinwardtia 4: 261. 1957) showed that the type of *Hicriopteris* belonged in *Dicranopteris*.

One of us (Iwatsuki) considers that *Diplopterygium*, as treated here, is split into too many species.

- 1a. Pinnules with a short stipe at base, stipe 3–4 mm 1. *D. blotianum*
 1b. Pinnules sessile.
 2a. Costae and costules with dense scales.
 3a. Lamina papery; stipes, costae, and costules with brown scales and stellate hairs; pinnules 22–24 mm wide; sori and veins bare 2. *D. chinense*
 3b. Lamina thinly leathery; stipes, costae, and costules with dense rufous scales and stellate hairs; pinnules 10–12 mm wide; sori and veins ± densely covered with rufous hairs 3. *D. rufum*
 2b. Costae and costules without scales, sometimes with sparse stellate hairs.
 4a. Lobes obliquely spreading.
 5a. Fronds 3-pinnate; pinnules irregular, entire, pinnatifid, or pinnatisect 4. *D. irregulare*
 5b. Fronds 2-pinnate; pinnules regular, pinnatifid or pinnatisect.
 6a. Pinnules pinnatisect, 15–25 mm wide, glossy; lobes 25–40 pairs 5. *D. laevisimum*
 6b. Pinnules pinnatifid, 30–40 mm wide; lobes 60–70 pairs 6. *D. cantonense*
 4b. Lobes horizontally or subhorizontally spreading.
 7a. Pinnae and pinnules smaller; pinnules 11–17 × 1.5–2.5 cm; veins 10 or 11 pairs on abaxial lobe surface 7. *D. glaucum*
 7b. Pinnae and pinnules larger; pinnules 15–22 × 2.4–4 cm; veins more than 15 pairs on abaxial lobe surface.

- 8a. Lobes thinly leathery; pinnules glaucous abaxially 8. *D. giganteum*
 8b. Lobes thickly membranous; pinnules green abaxially 9. *D. maximum*

1. *Diplopterygium blotianum* (C. Christensen) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 49. 1950.

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Gleichenia blotiana C. Christensen, Bull. Mus. Natl. Hist. Nat., sér. 2, 6: 103. 1934; *Dicranopteris blotiana* (C. Christensen) Tagawa; *Hicriopteris blotiana* (C. Christensen) Ching; *H. tamdaoensis* Ching & P. S. Chiu.

Plants 2–3 m tall. Fronds 2-pinnate; pinna rachises stramineous, 2–4 mm wide; pinnae 2-pinnatifid, 60–140 × 20–30 cm; pinnules many, alternate, deeply pectinately pinnatifid, lanceolate or narrowly lanceolate, 10–25 × 2–4 cm, base attenuate and with a 3–4 mm stipe, apex acuminate; lobes 20–40 pairs, linear-lanceolate to broadly lanceolate, 12–22 × 3–4 mm, apex emarginate; lamina thickly papery, glabrous adaxially, costae, costules, and veins abaxially with sparse brown stellate hairs; costae flat adaxially; veins prominent or slightly prominent on both surfaces. Sori brown, with 4 or 5 sporangia.

600–1400 m (in Taiwan). S Guangdong (Yangshan), S Guangxi, Hainan, C Taiwan, SE Yunnan (Pingbian) [Cambodia, Laos, Vietnam].

2. *Diplopterygium chinense* (Rosenstock) De Vol, Fl. Taiwan 1: 92. 1975 [“*chinensis*”].

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Gleichenia chinensis Rosenstock, Repert. Spec. Nov. Regni Veg. 13: 120. 1913; *Dicranopteris chinensis* (Rosenstock) Tagawa; *Hicriopteris chinensis* (Rosenstock) Ching.

Plants ca. 3 m tall. Rhizomes long creeping, ca. 5 mm in diam., densely covered with brown scales. Fronds 2-pinnate; stipe dark brown, 5–6 mm wide, with dense rufous scales, glabrescent, pinna rachises stramineous, 2–4 mm wide; pinnae 2-pinnatifid, oblong, 80–120 × 20–30 cm; pinnules many, alternate, deeply pectinately pinnatifid, lanceolate, 12–18 × 2.5–3 cm, base sessile, apex acuminate; lobes alternate, 40–60 pairs, narrowly lanceolate to lanceolate, 10–15 × 2.5–3.5 mm, apex obtuse or sometimes emarginate; lamina papery, costae, costules, and veins with dense brown stellate hairs abaxially; costae plane adaxially; veins prominent on both surfaces. Sori with 3 or 4 sporangia.

Dense forests, near forests or valleys; 100–2800 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Xizang (Zayü), Yunnan, Zhejiang [N Vietnam].

Two collections (*Qinghai-Tibet Exped. 73-805*), which have pinna costae with sparse brown scales, were provisionally labeled as “*Diplopterygium tsayuensis* Ching & S. K. Wu.” Here they are regarded as an ecotype of *D. chinense*.

3. *Diplopterygium rufum* (Ching) Ching ex X. C. Zhang, Novon 14: 150. 2004.

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Hicriopteris rufa Ching, Fl. Reipubl. Popularis Sin. 2: 347. 1959; *Diplopterygium rufopilosum* (Ching & P. S. Chiu) Ching ex X. C. Zhang; *H. rufopilosa* Ching & P. S. Chiu.

Plants 0.5–2 m tall. Fronds 2-pinnate; pinna rachises with dense rufous stellate hairs and ciliate scales; pinnae 2-pinnatifid, oblong, 30–40 × 14–17 cm, base attenuate, sessile, apex acuminate; pinnules 30–35 on each side, alternate, deeply pectinately pinnatifid to costa, narrowly lanceolate, ca. 10 × 1–1.3 cm, apex acuminate; lobes alternate, 20–35 on each side, broadly lanceolate, 5–6 × 2–2.2 mm, apex obtuse; lamina thinly leathery, costae, costules, and veins with dense rufous stellate hairs abaxially; costae depressed adaxially; veins obscure or slightly prominent abaxially. Sori covered with rufous hairs, obscure or slightly prominent abaxially; sporangia 3 or 4.

• Thickets, mountaintops; 2000–2400 m. Yunnan.

4. *Diplopterygium irregulare* W. M. Chu & Z. R. He, Acta Bot. Yunnan. 22: 255. 2000.

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Plants 1–1.8 m tall. Fronds 3-pinnate; primary pinnae opposite, oblong, 60–100 × 50–70 cm; secondary pinnae alternate, 30–40 on each side, pinnatisect, narrowly oblong, 10–40 × 1.5–1.5 cm, base attenuate, apex caudate-acuminate; ultimate pinnules irregularly entire, pinnatifid, or pinnatisect, linear or narrowly lanceolate, 10–65 × 2–3 cm; lobes alternate, 20–35 on each side, obliquely spreading, lanceolate, 2–7 × ca. 1 mm; lamina thinly leathery, greenish gray abaxially, glabrous; costae flat adaxially; veins prominent on both surfaces. Sori with 2–4 sporangia.

• Margins of evergreen broad-leaved forests; ca. 1600 m. S Yunnan (Xichou).

Diplopterygium irregulare is a distinctive species, which is close to *D. laevissimum* but differs by having tripinnate fronds with irregular pinnules.

5. *Diplopterygium laevissimum* (Christ) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 52. 1950.

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Gleichenia laevissima Christ, Bull. Acad. Int. Géogr. Bot. 11: 268. 1902; *Dicranopteris laevissima* (Christ) Nakai; *G. kiusiana* Makino; *Hicriopteris laevissima* (Christ) Ching; *Mertensia laevissima* (Christ) Nakai.

Plants 1–1.5 m tall. Rhizomes creeping, dark brown, cylindrical, covered with brown scales. Fronds 2-pinnate; pinnae opposite, ovate-oblong, 30–50 × 20–26 cm; pinnules alternate, 20–30 on each side, pinnatisect, narrowly lanceolate, 12–18 × 1.5–2.5 cm, base attenuate, apex caudate-acuminate; lobes alternate, 25–40 on each side, obliquely spreading, lanceolate, 7–13 × ca. 2 mm, apex acute; lamina thinly leathery, greenish gray abaxially, glabrous; costae flat adaxially; veins prominent on both surfaces. Sori orbicular, exindusiate, with 4 or 5 sporangia.

Forests, mountain slopes, forest margins; 500–2500 m. Anhui, Fujian, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Philippines, Vietnam].

6. *Diplazium cantonense* (Ching) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 49. 1950.

广东里白 *guang dong li bai*

Gleichenia cantonensis Ching, Lingnan Sci. J. 15: 391. 1936; *Dicranopteris cantonensis* (Ching) Ching; *Hicriopteris cantonensis* (Ching) Ching.

Plants ca. 3 m tall. Rhizomes creeping. Fronds 2-pinnate; pinnae opposite, oblong, 40–70 × 30–40 cm; pinnules alternate or subopposite, 30–40 on each side, deeply pinnatisect, linear-lanceolate, 25–30 × 3–4 cm, base broadly cuneate, apex long acuminate; lobes alternate, 60–70 on each side, obliquely spreading, linear, 15–20 × ca. 2 mm, apex obtuse; lamina thickly papery, glaucous abaxially, glabrous; costae flat adaxially; veins obscure on both surfaces. Sori with 2–4 sporangia.

• Guangdong (Huangpu, Shenzhen, Xinyi), Hainan, S Jiangxi (Longnan).

7. *Diplazium glaucum* (Thunberg ex Houttuyn) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 51. 1950.

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Polypodium glaucum Thunberg ex Houttuyn, Nat. Hist. 14: 177. 1783; *Dicranopteris glauca* (Thunberg ex Houttuyn) Underwood; *Gleichenia glauca* (Thunberg ex Houttuyn) Hooker (1844), not Swartz (1806); *G. japonica* Sprengel; *Hicriopteris glauca* (Thunberg ex Houttuyn) Ching; *H. remota* Ching.

Plants ca. 1.5 m tall. Rhizomes creeping, ca. 3 mm in diam., covered with brown scales. Fronds 2-pinnate; pinnae opposite, oblong, 60–90 × 18–28 cm, base slightly attenuate, apex acuminate; pinnules alternate or subopposite, 25–35 on each side, pinnatifid, linear-lanceolate to narrowly lanceolate, 11–16 × 1.2–2.4 cm, base truncate, apex acuminate; lobes alternate, 20–35 on each side, horizontally spreading, lanceolate, 7–12 × 2–3 mm, rarely lowest pairs reflexed to rachises, apex obtuse; lamina glaucous abaxially, green adaxially, papery, glabrous, costae and costules with sparse stellate hairs, glabrescent; costae flat adaxially; veins prominent on both surfaces. Sori with 3 or 4 sporangia.

Thickets, mountain slopes, forests, forest margins; 300–2300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan].

8. *Diplazium giganteum* (Wallich ex Hooker & Bauer)

Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 50. 1950.

大里白 *da li bai*

Gleichenia gigantea Wallich ex Hooker & Bauer, Gen. Fil. t. 39. 1840; *Diplazium criticum* (Ching & P. S. Chiu) Ching ex X. C. Zhang; *D. simulans* (Ching) Ching ex X. C. Zhang; *D. yunnanense* (Ching) Ching ex X. C. Zhang; *Hicriopteris critica* Ching & P. S. Chiu; *H. gigantea* (Wallich ex Hooker & Bauer) Ching; *H. glaucoides* Ching; *H. omeiensis* Ching & P. S. Chiu; *H. reflexa* Ching & P. S. Chiu; *H. simulans* Ching; *H. yunnanensis* Ching.

Plants 2–3 m tall. Rhizomes creeping, cylindrical, ca. 4 mm in diam., covered with rufous lanceolate scales. Fronds 2-pinnate; pinnae opposite, oblong, 90–120 × 27–40 cm, base slightly attenuate, apex acuminate; pinnules many, alternate or subopposite, pinnatifid, linear-lanceolate to lanceolate, 12–21 × 1.5–3.5 cm, base slightly attenuate, apex acuminate; lobes alternate, 30–50(–70) on each side, horizontally spreading, narrowly lanceolate to lanceolate, rarely linear, 10–15(–20) × 2.5–3.5 mm, apex obtuse; lamina papery, glaucous or gray-green abaxially, glabrous, costae and veins with sparse stellate hairs; costae plane or depressed adaxially; veins prominent on both surfaces. Sori with 3–5 sporangia.

Forest margins, mountain slopes, wet places; 800–2800 m. Hainan (Anding), Hubei (Lichuan), Sichuan (Emei Shan), Xizang (Zayü), Yunnan [Bhutan, India, Myanmar, Nepal].

9. *Diplazium maximum* (Ching) Ching & H. S. Kung, Fl. Sichuan. 6: 134. 1988.

绿里白 *lü li bai*

Hicriopteris maxima Ching, Fl. Reipubl. Popularis Sin. 2: 348. 1959.

Plants ca. 3 m tall. Fronds 2-pinnate; stipe brown, ca. 1 m × 5–7 mm; pinnae elliptic, 90–100 × 45–50 cm, base slightly attenuate, apex acuminate; pinnules many, plane, alternate or subopposite, deeply pinnatifid, narrowly lanceolate, 20–25 × 2.5–4 cm, apex long acuminate; lobes alternate, 50–70 on each side, horizontally spreading, linear or lanceolate, 15–20 × 3–3.5 mm, apex obtuse or sometimes emarginate; lamina submembranous, costae and veins abaxially with sparse stellate hairs; costae depressed adaxially; veins prominent on both surfaces. Sori with 3 sporangia.

• Under rocky cliffs; 1200–1400 m. Sichuan (Emei Shan).

3. STICHERUS C. Presl, Tent. Pterid. 51. 1836.

假芒萁属 *jia mang qi shu*

Ding Bingyang (丁炳扬), Jin Xiaofeng (金孝锋); Kunio Iwatsuki

Mertensia Willdenow (1804), not Roth (1797).

Rhizomes creeping, covered with scales. Fronds distant, erect; lamina often repeatedly pseudodichotomously divided, without lateral pinnules at dichotomies, upper axes pinnulelike with rows of lobes along each side; lamina gray-green or glaucous abaxially; veins once forked. Sori orbicular, exindusiate, in 1 line on each side of costule; sporangia 4 or 5(or 6), sessile; spores 2-sided or reniform, monolete.

About 100 species: tropical areas, mainly distributed in South America; one species in China.

Some authorities (e.g., Botany Vietnam Group, <http://www.botanyvn.com/cnt.asp?param=edir&v=Gleichenia%20truncata&list=species&lg=en>; accessed 4 Jul 2012) follow Holttum (Fl. Males., Ser. 2, 1: 20, f. 7a–b & 9. 1959) who included *Sticherus* (and *Diplopterygium*) within *Gleichenia* Smith and *S. laevigatus* within *S. truncatus*.

1. *Sticherus truncatus* (Willdenow) Nakai, Bull. Natl. Sci. Mus., Tokyo 29: 20. 1950.

假芒萁 *jia mang qi*

Mertensia truncata Willdenow, Kongl. Vetensk. Acad. Nya Handl. 25: 169. 1804; *Gleichenia laevigata* (Willdenow) Hooker; *G. truncata* (Willdenow) Sprengel; *M. laevigata* Willdenow; *Sticherus laevigatus* (Willdenow) C. Presl.

Plants 1–2 m tall. Rhizomes long creeping, covered with peltate scales. Stipe sprawling or scandent, 0.8–1.6 m; lamina

several times dichotomously branched, all but basal axes pinulelike with 2 rows of lobes; apical buds covered with brown ciliate scales and 2-pinnate bracts; ultimate pinnae deeply pectinately pinnatifid, broadly lanceolate, 12–18 × 2.5–5 cm; lobes horizontally spreading, opposite, 10–30 × 2–3 mm, base expanded, margin entire, apex obtuse or emarginate; lamina papery, with sparse brown stellate hairs and scales when young, glabrescent; costa prominent on both surfaces. Sori with 4 or 5 sporangia.

Hainan, SE Yunnan (Hekou, Jinping) [Cambodia, Malaysia, Sri Lanka, Thailand, Vietnam].