

## CIBOTIACEAE

金毛狗蕨科 jin mao gou jue ke

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Plants terrestrial; rhizomes massive, creeping to ascending or erect (up to 6 m), solenostelic or sometimes dictyostelic with vascular bundles lacking sclerenchymatous sheath, bearing adventitious roots, densely covered with soft, yellowish brown, multicellular long hairs at apices and persistent stipe bases. Fronds approximate, forming a crown at apex, monomorphic or dimorphic, mostly 2–4 m; stipe hairy at base, with 3 corrugated vascular bundles (1 abaxial, 2 adaxial) arranged in an omega-shape with adaxial ends curved strongly inward, or with abundant V-, U-, or W-shaped vascular bundles arranged in omega configuration, sometimes adaxial inwardly recurved arms of vascular bundles forming an isolated set of bundles in a reversed U-shape; stipe flattened on adaxial face with lateral aerophores (pneumatophores) forming a line on each side; lamina 2-pinnate + pinnatifid to 3-pinnate + pinnatifid, firm, often glaucous abaxially, glabrous when mature or persistently hairy on rachis, costa, costules, and veins; rachis hairy in middle, in dried material often sulcate in middle of ridge, which is flanked by 2 grooves; sterile segments entire or crenate; fertile segments poorly differentiated; veins free, simple or forked to pinnate; stomata paracytic with 3 subsidiary cells. Sori single, marginal at vein ends, indusiate; indusia bivalvate, each with a strongly differentiated, non-green outer indusium and a similarly modified tongue-like inner indusium; paraphyses few, short and brown; spores globose-tetrahedral, with prominent angles and a well-developed equatorial flange; antheridial walls 5-celled.  $x = 68$ .

One genus and ca. 11 species: E and SE Asia, Central America, Pacific islands (Hawaii); two species in China.

A fossil permineralized rhizome *Cibotium iwataense* Ogura (1933) is described from the Late Cretaceous of Iwate Prefecture, Japan.

The Cibotiaceae are monophyletic, with affinity to the tree fern families.

Ching Ren-chang, Fu Shu-hsia, Wang Chu-hao & Shing Gung-hsia. 1959. Dicksoniaceae. *In*: Ching Ren-chang, ed., *Fl. Reipubl. Popularis Sin.* 2: 197–198.

### 1. CIBOTIUM Kaulfuss, Berlin Jahrb. Pharm. Verbundenen Wiss. 21: 53. 1820.

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Morphological characters and geographic distribution are the same as those of the family.

- 1a. Pinnules on basiscopic side of lower pinnae present; sori usually 1–5 at base of lower pairs of pinnule segments; spores with an equatorial flange ..... 1. *C. barometz*  
1b. Pinnules on basiscopic side of lower pinnae usually lacking; sori usually 1 or 2 at base of lower pairs of pinnule segments; spores without an equatorial flange ..... 2. *C. cumingii*

1. *Cibotium barometz* (Linnaeus) J. Smith, London J. Bot. 1: 437. 1842.

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*Polypodium barometz* Linnaeus, Sp. Pl. 2: 1092. 1753; *Aspidium barometz* (Linnaeus) Willdenow; *Balantium glaucescens* (Kunze) Link; *Cibotium assamicum* Hooker; *C. djambianum* Hasskarl; *C. glaucescens* Kunze; *Dicksonia barometz* (Linnaeus) Link.

Rhizome prostrate, stout, densely covered with shiny brown long hairs. Stipes thick, up to 1 m or more, triangular in transverse section at base, with dense caducous appressed hairs, stipe and rachis green, turning purplish abaxially with age, stipe with a continuous or broken row of linear aerophores on each side, base with a mass of long (1–1.5 cm) hairs, upper part of stipe and rachis covered with small, appressed flaccid hairs becoming glabrescent; lamina 2-pinnate-pinnatifid, 1.5–3 m; medial pinnae 40–80 × 15–30 cm, lower pinnae shortened, deflexed; pinnae many, alternate, stalked, pinnules shortly

stalked, usually of ± equal length on either side of rachilla; pinnule segments slightly falcate, apiculate, margins crenulate to serrulate-serrate; veins free, fertile ones simple, sterile simple or forked; lamina subleathery, adaxial surface deep green, abaxial surface glaucous, glabrous on both sides, except hairy on midrib; venation visible on both surfaces, free, lateral veins simple or forked. Sori usually 1–5 at base of lower pairs of pinnule segments; indusia bivalvate, outer indusia orbicular, inner ones ± oblong; outer valve of indusium usually large; paraphyses dark reddish brown. Spores pale yellowish, with equatorial flange.

Open places in forests, forest margins, valleys, warm humid environments; (below 100–)200–600(–1600) m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, C Taiwan, Xizang, Yunnan, Zhejiang [NE India, Indonesia (Java to Sumatra), Japan (Ryukyu Islands), Malaysia (W Peninsular), Myanmar, Thailand, Vietnam].

*Cibotium barometz* is rather common in S subtropical regions and tropical regions, usually growing with *Alsophila spinulosa*, *Diplazium*

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*gium chinense*, and *Dicranopteris pedata*, sometimes abundant and forming a dense community. It is an indicator species of acidic soils in tropical and subtropical areas, mainly distributed in S and SW China, primarily in Guangdong, Guangxi, and Guizhou, but also in Sichuan and Yunnan. The most northerly distribution of this species in China reaches the Chang Jiang in Chongqing.

The rhizome of this plant is very thick, woody, and covered by long, soft, golden-yellow hairs, appearing like a golden-haired dog. Therefore, the plant is called “Jinmao Gouji” (golden hair dog), or “Huanggoutou” (yellow dog’s head) in China. It is a famous traditional Chinese herbal medicine known as “Gouji” (cibot rhizome, “rhizoma cibotii”). Hairs of the rhizome and stipe are also used as a wound dressing and to stanch blood loss. It is listed in CITES Appendix II. Conservation and sustainable use should be attained.

**2. *Cibotium cumingii* Kunze, Farnkräuter 1: 64. 1841.**

菲律宾金毛狗蕨 fei lü bin jin mao gou jue

*Cibotium barometz* (Linnaeus) J. Smith var. *cumingii* (Kunze) C. Christensen; *C. crassinerve* Rosenstock; *C. taiwanense* C. M. Kuo.

Habit as in *Cibotium barometz* in general but fronds not quite as large. Pinnules on basiscopic side of lower pinnae usually lacking; pinnules on larger pinnae 12–15 cm × 12–16 mm. Sori usually 1 or 2 at base of lower pairs of pinnule segments. Spores without an equatorial flange.

Open forests, road cuttings, slopes in hilly and montane areas; sea level to ca. 1000 m. Taiwan [Philippines].

In Taiwan, *Cibotium cumingii* is more widespread than *C. barometz*.