

MONACHOSORACEAE

(H.P. Nooteboom, Leiden, The Netherlands)

Monachosoraceae Ching, Acta Phytotax. Sin. 14 (1978) 17. — *Denstaedtiaceae* Ching
tribe *Monachosoreae* (Ching) R.M.Tryon & A.F.Tryon, Ferns & Allied Plants (1982)
372.

Terrestrial ferns with short-creeping or ascending, dictyostelic, rhizome. *Stipes* close together, non-articulated, well-developed, occasionally without lamina and consisting of a short, very thick, finger-like trophopod. *Plant* entirely without scales or larger hairs, bearing only minute, few-celled, cylindrical glandular hairs on the whole plant. *Lamina* pinnate to quadripinnate, the ultimate pinnules sometimes pinnatifid. *Pinnae* often opposite towards the base, primary pinnules alternate, catadromous or anadromous, often on the same lamina, sometimes different from base to top; the veins of the pinnae of *M. maximowiczii* (Baker) Hayata anadromous. *Stipe* with two strap-shaped vascular bundles with hippocampiform xylem. The bundles merging upward into one gutter-shaped bundle. Adaxial side of stipe with a groove with slightly raised centre, the groove continuous with the grooves on secondary axes, if present. *Leaf axes* bearing, beside the above-mentioned hairs, small, scarce, reddish, articulate, non-glandular hairs and like the lamina minute, club-like, mostly 2-celled hairs. *Rhachis* sometimes gemmiferous at the tip or at the insertion of a pinna, the gemma consisting of a small rosette of finger-like trophopods. Ultimate pinnules unequal sided, narrowly ovate, crenate to deeply pinnatifid. *Veins* free, ending well behind the margin. *Sori* terminal on the veins, roundish, exindusiate, consisting of rather few simultaneously maturing sporangia intermingled with cylindrical, few-celled trichomes with or without glandular top cell. *Sporangial stalk* 2–3-rowed, bearing some few-celled hairs. Annulus interrupted by the stalk; stomium well differentiated, of 2 cells. *Spores* trilete, tetrahedral-globose, with prominent angles, irregularly tuberculate, the tubercles with delicate echinae. *Gametophyte* (only known in *M. subdigitatum*) ribbon-like, lobed, the antheridia surrounding one or a few archegonia.

CHROMOSOMES

All chromosome counts seem to be based on $N = 56$. *Monachosorum maximowiczii*, with $2n = 112$ is diploid, *M. subdigitatum* with $2n = 224$ is tetraploid, and *M. flagellare* (Makino) Hayata with $2n = 336$ is hexaploid. Possibly *M. arakii* Tagawa, also hexaploid, is a separate species with different parent species and/or combinations. The separately described Chinese species, recently generally referred to *M. subdigitatum*, often resemble *M. arakii*, and could well be hexaploid, too. As long as there are no chromosome counts available their position remains obscure. This is especially so, because different forms seem to merge into each other. This might be explained by the fact that meiosis in the hexaploid species is irregular, as mentioned by Iwatsuki (1995), and different kind of offspring and hybridising is possible for those hexaploids.

Literature: Iwatsuki, K., Fl. Japan, vol. 1 (1995) 65–66. — Löve, Á, D. Löve & R.E.G. Picchi Ser-molli, Cytotaxonomical Atlas of the Pteridophyta (1977) 187–188.

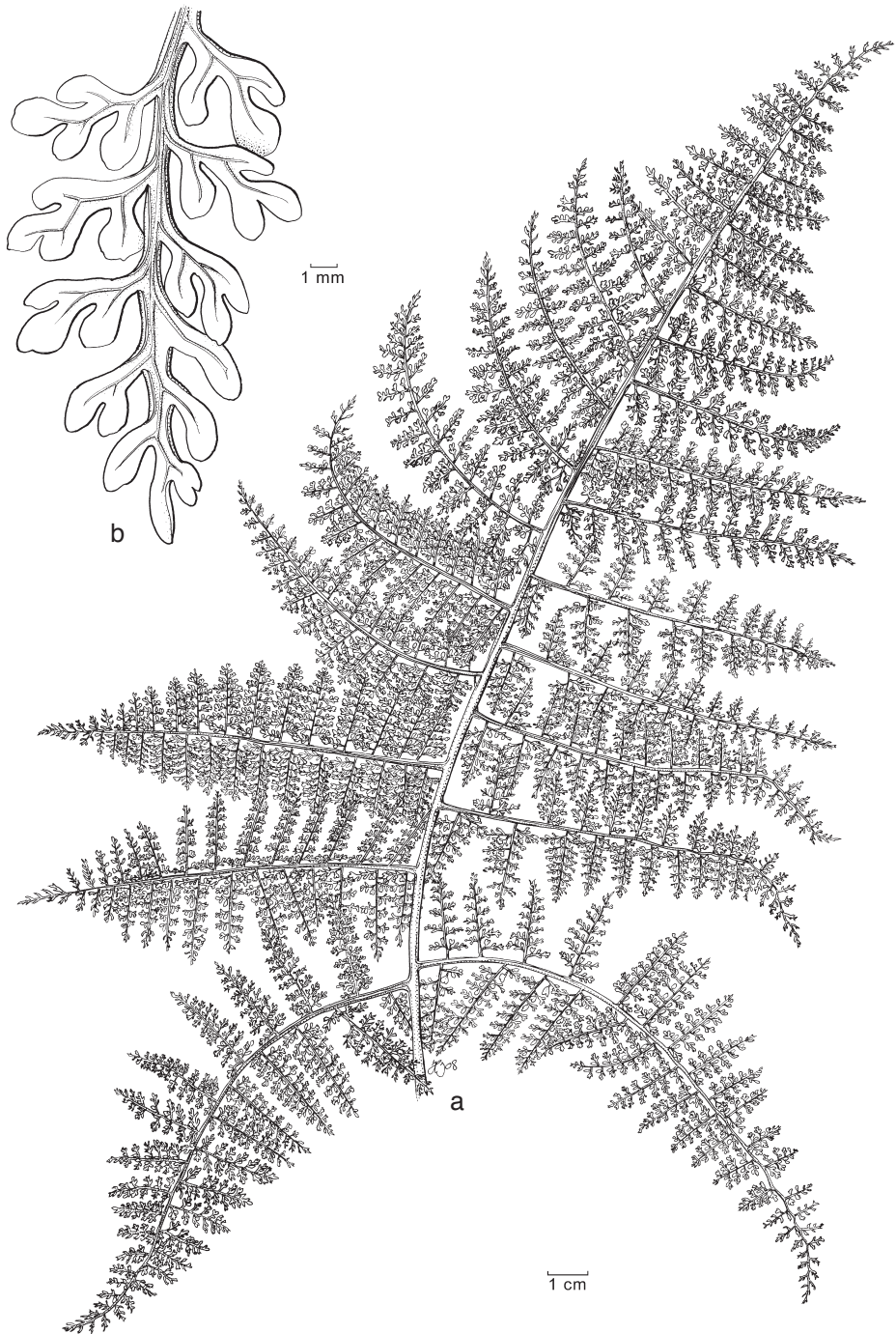


Fig. 1. *Monachosorum subdigitatum* (Blume) Kuhn. a. Top of frond; b. detail of pinna (*De Wilde* *cs.* 16365). — Drawing by Hanneke Jelles.

TAXONOMY

The single genus *Monachosorum* is often placed in a separate family because it does not fit in any other family. Probably it is associated with Denstaedtiaceae (Copeland 1947; Tryon & Tryon 1982, as tribe). Christensen (1938) suggested affinity with Thelipteridaceae but with very weak evidence. Posthumus (in Backer & Posthumus 1939) placed *M. subdigitatum* in *Anogramma* of the Pteridaceae, which seems very unlikely. Smith et al. (2006) placed *Monachosorum* in Demmstaedtiaceae.

References: Backer, C.A. & O. Posthumus, Varenflora voor Java (1939). 's Lands Plantentuin, Buitenzorg, Java. — Christensen, C., Filicinae, in F. Verdoorn (ed.), Manual of pteridology (1938) 544. Nijhoff, The Hague. — Copeland, E.B., Genera Filicum (1947). Chrocia Botanica, Waltham, Mass. — Kramer, K.U., Monachosoraceae, in K. Kubitzki, Fam. Gen. Vasc. Pl. (1990) 187–188. — Smith, A.R., K.M. Pryer, E. Schuettpelz, P. Korall, H. Schneider & P.G. Wolf, A classification for extant ferns. Taxon 55, 3 (2006) 714. — Tryon, R.M. & A.F. Tryon, Ferns and Allied Plants (1982) 372.

MONACHOSORUM

Monachosorum Kunze, Bot. Zeitung (Berlin) 6 (1848) 119. — Type: *Monachosorum davallioides* Kunze.

Distribution — China (Guizhou, Guangxi, Hunan, Jiangxi, Guangdong, Taiwan), Japan (Honshu, Shikoku, Kyushu), India, (Darjeeling, Sikkim, Assam, Khasia); in *Malesia*: see *M. subdigitatum*.

In Malesia only one species:

1. *Monachosorum subdigitatum* (Blume) Kuhn

Monachosorum subdigitatum (Blume) Kuhn, Chaetopt. (1882) 25; Holttum, Revis. Fl. Malaya 2, 2nd ed. (1968) 633; G.B. Nair & U. Sen, Ann. Bot. (London) 38 (1974) 749, f. 1–58. — *Aspidium subdigitatum* Blume, Enum. Pl. Javae (1828) 171. — *Polypodium subdigitatum* Blume, Fl. Javae Filic. (1829) 196, t. 93. — *Gymnogramma subdigitatum* Keyserl., Polyp. Herb. Bunge (1873) 31. — *Phegopteris subdigitatum* Bedd., Handb. Ferns Brit. India (1883) 295. — *Anogramma subdigitata* Backer & Posth., Varenfl. Jav. (1882) 155 — Type: *Blume* (L), Mt Buragrang.

Monachosorum davallioides Kunze, Bot. Zeitung (Berlin) 6 (1848) 119. — *Polypodium davallioides* Mett., Fil. Hort. Bot. Lips. (1856) 30. — Type: *Zollinger* (?), Tangkuban Prau.

Monachosorum gracile Copel., Univ. Calif. Publ. Bot. 12 (1931) 391; Tagawa, J. Jap. Bot. 9 (1937) 108, f. 1. — Type: *Keysser B.* 27 (UC).

Terrestrial fern 1–1.5 mm tall. *Stipe* 30–50 cm, basally glossy brown to straw coloured, with minute glandular hairs, sometimes nearly glabrous. *Lamina* 50–100 by 30–50 cm, narrowly ovate to triangular, 3–4(–5) pinnate, herbaceous, with the same minute hairs as the rest of the plant. Basal *pinnae* (sub)opposite, higher *pinnae* generally alternate, all *pinnae* with a short petiolule. *Pinnulae* narrowly ovate or triangular, divided in secondary *pinnules* which are pinnate or pinnatifid. The ultimate *pinnules* or lobes with one free vein not reaching the margin. *Sori* terminal or subterminal on the vein.

Distribution — Apparently very rare, from most localities only one or a few collections. Probably the species occurs in other places with a similar habitat as well. India,

(Darjeeling, Sikkim, Assam, Khasia), China (Kwangsi, Yaoshan; Kwangtung, Kau Fung; Taiwan); in *Malesia*: Sumatra (Aceh, G. Leuser, G. Kemiri), Malay Peninsula (Cameron Highlands), W Java (from Bantam to G. Tangkuban Prah), Borneo (Sabah, Kinabalu), Philippines (Mountain district, Mt Pulog, Mt Data), Central Sulawesi (Roroka Timbu), Moluccas (Seram); Papua New Guinea (Huon Peninsula, Milne Bay District).

Habitat & Ecology — In mountains, often in mossy and dark forest. Altitude 800–2900 m.