

SOME NOVELTIES IN BOLBITIS FROM ASIA
AND THE PACIFIC (FILICES)

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For practical reasons, some of the results obtained from a systematic revision of the genus *Bolbitis* (including the species formerly referred to *Egenolfia*) are published prior to an extensive account on all the species and including full synonymy. The few synonyms added to the taxa listed below generally refer to names nowadays in general use. The types mentioned have been studied. The herbarium abbreviations are those proposed by Lanjouw and Stafleu (1964).

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1. *Bolbitis appendiculata* (Willd.) K. Iwatsuki

ssp. **appendiculata**. — *Acrostichum appendiculatum* Willdenow, Spec. Pl. 5 (1810) 114. — *Bolbitis appendiculata* K. Iwatsuki, Act. Phytotax. Geobot. 18 (1959) 48. — Type: *Klein 912*, 'Ind. Or.' (B, herb. Willdenow 19551).

Acrostichum alatum Roxburgh ex Griffith, Calc. J. Nat. Hist. 4 (1844) 480 (*non* Fée, Hist. Acrost. (1845) 35, t. 5 fig. II, which is *Elaphoglossum*). — Type: *Roxburgh s.n.* (?2387), 'Malay Islands' (BR, fertile leaf; BM, phot.).

Polybotrya helferiana Kunze, Farnkr. 2 (1848) 35, t. 114. — *Bolbitis helferiana* K. Iwatsuki, Act. Phytotax. Geobot. 18 (1959) 49. — Type: *Helfer s.n.*, Burma, Tenasserim (B, holo, B, BR, K, MICH, S-PA, UC).

Pinnac or pinnulae of fertile leaves leaf-like with the sporangia beneath. Base of pinnac of sterile leaves oblique, the acroscopic side much better developed than the basiscopic side.

Distribution: Ceylon and India eastward to southern Japan; western and northern Malesia; not in Borneo.

ssp. **vivipara** (Ham. ex Hooker) Hennipm., *stat. nov.* — *Polybotrya vivipara* Hamilton ex Hooker.

Pinnac of fertile leaves moniliform exposing the sporangia to all directions. Base of pinnac of sterile leaves equally-sided, except sometimes in var. *neglecta*.

var. **vivipara**. — *Polybotrya vivipara* Hamilton ex Hooker, Exot. Fl. 2 (1825) 107. — *Bolbitis hookeriana* K. Iwatsuki, Act. Phytotax. Geobot. 18 (1959) 49. — Type: *Hamilton s.n. in herb. Wallich 29*, Assam, Goalpara (K).

Acrostichum seetacoenense Roxburgh ex Griffith, Calc. J. Nat. Hist. 4 (1844) 480. — Type: *Roxburgh s.n.*, eastern Pakistan, Chittagong, Seetacoond (BR, BM, phot.).

Fertile pinnac with the sporangia removed about round in cross-section, without parenchymatous tissues. Base of sterile pinnac equally-sided.

Distribution: Eastern Himalaya to Cambodia, ?Malesia.

var. **neglecta** Hennipm., *var. nov.* — Type: *Van Borssum Waalkes 603*, P. Panaitan (an island west of Java), G. Panjaweran, near Legon Kadam, 70 m alt. (BO, L, holo).

Pinnae frondis fertilis (sporangii exclusis) in sectione transversa rhomboideae: zona angusta texturae parenchymatosae a costa parallela adest. Pinnae frondis sterilis basi aequali vel inaequali.

Fertile pinnae with the sporangia removed in cross-section about rhomboid: a narrow zone of parenchymatous tissue present parallel to the costa. Base of pinnae of sterile leaves either equally- or unequally-sided.

Distribution: Andaman and Nicobar Is, Java (West Java, P. Panaitan, Karimoendjawa Arch.).

At the beginning of my studies it seemed clear enough that the two subspecies listed above could be distinguished as separate species. Amongst others, ssp. *appendiculata* has the fertile segments leaf-like and the sterile ones strongly unequally-based, whereas in the fertile segments of ssp. *vivipara* parenchymatous tissues are lacking and the sterile pinnae are equally-based. However, when analyzing material from Java, the var. *neglecta* was found which was intermediate as to these differences: the fertile pinnae show a narrow but marked parenchymatous zone parallel to the costa and the sterile pinnae are either equally- or unequally-based.

Roxburgh's two *Acrostichum* have for long been insufficiently known. Christensen, Ind. Fil. (1906, p. 18) lists *A. seetacoonense* as a dubious species guessing it to represent '*Plagiogyria vel Stenochlaena sp.*'. *A. alatum* is referred by him to *Stenochlaena sorbifolia* (L.) J. Smith 'var. 3'. The identity of Roxburgh's material could be traced thanks to annotations and photographs made by the late Dr A. H. G. Alston and present in the British Museum (Natural History).

2. *Bolbitis palustris* (Brack.) Hennipm., *comb. nov.* — *Cyrtogonium palustre* Brackenridge, U.S. Expl. Exp. 16 (1854) 86, t. 12. — Type: *Brackenridge s.n.*, Society Is, Tahiti (US, herb. 51085).

Acrostichum lonchophorum Kunze, Farnkr. 1 (1849) 5, t. 2, *nom. illeg.* — *Bolbitis lonchophora* Christensen, Ind. Fil. Suppl. 3 (1934) 49. — Type: *Cuming 1416*, Polynesia, Austral Is, Otarohu (= Rurutu) (BM, K).

Distribution: Melanesia and Polynesia.

Kunze's name, though older than Brackenridge's, cannot be used according to rule 34 of the International Code of Botanical Nomenclature (edition 1966). From a remark added to the original publication ('*Spätere Anmerkung*') it becomes clear that Kunze regarded his new species identical with *Acrostichum repandum* Blume, referring to Blume's plate 14 and 15 in Fl. Jav. Filices (1829).

3. *Bolbitis rhizophylla* (Kaulf.) Hennipm., *comb. nov.* — *Gymnogramma rhizophylla* Kaulfusz, Enum Fil. (1824) 78 ('*rhizophyllum*'). — Type: *Chamisso s.n.*, Philippines, Manila (B).

Polybotrya serrulata J. Smith ex Fée, Hist. Acrost. (1845) 76, t. 39 fig. *II. — *Bolbitis serrulata* K. Iwatsuki, Act. Phytotax. Geobot. 18 (1959) 49. — Type: *Cuming 47*, Philippines, Luzon (BM, G, GH, K, holo.; L, P, US).

Distribution: Formosa and the Philippines.

4. *Bolbitis sinuata* (Presl) Hennipm., *comb. nov.* — *Polypodium sinuatum* Presl, Rel. Haenk. 1 (1825) 21. — Type: *Haenke s.n.*, Philippines, Luzon, Sorsogon (P.R.C., sterile).

Acrostichum diversifolium Blume, Enum. Pl. Jav. (1828) 103. — *Bolbitis diversifolia* Schott, Gen. Fil. (1834) ad [t. 13]. — Type: *Blume s.n.*, Java (L, herb. 908. 289-113).

Distribution: Throughout Malesia.

5. *Bolbitis virens* (Hook. & Grev.) Schott

var. **virens**. — *Acrostichum virens* Hooker & Greville, Ic. Fil. (1831) t. 221, c. descr. — *Bolbitis virens* Schott, Gen. Fil. (1834) ad [t. 13]. — Type: *Wallich 1033*, 'Ind. Or.', Tovag (K).

Jenkinsia undulata Hooker, Gen. Fil. (?1840) t. 75B, c. descr. — *Bolbitis undulata* Ching ex Christensen, Ind. Fil. Suppl. 3 (1934) 50. — Type: *Wallich 140*, Burma, Martaban (BM, K, the fertile leaf only, holo).

Pinnae of fertile leaves measuring 80—120 by 2—7(—11) mm, usually more than 15 times as long as wide and fully acrostichoid, sometimes less so but then sporangia restricted to the margin of the pinnae only, leaving a zone parallel to the costa free of sporangia.

Distribution: Eastern Himalaya to eastern Thailand.

var. **deltigera** (Wall. ex Clarke) Hennipm., *stat. nov.* — *Meniscium deltigerum* Wallich ex Clarke, Trans. Linn. Soc. Bot. 1 (1880) 572. — *Bolbitis deltigera* Christensen, Ind. Fil. Suppl. 3 (1934) 48. — Type: *Wallich 59*, Nepal, above Mt Chesapang (K, herb. Wallich, holo; K).

Fertile pinnae 3—5 times as long as wide, measuring 50—160 by 15—45 mm. Arrangement of sporangia not acrostichoid but sporangia situated (in irregular patches) between the main lateral veins (veins arising directly from the costa) and near the margin only, leaving a narrow zone parallel to the main lateral veins free of sporangia.

Distribution: Eastern Himalaya to northern Thailand.

var. **compacta** Hennipm., *var. nov.* — Type: *Tagawa et al. T. 6802*, Pen. Thailand, Nakhon Sri Thammarat, Trang, Khao (Mt) Chong, 600—1100 m alt. (KYO, L, holo).

Pinnis frondis fertilis 3—4 × longiores quam latae, in sicco 65—70 mm longae, 18—20 mm latae, totum acrostichoideae (holotypus).

Pinnae of fertile leaves 3—7 times as long as wide, measuring 40—90 by (8—)11—20 mm, fully acrostichoid.

Distribution: Indo-China (Cochinchine), Malay Peninsula.

The three varieties are based on differences in the shape of the fertile pinnae and the location of the sporangia. The sterile leaves are similar in all three. Tagawa & Iwatsuki (1967) already noted the differently shaped fertile pinnae when comparing specimens from northern and southern Thailand. However, according to these authors, *B. virens* — which should range eastward to Java — should not include var. *deltigera* which they list separately as a species.

REFERENCES

- LANJOUW, J., & F. A. STAFLEU. 1964. Index Herbariorum. Part 1. The herbaria of the world, ed. 5. Regn. Veg. 31: 1—251.
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