

NOTES ON SOME FERNS

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ABSTRACT

Re-examination of *Bolbitis deltigera*, *Antrophyum callifolium* and *A. reticulatum* revealed that *B. deltigera* should be considered as distinct species; and *A. callifolium* and *A. reticulatum* should be treated as synonymous.

Keywords : Taxonomy, *Bolbitis deltigera*, *Antrophyum callifolium*, *Antrophyum reticulatum*.

Introduction

Fraser-Jenkins (2008) in his revision provided useful information about Indian fern flora. However, during reinvestigation of some doubtful materials present authors have observed that interpretation of Fraser-Jenkins (2008) was incorrect and unacceptable. These facts are discussed below.

***Bolbitis deltigera* (Wall.) C. Chr.**

Hennipman (1977) in his monograph of *Bolbitis* Schott separated different morphotypes as distinct varieties under *Bolbitis virens* (Wall.) Schott, including *Bolbitis deltigera* (Wall.) C. Chr. (Dryopteridaceae). *B. deltigera* differs from other varieties of *Bolbitis* in having broad fertile pinnae with sori borne along the margin and between costae (Fig. 1A, B). Whereas, in *Bolbitis virens* (Wall. ex Hook. et Grev.) var. *compacta* Hennipman fertile pinnae are smaller, lanceolate with sori scattered all over the surface. In *Bolbitis virens* (Wall. ex Hook. et Grev.) Schott var. *virens* fertile pinnae are very narrow, elongated with sori scattered all over the surface. In *Bolbitis virens* (Wall.)

Schott f. *undulata* (Hooker) Hennipman sori are restricted to margins of narrow, lanceolate fertile pinnae. Thus *B. deltigera* should be accepted as distinct species as done in recent Flora of China (2013a).

Somehow, Fraser-Jenkins (2008) ignored these prominent variations and unnecessarily "lumped" all varieties of *Bolbitis virens* in *B. virens*, including *B. deltigera*, as he had done in many other cases on Indian pteridophytic flora which were also considered unacceptable (Sharma and Purohit, 2011; Goswami and Arya, 2012). However, Fraser-Jenkins (*pers. comm.*, 1.9.2013) has realized his mistake and accepted *B. deltigera* as a valid species.

Examination of a herbarium specimen: India, Assam, *Anonymous 323* (CAL) of *Bolbitis deltigera* (Fig. 1A-D) supported its occurrence in Assam, not mentioned in Borthakur *et al.* (2001), but listed by Chandra (2000). Further study is needed to reveal its specific locality not mentioned in the sheet.

***Antrophyum callifolium* Blume**

Fraser-Jenkins (2008: 579, 580) recognized *Antrophyum callifolium* Blume and

A. reticulatum. (G. Forster) Kaulfuss (Pteridaceae) as distinct and mentioned that *A. callifolium* does not occur in India. But re-examination of specimens of *A. callifolium* from Andaman (Fig. 1 E, F) and *A. reticulatum* from Assam (Fig. 1 G, H) stored at BURD, revealed that they are identical in spore, sori, paraphysis, scale characters. But

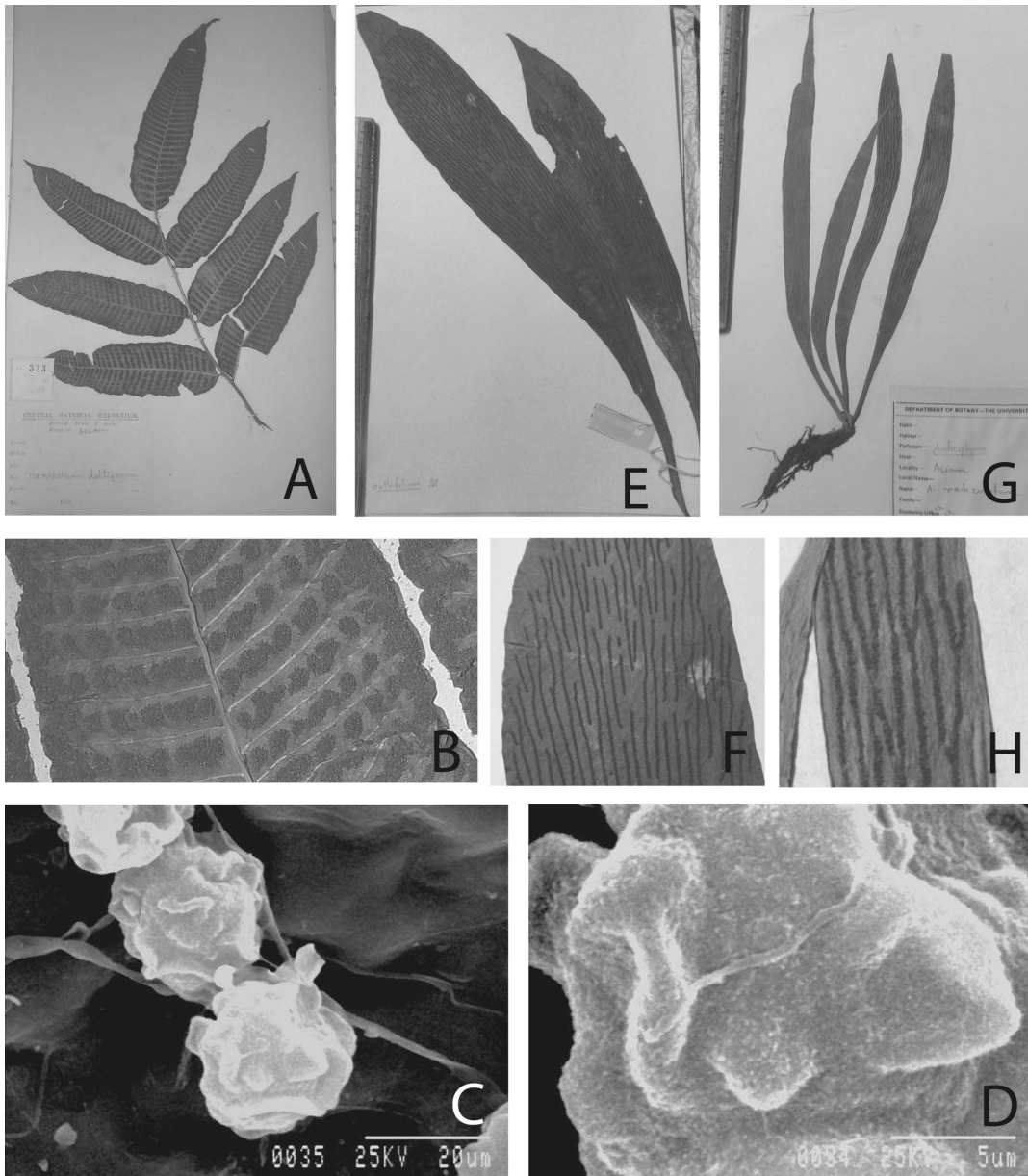


Fig. 1: (A-D) *Bolbitis deltigera*: A. Fertile frond B. Part of pinna showing sori C & D. SEM of spore showing undulate, smooth perispore. (E, F) *Antrophyum callifolium*: E. Whole plant F. Parallel sori lines (G, H) *Antrophyum reticulatum*: G. Whole plant H. Reticulate sori lines.

in *A. callifolium* fertile fronds are sessile, obovate-lanceolate, widest above middle, apex acuminate or round (Fig. 1 E); sori are parallel, rarely reticulate (Fig. 1 F); whereas in *A. reticulatum* fertile fronds are narrower, elliptical, apex acute, stipe long (Fig. 1 G); sori partly reticulate (Fig. 1 H).

However, study of digitalized specimens (listed below) revealed that above mentioned frond and sori types along with many intermediate forms occur both under labels of *A. callifolium* and *A. reticulatum*; thus supports their synonymy as suspected in Flora of China (2013b).

Bhandari and Mukhopadhyay (2009: 16) mentioned the presence of inner endodermal ring in rhizome of *A. callifolium*, but not in *A. reticulatum*. But utility of this feature requires further anatomical survey with more sampling.

SPECIMENS (DIGITALIZED) EXAMINED:

Bolbitis deltigera: China, Yunnan, 1988, *Li Qing-Jun 42636* (HITBC-056127); 1988, *Li Yanhui 42610* (HITBC-056126); 1981, *TAO Guo-up 12773* (HITBC-056116); 1981, *TAO Guo-up 12773* (HITBC-056118); 1978, *Sun Jiliang 11116* (HITBC-056117); 1939, *Wilder had 29432* (HITBC-056125); *Sylva saluca fluminis*, Marta bonia, 1824, *N. Wallich, 140* (BM-001066108). ***Bolbitis virens* var. *virens***: *Anonymous s.n.* (BM-001066109). ***Bolbitis virens* var. *compacta***. Thailand, Nakawn Skitamart, 1966, *M. Tagawa et al. T-6802* (US-00135378). ***Antrophyum reticulatum***: Australia, Queensland, Carrus-Camerunga, *Warburg 19263* (B-20 0009130), Brisbane, *Dietrich s.n.* (B-20 0009131), Nov. Hollandia, Rockingham Bay. 1.6.1865, *Wilhelmi s.n.* (B-20 0009132); Indonesia, Malesien, Bali. Batverita. Mischwald, Kaffeunterholz, häufig,

800m., 4.8.1927, *Rensch 1661* (B-20 0009498), Flores. Sita. niedriger Wald, vereinzelt, 6800 m., 30.6.1927, *Rensch 1407* (B-20 0009499), Lombok. Unterhalb d. Pussuk. Einzelexemplar, ca. 1200 m., 30.6.1927, *Rensch 1126* (B-20 0009500), Lahoem, ca. 20 m, 30.6.1925, *Endert 1794* (B-20 0009502); Philippines, Surigao. 30.1.1927, *Wenzel 2764* (B-20 0009501).

Antrophyum callifolium: Indonesia, Java, *C. L. Blume s.n. ex Herbario Lugduno-Batavo* (B-20 0008970) Java, 1858, *Nagler 432* (B-20 0008965), bei Bayvermas. Madjenang. ca. 30m., 17.1.1915, *Backer 10499* (B-20 0008966), Noesa Kambangan, *Raciborski s.n.* (B-20 0008967), Anjer auf Java. 4.1862, *Schottmueller 239* (B-20 0008968), *Zollinger 152* (B-20 0008969), 1858, *Nagler 432* (B-20 0008971), Anjer auf Java. 4.1862, *Schottmueller 239* (B-20 0008972), Borneo, *Wallace s.n.* (B-20 0008973), Borneo. Batu babi. Urwald. 9.7.1908, *Winkler 2797* (B-20 0008974), Borneo: Long Lele. 8.1901, *R. Schlechter 13488* (B-20 0008975). Papua New Guinea: New Guinea, Morobe, Kalasa, bush nr. swimming pool. Grassland country. Alt.: 1500 ft. 6 Jan 1938, *Clemens 7923* (B-20 0008996), Papua, Koitaki, c. 1500 feet. 1.5.1935, *Carr. 12103* (B-20 0008997), New Guinea, Morobe, Boana, steep above Bonzok R. on forest tree. 2000-3000 ft. 6 May 1938, *Clemens 8179* (B-20 0008998). India: Ins. Nicobareas. *Jelinek 38* (B-20 0008981).

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