NOTE

Asplenium aethiopicum – A New Distributional Record for Northern India

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ABSTRACT: *Asplenium aethiopicum* is reported for the first time from northern India, at Kakoi Reserve Forest, Lakhimpur, in Assam. Previous North Indian records referred to the rather similar species, *A. yoshinagae*. Its synonymy, description, range and phytogeographical details are given along with cytological comments on the *A. aethiopicum* complex. The Assamese plant, like those from South India, is identified as belonging to subsp. *aethiopicum*. Differences from *A. yoshinagae* and *A. crinicaule* are given. *A. aethiopicum* is understood to be an African element which has become a Hindu-Lankan, peninsular Indian species, and has presumably migrated northwards to Northeast India and Myanmar.

KEY WORDS: *Asplenium aethiopicum*, Kakoi Reserve Forest, Assam, African element.

INTRODUCTION

Pande (1973) first reported the occurrence of *Asplenium aethiopicum* (Burm.f.) Bech. in northern India, from the western Himalaya at Ranikhet, Almora District, in Uttarakhand State, but this was later considered to be erroneous by Singh and Bir (1989). Khullar (1994) excluded its report from West Himalaya, following further investigation by Fraser-Jenkins and Khullar. Khullar (1994) and Pangtey et al. (2011) showed that *A. aethiopicum* is a south Indian species, not known from northern India. Various reports (Pande, 1990; Pande and Pande, 2002; Dixit and Kumar, 2002) of its occurrence in the Himalayan region were incorrect and were made due to confusion with the common *A. yoshinagae* Makino subsp. *indicum* (Sledge) Fraser-Jenk.

No authentic specimen had been collected so far from northern India. However in a collection of unidentified ferns, among other plants, undertaken by NO and DKR in order to assess the flora of Kakoi Reserve Forest, Assam State, one of us, CRFJ, immediately recognised an unexpected specimen of true *A. aethiopicum*. This species is therefore reported here for the first time from northern India, in the subtropical region at the southern edge of the east Himalaya. A brief taxonomic description and account are provided here in order to bring this species to attention and provide help for its recognition and identification by other workers.

TAXONOMIC TREATMENTS

***Asplenium aethiopicum* (Burm.f.) Bech., Candollea 6:** 23, f. 1. 1935. *Trichomanes aethiopicum* Burm.f., Fl. Ind. Fl. Cap. Prodr.: 28. 1768. *Asplenium furcatum* Thunb., Prodr. Pl. Cap.: 172. 1800.

Rhizome elongated bearing a tuft of crowded stipes; stipes 10–20 cm long, grey-green, ±densely clothed with long (to 1 mm.), black, woolly fibrils, as is the rachis; fronds somewhat coriaceous, 25–45 cm long, 5–10 cm broad; pinnae 12–20 pairs, deltate-lanceolate, 1.3–2.5 cm broad, deeply divided nearly to the costa, ±equally on their acroscopic and basiscopic sides, into 3 to 5 cuneate-based, acuminate lobes, which in larger pinnae themselves bear an opposite pair of slightly enlarged supra-basal lobes, pinna-lobes sharply serrated at their lateral and distal apices; veins flabellate, deeply channeled; sori linear, slightly radiating from the base of each pinna or lobe, with an elongated lateral indusium which curls backward on soral ripening.

Locality: Northeast India, Assam State; Lakhimpur District, Kakoi Reserve Forest, ca. 5 km. N.W. of Siajuli, 35 km. North of Lakhimpur, bordering Arunachal Pradesh, at edge of forest, on and between mossy boulders, terrestrial-lithophytic, ca. 250 m. alt., *N. Odyuo* & *D.K. Roy* 123420, 20 Oct. 2011, ASSAM.

Distribution: India: South and Northeast India, (Andamans, Kerala, Tamil Nadu, Karnataka, Goa,? Maharashtra, Andhra Pradesh, Assam). Sri Lanka, MYANMAR, S. and E. AFRICA, Madagascar, MASCARENE ISLANDS (La Réunion, Mauritius), Macaronesia (Madeira, Canaries). A report from Bangladesh by Mirza and Rahman (1997) referred to

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A. yoshinagae subsp. *indicum* and reports from Central and South America refer to a closely related species with generally less dissect pinnae, *A. praemorsum* Sw., which has sometimes been reported from Asia in error.

DISCUSSION

Following various chromosome counts revealing different cytotypes (Manton and Sledge, 1954; Sledge, 1965; Manton et al., 1986; Manickam and Irudayaraj, 1988), Braithwaite (1984, 1986) studied the inner taxonomy of the species complex and divided it into several different subspecies based on different cytotypes with recognisable, if close morphological differences. Ploidy levels of tetraploid, octaploid and duodecaploid of *A. aethiopicum*, along with natural hybrids with irregular meiosis, are known from various different parts of its range. As known so far, the South Indian and Sri Lankan plants are octaploid sexual (Manton and Sledge, 1954; Manickam and Irudayaraj, 1988), along with unidentified hybrids, and the non-hybrid plants belong to the type subspecies, *A. aethiopicum* subsp. *aethiopicum*. The present collection from Assam is identical in morphology and is therefore identified here as also belonging to subsp. *aethiopicum*, but it would obviously be of interest to investigate its cytotype to check if it is similarly octaploid sexual as should be expected.

The only other north Indian species that can readily be confused with *A. aethiopicum* are the Northeast and South Indian etc. *A. crinicaule* Hance and the pan-Indian *A. yoshinagae* Makino and its subspecies. A summary of the differences is as follows:

A. aethiopicum (Fig. 1A): rhizome elongated to creeping; stipe and rachis usually well clothed in rather dense, woolly fibrils; pinnae more or less symmetrical with well-developed lobes both acroscopically and basiscopically; pinna-lobes well separated in larger pinnae, with divergent narrow lobes. Terrestrial, lithophytic, or less frequently epiphytic.

A. yoshinagae Makino subsp. *indicum* (Sledge) Fras.-Jenk. (Fig. 1B): rhizome short, erect; stipe and rachis ±naked or with rather scattered small dark, narrow scales; pinnae asymmetrical and dimidiate basiscopically, with larger lobes on the acroscopic side and only small basiscopic ones further up the pinna towards the apex; pinna-lobes widely fused at their bases, the lowest ones usually being rather wide and more shallowly separated, though the upper ones have long acute apices. Epiphytic or lithophytic.

A. crinicaule (Fig. 1C): rhizome short, erect; stipe and rachis well clothed with rather dense, shortish, narrow scales and some short fibrils; pinnae longer than in *A. yoshinagae*, strongly asymmetrical and dimidiate basiscopically, with larger lobes on the acroscopic side and only small basiscopic ones further up the pinna towards the apex; pinna-lobes widely fused with rather rounded apices, only the upper ones being narrow. Epiphytic.

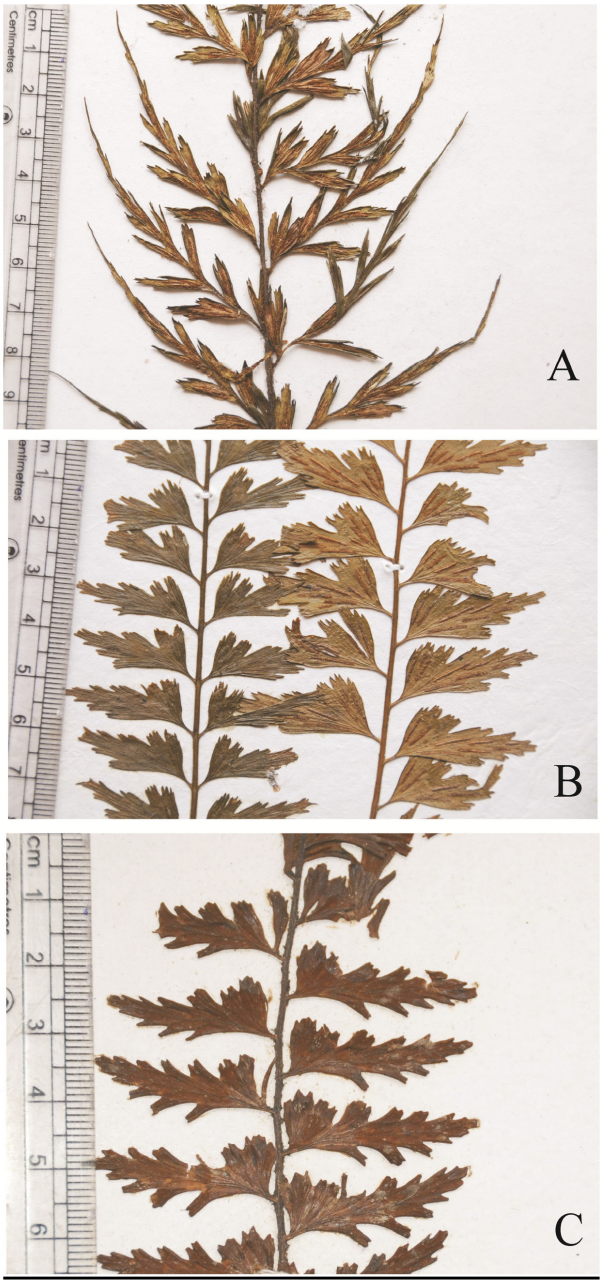


Fig. 1. A: *A. aethiopicum* (Burm.f.) Bech., Kakoi Reserve Forest, Assam, *N. Odyuo and D.K. Roy 123420* (ASSAM). B: *A. yoshinagae* Makino subsp. *indicum* (Sledge) Fras.-Jenk. Dampa Tiger Reserve, Mizoram, *B.K. Sinha and N. Odyuo 112947* (ASSAM). C: *A. crinicaule* Hance, Umchandian forest Jowai, *N.P. Balakrishnan 42898* (ASSAM)

The known distribution pattern of the *A. aethiopicum* complex, with its centre of diversity in

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southern Africa (Braithwaite, 1986), is not like that of a Southeast Asian element and it is evidently one of a certain number of African elements in the peninsular Deccan and Sri Lankan (Hindu-Lankan) flora. Although there are many Southeast Asian elements distributed in common between south India and Northeast India, there are fewer cases thought to represent the migration and penetration of peninsular species into northern India, though several species may reach as far north as Madhya Pradesh, Orissa and southern Jarkhand (including the Pachmarhi and Parasnath Hills). One such case reaching northern India appears to be *Athyrium falcatum* Bedd., another is *Selaginella bryopteris* (L.) Baker and another, *Thelypteris zeylanica* Ching. The presumed migration north-eastwards of *A. aethiopicum* is another example and, as with some of the others, may also relate to its presence not far away in Myanmar, which could also be due to the same north-eastward migration.

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Asplenium aethiopicum 在北印度的新紀錄分布

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摘要：本文首次報導了*Asplenium aethiopicum*在印度阿薩姆邦，卡奎森林自然保護區的新紀錄分布。本文指出先前在印度北部所發現的新紀錄應為另一相似種:*A. yoshinagae*。此文內容包含*Asplenium aethiopicum*的同名異種、物種描述、分布範圍、植物地理學以及*A. aethiopicum*複合群在細胞學特徵上的討論。

關鍵詞：*Asplenium aethiopicum*、卡奎森林自然保護區、阿薩姆邦、非洲群。

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