

ON THE OCCURRENCE OF THREE SPECIES OF *PSEUDOCYCLOSORUS* AIRY SHAW FROM WEST BENGAL

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Pseudocyclosorus esquirolli (Christ) Ching, was first described by Christ in Bull. Acad. Inst. Geogr. Bot. 17. 1907, under the genus *Dryopteris* as *D. esquirolli* Christ. Ching in Acta Phytotax. Sinica 8(4): 322-325. 1963, transferred it to the genus *Pseudocyclosorus*. The controversy regarding the Indian distribution of this taxon is on for a number of years. We have observed a collection of A. Meebold having collection no.2101, from Darjeeling which though identified as *Lastrea octhodes*, is actually *Pseudocyclosorus esquirolli*. The sheet also bears a det. slip of Holttum having the name *Thelypteris esquirolli*. Holttum in Kew Bull. 34(3): 514. 1979 reported its distribution from Vietnam, Yunnan, Taiwan, Ryukyu and Southern Japan but not from India. In a personal communication with C.R. Fraser-Jenkins, who kindly informed us that he believes and would like to accept the species occurring in and collected from several places of East and Central Nepal and again in Meghalaya.

The collection of Meebold of *Pseudocyclosorus esquirolli* thus constitutes a new record for the species in West Bengal as well as India.

1. *Pseudocyclosorus esquirolli* (Christ) Ching, Acta Phytotax. Sinica 8 : 324. 1963; Holttum & Grimes, Kew Bull. 34(3): 524-515. 1979; C.M. Kuo, Fl. Taiwan 1: 434, pl. 153 (1975). *Dryopteris esquirolli* Christ, Bull. Acad. Int. Geogr. Bot. 17: 144. 1907. *Thelypteris esquirolli* (Christ) Ching, Bull. Fan Mem. Inst. Biol. Bot. 6: 301. 1936; K. Iwats., Mem. Coll. Sci. Unit. Kyoto, B. 31: 180. 1965. *Thelypteris subochthodes* Ching, Bull. Fan Mem. Inst. Biol. Bot. 6: 305. 1936. *Pseudocyclosorus subochthodes* (Ching)Ching, Acta Phytotax. Sinica 8 : 325. 1963.

Rhizome short, creeping. Stipe 15-30 cm long; base of stipe to first large pinna 40-60 cm, lower pinnae rather suddenly reduced; reduced pinnae to at least 6 pairs, lowest 3 mm long or less, upper most 1-3 cm or more long, deeply lobed. Frond to 60 cm or more long, aerophores slightly swollen; largest pinnae about 18 × 2 cm, base broadly cuneate to truncate, apex caudate acuminate margin lobed 1.5 m from costa; veins 10-12 pairs, lower surface of rachis always bearing rather sparse hairs, 0.3-0.5 mm or more long; costa bearing erect hairs 0.1 mm long with a variable no. of small glands or short capitate hairs, no hairs between veins; upper surface of costae covered with hairs 0.5-1 mm long, similar hairs scattered on costule and veins; sori medial to supra-medial; indusia glabrous.

Distribution : India : West Bengal : Darjeeling - New record. Vietnam, Yunnan, Taiwan, Ryukyu Island, Southern Japan, and Eastern & Central Nepal.

Ecology : Terrestrial; grows in wet places, usually along streams and in open or light shade.

Specimen examined : West Bengal : Darjeeling, 7000 ft., Sept. 1905, A. Meebold, 2101. Acc. No. 16030.

Pseudocyclosorus falciloba (Hook.) Ching, is quite common in Assam, Arunachal Pradesh, Meghalaya, Nagaland, Manipur growing almost in streams at least at the very edge, on the banks. It is a low altitude species and actually described from Hong Kong. Many of these tropical S.E. Asian species are not turning up in places like S.E. Nepal. It has several pairs of very small reduced pinnae below the main wider part of the lamina;

pinna lobes oblique, lower surface of rachis, costa bearing long spreading hairs, which compelled us to designate the specimen from 'Bed Rangeet' (Darjeeling district) collected by Levingee on 3.11.1879 as true 'falciloba' from West Bengal.

2. *Pseudocyclosorus falciloba* (Hook.) Ching, Acta Phytotax, Sin. 8 : 324 (1963); Holttum & Grimes, Kew Bull. 34(3): 506-508. 1979. *Lastrea falciloba* Hook., Bot. & Kew Misc. 9 : 337. 1857. *Nephrodium falciloba* (Hook.) Hook., Spec. Fil. 4 : 108. 1862. excluding var. b. *Lastrea calcarata* var. *falciloba* (Hook.) Beddome, Handb. Ferns Brit. India 237. 1883. *Thelypteris falciloba* (Hook.) Ching, Bull. Fan Mem. Inst. Biol. 6 : 298. 1936.

Rhizome erect. Stipe about 10 cm long, scaly; base of stipe to first large pinnae 15-25 cm; reduced pinnae 6 pairs or more, more abruptly decrescent, larger ones narrow, subentire with a narrow acroscopic auricle, lower ones very small. Fronds 30-60 cm long pinnae about 20 pairs, texture firm; largest pinnae 6-12 cm long, 0.7-1.4 cm wide, swollen but not much elongate aerophore present at base of pinnae, both bases more or less cuneate, apex narrowly acuminate, margin lobed to 0.5 mm from costa, lobes very oblique acute, basal acroscopic lobe of lower pinnae free or nearly so; veins to 10 pairs; lower surface of rachis, costa and costule bearing sparse long spreading hairs, capitate hairs abundant on costules; costa or upper surface with pale hairs 1 mm long on costa and scattered shorter one on costules and veins; sori medial; indusia firm with short glands or capitate hairs.

Distribution : India : Eastern India, West Bengal - Darjeeling. Nepal, Bangladesh, Myanmar, Thailand, China, Vietnam.

Ecology : Growing mostly on river bank from 1500-2000 m altitude.

Specimen examined : West Bengal: Darjeeling, Bed of Rangeet, 1100 ft., 3.11. 1879, Levingee, s.n. Acc. No.15930.

Pseudocyclosorus oethodes (Kunze) Holttum, is a S.E. Asian element and only found in South India (type of this species is based on a specimen from Nilgiri hills), Thailand and Sri Lanka (?). According to Sledge (Bull. Brit. Mus. Nat. Hist. Bot. 8(1): 1-54. 1981) *P. oethodes* (Kunze) Holttum is not a Sri Lankan species. It was recorded from Sri Lanka in Beddome's Handbook because Thwaites misconstrued Kunze's *Aspidium oethodes*, the species referred to under the name in Enum. Pl. Zeyl. 392. 1864, being *Amphineuron opulentum* [*Nephrodium extensum* (Blume) Moore] though this error was subsequently corrected and the record withdrawn in Handb. Suppl. 53. 1893. The correction has been overlooked by later workers.

A careful study of a specimen from Darjeeling collected by A. Meebold 2103 on May 1905, turns out to be *Pseudocyclosorus oethodes*, hence a new record from West Bengal.

3. *Pseudocyclosorus ochthodes* (Kunze) Holttum in B.K.Nayar & S.Kaur, Companion Beddome's Handb. Ferns Brit. India 204. 1974; Holttum & Grimes, Kew Bull. 34(3): 508. f. 1.G-H, 1980. *Aspidium ochthodes* Kunze in Linnaea 24 : 282. 1851. *Lastrea ochthodes* (Kunze) Moore, Index Fil. 98. 1858; Bedd., Ferns S. India t. 106. 1863; Handb. Ferns Brit. India 240. 1883 excl. var. *tylodes*. *Dryopteris ochthodes* (Kunze) C. Chr., Index Fil. 280. 1905 p.p.; Suppl. 3: 93. 1934. *Thelypteris ochthodes* (Kunze) Ching, Bull. Fan Mem. Inst. Biol. Bot. 6 : 300. 1936.

Rhizome short creeping. Stipe 5-10 cm long, base of stipe to first large pinnae 20-25 cm, reduced pinnae 5-12 or more, more abruptly decrescent, upper reduced pinnae 2-2.5 cm long, 7 mm wide, above basal auricle, lobed throughout, auricle also lobulate, lower ones rather abruptly decrescent; basal ones of large fronds very small. Frond 45-80 cm long; largest pinnae 7-20 cm long, 1-2 cm wide, prominent elongate aerophores present at the base of pinnae, base truncate both basal lobes often enlarged, apex acuminate, margin lobed to 1-1.5 mm from costa, lobes slightly falcate with a broadly pointed tip; veins 8-12 pairs, fine slightly prominent on both

sides; lower surface of rachis and costae bearing rather sparse pale hairs 0.7 mm or more long, similar sparse hairs on costule, hairs on upper surface of costa, 0.5 mm or more long, similar scattered hairs on costule & veins; sori distinctly supramedial; indusia rather small, bearing a few acicular hairs.

Distribution : Southern India. West Bengal Darjeeling.

Ecology : Near streams in forest at 1500–2000 m.

Specimen examined : West Bengal: Darjeeling, 7000 ft., May 1905, A. Meebold 2103, Acc. No. 16070.

Key to the Species

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| 1a. Hairs on lower surface of costae 0.5 mm or more long; indusia hairy, either acicular or capitate | ...2 |
| 1b. Hairs on lower surface of costa short, 0.1 mm; indusia glabrous | ... <i>P. esquirolli</i> |
| 2a. Short capitate hairs present on indusia | ... <i>P. falciloba</i> |
| 2b. Acicular hairs present on indusia | ... <i>P. oethodes</i> |

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