

Additions to the Pteridophytic Flora of Tamil Nadu, India

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Abstract: Six fern-allies and three ferns from Nilgiri district are found to be additions to the Pteridophytic flora of Tamil Nadu. A detailed description of each of these species is provided.

Keywords: fern-allies, ferns, Nilgiri district, Tamil Nadu.

Introduction

While working on the ferns and fern-allies of Nilgiri district, we came across nine interesting Pteridophytic taxa i.e., six fern allies and three ferns. On critical examination with relevant literature, the taxa were identified as *Selaginella crassipes* Spring, *Selaginella delicatula* (Desv.) Alston, *Selaginella miniatospora* (Dalz.) Baker, *Selaginella minutifolia* Spring, *Selaginella uncinata* (Desv. ex Poir.) Spring, *Selaginella wildenovii* (Desv. ex Poir.) Baker (Selaginellaceae), *Microlepia manohara* B. K. Nayar & Madhus. (Dennstaedtiaceae), *Nephrolepis delicatula* (Decne) Pic.-Serm. (Lomariopsidaceae) and *Trichomanes insigne* (Bosch) Bedd. (Hymenophyllaceae) and it is found that above nine species are not included in the previous works published by earlier botanists like Beddome (1864); Dixit (1992); Manickam and Irudayaraj (1992; 2003). Hence, the present gathering of these species forms a new record and addition to the Pteridophytic flora of Tamil Nadu. The voucher specimens are deposited in the herbarium of Bharathiar University, Coimbatore (BU) for future reference.

Taxonomic account:

Selaginella crassipes Spring, Mem. Acad. Sci. Brux. 24: 243. 1850. *Selaginella fergusonii* Heiron, Hedw. 43: 59. 1904. Erect plants up to 6 – 10 cm height. Stem cylindrical, glabrous, yellowish-green, branched from base. Rhizophores soft, 2 – 4 cm, confined to basal one third portions, dichotomously branched. Leaves heteromorphic throughout, distantly arranged on main stem. Lateral leaves 2 x 1.5 mm, ovate-elliptic, oblique, margin serrulate, apex acute. Axillary leaves ovate, obtuse at base, acute at tip and margin ciliate at base while

serrate to serrulate towards tip. Median leaf 1.2 x 0.5 mm, ovate; margins serrate, apex aristate; arista 0.3 mm long. Strobilus 5.2 x 1.5 mm, terminal. Sporophylls dimorphic. Megasporophylls 1.2 x 0.6 mm, ovate – elliptic, oblique, cuspidate at tip and margins ciliate. Microsporophylls ovate-lanceolate, less oblique at base, acute at tip, margins ciliate to serrulate.

Ecology: Terrestrial species growing in dense moist shaded forests.

Notes: Nair *et al.*, (1988) reported this species from Kerala. However, Dixit (1992) did not include this species in his book. The previous workers failed to locate this species in Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Coonoor, ± 1750m, 01.09.2010, Sonia Abraham, 6189 (BU).

Selaginella delicatula (Desv.) Alston, Journ. Bot. 70: 282. 1932; Dixit, Cens. Ind. Pterid. 12. 1984; Selaginellaceae India 65, fig. 29. 1992; Manickam & Irudayaraj, Pterid. Fl. Western Ghats 40. Pl. 19. 1992. *Lycopodium delicatulum* Desv. ex Poir., Encycl. Suppl. 3: 584. 1814. Stem erect or sub erect, rooting at the base only, up to 4 mm thick without leaves, stramineous; entire plant up to 45 x 15 cm, lateral branches many, alternate, tripinnate; leaves scattered and oblique on main stem, arranged in four rows on lateral branches; lateral leaves ca. 2.5 x 1.5 mm, ovate, obtuse, entire; median leaves ovate, 2 x 1 mm, aristate, entire, arista less than half the length of the leaf. Spikes borne on ultimate branches, quadrangular, up to 2 x 0.2 cm; sporophylls uniform, ovate, acuminate, entire, 2 x 1mm; microspores green, megaspores pale brown.

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Ecology: Terrestrial species growing on moist shady areas along roadsides and earth cuttings.

Notes: Earlier workers Manickam and Irudayaraj (1992; 2003) and Nisha (2008) failed to locate this species in Tamil Nadu. Hence, the present gathering from Irumppupalam and Coonoor forms an addition to the Pteridophytic Flora of Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Irumppupalam, ±750m, 30.12.2009, Sonia Abraham, 6058; Coonoor, ±1700m, 08.04.2010, Sonia Abraham, 6104 (BU).

Selaginella miniatospora (Dalz.) Baker, J. Bot. 23: 249. 1885; Dixit, Cens. Indian Pterid. 14. 1984 et Selaginellaceae India 99. f. 61. 1992. *Lycopodium miniatosporum* Dalz. in Hook. J. Bot. 4: 114. 1852. Erect plants up to 12 – 18 cm height, stem slender, 1 mm thick, glabrous, green; branched from base, dichotomously branched towards apex of each branchlets. Rhizophores 2.5 – 5 cm long, confined to basal $\frac{1}{3}$ rd part, repeatedly branched. Leaves heteromorphic throughout, distant along main stem and branches; lateral leaf 2.2 x 1.1 mm, oblong – obovate, oblique, margin denticulate along proximal and smooth along distal side, apex sub-acute; median leaf 0.9 x 0.3 mm, ovate, oblique, margins serrate, apex aristate, arista half as long as the lamina. Strobilus 2.5 x 2.5 mm, terminal, solitary or branched. Sporophylls dimorphic; larger sporophylls 1.5 x 0.5 mm, oblong-elliptic, oblique, margins serrate, apex acute; smaller sporophylls 1 x 0.5 mm, broadly ovate, oblique, margins serrate, apex aristate, arista 0.4 mm.

Ecology: Lithophytic species growing on wet rock boulders and along moist earth cuttings.

Notes: In the present investigation, it is collected from Coonoor. Earlier botanists could not able to locate this species in Tamil Nadu. Hence the present collection forms a new record for Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Coonoor, ± 1750m, 16.11.2011, Sonia Abraham, 6432 (BU).

Selaginella minutifolia Spring, Mem. Acad. Brux. 24: 239. 1850; Dixit, Selaginellaceae India, 81, f.42. 1992. Erect

plants up to 8 – 10 cm long. Stem 1 – 1.5 mm thick, glabrous, branched from base, yellowish-green. Rhizophores 2 – 3 cm long, confined to basal one third part, dichotomously branched. Leaves heteromorphic through out distantly placed along main stem. Lateral leaves 2 x 1.5 mm, ovate-elliptic, oblique; margins dentate, apex sub-acute; Median leaf 0.9 x 0.5 mm, ovate – oblong, margins dentate – denticulate, apex acuminate. Strobilus 12.5 x 8 mm, terminal. Sporophylls 1.4 – 2 x 0.8 mm, dimorphic; Larger sporophylls ovate – oblong, oblique, margins dentate, laminal flap dentate, apex acute; smaller sporophylls ovate-oblong, oblique, margins long ciliate, apex acuminate.

Ecology: Terrestrial species growing in moist places in shady forests.

Notes: *S. minutifolia* closely resembles *S. ciliaris* but it differs from the latter by its erect stem with distant branches and the presence of rhizophores in the basal one third portions only. The present collection from Pandalur and Devala forms a new record for Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Pandalur, ±800m, 30.12.2009, Sonia Abraham, 6032; Devala, ± 875m, 29.12.2009, Sonia Abraham, 6010 (BU).

Selaginella uncinata (Desv. ex Poir.) Spring, Bull. Acad. Brux 10: 141. 1843; Dixit, Cens. Ind. Pterid. 17. 1984 et Selaginellaceae India 55. 1992. *Lycopodium uncinatum* Desv. ex Poir., Lamarck, Encycl. Suppl. 3: 558. 1813. Stem, trailing or creeping, up to 70 cm, slender, pale straw coloured, bi-sulcate, copiously branched from the base. Rhizophores throughout the stem, long, thick. Leaves heteromorphic, distant on the main stem, contiguous on the branches, entire; lateral leaves spreading, oblong to sometimes sub-obovate, bright green, distinct midrib present, cordate at base, acute at apex, inner half-leaf slightly dilated, oblong, outer half-leaf not dilated, oblong; axillary leaves more or less similar to the lateral leaves; median leaves small, imbricate, contiguous, oblique-oblong, cuspidate. Strobili 5-8 x 1-2 mm, single at the apex of branchlets. Sporophylls uniform, ovate-lanceolate, crowded.

Ecology: Terrestrial species gregariously growing in shady places.

Notes: This elegant species is much grown on account of its beautiful metallic-blue colour. In the present work, it is found growing inside Nadugani Gene pool garden in wild condition.

Specimens examined: India: Tamil Nadu, Nilgiri district, Nadugani, $\pm 850\text{m}$, 31.05.2011, Sonia Abraham, 6228 (BU).

Selaginella wildenovii (Desv. ex Poir.) Baker, Gard. Chron. 783, 950. 1867; Dixit, Cens. Ind. Pterid. 18. 1984 et Selaginellaceae India, 42. 1992. *Lycopodium wildenovii* Desv. ex Poir., Lamarck, Encycl. Suppl. 3: 540, 552. 1814. Stem trailing or climbing, thick, sulcate, shining stramineous, branched from the base, branches distant, pinnately compound. Rhizophores restricted in the basal part. Leaves isomorphic on the main stem, heteromorphic on the branches, distant on the main stem and branches, contiguous on the branchlets, light-green, thin but firm in texture, entire; lateral leaves ascending, ovate-oblong, obscurely petioled, cordate at base, sub acute at apex, inner half-leaf semi ovate, auriculate at base, outer half-leaf semi oblong-lanceolate, cordate at base; axillary leaves more or less similar to lateral leaves; median leaves small, oblong, oblique at the base, subacute at apex. Strobili quadrangular, 5-12 x 1-2.5 mm, single at the apex of the branchlets. Sporophylls uniform, broadly ovate, acute, entire.

Ecology: Terrestrial species growing in moist, shaded or partially exposed area. It is found only in a single locality, Nadugani in Nilgiris.

Notes: The beauty of this species resides in the magnificent peacock-blue colour of its foliage. The colour is intensified when the plant is grown in a moist, shady place, where it assumes a bright metallic colour, sometimes reflecting a most lovely blue. The present gathering from Nadugani is a new record for Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Nadugani, $\pm 850\text{m}$, 31.05.2011, Sonia Abraham, 6233 (BU).

Microlepia manohara B. K. Nayar & Madhus., Fern Gaz. (U.K.) 12(6): 335. 1984; Nayar and Geevarghese, Fern Fl. Malabar 163. 1993. Rhizomes long creeping branched. Fronds larger; stipe ca. 1.25 cm x 10 mm, glabrous, purplish brown basally, with a

shallow median groove. Young stipes covered with hairs. Lamina ca. 160 x 120 cm, broadly ovate-deltate, quadripinnate. Acroscopic side markedly longer than basiscopic side. Primary pinnae up to 65 x 20 cm, long, oblanceolate; Secondary pinnae ca. 10 x 2.5 cm, broadly lanceolate, distinctly stalked, long-caudate at apex. Tertiary pinnae ca. 18 x 5 mm, rhombic, obtuse at apex, broadly rounded at acroscopic base. Ultimate lobes ovate - rhombic, crenate at margin and obtuse at apex. Quaternary pinnae ca. 6 x 3 mm, serrate at margin. Rachis, its branches and midribs of ultimate pinnae straight, adaxially grooved. Lamina hairy throughout. Sori submarginal at apex of veinlets. Indusium broader than long, with entire glabrous margin.

Ecology: Large terrestrial species growing in shaded forests.

Notes: This fern was described by Nayar and Madhusoodanan (1984) from Wyanad, Kerala. The present collection from Kundha forms a new record for Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Kundha, $\pm 1800\text{m}$, 27.06.2010, Sonia Abraham, 6170 (BU).

Nephrolepis delicatula (Decne) Pic.-Serm., Webbia, 23: 181. 1968; Dixit, Cens. Ind. Pterid. 167. 1984; Chandra, Ferns Ind. 245. 2000. *Nephrodium delicatulum* Decne, Jacq. Voy. Ind. Bot. 4: 178. 1844. Rhizome short, erect, 1-2.5 mm diam., bearing a few fronds, many wiry slender roots, and stolons, scaly; stolons bearing elongated, narrow and smaller tubers; scales ca. 2.5 x 0.3 mm, pale brown, soft membranous. Fronds often drooping, 25-45 x 4-6 cm, slender; Stipes up to ca. 10 cm long, stramineous or darker, scaly. Lamina membranous, linear-lanceolate, up to 35 x 6 cm, pinnate; rachis green, grooved on upper surface, minutely scaly above; lateral pinnae 35 or more pairs; middle ones larger, gradually narrowing from base to acute apex, patent or falcate near apex, dimidiate at lower base, base truncate or with a small rounded acroscopic auricle, crenate at margin; lamina glaucous green, glabrous, herbaceous. Sori submarginal; indusia broadly reniform.

Ecology: Lithophytic species occasionally growing on mossy crevices of rocks or stone

walls. This species usually occur as epiphytic on mossy tree trunks.

Notes: The present collection from Gudalur is a new record for Tamil Nadu. It is usually occurring in two habitats i.e., one as epiphytic on the trees of evergreen forests; another is lithophytic in open or shaded areas (Nair *et al.*, 1992).

Specimens examined: India: Tamil Nadu, Nilgiri district, Gudalur, $\pm 850\text{m}$, 19.8.12, Sonia Abraham, 6651, 6649 (BU).

Trichomanes insigne (Bosch) Bedd., Ferns Brit. India pl. 284C. 1868; *Crepidomanes insigne* (Bosch) S.H. Fu, III. Handb. Chin. Pl. Pterid. 39. 1957; Dixit, Cens. Ind. Pterid. 91. 1984; Chandra, Ferns Ind. 339. 2000; Hameed *et al.*, Filmy Ferns S. India 63. 2003. *Didymoglossum insigne* Bosch, Ned. Kruid. Arch. 5: 143. 1863; *Trichomanes bipunctatum* var. *insigne* (Bosch) Bedd., Handb. Ferns Brit. India 42. 1883. Rhizome branched, long-creeping, densely covered with black, unicellular hairs. Fronds scattered on rhizome, 1.5-3 x 0.8-1 cm; stipes very small, 1-3 mm long, narrowly winged; laminae deltoid or ovate to oblong, pinnatifid, base decurrent; rachis-wing broad, undulate, sinus bearing tufts of hairs; hairs unicellular, dark brown, elongated; pinnae 4-5 in pairs, less deeply lobed; segments broad, ovate, up to 1.5 mm in diameter, with acute tips; submarginal false veinlets absent, other false veins few, short, conspicuous, oblique to the margin. Venation pinnate, costa zigzag, bearing single or forked costules ends at the apex of each lobe. Sori 4-6, arises at the apical part of laminae; indusia small, immersed, broadly conical, with rounded tips, just longer than tube; receptacles extruded.

Ecology: The plant was found growing on wet shaded rocks, on riparian shrubs and tree trunks.

Notes: This taxon was described by Beddome (l. c.) from N. W. Himalaya as a variety of *T. bipunctatum*. In South India, it was reported by Hameed *et al.*, (l. c.) from the states of Karnataka and Kerala. However, the present collection from Devagiri, Pandalur is an addition to the Pteridophytic flora of Tamil Nadu.

Specimens examined: India: Tamil Nadu, Nilgiri district, Devagiri, $\pm 800\text{m}$, 29.12.2009, Sonia Abraham, 6018 (BU).

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