

New additions to the Pteridophyte Flora of Nilgiris, Tamil Nadu

Sonia Abraham*^{1,2} and V. S. Ramachandran¹

¹Dept. of Botany, Bharathiar University, Coimbatore – 641 046, Tamil Nadu, India

²Dept. of Botany, St. Dominic's College, Kanjirapally – 686 512, Kerala, India

ABSTRACT

Six species of Pteridophytes from Nilgiri district are found to be additions to the Pteridophytic flora of Nilgiris. A detailed description of each of these species is provided.

Keywords: Pteridophytes, Nilgiri district, Tamil Nadu.

INTRODUCTION

Intensive explorations were carried out in Nilgiris during 2009-2012 in order to document the ferns and fern allies of Nilgiri district. On critical examination with relevant literature, it is found that, among the collected 169 taxa, six species viz, *Asplenium bipinnatum* Roxb. (Aspleniaceae), *Cheilanthes viridis* Sw. (Pteridaceae), *Huperzia phlegmaria* Rothm. (Lycopodiaceae), *Selaginella ciliaris* (Retz.) Spring (Selaginellaceae), *Selaginella intermedia* (Blume) Spring (Selaginellaceae) and *Trichomanes bipunctatum* Poir. (Hymenophyllaceae) are found to be not included in the previous works published by earlier botanists such as Beddome [2]; Dixit [3]; Manickam and Irudayaraj [4; 5]. Hence, the present gathering of these species forms a new record and addition to the Pteridophytic flora of Nilgiris.

MATERIALS AND METHODS

In order to document the ferns and fern-allies of Nilgiri district, intensive field explorations were carried out during the years 2009-2012. Identification of the plants were done with the help of *The Ferns of Southern India* (Beddome 1864) and *Pteridophyte Flora of the Western Ghats – South India* (Manickam and Irudayaraj 1992). The voucher specimens are deposited in the herbarium of Bharathiar University, Coimbatore (BU) for future reference.

RESULTS AND DISCUSSION

The study has resulted in the collection of 169 taxa among which six species forms new record for Nilgiris and are listed below.

Taxonomic account:

Asplenium bipinnatum Roxb. in Calcutta J. Nat. Hist. 4: 499. 1844. *Asplenium polydon* G. Forste. var. *bipinnatum* (Sledge) Sledge in Bot. J. Linn. Soc. 34: 6. 1982; Manickam & Irudayaraj, Pterid. Fl. Western Ghats: 219. Pl. 167. 1992. *Asplenium falcatum* var. *bipinnatum* Sledge in Bull. Brit. Mus. Nat. Hist. Bot. 3(6): 262 (1965); Dixit, Cens. Ind. Pterid.: 118. 1984.

Rhizomes suberect, ca. 3 cm thick, densely scaly all over; scales linear-lanceolate, uniformly dark brown, long acuminate, entire. Stipes tufted, ca. 28 x 0.4 cm, dark brown to black, rounded below, grooved above, scaly at the very base, glabrous above. Lamina lanceolate or oblong-lanceolate, about 70 x 25 cm, acuminate, broadly cuneate, bipinnate; primary pinnae about 10 pairs, subopposite, basal pinnae not reduced; largest pinna 12 x 4 cm, lanceolate, acuminate, cuneate, one-third to half distal part of the primary pinna shallowly lobed without bearing distinct pinnules; pinnules up to five pairs, anadromous, sessile, alternate, obovate or wedge-shaped, base cuneate, apex rounded and irregularly incised; veins forked two or three times, free, parallel, reaching the margin; pinnae pale green, glabrous above and below; texture subcoriaceous; few soft, linear, dark brown scales borne on main rachis especially at the junction of primary pinnae. Sori numerous, all along the veins except the extreme apex, indusiate; indusia pale brown, entire.

Ecology: Terrestrial or lithophytic species gregariously growing on exposed roadsides.

Notes: Previous workers [1], [2], [4], [5] could not able to collect this species from Nilgiris. Hence the present collection forms a **new record** for Nilgiris.

Specimens examined: India: Tamil Nadu, Nilgiri district, Fern hill, ± 2200m, 9.1.12, Sonia Abraham, 6504 (BU). *Cheilanthes viridis* Sw., Syn. Filic. (Swartz): 127. 1806; Manickam & Irudayaraj, Pterid. Fl. Western Ghats :86. Pl. 62. 1992. *Pellea viridis* (Forsk.) Prantl, C. Chr., Ind. Fil.: 483. 1906.

Rhizome short-creeping, up to 2 cm thick, densely scaly all over, scales lanceolate, up to 5 mm long, apex acuminate, margin slightly toothed. Stipes closely arranged up to 25 × 0.3 cm, dark brown, glossy, rounded below, flattened above, densely scaly at the base, glabrous above. Lamina ovate-lanceolate, up to 30 × 15 cm, apex acute, base cuneate, bi-tripinnate at base and bipinnate above with large trilobed pinnules below and small, simple pinnules above; rachis rounded below and slightly grooved above; pinnae up to ten pairs, shortly stalked, ovate to oblong with a terminal biauricled pinnule; pinnules up to seven pairs per pinna, alternate, sessile, ovate or narrowly deltoid, apex acute, base cuneate, auricled on basioscopic and/or acrosopic base, margin subcrenate; veins slightly distinct below, marked by grooves above, forked, free, reaching the margin; pinnules pale green, glabrous; herbaceous. Sori linear, continuous along the margin of the pinnule, protected by reflexed margin.

Ecology: Terrestrial on exposed areas; widespread along roadsides and cuttings in Ooty, Doddabetta and Fern Hill.

Notes: In South India it is reported from Kothayar hills, Southern Western Ghats [4]. It is a **new record** for Nilgiris.

Specimens examined: Tamil Nadu, Nilgiri district, Doddabetta, ± 2500m, 09.07.2011, Sonia Abraham, 6339; Ooty, ± 2100m, 09.01.2012, Sonia Abraham, 6487; Fern hill, ± 2200m, 09.01.2012, Sonia Abraham, 6502 (BU).

Huperzia phlegmaria Rothm. in Feddes Repert. Sp. Nov. 54: 62. 1994; Manickam & Irudayaraj, Pterid. Fl. Western Ghats: 24. Pl. 3. 1992. *Lycopodium phlegmaria* L., Sp. Pl. 2: 1101. 1753. *Phlegmariurus phlegmaria* (L.) Holub. in Preslia, 36: 21. 1964; Dixit, Cens. Ind. Pterid.: 9. 1984; Lycopod. India 70, fig. 16. 1988.

Stem pendulous, 30- 45 x 3 cm, isodichotomously forked. Leaves lax, 1-5 mm apart, subpatent, sessile or subsessile, ovate lanceolate, up to 1.5 x 0.5 cm, acuminate, entire, base broadly cuneate, midrib slightly distinct above and below, leaves dark green, glabrous, subcoriaceous. Cones terminal on the ultimate branches, up to 8 x 0.2 cm, slender, forked up to four times; sporophylls opposite decussate, adnate, appressed towards distal part; spreading at the basal part, broadly deltoid, up to 1 x 1.5 mm, thin, apex subcaute, margin entire; sporangia borne at the axil of the sporophyll, reniform, yellowish; spores trilete, tetrahedral.

Ecology: Epiphytic in shola forests.

Notes: Dixit [3] reported two variable forms of this species and the present collection match with the typical form. Earlier workers could not able to collect this species from Nilgiris. Hence, the present collection forms a **new record** for Nilgiris.

Specimens examined: Tamil Nadu, Nilgiri district, Avalanche, ± 2000m, 18.02.2012, Sonia Abraham, 6582 (BU).

Selaginella ciliaris (Retz.) Spring, in Bull. Acad. Brux. **10**: 231. 1843; Dixit, Cens. Ind. Pterid. :12. 1984 & Selaginellaceae India, 79. 1988.

Main stems creeping, 3-10 cm long, stramineous, glabrous, angular, rooting at intervals but mostly near base, Leaves dimorphic; lateral leaves unequal-sided, ovate-lanceolate, ciliate, acute or obtuse at apex, pointing outwards; median leaves nearly equal-sided, ovate, with prominent midrib, ciliate, cuspidate at apex, pointing upwards; axillary leaves equal-sided, ovate, acute at apex, ciliate at base. Strobili terminal, 5-10 mm long; sporophylls dimorphic, those of the upper side unequal-sided, lanceolate, ciliate, acuminate at apex; those of the lower side equal-sided, ovate, keeled, acuminate at apex, the margins with long conspicuous cilia.

Ecology: Terrestrial species growing abundantly on exposed moist places near streams in Gudalur.

Notes: Earlier workers [4], [5], [7] failed to locate this species in Nilgiris. Hence, the present collection forms **new record** for Nilgiris.

Specimens examined: Tamil Nadu, Nilgiri district, Gudalur, ± 750m, 19.08.2012, Sonia Abraham, 6658, 6657, 6654 (BU).

Selaginella intermedia (Blume) Spring in Bull. Acad.Brux.10 (66): 144. 1983; Dixit, Cens. Ind. Pterid.: 14. 1984 & Selaginellaceae India: 63, fig. 28. 1992; Manickam & Irudayaraj, Pterid. Fl. Western Ghats: 39. Pl. 17. 1992.

Stem erect or sub erect, up to 2 mm thick without leaves; rhizophores borne on the basal one-third part of the main stem as stilt roots, entire plants about 30 x 15 cm, distal two-third part of the main stem bears dichotomously branched lateral branches; leaves dimorphic throughout, lateral leaves oblong-lanceolate, ca. 5 x 2 mm, base unequal, apex subacute or obtuse, margin ciliolate at the basal basioscopic part, entire in the rest; median leaves ovate, 4 x 1.5 mm, apex aristate, margin denticulate; cones about 1 x 0.3 cm, sporophylls uniform, ovate, 2 x 1 mm, acuminate, margin denticulate, microspores yellowish-brown.

Ecology: Terrestrial species growing in moist shady forests.

Notes: This species is noted for its beautiful colouration and branches. In Tamil Nadu, it has been collected from Kanyakumari and Madurai districts only by earlier botanists. Hence, the present collection forms a **new record** for Nilgiris.

Specimens examined: Tamil Nadu, Nilgiri district, Gudalur, Kundha, ± 1800m, 08.12.2011, Sonia Abraham, 6477 (BU).

Trichomanes bipunctatum Poir., in Lam., Encycl. 8: 69. 1808; Bedd., Handb. Ferns. Brit. India: 41. 1883. *Crepidomanes bipunctatum* (Poir.) Copel., Phil. J. Sci. 67: 59. 1938; Chandra, Ferns Ind.: 339. 2000; Hameed et al., Filmy Ferns S. India: 63. 2003.

Rhizome long-creeping, filiform, branched, ca. 1 mm thick, covered with dark brown hairs. Fronds scattered on rhizome, ca. 3-5 x 1-2 cm; stipes winged above, bearing short hairs; lamina ovate to oblong, tripinnatifid, membranous, round to acute at apex; primary segments alternate, 4-5 in pairs, basal ones slightly reduced, bipinnately divided; ultimate segments linear-lanceolate, acute at apex, entire and flat along margin. Costa clear at both surface, divides to the pinnae and pinnules. Sub marginal false veinlets broad and almost continuous. Sori many, apical on the lower acrosopic pinnules of the upper pinnae; indusia tubular, base slender, completely sunken, winged; involucrel mouth bi-lipped into two erect or somewhat spreading, broad triangular lips. Receptacles exerted beyond the involucrel lips.

Ecology: This species grows on tree trunks as thin patches in shaded dense forests.

Notes: This species is almost indistinguishable in the field from *T. plicatum*.

Hameed et al. [6] reported this species from South India. The present collection forms a **new record** for Nilgiris.

Specimens examined: Tamil Nadu, Nilgiri district, Avalanche, ± 2240m, 18.02.2012, Sonia Abraham, 6573, 6579 (BU).

REFERENCES

- [1] Azeez K, Kurup VVG, Madhusoodanan PV, *Spleenworts (Asplenium L.-Pteridophyta) of South India*, Malabar Natural History Society, Calicut, **2008**.
- [2] Beddome RH, *The Ferns of Southern India*, Gantz Bros., Madras, **1864**, (Reprinted: Today and Tomorrow's Printers & Publishers, New Delhi, **1970**).
- [3] Dixit RD, *Selaginellaceae of India*, Bishen Singh Mahendra Pal Singh, Dehra Dun, India, **1992**.
- [4] Manickam VS, Irudayaraj V, *Pteridophyte Flora of the Western Ghats – South India*, B. I. Publications, New Delhi, India, **1992**.
- [5] Manickam VS, Irudayaraj V, *Pteridophyte Flora of Nilgiris, South India*, Bishen Singh Mahendra Pal Singh, Dehra Dun, **2003**.
- [6] Hameed CA, Rajesh KP, Madhusoodanan PV, *Filmy Ferns of South India*, Penta Book Publishers and Distributors, Calicut, India, **2003**.
- [7] Nisha P, Ph.D thesis, University of Calicut (Calicut, **2008**).