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Original Research Article

Dryopteris austro-indica Fraser-Jenk. (Dryopteridaceae) - A South Indian endemic fern from montane forests of Wayanad district, Kerala

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Abstract: *Dryopteris austro-indica* Fraser-Jenk., an interesting south Indian endemic fern species of restricted occurrence belongs to the family Dryopteridaceae. It is a threatened species narrowly distributed in south India and hitherto unknown to fern flora of Kerala. This fern is attractive for its magnificent fronds and well suited for growing in gardens as pot plants. A detailed taxonomic account of the species along with necessary photographs has been provided to facilitate easy identification of the species.

Key Words: *Dryopteris austro-indica*, Kurichiyarmala, Chembra Peak, Wayanad.

Introduction

Dryopteris austro-indica Fraser-Jenk. belonging to the family Dryopteridaceae, was described by Fraser-Jenkins in 1989 on the basis of collections by R. H. Beddome (1864). This species qualifies to endangered category with limited distribution in south India (Fraser Jenkins, 2008). As per earlier reports (Fraser-Jenkins, 1989 & 2012; Ebihara *et al*., 2012), the plant grows in the Shevaroys Hills, Gudliar Peak and Nilgiri of Western Ghats. After Fraser-Jenk's study, several works (Manickam, 1986; Nair *et al.*, 1992; Nayar & Geevarghese, 1993; Theuerkauf, 1993; Leena & Madhusoodanan, 1998; Manickam & Irudayaraj, 1992) had been carried out in south India, but this species could never be collected again anywhere from south India.

While working in the ferns of Wayanad district, the first author collected an interesting specimen of *Dryopteris* from the montane forests of Kurichiyarmala and Chembra Peak (Chembramala) in Wayanad district of Kerala (Figure 1). After critical study of the specimens with help of relevant literature, and consultation with experts, it was identified as *Dryopteris austro-indica* Fraser-Jenk.–an endemic and threatened species narrowly distributed in south India. The species was hitherto unknown to fern flora of Kerala. This constitutes the first authentic record of this species from North Kerala and the same is reported here as a new addition to the fern flora of Kerala. Full citation, description, phenology, distribution, and specimens examined along with colour photographs provided to facilitate further collection, identification and conservation. The voucher specimens deposited in the herbarium of M. S. Swaminathan Research Foundation, Kalpetta, Wayanad; Calicut University Herbarium, Malappuram (CALI).

Figure 1: A. Kurichiyarmala **B.** Chembramala

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Taxonomic Treatments

Dryopteris austro-indica Fraser-Jenk., Bull. Brit. Mus. Nat. Hist. (Bot.) 18 (5): 370. Fig. 24. 1989; Fraser-Jenk., Taiwania. 53(3): 270, 287. 2008; Maridass & Raju, IJBT 1: 53. 2010. *Lastrea intermedia* Bedd., Ferns S. India: 39. Pl. 113. 1864, nom. Illeg. (Art. 64.1), non C. Presl 1836, nec *Dryopteris intermedia* (Muhlenb. ex Willd.) A. Gray 1848. Type: India, Nilgiris, Mallee Mand, 6000 ft, R.H. Bedd. 1864.

Terrestrial. Rhizome erect or semi erect, covered with scales. Fronds seasonal, 5-7 per plant, up right, tufted, vegetative and fertile frond similar; stipe green, 7-15cm long, densely scaly at the base, sparsely scaly towards apex; scales ovate, glossy, pale, 6-8 x 2.5-3mm long, apex acuminate; rachis green, sparsely scaly; scales smaller than that of stipe; lamina lanceolate or ovate-lanceolate, 12-25cm long, up to 10 cm broad, simply pinnate or bipinnatifid, apex acute, young lamina light green, mature lamina dark green; pinnae lanceolate, up to 12 pairs, 3.5-7cm long, apex obtuse, coriaceous, pinna lobed, lobes up to 9 pairs, alternate, pinna-lobes joined at their bases by a narrow wing of tissue, except at the bases of the lower and middle pinnae where they become separated into pinnules, apex obtuse, margins slightly serrate towards apex, curved towards lower surface. Veins free, forked, up to 5 pairs, distinct below. Sori large, in pairs, or frequently more, close to costa, crowded, near the bases of the lobes; indusia completely enclosing the sorus, thick, white, reniform, with the dark colour of the sporangia showing through as grey, becoming brown, inflected at the edges and surrounding the sporangia even when ripe, persistent. Spores regular, dark chestnut-brown, very large (Figure 2).

Spore: April – October.

Distribution: Endemic to South India. Tamil Nadu (Nilgiris, Mallee Mand, Shevaroy Hills, Gudalir Peak); Kerala (Wayanad District: Chembra Peak (1868m), Kurichiyarmala (1657m)).

Ecology: It grows on the moist and shady places in beside boulders, rock crevices of grasslands above 1600 m. It also grows in forest margins of high altitude, usually not exposed to direct sunlight (Figure 3). Deciduous, seasonal pattern pronounced with new growth restricted to the rainy season, dormant during the dry months. The associated fern taxa are *Athyrium solenopteris, A. falcatum, A. anisopterum*. During summer, grassland may burn and it would cause the destruction of the plant. Spores also get destructed by such burning, resulting in to no germination of them but the underground rhizome withstand forest fire up to some extent and sprouts again during rain. This fern attractive for its shape of fronds and it is well suited for growing in gardens as pot plants. It was observed that the population is severely fragmented and area of occupancy is estimated to be less than 3 km^2, while the population size estimated from the localities (Chembra peak and Kurichiyarmala to number fewer than 30 mature individuals.

Figure 2: *Dryopteris austro-indica* Fraser-Jenk. A. Habit; B. Rhizome; C. scales on stipe base; D. Lamina Upper Surface; E. Fertile lamina; F. & G. Sori-Young; H. Sori-Mature; I. Lamina tip.

Figure 3: A. & B. Habit

Specimen examined Kerala: Wayanad district, Chembra peak 05-10-2011, Mini, V. 149; 20-09-2012, Mini, V. 334; Kurichiyarmala 22-08-2011, Mini, V. 125; 20-08-2012, Mini, V. 301; (M. S. Swaminanthan Research Foundation Herbarium, Kalpetta, Wayanad).

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References

1. Fraser Jenkins CR, A monograph of Dryopteris (Pteridophyta: Dryopteridaceae) in the Indian subcontinent, Bull. Brit. Mus. Nat. Hist. (Bot.), 1989, 18 (5): 323-477.

2. Fraser-Jenkins CR, Endemics and Pseudo-Endemics in Relation to the Distribution Patterns of Indian Pteridophytes. Taiwania, 2008, 53(3): 264-292.

3. Kramer KU, Dryopteridaceae. In: Kramer KU, Green PS (eds.), the Families and Genera of Vascular Plants, I. Pteridophytes and Gymnosperms. Springer-Verlag, Berlin. 1990, 101-144.

4. Leena KR, Madhusoodanan PV, Pteridophyte flora of Wayanad district, Kerala- A preliminary survey on ecology and distribution, J. Econ. Tax. Bot., 1998, 22: 149-155.

5. Manickam VS, Irudayaraj V, Pteridophyte flora of Western Ghats of South India, B.I. Publication, New Delhi, 1992.

6. Manickam VS, Fern flora of the Palni Hills (South India), today and tomorrow's printers and publishers, New Delhi, 1986.

7. Maridass M, Raju G, Conservation status of Pteridophytes, Western Ghats, South India, I J B T, 2010, 1: 42-57.

8. Nair NC, Gosh SR, Bhargavan P, Fern- Allies and ferns of Kerala part III, J. Econ. Tax. Bot., 1992, 16(3): 501-550.

9. Nayar BK, Geevarghese KK, Fern Flora of Malabar, Indus publishing Company, New Delhi, India, 1993.

10. Theuerkauf WD, South Indian Pteridophytes- Ex situ Conservation, Indian Fern. J., 1993, 10:219-225.

11. Ebihara A, Fraser-Jenkins CR, Parris BS, Zhang XC, Yang YH, Chiou WL, Chang HM, Lindsay S, Middleton D, Kato M, Praptosuwiryo TN, Amoroso V, Barcelona JF, Rajapaksha RHG, Park C-H, Murakami N, Hoya A Rare and threatened pteridophytes of Asia 1. An enumeration of narrowly distributed taxa, Bull. Natl. Mus. Nat. Sci., Ser. B., 2012, 38(3):93–119.

12. Fraser Jenkins CR, Rare and Threatened Pteridophytes of Asia 2. Endangered Species of India the Higher IUCN Categories, 2012. Bull. Natl. Mus. Nat. Sci., Ser. B., 2012, 38(4):153–181.

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