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Diversity and Distribution of Pteridophytes in Pulpatta Grama Panchayat, Malappuram District, Kerala, India.

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ABSTRACT

The present investigation documents the diversity and habitat-wise distribution of pteridophytes in Pulpatta Grama Panchayat, Malappuram District, Kerala. Systematic field surveys conducted during monsoon and post-monsoon seasons of 2025 recorded 16 species belonging to 11 genera. True ferns dominated the flora, followed by lycophytes and aquatic forms. Species were categorized into terrestrial, epiphytic, lithophytic and aquatic habitats. Morphological characters such as rhizome type, frond architecture, venation pattern and soral arrangement were used for identification. Habitat heterogeneity significantly influenced species distribution. The study establishes baseline floristic data for a midland ecosystem of Kerala and highlights the need for microhabitat conservation.
Keywords: Pteridophytes, Western Ghats, Fern diversity, Habitat distribution, Kerala flora.

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INTRODUCTION

Pteridophytes represent one of the earliest vascular plant lineages and play a crucial role in ecosystem functioning through soil stabilization, nutrient cycling and maintenance of forest microclimates [1,2]. Globally, approximately 12,000 species have been documented, with tropical regions showing maximum diversity [3]. The Western Ghats of India, recognized as a biodiversity hotspot, supports significant pteridophytic richness and endemism [4]. Kerala, forming the southwestern flank of this mountain system, provides favorable climatic conditions characterized by high rainfall and humidity [5].

Although several studies have documented fern diversity in protected forests of Kerala such as Silent Valley and Ponmudi [6,7], midland and semi-urban panchayat-level ecosystems remain underexplored. Micro-scale floristic inventories are essential for biodiversity conservation and environmental planning [8]. Therefore, the present study aimed to document species diversity and analyze habitat-wise distribution of pteridophytes in Pulpatta Grama Panchayat.

MATERIALS AND METHODS

Study Area

The study was conducted in Pulpatta Grama Panchayat, Manjeri Taluk, Malappuram District, Kerala. The region lies within the midland zone influenced by the southern Western Ghats. The climate is tropical monsoon with high relative humidity and substantial annual rainfall.

Survey Design and Sampling

Repeated field surveys were conducted during monsoon and post-monsoon seasons of 2025. Stratified random sampling was adopted across four habitat categories: terrestrial, epiphytic, lithophytic and aquatic environments. Transect walks were carried out in plantations, lateritic rocky outcrops, riparian zones, ponds and roadside embankments.

Collection and Identification

Specimens were collected ensuring intact rhizomes and fertile fronds. Standard herbarium techniques were followed for pressing, drying and mounting. Identification was carried out using regional floras and taxonomic keys [4,6]. Diagnostic morphological characters examined included rhizome type, frond dissection, venation pattern, soral position and indusium structure.

Data Analysis

Species were categorized based on habitat type and relative abundance. Qualitative habitat distribution patterns were analyzed and compared with previous regional studies.

RESULTS

A total of 16 species belonging to 11 genera were recorded. The documented taxa included *Selaginella* spp., *Lygodium flexuosum*, *Cheilanthes* spp., *Pteris* spp., *Adiantum latifolium*, *Adiantum philippense*, *Parahemionitis* spp., *Pityrogramma calomelanos*, *Christella* spp., *Athyrium* spp., *Nephrolepis* spp., *Drynaria quercifolia* and *Salvinia* spp.

Terrestrial species constituted the dominant group (approximately 56%), followed by epiphytic (19%), lithophytic (13%) and aquatic forms (12%). True ferns represented the major taxonomic group.
Key diagnostic characters observed included linear marginal sori in *Pteris* spp., reniform indusiate sori in *Adiantum* spp., dimorphic fronds in *Drynaria quercifolia*, circinate vernation *in Pityrogramma calomelanos* and sporocarps in *Salvinia* spp.

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Table 1: Habitat-wise Distribution of Recorded Species

Habitat Type	Representative Genera
Terrestrial	*Adiantum, Pteris, Christella, Athyrium*
Epiphytic	*Drynaria, Nephrolepis*
Lithophytic	*Cheilanthes, Parahemionitis*
Aquatic	*Salvinia*

PLATE 1: *Adiantum* sp. A. Habit B. Frond C. Sori D. Rhizome.

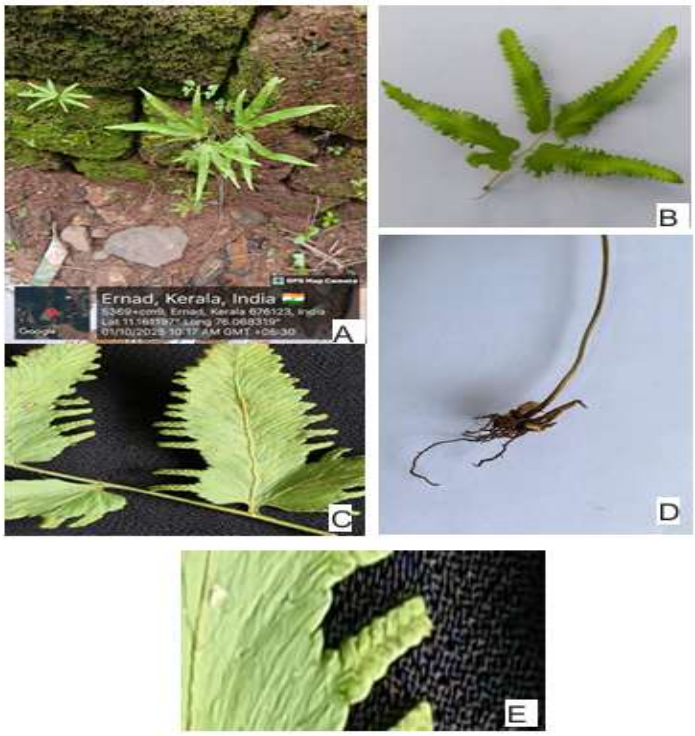

PLATE: 2 *Lygodium* sp. A. Habit B&C. Frond with Sori D. Rhizome E. Sori

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PLATE 3: *Drynaria* sp. A&B. Habit C. Rhizome D. Two Types of Fronds

PLATE 4: *Nephrolepis* sp. A. Habit B. Frond C. Spore D. Rhizome

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PLATE 5: *Christella* sp. A. Habit B. Sori C. Rhizome D. Frond with Sori

PLATE 6: *Pityrogramma* sp. A. Habit B. Rhizome C. Pinnae D. Sori

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PLATE 7*: Pteris* sp. 1 A. Habit B. Pinna C. Rhizome D. Spore

PLATE 8: *Pteris* sp. 2 A. Habit B. Sori C. Rhizome

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PLATE 9: *Salvinia* sp. A, B & C. Habit D. Sporocarp E. Young F. Rhizome

PLATE 10*: Selaginella* sp. A&D. Habit B. Sporophyll C. Rhizome

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PLATE 11: *Parahemionitis* sp. A&B. Habit C. Leaf D. Rhizome

PLATE 12: *Cheilanthes* sp. A. Habit B. Spore C. Rhizome

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PLATE 13: *Athyrium* sp. A&D. Habit B. Spore C. Rhizome

PLATE 14: *Pteris* sp.3 A&B. Habit C. Rhizome, D. Spore

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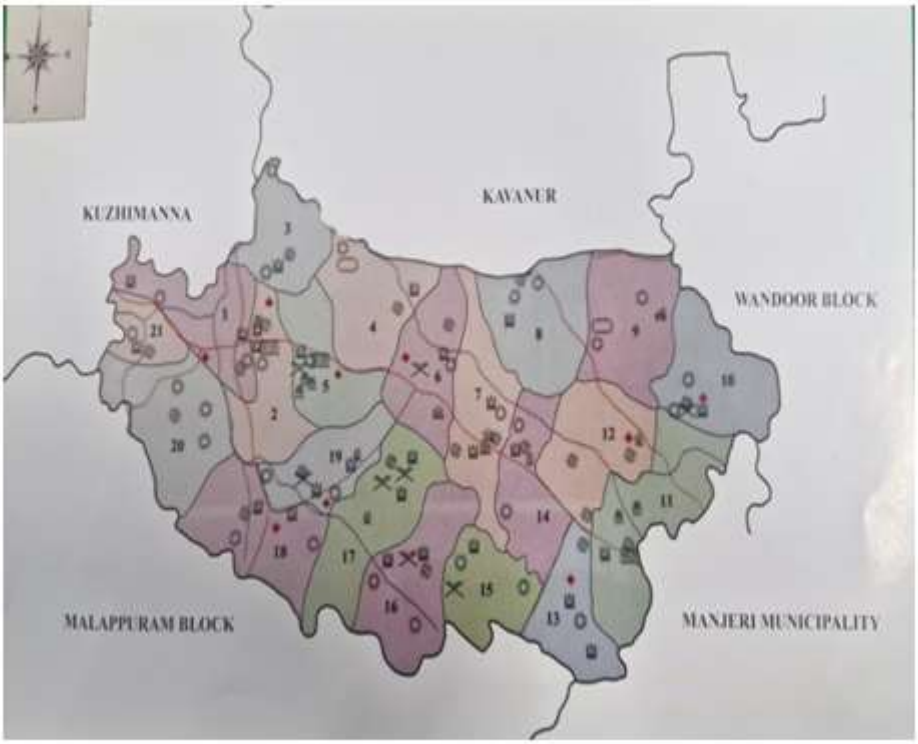
Map of Pulpatta Grama Panchayat



DISCUSSION

The dominance of terrestrial ferns aligns with previous floristic accounts from the Western Ghats [4,6]. Habitat heterogeneity, particularly shaded plantations and lateritic outcrops, significantly influenced species distribution. Lithophytic species demonstrated substrate specialization, while aquatic taxa were confined to stagnant water bodies.

Compared to protected forest ecosystems, species richness in Pulpatta is moderate; however, considering its semi-urban landscape, the diversity recorded is ecologically significant [7,8]. Microhabitat conservation plays a crucial role in sustaining pteridophytic diversity.

CONCLUSION

The study documents 16 species of pteridophytes from Pulpatta Grama Panchayat and provides baseline data for Malappuram district. Habitat heterogeneity supports moderate fern diversity. Continued monitoring and conservation of microhabitats are recommended.

REFERENCES

[1] Nayar BK, Kaur S. Gametophytes of homosporous ferns. Bot Rev. 1971; 37:295–396.
[2] Joseph J, Mathew P, Nair MC. Evolutionary significance of pteridophytes. J Plant Sci Res. 2017; 33:145–158.
[3] Smith AR et al. A classification for extant ferns. Taxon. 2006; 55:705–731.
[4] Manickam VS, Irudayaraj V. Pteridophyte flora of the Western Ghats. B.I. Publications; 1992.
[5] Government of Kerala. Malappuram district handbook. 2021.
[6] Muktesh K. Fern flora of Kerala. 1998.
[7] Rekha K, Athira P. Diversity of pteridophytes in Akamala forest. 2017; 12:45–52.
[8] Chandra S et al. Status of threatened pteridophytes of India. Taiwania. 2008; 53:170–209.