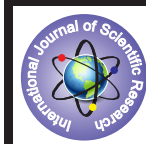


## Epiphytic angiosperm flora of Achankovil forests, Southern Western Ghats, Kerala, India



### Environment

**KEYWORDS :** Epiphytes, Achankovil, Endemism, Southern Western Ghats

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### ABSTRACT

*Epiphytic angiosperm flora is one of the important components of tropical montane rain forests. The epiphytic flora in Achankovil forest division of southern Western Ghats, situated in Kollam and Pathanamthitta districts of Kerala state, have not been subjected to detailed floristic investigation. Field surveys were conducted during the period 2009-12 and 67 epiphytic flowering plant species belonging to different families were collected and documented. Spatial patterns, endemism and the occurrence of accidental epiphytes were noted from the present investigation. Changes in the composition of epiphytic diversity were studied with respect to altitudinal gradients. As revealed in the present study, the density of epiphytes is increasing at higher altitudes. Altitudinal range of 1070- 1750 M, highest air humidity with smallest variation and slightly lower temperature are some of the factors that favour the abundance of epiphytic diversity in Achankovil forest.*

### Introduction:

Epiphytes derive its moisture and nutrient requirements from the air/rain and thrive on host plants. The first recorded comment on epiphytes is credited to Columbus (ca. 1492), who wrote that tropical trees "have a great variety of branches and leaves, all of them growing from a single root". The diversity as well as abundance of epiphytes is determined by many factors such as forest type, host relationship, humidity and altitude. Epiphytes were acclimatized in their habitats by the possessing certain key morpho-anatomical features such as succulent tissues, stomata remain closed during the day time, presence of the aerial roots or leaf-trichomes, clonal reproduction by fragmentation, dispersion by wind borne seeds and their ability to get affixed to bark surface of host plants. Humid tropical forests are exceptionally notable due to the richness and abundance of epiphytes. Many endemic temperate epiphytes occur in the Southern Hemisphere in strong contrast to the Northern Hemisphere. About 23,466 species of vascular epiphytes belonging to 879 genera have been recorded so far, most of which are angiosperms (20,863 species in 784 genera). Among epiphytes, family Orchidaceae occupies the first position (it includes 73% of all Orchid species and 60% of all epiphytic species) followed by Araceae. This study addresses the angiosperm epiphytic community and endemism in seasonally inundated tropical montane forests and grasslands of Achankovil forest belt of southern Western Ghats.

### Methodology:

The study area is situated in southern Western Ghats, part of the Kollam district, about 40 KM east of the Punalur and 30 KM west of the Shenkottai, Tamil Nadu. The tract lies within 9° to 9° 15" North Longitude and 77° to 77°16' 09" East latitude. The study spot comprises 256 km<sup>2</sup> of the tropical evergreen forests to montane grass land. The altitude ranges varies from 700- 1700 M from MSL. Flowering twigs were collected during the period 2009-2012 and taxonomically identified using the publications (Gamble and Fischer, 1957), (Ramachandran and Nair, 1988), (Sasidharan and Sivarajan, 1996). The identity of the plants species collected was confirmed by referring the herbaria of Kerala Forest Research Institute, JNTBGRI and Calicut University. The occurrence and distribution of endemic species were verified and analysed with the help of standard publications (IUCN Red Data Book, 1994; Ahammedullah and Nayar, 1986; Sukumaran and Raj, 2008 and IUCN Red List category, 2012). The voucher specimens were deposited in CMS College herbarium.

**Table 1: List of epiphytes enumerated from Achankovil forest.**

Botanical Name	Family	Distribution
<i>Solenocarpus indicus</i> Wight & Arn.	Anacardiaceae	SW/AE
<i>Ariopsis peltata</i> Nimmo	Araceae	IM/AE

<i>Remusatia vivipara</i> (Roxb.) Schott.	Araceae	Pal
<i>Polyscias acuminata</i> (Wight) Seem.	Araliaceae	SI & SL/AE
<i>Schefflera wallichiana</i> (Wight & Arn.) Harms.	Araliaceae	SI & SL
<i>Cynanchum callialatum</i> Ham. ex Wight.	Asclepiadaceae	IM
<i>Hoya ovalifolia</i> Wight & Arn.	Asclepiadaceae	SI & SL
<i>Hoya pauciflora</i> Wight.	Asclepiadaceae	SI & SL
<i>Hoya retusa</i> Dalz.	Asclepiadaceae	W
<i>Belosynapsis vivipara</i> (Dalz.) C.E.C. Fisch.	Commelinaceae	W
<i>Aeschynanthus perrottetii</i> A.DC.	Gesneriaceae	W
<i>Didymocarpus fischeri</i> Gamble	Gesneriaceae	SW/AE
<i>Didymocarpus humboldtiana</i> Gard.	Gesneriaceae	SI & SL/AE
<i>Utricularia striatula</i> Smith.	Lentibulariaceae	Pal/AE
<i>Fagraea ceilanica</i> Thunb.	Loganiaceae	IM
<i>Dendrophthoe falcata</i> (L. f.) E. var. <i>falcata</i> M. & S.	Loranthaceae	Asia
<i>Helixanthera intermedia</i> (Wight) Danser	Loranthaceae	SW
<i>Helixanthera wallichiana</i> (Schult.) Danser.	Loranthaceae	W
<i>Macrosolen capitellatus</i> (Wight & Arn.) Danser.	Loranthaceae	SI & SL
<i>Macrosolen parasiticus</i> (L.) Danser	Loranthaceae	SI & SL
<i>Scurrula parasitica</i> L.	Loranthaceae	Asia
<i>Taxillus tomentosus</i> (Heyne ex Roth) Tieghem	Loranthaceae	SI & SL
<i>Medinilla beddomei</i> Clarke.	Melastomataceae	SW
<i>Ficus religiosa</i> L.	Moraceae	Pan/AE
<i>Ficus rigida</i> Jack var. <i>bracteata</i> (Corner) Bennet	Moraceae	SW
<i>Ficus tinctoria</i> G. F. ssp. <i>parasitica</i> (K. ex W.) C.	Moraceae	IM/AE
<i>Acampe ochracea</i> (Lindl.) Hochr.	Orchidaceae	IM
<i>Acampe praemorsa</i> (Roxb.) Blatt. & McCann.	Orchidaceae	Asia
<i>Aerides ringens</i> (Lindl.) C.E.C. Fisch.	Orchidaceae	SI & SL

<i>Bulbophyllum rheedei</i> Manilal & Sathish	Orchidaceae	SW
<i>Bulbophyllum sterile</i> (Lam.) Suresh.	Orchidaceae	PI
<i>Cleisostoma tenuifolium</i> (L.) Garay.	Orchidaceae	SI & SL
<i>Conchidium braccatum</i> (Lindl.) Brieger.	Orchidaceae	SI & SL
<i>Conchidium microchilos</i> (Dalz.) Rauschert	Orchidaceae	PI
<i>Cymbidium aloifolium</i> (L.) Sw.	Orchidaceae	IM
<i>Dendrobium aphyllum</i> (Roxb.) Fischer	Orchidaceae	Asia
<i>Dendrobium herbaceum</i> Lindl.	Orchidaceae	PI
<i>Dendrobium heyneanum</i> Lindl.	Orchidaceae	PI
<i>Dendrobium ovatum</i> (L.) Kranz.	Orchidaceae	W
<i>Eria mysorensis</i> Lindl.	Orchidaceae	W
<i>Gastrochilus flabelliformis</i> (Baltt. & Mc.) Saldanha	Orchidaceae	IM
<i>Liparis elliptica</i> Wight	Orchidaceae	IM
<i>Liparis viridiflora</i> (Blume) Lindl.	Orchidaceae	IM
<i>Luisia macrantha</i> Blatt. & McCann	Orchidaceae	SW
<i>Luisia tristis</i> (G.Forst.) Hook.f.	Orchidaceae	Asia
<i>Oberonia brachyphylla</i> Blatt. & McCann.	Orchidaceae	SW
<i>Oberonia mucronata</i> (D. Don) Or. & Sf.	Orchidaceae	IM
<i>Pholidota imbricata</i> Hook.	Orchidaceae	IM
<i>Rhynchostylis retusa</i> (L.) Blume.	Orchidaceae	IM
<i>Schoenorchis nivea</i> (Lindl.) Schltr.	Orchidaceae	SI & SL
<i>Sirhookera lanceolata</i> (Wight) O. Ktze.	Orchidaceae	SI & SL
<i>Trias bonaccordensis</i> Sathish	Orchidaceae	SW
<i>Trias stocksii</i> Benth.	Orchidaceae	SW
<i>Vanda testacea</i> (Lindl.) Rchb.f.	Orchidaceae	SI & SL
<i>Vanilla wightiana</i> Lindl. ex Hook.f.	Orchidaceae	SW
<i>Peperomia heyneana</i> Miq.	Piperaceae	SI & SL/AE
<i>Peperomia portulacoides</i> (Lam.) Dietr.	Piperaceae	SI & SL/AE
<i>Peperomia tetraphylla</i> (G.Forst.) Hook. & Arn.	Piperaceae	Pan/AE
<i>Garnotia tenella</i> (Arn. ex Miq.) Janowsky	Poaceae	Asia/AE
<i>Ischaemum rangacharianum</i> C.E.C. Fisch.	Poaceae	SI&SL/AE
<i>Elatostema acuminatum</i> (Poir.) Brongn.	Urticaceae	IM/AE
<i>Elatostema lineolatum</i> Wt, var. <i>lineolatum</i> ; H. f.	Urticaceae	SI & SL/AE
<i>Lecanthus peduncularis</i> (Wall. ex Royle) Wedd.	Urticaceae	Pal/AE
<i>Pellionia heyneana</i> Wedd.	Urticaceae	SI & SL/AE
<i>Procris crenata</i> Robins.	Urticaceae	IM/AE
<i>Viscum articulatum</i> Burm. f. var. <i>articulatum</i>	Viscaceae	IM
<i>Viscum orientale</i> Willd.	Viscaceae	IM

**Abbreviations:-** AE- Accidental Epiphytes, IM- Indo Maleasian, SI-South India, SL- Sri Lanka, W- Western Ghats, Pal-Paleotropics, Pan- Pantropics, T-Tropics, SW- Southern Western Ghats and PI- Peninsular India.

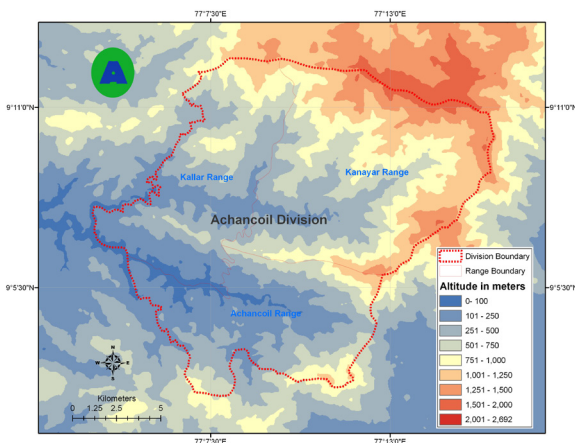
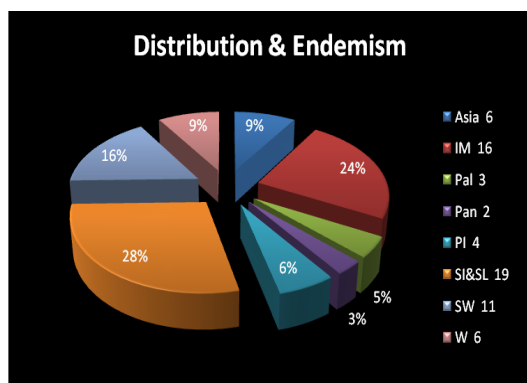
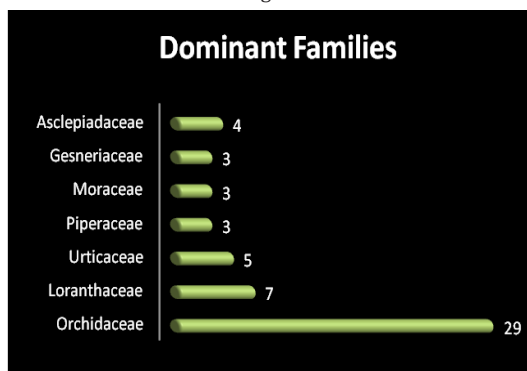


Plate 1: A: Altitudinal map of study area.

### Results and Conclusion

During the present study, 67 angiosperm epiphytes belonging to 46 genera and 16 families were identified. Of which, 18 species were accidental epiphytes. The dominant family Orchidaceae, represents 29 (43%) members of the epiphytes followed by Loranthaceae (10%), Urticaceae (7%) and Asclepiadaceae (5%). Among these plants, 28% were Indo-Sri Lankan linkage taxa, 24% Indo-Malayan members and 16% were endemic to southern Western Ghats. Western Ghats and Asiatic endemics contribute 9% of the epiphytic flora of Achankovil. Peninsular Indian, paleotropics and pantropical members shares the remaining 14% of the composition. Endemism of epiphytes throws light on the biogeography of the area and its importance as centres of speciation, areas of extinction and adaptive evolution of the flora. Indo- Sri Lankan and Indo- Malaysian epiphytic representations of the epiphytes in the study area throw light on the centers of their common origin.



The altitudinal variation of 700- 1700 M, highest air humidity, slightly lower temperature, and conducive geographical conditions viz; *Achankovil Shear zone*(AKSZ) *Achankovil* river and the *Ariyankavu* gap are some of the favourable factors that contribute to the abundance of epiphytic flora in this region. The study highlights the importance of stringent conservation measures to be adopted, considering the threat to the diversity of rare and endemic epiphytes in the *Kottavasal* hills of *Achankovil* forests.

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