



## Additions to the angiosperms of the flora of Kannur district, Kerala, India from Aralam wildlife sanctuary

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**Abstract:** A total of 216 species additions to the flora of Kannur district, Kerala, India from Aralam Wildlife Sanctuary is reported based on the floristic studies carried out. Out of 216 species, 161 are dicotyledons and 55 monocotyledons spread across 72 families. The list includes 109 Peninsular Indian endemics comprising 59 southern Western Ghats endemics.

**Key words:** Aralam Wildlife Sanctuary; Western Ghats; Additions; Kerala.

### Introduction

The millennium ecosystem assessment concluded that over the past 50 years, 60 per cent of all ecosystem services like watershed protection, hazard protection, climatic regulation etc have declined as a direct result of the growth of agriculture, industry, forestry, fisheries etc (Kinzing *et al.*, 2011). So the need for conserving ecosystem has increased. The Protected areas (PAs) like Wildlife reserves and National Parks cover more than 12% of the Earth's surface. PAs are considered as the conservation tool and front line of global campaign of biodiversity (Wells & Mc Shane, 2004). The PAs are effective only when the effective management is take place (Khan & Bhagwat, 2010). Monitoring is a crucial element of nature conservation and management in a rapidly changing world (Pertti Saurola, 2008). Ecologists are trying to understand the role of biodiversity in ecosystem functions (Pedro Flombaum & Osvaldo, 2012). The first and foremost step to understand the ecosystem is the identification of each group in the ecosystem. In tropical countries like India, the biodiversity is not thoroughly explored. Biodiversity documentation of PAs resulted in the description of many new species, new records of distribution and relocation of many species.

Aralam Wildlife Sanctuary, one among the 22 protected areas in Kerala, is situated in the Kannur revenue district of Kerala, along the northwest slopes of Western Ghats. It is contiguous with the forests of Coorg (Kodagu) district of Karnataka State and lies between 11.88° and 11.98° North latitude and 75.79° and 75.93° East longitudes. The altitude varies between 60 m to 1,500 m above sea level (map 1). Aralam is small area compared to other protective areas of Kerala. It has only 55 km<sup>2</sup> area and half of the Sanctuary is vested forest and

was subjected to irrational felling earlier. Nearly 25 km<sup>2</sup> are of undisturbed forest. The Aralam Sanctuary has good diversity, particularly in the Evergreen and Semi- Evergreen forests. The important association is *Dipterocarpus- Palaquim - Mesua*, this type of association is very few in Kerala. Besides this, *Dipterocarpus - Calophyllum - Palaquim* and *Mesua - Artocarpus - Hopea* associations are also seen. The diversity of epiphytes is relatively very high, especially in the forests above 700 m elevation. Orchids, lichens, mosses are well distributed in the evergreen forests. The flora and fauna of the Sanctuary is predominant with tropical west coast evergreen forests.

The flora of the Kannur (*Cannanore*) district was prepared by Ramachandran and V J Nair (1988). But the Sanctuary has not been subjected to detailed floristic study and the collections from the Sanctuary were very scanty. The present study was carried out systematically for accessing the floristic wealth of the Sanctuary. During the floristic explorations in the Sanctuary, it was noted that many of the plants are not reported from the district. Hence here the additions to the flora of Kannur district are highlighted.

### Materials and Methods

Repeated collection trips were carried out in different seasons to all habitats of the Sanctuary so as to collect all Phanerogams from the study area in flowering and fruiting stage (Map 2). The collected specimens were made in to herbarium. The specimens were identified with the help of relevant literature and authentic herbarium collections available in the KFRI herbarium and MH herbarium, Coimbatore. Voucher specimens are deposited in the herbarium of Kerala Forest Research Institute [KFRI] Peechi, Kerala.

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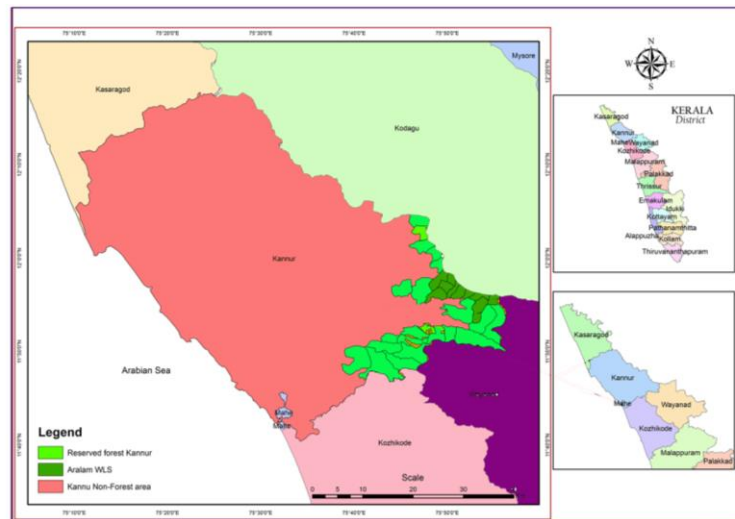
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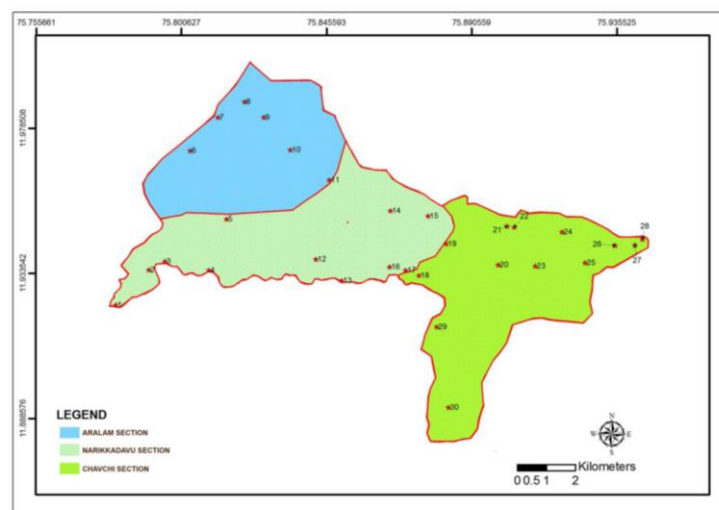
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Map.1. Location of Aralam Wildlife Sanctuary in Kannur district



Map 1. Different Collection Localities and Sections. **1.** Valayamchal, **2.** Pookundu, **3.** Checkdam, Pookund, **4.** Narikadavu, **5.** Uruppukunnu, **6.** Paripode, **7.** 55\_block, **8.** Pottichapara, **9.** Kurumbankallu, **10.** Kannadivechakunnu 1, **11.** Kannadivechakunnu2, **12.** Pothanplavu, **13.** Kariyankappu, **14.** Meenmutti, **15.** Meenmutti Vellachatam, **16.** Crossway, **17.** Chelachuvadu, **18.** Chavachi 1, **19.** Moonamthode, **20.** Chavachi vellachatam, **21.** Kattikari 2, **22.** Kattikari 1, **23.** Chavachi 2, **24.** Mullenpara, **25.** Pothurumi, **26.** Astippara, **27.** Ambalappara Tower, **28.** Ambalappara, **29.** Kolithat, **30.** Santhagiri

## Discussions

During the study, 1,006 species of flowering plants belonging to 598 genera under 128 families and two sub families were collected and described. Dicotyledons have 819 species belonging to 477 genera under 108 families and 2 sub families. Monocotyledons are represented by 186 species in 120 genera under 19 families. Gymnosperm is represented with single family and single species. Ramachandran and V J Nair (1988) recorded 1,132 species from the Cannore district. Their study area included some areas of the present Wayanad district and the total area covered was 3,670 km<sup>2</sup>. The area of Sanctuary is only 55 km<sup>2</sup>.

Scrutiny of literature according to the distribution reveals that out of 1,006 species, 216 are new additions to the district flora of Kannur. Out of 216 taxa, 161 are dicotyledons and 55 monocotyledons spread across 72 families (Table 1). The Sanctuary is situated in the Talacauvery cluster of *Nilgiri-Silent Valley-Wayanad-Kodagu* subcentre of Western Ghats. This subcentre is one of the richest regions with respect to diversity and endemism in the entire Western Ghats region. It is estimated that 150 endemic species are exclusive to this region (Nayar, 1996). Among the 216 additions, 109 species are Peninsular Indian endemics and 59 are restricted to the southern Western Ghats.

**Table 1:** List of plants which are additions to the Flora of Kannur District, Kerala, India.

No.	Scientific Name	Habit	Habitat	Locality in the Sanctuary	KFRI collection Number	Endemism
<b>Annonaceae</b>						
1	<i>Milusa wayanadica</i> Sujanapal, Ratheesh & Sasidh.	Shrub	Evergreen forests	Ambalappara, Asthippara	KJD 26085	SWG
2	<i>Orophea sivarajanii</i> Sasidh.	Shrub	Evergreen forests	Kattikkari	KVB 31616	SWG
3	<i>Polyalthia fragrans</i> (Dalz.) Bedd.	Tree	Evergreen forests	Kattikkari	KJD 26036	SWG
4	<i>Uvaria macropoda</i> Hook. f. & Thoms.	Woody climber	Semi-evergreen forests	Pookund, Narikkadavu	NS & KVB 31310	
<b>Menispermaceae</b>						
5	<i>Cyclea fissicalyx</i> Dunn	Climber	Evergreen forests	Kattikkari	KJD 26019	SWG
<b>Capparaceae</b>						
6	<i>Capparis moonii</i> Wight	Scandent shrub	Evergreen forests	Paripode	KJD 18758	
<b>Flacourtiaceae</b>						
7	<i>Casearia thwaitesii</i> Briq.	Tree	Evergreen forests	Ambalappara, Asthippara	KJD 18764	
8	<i>Flacourtia montana</i> Graham	Tree	Semi-evergreen forests	Narikadavu	KJD 26381	India
9	<i>Hydnocarpus alpina</i> Wight	Tree	Evergreen forests	Kariyenkappu, Chavachi	KJD 26074	
<b>Pittosporaceae</b>						
10	<i>Pittosporum tetraspermum</i> Wight & Arn.	Tree	Evergreen forests	Ambalappara	NS & KJD 31950	
<b>Polygalaceae</b>						
11	<i>Polygala arillata</i> Buch. -Ham. ex D. Don	Shrub	Evergreen forests	Ambalappara	KVB 31577	
12	<i>Polygala persicariifolia</i> DC.	Herb	Grasslands	Ambalappara	KVB 31758	
<b>Hypericaceae</b>						
13	<i>Hypericum wightianum</i> Wall. ex Wight & Arn.	Herb	Evergreen forests	Ambalappara	KJD 26321	
<b>Clusiaceae/ Guttiferae</b>						
14	<i>Calophyllum austrindicum</i> Kosterm. ex Stevens	Tree	Evergreen forests	Pothurumi	NS & KVB 31362	SWG
15	<i>Calophyllum calaba</i> L.	Tree	Semi-evergreen forests	Valayamchal	KJD 18754	WG
16	<i>Calophyllum polyanthum</i> Wall. ex Choisy	Tree	Evergreen forests	Chavachi, Kattikkari	KJD 22564	
17	<i>Garcinia gummi-gutta</i> (L.) Robs. var. <i>papilla</i> (Wight) N.P. Singh	Tree	Evergreen forests	Ambalappara, Pothurumi	KJD 26303	
18	<i>Garcinia talbotii</i> Rai & Sant.,	Tree	Fairly common in Evergreen forests		KVB 31278	WG
<b>Dipterocarpaceae</b>						
19	<i>Dipterocarpus bourdillonii</i> Brandis	Tree	Evergreen forests	Chavachi	KJD 26360	SWG
20	<i>Dipterocarpus indicus</i> Bedd.	Tree	Evergreen and Semi-evergreen forests	Chavachi, Meenmutty, Kattikkari	KVB 31530	SWG
21	<i>Hopea erosa</i> (Bedd.) van Sloot.	Tree	Evergreen forests	Chavachi, Kappu	KJD 26047	SWG
<b>Ancistrocladaceae</b>						
22	<i>Ancistrocladus heyneanus</i> Wall. ex Graham	Woody climber	Evergreen forests	Kattikkari, Meenmutty, chavachi	KJD 26006	
<b>Bombacaceae</b>						
23	<i>Cullenia exarillata</i> Robyns	Tree	Evergreen forests	Pothurumi	KJD 18788	SWG
<b>Tiliaceae</b>						
24	<i>Grewia umbellifera</i> Bedd.	scandent shrubs	Evergreen forests	Moonamthode, Chavachi	NS & KVB 31323	WG
<b>Balsaminaceae</b>						
25	<i>Impatiens goughii</i> Wight	Herb	Evergreen forests	Ambalappara	KJD 25438	WG
26	<i>Impatiens bensloviana</i> Arn.	Herb	Evergreen forests	Ambalappara	NS & KJD 31942	
27	<i>Impatiens jerdoniae</i> Wight	Herb	Evergreen forests	Ambalappara	KJD 26157	WG
28	<i>Impatiens lawsonii</i> Hook. f.	Herb	Evergreen forests	Ambalappara	KJD 25451	SWG
29	<i>Impatiens stocksii</i> Hook. f. & Thoms.	Herb	Evergreen forests	Ambalappara	KJD 25452	WG
30	<i>Impatiens veerapazhasii</i> Ratheesh, Sujanapal & Meera	Herb	Evergreen forests	Ambalappara	KJD 25437	SWG
<b>Rutaceae</b>						
31	<i>Atalantia wightii</i> Tanaka	Shrub	Evergreen forests	Ambalappara	KVB 31531	
32	<i>Glycosmis macrocarpa</i> Wight	Shrub	Evergreen forests	Kannadivechkunnu	KJD 26385	
33	<i>Vepris bilocularis</i> (Wight & Arn.) Engl.	Tree	Evergreen forests and Semi-evergreen forests	Kannadivechkunnu, Ammayikallu	KJD 22547	SWG
34	<i>Zantoxylum ovalifolium</i> Wight	Scandent shrub	Evergreen forests	Ambalappara	NS & KVB 31340	
<b>Meliaceae</b>						
35	<i>Aglaiia barberi</i> Gamble	Tree	Evergreen forests	Chavachi, Ammayikallu	KVB 31566	WG
36	<i>Dysoxylum malabaricum</i> Bedd. ex Hiern	Tree	Evergreen forests	Chavachi, Paripode, Kattikkari, Meenmutty	KVB 31559	SWG
37	<i>Reinwardtiodendron anamalaiense</i> (Bedd.) Mabb.	Tree	Evergreen forests	Mullenpara	KVB 31735	WG
<b>Olaceae</b>						
38	<i>Strombosia ceylanica</i> Gard.	Tree	Evergreen forests	Ambalappara	KVB 31510	

<b>Icacinaceae</b>						
39	<i>Apodytes dimidiata</i> Meyer ex Arn.	Tree	Evergreen forests	Mullenpara	KJD 18734	
40	<i>Gomphandra coriacea</i> Wight	Tree	Evergreen forests	Amabalappara	KJD 22578	
<b>Aquifoliaceae</b>						
41	<i>Ilex wightiana</i> Wall. ex Wight	Tree	Evergreen forests	Amabalappara	KJD 31478	
<b>Celastraceae</b>						
42	<i>Microtropis stocksii</i> Gamble	Shrub	Evergreen forests	Kattikari, Amabalappara	KVB 31705	WG
<b>Hippocrateaceae</b>						
43	<i>Salacia malabarica</i> Gamble	Woody climber	Evergreen and evergreen forests	Semi-Chacachi, KariyenKappu, Meenmutty, Paripode	KJD 22502	SWG
44	<i>Salacia oblonga</i> Wall. ex Wight & Arn.	Woody climber	Evergreen forests	Mullenpara	KVB 31593	
<b>Vitaceae</b>						
45	<i>Ampelocissus indica</i> (L.) Planch.	Climber	Stream side	Kariyenkappu	KJD 18731	
<b>Leeaceae</b>						
46	<i>Lea guineensis</i> G. Don	Shrub	Evergreen forests	Chavachi	NS & KVB 31437	
<b>Sabiaceae</b>						
47	<i>Meliosma pinnata</i> (Roxb.) Maxim. ssp. <i>barbulata</i> (Cufod.) Bens.	Tree	Evergreen forests	Ambalappara	NS & KVB 31368	
<b>Anacardiaceae</b>						
48	<i>Holigarna beddomei</i> Hook. f.	Tree	Semi-evergreen forests	Kariyenkappu	KJD 26349	SWG
<b>Connaraceae</b>						
49	<i>Connarus monocarpus</i> L.	Scandent shrub	Evergreen forests	Pothurumi, Moonamthode	NS & KVB 31395	
<b>Fabaceae/Leguminosae</b>						
<b>Subfamily Faboideae (Papilionoidea)</b>						
50	<i>Aganope thyrsoflora</i> (Benth.) Polhill var. <i>equalata</i> (Bedd.) Thoth. & Das	Woody climber	Evergreen forests	Kurumbankallu	KJD 18722	SWG
51	<i>Crotalaria obtecta</i> Graham ex Wight & Arn.	Shrub	Evergreen Forests	Ambalappara	NS & KJD 31947; KVB 31715	SWG
52	<i>Crotalaria spectabilis</i> Roth	Shrub	Deciduous forests and grasslands	Ambalappara, Narikadvu	KJD 26311; NS & KVB 31429	
53	<i>Desmodium repandum</i> (Vahl) DC.	Undershubs	Evergreen forests	Ambalappara, Pothurumi	KJD 26336	
54	<i>Smithia gracilis</i> Benth.	Herb	Evergreen forests	Ambalappara	KJD 22518	SWG
<b>Subfamily Caesalpinioideae</b>						
55	<i>Kingiodendron pinnatum</i> (Roxb. ex DC.) Harms	Tree	Evergreen forests	Chavachi, Paripode	KVB 31533	SWG
<b>Subfamily Mimosoideae</b>						
56	<i>Archidendron monadelphum</i> (Roxb.) Nielson var. <i>gracile</i> (Bedd.) Sanjappa	Shrub	Evergreen and evergreen forests	Semi-Moonamthode	KJD 31843	SWG
<b>Rosaceae</b>						
57	<i>Rubus ellipticus</i> Smith	Climber	Evergreen forests	Ambalappara	NS & KVB 31369	
58	<i>Rubus glomeratus</i> Blume	Straggling shrub	Evergreen forests	Ambalappara	KJD 25464	PI
<b>Parnassiaceae</b>						
59	<i>Parnassia mysorensis</i> Heyne ex Wight & Arn.	Herb	Evergreen forests	Ambalappara	KJD 25439	
<b>Crassulaceae</b>						
60	<i>Kalanchoe lanceolata</i> (Forssk.) Pers.	Herb	Evergreen forests	Ambalappara	KVB 31669	PI
<b>Myrtaceae</b>						
61	<i>Eugenia argentea</i> Bedd.	Shrub	Evergreen forests	Kattikari, Mullenpara, Chavachi	31359, KVB 31662, 31623	SI
62	<i>Eugenia codyensis</i> Munro ex Wight	Shrub	Evergreen forests	Kattikari, Mullenpara, Ambalappara	KJD 26334, KVB 31665, 31618	
63	<i>Syzygium densiflorum</i> Wall. ex Wight & Arn.	Tree	Evergreen forests	Ambalappara	NS & KJD 31955, KVB 31742, 31590, NS & KVB 31363	SWG
64	<i>Syzygium gardneri</i> Thw.	Tree	Evergreen forests	Meenmutty, Chavchi	KJD 26184	
65	<i>Syzygium hemisphericum</i> (Wight) Alston	Tree	Evergreen forests	Pothurumi, Chavachi	NS & KVB 31307	
66	<i>Syzygium lanceolatum</i> (Lam.) Wight & Arn.	Tree	Evergreen forests	Ambalappara, Asthipara, Pothurumi	NS & KJD, 31941; KVB 31643	
<b>Melastomataceae</b>						
67	<i>Memecylon randerianum</i> SM & MR Almeida	Shrub	Evergreen forests	Pothurumi, Chavach, Kattikari, Kurumbakallu	KVB 31627, KJD 26052	SWG

68	<i>Sonerila rotundifolia</i> Bedd.	Herb	Evergreen forests	Ambalappara, Asthipara	KJD 25429	SWG
<b>Lythraceae</b>						
69	<i>Rotala indica</i> (Willd.) Koebne	Herb	Evergreen forests	Ambalappara, Asthipara	KJD 26327	
<b>Cucurbitaceae</b>						
70	<i>Cayaponia laciniosa</i> (L.) C. Jeffrey	Climber	Evergreen forests	Kattikari, Pothurumi	KJD 31883	
71	<i>Cucumis silentrvalleyi</i> (Manilal, Sabu & Mathen) Ghebret. & Thulin	Climber	Evergreen forests	Mullenpara	KJD 26160	SWG
72	<i>Cucumis sativus</i> L. f. <i>hardwickii</i> (Royle) W.J.de Wilde & Duyffes	Climber	Deciduous forests	Paripode	KJD 18787	
73	<i>Momordica sahyadrica</i> Kattuk. & V.T. Antony	Climber	Evergreen forests	Chavachi, Meenmutty	KJD 31814	WG
74	<i>Trichosanthes lobata</i> Roxb.	Climber	Evergreen forests	Pothurumi	NS & KJD 25537	PI
75	<i>Trichosanthes nervifolia</i> L.	Climber	Evergreen forests	Chavachi, Paripode	KVB 31537	
76	<i>Zehneria maysoensis</i> (Wight & Arn.) Arn.	Climber	Evergreen forests	Kattikari, Chavachi, Pothurumi, Ambalappara	KJD 25430	WG
<b>Begoniaceae</b>						
77	<i>Begonia integrifolia</i> Dalz.	Herb	Evergreen forests	Chavachi, Kattikkari, Pothanplavu, Meenmutty	KJD 31883	PI
<b>Apiaceae/Umbelliferae</b>						
78	<i>Heracleum candolleianum</i> (Wight & Arn.) Gamble	Herb	Evergreen forests	Ambalappara	KJD 25507	SWG
<b>Araliaceae</b>						
79	<i>Schefflera roxburghii</i> Gamble	Straggling shrub	Evergreen forests	Chavachi, Kariyenkappu, Ambalappara	KVB 31365, KVB 31396	SWG
<b>Rubiaceae</b>						
80	<i>Argostemma verticillatum</i> Wall.	Herb	Evergreen forests	Kannadivechakunnu	KJD 26192	
81	<i>Canthium coromandelicum</i> (Burm. f.) Alston	Shrub	Evergreen forests	Ambalappara	KJD 31965	
82	<i>Canthium rheedei</i> DC.	Shrub	Evergreen forests	Chelachuvadu, Crossway, Chavachi, Kariyenkappu	KJD 31813, 31709	PI
83	<i>Discospermum apiocarpum</i> Dalz. ex Hook.f.	Tree	Evergreen forests	Ambalappara, Asthipara	KJD 26328, KVB 31352	
84	<i>Hedyotis leschenaultiana</i> DC.	Shrub	Evergreen forests	Ambalappara	KVB 31645; KJD 26330	
85	<i>Meyna laxiflora</i> Robyns	Shrub to small tree	Evergreen forests	Paripode	KJD 26702	
86	<i>Neanotis monosperma</i> (Wall. ex Wight & Arn.) Lewis	Herb	Evergreen forests	Mullenpara	KJD 31936	PI
87	<i>Ophiorrhiza barberi</i> Gamble	Herb	Evergreen forests	Meenmutty, Chavachi, Moonamthode, Mullenpara and Asthipara	KJD 26182, 26094, 26170	SWG
88	<i>Ophiorrhiza rugosa</i> Wall. var. <i>decumbens</i> (Gard. ex Thw.) Deb & Mondal	Herb	Evergreen forests	Kariyenkappu	KJD 26109	
89	<i>Pavetta breviflora</i> DC.	Shrub	Evergreen forests	Kannadivechakunnu, Chavachi and Pothurumi	KJD 25569, KVB 31734	SWG
90	<i>Pavetta brunonis</i> G. Don	Shrub	Evergreen forests	Pothurumi, Chavachi	KVB 31379, KVB 31389	SWG
91	<i>Psychotria bisulcata</i> Wight & Arn.	Shrub	Evergreen forests	Mullenpara, Kattikari and Meenmutty	KJD 26163, 31932	
92	<i>Psychotria macrocarpa</i> Hook. f.	Shrub	Evergreen forests	Mullenpara	KJD 26053	SWG
93	<i>Psydrax dicoccos</i> Gaertn.	Tree	Evergreen forests	Ambalappara and Mullenpara	KVB 31575, 31636	
94	<i>Tarenna alpestris</i> (Wight) Balakr.	Shrub	Evergreen forests	Ambalappara	KVB 31641; KJD 31945	SWG
<b>Asteraceae/ Compositae</b>						
95	<i>Adenoon indicum</i> Dalz.	Herb	Evergreen forests	Ambalappara	NS & KJD 25510	PI
96	<i>Anaphalis aristata</i> DC.	Herb	Evergreen forests	Ambalappara	KJD 25467	PI
97	<i>Anaphalis leptophylla</i> (DC.) DC.	Herb	Grasslands	Ambalappara	KJD 26344, KVB 31767	SWG
98	<i>Anaphalis subdecurrens</i> (DC.) Gamble	Herb	Grasslands	Ambalappara	KJD 25465	
99	<i>Cissampelopsis corymbosa</i> (Wall. ex DC.) Jeffrey & Chen.	Climber	Evergreen forests	Kurumbakallu	KJD 18774	
100	<i>Helicbrysum buddleioides</i> DC.	Shrub	Evergreen forests	Ambalappara	KJD 31729	
<b>Vacciniaceae</b>						
101	<i>Vaccinium neilgherrense</i> Wight	Tree	Evergreen forests	Ambalappara	NS & KVB 31353, 31756	SWG
<b>Myrsinaceae</b>						
102	<i>Rapanea capitellata</i> (Wall.) Mez	Tree	Evergreen forests	Ambalappara	NS & KJD 31951	

<b>Ebenaceae</b>						
103	<i>Diospyros assimilis</i> Bedd.	Tree	Evergreen forests	Chavachi, Chelachuvadu and Meenmutty	NS & KVB 31309	WG
104	<i>Diospyros bourdillonii</i> Brandis	Tree	Evergreen forests	Chavachi and Asthippara	NS & KVB 31390	SWG
105	<i>Diospyros buxifolia</i> (Blume) Hiern	Tree	Evergreen forests	Kannadivechakunnu	KJD 18792	
106	<i>Diospyros nilagirica</i> Bedd.	Tree	Evergreen forests	Asthippara, Amvalappara	KVB 31714, KJD 26079	SWG
<b>Symplocaceae</b>						
107	<i>Symplocos macrophylla</i> Wall. ex A. DC	Tree	Evergreen forests	Kattikkari	KJD 26013	SWG
108	<i>Symplocos racemosa</i> Roxb.	Tree	Evergreen forests	Ambalappara	NS & KJD 25508	
109	<i>Symplocos nynadense</i> (O. Ktze.) Nootb.	Tree	Evergreen forests	Kattikkari, Mullenpara and Ambalappara	KVB 31574	SWG
<b>Apocynaceae</b>						
110	<i>Chonemorpha fragrans</i> (Moon) Alston	Woody climber	Semi-evergreen forests	Narikkadavu, Pookund and Paripode	NS & KVB 31444	
<b>Asclepiadaceae</b>						
111	<i>Ceropegia metziana</i> Miq.	Climber	Evergreen forests	Mullenpara, Kattikari and Ambalappara	KVB 31658, NS & KJD 31979	SWG
112	<i>Gynemna montanum</i> (Roxb.) Hook. f.	Climber	Evergreen forests	Chavachi and Chelachuvadu	KJD 26120; KVB 31515	
113	<i>Marsdenia raziana</i> Yoga & Subram.	Climber	Evergreen forests	Kattikari, Pothurumi, Chavachi and Mullenpara	KVB 31548	SI
114	<i>Toxicarpus palghatensis</i> Gamble	Climber	Evergreen forests	of Meenmutty	KJD 31491	SWG
115	<i>Tylophora cappariifolia</i> Wight & Arn.	Climber	Evergreen forests	Ambalappara and Chavachi	KVB 31708	SWG
<b>Periplocaceae</b>						
116	<i>Decalepis nervosa</i> (Wight & Arn.) Venter	Climbing shrubs	Evergreen forests	Ambalappara	KVB 31703	WG
<b>Gentianaceae</b>						
117	<i>Svertia beddomei</i> Clarke	Herb	Evergreen forests	Ambalappara	KVB 31652; NS & KJD 31942	SWG
<b>Boraginaceae</b>						
118	<i>Ehretia canarensis</i> (Clarke) Gamble	Tree	Evergreen and evergreen forests	Semi-Valayamchal and Chavachi	KVB 31204	PI
<b>Convolvulaceae</b>						
119	<i>Ipomoea barlerioides</i> (Choisy) Benth. ex Clarke	creepers or twiners	Grasslands	Ambalappara	, KVB 31689; KJD 26308	
<b>Scrophulariaceae</b>						
120	<i>Sopubia trifida</i> Buch.-Ham. ex D. Don	Herb	Evergreen forests	Ambalappara	KJD 25459	
<b>Orobanchaceae</b>						
121	<i>Campbellia neilgherica</i> (Gardner) Panigrahi et Das	Herb	Evergreen forests	Evergreen forests	KJD 26123	
122	<i>Christisonia bicolor</i> Gard.	Herb	Evergreen forests	Kattikari	KVB 31670	
<b>Gesneriaceae</b>						
123	<i>Rhynchoglossum obliquum</i> Blume var. <i>parviflorum</i> Clarke	Herb	Evergreen forests	Moonamthode, Meenmutty and Chavachi	KJD 31596	
<b>Acanthaceae</b>						
124	<i>Andrographis neesiana</i> Wight	Herb	Evergreen forests	Evergreen forests	NS & KJD 31975	
125	<i>Barleria involucrata</i> Nees	Shrub	Evergreen forests	Mullenpara	NS & KJD 31927	
126	<i>Haplantodes neilgherryensis</i> (Wight) Majumdar	Herb	Evergreen and evergreen forests	Semi-Moonamthode, Paripode and Karienkappu	KVB 31542	
127	<i>Strobilanthes barbatus</i> Nees	Shrub	Evergreen forests	Meenmutty, Monamthode, Kattikari and Chavachi	KVB 31284	WG
128	<i>Strobilanthes decurrens</i> Nees	Shrub	Evergreen forests	Kattikari	KJD 26081	SWG
<b>Verbenaceae</b>						
129	<i>Premna glaberrima</i> Wight	Shrub	Evergreen forests	Pothanplavu and Karienkappu	KJD 26113	SWG
<b>Lamiaceae/ Labiate</b>						
130	<i>Pogostemon gardneri</i> Hook.f.	Herb	Evergreen forests	Ambalappara	KVB 31585	SWG
131	<i>Pogostemon mollis</i> Benth.	Shrub	Evergreen forests	Ambalappara	NS & KJD 25514; KVB 31750	WG
132	<i>Pogostemon peethapushpum</i> Pradeep	Shrub	Evergreen forests	Ambalappara	NS & KJD 25514; KVB 31750	WG
133	<i>Pogostemon pubescens</i> Benth.	Shrub	Evergreen forests	Ambalappara	KJD 18757	
<b>Polygonaceae</b>						
134	<i>Persicaria nepalensis</i> (Meisner) Gross	Herb	Evergreen forests	Ambalappara	NS & KJD 25503	

<b>Piperaceae</b>						
135	<i>Piper wightii</i> Miq.	Climber	Evergreen forests	Ambalappara	KVB 31746	WG
<b>Myristicaceae</b>						
136	<i>Myristica malabarica</i> Lam.	Tree	Evergreen and Semi-evergreen forests	Paripode, Chavachi and Valayamchal	KVB 31655, KVB 31678	WG
<b>Lauraceae</b>						
137	<i>Cinnamomum nicolsonianum</i> Manilal & Shylaja	Tree	Evergreen forests	Kattikari	KJD 26119	SWG
138	<i>Cinnamomum macrocarpum</i> Hook. f.	Tree	Semi-evergreen forests	Pothanplavu to Meenmutty and Paripode	KVB 31267	SWG
139	<i>Cinnamomum perrottetii</i> Meisner	Tree	Evergreen forests	Ambalappara and Pothurumi	KJD 18770	SWG
140	<i>Cinnamomum heyneanum</i> Nees	Tree	River banks	Valayamchal	KJD 31475	SWG
141	<i>Cinnamomum wightii</i> Meisner	Tree	Evergreen forests	Ambalappara and Asthippara	KJD 22576	SWG
142	<i>Litsea ghatica</i> Saldanha	Tree	Semi-Evergreen forests	Valayamchal to Narikkadavu	KJD 26198	WG
143	<i>Litsea wightiana</i> (Nees) Hook. f.	Tree	Evergreen forests	Ambalappara and Pothurumi	KVB 31656	SWG
144	<i>Neolitsea scrobiculata</i> (Meisner) Gamble	Tree	Evergreen forests	Kannadivechakunnu	NS & KJD 25549	WG
<b>Loranthaceae</b>						
145	<i>Dendrophthoe trigona</i> (Wight & Arn.) Danser ex Sant.	Shrub	Evergreen forests and Semi-evergreen forests	Chavachi, Kattikari, Chelachuvadu, Kariyenkappu, Pookund and Paripode	NS & KVB 31314	WG
146	<i>Macrosolen capitellatus</i> (Wight & Arn.) Danser	Shrub	Semi-Evergreen forests	Kariyenkappu	KJD 26001	
<b>Santalaceae</b>						
147	<i>Osyris quadripartita</i> Salzm. ex Decne.	Shrub	Margins of Grass lands and Evergreen forests	Ambalappara	KJD 26131, NS & KVB 31345	
<b>Balanophoraceae</b>						
148	<i>Balanophora abbreviata</i> Blume	Herb	Evergreen forests	Ambalappara	NS & KJD 31985	
<b>Euphorbiaceae</b>						
149	<i>Acephala excelsa</i> (Dalz.) Muell.-Arg.	Tree	Evergreen forests	Kattikari	NS & KVB 31339	
150	<i>Agrostistachys indica</i> Dalz.	Shrub	Evergreen forests	Kattikari, Mullenpara and Asthipara	KVB 31620	PI
151	<i>Aporosa fusiformis</i> Thw.	Tree	Evergreen forests and Semi-evergreen forests	Chavachi and Paripode.	KVB 31798	
152	<i>Croton malabaricus</i> Bedd.	Tree	Evergreen forests and Semi-evergreen forests	Pothanplavu to Meenmutty	KJD 18727	SWG
153	<i>Drypetes confertiflora</i> (Hook.f.) Pax & Hoffm.	Tree	Semi-evergreen forests	Kariyenkappu, Chulikandam, Pothanplavu and Bhoothamkallu	NS & KJD 31995	SWG
154	<i>Glochidion bobenackeri</i> (Muell.-Arg.) Bedd. var. <i>johnstonei</i>	Tree	Evergreen forests	Moonamthode	KJD 26374	PI
155	<i>Mallotus beddomei</i> Hook. f.	Tree	Evergreen forests and Semi-evergreen forests	Chelachuvadu, Chavachi, Kattikari and Monnamthode and Paripode	KJD 31805	SWG
156	<i>Micrococca beddomei</i> (Hook.f.) Prain	Herb	Evergreen forests	Kattikari and Kannadivechakunnu	KVB 31556	SWG
157	<i>Sauropus gour-maitii</i> Chakrab. & M.Gangop.	Shrub	Evergreen forests	Pothurumi	NS & KJD 25551	WG
158	<i>Tagia montana</i> (Thw.) Muell.-Arg.	twiners	Evergreen forests	Ambalappara and Mullenpara	NS & KJD 31959	WG
<b>Urticaceae</b>						
159	<i>Elatostema wightii</i> Hook. f.	Herb	Evergreen forests	Ambalappara	KJD 26127	WG
<b>Moraceae</b>						
160	<i>Artocarpus gomezianus</i> Wall. ex Trecul ssp. <i>zeylanicus</i> Jarrett	Tree	Semi-evergreen forests	Paripode	KJD 26319	
161	<i>Ficus beddomei</i> King	Tree	Evergreen forests	Chavachi	KJD 26378	WG
<b>Orchidaceae</b>						
162	<i>Acanthophippium bicolor</i> Lindl.	Herb	Evergreen forests	Kattikari	KJD 26317	
163	<i>Aerides crispa</i> Lindl.	Herb	Evergreen forests	Ambalappara	NS & KVB 31417	WG
164	<i>Aphyllorchis montana</i> Rehb.f.	Herb	Evergreen forests	Vellachatamkunnu and Kannadivechakunnu	KJD 31470	
165	<i>Brachycorythis iantha</i> (Wight) Summerh.	Herb	Grasslands	Ambalappara	KJD 26126	
166	<i>Bulbophyllum rosemarianum</i> Sathish & Saleem	Herb	Evergreen forest	Kariyenkappu, Crossway and Chavachi	NS & KJD 31986	SWG

167	<i>Cheirostylis parvifolia</i> Lindl.	Herb	Evergreen forests	Kannadivechakunnu	KJD 25562	
168	<i>Coelogyne odoratissima</i> Lindl.	Herb	Evergreen forests	Ambalappara	KVB 31738	
169	<i>Conchidium microchilos</i> (Dalz.) Rauschert	Herb	Evergreen forests	Ambalappara	KJD 25460	
170	<i>Dendrobium nutans</i> Lindl.	Herb	Evergreen forests	Ambalappara	KVB 31581	
171	<i>Gastrochilus flabelliformis</i> (Baltt. & McCann) Saldanha	Herb	Evergreen forests	Kattikkari Kariyenkappu	KJD 31589	WG
172	<i>Habenaria digitata</i> Lindl.	Herb	Evergreen forests	Ambalappara	KJD 25456	
173	<i>Habenaria longicornu</i> Lindl.	Herb	Evergreen forest	Ambalappara	KJD 25498	PI
174	<i>Habenaria perrottetiana</i> A. Rich.	Herb	Grasslands	Ambalappara	KJD 25499	SI
175	<i>Kingidium mysorensis</i> (Saldanha) Sathish	Herb	Moist deciduous forests	Paripode	KJD 26187	SI
176	<i>Malaxis purpurea</i> (Lindl.) O. Ktze.	Herb	Evergreen forests	Ambalappara	KJD 25447	
177	<i>Oberonia wynadensis</i> Sivad. & Balakr.	Herb	Evergreen forests	Ambalappara	NS & KJD 25516	SWG
178	<i>Peristylus aristatus</i> Lindl.	Herb	Evergreen forests	Ambalappara Asthippara	KJD 25454, 25457, 25458, 26158	
179	<i>Peristylus richardianus</i> Wight	Herb	Evergreen forests	Ambalappara	NS & KJD 25512	
180	<i>Pteroceras leopardinum</i> (Parish & Rehb.f.) Seidenf. & Smitin.	Herb	Evergreen forests	Kariyenkappu	KVB 31594	
181	<i>Satyrium nepalense</i> D. Don	Herb	Grasslands	Ambalappara	KJD 26316	
182	<i>Zeuxine gracilis</i> (Breda) Blume	Herb	Evergreen forests	Asthippara	KJD 26087	
<b>Zingiberaceae</b>						
183	<i>Amomum hypoleucum</i> Thw.	Herb	Evergreen forests Semi-evergreen forests and Moist deciduous forests	Kariyenkappu, Pothamplavu, Narikkadavu, Meenmutty Paripode	KJD 31485	
184	<i>Amomum pterocarpum</i> Thw.	Herb	Evergreen forests Semi-evergreen forests and Moist deciduous forests	Kariyenkappu, Chavachi, Pothanplavu Paripode,	KJD 26116, KJD 25420	
185	<i>Curcuma aurantiaca</i> Zipp	Herb	Moist Deciduous Forests	Paripode, Nraikkadvu, Pookund	KJD 26179	WG
186	<i>Zingiber wightianum</i> Thw.	Herb	Moist Deciduous Forests	Paripode	KJD 25421	
<b>Musaceae</b>						
187	<i>Ensete superbum</i> (Roxb.) Cheesman.	Herb	Evergreen forests	Meenmutty	KJD 18784	
<b>Hypoxidaceae</b>						
188	<i>Hypoxis aurea</i> Lour.	Herb	Grasslands Evergreen	and Ambalappara	KVB 31701	
<b>Smilacaceae</b>						
189	<i>Smilax wightii</i> A. DC.	Climbers	Evergreen forests	Kattikkari	KJD 26025	SWG
<b>Commelinaceae</b>						
190	<i>Belosynapsis vivipara</i> (Dalz.) C.E.C. Fisch.	Herb	Evergreen forests	Kattikkari, Mullenpara Ambalappara	NS & KJD 31909, KJD 25443	WG
191	<i>Commelina clavata</i> Clarke	Herb	Grasslands	Ambalappara	KJD 25434	
192	<i>Commelina paludosa</i> Blume	Herb	Evergreen forests	Meenmutty, Valayamchal, Kattikkari	KVB 31301, KVB 31338	
193	<i>Cyanotis racemosa</i> Heyne ex Hassk.	Herb	Evergreen forests	Kariyenkappu	KJD 25401	
194	<i>Cyanotis tuberosa</i> (Roxb.) Schult. f.	Herb	Grasslands	Meenmutty	KJD 25509	PI
195	<i>Cyanotis villosa</i> (Spreng.) Schult. f.	Herb	Evergreen forests	Meenmutty Kurumbamkallu	and KJD 31514	
196	<i>Murdannia loriformis</i> (Hassk.) Rao et Kammatthy	Herb	Semi-evergreen forests	Kariyenkappu	KJD 31829	
197	<i>Murdannia semiteres</i> (Dalz.) Sant.	Herb	Evergreen forests	Ambalappara, Kattikkari, Mullenpara	and KJD 25502	PI
198	<i>Murdannia simplex</i> (Vahl) Brenan	Herb	Grasslands	Asthippara Ambalappara	KJD 25462	
<b>Araceae</b>						
199	<i>Amorphoballus nicolsonianus</i> Sivad.	Herb	Evergreen forests	Kattikkari	KJD 25543	SWG
200	<i>Arisaema barnesii</i> C.E.C. Fisch.	Herb	Evergreen forests	Ambalappara Mullenpara	NS & KVB 31343	SWG
201	<i>Cryptocoryne retrospiralis</i> (Roxb.) Kuntb	Herb	Semi-evergreen forests	Kariyenkappu	KJD 26148	
202	<i>Remusatia vivipara</i> (Roxb.) Schott	Herb	Evergreen forests	Kattikkari Mullenpara	and NS & KVB 31336	
<b>Najadaceae</b>						
203	<i>Najas graminea</i> Del.	Herb	ponds	Kariyenkappu	NS & KVB 31374	
<b>Eriocaulaceae</b>						
204	<i>Eriocaulon pectinatum</i> Rubland	Herb	Evergreen forests	Ambalappara	KJD 31973	
205	<i>Eriocaulon robustobrownianum</i> Rubland	Herb	Evergreen forests	Ambalappara	KVB 31639	PI
206	<i>Eriocaulon talbotii</i> R. Ansari & N.P. Balakr.	Herb	Evergreen forests	Ambalappara	KJD 25571; NS & KJD 25530	WG



207	<i>Eriocaulon thwaitesii</i> Koernicke	Herb	Evergreen forests and Grasslands	Ambalappara	KVB 31640; NS & KJD825531
<b>Cyperaceae</b>					
208	<i>Cyperus sphacelatus</i> Rottb.	Herb	River side	Narikkadavu	NS & KVB 26240
209	<i>Fimbristylis complanata</i> (Retz.) Link	Herb	Grasslands	Ambalappara	KJD 25527
210	<i>Schoenoplectus mucronatus</i> (L.) Palla	Herb	Evergreen forests	Ambalappara	KJD 26248
<b>Poaceae/ Graminae</b>					
211	<i>Isachne globosa</i> (Thunb.) O. Ktze.	Herb	Evergreen forests	Ambalappara	KVB 26216
212	<i>Isachne walkeri</i> (Am. ex Steud.) Thw.	Herb	open areas	Ammayikallu	KVB 26217
213	<i>Jansenella griffithiana</i> (C. Muell.) Bor	Herb	Grasslands	Ambalappara	KJD 25525
214	<i>Paspalum canarae</i> (Steud.) Veldk.	Herb	Evergreen forests	Ambalappara	NS & KJD 26242
215	<i>Themeda cymbaria</i> (Roxb.) Hack.	Herb	Grasslands	Ambalappara	KVB 26226 PI
216	<i>Tripogon bromoides</i> Roem. & Schult.	Herb	Evergreen forests	Ambalappara	KJD 25523

NS N Sasidharan, KJD Dantas K J, KVB Binu K V, PI Peninsular India, SI South India, WG Western Ghats, SWG Southern Western Ghats

*Pogostemon peethapushpam* Pradeep, *Orophea sivarajanii* Sasidh., *Miliusa wayanadica* Sujanapal, Ratheesh & Sasidh. and *Impatiens veerapazhasii* Ratheesh, Sujanapal & Meera are new species recently described from northern Kerala and this is the first collection from the outside of the type locality. *Ophiorrhiza barberi* is endemic to the Anamalai, Agasthyamala and Puleeny Hills of southern Western Ghats. Collection from the Sanctuary is the first report from the Nilgiri region.

The study area has undisturbed forests like Chavachi, Vellachadamkunnu, Pothurumi, Mullenpara, Ambalappara and upper areas of Meenmutty. Nearly 190 species are reported from these areas. Ambalappara is the highest peak of the Sanctuary. Ambalappara- Pothurumi area shows the maximum diversity of plants.

The present investigation reveals that the undisturbed evergreen and semi evergreen forests harbour most of the diversity. Amabalappara, Asthippara, Mullenpara, Pothurumi, Chavachi and Kattikari are the areas with respect to the occurrence of endemic taxa.

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