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RESEARCH ARTICLE

FLORISTIC COMPOSITION AND LIFE FORM SPECTRUM ANALYSIS IN MANAGATHIFOREST, ARIYALUR DISTRICT, TAMILNADU

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ABSTRACT

Managathi forest of Ariyalur district, Tamilnadu was explored for the floristic studies and life form spectrum. It covers an area 32ha. Totally 141Angiosprmic plant species represented by 105 genera belonging to 49 families and the habit wise distribution of plants species dominance of herb 48 (28.36%)followed by shrub 38 species (26.95%), trees 36 species (25.53%)and climber 27 species (19.14%) were recorded. Life form spectrum revealed the dominance of Phanerophytes (55.31%) and these were followed by the Therophytes (35.46%), Chameophytes (14.63%), Hemicryprophytes (2.83%) and Cryptophytes (2.12%). Phanerophytes were found higher than the normal biological spectrum which indicated that study area prevailing environment. Some rare plants are confined these forest.

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INTRODUCTION

The detailed and systematic measurements of forest structure and floristicsare necessary for the study of forest dynamics, plant animal interactions and nutrient cycling (Reddy Sudhakar *et al.,* 2009). As life support system forests are the most important component on the earth. The rich Biodiversity has been instrumental in providing humanity with food security, health care goods, ecosystem function and stability (Pitchairamu *et al*., 2008). Tropical forests constitute the most diverse plant communities on the earth. During last few decades, for one or the other reasons the biodiversity of these forests are disappearing at alarming rate. To satisfy the needs and greed of the people, many important plants are threatened and becoming rare, even some are on the verge of extinction. The problem with the chronic form of forest disturbance is that plants or ecosystem often do not get time to recover adequately because the human onslaught never stops. Therefore it is very urgent to stop exploitation and develop an appropriate strategy for conservation and sustainable utilization of plant resources. Globally important biological diversity territories are called hot spot territories and India is one of the hot spot territories of the world having rich vegetation with a wide variety of plants.

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Biodiversity is the degree of nature variety including both the number and frequency of ecosystem, species genes assemblage (McNeely, 1988)or the variability among the living organisms from all sources including, interalia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part of this includes diversity within species, between species and ecosystem (Agarwal, 2002).

Plant biodiversity are precious endowment of nature upon which mankind has always been dependent. The different nutritional values of fruits and seeds enable a species to get the variety of the chemical that are necessary for its diet and hence to graze without exhausting the population of a given species (Trivedi, 2000). The studies of biodiversity have now assumed greater significance as ecologiststry seriously to document global biodiversity in the face of unprecedented perturbations, habit loss and extinction rates. To understand and assess richness of biodiversity, a taxonomic study of the flora of forests is very much essential. Floristic surveys are the only means by which we can achieve this goal. The floristic studies are considered the backbone of the assessment of phytodiversity, conservation management and sustainable utilization (Jayanthi and Rajendran, 2013). Vegetation is an important part of an ecosystem that interprets the effects of total environment (Billing 1952).

Vegetation complex fluctuates from season to season in a cycle over the years in a successional way and the fluctuations suggest a response by each species population to prevailing heat, moisture and light as modified by the vegetation itself. In forest ecosystem, the plant component is more important than the other living component of the system for the determination of its structure and function (Richards 1996). Raunkiaer (1934) proposed a life form system for the description of vegetation on physiognomic basis. This system is ecologically oriented and based primarily on the position of perennating organs or buds from which new shoots or foliage developed after an unfavorable season. He described communities of different climatic zones on earth on the basis of life form (the sum of adaptation of the plant to climate) composition.

MATERIALS AND METHODS

The study area Managathi forest, located at Udayarpalayam Taluk, Ariyalur district, Tamilnadu. The district boundaries are North of Cuddalour. West of Perambalur, East of Nagappattinam and south &east of Thanjavur district. It is geographical limit is 11º 08'12.09"N Latitude, 79º 04'33"E longitude , with elevation ranging 83m altitude above mean sea level. The temperature ranges from 33-40ºC during summer and 17ºC to 30ºC during winter. The annual rainfall was 954mm.

The floristic vegetation of the study area stand as tropical dry evergreen forest with local variations. Field trips to various parts of the selected area under taken to collect the specimens and information have to be used for future reference. The segments were visited repeatedly. The collected specimens were identified and systematic enumeration was made with available monographs, relevant literatures and taxonomic revisions (Gamble 1935, Mathew KM 1982).All the species were assigned a suitable life formand a biological spectrum was prepared. This was compared with the (Raunkiaer, 1934) normal biological spectrums.

RESULTS

A total 141 species of vascular plants belonging to 105 genera distributed among 49 families were recorded (Table1). Based on the habit classification of the 141 plants, the maximum numbers of species were herbs 40 species (28.36%), followed by shrubs 38 species (26.95%), trees 36 species (25.53%)and climbers 27 species (19.14%). Among the families Caesalpiniaceae was most dominant comprising 4 genera and 11 species followed by Mimosaceae, Euphorbiaceae represented by 8 species.Lamiaceae represented by 7 species. Malvaceae, Acanthaceae represented by 6 species. Asclepiadaceae, Asteraceae, Convolvulaceae, and Moraceae represented by 5 species. Capparaceae, Poaceae,

Table 1. Floristic composition, Habit and life form of the species in study area

S.No.	Species name	Family	Habit	Life form
1	*Abrus precatorius* L.	Fabaceae	Straggler	Ph
2	*Abutilon hirtum* (L.) Sweet	Malvaceae	Shrub	Ph
3	*Abutilon indicum* (L.) Sweet	Malvaceae	Shrub	Ph
4	*Acacia caesia* (L.) Willd.	Mimosaceae	Straggler	Ph
5	*Acacia chundra* (Rottler) Willd.	Mimosaceae	Tree	Ph
6	*Acacia leucophloea* (Roxb.) Willd.	Mimosaceae	Tree	Ph
7	*Acacia nilotica* (L.) Willd. ex Del.	Mimosaceae	Tree	Ph
8	*Acacia pinnata* L.	Mimosaceae	Straggler	Ph
9	*Acacia torta* L.	Mimosaceae	Tree	Ph
10	*Acalypha indica* L.	Euphorbiaceae	Shrub	Th
11	*Achyranthes aspera* L.	Amaranthaceae	Herb	Th
12	*Adhatoda zeylanica* Medic.	Acanthaceae	Shrub	Ph
13	*Aegle marmelos* (L.) Corr.	Rutaceae	Tree	Ph
14	*Aerva lanata* (L.) Juss.	Amaranthaceae	Herb	Th
15	*Agave americana* L.	Agavaceae	Herb	He
16	*Alangium salvifolium* (L.f.) Wang. ssp. *Salvifolium*	Alanginaceae	Tree	Ph
17	*Albizia amara* (Roxb.) Boivin	Mimosaceae	Tree	Ph
18	*Albizia lebbeck* Benth.	Mimosaceae	Tree	Ph
19	*Aloe vera* (L.) N. Burman	Liliaceae	Herb	He
20	*Alternanthera sessilis* (L.) R.Br.	Amaranthaceae	Herb	Ch
21	*Amaranthus spinosus* L.	Amaranthaceae	Herb	Th
22	*Ammannia baccifera* L.	Lythraceae	Herb	Th
23	*Anacardium occidentale* L.	Anacardiaceae	Tree	Ph
24	*Andrographis paniculata* Nees	Acanthaceae	Shrub	Th
25	*Anisomeles malabarica* R.Br. ex Sims	Lamiaceae	Shrub	Th
26	*Annona squamosa* L.	Annonaceae	Tree	Ph
27	*Argemone mexicana* L.	Papavaraceae	Herb	Th
28	*Argyreia cymosa* (Roxb.) Sw.	Convolvulaceae	Straggler	Ph
29	*Aristolochia bracteolata* Lam.	Aristolochiaceae	Twiner	Th
30	*Aristolochia indica* L.	Aristolochiaceae	Twiner	Th
31	*Artocarpus heterophyllus* Lam.	Moraceae	Tree	Ph
32	*Asparagus racemosus* Willd.	Liliaceae	Climber	Ph
33	*Azadirachta indica* A. Juss.	Meliaceae	Tree	Ph
34	*Bambusa arundinacea* (Retz.) Roxb.	Poaceae	Tree	Ph
35	*Barleria prionitis* L.	Acanthaceae	Shrub	Ph

Continue …….

36	*Bauhinia racemosa* Lam.	Caesalpiniaceae	Tree	Ph
37	*Boerhaavia diffusa* L.	Nyctaginaceae	Herb	He
38	*Cadaba fruticosa* (L.) Druce	Capparaceae	Shrub	Ph
39	*Calotropis gigantea*, R.Br. ex Ait.	Asclepiadaceae	Shrub	Ph
40	*Calotropis procera* (Ait.) R.Br	Asclepiadaceae	Shrub	Ph
41	*Canthium coromandelicum* (N. Burm.) Alst.	Rubiaceae	Shrub	Ph
42	*Capparis divaricata* Lam.	Capparaceae	Shrub	Ph
43	*Capparis sepiaria* L.	Capparaceae	Shrub	Ph
44	*Capparis zeylanica* L.	Capparaceae	Shrub	Ph
45	*Cardiospermum halicacabum* L.	Sapindaceae	Vine	Ph
46	*Carrissa carandas* L. Mantiss.	Apocynaceae	Shrub	Ph
47	*Carrissa spinarum* L. Mantiss.	Apocynaceae	Shrub	Ph
48	*Cassia absus* L.	Caesalpinaceae		Th
49	*Cassia auriculata* L.	Caesalpinaceae	Shrub	Ph
50	*Cassia fistula* L.	Caesalpiniaceae	Tree	Ph
51	*Cassia occidentalis* L	Caesalpinaceae	Shrub	Ph
52	*Cassia siamea* Lam.	Caesalpiniaceae	Tree	Ph
53	*Cassia sophera* L.	Caesalpiniaceae	Tree	Ph
54	*Cassia surattensis* N. Burman.	Caesalpiniaceae	Tree	Ph
55	*Cassia tora* L.	Caesalpinaceae	Shrub	Th
56	*Casuarina equisetifolia* L.	Casuarinaceae	Tree	Ph
57	*Catharanthus roseus* (L.) G.Don.	Apocynaceae	Herb	Th
58	*Chloris barbata* Sw.	Poaceae	Herb	Th
59	*Chloris virgata* L.	Poaceae	Herb	Th
60	*Cissus quadrangularis* L.	Vitaceae	Climber	Ph
61	*Cleome gynandra* L.	Cleomaceae	Herb	Th
62	*Cleome viscosa* L.	Cleomaceae	Herb	Th
63	*Clerodendrum inerme* (L.) Gaertn.	Verbenaceae	Shrub	Ph
64	*Clitoria ternatea* L.	Fabaceae	Climber	Th
65	*Coccinia grandis* (L.) Voigt.	Cuccurbitaceae	Climber	Th
66	*Cocculus hirsutus* (L.) Diels	Menispermaceae	Climber	Ph
67	*Commelina benghalensis* L.	Commelinaceae	Herb	Th
68	*Croton bonplandianus* Baillon	Euphorbiaceae	Shrub	Th
69	*Cuscuta reflexa* Roxb.	Cuscutaceae	Climber	Ph
70	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb	Ch
71	*Datura metel* L. Solanaceae	Solanaceae	Shrub	Ph
72	*Delonix regia* (Boj. ex Hook.f.) Raf.	Fabaceae	Tree	Ph
73	*Dodonaea viscosa* L.	Sapindaceae	Shrub	Ph
74	*Eclipta alba* (L.) Hassk.	Asteraceae	Herb	Th
75	*Eucalyptus globulus* Labill	Myrtaceae	Tree	Ph
76	*Euphorbia hirta* L.	Euphorbiaceae	Herb	Th
77	*Euphorbia tirucalli* L.	Euphorbiaceae	Shrub	Th
78	*Evolvulus alsinoides* (L.) L.	Convolvulaceae	Herb	Ch
79	*Ficus benghalensis* L.	Moraceae	Tree	Ph
80	*Ficus hispida* L.f.Suppl.	Moraceae	Tree	Ph
81	*Ficus racemosa* L.	Moraceae	Tree	Ph
82	*Ficus religiosa* L.	Moraceae	Tree	Ph
83	*Gloriosa superba* L.	Liliaceae	Climber	Cr
84	*Gymnema sylvestre* R.Br.	Asclepiadaceae	Straggler	Ph
85	*Heliotropium indicum* L.	Boraginaceae	Herb	Th
86	*Hemidesmus indicus* R.Br.	Periplocaceae	Straggler	Ph
87	*Hibiscus ros-sinensis* L.	Malvaceae	Shrub	Ph
88	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Shrub	Th
89	*Ipomoea nil* (L.) Roth	Convolvulaceae	Climber	Th
90	*Ipomoea obscura* (L.) Ker-Gawl.	Convolvulaceae	Climber	Th
91	*Ipomoea pes-tigridis* L.	Convolvulaceae	Climber	Th
92	*Jatropha glandulifera* Roxb.	Euphorbiaceae	Shrub	Ph
93	*Jatropha gossypifolia* L.	Euphorbiaceae	Shrub	Ph
94	*Justicia diffusa* willd.	Acanthaceae	Herb	Th
95	*Lannea coromandelica* (Houttuyn) Merr.	Anacardiaceae	Tree	Ph
96	*Lantana camara* L.	Verbenaceae	Shrub	Ph
97	*Launaea procumbens* (Roxb.) Ramayya & Rajgopal	Asteraceae	Herb	He
98	*Leucas aspera* Spreng.	Lamiaceae	Herb	Th
99	*Mangifera indica* L.	Anacardiaceae	Tree	Ph
100	*Melia azadirachta* L.	Meliaceae	Tree	Ph
101	*Mollugo pentaphylla* L.	Aizoaceae	Herb	Th
102	*Momordica charantia* L.	Cuccurbitaceae	Tree	Th
103	*Ocimum americanum* L.	Lamiaceae	Herb	Th
104	*Ocimum basilicum* L.	Lamiaceae	Herb	Th
105	*Ocimum gratissimum* L.	Lamiaceae	Herb	Ph

Continue……..

106	*Ocimum tenuiflorum* L.	Lamiaceae	Herb	Th
107	*Oldenlandia umbellata*	Rubiaceae	Climber	Th
108	*Opuntia elatior* (Willd.) Miller	Cactaceae	Shrub	Ph
109	*Passiflora foetida* L.	Passifloraceae	Climber	Th
110	*Pavonia odorata* Willd.	Rubiaceae	Shrub	Ph
111	*Pedalium murex* L.	Pedaliaceae	Herb	Ch
112	*Peltophorum pterocarpum* (DC.) Baker ex Heyne	Caesalpiniaceae	Tree	Ph
113	*Pentatropis capensis* (L.f.) Bullock	Asclepiadaceae	Straggler	Ph
114	*Phyllaanthus amarus* schum&Thonn	Euphorbiaceae	Herb	Th
115	*Phyllanthus emblica* L.	Euphorbiaceae	Tree	Ph
116	*Physalis minima* L.	Solanaceae	Herb	Th
117	*Polyalthia longifolia* (Sonner.) Thw.	Annonaceae	Tree	Ph
118	*Polycarpaea aurea* Wight & Arn.	Caryophyllaceae	Herb	Th
119	*Polygala chinensis* L.	Polygalaceae	Herb	Th
120	*Ricinus communis* L.	Euphorbiaceae	Shrub	Th
121	*Ruellia prostrata* Poir	Acanthaceae	Herb	Cr
122	*Ruellia tuberosa* L.	Acanthaceae	Herb	Cr
123	*Santalum album* L.	Santalaceae	Tree	Ph
124	*Sida acuta* Burm.	Malvaceae	Shrub	Ph
125	*Sida cordata* (N.Burman) Borssum	Malvaceae	Shrub	Th
126	*Sida cordifolia* L.	Malvaceae	Shrub	Th
127	*Solanum surattense* Burm.f	Solanaceae	Herb	Ch
128	*Solanum trilobatum* L.	Solanaceae	Climber	Th
129	*Sphaeranthus indicus* L.	Asteraceae	Herb	Th
130	*Syzygium gardneri* Thwaites	Myrtaceae	Tree	Th
131	*Tamarindus indica* L.	Caesalpiniaceae	Tree	Ph
132	*Tectona grandis* L.f.	Verbenaceae	Tree	Ph
133	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Herb	Ph
134	*Tinospora cordifolia* (Willd.) Hook.	Menispermaceae	Climber	Ph
135	*Tribulus terrestris* L.	Zygophyllaceae	Herb	Th
136	*Tridax procumbens* L.	Asteraceae	Herb	Ch
137	*Tylophora indica (*Burm. f.) Merr.	Asclepiadaceae	Climber	Ph
138	*Vernonia indica* C. B. Clarke	Asteraceae	Herb	Ph
139	*Vitex negundo* L.	Verbenaceae	Shrub	Ph
140	*Ziziphus mauritiana* Lam.	Rhmnaceae	Tree	Ph
141	*Ziziphus oenoplia* (L.) Mill.	Rhmnaceae	Straggler	Ph

Th-Therophytes
Ph-Phanerophytes
Ch-Chameophytes
Cr-Cryptophytes
He-Hemicryptophytes

Amaranthaceae, Fabaceae, Verbenaceae, and Solanaceae represented by 4 species. Rubiaceae, Apocyanaceae, Liliaceae Anacardiaceae andSapindaceae represented by 3 species. Annonaceae, Aristolochiaceae, Meliaceae, Menispermaceae, Cucurbitaceae and Myrtaceae represented by 2 species. Santalaceae, Caryophyllaceae, Cactaceae, Periplocaceae, Boraginaceae, Rutaceae, Agavaceae, Lythraceae, Papavaraceae, Nyctoginaceae, Passifloraceae, Casuarinaceae, Vitaceae, Commelinaceae, Cuscutaceae and Pedaliaceae, Polygalaceae represented by One Species. Out of the total 141 flowering species (28.36%) herbs, (26.95%) shrubs, (25.53%) trees and (19.14%) climber were studied (Table-2). This study shows that herbaceous plants (ephermeral plants) are dominating the forest. This is probably Owing to the semi-arid conditions and erratic rainfall. Further, the scrubby plants species (small trees and shrubs) can be observed as the dominant perennial vegetation of the area. In the biological spectrum, the trend of (Raunkiaer 1934) life forms present study sites are observed as phanerophytes 78 species (55.31%) > Therophytes 50 species (35.46%)> Chameophytes 6 species (14.63%) >Hemicryptophytes 4 species (2.83%) >cryptophytes 3 species (2.12%), (Table3). In the present study majority of the plant species were dicot than monocot.

Table 2. Composition of habit wise distribution of plants species in Managathi forest Ariyalur District

S.No	Habit	No. of Species	Percentage(%)
1	Herb	40	28.36
2	Shrub	38	26.95
3	Climber	27	19.14
4	Tree	36	25.53

Table 3. Total number of species and percentage of different life form classes in managathi forest Ariyalur district

S.No	Lifeform classes	No. of species	Percentage (%)
1	Therophytes (Th)	50	35.46
2	Phanerophytes (Ph)	78	55.31
3	Chameophytes (Ch)	06	14.63
4	Cryptophytes (Cr)	03	02.12
5	Hemicryptophytes (He)	04	02.83

DISCUSSION

Thisstudy enumerates the floristic composition and life form spectrumof Managathi forest in Ariyalur district. A total of 141 Angiospermic plant species represented by 105 genera distributed among 49 different families were recorded.

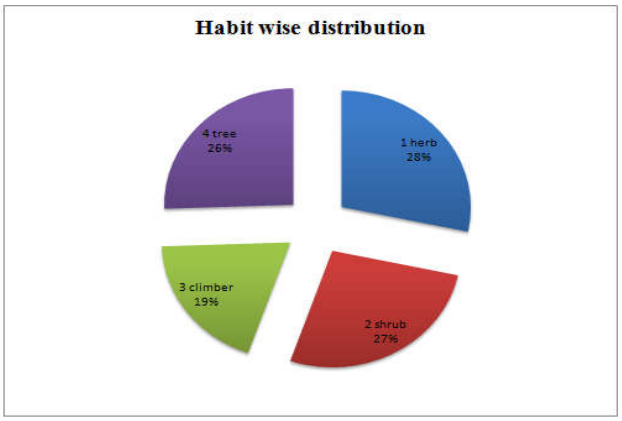

Fig.1. Composition of habit wise distribution of plants species in Managathi forest Ariyalur District

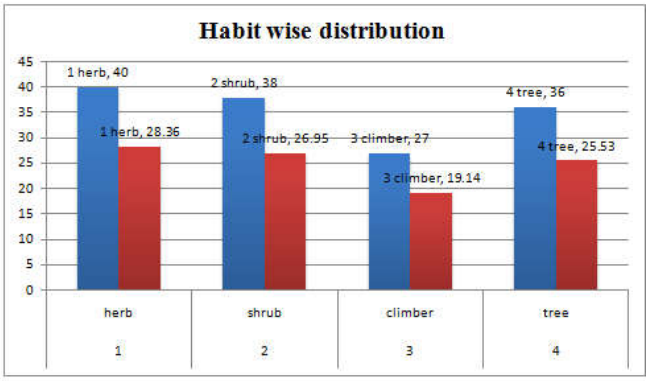

Fig. 2.Fig-1. Composition of habit wise distribution of plants species in Managathi forest Ariyalur District

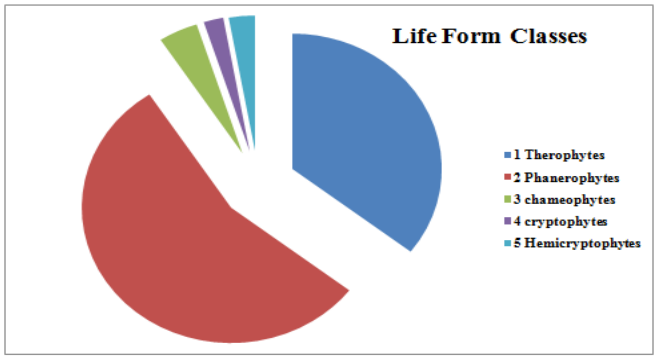

Fig. 3. Life form classes

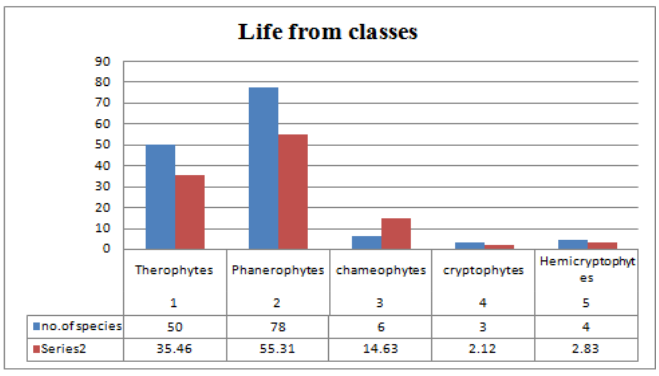

Fig.3. Life form classes

Among the families Caesalpiniaceae family most dominant comprising 4 genera and 11 species followed by Mimosaceae, Euphorbiaceae and represented by 8 species based on the habit classification the maximum number of species were Herbs 40 (28.36%) lower Climbers 27 species (19.14%).

Floristic study of vegetation is important to determine the distribution of food plants for wildlife (Ejtehadi *et al.,* 2005) and prerequisite for much fundamental research in tropical community (Jayakumar *et al.,* 2011). Several studies with respect to floristic inventory were reported includes 260 species in 176 genera and 62 families from malliganatham (John Britto *et al.,* 2001 a), 224 species in 175 genera and 63 families from Vamban (John Britto *et al.,*2001 b), 35 species in 32 genera and 22 families (Sridhar Reddy and Parthasarathy 2006), 77 species in 61 genera and 30 families (Mani and Parthasaarathy 2006) from 4 sacred groves of coromandal coast, 265 species from 50 sacred groves collectively (Karthikeyan and Thangavelu, 2011), 106 species belonging to 97 genera and 54 families from Managanampatti, Nadiamman and Suranviduthi village (Vinothkumar *et al.,* 2011) of Pudukottai district, 98 species in 38 families and 76 genera from 33 sacred groves of theni district (Manikandan *et al.,* 2011). 98 species in 87 genera and 43 families from 11 miniature sacred groves (Sukumaran and Jeeva, 2008) of Kanniyakumari district, 133 plant species from sacred groves in Pallipatty village of Maduari district (Ganesan *et al.,* 2007).

Thakur *et al*. (2009) have reported Generic coefficient as 86.3% in forest vegetation of Sagar district in M.P. They have reported 31 dicot and 1 monocot families distributed in 63 genera and 73 species of trees. Suresh *et al*., (2008) have enumerated 67 species from disturbed area of Thaniparai hills and 72 species from undisturbed area of Sundaramahalingan hills under Grizzled Giant squirrel wildlife sanctuary forest of Virudhunagar district. They have reported 51families from the two sites with 125 genera and 139 species. Nayar *et al., (*2008) has also provided a preliminary analysis of flowering plants of Kerala based as 1303 publication appeared until 2008. They have stated that the state harbours 4694 species under 1418 genera and 188 families. Silar Mohammad *et al*. (2008) have reported florisitc diversity of Ahobilam forest in Andhara Pradesh. They have collected a total of 250 wild and naturalized important plant speciesbelonging to 71 families. These include many medicinal rare endemic and threatened categories of plants. Awasthi *et al*. (2007) have also reported floristic diversity of Bandhavgarh national park, enumerating 47 plant species. Inamati *et al*. (2007) have reported 43 families represented by 130 species across four altitudinalzones in Devimane, (Western Ghats) Karnataka. Ganeshaiah *et al*. (2002) described a total of 178 families composed of 1408 genera and 4758 species in Karnataka. They have taken into consideration the major climatic zones of the state.Uma Shankar (2001) described the floristic composition of tropical deciduous Sal forest in Darjeeling. Thus, floristic diversity assessment is significant at local and regional levels to understand the present status and to make effective management strategies for conservation (Jain *et al.,* 1976). Life form of vegetation is to a certain extent, an indicator of the climate and is also useful in comparing geographically, widely distributed plant communities. Furthermore, it is traditionally

being used to describe world vegetation types at community level (Raunkiaer 1934). Proposed a system to classify life form based upon protection and degree of renewing bud, which are responsible for renewable of aerial body on the onset of favorable environment conditions. There are five major classes arranged according increased protection of renewing buds, these are phanerophytes (buds nacked or covered with scale and positioned high up on the plant), chamaephytes (buds close to ground), hemicryptophytes (buds hidden under soil). Geophytes (or) cryptophytes (buds completely hidden under soil) and therophytes (renewing occurs by seed germination).

The various life form classes (Raunkiar, 1934) as phanerophytes are represented by 78 (55.31%) species while Therophytes account for 50(35.46%) species, Chameophytes 6 (14.63%) species Hemicryptophytes 4 (2.83%) species and Cryptophytes 3 (2.12%) species, the Phanerophytes and Therophytes dominate in the study area (Table 3 and Fig. 2). The biological spectrum reflects the adaptation of plants to environment and primary climate (Smith, 1980). Geographically widely separated plant communities can be very usefully compared with one another on the basis of biological spectrum. Since life forms are related to the environment, biological spectrum is also an indicator of prevailing environment. Therophytes are the indicators of amount of biotic influence on the vegetation and developespecially in the area where vegetation has been distributed by some anthropogenic activites (Saxena *et al.,*1982). Stressed that higher therophytes are indicators of the magnitude of influence of man and animals on the habitat. A number of workers have worked out biological spectra of different regions. In India, (Bharucha *et al.,* 1941, 1944) have worked out the biological spectra of a number of places. However, a word of caution is necessary to stretch the results of such studies to economic botany (Missra and Puri, 1954).
Biological spectrum may be materially changed due to introduction of therophytes like annual weeds due to biotic influences like agricultural practices, grazing and other biotic disturbances. Frankia *et al.* (1976) studied the biological spectrum of grazed and ungrazed vegetation in Gambhar catchment and observed 7.8% increase in therophytes in the grazed site than ungrazed site. Lieberman *et al. (*1982) presented thero-nanophanerophytic biological spectrum of the flora of shajahanpur district, Uttar Pradesh. The dominance was again because of grazing in the area. In the climax vegetation or even in the developing communities, dominant species are in equilibrium with their environment. Thus, biological forms are related to the environment. Biological spectrum is also an indicator of the prevailing environment (Rathcke *et al*., 1985). The percentage of phanerophytes is maximum and hemicryprophytes minimum. The percentage of therophytes stands next to chameophytes.

Conclusion

The present study deals with floristic composition of flowering plants and life form spectrum analysis of Managathi forest is important as it is the native and endemic species of flora are conserved. Though there are many more life forms that need to be identified up to species level, the phanerophytes and therophytes dominate in all the parts. The biological spectrum reflects the adaptation of plants to environment and primary climate. Geographically widely separated plant communities can be very usefully compared with one another on the basis of biological spectrum. Since life forms are related to the environment, biological spectrum is also an indicator of prevailing environment. Further study is needed to quantity the data and suggests plans for the conservation of the area.

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