FLORISTIC DIVERSITY AND CONSERVATION STATUS OF KURUNTHAMALAI HILLS, COIMBATORE, TAMIL NADU

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ABSTRACT

A Floristic survey was carried out in Kurunthamalai hills part of Western ghats situated at Karamadai, Coimbatore district, Tamil Nadu, during the period of December 2019 to January 2020. The present study shows that 93 species of Angiosperms distributed 82 genera belonging to 41 families and 2 species of pteridophytes were recorded in Kurunthamalai hills. Out of this 87 species in 78 genera and 38 families belongs to Dicotyledons and 5 species in 4 genera and 4 families belongs to Monocotyledons. In the present study out of 93 species recorded, one species namely *Santalum album* is vulnerble, 2 species are rare namely *Aristalochia indica* and *Dioscorea oppositifolia* and 36 species are least concern. In our present study 10 Monotypic genera are documented. Floristic diversity of the study area directly helps the management to protect and conserve rare, endangered and vulnerable plant species.

KEYWORDS Floristic survey, Kurunthamalai, Western Ghats, *Aristalochia indica*,

INTRODUCTION

India is blessed with high biological diversity and one of the world's top 12 megadiversity country which representing a store house of 17,500 species of higher plants, 64 gymnosperms, 1,200 pteridophytes, 2,850 bryophytes, 2,021 lichens, 15,500 fungi and 6,500 algae [1] which are present in different biogeographical region mostly tropical moist and dry deciduous forest. Western Ghats and Eastern Himalayan of India is rich in its own flora that is endemic plant species with 5725 angiosperms, 10 gymnosperms, 1200 pteridophytes, 678 bryophytes, 260 liverworts, 466 lichens, 3500 fungi and 1924 algae [2]. Recoded of endemic species reveals that Western ghats being older in age compared to Himalayan mountain [3]. In generally the forest area the rich in plant diversity from the floristic point of view. The vast diversity of the life on earth is essential for Ecosystem function and stability.

The floristic studies are considered as the backbone of assessment of phytodiversity. Conservation management and sustainable utilization of bioresearches of a region. They are helpful in providing clues of changing floristic pattern, new invasions, current status, rare, endemic and threatened (RET) taxa in a

phytogeographical area. [3]. The flora is fast dwindling due to several anthropogenic factors so an urgent need to systematically survey and document all the economically important species in the wild for future bioprospection work. Plant diversity is an important factor in the management of biodiversity in ecosystem. The conservation of biological diversity has become major concern for much of the society and many Government agencies in all level. Floristic diversity refers to the variety and variability of plants in a given region. It refers to the number of type or taxa in a given region or group. Floristic diversity can be measured at any level from overall global diversity to ecosystem, community, species, populations, individuals and even to genes within a single individual. A flora is an inventory of the plants of a defined biogeographically region. Floristic diversity and Conservation status of Kurunthamalai Hills division is lacking. Therefore the present study has been undertaken to the Floristic diversity and Conservation status of Kurunthamalai Hills.

MATERIALS AND METHODS

Study area

The study area Kuruthamalai hills is a part of Western Ghats situated at Karamadai, Coimbatore district. Kurunthamalai located 24 kms from the city of Coimbatore and only 4km from Karamadai. It is situated at a latitude 11.250953150768078 and longitude 76.92166317254306. The average annual rainfall is around 22.4 mm.

Field survey

An extensive and intensive floristic survey were undertaken during December 2019- February 2020 in Kurunthamalai hills. The area was surveyed at every visit and periodical collection of plants made from each locality.

Identification, preservation and creation of Plant list species:

The collected plant species were dried and pressed in the field and taken to the laboratory for identification purpose. These plants specimens were critically studied and identified with the help of standard floras [4 and 5] and various available resources including World Wide Web and expertise available in the Department by using field keys. The voucher specimens were deposited in the Botany herbarium center, Department of Botany Kongunadu Arts and Science College, Coimbatore.

RESULTS AND DISCUSSION

The present study has been carried out in Kurunthamalai Hills, Karamadai, Coimbatore District, Tamil Nadu, India to document the current floristic composition and conservation status of the study area.

Plant species and their habit

Taxonomically a total number of 93 species of Angiosperms distributed 82 genera belonging to 41families and 2 species of pteridophytes has been recorded from the study area of Kurunthamalai Hills and listed in the table.1. Out of this 86 species in 78 genera and 38 families belongs to Dicotyledons and 5 species in 4 genera and 4 families belongs to Monocotyledons and two species were Pteridophyte (*Actiniopteris radiata*, *Cheilianthus mysurensis*). Our findings revealed that the Angiospermic plant species are more abundant in the study area because flowering plants grow in virtually every habitable region compare to pteridophytes.

In the life form category of the enumerated plants the majority of the species were herbs (53 species) followed by shrubs (24 species), climber (9 species) and tree (7species) (Table 2). The finding the more herbs are present in the study area is in line with the previous report were the same (1 and 6). This unanimity in result suggest that the herbs grow readily well in moderate climate and also that they can be easily accessed.

Species, Family and Relative Dominance

Parthenium hysterophorus was the most abundant species when compared to other species in the study area. The most species rich Families include Asteraceae (9 genera and 9 species) was the dominant family followed by Amaranthaceae (5 genera and 7 species), Euphorbiaceae (5 genera and 7 species), Cucurbitaceae (5 genera and 5 species), Lamiaceae (5 genera and 6 species), Fabaceae (5 genera and 5 species), Malvaceae (3 genera and 5 species), Acanthaceae (4 genera and 4 species), Convolvulaceae and Solanaceae (3 genera and 3 species each), Apocynaceae, Caesalpiniaceae, Capparidaceae, Pedaliaceae, Pteridaceae and Tiliaceae with one genera and two species each. Aristalochiaceae, Asclepiadaceae, Boraginaceae, Cruciferae, Cactaceae, Cyperaceae, Dioscoraceae, Meliaceae, Menispermaceae, Mimosaceae, Moraceae, Nyctaginaceae, Nymphaceae, Oleaceae, Passifloraceae, Poaceae, Portulacaceae, Rhamnaceae, Rubiaceae, Rutaceae, Santalaceae, Sapindaceae, Verbanaceae, Vitaceae, Zygophyllaceae with one genera and one species each. Megha Rawat *et al. [*7] reported Asteraceae was the most dominant family in the Kunjapuru Sacred Grove.

Conservation status of taxa

Assessment of conservation status of the species level was performed using the International Union for conservation on Nature of Red list Criteria. In the present study out of 93 species recorded one species namely *Santalum album* is endaged, 2 species Namely *Aegle marmelous* and *Dalbergia latifolia* are vulnerble, 2 species are rare namely *Aristalochia indica* and *Dioscorea oppositifolia* and 36 species are least concern (Table 1). Similar classification of species occurrence status offering plant species has been observed in previous reports [1, 8 and 9].

Geographic origin of Taxa

The origin of recoded taxa was done based on the literature available from ENVIS. In the Kurunthamalai Hills represents 10 Invasive and 83 Native species. In Asteraceae 4 invasive species (*Ageratum conyzoides*, *Chromolaena odorata*, *Parthenium hysterophorus*, and *Vernonia cinerea*) were recorded. Highest number of Invasive species was documented in the Family Asteraceae Followed by Euphorbiaceae, Sapindaceae, Pedaliaceae, Mimosaceae, Verbanaceae and Amaranthaceae with 1 species each. The listed Invasive species were *Aerva javanica* , *Ageratum conyzoides*, *Cardiospermum helicacabum* , *Chromolaena odorata* , *Euphorbia hirta* , *Lantana camara* , *Martynia annua* , *Mimosa pudica* , *Parthenium hysterophorus* and *Vernonia cinerea* (Table 1). The presence of invasive species in the rangeland increases its biodiversity and species richness, it can decrease the health of the ecosystem [10]. Document the geographic origin of the plant species bring out a valuable database, enable the better management and conservation of Kurunthamalai Hills.

Monotypic genus

It is interesting to record that monotypic genera occur in Kurunthamalai Hills are *Aegle*, *Ageratum*, *Azardirachta*, *Benincasa*, *Martynia*, *Mukia*, *Opuntia*, *Riccinus*, *Tinospora*, and *Tridax* (Table 4). Raghavendra Rao (2012) reported 12 monotypic genera in Western ghats and Sharma *et al*. (2014) reported 28 monotypic families in the Western Himalayan Forest. In our present study 10 Monotypic genera are documented. Monotypic genera makes the region Floristically unique and significant.

Figure: 1 Overview of Kurunthamalai Hills

Figure: 2 Location of Study Area map showing Kurunthamalai Hills

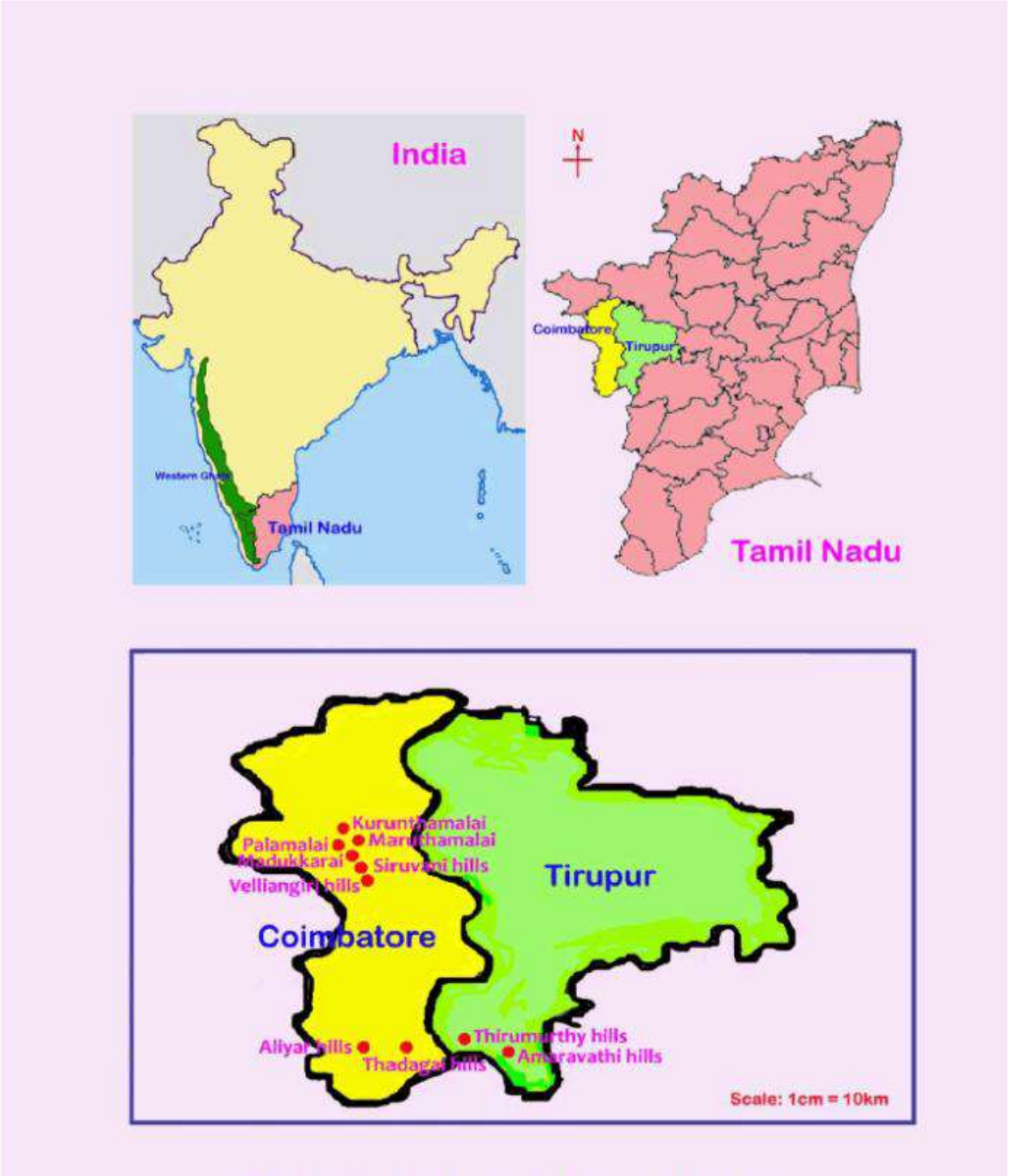

Table: 1 Floristic composition and conservation status of recorded species in Kurunthamalai Hills

S. No	Binomial name	Family	Life form	Category	IUCN red list category
1.	*Abutilon indicum* G. Don.	Malvaceae	Shrub	Native	NE
2.	*Acalypha indica,* Linn.	Euphorbiaceae	Herb	Native	LC
3.	*Achyranthus aspera* Linn.	Amaranthaceae	Herb	Native	LC
4.	*Actiniopteris radiate (* Koenig ex	Pteridaceae	Herb	Native	NE

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5.	*Aegle marmelous* Corr.	Rutaceae	Tree	Native	VU
6.	*Aerva javanica* Wt. Ic.	Amaranthaceae	Herb	Invasive	LC
7.	*Aerva lanata* Juss.	Amaranthaceae	Herb	Native	LC
8.	*Ageratum conyzoides* Linn.	Asteraceae	Herb	Invasive	LC
9.	*Albizzia amara* Boevin.	Fabaceae	Tree	Native	LC
10.	*Aleternanthera pungens Kunth.*	Amaranthaceae	Herb	Native	NE
11.	*Alternanthera sessilis* R. Br.	Amaranthaceae	Herb	Native	LC
12.	Amaranthus viridis Linn.	Amaranthaceae	Herb	Native	NE
13.	*Andrographis paniculata*, Nees.	Acanthaceae	Herb	Native	LC
14.	*Anisomeles malabarica* R. Br.	Lamiaceae	Herb	Native	LC
15.	*Anisomeles indica* (L) Kuntze.	Lamiaceae	Herb	Native	NE
16.	*Aristalochia indica* Linn.	Aristalochiaceae	Shrub	Native	RE
17.	*Artimisia vulgaris* Linn.	Asteraceae	Shrub	Native	NE
18.	*Azardirachta indica* Juss.	Meliaceae	Tree	Native	NE
19.	*Bauhinia acuminata* Linn.	Caesalpiniaceae	Shrub	Native	LC
20.	B*enincasa hispida* (Thunb.) Cogn.	Cucurbitaceae	Climber	Native	NE
21.	B*oerhavia diffusa* Linn.	Nyctaginaceae	Herb	Native	NE
22.	*Caesalpinia pulcherrima* Swarz.	Caesalpiniaceae	Shrub	Native	LC
23.	*Calotropis gigantea* R. Br.	Asclepiadaceae	Shrub	Native	LC
24.	*Calyptocarpus vialis* Less.	Asteraceae	Herb	Native	NE
25.	C*ardiospermum helicacabum* Linn.	Sapindaceae	Climber	Invasive	LC
26.	*Cassia alata* (L). Roxb.	Fabaceae	Tree	Native	LC

27.	*Catharanthus roseus* (L) G. Don.	Apocynaceae	Herb	Native	LC
28.	C*heilianthus mysurensis* Wall.	Pteridaceae	Herb	Native	NE
29.	*Chromolaena odorata* (L) R.M. King& H.Rob.	Asteraceae	Shrub	Invasive	NE
30.	*Cissus quadrangularis* Linn.	Vitaceae	Climber	Native	LC
31.	*Cleome gynandra* Linn.	Capparidaceae	Herb	Native	NE
32.	*Cleome viscosa* Linn.	Capparidaceae	Herb	Native	LC
33.	*Coccinea grandis* (L)Voigt.	Cucurbitaceae	Climber	Native	LC
34.	*Commelina benghalensis* Linn.	Commelinaceae	Herb	Native	LC
35.	*Commelina obliqua* Ham.	Commelinaceae	Herb	Native	NE
36.	*Corchorus trilocularis* Linn.	Tiliaceae	Herb	Native	NE
37.	*Croton sparsiflorus* Morong.	Euphorbiaceae	Herb	Native	NE
38.	*Cucumis sativus* Linn.	Cucurbitaceae	Climber	Native	NE
39.	*Cyanodon dactylon* L. Pers.	Poaceae	Herb	Native	LC
40.	*Cyanthillium cinereum (*L) H.Robx.	Asteraceae	Herb	Native	NE
41.	*Cyperus rotundus* Linn.	Cyperaceae	Herb	Native	LC
42.	*Dalbergia latifolia* Roxb.	Fabaceae	Tree	Native	VU

43.	*Dicliptera cuneata* Nees.	Acanthaceae	Herb	Native	NE
44.	*Digera muricata* (L) Mart.	Amaranthaceae	Herb	Native	NE
45.	*Dioscorea oppositifolia* Linn.	Dioscoreaceae	Climber	Native	RE
46.	*Euphorbia hirta* Linn.	Euphorbiaceae	Herb	Invasive	LC
47.	*Evolvuls alsinoides* Linn.	Convolvulaceae	Herb	Native	LC
48.	*Ficus benghalensis* Linn.	Moraceae	Tree	Native	LC
49.	*Grewia hirsuta* Vahl.	Tiliaceae	Shrub	Native	NE
50.	*Helminthotheca ehinoides* (L) Holub.	Asteraceae	Herb	Native	NE
51.	*Hewittia malabarica* (L) Suresh.	Convolvulaceae	Climber	Native	NE
52.	*Hibiscus micranthus* Linn.	Malvaceae	Herb	Native	NE
53.	*Hyptis suaveolens* Poit.	Lamiaceae	Herb	Native	NE
54.	*Indigifera asplathoides* Vahl.	Fabaceae	Shrub	Native	NE
55.	*Ipomea obscura* Ker-Gawl	Convolvulaceae	Shrub	Native	NE
56.	*Jasminium malabaricum* Wt. Ic.	Oleaceae	Shrub	Native	NE
57.	*Justicia glauca* Rottl.	Acanthaceae	Shrub	Native	NE
58.	*Lantana camara* Linn.	Verbanaceae	Shrub	Invasive	LC
	Leucas aspera Spreng.	Lamiaceae	Herb	Native	LC

59.					
60.	*Martynia annua* Linn.	Pedaliaceae	Herb	Invasiv	LC
61.	*Mimosa pudica* Linn.	Mimosaceae	Herb	Invasive	LC
62.	*Momordica charantia* Linn.	Cucurbitaceae	Herb	Native	NE
63.	*Mukia maderaspatana* (L). Roem.	Cucurbitaceae	Climber	Native	NE
64.	*Nerium indicum* Miller.	Apocynaceae	Shrub	Native	NE
65.	*Nymphia stellata* Willd.	Nymphaceae	Herb	Native	NE
66.	*Ocimum cannum* Sims.	Lamiaceae	Herb	Native	NE
67.	*Ocimum sanctum* Linn.	Lamiaceae	Herb	Native	LC
68.	*Oldenlandia umbellata* Linn.	Rubiaceae	Herb	Native	NE
69.	*Opuntia stricta* Var. Dillenii	Cactaceae	Shrub	Native	LC
70.	*Parthenium hysterophorus* Linn.	Asteraceae	Herb	Invasive	LC
71.	*Passiflora foetida* Linn.	Passifloraceae	Climber	Native	NE
72.	*Pavonia procumbens* Boiss .	Malceae	Shrub	Native	NE
73.	*Phyllanthus maderaspatensis* Linn.	Euphorbiaceae	Herb	Native	NE
74.	*Phyllanthus neruri* Linn.	Euphorbiaceae	Herb	Native	NE

75.	*Phyllanthus urinaria* Linn.	Euphorbiaceae	Herb	Native	NE
76.	*Physalis peruviana* Linn.	Solanaceae	Shrub	Native	LC
77.	*Portulaca oleracea* Linn.	Portulacaceae	Herb	Native	LC
78.	*Riccinus communis* Linn.	Euphorbiaceae	Shrub	Native	NE
79.	*Ruellia prostrata* Linn.	Acanthaceae	Herb	Native	NE
80.	*Santalum album* Linn.	Santalaceae	Tree	Native	EN
81.	*Seasamum indicum* Linn	Pedaliaceae	Herb	Native	NE
82.	*Senegalia pennata* (L) Maslin.	Fabaceae	Shrub	Native	NE
83.	*Sida acuta* Burm.	Malvaceae	Shrub	Native	LC
84.	*Sida rhombifolia* Linn.	Malvaceae	Herb	Native	NE
85.	*Solanum indicum* Willd.	Solanaceae	Herb	Native	NE
86.	*Solanum nigrum* Linn.	Solanaceae	Herb	Native	NE
87.	*Synapis arvensis* Linn.	Cruciferae	Shrub	Native	NE
88.	*Tinospora cordifolia* Miers.	Menispermaceae	Shrub	Native	NE
89.	*Tribulus terrestris* Linn.	Zygophyllaceae	Herb	Native	LC
90.	*Trichodesma indicum* R.Br.	Boraginaceae	Herb	Native	NE
	Tridax procumbens Linn.	Asteraceae	Herb	Native	NE

91.					
92.	*Vernonia cinerea* (Linn) Less.	Asteraceae	Herb	Invasive	LC
93.	*Zizyphus jujuba* Lamk.	Rhamnaceae	Shrub	Native	NE

Table 2: Life forms of the Species

Life forms	Number of species
Herbs	53
Shrubs	24
Climber	9
Trees	7

Table: 3 Distribution of species under family

S. No	Family	No. of plant species
1	Asteraceae	9
2	Amaranthaceae and Euphorbiaceae	7
3	Lamiaceae	6
4	Fabaceae, Malvaceae and Cucurbitaceae,	5
5	Acanthaceae	4
6	Convolvulaceae and Solanaceae	3

Table: 4 Monotypic Genera in Kurunthamalai Hills

S. No	Binomial Name	Family
1	*Aegle marmelous* Corr.	Rutaceae
2	*Ageratum conyzoides* Linn.	Asteraceae
3	*Azardirachta indica* Juss.	Meliaceae
4	B*enincasa hispida* (Thunb.) Cogn.	Cucurbitaceae
5	*Opuntia stricta* Var. Dillenii	Cactaceae
6	*Martynia annua* Linn.	Pedaliaceae
7	*Mukia maderaspatana* (L). Roem.	Cucurbitaceae
8	*Riccinus communis* Linn.	Euphorbiaceae
9	*Tinospora cordifolia* Miers.	Menispermaceae
10	*Tridax procumbens* Linn.	Asteraceae

REFERENCES

[1] P. Subbaiyan,, M. Samyadurai, R. Karthik Prabu, V. Ramakrishnan and V. Thangapandian, 2014, Inventory of Rare, Endaged and Threatened (RET) Plant species in Maruthamalai Hills, Western Ghats of Tamil Nadu, South India, Our nature, vol . pp. 12 37-43.

[2] V.Vijay, Wagh and K. Ashok Jain, 2013, Floristic Diversity of Jhabua District, Madhya Pradesh, India. Academic Journal of Plant Sciences, vol 6. Pp. 146-167.

[3] R. Raghavendra Rao, 2012. Floristic diversity in Western ghats: documentation, conservation and bioprospection– a priority agenda for action. SahyDRI e-news, vol 38. pp. 2-38.

[4] J.S.Gamble, and CEC Fischer, 1935, Flora of the Presidency of Madras, Adlord and Sons Ltd., London, pp. 1-3.

[5] K.M. Matthew, 1983. An Excursion Flora of Central Tamil Nadu, Oxford and IBH Publishing Co Pvt Ltd, New Delhi.

[6] R. Saranya, A. Rajendran and A. Sarvalingam, 2015, Floristic Diversity and Ethanobotanical uses of Vedhagiri Hills in Bhavani, Erode District, Tamil Nadu. Open access Library Journal, 3, pp. 2259.

[7] H. Megha Rawat, B. Vasistha, R.K. Manas & Mridula Negi, 2013, Floristic diversity of the Kunjapuri Sacred Grove, Garwal Himalaya, India. Journal of the Bombay Natural History Society, vol. 110, pp. 57-64.

[8] N. Komalavalli, 2015, Floristic diversity and conservation status of Ammankkuruchi reserve forest, Pudukkottai district, Tamil Nadu. Malaya Journal of Biosciences, vol 2, pp. 198-208.

[9] P. Saikia, J. Deka, S. Bharali, Amit Kumar, O. P. Tripathi, L. B. Singha, S. Dayanandan and M. L. Khan, 201, Plant diversity patterns and conservation status of eastern Himalayan forests in Arunachal Pradesh, Northeast India. Forest Ecosystems, vol 4, pp. 2-12.

[10] Farzaneh khojasteh, Ameneh Sobhani & Mohammad Ali Zare Chahouki, 2012, Floristic study and estimating species diversity indices in a rangeland of middle Iran. Journal of Agricultural Technology, vol 8. pp. 1769-1777.