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Documentary of Woody flora and its usage in Maruthamalai Hills of the Southern Western Ghats of Coimbatore district, India

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The present study described the occurrence of woody species and its usage in Maruthamalai Hills of the southern Western Ghats. A total of 119 species were collected of which one individual categorized as gymnosperm and the remaining 118 individuals categorized as an angiosperms. Among the life habit the trees are the dominant species (86) other than shrubs (28) and lianas (5). The Fabaceae, Mimosaceae, Caesalpiniaceae and Bignoniaceae are the dominant families of woody flora of the Maruthamalai Hills. The importance of recording the usage of plants in this region is imperative because of rapid loss of forest wealth and traditional wisdom. In view of the various resources use, habitat uniqueness and anthropological pressure on the forest resources, the need for conservation is stressed.

Keywords: Woody flora, Maruthamalai hills, Western Ghats, India

Woody species are natural asset of immense nature to any country. They have been listed into broad groups, under pteridophytes, gymnosperms and angiosperms. Based on the habit the woody species have been categories in to three types; trees, shrubs and woody climbers. They are not only preserve the physical feature of the earth, prevent soil erosion, mitigate floods but make the streams flow permeably and help in sustaining river flows.

They provide shelter to wild life and support the biological chain. Trees, shrubs and climbers cover helps in maintenance of ecological balance of nature (Bennic *et.al.* 2008). Besides woody species meet the seeds of timber, fuel, medicines and edible products which are indispensable require meats of human beings.

Plant diversity inventories in tropical forests have mostly been concentrated on trees species than the others life forms, because tree species diverse is an important aspects of forest ecosystem (Rannals & Laumonter 2000) and also fundamental to total tropical forest diversity (Huang *et. al*., 2003).

The present study has been undertaken with the aim of recording the details of various woody plants used by the Irulars tribal and local inhabitants of Maruthamalai Hills, Tamil Nadu. The Irulas tribal still derives their daily need from various plants growing around them. The large part of such information is passed orally

from one generation to another. So, it is desirable to collect and need to document such information for proper scientific evaluation.

STUDY AREA

The study area Maruthamalai Hills consists of an environment of mixed dry deciduous type of forest at an altitude of 450 MSL, 11.04'E of longitude and 76.93'N latitude (Figure 1). The area has a predominant red soil impregnated with organic matter, and granite, bed rock is overlaid with shallow, sandy loam, and glacial soils are moderate to well drained. Temperature begins increasing after March and April is the hottest month with a near daily maximum temperature of 38.2^{o}C and maximum of 25-6 ^{o}C.

Figure 1. A View of Maruthamalai Hills

MATERIALS AND METHODS

Several intensive and extensive field trips were conducted throughout the study area at regular intervals from 2009 - 2010. The study is based on extensive survey and field observations as a part of quantitative inventory of all woody species ≥ 10 cm gbh in the study area, data on various usages of woody species by the Irulars tribe and other local aged inhabitants were gathered. The plant specimens were collected in flowering and fruiting stage for preservation as herbarium specimens based on the standard instructions (Santappau 1955; Jain & Rao 1976; Rao & Sharma 1990). All the plant specimens collected during these surveys were identified with help of various local floras (Gamble 1915- 1936; Matthew 1971; Chandrabose & Nair 1998). Further their identification was confirmed at Madras Herbarium (MH) of Botanical Survey of India, Southern circle, Coimbatore. Voucher specimens are deposited in the Herbarium of Department of Botany, Bharathiar University, Coimbatore.

RESULT AND DISCUSSION

The present study on woody species of Maruthamalai Hills, Coimbatore, and Tamil Nadu has brought out a detailed survey, collection and documentation yielded 86-trees, 28-shrubs and 5- woody climbers were spreading over 88-genera and 37 families (Table 1).

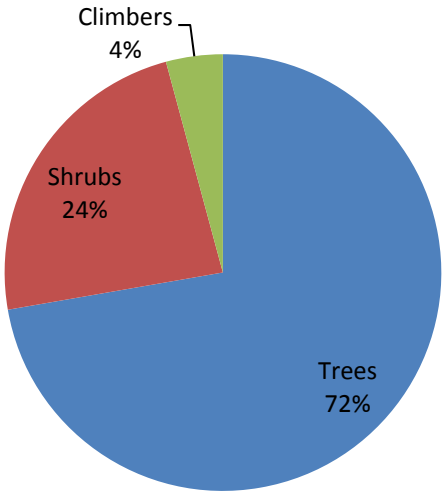

Fig. 2: Analysis of Life forms

In order to infer the dominant families, an analysis were made and found that, out of 37 families, Fabaceae is the first dominant family with 17 species, Mimosaceae is the second dominant family with 14 species, Caesalpiniaceae is the third dominant family with 11 species other dominant families such as Bignoniaceae (10 species), Moraceae (7 species), Euphorbiaceae (5 Species), then Malvaceae, Myrtaceae, Rubiaceae and Apocynaceae having 4 species each.

The present study has resulted in collection of 119 species of trees and shrubs. Out of these 86 individual belongs to trees, 28 individual belongs to shrubs and 5 individuals are climbers. This indicates that the trees are more dominant than shrubs and woody climbers (Fig. 2).

The 86 tree species are coming under 61 genera. Among the 61 tree genera *Acacia* and *Ficus* are first dominant genera each having 6 species. *Cassia* is the second dominant genera with 4 species, followed by *Tabebuia* and *Plumeria* having 3 and 2 species respectively. All other genera had one species each. Among 23 genera of shrubs, the genus like *Sida, Crotalaria, Barleria,* and *Ixora* having 2 species each and rest of the genera had one species each. Among 5 genera of woody climbers, the genera like *Toddalia, Jasminum, Tylophora, Bauhinia, Phyllanthus,* and *Canavalia* having each 1species. Most of the woody species used as medicine, gum yielding, timber value, edible and ornamental purposes by Irulars tribe and local inhabitants of Maruthamalai hills.

Table 1. Diversity and distribution of woody species in Maruthamalai Hills of the Southern Western Ghats, Coimbatore

Sl. No	Botanical name	Family	Distribution	Uses
	Tree species			
1	***Michelia champaca*** L,	Magnoliaceae	Uncommon	Used in religious ceremonies
2	***Annona squamosa*** L.	Annonaceae	Common	Fruit edible and leaf paste is used to remove lice of cattle.
3	***Polyalthia longifolia*** Sonn.	Annonaceae	Common	Used in ornamental
4	***Thespesia populnea*** (L.) Sol	Malvaceae	Common	Used in ornamental and paste of bark and fruit applied on wounds and boils.
5	***Ceiba pentandra*** (L.) Gaertn.	Bombacaceae	Common	Used in ornamental
6	***Helicteres isora*** L.	Sterculiaceae	Rare	Ripe fruit and stem bark is employed in dysentery and diarrhoea.

7	***Muntingia calabura*** L.	Elaeocarpaceae	Common	Used in ornamental.
8	***Guaiacum officinale*** L.	Zygophyllaceae	Un common	Used in ornamental.
9	***Murraya koenigii*** (L.) Spreng.	Rutaceae	Common	Leaves used in flavouring food preparation.
10	***Azadirachta indica*** Juss.	Meliaceae	Common	Fresh leaves are fired and its smoke used as mosquito repellent.
11	***Melia azedirachta*** L.	Meliaceae	Common	Paste of leaves is applied on boils and wounds.
12	***Ziziphus mauritiana*** Lam.	Rhamnaceae	Common	Fruits edibles.
13	***Ziziphus oenoplia*** L.	Rhamnaceae	Common	Fruits edibles
14	***Filicium decipiens*** (Wight&Arn.) Thw.	Sapindaceae	Common	Used in ornamental
15	***Majidea zanquebarica***	Sapindaceae	Common	Used in ornamental
16	***Mangifera indica*** L.	Annacardiaceae	Common	Edible and fresh seed paste is said to be dysentery if taken twice a day for seven days.
17	***Moringa pterygosperma*** Gaertn	Moringaceae	Common	Juice of cooked fruits is also employed in diabetes.
18	***Dalbergia sissoo*** Roxb.	Fabaceae	Common	Used in ornamental.
19	***Mundulea sericea*** (Willd.) A. Chev.	Fabaceae	Rare	Used in ornamental
20	***Pongamia pinnata*** (L.) Pierre,	Fabaceae	Common	Oil from seed is applied to cure scabies.
21	***Pterocarpus marsupium*** Roxb.	Fabaceae	Rare	Timber yielding
22	***Pterocarpus santalinus*** L.f.	Fabaceae	Common	Timber yielding
23	***Sesbania grandiflora*** (L.) Poir.	Fabaceae	Uncommon	Leaves used as vegetables and leaves used as fodder.
24	***Bauhinia purpurea*** L.	Caesalpiniaceae	Common	Used in ornamental
25	***Cassia fistula*** L.	Caesalpiniaceae	Common	Bark extract used as dysentery and used in ornamental
26	***Cassia siamea*** Lam.	Caesalpiniaceae	Common	Used in ornamental
27	***Cassia roxburghii*** DC.	Caesalpiniaceae	Common	Used in ornamental
28	***Cassia spectabilis.***DC.	Caesalpiniaceae	Un common	Used in ornamental
29	***Delonix regia*** (Boj.ex Hook.) Raf.	Caesalpiniaceae	Common	Used in ornamental
30	***Peltophorum pterocarpum*** DC.	Caesalpiniaceae	Common	Timber yielding.
31	***Tamarindus indica*** L.	Caesalpiniaceae	Common	Fruit edible and wood used for fuel.
32	***Acacia auriculiformis*** A.Cunn.	Mimosaceae	Common	Juice of flowers is used are joint pain and rheumatisms.
33	***Acacia ferruginea*** DC.	Mimosaceae	Common	Gum yielding.
34	***Acacia holosericea***	Mimosaceae	Common	Used in ornamental
35	***Acacia leucophloea*** (Roxb) Willd.	Mimosaceae	Common	Bark used in the distillation of sprit and gum yielding.
36	***Acacia lenticularis*** Buch.	Mimosaceae	Un common	Gum yielding
37	***Acacia planifrons*** Wight & Arn.	Mimosaceae	Un common	Gum yielding
38	***Adenanthera pavonina*** L.	Mimosaceae	Rare	Leaves used as dysentery.
39	***Albizia lebbeck*** (L.) Willd.	Mimosaceae	Common	Gum yielding.
40	***Albizia odoratissima*** (L.f.) Benth.	Mimosaceae	Common	Gum yielding.
41	***Dichrostachys cinerea***	Mimosaceae	Common	

	(L.)Wight & Arn.			The flowers can be a valuable source of honey.
42	***Parkia biglandulosa*** Wight & Arm.	Mimosaceae	Common	Used in ornamental.
43	***Pithecellobium dulce*** (Roxb.)B & H.	Mimosaceae	Non common	Fruits edible
44	***Prosopis chilensis*** (Molina) Stuntz	Mimosaceae	Common	Gum yielding and leaves applied on swellings, boils and wounds.
45	***Samanea saman*** (Jacq.) Merr.	Mimosaceae	Common	Used in ornamental
46	***Terminalia catappa*** L.	Combretaceae	Un Common	Used in ornamental and fruits edible.
47	***Callistemon citrinus*** (Curtis) Staf.	Myrtaceae	Un common	Used in ornamental.
48	***Eucalyptus tereticornis*** Sm.	Myrtaceae	Common	The leaves are used in The production of cineole based eucalyptus oil.
49	***Psidium guajava*** L.	Myrtaceae	Common	Fruits edible
50	***Syzygium cumini*** (L.)Skeels.	Myrtaceae	Un common	Fruits edible and timber yielding
51	***Canthium parviflorum*** Lam.	Rubiaceae	Un common	Roots and Leaves Plant uses in diarrhoea, fever, leucorrhoea, and general debility.
52	***Morinda pubescens*** Buch.	Rubiaceae	Common	Fruits edible.
53	***Manilkara zapota*** (L.) P. Royen.	Sapotaceae	Un common	Fruits edible
54	***Nyctanthes arbor-tristis*** L.	Nyctanthaceae	Un common	Ornamental and leaf juice is given to cure fever.
55	***Plumeria alba*** L	Apocynaceae	Common	Used in ornamental
56	***Plumeria rubra*** L	Apocynaceae	Common	Used in ornamental
57	***Wrightia tinctoria,*** R.Br.	Apocynaceae	Common	Gum yielding.
58	***Cordia sebestena*** L	Boraginaceae	Un common	Used in ornamental
59	***Crescentia cujete*** L.	Bignoniaceae	Un common	Used in ornamental
60	***Jacaranda mimosifolia*** D.	Bignoniaceae	Un common	Used in ornamental
61	***Kigelia africana*** (Jacq.) DC.	Bignoniaceae	Un common	Used in ornamental
62	***Markhamia platycalyx***	Bignoniaceae	Un common	Used in ornamental
63	***Millingtonia hortensis*** L.f.	Bignoniaceae	Common	Used in ornamental
64	***Spathodea campanulata*** P.Beauv.	Bignoniaceae	Common	Used in ornamental
65	***Tecoma stans*** (L.) Kunth.	Bignoniaceae	Common	Used in ornamental
66	***Tabebuia aurea*** **(** Manso) B & H.	Bignoniaceae	Non common	Used in ornamental
67	***Tabebuia pallida*** **(**Lndl.) Miers.	Bignoniaceae	Non common	Used in ornamental.
68	***Tabebuia rosea*** Berol.	Bignoniaceae	Common	Used in ornamental.
69	***Gmelina arborea*** Roxb.	Verbenaceae	Un common	Ripe dried fruits are employed in urticaria, tosiemia and worms.
70	***Vitex negundo*** L.	Verbenaceae	Un common	Leaves used on boils and swellings.
71	***Tectona grandis*** L.	Verbenaceae	Common	Timber yielding.
72	***Santalum album*** L.	Santalaceae	Common	Timber yielding and wood is used to cure boils.
73	***Phyllanthus acidus*** (L.) Skeels.	Euphourbiaceae	Un common	Fruits edible.
74	***Phyllanthus emblica*** L.	Euphourbiaceae	Un common	Fruits edible

75	***Casuarina litorea*** L.	Casurinaceae	Un common	Timber yielding
76	***Holoptelea integerifolia*** (Roxb.) Planch.	Ulmaceae	Common	Timber yielding and bark used as relive joint pains.
77	***Artocarpus heterophyllus*** Lam.	Moraceae	Common	Edible and dye yielding
78	***Ficus amplissma*** J.E.Sm.	Moraceae	Common	Fruit is used in dysentery.
79	***Ficus benghalensis*** L.	Moraceae	Common	Fruits edible and root twigs are used as tooth brush.
80	***Ficus elastica*** Roxb.	Moraceae	Non common	Used in ornamental.
81	***Ficus microcarpa*** L.f.	Moraceae	Common	Fruits edible.
82	***Ficus hispida*** L.f.	Moraceae	Common	Bark used as remedy to treat diabetes.
83	***Ficus religiosa*** L.	Moraceae	Common	The bark boil in hot water and the extract is given orally to the Diabetic person.
84	***Cycas circinalis*** L.	Cycadaceae	Common	Used in ornamental.
85	***Borassus flabellifer*** L.	Arecaceae	Non common	The decoction of roots of young plant is given in urinary infections.
86	***Cocos nucifera*** L.	Arecaceae	Common	Fruits edible
	Shrub species			
1	***Hibiscus lunariifolius*** Wild.	Malvaceae	Common	Stem used as cure fever.
2	***Sida cordifolia*** L.	Malvaceae	Common	Decoction of leaves and seeds in employed in asthma and cough.
3	***Sida rhombifolia*** L.	Malvaceae	Common	Stem/ bark used as fever, diuretic, gonorrhoea.
4	***Dodonaea viscosa*** L.	Sapindaceae	Common	Paste of leaves is applied on cuts, wounds and scabies.
5	***Alysicarpus heterophyllus*** Baker.	Fabaceae	Rare	-
6	***Crotalaria pallida*** Dryand	Fabaceae	Common	stem fibber is used as a material for thread.
7	***Crotalaria retusa*** L.	Fabaceae	Common	Used as Food and Drink.
8	***Desmodium laxiflorum*** DC.	Fabaceae	Non common	Used in aggressively in agriculture as part of the push-pull technology.
9	***Indigofera longeracemosa*** Boiv.	Fabaceae	Common	-
10	***Macrotyloma ciliatum*** Willd.	Fabaceae	Non common	-
11	***Ricinus communis*** L.	Euphorbiaceae	Non common	Seeds made in to past form and applied on sores, swellings boils.
12	***Tephrosia hookeriana*** Wight & Arn.	Fabaceae	Common	-
13	***Bauhinia tomentosa*** L.	Caesalpinaceae	Common	Root and bark used in intestinal complaints.
14	***Cassia absus*** L.	Caesalpiniaceae	Common	Used in ornamental.
15	***Caesalpinia pulcherrima*** L.	Caesalpiniaceae	Common	Used in ornamental.
16	***Ixora coccinea*** L.	Rubiaceae	Common	Used in ornamental
17	***Ixora finalysoniana*** Wall.	Rubiaceae	Common	Used in ornamental
18	***Calotropis gigantea*** L.	Asclepiadaceae	Common	Leaves are used to cure tooth pain.
19	***Nerium oleander*** L.	Apocynaceae	Common	Used in ornamental
20	***Solanum surattense*** Burm.f.	Solanaceae	Common	Decoction of whole plant is given in asthma and cough.
21	***Barleria buxifolia*** L.	Acanthaceae	Common	Roots and leaves used in stomach

				ache, tonic and febrifuge.
22	***Barleria cuspidata*** Heyne	Acanthaceae	Common	-
23	***Lantana camara*** L.	Verbenaceae	Common	Ripe fruit is edible and ornamental.
24	***Anisomeles malabarica*** L.	Lamiaceae	Common	The plant is stimulated. Expectorant and diaphoretic.
25	***Bougainvillea spectabilis*** Willd.	Nyctaginaceae	Common	Used in ornamental
26	***Euphorbia cyathophora*** Murr.	Euphourbiaceae	Common	Used in ornamental.
27	***Ricinus communis*** L.	Euphourbiaceae	Common	Latex of the plants is used in skin disease.
28	***Phyllanthus reticulatus*** Poir.	Euphourbiaceae	Uncommon	The root is used to make a dark brown to black dye and is often used to colour fishing lines.
	Lianas species			
1	***Bauhinia vahlii*** Wight & Arn.	Caesalpiniaceae	Uncommon	Stem fibre is used to make rope and leaves for shatter.
2	***Canavalia gladiata*** (Jacq.) DC.	Fabaceae	Uncommon	Fruits Edible.
3	***Tylophora indica*** (Burm.f.) Merr.	Asclepiadaceae	Uncommon	Leaves are employed in asthma, whooping cough and bronchitis.
4	***Toddalia asiatica*** (L.) Lam.	Rutaceae	Common	Fruit is used by massai as a cough remedy.
5	***Jasminum auriculatum*** Vahl.	Oleaceae	Common	Flowers used as Fragrant.

Conclusion

Recently, the efforts of biodiversity on ecosystem process have received much attention because of the growing concern that loss of biodiversity may impair ecosystem functioning. Some of the threatened factors like fast rate of biotic interference, destruction of natural habitat by human interference, cutting of trees and shrubs for construction purpose and unsustainable utilization of resources may adversely affect the existing diversity of both trees and shrubs of study area. From the conservational angle, the data presented here provide a basis for future studies on this ecosystem in general. In view of various resources use, habitat uniqueness and human pressure of the forest resources the need for conservation of Maruthamalai hills.

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