



Checklist of tree species in selected forest fragments of the Western Ghats, Tamilnadu

A. Sivakumar*, M. Murugesan** and K. Vasantha*

*PG and Research Department of Botany, Government Arts College, Coimbatore, Tamilnadu, India

**Department of Botany, PSG college of arts and science, Coimbatore, Tamilnadu, India

Article History : Received 15 February 2014, Accepted 06 April 2014

Abstract

A preliminary survey of tree species diversity was carried out in three semi evergreen forest patches, Valparai forest (VF), Injiparai forest (IF) and Kurangumudi forest (KF) of Anamalai hills of the Western Ghats. A total of 91 tree species representing 67 genera and 43 families were recorded. Lauraceae with 15 species was the most species family followed by Moraceae (7 species), Euphorbiaceae (6 species), Anacardiaceae (5 species), Meliaceae (4 species) and Sapindaceae (3 species). At the genus level, *Ficus* dominated with seven species followed by *Elaeocarpus* (4 species), *Actinodaphne* (4 species) and *Neolitsea* (3 species). The overall objective of this study was to list out the tree species in fragmented forests which may focus on the ecological impacts associated with fragmentation.

Keywords : Anamalai hills, Western Ghats, Moraceae, Euphorbiaceae, Anacardiaceae, Meliaceae and Sapindaceae.

Introduction

Floristic inventory and diversity studies help us to understand the species composition and diversity status of forests which also offer vital information for forest conservation (Gordon and Newton, 2006). Prior to forest management operations, biodiversity inventories are used to determine the nature and distribution of biodiversity resources of the region being managed. Such biodiversity inventories are best integrated with the timber resource inventories in order that forest management operations can be planned (Rennolls and Laumonier, 2000). In these inventories, quantification of tree species diversity is an important aspect as it provides resources and habitat for many species (Cannon *et al.*, 1998).

The richest of most diverse terrestrial ecosystem on the earth are the tropical forests.

Although they now occupy less than 10% of the earth's land surface, they contain more than two-thirds of all higher plant biomass and at least one half of all plants, animals and microbial species in the world (Jane Ihenyen *et al.*, 2011). Due to lack of management approaches and protection, forests adjacent to relict forest fragments were converted to cardamom and tea plantations.

The fragmentation of rain forests was related to an increase of ongoing human disturbances such as forest logging and animal grazing. In particular, smaller remnant fragments were highly vulnerable to ongoing disturbances as they were accessible for logging and clearance (Cristian Echeverría *et al.*, 2007). The present study provides a checklist of tree species and highlights the stocking status of the trees in such forest fragments for better ecological plans.

Materials and methods

Study Area

The present study was carried out in three semi evergreen forest patches of Anamalai hills, Western Ghats. It is located in Coimbatore District of Tamilnadu State, southern India at an elevation of 1650 to 2100 metres above msl. The temperature ranges from 15 to 32° C in an year. The rainfall of the study area mainly occurs during south-west (June – August) and north-east (October – December) monsoons. The average annual rainfall for the past twenty years is as much as 3000mm and the relative humidity ranges from 64 to 82%. Since the forests occupy the highest range of hills in Anamalais, it is subjected to high velocity of wind during south-west monsoon period.

Sampling methods

Three 1-ha square plots were established, distributed one in each study forest. Each plot was subdivided into 10 x 10 m workable units and they were systematically surveyed by identifying and measuring all living trees of ≥ 30 cm girth at breast height (gbh 1.3 m) Nomenclature of taxa is mostly based on the flora of Tamil Nadu (Nair and Henry, 1983; Henry et al., 1987, 1989).

Results and Discussion

The checklist of tree species in three semi evergreen forest patches is given in Table - 1. A total of 91 tree species representing 67 genera and 43 families were recorded. Lauraceae comprises of 15 species followed by Moraceae (7 species), Euphorbiaceae (6 species), Anacardiaceae (5 species), Meliaceae (4 species) and Sapindaceae (3 species). Other families constitute one or more species in the study area (Table - 1). At the genus level, *Ficus* dominated with 7 species followed by *Elaeocarpus* (4 species), *Actinodaphne* (4 species) and *Neolitsea* (3 species). The checklist of tree species in these forest fragments shows that the diversity of tree species in forest fragments is confined to a minimum number. To quantify the damage caused to commercial tree species in advanced stages of regeneration from each component of the felling and bole removal process needs proper understanding. If subsequent research confirms that these processes are aiding regeneration dominance by pioneer species, then forest managers may need to increase supervision reduce damage to commercial tree species in advanced stages of regeneration (Adam Felton et al., 2006). It is also suggested that the reduction of human interference in these study sites for purposes such as collection of fuel wood,

Table 1. Check list of tree species in three semi evergreen forest fragments

S. No.	Name of the species	Family	Valparai forest	Injiparai Forest	Kurangumudi forest
1.	<i>Acrocarpus fraxinifolius</i>	Fabaceae	+	-	-
2.	<i>Actinodaphne bourdillonii</i>	Lauraceae	+	+	+
3.	<i>Actinodaphne campanulata</i>	Lauraceae	+	+	+
4.	<i>Actinodaphne malabarica</i>	Lauraceae	+	+	+
5.	<i>Actinodaphne tadulingami</i>	Lauraceae	+	+	-
6.	<i>Aglaia elaeagnoidea</i>	Meliaceae	+	+	-
7.	<i>Allophylus serratus</i>	Sapindaceae	+	-	+
8.	<i>Alstonia scholaris</i>	Apocynaceae	+	-	-
9.	<i>Aphanamixis polystachya</i>	Meliaceae	-	-	+

S. No.	Name of the species	Family	Valparai forest	Injiparai Forest	Kurangumudi forest
10.	<i>Artocarpus heterophyllus</i>	Moraceae	+	+	
11.	<i>Artocarpus hirsutus</i>	Moraceae	-	+	+
12.	<i>Bhesa indica</i>	Celastraceae	+	-	-
13.	<i>Bischofia javanica</i>	Euphorbiaceae	+	+	+
14.	<i>Boehmeria glomerulifera</i>	Urticaceae	+	+	+
15.	<i>Callicarpa tomentosa</i>	Verbenaceae	+	-	-
16.	<i>Canarium strictum</i>	Burseraceae	+	+	+
17.	<i>Canthium dicoccum</i>	Rubiaceae	+	-	-
18.	<i>Celtis tetrandra</i>	Ulmaceae	+	+	+
19.	<i>Celtis timorensis</i>	Cannabaceae	+	-	-
20.	<i>Cinnamomum malabattrum</i>	Lauraceae	+	+	+
21.	<i>Cinnamomum wightii</i>	Lauraceae	+	+	+
22.	<i>Clerodendrum viscosum</i>	Verbenaceae	+	+	+
23.	<i>Cryptocarya bourdilloni</i>	Lauraceae	-	-	+
24.	<i>Cullenia exarillata</i>	Bombacaceae	+	+	+
25.	<i>Daphniphyllum neilgherrense</i>	Daphnipllyllaceae	+	+	+
26.	<i>Debregeasia longifolia</i>	Urticaceae	+	+	+
27.	<i>Dimocarpus longan</i>	Sapindaceae	+	+	+
28.	<i>Drypetes roxburghii</i>	Euphorbiaceae	-	-	+
29.	<i>Elaeocarpus munronii</i>	Elaeocarpaceae	-	-	+
30.	<i>Elaeocarpus oblongus</i>	Elaeocarpaceae	+	-	+
31.	<i>Elaeocarpus serratus</i>	Elaeocarpaceae	-	+	-
32.	<i>Elaeocarpus tuberculatus</i>	Elaeocarpaceae	+	+	+
33.	<i>Eugenia thwaitesii</i>	Myrtaceae	-	-	+
34.	<i>Eurya japonica</i>	Theaceae	-	+	-
35.	<i>Euvodia lunu-ankenda</i>	Rutaceae	-	+	+
36.	<i>Ficus amplissima</i>	Moraceae	+	-	-
37.	<i>Ficus arnottiana</i>	Moraceae	-	+	+
38.	<i>Ficus asperrima</i>	Moraceae	+	+	+
39.	<i>Ficus beddomei</i>	Moraceae	-	+	-
40.	<i>Ficus callosa</i>	Moraceae	-	+	-
41.	<i>Ficus hispida</i>	Moraceae	+	+	+

S. No.	Name of the species	Family	Valparai forest	Injiparai Forest	Kurangumudi forest
42.	<i>Ficus tsjahela</i>	Moraceae	-	+	-
43.	<i>Filicium decipiens</i>	Sapindaceae	-	-	+
44.	<i>Garcinia gummi-gutta</i>	Clusiaceae	+	+	+
45.	<i>Glochidion ellipticum</i>	Euphorbiaceae	+	+	+
46.	<i>Glochidion neilgherrense</i>	Euphorbiaceae	+	-	-
47.	<i>Gordonia obtusa</i>	Theaceae	+	-	-
48.	<i>Hydnocarpus alpina</i>	Flacourtiaceae	+	+	+
49.	<i>Ixora notoniana</i>	Rubiaceae	+	+	+
50.	<i>Ligustrum perrottetii</i>	Oleaceae	+	+	+
51.	<i>Litsea floribunda</i>	Laraceae	+	-	+
52.	<i>Litsea wightiana</i>	Lauraceae	-	-	+
53.	<i>Macaranga peltata</i>	Euphorbiaceae	+	+	+
54.	<i>Maesopsis eminii</i>	Rhamnaceae	+	-	-
55.	<i>Mallotus muricatus</i>	Euphorbiaceae	+	+	+
56.	<i>Mangifera indica</i>	Anacardiaceae	-	-	+
57.	<i>Meliosma pinnata</i>	Sabiaceae	+	+	+
58.	<i>Meliosma simplicifolia</i>	Sabiaceae	-	+	-
59.	<i>Memecylon umbellatum</i>	Melastomataceae	+	-	+
60.	<i>Mesua ferrea</i>	Calophyllaceae	+	+	+
61.	<i>Michelia champaca</i>	Magnoliaceae	+	+	+
62.	<i>Michelia nilagirica</i>	Magnoliaceae	+	-	+
63.	<i>Myristica dactyloides</i>	Myristicaceae	+	+	+
64.	<i>Neolitsea fischeri</i>	Lauraceae	+	-	-
65.	<i>Neolitsea scrobiculata</i>	Lauraceae	+	+	+
66.	<i>Neolitsea zeylanica</i>	Lauraceae	+	+	+
67.	<i>Nothapodytes nimmoniana</i>	Icacinaceae	+	+	+
68.	<i>Nothopegia beddomei</i>	Anacardiaceae	+	+	+
69.	<i>Olea dioica</i>	Oleaceae	+	+	+
70.	<i>Palaquium ellipticum</i>	Sapotaceae	+	-	-
71.	<i>Persea macrantha</i>	Lauraceae	+	+	+
72.	<i>Phoebe paniculata</i>	Lauraceae	+	-	+
73.	<i>Phoebe wightii</i>	Lauraceae	-	-	+

S. No.	Name of the species	Family	Valparai forest	Injiparai Forest	Kurangumudi forest
74.	<i>Pygeum gardneri</i>	Rosaceae	-	+	+
75.	<i>Rapanea wightiana</i>	Myrsinaceae	+	-	+
76.	<i>Scolopia crenata</i>	Flacourtiaceae	-	+	-
77.	<i>Semecarpus auriculata</i>	Anacardiaceae	+	-	+
78.	<i>Semecarpus travancorica</i>	Anacardiaceae	+	+	-
79.	<i>Semecarpus sps</i>	Anacardiaceae	+	+	-
80.	<i>Sterculia guttata</i>	Sterculiaceae	+	+	+
81.	<i>Stereospermum colais</i>	Bignoniaceae	+	-	-
82.	<i>Strychnos sps</i>	Loganiaceae	+	-	-
83.	<i>Symplocos cochinchinensis</i>	Symplocaceae	+	+	+
84.	<i>Syzygium cumini</i>	Myrtaceae	+	+	+
85.	<i>Terminalia paniculata</i>	Combretaceae	+	-	+
86.	<i>Toona ciliata</i>	Meliaceae	+	-	-
87.	<i>Trichilia connaroides</i>	Meliaceae	-	+	-
88.	<i>Turpinia nepalensis</i>	Staphyleaceae	-	+	+
89.	<i>Vateria indica</i>	Dipterocarpaceae	-	+	+
90.	<i>Vernonia monosis</i>	Compositae	+	+	+
91.	<i>Zanthoxylum tetraspermum</i>	Rutaceae	-	-	+

non-timber forest produce etc, alters the vegetation structure and also influence the natural regeneration of plant species (Sivakumar, 2014). Thus, the need for protecting forest fragments in the current context of increasing tropical deforestation and forest fragmentation in order to conserve biological diversity is evident, particularly because the Indian Western Ghats has such high levels of endemism (Muthuramkumar et al., 2006).

Conclusion

Though the studied forest patches comprises high a number of standing trees, the number in terms of diversity of species is considerably less. Efforts should be made to control the intensity of degradation by planting site specific indigenous

species, illegal entries and over exploitation of valuable plant species has to be controlled.

References

- Adam Felton., Annika M., Felton., Jeff Wood., David B. and Lindenmayer, 2006. Vegetation structure, phenology, and regeneration in the natural and anthropogenic tree-fall gaps of a reduced-impact logged subtropical Bolivian forest. *Forest Ecology and Management.*, 235 : 186 - 193.
- Cannon, C.H., Peart D.R. and Leighton M. 1998. Tree species diversity in commercially logged Bornean rain forest. *Science.*, 28 : 1366 - 1368.
- Cristian Echeverría., Adrian, C., Newton., Antonio Lara., José María Rey Benayas and David A. Coomes. 2007. Impacts of forest fragmen-

- tation on species composition and forest structure in the temperate landscape of southern Chile. *Global Ecol. Biogeogr.*, 1 - 14.
- Gordon, J.E. and Newton A.C. 2006. Efficient floristic inventory for the assessment of tropical tree diversity: A comparative test of four alternative approaches. *Forest Ecology and Management.*, 237 : 564 - 573.
- Henry, A.N., Chitra, V. and Balakrishnan, N.P. 1989. Flora of Tamilnadu, India, Ser 1. Vol. 3. Botanical Survey of India, Coimbatore.
- Henry, A.N., Kumari, G.R. and Chitra V., 1987. Flora of Tamil Nadu, India, Ser.1, Vol. 2. Botanical Survey of India, Coimbatore.
- Jane Ihenyen., Mensah, J.K., Osunde, W.O. and Ogie - Odia, E. 2011. Checklist of the Tree/Shrub Species of Edo South, Nigeria. *J. Appl. Environ. Biol. Sci.*, 1(9) : 276 - 282.
- Muthuramkumar, S., Ayyappan, N., Parthasarathy, N., Divya Mudappa, T.R., Shankar Raman, M., Arthur Selwyn and Arul Pragasan, L. 2006. Plant community structure in tropical rain forest fragments of the Western Ghats, India. *Biotropica.*, 38(2) : 143-160.
- Nair, N.C. and Henry, A.N. 1983. Flora of Tamil Nadu, India. Ser.1. Vol.1. Botanical Survey of India, Coimbatore.
- Rennolls, K. and Laumonier, Y. 2000. Species diversity structure analysis at two sites in the tropical rain forest of Sumatra. *Journal of Tropical Ecology.*, 16 : 253 - 270.
- Sivakumar, A. 2014. Diversity of tree species in three semi evergreen forests of Anaimalai Hills, the Western Ghats, Southern India. *The Journal of Biodiversity. Photon.*, 113 : 281-290.
