WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES
SJIF Impact Factor 6.647
Volume 6, Issue 8, 1056-1063 Research Article ISSN 2278 – 4357

FLORSITIC DIVERSITY OF ILANGUDIPATTI AYYANAR SACRED GROVE AT PUDUKOTTAI DISTRICT OF TAMIL NADU, INDIA

Dr. Thandavamoorthy M.*

Assistant Professor, Vasavi College of Education, Madagadipet, Pondicherry - 605 107.

Article Received on
11 June 2017,
Revised on 02 July 2017,
Accepted on 24 July 2017,
DOI: 10.20959/wjpps20178-9688

***Corresponding Author**
Dr. Thandavamoorthy M.
Assistant Professor,
Vasavi College of Education, Madagadipet,
Pondicherry - 605 107.

ABSTRACT

Sacred groves are ecologically and genetically very important. They possess a great heritage of diverse gene pool of many forest species having religious attachment and possessing medicinal values. The present study was conducted in Ilangudipatti Ayyanar sacred grove in Pudukottai district of south India. The study aimed at documenting the plant wealth and diversity of the grove. A total of 48 woody species belonging to 41 genera and 27 families were documented from this grove, which measure 7.5 ha. Some medicinal, endemic, rare plants are also protected in this grove. These observations indicate that the sacred grove is the traditional way of conserving plants. The vegetation structure indicates that this grove is inland tropical dry evergreen forest.

KEYWORDS: Plant biodiversity, Sacred Groves, Conservation.

INTRODUCTION

Nature worship has been a key force of shaping the human attitudes towards conservation and sustainable utilization of natural resources. Such traditional practices have been invariably operating in different parts of India (Anthwal, *et al*., 2006). Conservation linked to religious and cultural beliefs has been important in preserving biodiversity in different regions of India. In India, conservation of plants and animals are considered as sacred by the indigenous people. They believe that trees represent God (Ganesan, *et al.*, 2009). Earlier there have been many traditional conservation practices by indigenous communities for conservation and protection of flora. One such practice is named as sacred groves. Sacred groves are patches of forests dedicated to a local spirit or deity and protected by cultural traditions and religious precept (Gadgil and Vartak, 1975, 1976). Sacred groves, also known as “Kovil Kadugal” in

Tamil have been identified all over the world including India; they are rich in biodiversity (Sukumaran, 2002; Anbarasan and Padmavathy, 2010). They are composed of several floras with medicinal, rare, endemic, threatened, timber and fuel wood yielding plants (Sukumaran and Raj 2007; Sukumaran *et al*., 2007).

Sacred groves are the repositories of rare and endemic species and can be regarded as the remnant of the primary forest left untouched by the local inhabitants and protected them due to the belief that the deities reside in these forests. Many people have described sacred groves in different ways. However, there is an evident fact that wherever sacred groves existed, indigenous traditional societies have spiritual relationships with the existing physical environment sustained them. The role of sacred groves in the conservation of biodiversity has long been recognized (Kosambi, 1962; Gadgil and Vartak, 1976; Haridasan and Rao, 1985; Ramanujam, 2000; Khan *et al*. 1997; 2008). In this paper, the floristic wealth of Ilangudipatti Ayyanar sacred grove from Pudukottai district of Tamil Nadu state was reported here in order to prepare the conservation and management plan for the biodiversity protection in India.

MATERIALS AND METHODS

Study Area

Ilangudipatti Ayyanar sacred grove measuring 7.5 hectares is dedicated to Ayyanar who is present in open place with his consorts, Poorani and Porkalai. This grove is located nearly 9 km away from Pudukttttai town. Geographically, it is lying between10^{o}20’ N latitude and 78º46’ E longitude. Temperature is moderately high and the average temperature during summer is 34°C and fewer less in winter. Annual rainfall is ranging from 850 to 1000 mm. However, during the two decades the district has experienced rainfall is less. Most of the rains occur during north east monsoon. Soil is a ferruginous type with admixture of limestone. The soil is shallow in rocky area and deeper in valley with little or no humus. The vegetation of Ilangudipatti Ayyanar sacred grove is tropical dry evergreen forest type (Champion and Seth, 1968).

Methods

Intensive field surveys were made during the year 2012-2014 to explore the floristic composition and the conservation status of the Ilangudipatti Ayyanar sacred grove of Pudukottai district, Tamil Nadu. All the plant specimens available in the study areas were collected for authenticity and the herbarium specimens are prepared by following the

methodology of Jain and Rao (1976). Photographs were also taken. Flowering twigs were collected and identified taxonomically using the publications of Gamble and Fisher, 1967 and Mathew, 1981, 1982, 1991, and 1993. The nomenclature of the plants is corrected with the publications of Henry, *et al.*, 1987, and 1989 and Nair, *et al.*, 1983.

RESULTS AND DISCUSSION

Table. 1: List of woody plant species (≥ 20 cm gbh) at Ilangudipatti sacred grove.

Sl. No.	Species	Family	Habit
1	*Acacia intsia*	Fabaceae-Mimosoideae	Tree
2	*Acacia leucophloea*	Fabaceae-Mimosoideae	Tree
3	*Acacia polyacantha*	Fabaceae-Mimosoideae	Tree
4	*Albizia amara*	Fabaceae-Mimosoideae	Tree
5	*Albizia lebbeck*	Fabaceae-Mimosoideae	Tree
6	*Atalantia monophylla*	Rutaceae	Tree
7	*Azadirachta indica*	Meliaceae	Tree
8	*Bauhinia racemosa*	Fabaceae-Caesalpinoideae	Tree
9	*Benkara malabarica*	Rubiaceae	Tree
10	*Borassus flabellifer*	Arecaceae	Tree
11	*Capparis grandis*	Capparaceae	Tree
12	*Carissa spinarum*	Apocyanaceae	Shrub
13	*Catunaregam spinosa*	Rubiaceae	Tree
14	*Chloroxylon swietenia*	Rutaceae	Tree
15	*Cocculus hirsutus*	Menispermaceae	Liana
16	*Crateva religiosa*	Capparaceae	Tree
17	*Dalbergia lanceolaria* sub sp. *paniculata*	Fabaceae-Faboideae	Tree
18	*Dalbergia latifolia*	Fabaceae-Faboideae	Tree
19	*Derris scandens*	Fabaceae-Faboideae	Liana
20	*Diospyros ebenum*	Ebanaceae	Tree
21	*Discospermum sphaerocarpum*	Rubiaceae	Tree
22	*Drypetes sepiaria*	Putranjivaceae	Tree
23	*Euphorbia antiquorum*	Euphorbiaceae	Shrub
24	*Grewia carpinifolia*	Malvaceae	Tree
25	*Gyrocarpus americanus*	Hernandiaceae	Tree
26	*Haldina cordifolia*	Rubiaceae	Tree
27	*Ixora pavetta*	Rubiaceae	Tree
28	*Jasminum angustifolium*	Oleaceae	Liana
29	*Lannea coromandelica*	Anacardiaceae	Tree
30	*Lepisanthes tetraphylla*	Sapindaceae	Tree
31	*Manilkara hexandra*	Sapotaceae	Tree
32	*Miliusa montana*	Annonaceae	Tree
33	*Morinda pubescens*	Rubiaceae	Tree
34	*Pavetta indica*	Rubiaceae	Shrub
35	*Pleiospermium alatum*	Rutaceae	Tree
36	*Polyalthia korintii*	Annonaceae	Tree
37	*Prosopis chilensis*	Fabaceae-Faboideae	Tree
38	*Prosopis juliflora*	Fabaceae-Faboideae	Tree

39	*Psydrax dicoccos*	Rubiaceae	Tree
40	*Sapindus emarginatus*	Sapindaceae	Tree
41	*Scutia myrtina*	Rhamnaceae	Shrub
42	*Strychnos nux-vomica*	Loganiaceae	Tree
43	*Strychnos potatorum*	Loganiaceae	Tree
44	*Tamarindus indica*	Fabaceae-Caesalpinoideae	Tree
45	*Ventilago maderaspatana*	Rhamnaceae	Liana
46	*Wrightia tinctoria*	Apocyanaceae	Tree
47	*Ziziphus jujuba*	Rhamnaceae	Shrub
48	*Ziziphus nummularia*	Rhamnaceae	Shrub

Table. 2: Inventory of woody species.

Variables	Number/Value
No. of Species	48
No of genera	41
No. of families	22
No. of tree species	38
No. of Shrub Species	6
No. of liana species	4

In the present study, totally 48 woody species (Table -1) belonged to 22 families and 41 genera were recorded from 7.5 ha. of land area. Among the habitwise distribution, trees were the dominant form represented with 38 species followed by shrubs with 6 species, and lianas with 4 species (Table -2). Among family-wise distribution, Rubiaceae is the dominant with 8 species followed by Fabaceae- Faboideae, Fabaceae- Mimosoideae (5 species each), Rhamnaceae (4 species), Rutaceae (3 species) and Apocyanaceae, Capparaceae, Fabaceae-Caesalpinoideae, Sapindaceae and Loganiaceae each with two species. Among the top generic-wise distribution, *Acacia* is the dominant plant genus represented with 3 species followed by *Albizia, Dalbergia, Prosopis, Strychnos and Ziziphus* each with 2 species and others are represented each with single species.

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). The present findings are comparable with other studies in sacred groves of Tamil Nadu and other regions of India. In Tamil Nadu, several studies with respect to floristic inventory were reported includes 260 species in 176 genera and 62 families from Malliganatham (John Britto *et al.*, 2001a), 224 species in 175 genera and 63 families from Vamban (John Britto *et al*., 2001b), 35 species in 32 genera and 22 families (Sridhar Reddy and Parthasarathy, 2006), 77 species in 61 genera and 30 families (Mani and Parthasarathy, 2006) from four sacred groves of Coromandel coast, 106 species belonging to

97 genera and 54 families from Manganampatti, Nadiamman and Suranviduthi village (Vinothkumar *et al.*, 2011) of Pudukottai district, In addition, Sambandan and Dhatchanamoorthy, (2012) reported 59 species in 55 genera and 30 families from Karaikal. Thus, floristic diversity assessment is significant at local and regional levels to understand the present status and to make effective management strategies for conservation (Jayakumar *et al*., 2011).

The vegetation of the selected sacred grove is a tropical dry evergreen forest type comprises the species include *Albizia amara*, *Euphorbia antiquorrum*, *Morinda pubescens*, *Stychnos nux-vomica* etc. This is due to the presence of typical, characteristic and preferential evergreen tree species Meher-Homji (1974). The presence of gaint lianas such as *Ventilago maderaspatana*, *Derris scandens* revealed the undisturbed status of the vegetation. Key stone species found in this sacred grove which harbors a number of birds and other survival of many other species. Keystone species play a crucial role in biodiversity conservation through key functions that they perform in an ecosystem often they are also socially or culturally valued (Ramakrishnan, 2001), used not only for managing pristine ecosystems (Ramakrishnan, 1992) but also for building up biodiversity in both natural and human-managed ecosystems through appropriately conceived rehabilitation strategies that will ensure people's participation (Ramakrishnan *et al.*, 1994). The threatened medicinal plants also recorded from this sacred grove like, *Strychnos potatorum*, Hence it concluded that the present study area with high species diversity tends to preserve its biodiversity.

CONCLUSION

The present study, while enumerating the biodiversity and assessing the botanical significance of the Ilangudipatti sacred grove along the south eastern coast of India, has also validated the conservational strategy evolved by ancient societies, subtended by religious faith and cultural traditions (Ramakrishnan, *et al.*, 1998). The concept of sacred groves appears to be an efficacious tool in the micro level biodiversity conservation worth continuing into the next millennium.

ACKNOWLEDGEMENT

The author is thankful to his guide Dr. S. Nadanakunjidam and also thankful to Dr. M.P. Ramanujam for his encouragement and moral support. The author is also thankful to the local people who were helped during the field visit.

REFERENCES

1. Anbarasan, M. and Padmavathy, A. Ethno-medicinal plants in five sacred groves in Cuddalore district, Tamilnadu, India. Ethanobotanical leaflets, 2010; 14: 774-80.
2. Anthwal, A., Sharma, R. C. and Sharma, A. Sacred Groves: Traditional Way of Conserving Plant Diversity in Garhwal Himalaya, Uttaranchal. J. Amer. Sci., 2006; 2: 35- 38.
3. Ejtehadi, H., Amini, T. and Zare, H. Importance of Vegetation Studies in Conservation of Wildlife: a Case Study in Miankaleh Wildlife Refuge, Mazandaran Province, Iran. Environ. Sci., 2005; 9: 53-58.
4. Gadgil M. and Vartak V. D. Sacred groves of India: a plea for continued conservation. Journal of Bombay Natural History Society, 1975; 72: 314–320.
5. Gadgil, M. and Vartak, V. D. The Sacred Groves of Western Ghats in India.Econ. Bot., 1976; 30: 152-160.
6. Gamble, J. S. and Fischer C. E. C. The Flora of the Presidency of Madras, Vols. I–III, 2nd Edition, (Botanical Survey of India, Culcutta).1967.
7. Ganesan, S., Ponnuchamy, M., Kesavan, L. and Selvaraj, A. Floristic composition and practices on the selected sacred groves of Pallapatty village (Reserved forest) Tamil Nadu. Indian Journal of Traditional knowledge, 2009; 8(2): 154–162.
8. Haridasan, K. and Rao, R.R. Forest Flora of Meghalaya, Vol. 1. Bishen Singh and Mahendrapal Singh, Dehra Dun. 1985.
9. Henry A.N., Kumari G.R. and Chitra V. Flora of Tamil Nadu, Series–I, Vol. II.Botanical survey of India, southern – Circle, Coimbatore. 6.1987.
10. Henry A.N., Chitra V. and Balakrishnan N.P. Flora of Tamil Nadu, Series–I. Vol III.Botanical Survey of India, Coimbatore, India.1989.
11. Jain, S.K. and Rao, R.R. A Hand Book of field and Herbarium Methods. Today and. Tomorrows Publishers. 1976.
12. Jayakumar, S., Kim, S. and Heo, J. Floristic inventory and diversity assessment - A Critical Review. Proc. Inter. Acad. Ecol. Environ. Sci., 2011; 1: 151-168.
13. John Britto, S., Balaguru, B., Soosairaj, S. and Arockiasamy, D.I. Diversity of plants in a sacred grove of Pudukottai District in Tamil Nadu. J. Econ. Tax. Bot., 2001a; 25: 58-62.
14. John Britto, S., Balaguru, B., Soosairaj, S. and Arockiasamy, D.I. Floristic analysis of a sacred grove at Vamban in Pudukottai District of Tamil Nadu, South India. J. Econ. Tax. Bot., 2001b; 25: 81-90.

15. Khan, M.L., Menon, S. and Bawa, K.S. Effectiveness of the protected area network in bio diversity conservation: a case study of Meghalaya state. Biodiver. Conserv., 1997; 6: 853–868.
16. Khan ML, Khumbongmayum AD and Tripathi RS. Sacred groves and their significance in conserving biodiversity: An overview. International Journal of Ecology and Environmental Science, 2008; 34: 277-291.
17. Kosambi, D.D. Myth and Reality. Popular Press, Bombay, India. Ramakrishnan, P.S. 2001. Increasing population and declining biological resources in the context of global change and globalization. J. Biosci., 1962; 26: 465–479.
18. Mani, S. and Parthasarathy, N. Tree diversity and stand structure in inland and coastal tropical dry evergreen forests of peninsular India. Curnnt Science, 2006; 90: 1238-1246.
19. Mathew, K.M. Materials for a Flora of the Tamil Nadu Carnatic Vol. 1. The Rapinat Herbarium, St.Joseph's College, Tiruchirapalli, India.1981.
20. Mathew, K. M. Illustrations on the Flora of the Tamil Nadu Carnatic. Vol. 2. The Rapinat Herbarium, St Joseph's College, Tiruchirapalli, India. 1982.
21. Mathew, K. M. An Excursion Flora of Central Tamil Nadu, India. Oxford & IBH Publ. Co., New Delhi, India. 1991.
22. Mathew K.M. The Flora of the Tamil Nadu Carnatic. Vol. 3. The Rapinat Herbarium, St Joseph's College, Tiruchirapalli, India.1993.
23. Meher-Homji, V. M. On the origin of the tropical dry evergreen forest of South India. International Journal of Ecology and Environmental Sciences, 1974; 1: 19–39.
24. Nair N.C. Henry A.N., Kumari G.R. and Chitra V. Flora of Tamil Nadu, Series–I, Vol. I. Botanical survey of India, southern – Circle, Coimbatore. 1983.
25. Ramakrishnan, P.S. Shifting agriculture and sustainable development: An interdisciplinary study from north-eastern India. UNESCO– MAB Series, Paris and Parthenon Publ, Carnforth, Lancs., UK.1992.
26. Ramakrishnan PS. Participatory development in managing population pressure on natural resources; in Growing numbers and dwindling resources (ed.) R Krishnan (New Delhi: Tata Energy Research Inst.), 1994; 86-96.
27. Ramakrishnan P.S. Conserving the sacred for biodiversity: the conceptual framework. In: Ramakrishnan P.S., Saxena K.G. and Chandra Shekera U.M. (eds), Conserving the Sacred for Biodiversity Management. Oxford IBH Publishing Co. Pvt. Ltd., New Delhi, India, 1998; 3-16.

28. Ramakrishnan, P.S. Increasing population and declining biological resources in the context of global change and globalization. J. Biosci. 2001; 26: 465–479.
29. Ramanujam M.P. Conservation of environment and human rights; sacred groves in cultural connections to biodiversity PRP. Journal of Human Rights, 2000; 4: 34-38.
30. Sambandan, K. and Dhatchanamoorthy, N. Studies on the Phytodiversity of a Sacred Grove and its Traditional Uses in Karaikal District, U.T. Puducherry. J. Phytol., 2012; 4(2): 16-21.
31. Sridhar Reddy, M. and Parthasarathy, N. Liana diversity and distribution on host trees in four tropical dry evergreen forests of peninsular India. Tropical Ecology, 2006; 47(1): 109-123.
32. Sukumaran, S. Studies on the scared groves of Kanyakumari district and their values in rural life, PhD dissertation (Mamonmannian Sundaranar University, Tirunelveli, Tamilnadu). 2002.
33. Sukumaran, S. & Raj, A. D. S. Rare, endemic, Threatened tress and lianas scared groves of Kanyakumari district, Indian For., 2007; 133(9): 1254-1266.
34. Sukumaran S. Jeeva S. Raj A.D.S. and Laloo R.C. Rediscovery of Tectaria Zeilanica (Tectariopideae) – A Rare fern from Vilavancode sacred grove, Southern Western ghats, India, Indian For., 2007; 30(3): 331-332.
35. Vinothkumar, D., Murugavelu, S. and Kethsy Prabhavathy, A. Phytosociological and Ethnobotanical Studies of Sacred Groves in Pudukottai District, Tamil Nadu, India. Asian J. Exp. Biol. Sci., 2011; 2(2): 306-315.