

Floristic Diversity of Sacred Grove in Kudap Village in Ratnagiri District, Maharashtra

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Abstract

Biodiversity refers to variety and variability of living organisms in a given habitat. Floristic diversity refers to variety and diversity of plants in a given habitat. The floristic diversity of Western Ghats is very rich in its medicinal wealth, which was well protected since its natural conception. Kudap is a village situated in Chiplun tehsil of Ratnagiri district in Maharashtra, India, located in the shade of Western Ghats. The sacred grove of this village is known as “Kudap Sacred Groove” which was visited seasonally to carry out the survey during the period April 2016 to March 2017. The study revealed that it has heavy vegetation containing nearly 35 medicinal plants belonging to 18 families. Out of which about 24 species are used by local natural healers for traditional and folk medicinal practices to cure different ailments like diarrhea, poison bites, wounds, piles, rheumatism, jaundice etc. The recent developmental activities for transportation, uncontrolled exploitation of natural resources by some of the local people, forest land conversion for agriculture purpose and forest fires due to human carelessness in the study area are major issues due to which the floristic diversity is being affected seriously. Such activities are reducing the density of important medicinal plants. Hence, there is an immense need for protection and conservation of diversity of medicinal plant wealth for the present and forth coming generations by adapting the suitable strategy with most appropriate method of conservation.

KEYWORDS - .Kudap, floristic diversity, sacred groves, medicinal plants, healers

INTRODUCTION

The word biodiversity was coined by Walter G. Rosen in 1986, and it is highly popularized during the recent times. Biodiversity is an “assurance” for life on our planet, and therefore must be protected at all costs, because it is a universal heritage that can offer immediate advantages to human beings. Biodiversity refers to the variety of life and the ecological processes that support life (Ridder 2008). More important is the general recognition that diversity of plants and animals in the natural world supports human interests ranging from basic food and fiber needs to medicinal products to recreation and purely appreciative aspects of nature

India, with its diverse agro-climatic conditions and regional topography, has been considered as the treasure house or botanical garden of plant genetic resources. In India nature worship dates back to the Vedic period (5000 B.C.) and is based on the promise that all creations of nature have to be protected. Several plant species such as peepal (*Ficus religiosa*), Tulsi (*Ocimum sanctum*), Rudraksha (*Eleo carpus*), Bel (*Agele marmelos*), Ashok (*Saraca asoka*) and Kadamb (*Anthrocephalus chinesis*) have been considered as sacred species. Besides sacred species required for rituals, patches of forests and water bodies were also conserved in the name of local deities. An important

tradition of nature worship is to protect patches of forest dedicated to deities of ancestral spirits. These forest patches have been designated as “Sacred groves”. They manifest the spiritual and ecological ethos of local indigenous communities. Recently efforts have been made by the scientist to define the sacred groves. One such effort is that of Hughes and Chandran (1998) who have defined sacred groves as “Segments of landscape containing vegetation, life forms and geographical features, delimited and protected by human societies under the belief that to keep them in a relatively undisturbed state is expression of an important relationship of humans with the divine or with nature”. They were believed to be the abode of gods. In Maharashtra, sacred groves are locally known as ‘Devrai’. The biodiversity status of sacred groves is very higher. They are rich in flora and fauna. Most of the wild relatives of plants, rare, threatened and endemic plants are found in abundance.

The Western Ghats is one of the world’s ten Hottest biodiversity hotspots, which is a home for several globally endangered species (UNESCO, whc.unesco.org).

The floristic diversity of sacred groves includes several plants of medicinal importance. These plants are being used by natural healers for curing various types of diseases in mankind. Destruction of natural habitat of medicinal plants due to various reasons like industrialization, urbanization, deforestation, forest fires, etc., leads to considerable depletion of plant genetic resources and many of them are being in the process of extinction (Vijayalatha, 2004).

Kudap is a village situated in western ghat ranges in Chiplun tehsil of Ratnagiri district in Maharashtra, India. The devrai of Kudap village is locally known as ‘Kudap devrai’ or ‘Kudap sacred grove’ scattered in 14.81 hectare and is maintained by some tribal people like Katkari, Dhanagar to fulfill their daily need. The life of these people is influenced by major components like biodiversity, its conservation, water resource management, changes in local climate and other ecological factors. These people use conventional ethnomedicinal plants for various purposes like treatment of dysentery, cough, cold, skin infections, snake, scorpion and honey bee bite, piles, jaundice, etc.

In the present context of ‘back to nature’ in health care, it is very relevant that the valuable plant species are not only studied and preserved but also their cultivation as well as conservation methods should be developed. The main objective of present study is to survey the floristic diversity of Kudap sacred grove, understanding the importance of medicinal plant species occurring in the area, conveying the importance of cultivation and conservation of these plants to the local public, making them aware of pharmacological importance of these plants in the world, so that the floristic diversity be maintained in the area, which is part of the wealth of our nation.

MATERIALS AND METHODS

Study Area:

Kudap is a village situated in Ratnagiri district of Maharashtra, India. The geographical coordinates i.e. latitude and longitude of Kudap is 17.08 and 73.19 respectively. The climatic condition of the village is drastically influenced by Arabian sea and Sahyadri mountains. The annual rainfall at the village is about 3970mm. The temperature of the area ranges between 25 °C and 35 °C. The percent humidity varies from 78 - 85 % during the year.

Materials and Methods:

A preliminary survey was carried out to record the plant diversity of the Kudap sacred grove. For the proposed study, the study area was visited 3-4 times during each of the three seasons of study period. Explorations were undertaken from one end through the center of the forest area to the opposite end and back. Six spots were selected randomly from the study area. Quadrants of 10m x 10m for trees, 5m x 5m for shrubs and 1m x 1m for herbs were laid and different plant species were recorded from each spot.

The plant specimens were collected from the study area by taking optimum care as of their occurrence and number and using standard method of collection.. The collected specimens were preserved as herbarium in our laboratory. The collected and preserved specimens were identified using Flora of Presidency of Bombay (Cooke, 1958), Flora of Maharashtra (Almeida, 1996-2009), (Singh and Karthikeyan, 2000), (Singh *et. al.*, 2001), Flora of Raigad District (Kothari and Moorthy, 1993) and The Flora of Sawantwadi (Almeida, 1990). Voucher specimens were deposited in the herbarium of Department of Botany, RKT College, Ulhasnagar, Thane.

The floristic diversity and the importance of the sacred grove are also recorded. Simultaneously, the floristic diversity destroying factors were also visually observed and recorded.

Broad morphological features of plants were studied by referring to the standard literature and plants were classified as grass, climber, herb, shrub and tree. A questionnaire was prepared and distributed among the local natural healers to collect the information regarding uses of reported plants as folk medicine. The information about medicinal plants, diseases for which they are used, time and period of collection, availability of plant, flowering season of plant and recipes of the medicine preparation were collected from the local natural healers and presented in tabular format in result section. The collected data were analyzed for arriving at useful conclusions.

RESULTS AND DISCUSISON:

The results of floristic survey of study area and information about ethnomedicinal applications of plants by local natural healers are presented in table no. 1. The healers were found to be reluctant for providing information about methods of preparation of medicines. The leaves and roots were the two major plant parts frequently used for the treatments of the diseases by them.

As per the classification of the forests by Champion and Seth (1968), the forests of Kudap village fall in the category of 'Tropical Moist Deciduous Forest'. Relatively more common plants in the study area were: *Syzygium* (Fam- Myrtaceae), *Terminalia* (Fam. Combretaceae), *Sapindus* (Sapindaceae), *Dalbergia* (Fam- Leguminaceae), *Carrisa* (Fam- Apocyanaceae) and *Tectona* (Fam-Verbinaceae) and *Holarrhena* (Fam-Apocyanaceae).

In the ground flora, undergrowth comprises members of *Euphorbiaceae* (*Phyllanthus*), *Lamiaceae* (*Ocimum*). The middle canopy consisted of shrubs like *Holarrhena*, *Rauwolfia serpentina* are present. Top canopy was made up of *Mangifera indica* L.

The parasites like *Dendrophthoe*, *Loranthus* and *Viscum* were present on the host like *mangifera*, *Syzygium*, *Terminalia*, *Ficus* and *Acacia*. The most dominant group belongs to tree category, followed by shrubs, climbers and herbs. There was only one dominant grass species and that was *Andropogon tricticeus*. It was found that weeds like

Argemone mexicana, *Phyllanthus niruri* and *Lantana camara* grow on cultivated and wastelands. *Hemidesmus indicus* grew on hedges. Most of the other species found were of evergreen and moist deciduous habitat. The rare and threatened species like *Gloriosa superba*, *Drosera indica* and *Rauvolfia serpentina* were also reported. All of the climbers, grasses, shrubs, herbs and trees found were used by the tribals for their medicinal, fodder, veterinary medicine, floss, fibre, oil, tan, dye, species, fruits, vegetable, aromatic, resin yielding purposes. (Table no. 1.). It was observed that the people depended on the medicinal plants of this sacred grove for curing some of the diseases. The edible plants available in the forests were used in the times of drought or special occasions. The grasslands were used for grazing their cattle and in the dry seasons some of the forest plants were used to provide fodder to their cattle. The medicine for their cattle was also obtained from the forests on some occasions. The plants yielding aroma were used to prepare perfumes. The fibre, floss, tan, resin, oil, dye, gum yielding plants found place in their day to day activities and occupation. Most of these species are being used by the local people living around the sacred grove threatening the existence of these species. Therefore, the threatened species are now on the verge of extinction and many other species will enter the threatened list soon.

Different types of preparation made from medicinally significant plants including decoction, powder, juice paste, oil and whole plant extract. The procedures of preparation of folk medicines, also called recipes of folk medicines were not obtained from the local healers, due to their non-specific approaches towards modern study. However, attempts are needed to explore the information of this aspect, which needs still more frequent meetings with these people.

CONCLUSIONS

The preliminary study showed the presence of good-enough floristic diversity in the Kudap village which is maintained by local public. Some plant species of this village are endemic but at present endangered, which are economically and medicinally important. The study area did not show uniform habitat. The forest destructing factors such as land use for agriculture, forest fires, road expansions, installations of cables by different companies and some of the upcoming projects were also reported and needs to be controlled to prevent loss of national wealth. As stated earlier, the flow of information from one generation to the next is being reduced for several reasons. Therefore, earliest actions like exploration, scientific documentation, creating awareness on conservation of natural resources needs to be initiated. More studies are needed for conservation and cultivation of threatened species of medicinal plants which would be helpful in phytochemical studies and pharmaceutical point of view in future. The study highlights the need for building local ecological knowledge and incorporating it in the strategy for strengthening the management of sacred groves institution.

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Table No. 1. Checklist of Floristic Diversity of Kudap sacred grove and Ethnomedicinal uses of plants by natural healers in Kudap village.

Sr. No.	Botanical Name	Common Name	Habit	Family	Distribution	Flowering seasons	Medicinal Uses
1	<i>Santalum album L.</i>	Chandan	Tree	Santalaceae	Rare	Feb – Apr	Medicine, used in cosmetics
2	<i>Gliricidia sepium(Jacq.) Walp.</i>	Undirmari	Tree	Fabaceae	Wild	Jan – May	Used for rat kill
3	<i>Butea monosperma (Lam.) Kuntz.</i>	Palas	Tree	Fabaceae	Wild	Mar –May	Medicine, used in body heat
4	<i>Ocimum tenuiflorum L.</i>	Indian Basil	Herb	Lamiaceae	Common	Mar-May	Medicine, used in cough
5	<i>Mimusops elengi (L.)</i>	Bakul	Tree	Mimosaceae	Common	Feb –May	Medicine, Edible fruits, Aromatic plant, Oil-yielding
6	<i>Saraca indica L.</i>	Ashok	Tree	Fabaceae	Rare	Feb - Apr	Used in ayurvedic medicine
7	<i>Mesua ferrea L.</i>	Nagkeshar	Tree	Calophyllaceae	Rare	Feb –May	Medicine , spices
8	<i>Mangifera indica L.</i>	Amba	Tree	Anacardiaceae	Common Cultivated	Dec – Mar	Edible fruits, seeds used for protein powder
9	<i>Azadirachta indica A.Juss</i>	Neem	Tree	Meliaceae	Rare	Dec - May	Medicine , used in toothache
10	<i>Bauhinia racemosa(Lam)</i>	Apta	Tree	Caesalpiniaceae	Common	Apr – Jun	Gum yielding
11	<i>Cassia tora (L)</i>	Takala	Herb	Caesalpiniaceae	Common	Sep – Nov	Medicine , Vegetable preparation
12	<i>Delonix regia (B.Hook)</i>	Gulmohar	Tree	Caesalpiniaceae	Rare	Oct- Mar	Fodder
13	<i>Tamarindus indica (L)</i>	Chinch	Tree	Caesalpiniaceae	Rare	Jun – Aug	Medicine, used in cooking
14	<i>Ficus religiosa (L).</i>	Pimpal	Tree	Moraceae	Wild	Apr – Aug	Fodder
15	<i>Ficus racemosa (L).</i>	Umber	Tree	Moraceae	Wild	Feb – Jun	Fodder, Fibre yielding
16	<i>Moringa oleifera (Lam)</i>	Shevaga	Tree	Moringaceae	Cultivated	Jan – Jun	Medicine , Vegetable preparation
17	<i>Phyllanthus emblica (L)</i>	Awla	Tree	Euphorbiaceae	Cultivated	Sep-Nov	Medicine, Tan yielding
18	<i>Carrissa congesta carandus (L)</i>	Karavand	Shrub	Apocynaceae	Common	Mar – May	Edible fruits
19	<i>Rauwolfia serpentina (L)</i>	Sarpangandha	Shrub	Apocynaceae	Rare		Medicine, used against snake bite

20	<i>Oxalis corniculata L.</i>	Ambushi	Herb	Oxalidaceae	Wild	Mar – Sep	Medicine
21	<i>Plumeria rubra (Lim)</i>	Chapha	Tree	Apocynaceae	Wild	Apr – Sep	Medicine , used in injury
22	<i>Holarrhena antidysenterica (L)</i>	Kuda	Shrub	Apocynaceae	Common	Oct – May	Medicine, used in vegetable preparation
23	<i>Tectona grandis (Linn.f.)</i>	Sag	Tree	Verbenaceae	Common	Aug – Jan	Medicine , Fodder
24	<i>Acacia catechu (Arn.)</i>	Khair	Tree	Mimosaceae	Common	July –Nov	Fodder, tan , gum yielding
25	<i>Aegel marmelos (Corr-ex-roxb)</i>	Bel	Tree	Rutaceae	Rare	Sept - Mar	Medicine, used in chywanprash
26	<i>Annona reticulate (L)</i>	Ramphal	Tree	Annonaceae	Occasionall y wild	Sept –Nov	Edible fruits
26	<i>Annona squamosa (L)</i>	Sitaphal	Tree	Annonaceae	Occasionall y wild	Jun – Sept	Edible fruits, seeds used in hair shampoo
28	<i>Sapindus laurifolius (Vahl)</i>	Soapnut	Tree	Sapindaceae	Wild	Oct – Nov	Medicine , Biodetergent
29	<i>Terminalia chebula (Retz)</i>	Hirada	Tree	Combretaceae	Common	Jan – Apr	Medicine, used in churn
30	<i>Terminalia crenulata (Roth)</i>	Ain	Tree	Combretaceae	Common	Jan – Apr	Medicine, used in churn
31	<i>Terminalia arjuna (W & A)</i>	Arjun	Tree	Combretaceae	Common	Jan – Apr	Fodder
32	<i>Syzygium cumini (L)</i>	Jambul	Tree	Myrtaceae	Common	Feb – May	Medicine, used for diabetis
33	<i>Hemidesmus indicus (L.) Schult</i>	Anantvel	Climber	Apocynaceae	Rare	Feb –May	Used in veterinary Medicine
34	<i>Andropogon triticeus.</i>	Bhalekusal	Grass	Poaceae	Rare	Jan – Apr	Fodder
35	<i>Argimone Mexicana L.</i>	Piwala Dhotra	Herb	Papaveraceae	Rare	Jan –Mar	Veterinary Medicine