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STUDIES ON PHYTO DIVERSITY OF MALLIKARJUN HILL ADI : A SACRED GROVE IN KARNATAKA, INDIA

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ABSTRACT

Sacred groves comprise of patches of forests or natural vegetation – from a few trees to forests of several acres. Sacred groves are classified into three types 1) Traditional Sacred Groves – It is the place where the village deity resides, who is represented by an elementary symbol 2) Temple Groves – Here a grove is created around a temple and conserved. 3) Groves around the burial or cremation grounds. Sacred groves are ecologically significant because they conserve biodiversity, recharge aquifers and conserve soil. The sacred groves face some threats also, keeping all these views in mind, the present paper deals with the study of angiosperm plants diversity in “Mallikarjun hill Adi” a temple grove located in Adi Tal. Chikkodi, dist. Belgaum, Karnataka and discuss their importance in conservation of regional plant diversity and uses.

Keywords : Sacred groves, Phyto Diversity, Mallikarjun hill Adi.

Introduction

Sacred groves comprise of patches of forests or natural vegetation – from a few trees to forests of several acres – that are usually dedicated to local folk deities (eg. Ayyanar and Amman) or tree spirits *Vanadevatais*, Gadgil *et al.*, 1975. These spaces are protected by local communities because of their religious beliefs and traditional rituals that run through several generations. The degree of sanctity of the sacred forests varies from one grove to another. In some forests even the dry foliage and fallen fruits are not touched. People believe that any kind of disturbance will offend the local deity, causing diseases, natural calamities or failure of crops. For example, the Garo and the Khasi tribes of northeastern India completely prohibit any human interference in the sacred groves. In other groves, deadwood or dried leaves may be picked up, but the live tree or its branches are never cut. For example, the Gonds of central India prohibit the cutting of a tree but allow fallen parts to be used. Sacred groves are classified into three types 1) Traditional Sacred Groves – It is the place where the village deity resides, who is represented by an elementary symbol 2) Temple Groves – Here a grove is created around a temple and conserved. 3) Groves around the burial or cremation grounds.

Sacred groves are ecologically significant because they 1) Conserve Biodiversity – The sacred groves are important repositories of floral and faunal diversity that have been conserved by local communities in a sustainable manner. They are often the last refuge of endemic species in the geographical region. 2) Recharge of aquifers – The groves is often associated with ponds, streams or springs, which help meet the water requirements of the local people. The vegetative cover also helps in the recharging the aquifers. 3)

Soil conservation-The vegetation cover of the sacred groves improves the soil stability of the area and also prevents soil erosion.

The sacred groves have some threats; the threats vary from one region to the other and even from one grove to the other. But the common threats identified are: 1) Disappearance of the traditional belief systems, which were fundamental to the concept of sacred groves. These systems and their rituals are now considered mere superstition. 2) Sacred groves in many parts of our country have been destroyed due to rapid urbanization and developmental interventions such as roads, railways tracks, dams including commercial forestry. Encroachment has led to the shrinkage of some of the largest groves in the country. 3) Many groves are suffering due to ‘Sanskritisation’ or the transformation of the primitive forms of nature worship into formal temple worship. 4) Invasion by exotic weeds such as *Eupatorium odoratum*, *Lantana camara* and *Prosopis juliflora* is a serious threat to some groves. 5) Pressures due to increasing livestock and fuel wood collection. (ENVIS report).

Keeping all these views in mind, the present paper deals with the study of angiosperm plants diversity in “Mallikarjun hill Adi” a temple grove located in Adi Tal. Chikkodi, dist. Belgaum, Karnataka and discuss their importance in conservation of regional plant diversity and uses.

Material and Methods

Study area

Adi (Chikodi) is a village in the southern state of Karnataka, India. It is located in the Chikodi taluka of Belgaum district in Karnataka with Latitude 16.4961598 Longitude 74.3726732. (Figure-1). The average annual

rainfall recorded during 2021-22 is 808 mm. Its population is nearly 5000. It is located near Bangalore-Pune highway in the state of Karnataka, belgavi dist. Kannada is the local language. Adi is famous for Shri Mallikarjun (Gram Daivat) and Shri Dattatraya (Parmatmraj Maha raja) temple located on Shri Mallikarjun Devasthan Hill. Which is 75kms away from the belgaum city karnataka and 30kms from Kolhapur (MH). Shri Mallikarjun devsthan is also known as shri adi Mallyya or sanjeevan giri Adi. Infront of Mallikarjun temple Shrunggi Brungi is present and on back side goddess Shri Bhramarabika Devi mandir which is one of the Mahasakthi and both are believed to be self-manifested. On the right side of the Mallikarjun hill a famous Shri Datta Devstan Temple is present which is maintained by Shri Paramatmaraj Maharaj. Totally the hill side view shows like a mahalinga. No any other place like this, Devastana administration has taken all measures for the pilgrim's. Every year during shravan month lakhs of devotees visited to this hill.

Field Work: Extensive field visits were carried out, at monthly intervals during 2021-22 to document the floristic diversity of Mallikarjun hill the sacred grove. Specimens of flowering plants were collected and identified with the aid of different regional floras (Hooker, 1872–1897; Saldhana 1984, 1996, Singh, 1984; Seetharam 2000). Lists of endangered, threatened and rare plants found in the sacred groves were prepared with the help of published works. The survey tours had been planned in such a way that it was possible to cover all the seasons and months of the year. Thus, it was made possible to have a comprehensive and exhaustive study of the vegetation of the entire area which resulted in the representative collection of medicinal plants at monsoon and post monsoon period. It also covered different habitats in the area like rocky and open grassland. Photographs have been taken at different stages of development of plants, landscape, forest view, canopy and other general feature for interpretation and aesthetic value (Plate 1).

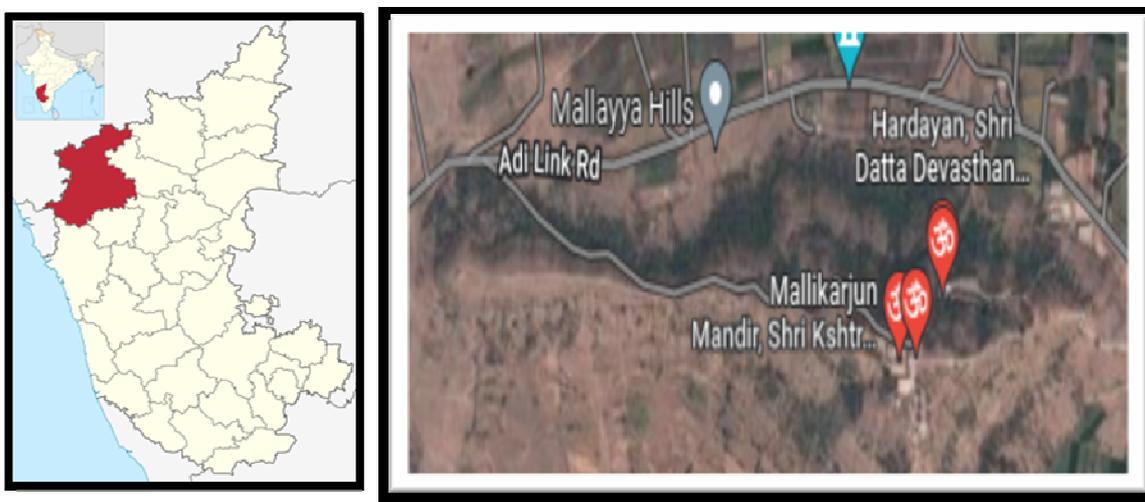


Fig. 1 : Location map of the study area

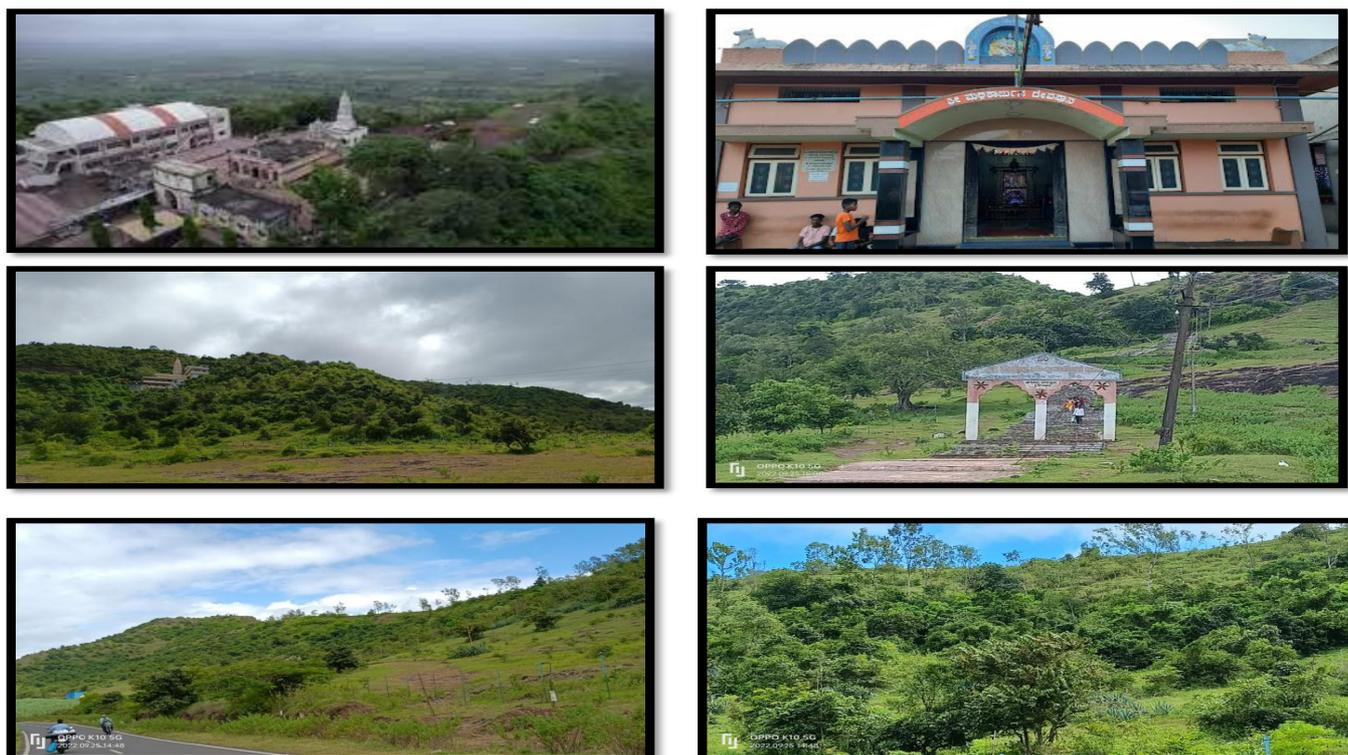


PLATE 1 : Scenic view of the study area Mallikarjun hill, Adi sacred grove

Result and Discussion

The present study deals with floristic composition of angiosperms grown and nurtured in the sacred grove located in Shri Mallikarjun Devasthan hill Adi. Species diversity In all, 160 plant species belonging to 133 genera and 58 families have been recorded from the area under study. The monocots were represented by 28 species belonging to 20 genera and 10 families, and dicots contributing 128 species belonging to 109 genera and 44 families. While remaining 4 species belonging to 4 genera and 4 families are lower plants.

Based on habit classification of the enumerated plants, the majority of species were herbs (66 species) followed by trees (56 species) and shrubs (26 species) climbers (12 species). The most species rich families included Fabaceae as the dominant family with 15 species, followed by Poaceae (11 species), Euphorbiaceae and Mimosaceae (9 species each). Flora of this sacred grove is enriched by Karnataka forest department regularly. Local grazing animals causes somewhat treat to this grove.

Table 1 : Phytodiversity of sacred grove located in Shri Mallikarjun Devasthan hill Adi

S. No.	Botanical Name	Family name	Habit	Status	Vernacular name
1.	<i>Abrus precatorius</i> Wall.	Fabaceae	Cl	Common	Gunj
2.	<i>Abutilon indicum</i> (L.) Sweet.	Malvaceae	S	Common	Mudrika
3.	<i>Acacia auriculiformis</i>	Mimosaceae	T	Common	Austrelian babhul
4.	<i>Acacia conciana</i>	Mimosaceae	CL	Rare	Shikekai
5.	<i>Acacia farnesiana</i>	Mimosaceae	T	Common	Sweet acacia
6.	<i>Acacia nilotica</i>	Mimosaceae	T	Common	Babhul
7.	<i>Acacia catechu</i>	Mimosaceae	T	Rare	Khair
8.	<i>Achyranthes aspera</i> L.	Amaranthaceae	H	Common	Agada
9.	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	T	Common	Bel
10.	<i>Agave americana</i>	Agavaceae	S	Common	Gayapat
11.	<i>Ageratum conyzoides</i> L.	Asteraceae	H	Common	Billygoat weed
12.	<i>Albizia lebbek</i>	Fabaceae	T	Common	Woman's tongue tree
13.	<i>Aloe barbadensis</i> Miller.	Liliaceae	H	Rare	korphad
14.	<i>Alternanthera sessilis</i> (L.) R.Br.	Amaranthaceae	H	Common	Golkusal
15.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	H	Common	Spiny Amaranth
16.	<i>Amaranthus viridis</i> L.	Amaranthaceae	H	Common	Green Amranth
17.	<i>Annona reticulata</i>	Annonaceae	T	Rare	Ramphal
18.	<i>Annona squamosa</i> L.	Annonaceae	T	Rare	Sitaphal
19.	<i>Argemone mexicana</i> L.	Papaveraceae	H	Common	Pivala dhotara
20.	<i>Artabotrys zeylanicus</i>	Anonaceae	S	Rare	Green chapha
21.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	T	Common	Neem
22.	<i>Barleria cristata</i> L.	Acanthaceae	H	Common	Koranti
23.	<i>Bauhinia purpurea</i>	Caesalpiniaceae	T	Rare	Kanchan
24.	<i>Bautea monosperma</i>	Fabaceae	T	Common	Palas
25.	<i>Bidens pilosa</i> L.	Asteraceae	H	Rare	Morshend
26.	<i>Bixa orellana</i>	Bixaceae	S	Rare	Shendri
27.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	H	Common	Punarnava
28.	<i>Bougainvillea spectabilis</i> Willd	Nyctaginaceae	S	Common	Paper flower
29.	<i>Bombax ceiba</i>	Bombacaceae	T	Rare	katesavar
30.	<i>Brachiari aramosa</i> (L.) Stapf.	Poaceae	H	Common	Signal grass
31.	<i>Caesalpinia bonduc</i>	Caesalpiniaceae	CL	Rare	Sagargota
32.	<i>Caesalpinia pulcherrima</i> (L.) Sw.	Caesalpinaceae	S	Rare	Shankasur
33.	<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae	S	Common	Rui
34.	<i>Calocasia esculanta</i>	Araceae	H	Rare	Green taro
35.	<i>Canna indica</i>	Cannaceae	H	Rare	karadal
36.	<i>Cardiospermum halicacabum</i>	Sapindaceae	H	Rare	Kapalphodi
37.	<i>Carrisa carandus</i>	Apocynaceae	S	Common	Karavand
38.	<i>Caryota urens</i>	Arecaceae	T	Rare	Bherli mad
39.	<i>Cassia tora</i> L.	Caesalpinaceae	S	Common	Takala
40.	<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae	H	Rare	sadaphuli
41.	<i>Celosia cristata</i> L.	Amaranthaceae	H	Rare	kurdu
42.	<i>Citrus limon</i> L.	Rutaceae	S	Rare	limbu
43.	<i>Clerodendron inermis</i>	Verbenaceae	S	Rare	koynel
44.	<i>Cleome viscosa</i>	Capparaceae	H	Rare	Tick weed
45.	<i>Clitoria ternatea</i>	Papilionaceae	H	Rare	gokarn
46.	<i>Clorophytum borivilianum</i>	Liliaceae	H	Common	Safed musali
47.	<i>Cocus nucifera</i>	Arecaceae	T	Rare	Naral

48.	<i>Commelina benghalensis L.</i>	Commelinaceae	H	Common	kena
49.	<i>Corchorus capsularis L.</i>	Tiliaceae	H	Common	White jute
50.	<i>Crossandra infundibuliformis L.</i>	Acanthaceae	H	Sporadic	Aboli
51.	<i>Crotalaria verrucosa L.</i>	Fabaceae	H	Common	Blue rattlepod
52.	<i>Cyanotis cristata (L.) D. Don.</i>	Commelinaceae	H	Sporadic	Crested Dew grass
53.	<i>Cynotis burmanniana Wight.</i>	Commelinaceae	H	Sporadic	Dew grass
54.	<i>Cynodon dactylon (L.) Pers.</i>	Poaceae	H	Common	Durva
55.	<i>Cyperus mindorensis</i>	Poaceae	H	Common	Nivarsha
56.	<i>Cyperus rotundus L.</i>	Cyperaceae	H	Sporadic	Nagarmotha
57.	<i>Dalbergia sisso</i>	Fabaceae	T	Rare	Indian rosewood
58.	<i>Datura metal L.</i>	Solanaceae	H	Common	Dhotara
59.	<i>Decaschistia trilobata</i>	Malvaceae	H	Rare	Mysore mallow
60.	<i>Delonix regia</i>	Caesalpiniaceae	T	Common	Gulmohar
61.	<i>Dendrocalamus strictus</i>	Poaceae	S	Rare	Bamboo
62.	<i>Digitaria ciliaris (Retz.) Koeler.</i>	Poaceae	H	Sporadic	crabgrass
63.	<i>Emblica officinalis</i>	Euphorbiaceae	T	Rare	Amala
64.	<i>Eragrostis unioloides</i>	Poaceae	H	Sporadic	Siteche pohe
65.	<i>Eriocaulon tuberiferum</i>	Eriocaulaceae	H	Sporadic	pangend
66.	<i>Erythrina stricta</i>	Fabaceae	T	Rare	Pangara
67.	<i>Eucalyptus globulus</i>	Myrtaceae	T	Common	Nilgiri
68.	<i>Euphorbia antiquorum L.</i>	Euphorbiaceae	S	Common	Dudhi
69.	<i>Euphorbia hirta L.</i>	Euphorbiaceae	H	Common	Asthma plant
70.	<i>Euphorbia tirucalli L.</i>	Euphorbiaceae	T	Common	Indian tree spurge
71.	<i>Ficus benghalensis L.</i>	Moraceae	T	Rare	Vad
72.	<i>Ficus racemosa L.</i>	Moraceae	T	Rare	Umbar
73.	<i>Ficus religiosa L.</i>	Moraceae	T	Rare	Pimpal
74.	<i>Ficus virens</i>	Moraceae	T	Rare	Payar
75.	<i>Gliricidia sepium</i>	Fabaceae	T	Common	Rat poison tree
76.	<i>Gloriosa superba L.</i>	Liliaceae	CL	Rare	kalalavi
77.	<i>Gomphrena serrata L.</i>	Amaranthaceae	H	Sporadic	Globe amaranth
78.	<i>Hibiscus ovalifolius (Forsk.) Vahl.</i>	Malvaceae	H	Sporadic	Grape leaved mallow
79.	<i>Hibiscus rosa-sinensis L.</i>	Malvaceae	S	Rare	Jasvandi
80.	<i>Hyptis suaveolens L.</i>	Lamiaceae	S	Common	Pignut
81.	<i>Impatiens balsamina L.</i>	Balsamiaceae	H	Common	Terada
82.	<i>Ipomoea obscura (L.) Ker-Gawl.</i>	Convolvulaceae	CL	Common	Morning glory
83.	<i>Jasminum malabaricum Wight.</i>	Oleaceae	CL	Sporedic	Kusar
84.	<i>Jatropha curcas L.</i>	Euphorbiaceae	S	Common	Mogali Erand
85.	<i>Justicia adathoda L. f.</i>	Acanthaceae	S	Rare	Adulasa
86.	<i>Lantana camara L.</i>	Verbenaceae	S	Sporadic	Ghaneri
87.	<i>Lawsonia inermis L.</i>	Lytharaceae	S	Rare	Mehandi
88.	<i>Leucas aspera (Willd.) Link.</i>	Lamiaceae	H	Sporadic	Shakroba
89.	<i>Mallotus philippensis</i>	Euphorbiaceae	T	Rare	Kunkuphal
90.	<i>Mangifera indica</i>	Anacardiaceae	T	Rare	Amba
91.	<i>Melia azedarach L.</i>	Meliaceae	T	Rare	kadulimb
92.	<i>Michelia champaca</i>	Magnoliaceae	T	Rare	Sonchapha
93.	<i>Mimosa pudica L.</i>	Mimosaceae	H	Rare	lajalu
94.	<i>Mimusops elengi</i>	Sapotaceae	T	Rare	Bakuli
95.	<i>Morinda citrifolia</i>	Rubiaceae	T	Sporadic	Noni
96.	<i>Musa paradisiaca L.</i>	Musaceae	T	Rare	keli
97.	<i>Neolamarckia cadamba</i>	Rubiaceae	T	Common	Burflower tree
98.	<i>Nyctanthes arbor-tristis L.</i>	Nyctaginaceae	T	Rare	Parijatak
99.	<i>Oberonia falconeri</i>	Orchidaceae	H	Rare	Hiravi chapati aamari
100.	<i>Ocimum americanum L.</i>	Lamiaceae	H	Common	Lime basil
101.	<i>Ocimum basilicum L.</i>	Lamiaceae	H	Sporadic	Sweet basil
102.	<i>Ocimum tenuifolium L.</i>	Lamiaceae	H	Sporadic	Holy basil
103.	<i>Opuntia stricta (Haw.) Haw.</i>	Cactaceae	S	Sporadic	Nivdung
104.	<i>Oxalis corniculata L.</i>	Oxalidaceae	H	Sporadic	Ambushi
105.	<i>Panicum curviflorum Hornem.</i>	Poaceae	H	Sporadic	Grass
106.	<i>Panicum maximum Jacq.</i>	Poaceae	H	Common	Guinea grass
107.	<i>Parthinium hysterophorus L.</i>	Asteraceae	H	Common	Gajargavat
108.	<i>Peltophorum pterocarpum</i>	Fabaceae	T	Common	Copper pod tree

109.	<i>Phoenix sylvestris</i>	Arecaceae	T	Rare	Shindi
110.	<i>Phyllanthus amarus</i> Schum	Euphorbiaceae	H	Common	Bhuiamala
111.	<i>Phyllanthus maderaspatensis</i> Poir.	Euphorbiaceae	H	Sporadic	Madras leaf flower
112.	<i>Physalis minima</i> L.	Solanaceae	H	Rare	Native gooseberry
113.	<i>Pithecellobium dulce</i> (Rob.) Benth.	Mimosaceae	T	Rare	Vilayati chinch
114.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	H	Common	Chitrak
115.	<i>Plemeria rubra</i>	Apocynaceae	T	Rare	Chapha
116.	<i>Polyalthia longifolia</i>	Anonaceae	T	Common	Ashok
117.	<i>Pongamia glabra</i>	Fabaceae	T	Common	Karanj
118.	<i>Portulaca oleracea</i>	Portulacaceae	H	Common	Ghol
119.	<i>Prosopis cineraria</i> (L.) Druce	Mimosaceae	T	Rare	Shami
120.	<i>Prosopis juliflora</i> (Sw) DC.	Mimosaceae	T	Common	Vilayati babhul
121.	<i>Quisqualis indica</i>	Combretaceae	CL	Rare	Madhumalati
122.	<i>Ricinus communis</i> L.	Euphorbiaceae	S	Rare	Erand
123.	<i>Saccharum officinarum</i>	Poaceae	S	Common	Sugarcane
124.	<i>Samanea saman</i>	Fabaceae	T	Common	Rain tree
125.	<i>Santalum album</i> L.	Santalaceae	T	Rare	Chandan
126.	<i>Setaria intermedia</i> Roem. & Schultes.	Poaceae	H	Common	Pandar
127.	<i>Setaria pumila</i> (Poir.) Roem. & Schultes.	Poaceae	H	Common	Yellow foxtail
128.	<i>Setaria verticillata</i> (L.) P.Beauv.	Poaceae	H	Common	Bristly foxtail
129.	<i>Sida cordata</i> (Burm.f)	Malvaceae	H	Common	Flannel weed
130.	<i>Smithia setulosa</i>	Fabaceae	H	Common	Kawla
131.	<i>Solanum nigrum</i>	Solanaceae	H	Rare	Black night shade
132.	<i>Solanum pubescens</i> Willd.	Solanaceae	H	Sporadic	Turkey berry
133.	<i>Spathodea campanulata</i> L.	Bignoniaceae	T	Rare	African tulip tree
134.	<i>Syzygium cumini</i>	Myrtaceae	T	Rare	Jambhul
135.	<i>Tabernaemontana citrifolia</i>	Apocynaceae	S	Rare	Rare
136.	<i>Tagetes erecta</i> L.	Asteraceae	H	Rare	Marigold
137.	<i>Tamarindus indica</i> L.	Caesalpinaceae	T	Rare	Chinch
138.	<i>Tecoma stans</i> (L.) Kunth.	Bignoniaceae	S	Sporadic	Tikoma
139.	<i>Tectona grandis</i>	Verbenaceae	T	Common	Sag
140.	<i>Teramnus labialis</i>	Fabaceae	CL	Common	Blue wiss
141.	<i>Terminalia bellarica</i>	Combretaceae	T	Rare	Behada
142.	<i>Terminalia chebula</i>	Combretaceae	T	Rare	Hirda
143.	<i>Terminalia catappa</i>	Combretaceae	T	Rare	Indian almond
144.	<i>Terminalia elliptica</i>	Combretaceae	T	Rare	Ain
145.	<i>Terminalia paniculata</i>	Combretaceae	T	Rare	Kinjal
146.	<i>Thespesia populnea</i> L.	Malvaceae	T	Common	Indian tulip tree
147.	<i>Thevetia peruviana</i> (Pers.) K.	Apocynaceae	S	Rare	Yellow oleander
148.	<i>Tinospora cordifolia</i> (Willd.) Miers.	Menispermaceae	CL	Sporadic	Gulwel
149.	<i>Tribulus terrestris</i>	Zygophyllaceae	H	Sporadic	Gokharu
150.	<i>Tridax procumbens</i> L.	Asteraceae	H	Common	Tikyacha pala
151.	<i>Trigonella occulta</i>	Fabaceae	H	Rare	Ranmethi
152.	<i>Vigna aconitifolia</i> (Jacq.) Mar.	Fabaceae	CL	Common	Ranmug
153.	<i>Vigna trilobata</i> (L.) Verd.	Fabaceae	CL	Sporadic	Mukani
154.	<i>Vitex negundo</i> L.	Verbenaceae	S	Rare	Nirgudi
155.	<i>Woodfordia fruticosa</i>	Lytharaceae	S	Rare	Dhayati
156.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	T	Rare	Indian plum
157.	<i>Adiantum incisum</i> Forssk.	Adiantaceae	H	Rare	Maidenhair fern
158.	<i>Anthoceros</i> sp.	Anthocerotaceae	H	Common	Hornworts
159.	<i>Riccia crystallina</i> L.	Ricciaceae	H	Common	Liverworts
160.	<i>Funaria hygrometrica</i>	Funariaceae	H	Common	Moss

T – Tree; S – Shrub; CL – Climber; H – Herb.

Conclusion

Sacred groves are important for both conservation, lively hood development and in modification of landscape. The sacred grove as a unique unit in the rural landscape, it performs several ecological functions, which can directly or

in directly help in the maintenance of ecosystem health of all interacting landscape units. So it is suggested that degraded grove should be immediately regenerated and need to conduct awareness programme among the rural people regarding importance and utility of sacred grove.



PLATE 2 : Photographs of some of the plants of the grove.

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