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# Assessment of plant diversity in the community protected forest of Kusnur Village, Hangal, Haveri District, Karnataka, India

## Abstract

An assessment was carried out through random quadrates plot in the study area. A total 129 plant species were documented. Frequency and density varied greatly among the taxa, while many species were not evenly abundant in the study areas. The present study revealed that there are many medicinal plants which are used by local peoples, who residing near the forest area. Besides medicine, plant resources were found utilized as other sources as vegetables and also for forage, manure, sheltering and religious purposes which indicates diversity of the study area and needs urgent conservation.

**Keywords:** biodiversity, invasive species, medicinal plants, plant diversity

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## Introduction

India is one of the 12 centres of mega-diversity in the world and encompass of 17,500 flowering plant species. It exhibits a wealth of complex and diverse ecosystems with a great deal of variation.<sup>1</sup> It accounts for 8% of the global biodiversity with only 2.4% of the total land area in the world.<sup>2</sup> Plants are one of the major component of biodiversity, thus the knowledge of plant species found in the different areas of the world is a pre-requisite to conserve the ecological biodiversity and an essential resource for human well-being.<sup>3,4</sup> For this reason precise information of the known local plant species from a given area is essential. It is worth to explore any area with wide range of forest types and identify the economically and medicinally important plant species found there. Further the knowledge about the plants in the region is essential with the increasing conspicuous of people about the environment and its impact on living organisms in general.

## Material and methods

The study area Kusnur is located at 14. 69 42.41 N 75.23 00.89 E in the outskirts of Western Ghats lies in a maiden with a few outcrops of low hills. The topography of the area in not even, so it create many minor as well as major tanks. The soil pattern changes variably and annual rainfall is fairly good. The survey was carried out in 2009-2010. The sufficient sample plots of 30 x 30m were laid out randomly, covering the entire forest area about 339 acres. The trees were identified and the density and diameter of each tree species per plots were recorded<sup>5-7</sup> and analyzed for carbon sequestration followed by Pearson et al.<sup>8</sup> The collected specimens were identified with the aid of floras.<sup>9-12</sup> The collected specimens were pressed and prepared herbarium followed by dry method of Jain and Rao.<sup>13</sup> The specimens were deposited in the Herbarium of Botany Department, Karnatak Science College, Dharwad.

## Results and discussion

### Floristic

The survey indicates that, they are about 129 species belonging to

109 genera under 52 families (Table 1). Of the 52 families documented, the family Fabaceae is the dominant family, comprising 9 spp., the dominance of Fabaceae may be due to the nitrogen-fixing bacteria with which these taxa often are associated, allowing these species to improve their soils.<sup>14</sup> This was followed by *Caesalpinaceae* (8 spp.), *Euphorbiaceae* (7 spp.), *Capparaceae* and *Mimosaceae* (6 spp. each), *Asclepiadaceae*, *Asteraceae*, *Malvaceae*, *Tiliaceae* are represented by 5 species each. The families *Boraginaceae*, *Liliaceae*, *Rubiaceae* are represented by 4 species each. Seven families are represented by 3 species each, they are: *Acanthaceae*, *Apocyanaceae*, *Convolvulaceae*, *Moraceae*, *Poaceae*, *Rutaceae*, *Verbenaceae*. Again seven families are represented by 2 species *Amaranthaceae*, *Combretaceae*, *Dioscoreaceae*, *Meliaceae*, *Sapindaceae*, *Scrophulariaceae* and *Vitaceae*. The family *Aizoaceae*, *Alangiaceae*, *Anacardiaceae*, *Aponogetonaceae*, *Araceae*, *Aristolochiaceae*, *Cactaceae*, *Calestraceae*, *Cucurbitaceae*, *Diospyraceae*, *Flacourtiaceae*, *Hypoxidaceae*, *Lamiaceae*, *Lythraceae*, *Menispermaceae*, *Myrtaceae*, *Oleaceae*, *Polygonaceae*, *Rhamnaceae*, *Sapotaceae*, *Simaroubaceae*, *Solanaceae*, *Sterculiaceae*, *Urticaceae*, *Violaceae* and *Zingiberaceae* are represented by only a single species.

Of these, many are medicinally important plants and other economic uses are beedi (*Diospyros malabarica* Kostel), plate (*Butea monosperma* (Lam.) Taub.) and broom making (*Dodonea angustifolia* L.f.) plants were also found in the area. The community managed forest area is over dominated by *Eucalyptus globulus* Labill. (*Myrtaceae*), *Gliricidia sepium* (Jacq.) Kunth ex Walp (*Fabaceae*) and *Azadirachta indica* A. Juss (*Meliaceae*). The survey clearly indicates that, there is a severe threat to the forest mainly from these two alien species i.e. *Eucalyptus globulus* Labill. and *Gliricidia sepium* (Jacq.) Kunth ex Wal. Seed dribbling programme was conducted every year since 1987. It was not been success, because these two invasive alien species (*Eucalyptus globulus* Labill. and *Gliricidia sepium* (Jacq.) Kunth ex Wal.) are over dominated and they emits oil through the leaves. It affects the germination and growth of the other species especially native species and this is known as allelopathic interaction.

### Carbon sequestration observation during quadrat studies

The sufficient number of quadrats of 30x30meters size was laid

randomly, covering the entire forest area. The obtained result is given below:

- Number of Poles (Plants) per quadrat = 86
- Girth of single Pole = 20cm
- Height of single Pole = 5meter or ca. 15feet

Then the number of *Eucalyptus* standing (poles) in one acre = 12470/acre

12470 x 339 acre of community managed forest area = 42, 27,330 poles (Plants) with 20 cm girth and 5 meter height are available in Kusnur forest.

The outcome of the result indicate the approximate amount of carbon sequestration is 84,34,660kg {the process of capture and long-term storage of atmospheric carbon dioxide (CO<sub>2</sub>)} in Kusnur village alone.

**Table 1** List of plant species in the study area

Botanical name	Family	Local name	Habit	Fl-Fr	Uses
<i>Abrus precatorius</i> L.	Fabaceae	Gulgangi	C	May-July	M
<i>Abutilon indicum</i> Sweet	Malvaceae	Turubigida	H	Sep-Oct	M
<i>Acacia chundra</i> (Rott.) Willd.	Mimosaceae	Teradgida	T	Feb-Apr	WO
<i>Acacia concinna</i> (Willd.) DC.	Mimosaceae	Segiballi	T	Dec-Feb	WO
<i>Acacia nilotica</i> L.	Mimosaceae	Pickjali	T	Feb-Mar	WO
<i>Alangium salvifolium</i> Wang	Alangiaceae	Ankolemara	T	Jan-Mar	WO
<i>Alternanthera sessilis</i> R. Br.	Amaranthaceae	Honogoni	H	Sep-Nov	M
<i>Alysicarpus tetragonolobus</i> Edgew.	Fabaceae	Alubu	H	Sep-Nov	M
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Mullarive	H	Jan-Aug	LV
<i>Ampelocissus indica</i> (L.) Planchon	Vitaceae	--	C	Dec-Jan	NK
<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees.	Acanthaceae	Nelabevu	H	Aug-Sep	M
<i>Aponogeton natans</i> (L.) Engl. & Krause.	Aponogetonaceae	Neerukasa	H	Nov-Dec	NK
<i>Argyrea cymosa</i> Sweet	Convolvulaceae	--	C	Aug-Sep	NK
<i>Arisaema leschenaultii</i> Blume	Araceae	--	H	Aug-Sep	NK
<i>Aristida setacea</i> Retz.	Poaceae	--	H	Jul-Aug	FO
<i>Aristolochia indica</i> L.	Aristolochiaceae	Ishweriberu	C	Nov-Dec	M
<i>Asparagus racemosus</i> Willd.	Liliaceae	Halavumakkalatai	H	Aug-Sep	M
<i>Azadirachta indica</i> A. Juss	Meliaceae	Bavu	T	Apr-May	M, WO
<i>Balanites aegyptiaca</i> (L.) Del.	Simaroubaceae	Ingalgida	T	Feb-Mar	M
<i>Bauhinia racemosa</i> Lam.	Caesalpiniaceae	Arimara	T	Jan-Feb	M
<i>Blepharis repens</i> (Vahl.) Roth	Acanthaceae	Hachuga	H	Nov-Dec	M
<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Muthlamara	T	Apr-May	DYP
<i>Cadaba fruticosa</i> (L.) Druce	Capparaceae	Isbugaddi	S	Jan-Feb	M
<i>Caesalpinia bonduc</i> (L.) Roxb.	Caesalpiniaceae	Gajuga	S	Dec-Jan	M
<i>Canthium coromandelicum</i> (N. Burm.) Alst.	Rubiaceae	Karekai	T	Mar-Apr	EF
<i>Capparis divaricata</i> Lam.	Capparaceae	Ravudigida	S	Jan-Feb	EF
<i>Capparis grandis</i> L.f.	Capparaceae	--	S	Jan-Feb	NK
<i>Capparis sepiaria</i> L.	Capparaceae	Hippi	S	Jan-Feb	NK
<i>Capparis zeylanica</i> L.	Capparaceae	Tottilaballi	S	Dec-Jan	NK
<i>Carissa carandas</i> L.	Apocyanaceae	Kavali	S	Apr-May	EF
<i>Cassia auriculata</i> L.	Caesalpiniaceae	Honnriki	S	Sep-Oct	M
<i>Cassia sericea</i> Sw.	Caesalpiniaceae	--	H	Sep-Oct	NK
<i>Cassia siamea</i> Lam.	Caesalpiniaceae	--	T	Mar-Apr	NK

Botanical name	Family	Local name	Habit	Fl-Fr	Uses
<i>Cassia tora</i> L.	Caesalpinaceae	Taratagida	H	Sep-Nov	NK
<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	Kakki	S	Aug-Sep	EF
<i>Cayratia trifolia</i> (L.) Domin	Vitaceae	--	C	Aug-Sep	EF
<i>Celastrus paniculatus</i> Willd.	Celastraceae	--	S	Sep-Oct	FO
<i>Chlorophytum laxum</i> R. Br.	Liliaceae	--	H	Jul-Aug	M
<i>Chloroxylon swietenia</i> DC.	Rutaceae	Masavala	T	Jan-Mar	FO, CH
<i>Clerodendron serratum</i> (L.) Moon	Verbenaceae	--	S	Aug-Sep	LF
<i>Cocculus hirsutus</i> (L.) Diels	Menispermaceae	Dagdiballi	C	Dec-Jan	M
<i>Coldenia procumbens</i> L.	Boraginaceae	--	H	Nov-Dec	M
<i>Corchorus olitorius</i> L.	Tiliaceae	--	H	Nov-Dec	RM
<i>Cryptolepis buchanani</i> R. Br. & Roem. & Schult.	Asclepiadaceae	Karibunta	C	Aug-Sep	M
<i>Curculigo orchioides</i> Gaerth	Hypoxidaceae	--	H	Aug-Oct	M
<i>Curcuma</i> sp.	Zingiberaceae	--	H	Aug	M
<i>Cynodon dactylon</i> (L.) Pers	Poaceae	Kariki	H	Sep-Dec	FO
<i>Dalbergia lanceolaria</i> L.f.	Fabaceae	--	T	Mar-Apr	FO
<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	--	H	Sep-Oct	NK
<i>Dioscorea oppositifolia</i> L.	Dioscoreaceae	--	C	Jul-Aug	M
<i>Dioscorea</i> sp.	Dioscoreaceae	--	C	Jul-Aug	M
<i>Diospyros malabarica</i> Kostel	Diospyraceae	Tumrigidi	T	Mar-Apr	FO
<i>Dodonea angustifolia</i> L.f.	Sapindaceae	Bandariki	S	Nov-Jan	M
<i>Echinops echinatus</i> DC.	Asteraceae	Bramhdandi	H	Sep-Oct	NK
<i>Ehretia laevis</i> Roxb.	Boraginaceae	Addkisuppu	T	Jan-Mar	WO
<i>Ehretia microphylla</i> Lour.	Boraginaceae	--	S	Jan-Feb	M
<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	--	H	Jul-Aug	M
<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Nelageri	T	Mar-Apr	CH
<i>Eupatorium capillifolium</i> (Lam.) Small	Asteraceae	Mungulli	H	Sep-Dec	FO
<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	Gutkalli	S	Jul-Aug	NK
<i>Euphorbia nivulia</i> Buchanan-Hamilton	Euphorbiaceae	--	S	Jul-Aug	NK
<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Cominust grass	H	Sep-Oct	NK
<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Shankapuspi	H	Sep-Oct	M
<i>Evolvulus nummularius</i> L.	Convolvulaceae	--	H	Oct-Nov	M
<i>Feronia elephantum</i> Corr.	Rutaceae	Belavala	T	Mar-Apr	M
<i>Ficus bengalensis</i> L.	Moraceae	Aralimara	T	Jan-Mar	M
<i>Ficus racemosa</i> L.	Moraceae	Hattimara	T	Jan-Mar	EF
<i>Flacourtia indica</i> (N. Burm.) Merrill	Flacourtiaceae	--	T	Mar-Apr	FO
<i>Gardenia gummifera</i> L. f.	Apocynaceae	Kaduberu	T	Aug-Sep	EF, M
<i>Glinus lotoides</i> L.	Aizoaceae	Gobbaradasasi	H	Aug-Sep	NK
<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp	Fabaceae	--	T	Mar-Apr	FO
<i>Gloriosa superba</i> L.	Liliaceae	Kardiguddigida	C	Jul-Sep	M
<i>Grewia tenax</i> (Forsk.) Fiori.	Tiliaceae	Sirikisoppu	T	Mar-Apr	M, EF
<i>Grewia tiliifolia</i> Vahl	Tiliaceae	--	T	Mar-Apr	EF
<i>Grewia nervosa</i> (Lour.) Panigrahi	Tiliaceae	--	T	Mar-Apr	EF



Botanical name	Family	Local name	Habit	Fl-Fr	Uses
<i>Gymnema sylvestre</i> R. Br.	Asclepiadaceae	Madavi	C	Sep-Nov	M
<i>Hardwickia binata</i> Roxb.	Caesalpiniaceae	Anjanamara	T	Feb-Mar	FO,WO
<i>Heliotropium ovalifolium</i> Forssk.	Boraginaceae	--	H	Sep-Nov	M
<i>Hemidesmus indicus</i> (L.) R. Br.	Asclepiadaceae	Sogadheberu	C	Sep-Nov	M
<i>Holoptelea integrifolia</i> Roxb.	Urticaceae	Tapsi	T	Feb-Mar	FO
<i>Holostemma annulare</i> (Roxb.) K. Schum.	Asclepiadaceae	Jeventhi	C	Sep-Oct	M
<i>Hybanthus enneaspermus</i> L.	Violaceae	Purushrathna	H	Sep-Oct	M
<i>Hyptis suaveolens</i> Poit.	Lamiaceae	--	H	Oct-Nov	FO
<i>Indoneesiella echinoides</i> (L.) Sreem	Acanthaceae	Ativishagida	H	Sep-Oct	M
<i>Iphigenia pallida</i> Baker	Liliaceae	--	H	Aug-Sep	M
<i>Ixora pavetta</i> Andr.	Rubiaceae	--	S	Dec-Jan	FO
<i>Jasminum roxburghianum</i> Wall. ex C. B. Clarke	Oleaceae	Kadumallige	S	Dec-Jan	M, CH
<i>Jatropha curcas</i> L.	Euphorbiaceae	Maroudla	S	Apr-May	M
<i>Jatropha glandulifera</i> Roxb.	Euphorbiaceae	--	H	Nov-Dec	NK
<i>Lagerstromia parviflora</i> Roxb.	Lythraceae	Chennangimara	T	Feb-Mar	FO
<i>Lantana camara</i> L.	Verbenaceae	Buduranga	S	Jul-Aug	FO
<i>Leucaena leucocephala</i> (Lam.) de Wit	Mimosaceae	Babul tree	T	Apr-May	FO
<i>Madhuca longifolia</i> (L.) Macbr.	Sapotaceae	Hippimara	T	Apr-May	EF
<i>Maerua oblongifolia</i> (Forssk) A. Rich.	Capparaceae	--	S	Feb-Mar	FO
<i>Melochia corchorifolia</i> L.	Sterculiaceae	--	H	Nov-Dec	M
<i>Mimosa pudica</i> L.	Mimosaceae	Mullumutuga	H	Nov-Dec	M
<i>Morinda pubescens</i> J. E. Sm.	Rubiaceae	Maligimara	T	Apr-Mar	DYP
<i>Nerium indicum</i> Mill.	Rutaceae	Naibelavala	T	Sep-Nov	O
<i>Opuntia dillenii</i> Haw.	Cactaceae	Dabgalli	S	Oct-Nov	EF
<i>Parthenium hysterophorus</i> L.	Asteraceae	Cangress grass	H	Aug-Sep	NK
<i>Pavonia odorata</i> Willd.	Malvaceae	--	H	Sep-Oct	NK
<i>Phoenix sylvestris</i> (L.) Roxb.	Poaceae	Echalmara	T	Jan-Mar	EF
<i>Phyllanthus</i> sp.	Euphorbiaceae	--	H	Aug-Sep	M
<i>Physalis minima</i> L.	Solanaceae	Marugannu	H	Sep-Oct	M
<i>Polygonum plebeium</i> var <i>indica</i> . J. Hooker	Polygonaceae	--	H	Sep-Oct	M
<i>Pongamia pinnata</i> (L) Pierre	Fabaceae	Hulagail	T	Apr-May	CH
<i>Prosopis juliflora</i> (Sw.) DC.	Mimosaceae	Sarkari Jaligida	S	Dec-Mar	WO
<i>Quirivelia frutescens</i> (L.) R. Br.	Apocyanaceae	--	S	Dec-Jan	M
<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	--	C	Nov-Dec	M
<i>Sapindus emarginatus</i> Vahl	Sapindaceae	Antuvala	T	Jan-Mar	WO
<i>Scoparia dulcis</i> L.	Scrophulariaceae	--	H	Sep-Oct	M
<i>Securinega leucopyrus</i> (Willd.) Muell. - Arg.	Euphorbiaceae	Biligulikaigida	S	Nov-Dec	M
<i>Semecarpus anacardium</i> L.	Anacardiaceae	Garumara	T	Jan-Mar	EF
<i>Sida acuta</i> Burm f.	Malvaceae	--	H	Aug-Sep	M
<i>Sida cordata</i> Borss.	Malvaceae	--	H	Aug-Sep	M
<i>Sida rhombifolia</i> L.	Malvaceae	--	H	Aug-Sep	M
<i>Soymida febrifuga</i> (Roxb.) Juss	Meliaceae	--	T	Apr-May	WO
<i>Stachytarpheta indica</i> Vahl	Verbenaceae	Kerituti	H	Sep-Oct	M

Botanical name	Family	Local name	Habit	Fl-Fr	Uses
<i>Streblus asper</i> Lour.	Moraceae	Mitligida	T	Mar-Apr	WO
<i>Striga asiatica</i> (L.) O. Ktze.	Scrophulariaceae	Bilikasa	H	Sep-Oct	M
<i>Stylosanthes fruticosa</i> (Retz.) Alston	Fabaceae	--	H	Oct-Nov	NK
<i>Tamarindus indica</i> L.	Caesalpinaceae	Hunusai	T	Mar-Apr	EF
<i>Terminalia alata</i> Heyne ex Roth	Combretaceae	Karimatti	T	Feb-Mar	FW
<i>Terminalia arjuna</i> (Roxb. ex DC) W. & A.	Combretaceae	Bilimatti	T	Feb-Mar	M
<i>Trichosanthes tricuspidata</i> Lour.	Cucurbitaceae	Kagitondiballi	C	Jul-Sep	M
<i>Triumfetta rotundifolia</i> Lam.	Tiliaceae	--	H	Sep-Oct	RM
<i>Tylophora indica</i> (Burm. f.) Merr.	Asclepiadaceae	Aadusogi	C	Sep-Oct	M
<i>Xanthium indicum</i> Koen.	Asteraceae	Artheli	H	Nov-Dec	NK
<i>Ziziphus xylopyrus</i> (Retz.) Willd.	Rhamnaceae	Godachi	S	Jan-Mar	EF

C, climbers; H, herbs; T, trees; S, shrubs; FO, fodder; M, medicinal; RM, rope making; O, ornamental; LV, leafy vegetable; NK, not known; WO, wood; CH, bioactive chemicals; EF, edible fruit; DYP, dye yielding plant; FW, firewood

## Conclusion

The present study recorded 129 species of plants belonging to 109 genera and 52 families in the study site. Among total families, the family *Fabaceae* is the dominant family. 42, 27,330 poles (Plants) with 20cm girth and 5meter height are available in Kusnur forest. The process of removing carbon from the atmosphere and depositing in the plants it acts as a carbon reservoir in Kusnur village. The approximate amount of carbon sequestration is 84,34,660kg.

The study highlights a severe threat to the forest mainly by alien species. Hence the forest managers should pay attention to the natural composition of forest communities and should not try to replace the native species by invasive ones. Presently, there is a need for increased legal protection, well designed management practices to conserve the local diversity of the study area. Some indigenous species should be planted in the study area which will fulfill the demand of local people.

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None.

## Conflict of interest

Authors declare there is no conflict of interest in publishing the article.

## References

- Venu P. A Review of Floristic Diversity Inventory and Monitoring Methodology in India. *Pinsa*. 1998;64(5&6):281–292.
- Singh RP, Rai N, Tiwari VK. A Study of Polypetalous Plant Diversity of Moradabad District, Uttar Pradesh, India. *Webmed Central Ecology*. 2011;2(4):1–20.
- Sumeet G, Sharma CM, Rana CS, et al. Phytodiversity (*Angiosperms and Gymnosperms*) in Mandal – Chopta Forest of Garhwal Himalaya, Uttarakhand, India. *Nat & Sci*. 2010;8(1):1–17.
- Talukdar D, Talukdar T. Floral diversity and its indigenous use in old basin (Khari) of river Atreyee at Balurghat block of Dakshin Dinajpur district, West Bengal. *NeBIO*. 2012;3(2):26–32.
- Pascal JP, *Wet Evergreen Forest of the Western Ghats of India*. Institut Francais De: Pandicherry; 1988.
- Odum EP, *Fundamentals of Ecology*. 1st ed. Nataraj Publishers: Dehradun; 1996.
- Molles MC, *Ecology: Concepts and Applications*. Mc Graw Hill: Boston; 1999.
- Pearson TRH, Brown SL, Birdsey RA, Measurement Guidelines for the Sequestration of Forest Carbon. USDA: Forest Service Publications Delaware; 2007. p. 42.
- Hooker JD. *Flora of British India*. vol 1-7. L. Reeve & Co. London; 1872-97.
- Cooke T. *The Flora of Presidency of Bombay*. vol I-III. Bisen Singh Mehandra Pal Singh: Dehra Dun; 1958.
- Saldanha CJ. *Flora of Karnataka*. vol 1. Oxford & IBH Publishing Co. Pvt. Ltd.: New Delhi; 1984.
- Saldanha CJ. *Flora of Karnataka*. vol 2. Oxford & IBH Publishing Co. Pvt. Ltd.: New Delhi; 1996.
- Jain SK, Rao RR. *A handbook of field and herbarium methods*. Today & Tomorrow's Publishers: New Delhi; 1977.
- Kambhar SV, Kotresha K. A study on alien flora of Gadag District, Karnataka, India. *Phytotaxa*. 2011;16:52–62.

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# Floristic Assessment of Panchlingeshwar Sacred Grove, Nandikurali, Raibag, Belagavi, Karnataka

**The Sacred groves are forest patches conserved by the local people based on the socio-cultural and religious practices. The sacred groves are rich in diversity and play a significant role in the conservation of biodiversity. The present work was carried with the aim to document the floristic account and its assessment in the Panchlingeshwar sacred grove, Nandikurali, Raibag, Belagavi. A total of 171 taxa belonging to 145 genera distributed in 59 families were recorded, also the grove representing with 54 medicinal plant species belonging to 48 genera and 28 families.**

**Key words:** Sacred groves, Nandikurali, Conservation, Belagavi.

## Introduction

Prehistoric man was well cherished with their surroundings. The ancient generation gave importance to trees and surrounding forests, and they worshipped and protected these forests and trees. The protection of these forest patches as sacred groves and several tree species as sacred trees belong to the religion based conservation of ancient people all over the world. Sacred groves are community based repositories of biological diversity and got protected on the basis of religious practices and faith (Hasting, 1934).

In India, about 13,720 sacred groves have been enumerated from different states. Andhra Pradesh, Kerala, Maharashtra and Tamil Nadu have the maximum number of these forests. In Karnataka, Western Ghat have has maximum number of sacred patches with compare to Deccan terrain, namely Uttara Kannada, Shimoga, Udupi, Mangalore, Dakshina Kannada and Kodagu harbour 1477 sacred groves (Kalam, 1996; Malhotra, 1998; Gokhale *et al.*, 1998). Western Ghats sacred groves broadly fall under two categories, small groves are entirely protection, biomass extraction may be allowed. Larger groves function sustained and ecological security (Chandran and Gadgil, 1993). Sacred groves are referred to by different names in local languages (in Kannada) Devarbana, Devarakadu, Hulidevarakades, Nogabana, Bhutappanbana, Jataka-panbana, Chowdibana, etc.

These sacred groves are protected by some ethnic communities. The ethnic people all over the world have affecting and symbiotic relationship with biodiversity, which they have been protecting and conserving since ancient time. These sacred groves forest harbouring rich biodiversity protected by the local people based on the ground of indigenous cultured and religious belief and taboos (Airi *et al.*, 2000). These ethnical peoples protect the plants because of worshiping and also medicinal value.

These medicinally important sacred plant species were used to treat diverse type diseases and to maintain good health. These groves provides very basic of human survival and economic well-being and comprises the resources upon which families, communities, nations and future generations depend and also they have some ecologically valuable species such as *Albizia lebbek* and *Ficus* spp. which have high amount of nitrogen, phosphorous, magnesium and calcium in their leaves (Singh *et al.*, 1994). Apart from this, many sacred groves hold water resource in the form of

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springs, pond, lakes, streams or rivers. The vegetative mass of the groves itself retain water, soaking it up like a sponge during wet periods and releasing it slowly in times of drought. Although, sacred groves play a crucial role in soil and water conservation. The soil itself has little nutrients to support a large biomass of sacred groves (Pushpangadan *et al.*, 1998).

Sacred Groves are invariably associated with certain

Gods or Goddesses. They are normally associated with Goddess 'Laxmi', 'Lord Ganesha' and 'Basavanna' and are never destroyed under fear of wrath from presiding deity. Along with the sacred groves certain species are also considered holy and are planted and protected (*e.g. Aegle marmelos, Azadirachta indica, Ficus religiosa, Nyctanthes arbor-tristis, Ocimum sanctum*), thus, nature conservation is seen to be closely linked with religion. Our culture has provided protection to the landscape in

**Table 1.** List of tree species along with their family name, density (Dn), abundance (Ab) and frequency (Fr %) and IVI

Species name	Family	Dn	Ab	Fr %	Basal area	RDn	RFr	RAb	IVI
<i>Azadirachta indica</i> A. Juss	Meliaceae	0.17	4.25	4	12.5664	5.648	2.963	3.765	12.376
<i>Laucaena leucocephala</i> (Lam.) de wit	Mimosaceae	0.14	3.50	4	12.5664	4.651	2.963	3.765	11.379
<i>Dendrocalamus strictus</i> (Roxb.) Nees	Poaceae	0.13	3.25	4	12.5664	4.319	2.963	3.765	11.047
<i>Tamarindus indicum</i> L.	Caesalpiniaceae	0.13	3.25	4	12.5664	4.319	2.963	3.765	11.047
<i>Cocos nucifera</i> L.	Arecaceae	0.11	2.75	4	12.5664	3.654	2.963	3.765	10.382
<i>Mangifera indica</i> L.	Anacardiaceae	0.11	2.75	4	12.5664	3.654	2.963	3.765	10.382
<i>Ficus religiosa</i> L.	Moraceae	0.1	2.50	4	12.5664	3.322	2.963	3.765	10.050
<i>Dalbergia latifolia</i> Roxb.	Fabaceae	0.08	2.00	4	12.5664	2.658	2.963	3.765	9.385
<i>Mimusops elengi</i> L.	Mimosaceae	0.08	2.00	4	12.5664	2.658	2.963	3.765	9.385
<i>Moringa oleifera</i> Lam.	Moringaceae	0.08	2.00	4	12.5664	2.658	2.963	3.765	9.385
<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	0.07	1.75	4	12.5664	2.326	2.963	3.765	9.053
<i>Holoptelea integrifolia</i> (Roxb.) Planch.	Ulmaceae	0.07	1.75	4	12.5664	2.326	2.963	3.765	9.053
<i>Millingtonia hortensis</i> L.f.	Bignoniaceae	0.07	1.75	4	12.5664	2.326	2.963	3.765	9.053
<i>Ficus benghalensis</i> L.	Moraceae	0.06	1.50	4	12.5664	1.993	2.963	3.765	8.721
<i>Carica papaya</i> L.	Caricaceae	0.09	3.00	3	7.0686	2.990	2.222	2.118	7.330
<i>Delonix elata</i> (L.) Gamble	Caesalpiniaceae	0.08	2.67	3	7.0686	2.658	2.222	2.118	6.998
<i>Santalum album</i> L.	Santalaceae	0.08	2.67	3	7.0686	2.658	2.222	2.118	6.998
<i>Bauhinia racemosa</i> Lam.	Caesalpiniaceae	0.07	2.33	3	7.0686	2.326	2.222	2.118	6.665
<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	0.07	2.33	3	7.0686	2.326	2.222	2.118	6.665
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	0.06	2.00	3	7.0686	1.993	2.222	2.118	6.333
<i>Prosopis cineraria</i> (L.) Druce	Mimosaceae	0.06	2.00	3	7.0686	1.993	2.222	2.118	6.333
<i>Tectona grandis</i> L.f.	Verbenaceae	0.06	2.00	3	7.0686	1.993	2.222	2.118	6.333
<i>Callistemon lanceolatus</i> R.Br.	Myrtaceae	0.05	1.67	3	7.0686	1.661	2.222	2.118	6.001
<i>Casurina equisetifolia</i> L.	Casurinaceae	0.05	1.67	3	7.0686	1.661	2.222	2.118	6.001
<i>Citrus limon</i> (L.) Burm.f.	Rutaceae	0.05	1.67	3	7.0686	1.661	2.222	2.118	6.001
<i>Manikara zapota</i> (L.) P. Royen	Sapotaceae	0.05	1.67	3	7.0686	1.661	2.222	2.118	6.001
<i>Polyalthia longifolia</i> (Sonn.) Thw.	Annonaceae	0.05	1.67	3	7.0686	1.661	2.222	2.118	6.001
<i>Magnolia champaca</i> (L.) Baill ex Pierre	Magnoliaceae	0.04	1.33	3	7.0686	1.329	2.222	2.118	5.669
<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	0.04	1.33	3	7.0686	1.329	2.222	2.118	5.669
<i>Adenanthera pavonia</i> L.	Mimosaceae	0.06	3.00	2	3.1416	1.993	1.481	0.941	4.416
<i>Acacia farnesiana</i> (L.) Willd.	Mimosaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Acacia nilotica</i> (L.) Del. ssp. <i>indica</i> (Benth.) Brenan	Mimosaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Acacia torta</i> (Roxb.) Craib	Mimosaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Aegle marmelos</i> (L.) Correa	Rutaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Cassia siamea</i> Lam.	Caesalpiniaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Limonia acidissima</i> L.	Rutaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	0.05	2.50	2	3.1416	1.661	1.481	0.941	4.084
<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	0.04	2.00	2	3.1416	1.329	1.481	0.941	3.752
<i>Anona reticulata</i> L.	Annonaceae	0.04	2.00	2	3.1416	1.329	1.481	0.941	3.752
<i>Anona squamosa</i> L.	Annonaceae	0.03	1.50	2	3.1416	0.997	1.481	0.941	3.419
<i>Melia azedarach</i> L.	Meliaceae	0.03	1.50	2	3.1416	0.997	1.481	0.941	3.419
<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	0.03	1.50	2	3.1416	0.997	1.481	0.941	3.419
<i>Plumeria alba</i> L.	Rubiaceae	0.03	1.50	2	3.1416	0.997	1.481	0.941	3.419
<i>Syzygium cumini</i> (L.) Skeels	Combretaceae	0.03	1.50	2	3.1416	0.997	1.481	0.941	3.419
<i>Acacia sinuta</i> (Lour.) Merr.	Mimosaceae	0.02	1.00	2	3.1416	0.664	1.481	0.941	3.087
<i>Agave americana</i> L.	Agavaceae	0.04	4.00	1	0.7854	1.329	0.741	0.235	2.305
<i>Sterospermum chelenoides</i> DC.	Bignoniaceae	0.01	1.00	1	0.7854	0.332	0.741	0.235	1.308
		<b>3.01</b>	<b>103</b>	<b>135</b>	<b>333.795</b>	<b>100</b>			<b>300</b>

different pockets of the country where the relict vegetation is preserved intact from human interference. Thus, the sacred groves serve as unique examples of in situ genetic resource conservation through the involvement of local people in the most economic and efficient manner (Khoshoo, 1996). The present study enlightens the floristic assessment on the Panchlingeshwar sacred groves Nandikurali, Raibag, Belagavi, Karnataka.

### Study Area

Nandikurali village is in Raibag taluka. It is located between 16°25' N latitude and 74°35' E longitudes with 510m. The average rain fall measures about 180.4 maximum and minimum of 78mm. The vegetation is of thorny forest. Here Sri Panchalingeshwar temple is situated on the banks of Parameshwar stream, which joins Karkariver. Traditionally, it is said that Drakshyani, daughter of Dakshabrahma descended here from Heaven and went to her father on the back of Nandi, sacred bull. So it gets the name Nandikuroli. Five Sri Lingas out of sixty Lings have been seen and the people even today worship them. God Shiva himself has taken the shape of Linga so they say. Folklore says that Sri Rama and Sri Bharat met here when Sri Rama was wanderer in forest. The area consists of about 28.10 acres.

### Methodology

The plant specimens were collected (in duplicate) from the study area, between August 2017 and March 2018. Quadrates were laid in Panchlingeshwar Sacred grove, Nandikurali, Raibag for evaluating the floristic assessment (Panse and Sukhatme, 1985). The collected specimens were identified with aid of floras. The specimens were deposited in the Herbarium Department of Botany, B. K. College, Chikodi, Belagavi. Phytosociological data were recorded by quadrat method by laying quadrats of 30x30m<sup>2</sup> for trees, 5x5m<sup>2</sup> for shrubs and 1x1m<sup>2</sup> for herbs (including climbers). The density, frequency and abundance or dominance relative frequency, relative density and Importance Value Index (IVI) were calculated for every species were calculated by

using formulae given by Curtis and McIntosh (1950); Curtis (1959) and Odum (1971).

### Results and Discussion

The present study area is located in Nandikurali village, Raibag taluka, Belagavi district. The north east part of the district is open and well cultivated but to the south, it is intersected by the spurs of Western Ghats, thickly covered in some places with forests. The district in western part is covered with thick forests ranging from moist deciduous forest to evergreen forests with damp and cool climate with heavy rainfall. The grove is representing with good number of species and many of them are used in the preparation of traditional medicine.

Around 171 species have been recorded under 145 genera belonging to 59 families. Among the 59 families, first ten families contributing 93 species (54%). Of these, the family Fabaceae is leading with 22 sp., followed by Poaceae 19 sp. and Asteraceae 11 sp., Euphorbiaceae with 9 sp., Malvaceae and Lamiaceae with 6 sp. each, Apocynaceae, Mimosaceae, Rutaceae, Solanaceae and Verbenaceae with 5 sp. each. Most of these families have a large number of herbs, resulting in their dominance. The dominance of Fabaceae may be due to the nitrogen-fixing bacteria with which these taxa often are associated, allowing these species to improve their soils (Kambhar and Kotresha, 2011).

The family Asclepiadiaceae is representing with 4 sp., followed by Amaranthaceae, Annonaceae, Convolvulaceae and Cucurbitaceae contributing 3 sp. each. Fifteen families contributing 2 species each, they are Arecaceae, Acanthaceae, Apiaceae, Bignoniaceae, Caesalpinaceae, Cleomaceae, Combretaceae, Commelinaceae, Liliaceae, Meliaceae, Menispermaceae, Moraceae, Rhamnaceae, Sapotaceae and Tiliaceae. Only one species contributed by twenty eight families (Agavaceae, Anacardiaceae, Aristolochiaceae, Cactaceae, Capparaceae, Cariaceae, Casuarinaceae, Cyperaceae, Lythraceae, Magnoliaceae, Moringaceae, Myrtaceae, Nyctaginaceae, Oleaceae, Orobanchaceae,

**Table 2.** List of shrub species along with their family name, density (Dn), abundance (Ab) and frequency (Fr %) and IVI

Species name	Family	Dn	Ab	Fr %	RDn	RFr	RAb	IVI
<i>Cassia auriculata</i> L.	Caesalpinaceae	0.17	2.83	6	13.178	7.792	13.178	34.149
<i>Pandanus odoratissimus</i> L.	Pandanaceae	0.14	2.33	6	10.853	7.792	10.853	29.498
<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	0.12	1.71	7	9.302	9.091	9.302	27.696
<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadiaceae	0.11	1.83	6	8.527	7.792	8.527	24.846
<i>Lantana camera</i> L.	Verbenaceae	0.1	1.67	6	7.752	7.792	7.752	23.296
<i>Caesalpinia pulcherrima</i> (L.) Sw.	Caesalpinaceae	0.08	1.60	5	6.202	6.494	6.202	18.897
<i>Hibiscus cannabinus</i> L.	Malvaceae	0.08	1.60	5	6.202	6.494	6.202	18.897
<i>Calotropis procera</i> (Ait.) R. Br.	Asclepiadiaceae	0.07	1.17	6	5.426	7.792	5.426	18.645
<i>Ipomoea carnea</i> Jacq. ssp. <i>fistulosa</i> (Mart. ex Choisy) Austin	Convolvulaceae	0.06	1.20	5	4.651	6.494	4.651	15.796
<i>Clerodendrum phlomidis</i> L.f.	Verbenaceae	0.06	1.50	4	4.651	5.195	4.651	14.497
<i>Ziziphus mauritiana</i> Mill.	Rhamnaceae	0.06	1.50	4	4.651	5.195	4.651	14.497
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	0.06	2.00	3	4.651	3.896	4.651	13.198
<i>Ziziphus oenoplia</i> (L.) Mill.	Rhamnaceae	0.05	1.25	4	3.876	5.195	3.876	12.947
<i>Lawsonia inermis</i> L.	Lythraceae	0.05	1.67	3	3.876	3.896	3.876	11.648
<i>Capparis spinosa</i> L.	Capparaceae	0.03	1.00	3	2.326	3.896	2.326	8.547
<i>Opuntia dillenii</i> (Ker-Gawl.) Haw.	Cactaceae	0.03	1.50	2	2.326	2.597	2.326	7.249
<i>Holorrhena pubescens</i> Wall. ex G. Don	Apocynaceae	0.02	1.00	2	1.550	2.597	1.550	5.698
		<b>1.29</b>	<b>27.36</b>	<b>77</b>	<b>100</b>			<b>300</b>

**Table 3.** List of herbs species along with their family name, density (Dn), adundance (Ab) and frequency (Fr %) and IVI

Species name	Family	Dn	Ab	Fr %	RDn	RFr	RAb	IVI
<i>Indigofera cordifolia</i> Roth	Fabaceae	0.6	3.0	20	3.041	2.315	3.041	8.397
<i>Eragrostis minor</i> Host.	Poaceae	0.55	2.9	19	2.788	2.199	2.788	7.774
<i>Dicanthium pertusum</i> (L.) W. D. Clayton	Poaceae	0.54	3.0	18	2.737	2.083	2.737	7.557
<i>Cyanotis fasciculata</i> (Heyne ex Roth) J.A. & J.H. Schult.	Commelinaceae	0.49	2.7	18	2.484	2.083	2.484	7.050
<i>Parthenium hysterophorus</i> L.	Asteraceae	0.48	3.2	15	2.433	1.736	2.433	6.602
<i>Eragrostis ciliaris</i> (L.) R. Br.	Poaceae	0.46	2.9	16	2.331	1.852	2.331	6.515
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	0.38	2.4	16	1.926	1.852	1.926	5.704
<i>Melanocenchris jacquemontii</i> Jaub. & Spach.	Poaceae	0.35	2.3	15	1.774	1.736	1.774	5.284
<i>Tephrosia purpurea</i> (L.) Persoon	Fabaceae	0.35	2.3	15	1.774	1.736	1.774	5.284
<i>Hedyotis corymbosa</i> L.	Rubiaceae	0.36	2.6	14	1.825	1.620	1.825	5.270
<i>Cassia tora</i> L.	Caesalpiniaceae	0.37	3.1	12	1.875	1.389	1.875	5.140
<i>Tetrapogon tenellus</i> (Roxb.) Chiov.	Poaceae	0.35	2.7	13	1.774	1.505	1.774	5.053
<i>Euphorbia hirta</i> L.	Euphorbiaceae	0.32	2.5	13	1.622	1.505	1.622	4.748
<i>Setaria verticillata</i> (L.) P. Beauv.	Poaceae	0.32	2.7	12	1.622	1.389	1.622	4.633
<i>Oxalis corniculata</i> L.	Oxalidaceae	0.3	2.3	13	1.521	1.505	1.521	4.546
<i>Stachytarpheta indica</i> (L.) Vahl.	Verbenaceae	0.3	2.3	13	1.521	1.505	1.521	4.546
<i>Spilanthes clava</i> DC.	Asteraceae	0.27	2.1	13	1.368	1.505	1.368	4.242
<i>Leucas longifolia</i> Benth.	Lamiaceae	0.28	2.3	12	1.419	1.389	1.419	4.227
<i>Tridax procumbens</i> L.	Asteraceae	0.28	2.5	11	1.419	1.273	1.419	4.111
<i>Turnera ulmifolia</i> L.	Turneraceae	0.28	2.5	11	1.419	1.273	1.419	4.111
<i>Setaria pumila</i> (Poir) Roem & Schult	Poaceae	0.25	1.9	13	1.267	1.505	1.267	4.039
<i>Cymbopogon citratus</i> (DC.) Stapf.	Poaceae	0.25	2.1	12	1.267	1.389	1.267	3.923
<i>Euphorbia prostrata</i> Aiton	Euphorbiaceae	0.25	2.1	12	1.267	1.389	1.267	3.923
<i>Setaria intermedia</i> Roem & Schult.	Poaceae	0.26	2.4	11	1.318	1.273	1.318	3.909
<i>Tragus roxburghii</i> Panigrahi	Poaceae	0.25	2.3	11	1.267	1.273	1.267	3.807
<i>Croton bonplandinus</i> Bail.	Euphorbiaceae	0.25	2.5	10	1.267	1.157	1.267	3.692
<i>Bacopa monnieri</i> L.	Scrophulariaceae	0.26	2.9	9	1.318	1.042	1.318	3.677
<i>Euphorbia geniculata</i> L.	Euphorbiaceae	0.23	2.1	11	1.166	1.273	1.166	3.605
<i>Sida acuta</i> Burm.f.	Malvaceae	0.24	2.4	10	1.216	1.157	1.216	3.590
<i>Urochloa ramosa</i> (L.) Nauyen	Poaceae	0.25	2.8	9	1.267	1.042	1.267	3.576
<i>Cyperus compressus</i> L.	Cyperaceae	0.22	2.0	11	1.115	1.273	1.115	3.503
<i>Eleusine indica</i> (L.) Gaertn	Poaceae	0.22	2.0	11	1.115	1.273	1.115	3.503
<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae	0.22	2.0	11	1.115	1.273	1.115	3.503
<i>Polygala arvensis</i> Willd.	Polygalaceae	0.22	2.0	11	1.115	1.273	1.115	3.503
<i>Passiflora caerulea</i> Lindl.	Passifloraceae	0.23	2.3	10	1.166	1.157	1.166	3.489
<i>Borreria stricta</i> (L.f.) K. Schum	Rubiaceae	0.24	2.7	9	1.216	1.042	1.216	3.475
<i>Chloris barbata</i> Sw.	Poaceae	0.22	2.2	10	1.115	1.157	1.115	3.388
<i>Duranta plumieria</i> Jacq.	Verbenaceae	0.25	3.6	7	1.267	0.810	1.267	3.344
<i>Indigofera linnaei</i> Ali	Fabaceae	0.21	2.1	10	1.064	1.157	1.064	3.286
<i>Eupatorium adenophorum</i> Spreng.	Asteraceae	0.2	2.0	10	1.014	1.157	1.014	3.185
<i>Tribulus terrestris</i> L.	Zygophyllaceae	0.2	2.0	10	1.014	1.157	1.014	3.185
<i>Triumfetta malabarica</i> Koen. ex Rottb.	Tiliaceae	0.2	2.0	10	1.014	1.157	1.014	3.185
<i>Urochloa reptans</i> Stapf.	Poaceae	0.21	2.3	9	1.064	1.042	1.064	3.170
<i>Indigofera hochstetteri</i> Baker	Fabaceae	0.22	2.8	8	1.115	0.926	1.115	3.156
<i>Withania somnifera</i> (L.) Dunal	Solanaceae	0.18	1.6	11	0.912	1.273	0.912	3.098
<i>Portulaca oleracea</i> L.	Portulacaceae	0.18	1.8	10	0.912	1.157	0.912	2.982
<i>Boerhavia verticillata</i> Cav.	Nyctaginaceae	0.2	2.5	8	1.014	0.926	1.014	2.953
<i>Sonchus asper</i> (L.) Hill.	Asteraceae	0.17	1.7	10	0.862	1.157	0.862	2.881
<i>Cassia occidentalis</i> L.	Caesalpiniaceae	0.17	1.9	9	0.862	1.042	0.862	2.765
<i>Sporobolus capillaris</i> Miq.	Poaceae	0.17	1.9	9	0.862	1.042	0.862	2.765
<i>Acalypha indica</i> L.	Euphorbiaceae	0.16	1.8	9	0.811	1.042	0.811	2.664
<i>Sonchus oleraceus</i> L.	Asteraceae	0.17	2.1	8	0.862	0.926	0.862	2.649
<i>Blainvillea acmella</i> (L.) Philip	Asteraceae	0.18	2.6	7	0.912	0.810	0.912	2.635
<i>Achyranthus aspera</i> L.	Amaranthaceae	0.16	2.0	8	0.811	0.926	0.811	2.548
<i>Vernonia divergens</i> (Roxb.) Edgew.	Asteraceae	0.16	2.0	8	0.811	0.926	0.811	2.548

Species name	Family	Dn	Ab	Fr %	RDn	RFr	RAb	IVI
<i>Cucumis sativus</i> L.	Cucurbitaceae	0.16	2.3	7	0.811	0.810	0.811	2.432
<i>Bidens biternata</i> (Lour.) Merr. & Sherff	Asteraceae	0.14	1.8	8	0.710	0.926	0.710	2.345
<i>Solanum nigrum</i> Mill.	Solanaceae	0.14	1.8	8	0.710	0.926	0.710	2.345
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae	0.15	2.1	7	0.760	0.810	0.760	2.331
<i>Aristida adscensionis</i> L.	Poaceae	0.14	2.0	7	0.710	0.810	0.710	2.229
<i>Corchorus olitorius</i> L.	Tiliaceae	0.14	2.0	7	0.710	0.810	0.710	2.229
<i>Ocimum sanctum</i> L.	Lamiaceae	0.14	2.0	7	0.710	0.810	0.710	2.229
<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	0.13	1.9	7	0.659	0.810	0.659	2.128
<i>Tinospora cordifolia</i> (Willd.) Miers ex Hook.f. & Thoms.	Menispermaceae	0.15	3.0	5	0.760	0.579	0.760	2.099
<i>Convolvulus arvensis</i> L.	Convolvulaceae	0.12	1.7	7	0.608	0.810	0.608	2.027
<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.	Poaceae	0.12	1.7	7	0.608	0.810	0.608	2.027
<i>Ageratum conyzoides</i> L.	Asteraceae	0.11	1.6	7	0.558	0.810	0.558	1.925
<i>Cissus quadrangularis</i> L.	Vitaceae	0.11	1.6	7	0.558	0.810	0.558	1.925
<i>Ocimum basilicum</i> L.	Lamiaceae	0.14	3.5	4	0.710	0.463	0.710	1.882
<i>Alysicarpus bupleurifolius</i> (L.) DC.	Fabaceae	0.1	1.4	7	0.507	0.810	0.507	1.824
<i>Phyllanthus madraspatansis</i> L.	Euphorbiaceae	0.1	1.4	7	0.507	0.810	0.507	1.824
<i>Lactuca sativa</i> L.	Asteraceae	0.11	1.8	6	0.558	0.694	0.558	1.809
<i>Mimosa pudica</i> L.	Mimosaceae	0.12	2.4	5	0.608	0.579	0.608	1.795
<i>Rauwolfia tetraphylla</i> L.	Rubiaceae	0.12	2.4	5	0.608	0.579	0.608	1.795
<i>Amaranthus viridis</i> L.	Amaranthaceae	0.09	1.5	6	0.456	0.694	0.456	1.607
<i>Aloevera</i> (L.) Burm.f.	Liliaceae	0.1	2.0	5	0.507	0.579	0.507	1.592
<i>Ocimum gratissimum</i> L.	Lamiaceae	0.11	2.8	4	0.558	0.463	0.558	1.578
<i>Crotalaria juncea</i> L.	Fabaceae	0.09	1.8	5	0.456	0.579	0.456	1.491
<i>Jatropha glandulifera</i> Roxb.	Euphorbiaceae	0.11	3.7	3	0.558	0.347	0.558	1.462
<i>Coriandrum sativum</i> L.	Apiaceae	0.09	2.3	4	0.456	0.463	0.456	1.375
<i>Daucus carota</i> L.	Apiaceae	0.09	2.3	4	0.456	0.463	0.456	1.375
<i>Ipomoea obscura</i> (L.) Ker Gawl.	Convolvulaceae	0.09	2.3	4	0.456	0.463	0.456	1.375
<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	0.09	2.3	4	0.456	0.463	0.456	1.375
<i>Pentatropis capensis</i> (L.f.) Bullock	Asclepiadiaceae	0.1	3.3	3	0.507	0.347	0.507	1.361
<i>Cleome gynandra</i> L.	Cleomaceae	0.08	2.0	4	0.405	0.463	0.405	1.274
<i>Commelina forskolii</i> Vahl	Commelinaceae	0.08	2.0	4	0.405	0.463	0.405	1.274
<i>Cardiospermum halicacabum</i> L.	Sapindaceae	0.07	1.8	4	0.355	0.463	0.355	1.173
<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	0.06	1.5	4	0.304	0.463	0.304	1.071
<i>Cleome viscosa</i> L.	Cleomaceae	0.07	2.3	3	0.355	0.347	0.355	1.057
<i>Clitoria ternatea</i> L.	Fabaceae	0.07	2.3	3	0.355	0.347	0.355	1.057
<i>Cucurbita maxima</i> Duchesne	Cucurbitaceae	0.05	1.3	4	0.253	0.463	0.253	0.970
<i>Datura stramonium</i> L.	Solanaceae	0.06	2.0	3	0.304	0.347	0.304	0.955
<i>Malva parviflora</i> L.	Malvaceae	0.07	3.5	2	0.355	0.231	0.355	0.941
<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	0.05	1.7	3	0.253	0.347	0.253	0.854
<i>Leucas biflora</i> R.Br. ex Sm.	Lamiaceae	0.05	1.7	3	0.253	0.347	0.253	0.854
<i>Oxystelma esculentum</i> (L.f.) R.Br. ex Schult.	Asclepiadiaceae	0.06	3.0	2	0.304	0.231	0.304	0.840
<i>Quisqualis indica</i> (L.) De Filippis	Combretaceae	0.06	3.0	2	0.304	0.231	0.304	0.840
<i>Abrus precatorius</i> L.	Fabaceae	0.04	1.3	3	0.203	0.347	0.203	0.753
<i>Cocculus hirsutus</i> (L.) Diels.	Menispermaceae	0.04	1.3	3	0.203	0.347	0.203	0.753
<i>Cryptostgia grandiflora</i> Roxb. ex R.Br.	Asclepiadiaceae	0.04	1.3	3	0.203	0.347	0.203	0.753
<i>Datura innoxia</i> Mill.	Asclepiadiaceae	0.05	2.5	2	0.253	0.231	0.253	0.738
<i>Jushicia adathoda</i> L.	Acanthaceae	0.05	2.5	2	0.253	0.231	0.253	0.738
<i>Canavalia gladiata</i> (Jacq.) DC.	Fabaceae	0.04	2.0	2	0.203	0.231	0.203	0.637
<i>Hybanthus ennespermus</i> (L.) F. Muell.	Violaceae	0.04	2.0	2	0.203	0.231	0.203	0.637
<i>Aristolochia indica</i> L.	Aristolochiaceae	0.03	1.5	2	0.152	0.231	0.152	0.536
<i>Asparagus racemosus</i> Willd. var <i>javanica</i> (Kunth) Baker	Liliaceae	0.03	1.5	2	0.152	0.231	0.152	0.536
<i>Orobancha cernua</i> Loeffl.	Orobanchaceae	0.03	1.5	2	0.152	0.231	0.152	0.536
<i>Solanum trilobatum</i> L.	Solanaceae	0.03	1.5	2	0.152	0.231	0.152	0.536
		<b>19.73</b>	<b>238.9</b>	<b>864</b>	<b>100</b>			<b>300</b>

Density (Dn), Abundance (Ab) and Frequency (Fr %), Relative density (RDn), Relative frequency (RFr), Relative dominance (RAb) IVI (Important Value Index)



Oxalidaceae, Pandanaceae, Passifloraceae, Polygalaceae, Portulacaceae, Rubiaceae, Santalaceae, Scrophulariaceae, Turneraceae, Ulmaceae, Violaceae, Vitaceae and Zygophyllaceae).

Analysis of the habit shows that herbs predominate with 94 species (54%), followed by trees 46 species (27%) and shrubs contributing 17 species (10%) and climbers with 14 species (9%). The herbs attain physiological maturity soon and produce the progeny within a short period of months in comparison to trees and shrubs that need a longer time to mature. The greater tolerance to harsh conditions could result in the dominance of herbs (Kambhar and Kotresha, 2011).

The study area constitutes variety of plant species, various biotic and edaphic factors have played dominant role in determining its growth in the area. The most dominant trees in the area were *Azadirachta indica* A. Juss, *Cocos nucifera* L. and *Dalbergia latifolia* Roxb. Other species are least dominant in the area; they are *Syzygium cumini* (L.) Skeels, *Agave americana* L. and *Sterospermum chelenoides* DC.

A total 46 tree species and 41 genus belonging to 25 families were recorded during the study. The species of *Azadirachta indica* A. Juss (D=0.17, A=4.25), *Cocos nucifera* L. (D=0.11, A=2.75), *Dalbergia latifolia* Roxb. (D=0.08, A=2). The species of *Sterospermum chelenoides* DC. having the least density and abundance (D=0.01, A=1) respectively. In case of frequency analysis, the species of *Azadirachta indica* A. Juss, *Cocos nucifera* L. and *Dalbergia latifolia* Roxb. (F=4) trees are representing the highest frequency. The species of *Agave americana* L. and *Sterospermum chelenoides* DC., showing the least frequency (F=1). It is represented in Table 1.

A total 17 shrub species and 14 genus belonging to 11 families were recorded during the study. The species of *Cassia auriculata* L. (D=0.17, A=2.83), *Abutilon indicum* (L.) Sweet (D=0.12, A=1.71). The species of *Capparis spinosa* L., (D=0.03, A=1) *Opuntia dillenii* (Ker Gawl.) Haw. (D=0.03, A=1.5) and *Holorrhena pubescens* Wall. ex G. Don (D=0.02, A=1) having the least density and abundance (Table 2).

About 108 species of herbs (including climbers) belonging to 92 genera and 37 families were encountered in the study area, which indicates the rich herbaceous diversity with compare to other life form. The species of *Indigofera cordifolia* Roth (D=0.6, A=3.0), *Eragrostis minor* Host. (D=0.55, A=2.9) and *Dicanthium pertusum* (L.) W. D. Clayton (D=0.54, A=3.0) showing highest density and abundance with compare to other species. The species of *Orobancha cernua* Loefl., and *Solanum trilobatum* L. representing the least density and abundance (D=0.03, A=1.5) each. In case of frequency of herbs, *Indigofera cordifolia* Roth (F=20), *Eragrostis minor* Host. (F=19) and *Dicanthium pertusum* (L.) W. D. Clayton (F=18) are having the highest frequency. The *Orobancha cernua* Loefl., and *Solanum trilobatum* L. having the least frequency (F=2) respectively (Table 3).

Importance value index (IVI) combines relative density, relative frequency and relative dominance can be used to indicate the ecological influence of each species in the forest. Species with the greatest importance value are the

most dominant of particular vegetation. The importance value indexes of trees, shrubs and herbs species are shown in Table 1, 2 and 3 respectively.

As the study area (Panchlingeshwar sacred grove) is near to Nandikurali village and there is no compound wall around the sacred grove; various anthropological disturbances are common and these affect the normal growth of natural flora. Floral diversity studies show that regional diversity is well represented in grove system. Groves often have the relic species of the region and there are frequent changes in floral composition due to various external influences (Khumbongmayum *et al.*, 2004; Rao *et al.*, 1990). Regeneration of herbaceous species in this area was very poor because of zoo-anthropogenic activities.

### Conclusion

The present study reveals that, a total 171 species have been recorded under 145 genera belonging to 59 families. Of these, the family Fabaceae is leading with highest number of species. Some of the notable species in the groves are *Andrographis paniculata* (Burm.f.) Nees, *Holorrhena pubescens* Wall. ex G. Don, *Pentatropis capensis* (L.f.) Bullock, *Rauvolfia traphylla* L., *Solanum trilobatum* L., *Sterospermum chelenoides* DC., *Tinospora cordifolia* (Willd.) Miers ex Hooks.f.&Thoms. and *Withania somnifera* (L.) Dunal. Also the grove representing with 54 medicinal plant species belonging to 48 genera and 28 families.

As degradation of sacred groves and fragmentation of habitats have been widespread worldwide, preservation of natural habitats, however small they might be, has become crucial along with the re-orientation of the strategies for the conservation of biodiversity towards the sacred groves, and the cultural traditions associated with them. Thus, the enumeration of the sacred grove area, and their assessment of the floristic wealth, medicinal importance would provide a strong basis for evolving measures for their protection.

Groves are important for conservation of biological diversity. Its values and functions can be maintained through effective conservation and management. Almost all species of flora is medicinal inside the grove and used in various systems of medicine. This study shows due to diverse threats the floristic diversity reaches near to its minimum level. Local people must become aware of direct benefits of groves and they can learn more about the functions. The above facts focus the aspects of conservation of groves, facing great danger of existence due to loss of sanctity values.

पंचलिंगेश्वर पवित्र बाग, नन्दीकुराली, रायबाग, बेलागवी,

कर्नाटक का पादपी मूल्यांकन

सिदानन्द वी, कम्भर, तेजा बी. जगातप, जी.पी. येलावेदित्मठ

एवं के. कोटरीशा

सारांश

पवित्र बाग सामाजिक-सांस्कृतिक एवं धार्मिक प्रथाओं पर आधारित स्थानीय लोगों द्वारा संरक्षित वन खण्ड हैं। पवित्र बाग विविधता में समृद्ध हैं और जैवविविधता के संरक्षण में महत्वपूर्ण भूमिका अदा



करते हैं। वर्तमान शोध कार्य इस उद्देश्य के साथ किया गया ताकि पंचलिंगेश्वर पवित्र बाग, नन्दीकुराली, रायबाग, बेलागवी में पादपी परिमाण का प्रलेखन और इसका मूल्यांकन किया जा सके। 59 कुलों में विस्तार लिए हुए 145 वंश में संबंधित कुल 171 टेक्सा को अभिलिखित किया गया तथा बाग में 48 वंश एवं 28 कुलों से संबंधित 54 औषधीय पादप प्रजातियों का प्रतिनिधित्व भी है।

#### References

- Airi S.R., Dhav R.S., and Parohit A.N. (2000). Assessment of availability and habitat preference of Jatamansi-a critically endangered medicinal plant of Western Himalaya. *Curr. Sci.*, **79**(10):1469.
- Chandran M.D.S and Gadgil M. (1993). *Sacred groves and sacred tree of Uttara Kannada capilot study Mimeograph*. Centre for Ecological Science, Indian Institute of Science, Bangalore.
- Curtis J.T. (1959). *The vegetation of Wisconsin: An ordination of plant communities*. University Wisconsin press. Madison, Wis, USA.
- Curtis J.T. and McIntosh R.P. (1950). The interrelation of certain analytic synthetic phytosociological characters, *Ecology*, **31**:443-445.
- Gokhale Y., Velankar R., Subash Chandran M.D. and Gadgil M. (1998). Sacred woods, grasslands and waterbodies as self-organized systems of conservation, *In: Conserving the Sacred for Biodiversity Management* (Ramakrishnan, P.S., Saxena, K.G. and Chandrashekhara, U.M., eds.) Oxford and IBH Publishing Co., New Delhi, pp.365-98.
- Hasting J. (1934). *Encyclopedia of religion and ethics*. **12**. 448-452.
- Kalam M.A. (1996). *Sacred Groves in Kodagu District of Karnataka (South India): A Socio Historical Study*. Institute Francais de Pondichery, Pondichery.
- Kambhar S.V. and Kotresha K. (2011). A study on alien flora of Gadag District, Karnataka, India, *Phytotaxa*, **16**:52-62.
- Khoshoo T.N. (1996). India needs a National Biodiversity Conservation Board. *Curr. Sci.*, **71** (7): 506-513.
- Khumbongmayum A.D., Khan M.L. and Tripathi R.S. (2004). Sacred groves of Manipur-ideal centres for biodiversity conservation. *Curr. Sci.*, **87**(4):430-433.
- Malhotra K.C. (1998). Anthropological dimensions of sacred groves in India: an overview. *In: Conserving the Sacred for Biodiversity Management*, (Ramakrishnan, P.S., Saxena, K.G. and Chandrashekhara, U.M. eds.), Oxford and IBH Publishing Co., New Delhi, 423-438 pp.
- Odum E.P. (1971). *Fundamentals of ecology*. Nataraj Publishers. Dehradun.
- Panse V.G. and Sukhatme P.V. (1985). *Statistical methods for agricultural workers*. ICAR, New Delhi.
- Pushpangadan P., Rajendraprasad M. and Krishnan R.N. (1998). Sacred groves of Kerala; a synthesis on the state of art of Knowledge, *In: Conserving the sacred for Bio-diversity Mangement* (Ramakrishnan, P.S., Saxena, K.G. and Chandrashekhara, V.M. eds.), Oxford and IBH publishing Co., New Delhi, 193-210 pp.
- Rao P., Barik S.K., Pandey H.N. and Tripathi R.S. (1990). Community composition and tree population structure in a sub-tropical broad-leaved forest along a disturbance gradient. *Vegetation*, **88**:151-162.
- Singh J.S., Raghubanshi A.S. and Varshney K. (1994). Integrated biodiversity research in India, *Curr. Sci.*, **66**(70):109.

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This is to certify that **Dr. Kambhar Sidanand V.**, Assistant Professor, P. G. Department of Botany, B.K. College, Chikkodi, has delivered a lecture on **Plant Nomenclature** on 22.12.2018.

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