

NATURAL HERITAGE OF BIODIVERSITY CONSERVATION IN PALGHAR DISTRICT, MAHARASHTRA STATE, INDIA

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ABSTRACT

The western part of Maharashtra has certain protected vegetation areas (forest patches) preserved on religious grounds are known as Sacred groves, or Deo-Rahat, or Deo-rai. These groves have enjoyed complete immunity from human interference. Due to firm belief and mystic folklores nobody dares to commit any offence which will disturb the sanctity of the forest spirit. Original Thane district is recently divided into Thane and Palghar. It has rich floristic diversity in Ulhasnagar, Bhiwandi, Wada, Murbad and Jawhar areas which is a hilly tract. The local tribal people are preserving sacred groves along with forest for conservation of biodiversity which is a part of their life. The survey of 8 sacred groves from Jawhar taluka of Palghar district was carried out and was recorded floristic diversity.

Keywords: Sacred Groves, Biodiversity Conservation, Palghar District

INTRODUCTION

Sacred groves are the only patches of forest representing the “climax” type of native vegetation in natural or near natural state, preserved since many generations. Climax forest is the ultimate state of forest favored by that particular local climate, rainfall and physical conditions; without any biological interference. These groves represent the index of natural vegetation, with rare species of plants and animals of that particular region (Nipunage and Kulkarni, 2010).

The importance of these sacred groves is significant because most of the area surrounding these groves is in degraded condition. It must have experienced the similar set of flora and fauna that is found in sacred grove.

But due to biotic interference like shifting cultivation and grazing the forest patches are being destroyed. So, these groves are the only forest patches remained like a live museum of original diversity. Due to complete protection, micro climate needed for species is preserved. With such specialized species diversity, the status of such groves becomes very fragile. If these habitats are lost, it is nearly impossible to restore it back to its original state. So, these sacred groves hold heritage value which is beyond evaluation.

The term "remnant vegetation" is broadly used to traditional conservation of native vegetation that occurs within fragmented landscapes.

Remnants are generally small to medium sized patches of vegetation surrounded by highly modified land, such as cropping or grazing lands. Remnants are often thought of as patches of trees, shrubs and huge climbers (Carle & Mike, 1997). However, remnants may also be used to describe any fragmented native ecosystem preserved on religious aspect. The flora and fauna of these sacred groves are protected under sanctions and taboos which provide limits to overexploitation (Lebbie and Guires, 1995; Kulkarni and Upadhye, 2006).

An assessment of biological diversity is a widely accepted new trend in life sciences. Exploring the biodiversity consists of surveying, sorting, cataloguing and quantifying resources which are an essential part for conservation. In this respect, Shirikai sacred grove in Pune district was evaluated for their plant diversity (Kulkarni and Shindikar, 2005). Kulkarni and Nipunage, (2009) recorded floristic diversity and ecological studies of Dhup-Rahat from Bhor region in Pune district.

An environmental impact of sacred groves on flora and fauna as well as conservation of water streams are reported from Western ghats (Kumbhojkar and Kulkarni, 1998; Kulkarni and Kumbhojkar, 1999). The

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tree species in the sacred groves will improve the physical properties of soil through elimination of surface soil disturbance.

Presence of leaf litter encourages activity of soil organic carbon (SOC). There is an appreciable influence of trees on carbon pool and effect of physical properties of soil on carbon sequestration (Hangarge *et al.*, 2012; Kulkarni and Kulkarni, 2013).

Nipunage *et al.*, (2009) carried out ecological survey of sacred groves from Malshej ghat, Pune district and recorded floristic diversity, soil analysis and myco-flora from five sacred groves. In general forest vegetation profiles with more organic matter in forest soil will manage water runoff, soil erosion and nutrient loss (Lal, 1987).

Leaf litter in same place of land decomposes at faster rate and natural re-generation increases. In this connection, Nipunage and Kulkarni (2011) carried out survey in 19 sacred groves of Ambegaon Taluka for natural regeneration. Most of the plants regenerate due to micro-climate available in sacred groves.

Sacred Groves have been fairly well studied in India from anthropological as well as biological conservation points of view. In the present day India the tradition of Sacred Groves is reported from most parts of the country except some states. Most of them are reported in tribal areas; very few are located in non tribal areas.

Most of the sacred groves are located in high or medium rainfall areas (>3000 mm average annual rain fall) than in semi arid areas of India.

These are found all over the country and abundantly along the Western ghats and the West coast and in several parts of Kerala, Karnataka, Tamil Nadu, Maharashtra, Madhya Pradesh, Rajasthan, Orissa and Himachal Pradesh.

These sacred groves provides ecosystem services to the nation in different aspects like conservation of rare, endangered plants, provide natural resources, education to the students, treasure of medicinal plants and food resources, etc. (Joshi *et al.*, 2015).

Present study of sacred groves in Palghar districts is important in understanding natural resources available in the area.

a) Present Scope

Present study in Palghar district is aimed to document sacred groves in Jawhar and Vikramgad region to analyze its ecological status and evolve a restoration and management plan for each sacred grove taking into consideration active participation of villagers or owners.

In all 16 sacred groves were studied during the period of October 2007 to April 2008, out of which special attestation was given on Kalamvira sacred grove for eco-restoration point of view. These are as follows,

1. Kasatwadi, - 5-6 km from Jawhar
2. Utawali, Vikramgad
3. Khand, Vikramgad
4. Balapur, Vikramgad
5. Hade 15 km from Jawhar
6. Kalamvira, 13 km from Jawhar-
7. Jamsar, -10 km from Jawhar
8. Malghar, Jawhar
9. Chamel pada, - 16 km from Jawhar
10. Kundacha pada, 7 km from Jawhar-
11. Gadade, Vikramgad
12. Ozar, Jawhar
13. Kharonda, Jawhar
14. Aptale, Jawhar
15. Akhar -8 km from Jawhar
16. Pathardi, -13 km from Jawhar

From the above list, 8 sacred groves were studied for floristic composition, water conservation and for soil profile.

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I. Name: Kasatwadi **Village: Kasatwadi, Jawhar**

No	Local Name	Scientific Name	Habit
1.	Ain	<i>Terminalia elliptica</i> Willd.	Tree
2.	Amba	<i>Mangifera indica</i> L.	Tree
3.	Bahawa	<i>Cassia fistula</i> I.	Middle size tree
4.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
5.	Bokada	<i>Casearia graveolens</i> Dalz.	Shrub
6.	Chilhar	<i>Acacia caesia</i> (L.) Willd.	Climber
7.	Dhawda	<i>Anogeissus latifolia</i> Wall ex Guill.	Tree
8.	Dhayti	<i>Woodfordia fruticosa</i> Kurz.	Shrub
9.	Dinda	<i>Leea indica</i> Merr.	Shrub
10.	Galgugar	<i>Flacourtia latifolia</i> Cooke	Shrub
11.	Hirda	<i>Terminalia chebula</i> Retz.	Tree
12.	Jambhul	<i>Syzygium cumini</i> Skeels.	Tree
13.	Kakad	<i>Garuga pinnata</i> Roxb.	Tree
14.	Kala kuda	<i>Wrightia tinctoria</i> R.Br.	Middle size tree
15.	Kharoti	<i>Ficus exasperate</i> Vahl.	Shrub
16.	Khuri	<i>Ixora brachiate</i> Roxb.	Middle size tree
17.	Kuda	<i>Holarrhena bubescens</i> Wall ex G. Don.	Shrub
18.	Kumbha	<i>Careya arborea</i> Roxb.	Tree
19.	Kusum	<i>Schleichera oleosa</i> Oken.	Middle size tree
20.	Moha	<i>Madhuca longifolia</i> Macbr.	Tree
21.	Pangara	<i>Erythrina suberosa</i> Roxb.	Tree
22.	Payar	<i>Ficus arnottiana</i> Miq.	Tree
23.	Phanashi	<i>Carallia brachiate</i> Merr.	Tree
24.	Pithungri	<i>Albizia procera</i> Benth.	Tree
25.	Sawar	<i>Bombax ceiba</i> L.	Tree
26.	Temrun	<i>Diospyros melanoxylon</i> Roxb.	Tree
27.	Toran	<i>Zizyphus rugosa</i> Lamk.	Scandent shrub
28.	Gela	<i>Catunaregam spinosa</i> Tirveng,	Middle size tree
29.	Karwand	<i>Carissa congesta</i> Wt.	Shrub
30.	Ranbhend	<i>Thespesia lampas</i> Dalz & Gibs	Middle size tree
31.	Asuda	<i>Flemingia strobilifera</i> Ait & Ait.	Herb
32.	Ranmethi	<i>Desmodium triflorum</i> DC.	Herb.

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II. Name: Utawali

Village: Utawali, Vikramgad

	Local Name	Scientific Name	Habit
1.	Ain	<i>Terminalia elliptica</i> Willd	Tree
2.	Alay	<i>Meyna laxiflora</i> Robyns.	Middle size tree
3.	Amba	<i>Mangifera indica</i> L.	Tree
4.	Apta	<i>Bauhinia racemosa</i> Lamk.	Middle size tree
5.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
6.	Bhokar	<i>Cordia dichotoma</i> Forst.f.	Middle size tree
7.	Galgugar	<i>Flacourtia latifolia</i> Cooke	Shrub
8.	Garbhenda	<i>Leea macrophylla</i> Roxb. ex Hornem	shrub
9.	Jambhul	<i>Syzygium cumini</i> Skeels.	Tree
10.	Karwand	<i>Carissa congesta</i> Wt	Shrub
11.	Khuri	<i>Ixora brachiata</i> Roxb.	Middle size tree
12.	Kuda	<i>Holarrhena bubescens</i> Wall ex G. Don.	Shrub
13.	Kumbha	<i>Careya arborea</i> Roxb	Tree
14.	Moha	<i>Madhuca longifolia</i> Macbr.	Tree
15.	Murudsheng	<i>Helicteres isora</i> L.	Shrub
16.	Neem	<i>Azadirachta indica</i> A. Juss.	Tree
17.	Owi	<i>Dalbegia volubilis</i> Roxb.	Climber
18.	Palas	<i>Butea monosperma</i> Taub.	Tree
19.	Pipar	<i>Ficus amplissima</i> Smith.	Tree
20.	Sag	<i>Tectona grandis</i> L.	Tree
21.	Temrun	<i>Diospyros melanoxylon</i> Roxb	Tree
22.	Umbar	<i>Ficus racemosa</i> L.	Tree
23.	Wad	<i>Ficus benghalensis</i> L.	Tree
24.	Ranbhend	<i>Thespesia populena</i> Dalz & Gibs	Middle size tree
25.	Asuda	<i>Flemingia strobilifera</i> Ait & Ait.	Shrub
26.	Ran methi	<i>Desmodium triflorum</i> DC.	Herb
27.	Pangali	<i>Pogostemon benghalensis</i> O.Ktze.	Herb
28.	Chikata	<i>Triumfetta rhomboidea</i> Jacq.	Herb
29.	Takla	<i>Cassia tora</i> L.	Herb
30.	-Bala	<i>Urena lobata</i> L.	Herb
31.	Ran jire	<i>Vernonia anthelmintica</i> Willd.	Herb
32.	Sapkanda	<i>Arisaema murrayi</i> Hook.	Herb
33.	Ransuran	<i>Amorphophallus</i> <i>Commotatus</i> Engl.	Herb
34.	Pew	<i>Costus speciosus</i> Smith.	Herb
35.	Bharangi	<i>Clerodendrone serratum</i> Moon.	Shrub
36.		<i>Asystasia mysurensis</i> Anders.	Herb
37.	Bala	<i>Sida acuta</i> Burm.f.	Herb
38.	Ukshi	<i>Calycopteris floribunda</i> Poir.	Climber
39.	Kusar	<i>Jasminum malabaricum</i> Wt.	Climber
40.	Halunda	<i>Vigna vexillata</i> A,Rich	Climber
41.	Khajkuri	<i>Mucuma pruriens</i> DC	Climber
42.	Karanda	<i>Dioscorea bulbifera</i> L.	Climber
43.		<i>Argyreia elliptica</i> Choisy	Climber
44.	Chai	<i>Smilax zeylanica</i> L.	Climber

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III. Name: Patilpada

Village: Balapur, Vikramgad

No	Local Name	Scientific Name	Habit
1.	Ain	<i>Terminalia elliptica</i> Willd	Tree
2.	Alay	<i>Meyna laxiflora</i> Robyns.	Middle size tree
3.	Asana	<i>Bridelia retusa</i> Spreng.	Middle size tree
4.	Bartondi	<i>Morinda pubescence</i> Smith.	Tree
5.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
6.	Bel	<i>Aegle marmelos</i> Corr.	Tree
7.	Chinch	<i>Tamarindus indica</i> L.	Tree
8.	Dhaman	<i>Grewia tiliifolia</i> Vahl.	Tree
9.	Hedu	<i>Haldina cordifolia</i> Ridsd.	Tree
10.	Humb	<i>Miliusa tomentosa</i> Sinclair.	Tree
11.	Kala kuda	<i>Wrightia tinctoria</i> R.Br.	Middle size tree
12.	Kalam	<i>Mitragyna parvifolia</i> Korth.	Tree
13.	Karwand	<i>Carissa congesta</i> Wt	Shrub
14.	Kuda	<i>Holarrhena bubescens</i> Wall ex G. Don.	Shrub
15.	Palas	<i>Butea monosperma</i> Taub.	Tree
16.	Pipar	<i>Ficus amplissima</i> Smith.	Tree
17.	Sawar	<i>Bombax ceiba</i> L.	Tree
18.	Shemat	<i>Lannea coromandelica</i> Merr.	Tree

IV Name: Hade

Village: Hade, Jawhar

No	Name	Scientific name	Tall
1.	Ain	<i>Terminalia elliptica</i> Willd	Tree
2.	Asana	<i>Bridelia retusa</i> Spreng.	Tree
3.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
4.	Bondara	<i>Lagerstroemia parviflora</i> Roxb.	Tree
5.	Dinda	<i>Leea indica</i> R.Br. ex Vatke.	shrub
6.	Kakad	<i>Garuga pinnata</i> L.	Tree
7.	Karmal	<i>Dillenia pentagyna</i> Roxb.	Tree
8.	Karwand	<i>Carissa congesta</i> Wt.	Shrub
9.	Kharwat	<i>Ficus exasperate</i> Vahl.	Shrub
10.	Khuri	<i>Ixora brachiate</i> Roxb.	Tree
11.	Koshim	<i>Schleichera oleosa</i> Oken.	Middle sizeTree
12.	Kumbha	<i>Careya arborea</i> Roxb	Tree
13.	Moha	<i>Madhuca longifolia</i> Macbr.	Tree
14.	Pimpal	<i>Ficus religiosa</i> L.	Tree
15.	Shemat	<i>Lannea coromandelica</i> Merr	Tree
16.	Shirish	<i>Albizia lebeck</i> Willd.	Tree
17.	Waras	<i>Heterophragma quadriloculare</i> K. Schum.	Tree
18.	Wawding	<i>Embelia basaal</i> DC.	Shrub
19.	Koranti	<i>Barleria cristata</i> L.	Shrub
20.	Ransuran	<i>Amorphophallus Commutatus</i> Engl.	Herb
21.	Kayri	<i>Entada rheedei</i> Spreng.	Climber
22.	Owi	<i>Dalbegia volubilis</i> Roxb.	Climber
23.	Kadu kanda	<i>Dioscorea bulbifera</i> L.	Climber

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V. Name: Kalamvihira

Village: Kalamvihira, Jawhar

No	Local Name	Botanical Name	Habit
1	Shendri	<i>Mallotus philippensis</i> (Lam.) Muell. -Arg.	Middle size tree
2	Karvand	<i>Carrisa carandus</i> L.	Shrub
3	Apta	<i>Bauhinia racemosa</i> Lam.	Middle size tree
4	Kanchan	<i>Bauhinia purpurea</i> L.	Middle size tree
5	Kumba	<i>Careya arborea</i> Roxb.	Tree
6	Humb	<i>Milliusa tomentosa</i> (Roxb.) Sinclair	Tree
7	Wagati	<i>Capparis zeylanica</i> L.	Climber
8	Phanshi	<i>Carallia brachiata</i> (Lour.) Merr.	Tree
9	Piluka	<i>Combretum albidum</i> G. Don.	Climber
10	Ain	<i>Terminalia alata</i> Heyne ex Roth	Tree
11	Hirda	<i>Terminalia chebula</i> Retz.	Tree
12	Kosimb	<i>Schleichera oleosa</i> (Lour.) Oken	Middle size tree
13	Shimati	<i>Lannea coromandelica</i> (Houtt.) Merr.	Tree
14	Kakad	<i>Garuga pinnata</i> Roxb.	Tree
15	Pival vel	<i>Dalbergia volubilis</i> Roxb.	Climber
16	Kavala	<i>Smithia conferta</i> J. E. Smith	Herb
17	Kavala	<i>Smithia salsuginea</i> Hance	Herb
18	Bhui Kohala	<i>Pueraria tuberosa</i> (Roxb. ex Willd) DC.	Climber
19	Chikana	<i>Sida acuta</i> Burm.f.	Herb
20	Atibala	<i>Sida rhombifolia</i> L.	Herb
21	Van Bhedni	<i>Urena lobata</i> L.	Herb
22	Nandana	<i>Cissus pallida</i> (Wight & Arn.) Steud	Climber
23	Terda	<i>Impatiens balsamina</i> L.	Herb
24	Chichuria	<i>Corchorus olitorius</i> L.	Herb
25	Ambet vel	<i>Cayratia trifolia</i> (L.) Domin	Climber
26	Takala	<i>Cassia tora</i> L.	Herb
27	Chilar	<i>Acacia torta</i> (Roxb.) Craib.	Climber
28	Jambhul	<i>Syzygium cumini</i> (L.) Skeels	Tree
29	Nana	<i>Lagerstroemia microcarpa</i> Wight.	Tree
30	Chirati	<i>Mukia maderaspatana</i> (L.) Roem.	Climber
31	Chibud	<i>Cucumis callosus</i> (Rottl.) Cogn.	Climber
32	Jharasi	<i>Mollugo pentaphylla</i> L.	Herb
33	Lokhandi	<i>Ixora nigricans</i> R.Br.	Shrub

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34	Alu	<i>Meyna laxiflora</i> Robyns	Middle size tree
35	Moha	<i>Madhuca longifolia</i> (Koen.) Mac. <i>Var. latifolia</i>	Tree
36	Kadu jire	<i>Phyllocephalum scabridum</i> (DC.) Kirkman	Herb
37	Kusar	<i>Jasminum malabaricum</i> Wt.	Climber
38	Pandhara Chappha	<i>Plumeria alba</i> L.	Tree
39	Kavali	<i>Cryptostegia grandiflora</i> R. Br.	Climber
40	Varas	<i>Heterophragma quadriloculare</i> (Roxb.) K. Schum.	Tree
41	Tetu	<i>Oroxylum indicum</i> (L.) Vent.	Middle size tree
42	Aghada	<i>Achyranthes aspera</i> L.	Herb
43	Kurdu	<i>Celosia argentea</i> L.	Herb
44	Barki	<i>Geissaspis cristata</i> Wight & Arn	Herb
45	Bhui awali	<i>Phyllanthus urinaria</i> L.	Herb
46	Alu	<i>Colocasia esculenta</i> (L.) Schott.	Herb
47	Badad	<i>Sauromatum venosum</i> (Ait.) Schott.	Herb
48	Gauri cha kand	<i>Curcuma inodora</i> Blatt.	Herb
49	Kali Musali	<i>Curculigo orchoides</i> Gaertn.	Herb
50	Konphal	<i>Dioscorea alata</i> L.	Climber
51	Kadu kand	<i>Dioscorea bulbifera</i> L.	Climber
52	Shend vel	<i>Dioscorea pentaphylla</i> L.	Climber
53	Pahadvel	<i>Cyclea peltata</i> (lam.) Hook.f. & Thoms	Climber
54	Savar	<i>Bombax ceiba</i> L.	Tree
55	Dinda	<i>Leea indica</i> (Burm.f.) Merr.	Shrub
56	Padal	<i>Stereospermum chelenoides</i> (L.f.) DC.	Tree
57	Kate Kalak	<i>Bambusa arundinacea</i> (Retz.) Willd.	Shrub
58	Kirmira	<i>Casearia graveolens</i> Dalz.	Shrub
59	Kasur grass	<i>Coix lacryma-jobi</i> L.	Herb
60	Sarbal	<i>Rungia</i> sp.	Herb
61	Kanchri	<i>Alternanthera sessilis</i> (L.) R.Br.ex DC.	Herb
62	Pivala Dhotra	<i>Argemone mexicana</i> L.	Herb
63	Khadak payar	<i>Ficus arnottiana</i> (Miq.) Miq.	Shrub
64	Ukshi	<i>Calopteris floribunda</i> (Roxb.) Poir.	Climber
65	Amguli	<i>Eleagnus conferta</i> Roxb.	Climber
66	Umbar	<i>Ficus racemosa</i> L.	Tree
67	Motha gulvel	<i>Tinospora sinensis</i> (Lour.) Merr.	Climber
68		<i>Aeginetia indica</i> L.	Herb

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VI. Name: Jamsar

Village: Jamsar, Jawhar

No	Name	Scientific Name	Habit
1.	Ain	<i>Terminalia elliptica</i> Willd	Tree
2.	Amba	<i>Mangifera indica</i> L.	Tree
3.	Asana	<i>Bridelia retusa</i> Spreng.	Middle size tree
4.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
5.	Chandava	<i>Macaranga peltata</i> Muell.-Arg.	Tree
6.	Kate sawar	<i>Bombax ceiba</i> L.	Tree
7.	Karwand	<i>Carissa congesta</i> Wt.	Shrub
8.	Kharwat	<i>Ficus exasperate</i> Vahl.	Shrub
9.	Shendri	<i>Mallotus philippensis</i> (Lam.) Muell. –Arg.	Middle size tree
10.	Shiras	<i>Albizia procera</i> Benth.	Tree
11.	Mogali erand	<i>Jatropha curcas</i> L.	Shrub
12.	Pipar	<i>Ficus amplissima</i> Smith.	Tree
13.	Koranti	<i>Barleria cristata</i> L.	Herb
14.	Kadu kanda	<i>Dioscorea bulbifera</i> L.	Climber
15.	Ransuran	<i>Amorphophallus commutatus</i> Engl.	Herb
16.	Sapkanda	<i>Arisaema murrayi</i> Hook.	Herb
17.	Sahadevi	<i>Aegeratum conyzoides</i> L	Herb

VII. Name: Malghar

Village: Malghar, Jawhar

No	Name	Scientific Name	Habit
1.	Ain	<i>Terminalia tomentosa</i>	Tree
2.	Asana	<i>Bridelia retusa</i> Spreng.	Middle size tree
3.	Bahawa	<i>Cassia fistula</i> L.	Middle size tree
4.	Bamboo	<i>Bambusa arundinaceae</i> Willd.	Woody shrub
5.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
6.	Chamel	<i>Bauhinia foveolata</i> Dalz.	Tree
7.	Dinda	<i>Leea indica</i>	Shrub
8.	Hedu	<i>Haldina cordifolia</i> Ridsd.	Tree
9.	Karwand	<i>Carissa congesta</i> Wt.	Shrub
10.	Kalam	<i>Mitragyna parvifolia</i> Korth.	Tree
11.	Kate sawar	<i>Bombax ceiba</i> L.	Tree
12.	Karu	<i>Sterculia urens</i> Roxb.	Tree
13.	Koshimb	<i>Schleichera oleosa</i> Oken.	Middle size tree
14.	Papada	<i>Holoptelia integrifolia</i> Planch.	Tree
15.	Sag	<i>Tecona grandis</i> L.	Tree
16.	Shisav	<i>Dalbergia latifolia</i> Roxb.	Tree
17.	Temru	<i>Diospyros melanoxylon</i> Roxb.	Tree
18.	Umbar	<i>Ficus racemosa</i> L.	Tree
19.	Waras	<i>Heterophragma quadriloculare</i> K. Schum.	Tree
20.	Ran halad	<i>Curcuma pseudomontana</i> Grah.	Herb
21.	Koranti	<i>Barleria cristata</i> L.	Herb
22.		<i>Desmodium triquertum</i> DC	Herb
23.	Ukshi	<i>Calycopteris floribunda</i> Poir.	Climber
24.	Kadu kanda	<i>Dioscorea bulbifera</i> L.	Climber
25.	Fern	<i>Adiantum lunulatum</i>	Herb
26.	Silver fern	<i>Cheilanthes albomarginata</i>	Herb

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VIII. Name: Chamel pada Village: Chamel pada, Jawhar

No	Name	Scientific name	Habit
1.	Asana	<i>Bridelia retusa</i> Spreng.	Tree
2.	Bahawa	<i>Cassia fistula</i> L.	Middle size tree
3.	Behda	<i>Terminalia bellirica</i> Roxb.	Tree
4.	Bondara	<i>Lagerstroemia parviflora</i> Roxb.	Tree
5.	Chinch	<i>Tamarindus india</i> L.	Tree
6.	Dhaman	<i>Grewia tiliifolia</i> Vahl.	Tree
7.	Kadwai	<i>Hymenodictyon obovatum</i> Wall.	Middle size tree
8.	Kakad	<i>Garuga pinnata</i> Roxb.	Tree
9.	Kala Kuda	<i>Wrightia tinctoria</i> R.Br.	Middle size tree
10.	Kate sawar	<i>Bombax ceiba</i> L.	Tree
11.	Payar	<i>Ficus arnottiana</i> Miq.	Tree
12.	Shendri	<i>Mallotus philipenis</i> Muell-Arg.	Middle size tree
13.	Dandoshi/ Shiras	<i>Albizia procera</i> Benth.	Tree
14.	Waras	<i>Heterophragma quadriloculare</i> K. Schum.	Tree
15.	Bandgul	<i>Viscum articulatum</i> Burm.f.	Parasite



Jamsar Pond with *Nymphaea* and Covered with *Pistia*



**Kalamvirhri with Huge Linana
Combretum Albidum G. Don**



Huge rare climber of *Entada Rheedei* Spreng

Research Article

RESULTS AND DISCUSSION

Sacred groves are natural virgin forest patches preserved on religious ground. These forest lands are conserved since ancient time. Huge trees, lianas, shrubs, herbs and rare, endangered plants are conserved in this ecosystem. This biomass has been conserved through people's participation. In Maharashtra state there are more than 4000 sacred groves which are still conserved by local communities (Deshmukh, 1994).

The present attempt of documentation of sacred groves from Palghar district in general and Jawhar and Vikramgad region in particular is unique and therefore very important. There are 16 sacred groves out of which 8 were studied for floristic point of view. It is observed that each sacred grove has unique feature. The floristic documentation of each sacred grove and its special features are as below:

Kasatwadi sacred grove has 32 plant resources, 15 trees, 6 middle size trees, 7 shrubs, 2 herbs and one climber. Few Non-timber forest producing trees are *Anogeissus latifolia* Wall ex Guill (Dhawada), Tribal people collect gum from this tree.

Flowers of *Madhuca longifolia* Macbr (Moha) are collected and sold in market for good price. Wild edible fruit plants like *Flacurtia latifolia* Cooke (Galgugar) *Syzygium cumini* Skeel, (Jambhul) *Diospyros melanoxylon* Roxb. (Toran) and *Carissa congesta* Wt. (Karvand) are common in the grove.

In Utawali sacred groves there are 44 plant species out of which 13 are trees, 5 middle size trees, 7 shrubs, 11 herbs, 8 climbers. One rare plant *Asystasia mysurensis* Anders is recorded. Some wild edible plants like *Meyna laxiflora* Robyns (Aliv) Robns, *Cordia dichotoma* Forst. (Bhokar), *Leea macrophylla* Roxb. (Garbendha), *Cassia tora* L. (Takala), *Amorphophallus commutatus* Engl. (Ran suran), *Arisaema murrayi* Hook (Sap kand), *Jasminum malabaricum* Wt. (Kusar), *Vigna vexillata* A.Rich. (Halunda), *Dioscorea bulbifera* L. (Kadu karanda), etc. Most of these wild plants are used as vegetable and fruits are used for pickles (Chothe et al., 2014).

Sacred grove of Patilpada in village Balapur has 18 plant species out of which 13 trees, 3 middle size trees and 2 shrubs. It is recorded that two trees like *Morinda pubescence* Smith and *Milusa tomentosa* Sinclair are rarely observed in sacred groves in Kokan region.

Hade sacred grove has disturbed due to non-cooperation of villagers regarding conservation point of view. In this sacred grove 23 plant species recorded out of which 13 are trees, 1 middle size tree, and a huge rare climber *Entada rheedei* Spreng. In this connection Vartak and Kumbhojkar (1984) reported lianas from some sacred groves in Western Maharashtra. It indicated that this sacred grove has enjoyed climax vegetation in past.

Kalamvirhri sacred grove has unique approach of eco-restoration and people's participation for conservation of sacred grove. Due to efforts of local people 67 plants conserved, out of which 15 are trees, 6 middle size trees, 6 shrubs, 15 climbers and 22 are herbs. Huge lianas like *Combretum albidum* G. Don, *Tinospora sinensis* (Lour.) Merr. *Calopteris floribunda* (Roxb.) Poir. *Eleagnus conferta* Roxb. are observed.

Rare plants like *Aeginetia indica* L., *Stereospermum chelenoides* (L.f.) DC., *Smithia salsuginea* Hance, *Pueraria tuberosa* (Roxb. ex Willd) DC. are present in sacred groves. On this background a first attempt of eco-restoration of sacred grove by conserving ecosystem using man made efforts and ultimately beneficial for livelihood of people has been made by BAIF, Development and Research Foundation, Pune and Oikos, Pune and funded by Praj Foundation, Pune.

Jamsar sacred grove is situated near a big pond. Local people use well for fetching water for day to day use. Previously pond was full of *Nymphaea pubesces* Willd and now it is covered by the noxious weeds like *Eichhornia crassipes* (Mart.) Solms. and *Pistia stratiotes* L. We recorded 17 plant species, out of which 7 are trees, 2 middle size trees 3 shrubs, 1 climber and 4 are herbs. Population of *Mangifera indica* L., *Macaranga peltata* Muell.-Arg., *Mallotus philippensis* (Lam.) Muell. -Arg. is remarkable in this small patch of sacred grove.

Malghar sacred grove has 26 plant resources, out of which 13 are trees, 3 middle size trees, 3 shrubs, 5 herbs and 2 are climbers. One non-timber forest species is *Sterculia urens* Roxb. which gives gum and tribal people fetch good income from barter system of marketing.

Research Article

Chamel pada sacred groves are having 15 plant species out of which 10 are trees, 4 middle size trees and one is parasite *Viscum articulatum* Burm.f. Tribal people use this parasite for bone fracture.

Villagers with support from forest department and NGOs can protect the groves at their vicinity. Initiatives like prevention of cattle grazing, restriction on manure collection, removal of invasive plants, complete ban on infrastructure development etc. can be taken as a precaution for saving grove biota and ecological activities.

Grove conservation activities could be enlisted in the village development programs along with the provision of small incentives to attract the young people. Incentives could be made in the form of carbon credit, ecotourism and for monitoring activities with emphasis on local condition and requirement (Rajasri Ray et al., 2015).

Conclusion

Grove restoration is well adapted in many areas as a participatory activity between NGOs and villagers. Restoration activities include planting native species, protection for seedlings and saplings, nursery establishment for rare, endemic plants, measures for soil and water conservation etc.

It is essential to plan long term sustainability of the programs and is very much depends on interests /awareness of local community, livelihood benefits as well as proper scientific assessment / monitoring of the conservation activities.

Ecosystem services like pollination, seed dispersal, nutrient cycling and soil and water conservation are usually operated in larger spatial extent combining different land use types at different times and therefore, require an integrated approach at landscape level. Considering the present fragmented conditions of the groves, they can be used as repositories of endemic plants, soil seed bank, connective corridor for birds and animals in human dominated landscapes. Therefore, it requires combined and holistic approach to conserve the grove tradition in landscape level as well as ecosystem services (Joshi et al., 2015).

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