

Natural heritage of forest conservation in Bhore region of Pune, India

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SUMMARY

Bhor area in Pune district was famous from the earlier period as a "Territory of Pant Sachiv" and surrounded by many historical forts like Rajgad, Rayareshwar, Rohideshwar, etc. The natural heritage of forest conservation is known as Dev-Rahati or sacred groves. Bhor division was under control of Religious committees and that are monitored by forest department, Maharashtra government. In the study area eight sacred groves were surveyed for plant diversity and results have been presented and discussed accordingly.

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The western part of Maharashtra, (India) has certain protected vegetation areas (forest patches) preserved on religious ground and 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.

These forest patches (sacred groves) are preserved for a very long period of time, probably for centuries of years or even thousands of years. Sacred groves from Pune district are surveyed for multidimensional aspects by several workers. Detailed floristic account of submerged sacred groves in Panshet and Varasgaon dam sites were recorded by Vartak and Gadgil (1981) and Kulkarni and Kumbhojkar (1999), Tetali and Gunale (1990). Threat to medicinal plants in Pune district was reported by Upadhye *et al.* (2004). Gadgil and Vartak (1981) made inventory of sacred groves from Maharashtra state in general and recorded 11 sacred groves from Bhore Taluka. Waghchaure *et al.* (2006) recorded 14 sacred groves from Parinche valley of Pune district for their cultural and ecological point of view. Kulkarni and Sindikar (2005) made plant diversity evaluation of Shirikai sacred grove situated at village Shirkoli from Bhore Taluka. Kulkarni and Nipunage (2009) reported

floristic diversity and ecological evaluation of 'Dhup-rahath' sacred grove situated in Bhore region of Pune district. The sacred grove is specifically known as 'Dhup-Rahath' due to magnificent trees of *Dhup i.e. Canarium strictum* Roxb. The grove is situated southwest of Hirdoshi village on Bhore-Mahad Road in Pune district and on one of the descending spurs of Rairi hills at an elevation of about 1050 m. It covers an area of about 5 hectares along a gentle slope near Varandha pass, only a few km below the origin of 'Nira' river, flowing through a narrow ravine passing along the grove. The reigning deity of the grove is goddess 'Durga'. It indicates that Bhore region has heritage of forest conservation since ancient time. However, very scattered studies on sacred groves from Bhore region have been carried out so far.

Bhore area was famous in earlier period as a "Sansthan of Pant Sachiv" surrounded by many historical forts like Rajgad, Rayareshwar, Rohideshwar, etc. Bhore area is famous as Karmbhumi of Maharaja Chatrapati Shivaji. Sacred groves from Bhore Taluka are under control of Devasthan committees and that are monitored by forest Department, Maharashtra Government. The sacred groves are under threat because of anthropogenic pressure and developmental activities like Bhatghar, Nira, Devodhar and Gunjavani dams. In the study

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area, local people /tribals were displaced from their original settlements due to developmental activities. They were rehabilitated to new environment. It resulted into loss of plant diversity in sacred groves and traditional practices, medicinal health resources and gene pool of cultivated crop plants (Kulkarni, 2005). Documentation of plant diversity from sacred groves has got prime importance in last few decades. It will be useful for *in situ* biodiversity conservation.

Bhor covers an area of 892.0 sq. km. It is situated 55 km. South of Pune and between 18° and 18°45' N latitude and 73° – 15' E longitude. It includes 185 villages and total population is 1,54,903. The forest area is classified into reserved forest 3818.444 ha, protected forest 9.984 ha, acquired private forest 1719.31 ha and compensatory afforested land 35.10 ha. (Anonymous 2003-2004). Forest in hilly area of western part is evergreen type due to heavy rainfall and higher elevations of Sahyadri's main region having 650 to 1424 meters of altitude. This is an undisturbed, well developed evergreen forest often showing distinct layers and a variety of habitat patterns. The southern part of Bhor Taluka has moist deciduous forest along higher elevation. The dry mixed deciduous forest covers the broad western part of the area. This forest incorporates economic species in the form of timber or minor forest products.

Present paper deals with documentation of plant diversity in eight sacred groves from Bhor region.

MATERIALS AND METHODS

A survey of sacred groves from Bhor division of Pune districts was made and floristic diversity as well as status of plant species from groves was recorded. Two rivers originate from the region: the Nira and Velvane flowing in Bhor Taluka and Bhatghar, Nira Devoghar and Gunjavani dam constructed on Gunjavani river. The sacred groves are out of submerged area and still protected by Mahadeokoli tribe. Local people were consulted for floristic data collection and observations on rare endangered plant species presented in this paper in tabular format.

RESULTS AND DISCUSSION

Sacred groves play very important role in conservation of plant diversity and cultural heritage (Nipunage *et al.*, 1991). These groves are often dedicated to several deities (Table 1). Some of the deities are ferocious in nature and their names being something like Bapujiboova, Kalubai, Navlaidevi, Mariai, Andharidevi, Kadjai, Dongraidevi, Jakuradevi, Kalkai, Kalbhairi, Vanghrunjai, Gulumbai,

Chiraidevi. However, there are sacred groves, which are dedicated to deities that are not thought to be of ferocious nature such as Maruti, Ganpati and Khandoba etc.

The most important justification for nature conservation is that it provides an insurance policy for the future. The sacred groves in Bhor Taluka are in the range of 0.02 to 10.00 ha in area. The sacred groves with lofty trees, shrubs and giant lianas are peculiar features of natural ecosystem. (Vartak and Kumbhojkar, 1985; Vartak *et al.*, 1986).

Giant climbers which were recorded in Dhamunshi sacred grove like *Entada pursaetha* DC., *Ancistrocladus heyneanus* Wall., *Gnetum ula* Brong., *Butea superba* Roxb., *Diploclisia glaucescens* Diels. indicate that the evergreen elements are present in natural floristic wealth of sacred groves.

Baneshwar sacred grove is under control of Forest Department of Maharashtra State. This grove has been developed as garden and a good picnic spot. Water stream is flowing near the sacred grove and visitors enjoy the water fall. Big trees and some rare plants like *Tacca leontopetaloides* (L.) O. Ktze., *Acacia polyacantha* Willd. are prominent features of Baneshwar sacred grove.

Dhup rahat sacred grove harbours trees like *Terminalia bellirica* Roxb., *Syzygium cumini* (L.) Skeels., *Holigarna grahmi* Hk. and *Canarium strictum* Roxb. which are prominent species of the vegetation.

Nageshwar grove has been encroached by Govt. building and Schools. Due to Nageshwar temple local people use it as picnic spot. Natural water source is present inside the grove. This grove harbours big trees of *Milium tomentosum* Roxb., *Plumeria alba* Linn, *Artocarpus teterophyllus* Lamk, *Celtis cinnamomea* Lindl. A.Juss., *Mallotus philippensis* Muell. which are remnants of past floristic wealth. Some climbers like *Vallisneria spiralis* L., *Clematis gourina* Roxb. ex DC., *Acacia caesia* Willd. are well preserved. In recent years many exotic species of plants are introduced like *Parthenium hysterophorus* L., *Synedrella nodiflora* (L.) Gaertn. *Mirabilis jalapa* L. etc.

Andharwadachi Rai –means once upon a time light was not passing through the thick vegetation on ground. Due to human activities around the sacred grove in last century like agriculture, road construction, cutting of large trees, etc. it has vanished its total plant wealth and only one tree of *Ficus benghalensis* L. is survived with *Capparis zeylanica* L. climber on it.

In Kalubaichi Rai near Hirdoshi village, natural regeneration of *Memecylon* and *Zanthoxylon* was observed. Surrounding area was protected by plantations

Sr. No.	Name of Species	Family	Common Name	Local Name	Height (m)	Uses	Remarks
1.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region
2.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region
3.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region
4.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region
5.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region
6.	<i>Carissa carandas</i> L.	Celastraceae	Carissa	Carandha	3-6	Medicinal, wood for fuel	Common in the region

Table 1 contd...

Condit... Table 1

1.	Varvand	Somajichi Rai	5.00	<p><i>Bridelia retusa</i> Spreng., <i>Bombax ceiba</i> L., <i>Mangifera indica</i> L., <i>Zanthoxylum rhetsa</i> DC., <i>Cassia fistula</i> L., <i>Heterophragma quadrilocularis</i> K. Schum., <i>Nothapodytes nanamiana</i> V.S.G., <i>Dendrocalum strictus</i> Nees</p>	<p><i>Allophylus cobbe</i> Roxb., <i>Lantana camara</i> L., <i>Navelia indica</i> L., <i>Carissa caranda</i> L., <i>Macaranga latifolia</i> Choisy, <i>Moringa strobilifera</i> A. & N.</p>	<p><i>Zyzygium rugosa</i> Lam., <i>Alseodaphne conferta</i> Roxb., <i>Smilax zeylanica</i> L., <i>Dalbergia volubilis</i> Roxb.</p>	<p>Vegetation recorded by V.S.G. et al. 2002 etc.</p>
8.	Varvand	Manojkumar Rai	2.00	<p><i>Memecylon umbellatum</i> Benth., <i>Caraka brachistata</i>, <i>Terminalia bellirica</i> Roxb., <i>Terminalia chebula</i> Retz., <i>Dendrocalamus strictus</i> Nees, <i>Syzygium cumini</i> Merr. & Seem., <i>Cassia fistula</i> L., <i>Terminalia elliptica</i> Willd.</p>	<p><i>Carissa carandas</i> L., <i>Lantana camara</i> L., <i>Meyna laxiflora</i> Roxb., <i>Cordia glauca latifolia</i> Lam., <i>Cordia</i> sp., <i>Cassia graveolens</i> DC., <i>Pavetta indica</i> L.</p>	<p><i>Dioscorea bulbifera</i> L., <i>Combretum ovalifolium</i> B., <i>Ampelocissus</i> sp., <i>Terminalia</i> sp., <i>Terminalia</i> sp., <i>Hemidesmus indicus</i> R.Br.</p>	<p>Sacred grove with natural regeneration of <i>Smilax zeylanica</i> L., <i>Teramnus labialis</i> Spreng., <i>Hemidesmus indicus</i> R.Br.</p>

of *Eucalyptus* done by Forest Department, Maharashtra State.

In village Nandghur, there were six sacred groves protected by Mahadeokoli tribe. Some of them were located in remote places and scanty vegetation was present in Somjaichi Rai. There were well protected trees like *Bombax ceiba* L., *Mangifera indica* L., *Zanthoxylum rhetsa* DC., *Cassia fistula* L., *Heterophragma quadrilocularis* K. Schum., *Nothapodytes nimmoniana* (Grah.) Mabb. and *Dendrocalum strictus* Nees was abundant along with shrubs and climbers.

Maulichi Rai near Varvand village has thick population of trees, shrubs and climbers as well as natural regeneration of *Smilax zeylanica* L., *Teramnus labialis* (L. f.) Spreng., *Hemidesmus indicus* R. Br. etc.

Plant species like *Caryota urens* L., *Memecylon umbellatum* Burm. F., *Holigarna grahamii* Hook, *Terminalia bellirica* Roxb., *Bombax ceiba* L., *Gnetum ula* Brongn., *Dalbergia horrida* Mabb., *Jasminum malabaricum* Wt., etc. were preserved in many sacred groves. A holy tree *Plumeria alba* L. was observed in sacred groves. It was also interesting to note that *Pongamia pinnata* Pierr., *Erythrina suberosa* Roxb., *Cassia fistula* L., *Phoenix sylvestris* Roxb., *Xantolis tomentosa* Raf. etc. were occasionally found in the sacred groves from Bhor region.

It is universally accepted that sacred groves should be conserved on priority basis as there is an urgent need to protect the wealth of biodiversity. There are some luxuriant pockets of vegetation still surviving on religious grounds, dogmas and age-long beliefs. An evergreen patch in desolate area suggests the composition of pre-existing vegetation before human influence started working on the area. These sites can be treated as long term research areas for carbon sequestration and witness the ecological processes like succession, niche dynamics and its environmental impact (Kumbhojkar and Kulkarni, 1998). A thorough study of floristic and genetic diversity of rare species in such places will bring out many interesting facts which will be useful to botanists and geneticists.

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