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ORIGINAL ARTICLE

Floral Diversity in and around some Sacred Sites: A Case Study from Rampur, Uttar Pradesh, India

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ABSTRACT
The sacred groves are unique in ensuring biodiversity conservation through traditional belief systems from time immemorial. Apart from being rich in genetic resources for many regional plants the groves provide various direct and indirect ecosystem services. The present study deals floral diversity in and around ten sacred sites of Uttar Pradesh, India. More than 200 plant species belonging to 171 genera and 73 families were recorded from the study sites which indicates that the such sacred sites play an important role in biodiversity conservation and ecological balance (apart from being the centers of religious significance). Out of the total recorded species, 71.14% were with medicinal importance followed by edible, fodder, ornamental, timber and of religious importance. The information on life forms, vernacular names, indigenous utility and species distribution in the studied groves has been discussed.
Keywords: *Biodiversity conservation, culture, ecosystem services, phytodiversity, life forms*

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INTRODUCTION

The sacred groves are natural areas of special spiritual significance recognized as sacred by aboriginal people [1]. These are one of the, various traditional approaches and belief systems for the biodiversity conservation which include a number of prescriptions and proscriptions for restrained resource use [2]. Sacred groves are believed to be crucial for in-situ conservation as protected by local communities by establishing rules to prohibit felling of trees and killing of animals [3]. Such groves are reported from many countries around the world [4] where they frequently pertain to provide various ecosystem services especially ground water and rainfall. On account of rapid urbanization and extension of urban cultures, these groves are losing their cultural importance for younger generations and degrading gradually throughout the world [5, 6]. There is need to develop adequate strategy for the study and conservation of these important areas [7]. The present work was amid to assess the floristic inventory and their socioeconomic dimensions from ten sacred sites of Uttar Pradesh, India.

MATERIAL AND METHODS

Study area

The detailed feature of the selected sacred sites are summarized in **Table 1**.Geographically, these lie between 28° 21' 12.28'' N to 28° 34' 25.91'' N latitude and 78° 36' 05.24'' E and 79° 07' 14.11'' E

longitude and administratively fall under Bareilly, Rampur and Sambhal districts of the state Uttar Pradesh.

MATERIAL AND METHODS

Periodic field visits were made to explore the floristic composition of ten selected sacred sites during the years 2018 and 2020. The plant specimens were collected with field notes and processed for herbarium [8]. The collected specimens were identified with help of regional floras [9–13] and herbaria (BSD, GUH). The accepted scientific names have been given for each species following *The Plant List* [14]. A structured questionnaire was used to collect socioeconomic importance of plants growing in and around (ca. 25 m radius) selected sites. The questionnaire was applied on 15–20 informants especially local healers, *priests*, *vaidyas,* elder men and women at each site [15]. Validity of collected information was confirmed through cross checking.

RESULTS

The floristic assessment of selected sites resulted in documentation of more than 200 plant species belonging to 171 genera and 73 families. The recorded species with their vernacular names, life form, socioeconomic values and distribution are represented in Table 2. The dominant families with number of genera and species are shown in Fig. 1. *Ficus* revealed as dominant genus represented by 7 spp., followed by *Euphorbia* (5 spp.) and *Cyperus*, *Phyllanthus* and *Solanum* (3 spp. each). Among the life forms, maximum species (45.77%) were herbs followed trees (28.86%), shrubs (21.39%) and climbers (3.98%). The socioeconomic assessment of plants revealed that 71.14% of total species were of medicinal value (Fig. 2) being used in curing different ailments (Table 3).

DISCUSSION

In this study, the number of species at sacred sites varied between 41 and 109 with the mean of 83±7 (S.E.). The herbs dominated the life forms. Similar ranges of species viz. 64–207 were reported for sacred groves from Andhra Pradesh [16], Karnataka [17], Kerala [18], Tamil Nadu [19–22], Uttarakhand [23], West Bengal [24], etc. The species composition varied from one grove to another on account of changed geographic area, altitude, environmental conditions, soil properties and the anthropogenic factors.

Through species growing in these sites are the source of edibles, fodders, fuel wood, medicines, timbers and rituals to local people in the vicinity, yet the villagers are for bidden to exploit them of their own. The plants for medicinal use and ritual practices are collected by the elders exclusively for use of the villagers (not for commerce proposes). A strict belief exists among the villagers that any disobedience of set rules would inflict wrath of deity in from of miss happenings. The lack of proper management plan, over exploitation of medicinal plants and encroachment by invasive species are the factors collectively leading to gradual degradation of these sites at present.

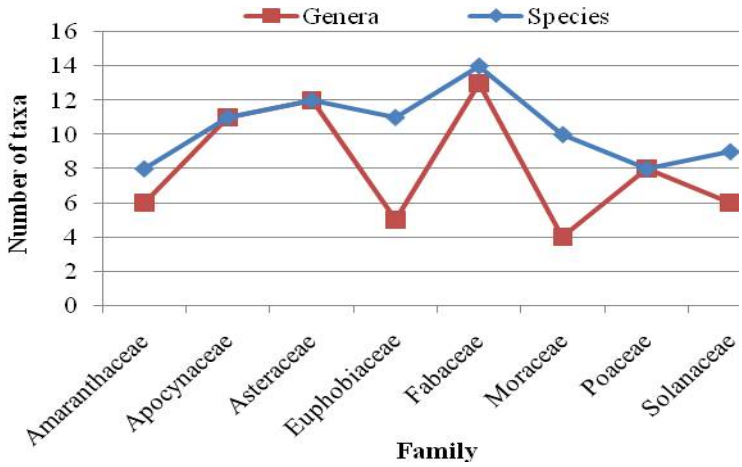

Figure 1. Dominant families with number of genera and species

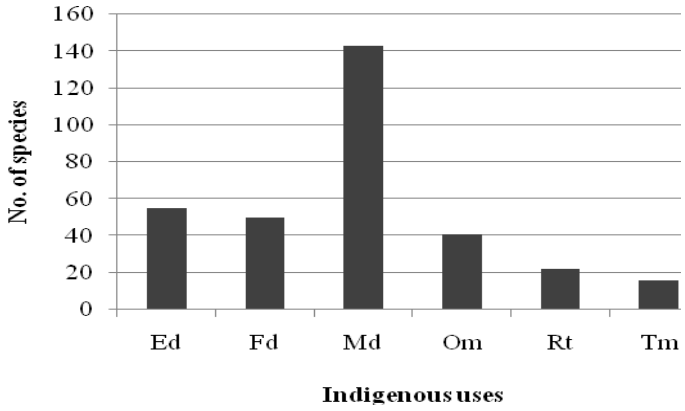

Figure 2. Indigenous uses of plants in the study area

Plate 1. The Sacred groves: (A) Shiv Mandir, (B) Much wale Hanuman ji, (C) Sidhi Dattri Nav Durga, (D) Shid Bhairo Baba Manokamna.

Table 1. Details of selected sacred groves for the present study

Sl. No.	Name of sacred grove	Name of place (District)	Coordination	Altitude (m asl)	Area (ha)*	No. of species
1.	Much wale Hanuman Ji	Chandausi (Sambhal)	28° 26' 34.82'' N & 78° 47' 20.72'' E	192	08.5	101
2.	Chodrana Baba	Kesarpur (Rampur)	28° 34' 25.91'' N & 78° 58' 31.44'' E	184	05	84
3.	Jain Mandir	Ramnagar (Bareilly)	28° 22' 06.25'' N & 79° 07' 14.11'' E	176	10	104
4.	Raghunath Mandir	Chandausi (Sambhal)	28° 26' 35.54'' N & 78° 47' 23.49'' E	191	04	100
5.	Shid Bhairo Baba Manokamna	Shahabad (Rampur)	28° 33' 41.41'' N & 78° 59' 48.27" E	183	02.5	54
6.	Shiv Mandir	Mahunagar (Rampur)	28° 31' 55.70'' N & 79° 00' 39.27'' E	183	02	65
7.	Shiv Mandir Lakhi Bagh	Shahabad (Rampur)	28° 28' 57.52'' N & 79° 02' 20.77'' E	182	03	86
8.	Shri Pashupati Nath	Sadatwari (Sambhal)	28° 21' 12.28'' N & 78° 36' 05.24'' E	189	07.5	86
9.	Shri Sidhi Dattri Nav Durga	Sambhal, Chandausi	28° 26' 08.84'' N & 78° 46' 39.56'' E	193	06.2	109
10.	Sidh Baba Ki Madi	Dhakuriya (Rampur)	28° 33' 17.60'' N & 79° 01' 38.98'' E	183	03	42

*Approximate area of the groves is based on the field observation as well as reported by the informants.

Table 2. Plant diversity, its indigenous uses and distribution in the selected sacred groves of Uttar Pradesh

Botanical name /Vernacular name	**Family**	**Indigenous utility***	**Distribution of species ****									
Trees			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**8**	**10**
Acacia catechu (L.f.) Willd. '*Babool*'	Mimosaceae	Md	-	-	-	-	-	+	+	-	+	+
Aegle marmelos (L.) Corrêa *'Bail*'	Rutaceae	Ed,Md,Rt		-	+	-	+	+	+	+	+	+
Albizia lebbeck (L.) Benth. '*Siris*'	Fabaceae	Fd,Md,Tm,Om	-	-	+	-	+	-	-	-	-	-
Araucaria araucana (Molina) K.Koch	Araucariaceae	Om	-	-	-	+	+	+	-	+	+	-
Artocarpus heterophyllus Lam. '*Kathal*'	Moraceae	Ed	-	-	-	-	-	-	-	+	-	+
Azadirachta indica A.Juss. '*Neem*'	Meliaceae	Md	+	+	+	+	+	+	+	+	+	+
Bombax ceiba L. '*Semal*'	Bombacaceae	Ed,Md,Tm	-	-	-	-	+	-	+	-	-	+
Broussonetia papyrifera (L.) L'Hér. ex Vent.	Moraceae	Fd,Md	-	-	-	-	+	-	-	-	-	+
Butea monosperma (Lam.) Taub. '*Teshu*'	Fabaceae	Fd,Md	-	-	-	-	-	-	+	-	-	+
Callistemon citrinus (Curtis) Skeels	Myrtaceae	Om	+	-	-	+	+	+	-	+	+	-
Carica papaya L. '*Papeeta*'	Caricaceae	Ed,Md	-	-	-	+	+	+	-	+	+	+
Cassia fistula L. '*Amaltas*'	Caesalpiniaceae	Md,Om	-	-	-	+	+	+	-	+	-	-
Cordia dichotoma G.Forst. '*Lisora*'	Boraginaceae	Ed,Md	-	-	+	-	-	-	+	-	-	-
Cupressus torulosa D.Don '*Surai*'	Cupressaceae	Om,Tm	-	-	-	+	-	+	-	+	-	-
Cycas revoluta Thunb.	Cycadaceae	Om	-	-	-	+	-	+	-	+	+	-
Dalbergia sissoo DC. '*Sisham*'	Fabaceae	Md,Tm	+	+	+	+	+	+	+	-	+	+
Delonix regia (Hook.) Raf. '*Gulmohr*'	Fabaceae	Om,Tm	-	-	-	+	-	-	-	-	+	-
Dichrostachys cinerea (L.) Wight & Arn. '*Shami*'	Fabaceae	Ed,Fd,Md	-	-	-	-	-	-	-	-	+	-
Erythrina variegata L. '*Dauldhak*'	Fabaceae	Md,Om	-	-	-	+	-	-	-	-	+	-
Eucalyptus obliqua L'Hér. '*Lyptus*'	Myrtaceae	Tm	-	-	+	+	-	-	+	-	-	-
Ficus benghalensis L. '*Bargad*'	Moraceae	Ed,Fd,Md,Rt	+	+	+	+	+	+	+	+	+	+
Ficus elastica Roxb. ex Hornem. '*Raber*'	Moraceae	Md,Om	-	-	-	-	-	-	-	-	+	-
Ficus hispida L.f. '*Kathgular*'	Moraceae	Ed,Fd	-	-	+	-	-	+	-	+	+	+
Ficus palmata Forssk. '*Khemri*'	Moraceae	Ed,Fd,Md	+	+	+	+	-	-	+	-	-	+
Ficus racemosa L. '*Gular*'	Moraceae	Ed,Fd	-	-	-	-	-	-	-	+	+	-
Ficus religiosa L. '*Pipal*'	Moraceae	Fd,Md,Rt	+	+	+	+	+	+	+	+	+	+
Ficus minahassae (Teijsm. & Vriese) Miq. '*Pakhad*'	Moraceae	Ed,Fd	-	-	+	+	+	-	+	-	+	-
Jacaranda mimosifolia D.Don	Bignoniaceae	Md,Tm	-	-	-	-	-	-	-	+	+	-
Livistona chinensis (Jacq.) R.Br. ex Mart.	Arecaceae	Om	-	-	-	+	-	-	-	+	-	-
Madhuca longifolia (J.Koenig ex L.) J.F.Macbr. '*Mahwa*'	Sapotaceae	Ed,Md,Rt	-	-	-	-	-	-	-	-	+	-
Magnolia champaca (L.) Baill. ex Pierre. '*Champa*'	Magnoliaceae	Md,Om	+	-	-	+	-	-	-	+	+	-
Magnolia grandiflora L. '*Him Champa*'	Magnoliaceae	Tm	-	-	-	+	-	-	+	+	+	+
Mangifera indica L. '*Aam*'	Anacardiaceae	Md,Ed,Rt,Tm	+	+	+	+	+	+	+	+	+	+
Melia azedarach L. '*Bakain*'	Meliaceae	Fd,Md,Tm	+	-	-	+	+	-	-	-	-	-
Morus alba L. '*Shahtut*'	Moraceae	Md,Ed,Fd	+	-	+	-	+	-	+	-	+	+

Neolamarckia cadamba (Roxb.) Bosser '*Kadam*'	Rubiaceae	Md,Rt	-	-	-	-	-	+	-	+	-	-
Phoenix dactylifera L. '*Khajoor*'	Arecaceae	Ed	-	-	-	+	-	+	-	-	+	-
Phyllanthus emblica L. '*Aonla*'	Euphorbiaceae	Ed,Md,Rt	-	-	-	+	+	+	+	+	+	-
Pinus roxburghii Sarg. '*Chir*'	Pinaceae	Tm,Rt	-	-	-	-	-	-	-	-	+	-
Pithecellobium dulce (Roxb.) Benth. '*Jangl jalebi*'	Mimosaceae	Ed	-	+	-	-	+	-	-	-	-	-
Platycladus orientalis (L.) Franco '*Morpankhi*'	Cupressaceae	Om	+	-	-	+	+	+	-	+	+	+
Plumeria rubra L. '*Golenchi*'	Apocynaceae	Md,Om	-	-	-	+	+	-	+	-	+	-
Polyalthia longifolia (Sonn.) Thwaites '*Ashok*'	Annonaceae	Md,Om	-	-	-	+	+	+	-	+	+	+
Populus tremula L. '*Popular*'	Salicaceae	Fd	-	-	-	-	-	-	+	-	-	-
Premna barbata Wall. ex Schauer '*Bakhara*'	Verbenaceae	Fd,Md,Tm	-	-	-	+	-	-	-	-	-	-
Prunus persica (L.) Batsch '*Aaru*'	Rosaceae	Ed	+	-	-	+	-	+	+	-	+	-
Psidium guajava L. '*Amrood*'	Myrtaceae	Ed,Md	-	-	+	+	-	-	-	+	+	+
Schleichera oleosa (Lour.) Merr. '*Kusum*'	Sapindaceae	Ed	-	-	-	+	-	-	-	+	+	-
Syzygium cumini (L.) Skeels '*Jamun*'	Myrtaceae	Ed, Md	-	+	+	+	+	+	+	+	+	-
Tamarindus indica L. '*Imli*'	Caesalpiniaceae	Md	-	-	-	+	-	-	-	-	+	-
Tecoma stans (L.) Juss. ex Kunth '*Piliya*'	Bignoniaceae	Om	-	-	-	+	+	+	+	+	+	+
Tectona grandis L.f. '*Saigaun*'	Lamiaceae	Md, Om,Tm	-	-	+	-	-	-	-	-	-	-
Terminalia arjuna (Roxb. ex DC.) Wight & Arn. '*Arjun*'	Combretaceae	Md,Om	-	-	-	-	-	+	-	-	-	+
Toona ciliata M.Roem. '*Toon*'	Meliaceae	Md,Tm	-	-	-	+	-	+	-	-	-	-
Toona hexandra M.Roem. '*Toon*'	Meliaceae	Md,Tm	-	-	+	-	-	-	+	-	-	-
Shrubs												
Abutilon indicum (L.) Sweet '*Kangi ghas*'	Malvaceae	Md	-	-	+	+	+	+	+	+	+	+
Aerva sanguinolenta (L.) Blume	Amaranthaceae	Md	-	-	-	-	-	-	-	+	-	-
Agave sp.	Agavaceae	Md	-	-	-	+	-	+	-	-	-	-
Artemisia nilagirica (C.B.Clarke) Pamp.	Asteraceae	Md	-	-	+	+	+	+	-	-	+	-
Asclepias curassavica L.	Apocynaceae	Md	-	-	+	+	-	-	-	+	-	-
Asparagus racemosus Willd. '*Satabar*'	Asparagaceae	Md	-	-	+	-	+	-	+	-	-	-
Bambusa bambos (L.) Voss '*Bans*'	Poaceae	Ed,Fd	+	+	-	+	+	+	+	+	+	-
Bougainvillea spectabilis Willd.	Nyctaginaceae	Md,Om	-	-	-	+	-	+	+	-	+	+
Caesalpinia bonduc (L.) Roxb. '*Kanja*'	Caesalpiniaceae	Fd,Md	-	-	-	-	-	-	+	-	-	-
Calliandra brevipes Benth.	Fabaceae	Om	-	-	-	-	-	+	-	+	-	-
Calotropis gigantea (L.) Dryand. '*Bada madar*'	Apocynaceae	Md,Rt	+	+	+	+	+	+	+	+	+	+
Calotropis procera (Aiton) Dryand. '*Akaua*'	Apocynaceae	Md,Rt	-	-	+	+	-	-	+	+	-	-
Carissa carandas L. '*Kakronda*'	Apocynaceae	Ed,Fd	-	-	+	-	-	-	+	-	-	-
Carissa spinarum L. '*Khees makoi*'	Apocynaceae	Ed,Fd	-	-	+	-	+	-	+	-	-	+
Cascabela thevetia (L.) Lippold '*Peeli kaner*'	Apocynaceae	Om	-	-	-				-			-

Cestrum nocturnum L. '*Rat ki rani*'	Solanaceae	Md	-	-	-	+	-	+	-	+	-	-
Cestrum parqui (Lam.) L'Hér. '*Rat ki rani*'	Solanaceae	Md	-	-	-	-	-	-	+	+	-	-
Citrus aurantiifolia (Christm.) Swingle '*Kagzi nimbu*'	Rutaceae	Ed	-	-	-	+	-	+	-	-	-	+
Dendrocalamus strictus (Roxb.) Nees '*Bans*'	Poaceae	Tm	-	-	+	+	-	+	-	-	-	-
Dracaena terniflora Roxb.	Agavaceae	Om	-	-	-	-	-	-	-	+	+	-
Duranta erecta L. '*Baut*'	Verbenaceae	Md,Om	-	-	-	+	+	+	-	+	+	-
Hamelia patens Jacq.	Rubiaceae	Ed, Md,Om	-	-	-	+	-	+	-	+	+	-
Hibiscus rosa-sinensis L. '*Gulhal*'	Malvaceae	Md	+	-	-	+	+	+	+	+	+	+
Indigofera glabra L.	Fabaceae	Fd	-	-	+	+	-	-	-	-	-	-
Ipomoea fistulosa Mart. ex Choisy '*Sadashuhagan*'	Convonlvulaceae	Md	-	-	-	+	+	+	-	-	-	+
Jasminum officinale L. '*Chameli*'	Oleaceae	Md	-	-	-	+	+	-	-	+	-	-
Justicia adhatoda L. '*Bisontha*'	Acanthaceae	Md	+	+	+	-	-	-	-	+	-	-
Lantana camara L. '*Kuri ghas*'	Verbenaceae	Md	+	+	+	-	+	+	+	-	-	-
Lawsonia inermis L.*Mehandi*'	Lythraceae	Md	-	-	+	+	-	+	+	+	+	+
Mimosa pudica L. '*Chuimui*'	Fabaceae	Md,Om	-	-	-	+	-	-	-	-	-	-
Murraya koenigii (L.) Spreng. '*Currypatta*'	Rutaceae	Md	+	-	+	-	-	-	+	-	-	-
Nerium oleander L. '*Kaner*'	Apocynaceae	Md,Om	+	+	+	+	+	+	+	+	+	+
Nyctanthes arbor-tristis L. '*Harsingar*'	Oleaceae	Md, Rt	-	-	+	+	+	+	+	+	+	+
Opuntia ficus-indica (L.) Mill. '*Nagfani*'	Cactaceae	Md	-	-	+	-	-	+	-	-	-	-
Opuntia littoralis (Engelm.) Cockerell	Cactaceae	Md	-	-	-	-	-	+	+	-	-	-
Phyllanthus reticulatus Poir. '*Neel*'	Euphorbiaceae	Ed,Md	-	-	-	-	-	-	-	-	+	-
Punica granatum L. '*Anar*'	Punicaceae	Ed,Md	-	-	-	+	+	-	-	+	+	+
Ricinus communis L. '*Andi*'	Euphorbiaceae	Md	+	+	+	+	+	+	+	+	+	+
Rosa indica L. '*Gulab*'	Rosaceae	Om	-	-	+	+	+	+	+	+	+	+
Senna tora (L.) Roxb. '*Uchaya*'	Fabaceae	Md	+	+	+	+	-	-	-	+	-	+
Solanum erianthum D. Don '*Akra*'	Solanaceae	Md	-	-	+	-	-	-	-	-	-	-
Solanum virginianum L. '*Nili kateli*'	Solanaceae	Md	-	-	-	-	-	-	+	-	-	-
Tabernaemontana divaricata (L.) R.Br. ex Roem. & Schult. '*Chandni*'	Apocynaceae	Md, Om	-	-	-	+	-	+	-	+	+	-
Triumfetta rhomboidea Jacq. '*Leswakura*'	Tiliaceae	Md	+	-	+	-	-	-	-	-	+	-
Urena lobata L. '*Vilayti san*'	Malvaceae	Md	-	-	+	-	-	-	+	-	-	-
Vitex negundo L. '*Shiwali*'	Verbenaceae	Md	-	+	-	-	-	-	-	+	-	-
Volkameria inermis L.	Verbenaceae	Md,Om	-	-	-	-	-	-	-	+	+	-
Ziziphus glaberrima (Sedgw.) Santapau '*Ber*'	Rhamnaceae	Ed	-	-	+	-	-	+	+	-	-	+
Ziziphus jujuba Mill. '*Jhal ber*'	Rhamnaceae	Ed, Md	+	-	+	-	-	-	-	+	-	-
Herbs												

Acalypha indica L.	Euphorbiaceae	Md	-	-	-	+	-	-	-	+	-	-
Achyranthes aspera L. '*Chirchita*'	Amaranthaceae	Fd,Md	+	+	+	+	+	+	+	-	+	-
Ageratum conyzoides (L.) L.	Asteraceae	Md	+	+	+	+	+	+	+	+	+	+
Alocasia macrorrhizos (L.) G.Don '*Chot sabji*'	Araceae	Md	-	-	-	-	-	+	-	-	-	-
Aloe vera (L.) Burm.f. '*Gheekumari*'	Liliaceae	Md,Om	-	-	-	+	+	+	-	+	+	+
Alternanthera pungens Kunth	Amaranthaceae	Fd	-	-	+	-	+	-	-	+	-	-
Alysicarpus vaginalis (L.) DC.	Fabaceae	Fd	-	-	-	-	-	-	-	+	-	-
Amaranthus spinosus L. '*Gojhua*'	Amaranthaceae	Fd	+	+	+	-	-	+	-	-	-	-
Amaranthus viridis L. '*Jangli chaulai*'	Amaranthaceae	Ed	+	+	+	+	+	+	+	+	+	+
Amaryllis belladonna L.	Amaryllidaceae	Om	-	-	-	-	-	-	-	-	+	-
Argemone mexicana L. '*Pili kateli*'	Papaveraceae	Md	-	-	-	-	-	+	+	-	+	-
Bidens pilosa L. '*Gumra*'	Asteraceae	Fd,Md	-	-	-	-	+	-	-	-	-	-
Boerhavia diffusa L.	Nyctaginaceae	Fd,Md	-	-	+	+	+	+	+	+	+	+
Bryophyllum pinnatum (Lam.) Oken '*Ajuba*'	Crassulaceae	Md	-	-	-	+	-	-	-	+	+	-
Canna indica L. '*Keri*'	Cannaceae	Md,Om, Rt	+	-	+	+	+	+	-	+	-	+
Cannabis sativa L. '*Bhang*'	Cannabinaceae	Ed,Md,Rt	+	+	+	+	+	+	+	+	+	+
Capsicum annuum L. '*Mirch*'	Solanaceae	Ed	-	-	-	-	-	-	-	-	-	+
Catharanthus roseus (L.) G.Don. '*Sadabhar*'	Apocynaceae	Md,Om	+	-	+	+	+	+	+	+	+	+
Celosia argentea L. '*Silmili*'	Amaranthaceae	Ed	-	-	-	+	-	-	-	-	+	+
Chenopodium album L. '*Bathua*'	Chenopodiaceae	Ed,Md	+	+	+	+	+	+	+	+	+	+
Chrysanthemum indicum L. '*Guldaudi*'	Asteraceae	Om	-	-	+	+	+	+	+	+	+	+
Cleome viscosa L. '*Jakhya*'	Cleomaceae	Md	-	-	-	-	-	-	-	-	+	-
Colocasia esculenta (L.) Schott '*Ghuinya*'	Araceae	Ed	-	-	-	-	+	+	-	-	-	-
Commelina benghalensis L.	Commelinaceae	Fd,Md	-	-	+	+	+	+	-	+	-	-
Corchorus aestuans L.	Tiliaceae	Md	-	+	-	-	+	-	-	-	-	-
Crinum asiaticum L.	Amaryllidaceae	Md, Om	-	-	-	-	-	+	-	-	+	-
Croton bonplandianus Baill. '*Jamal ghota*'	Euphobiaceae	Md	-	+	+	-	-	-	+	-	-	-
Cucumis melo L. '*Kharbuja*'	Cucurbitaceae	Ed	-	-	-	-	-	+	-	-	+	-
Cucumis sativus L. '*Kheera*'	Cucurbitaceae	Ed	-	-	-	+	-	-	-	+	+	-
Cuscuta reflexa Roxb. '*Amarbel*'	Cuscutaceae	Md	-	-	-	-	-	-	+	-	-	-
Cyanthillium cinereum (L.) H.Rob. '*Kalgira*'	Asteraceae	Md	-	-	-	+	+	+	-	+	+	-
Cynodon dactylon (L.) Pers. '*Dhub ghas*'	Poaceae	Fd,Md,Rt	+	+	+	+	+	+	+	+	+	+
Cyperus compressus L. '*Bhada ghas*'	Cyperaceae	Fd	+	+	+	+	+	+	+	+	+	+
Cyperus cyperoides (L.) Kuntze	Cyperaceae	Fd	+	-	-	-	-	-	-	-	-	-
Cyperus rotundus L. '*Motha ghas*'	Cyperaceae	Fd	+	+	+	+	+	+	+	+	+	+
Dactyloctenium aegyptium (L.) Willd. '*Makar kirchbai*'	Poaceae	Fd	-	-	+	-	-	+	-	-	-	+
Datura stramonium L. '*Datura*'	Solanaceae	Md,Rt	+	+	+	+	+	-	+	+	+	-
Desmostachya bipinnata (L.) Stapf '*Dhad*'	Poaceae	Md	-	-	+	+	-	-	+	-	-	-
Dysphania ambrosioides (L.) Mosyakin & Clemants	Chenopodiaceae	Md	-	-	-	-	-	+	+	+	-	-

Eclipta prostrata (L.) L. '*Bhangra ghas*'	Asteraceae	Fd,Md	+	+	+	+	+	+	+	+	+	+
Eichhornia crassipes (Mart.) Solms'*Jal kumbhi*'	Pontederiaceae	Md	-	-	-	-	+	-	-	-	-	+
Euphorbia hirta L. '*Badi dudhi*'	Euphorbiaceae	Fd,Md	+	+	+	+	+	+	+	+	+	+
Euphorbia prostrata Aiton	Euphorbiaceae	Md	-	+	+	+	+	+	+	+	+	-
Euphorbia pulcherrima Willd. ex Klotzsch	Euphorbiaceae	Md,Om	-	-	-	+	-	-	-	-	-	-
Euphorbia serpens Kunth	Euphorbiaceae	Fd,Md	-	-	-	-	-	-	+	-	+	-
Euphorbia thymifolia L. '*Choti dudhi*'	Euphorbiaceae	Fd,Md	-	-	+	+	+	+	-	+	+	-
Fumaria indica (Hausskn.) Pugsley '*Pit papra*'	Fumariaceae	Md	-	-	+	-	+	-	-	-	-	-
Gloriosa superba L. '*Kalihari*'	Liliaceae	Md,Rt	-	-	+	-	-	-	-	-	-	-
Gomphrena celosioides Mart.	Amaranthaceae	Fd,Md	-	-	-	-	-	+	-	-	+	-
Gomphrena globosa L.	Amaranthaceae	Md	-	-	-	-	-	-	+	+	-	-
Helianthus annuus L. '*Surajmukhi*'	Asteraceae	Ed	-	-	-	-	-	+	-	+	-	-
Heliotropium indicum L. '*Hathisude*'	Boraginaceae	Md	-	-	-	-	-	-	-	-	+	-
Hymenocallis speciosa (L.f. ex Salisb.) Salisb.	Amaryllidaceae	Om	-	-	-	+	-	-	-	-	+	-
Ipomoea cheirophylla O'Donell '*Jaljamini*'	Convonlvulaceae	Md	+	-	-	-	-	-	+	-	-	-
Malvastrum coromandelianum (L.) Garcke	Malvaceae	Md	-	-	+	-	-	+	-	-	-	-
Martynia annua L.	Martyniaceae	Md	-	-	-	-	-	-	-	+	+	-
Mazus japonicus (Thunb.) Kuntze	Scrophulariaceae	Fd	-	-	-	-	-	-	-	-	+	+
Mentha arvensis L. '*Paudina*'	Lamiaceae	Ed,Md	+	+	+	+	+	-	-	+	-	+
Mirabilis jalapa L. '*Gulabans*'	Nyctaginaceae	Md,Om	+	+	+	+	+	+	+	+	+	+
Musa × paradisiaca L. '*Kela*'	Musaceae	Ed,Md,Rt	+	-	+	+	+	+	+	+	+	+
Narcissus tazetta L. '*Nargis*'	Amaryllidaceae	Md,Om,Rt	-	-	-	+	-	-	-	+	-	-
Nicotiana tabacum L. '*Tambakhu*'	Solanaceae	Md	-	+	-	-	-	-	-	-	-	-
Ocimum basilicum L. '*Tulsi*'	Lamiaceae	Ed,Md,Rt	+	+	+	+	+	+	+	+	+	+
Ocimum gratissimum L. '*Ban tulsi*'	Lamiaceae	Md,Rt	-	-	-	-	-	-	-	-	+	-
Oxalis corniculata L. '*Khata mitha*'	Oxalidaceae	Ed,Fd, Md	+	+	+	+	+	+	+	+	+	+
Parthenium hysterophorus L. '*Gajar ghas*'	Asteraceae	Md	+	+	+	+	+	+	-	+	+	-
Pennisetum glaucum (L.) R.Br. '*Bajra*'	Poaceae	Ed,Fd	-	-	-	-	-	+	-	-	-	+
Persicaria barbata (L.) H.Hara. '*Kabra buti*'	Polygonaceae	Md	-	-	-	-	-	+	-	-	+	-
Phyllanthus niruri L. '*Hajar dana*'	Euphorbiaceae	Fd,Md	-	-	-	-	-	+	-	+	+	-
Physalis minima L. '*Badi makoi*'	Solanaceae	Ed,Fd	+	+	+	+	+	+	+	+	+	-
Plumbago zeylanica L. *Chitrak*'	Plumbaginaceae	Md	-	-	-	-	-	+	-	-	+	-
Polygonum plebeium R.Br. '*Machechi*'	Polygonaceae	Md	+	-	-	+	-	-	-	-	+	-
Portulaca pilosa L. '*Kulfa sag*'	Basellaceae	Fd	-	-	-	-	-	+	+	-	+	-
Saccharum officinarum L. '*Ganna*'	Poaceae	Ed,Rt	-	-	+	-	+	+	-	-	-	-

Sesamum indicum L. '*Til*'	Pedaliaceae	Md, Rt	-	-	-	-	-	-	-	-	+	-
Setaria verticillata (L.) P.Beauv.	Poaceae	Fd	-	-	-	-	+	-	+	-	-	-
*Sida acuta Burm.*f. '*Karenti*'	Malvaceae	Md	+	+	+	+	+	+	+	-	+	-
Solanum americanum Mill.*Makoi*'	Solanaceae	Ed,Fd,Md	+	+	+	+	+	+	+	+	+	+
Sphagneticola trilobata (L.) Pruski.	Asteraceae	Md,Om	-	-	-	-	-	-	-	+	-	-
Tagetes erecta L. '*Genda*'	Asteraceae	Md	+	+	+	+	+	+	+	+	+	+
Trianthema portulacastrum L. '*Vishkhapra/ Santhi*'	Aizoaceae	Ed,Md	+	-	-	+	-	-	-	+	-	-
Tribulus terrestris L. '*Gokhru*'	Zygophyllaceae	Fd,Md	-	-	-	-	-	-	+	+	+	-
Tridax procumbens (L.) L. '*Kumra*'	Asteraceae	Ed,Fd,Md	-	-	-	-	+	-	-	-	-	-
Vicia faba L. '*Bakala*'	Fabaceae	Ed	-	-	-	-	-	-	-	-	-	+
Vicia hirsuta (L.) Gray '*Kura*'	Fabaceae	Fd	+	+	+	+	+	+	-	-	-	-
Xanthium strumarium L. '*Gokhuriya*'	Asteraceae	Md	-	-	+	-	+	-	+	-	-	-
Zephyranthes candida (Lindl.) Herb. '*Lily*'	Amaryllidaceae	Om	-	-	-	+	+	-	+	+	+	-
Climbers												
Cayratia trifolia (L.) Domin '*Amlabel*'	Vitaceae	Fd,Md	-	-	-	-	+	+	-	+	-	-
Coccinia grandis (L.) Voigt. '*Ban parimal*'	Cucurbitaceae	Md	-	-	+	-	+	+	+	-	+	-
Combretum indicum (L.) DeFilipps. '*Madhu malti*'	Combretaceae	Md,Om	-	-	-	+	-	+	-	+	+	-
Dioscorea bulbifera L. '*Genthi*'	Dioscoreaceae	Ed,Md	-	-	-	-	-	-	+	-	-	-
Ichnocarpus frutescens (L.) W.T.Aiton '*Siamlata*'	Apocynaceae	Md	-	-	-	-	-	-	-	+	+	-
Lablab purpureus (L.) Sweet. '*Sem*'	Fabaceae	Ed,Fd	-	-	+	-	-	+	+	-	-	+
Luffa cylindrica (L.) M.Roem. '*Torai*'	Cucurbitaceae	Ed	+	-	+	+	+	+	+	+	+	-
Tichosanthes cucumerina L. '*Chachinda*'	Cucurbitaceae	Ed,Md	-	-	-	-	-	-	+	-	-	-
Tinospora cordifolia (Willd.) Miers '*Giloi*'	Menispermaceae	Fd,Md,Om	-	-	-	-	-	+	+	-	-	-
Vitis vinifera L. '*Angoor*'	Vitaceae	Ed,Md	-	-	-	-	+	-	-	-	-	-

***Indigenous utility:** **Ed**=edible, **Fd**= fodder, **Md**= medicinal, **Om**= ornamental, **Rt**= ritual and **Tm**= timber.

****Sacred sites:** **1**=Shid Bhairo Baba Manokamna, **2**=Sidh Baba Ki Madi, **3**=Chodrana Baba, **4**=Jain Mandir, **5**=Shiv Mandir Lakhi Bagh, **6**=Much wale Hanuman Ji, **7**=Shri Pashupati Nath, **8**=Raghunath Mandir, **9**=Shri Sidhi Dattri Nav Durga and **10**=Shiv Mandir.

Table 3. Uses of some plants in ethno medicine in the vicinity of the sacred groves

S.No.	Body ailments	Commonly used species
1	Respiratory disorders	*Acacia catechu, Acalypha indica, Boerhavia diffusa, Calotropis gigantea, Calotropis procera, Eclipta prostrata, Ficus religiosa, Gomphrena globosa, Justicia adhatoda, Narcissus tazetta, Ocimum basilicum, Punica granatum, Tribulus terrestris,* etc.
2	Liver disorders	*Agave* sp., *Coccinia grandis, Madhuca longifolia, Phyllanthus niruri, Solanum americanum, Tinospora cordifolia,* etc.
3	Skin diseases	*Aloe vera, Azadirachta indica, Butea monosperma, Carica papaya, Cordia dichotoma, Dioscorea bulbifera, Euphorbia hirta, Heliotropium indicum, Lawsonia inermis, Senna tora, Tabernaemontana divaricata, Tagetes erecta,* etc.
4	Digestive disorders	*Aegle marmelos, Aloe vera, Bombax ceiba, Bougainvillea spectabilis, Caesalpinia bonduc, Chenopodium album, Croton bonplandianus, Desmostachya bipinnata, Eclipta prostrata, Malvastrum coromandelianum, Narcissus tazetta, Ricinus communis, Solanum virginianum, Tamarindus indica,* etc.
5	Reproductive diseases	*Abutilon indicum, Argemone mexicana, Asparagus racemosus, Canna indica, Chenopodium album, Coccinia grandis, Desmostachya bipinnata, Gloriosa superba, Melia azedarach, Mirabilis jalapa, Ocimum gratissimum, Sida acuta, Triumfetta rhomboidea, Vitis vinifera,* etc.
6	Eye disorders	*Albizia lebbeck, Boerhavia diffusa, Musa paradisiaca, Oxalis corniculata, Solanum americanum,* etc.
7	Miscellaneous diseases	*Catharanthus roseus, Cassia fistula, Cuscuta reflexa, Euphorbia pulcherrima, Ficus elastica, Lawsonia inermis, Neolamareckia cadamba, Opuntia ficus-indica, Phyllanthus emblica, Schleichera oleosa, Terminalia arjuna, Tinospora cordifolia,* etc.
8	Neurological disorders	*Argemone mexicana, Asclepias curassavica, Capsicum annuum, Cordia dichotoma, Mangifera indica, Parthenium hysterophorus, etc.*
9	Dental disorders	*Azadirachta indica, Chenopodium album, Ocimum gratissimum, Solanum erianthum, Tabernaemontana divaricata,* etc.
10	Wounds and cuts	*Bryophyllum pinnatum, Cleome viscosa, Lawsonia inermis, Mirabilis jalapa, Opuntia littoralis, Plumbago zeylanica, Phyllanthus reticulatus, Psidium guajava, Senna tora, Tridax procumbens, Ziziphus jujube,* etc.
11	Heart diseases	*Croton bonplandianus, Ipomoea cheirophylla, Ipomoea fistulosa, Madhuca longifolia, Musa paradisiaca, Ocimum gratissimum, Opuntia ficus-indica, Terminalia arjuna,* etc.
12	Fever	*Caesalpinia bonduc, Chenopodium album, Eclipta prostrata, Gloriosa superba, Gomphrena globosa, Nyctanthes arbor-tristis, Ocimum basilicum, Ocimum gratissimum, Solanum americanum, Tichosanthes cucumerina, Urena lobata,* etc.
13	Orthopedic diseases	*Alocasia macrorrhizos, Chenopodium album, Cleome viscosa, Cuscuta reflexa, Ichnocarpus frutescens, Musa paradisiaca, Phyllanthus reticulatus, Premna barbata, Senna tora, Sesamum indicum, Tinospora cordifolia, Urena lobata, Vitex negundo,* etc.

CONCLUSION

Since last three decades, conservation scientists and researchers have realized value of the groves managed and protected by local communities [25]. The main aim of this traditional culture was conservation of biodiversity at local scales [26]. The sacred groves are the baskets full of medicinally important plant species which contributed much towards the health care of indigenous people settled in the vicinity. It is needed to make effective strategies for conservation of sacred groves to check their degradation.

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