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Floristic Diversity of Sacred Places in Gorakhpur Uttar Pradesh India: Towards Biotechnological Initiatives for *Ex-Situ* Conservation

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Abstract

Sacred places are the oldest existing farms what are known as ancient botanical gardens and modern day biodiversity hotspots. Sacred places are one of the way to protect the biodiversity. For dwindling of diversity and their habitat in an alarming rate is a serious issue on the national and global level and is a matter of urgency to preserve biodiversity for future generations. For germplasm is valuable because it contains diversity of genotypes that is related to develop new and improved genetic stocks, varieties and hybrids. Therefore, germplasm is the basic indispensable ingredient of all breeding programs and great emphasis is placed on collection, evaluation and conservation of germplasm. To achieve this lasting Objective, the present study is carried out to enumerate the various types of herbs, shrubs and tree species in sacred places of St. Joseph's Cathedral, Gorakhnath Temple, Budhiya Mai Temple and Geeta Vatika Temple in Gorakhpur and ascertaining their respective taxonomic position. For sacred places act as a natural antibiotic to treat the ailing environment.

The management and the conservation of local traditional plant resources has become a matter of urgency. However, the enumeration of the local flora is inevitable for fulfilling this long lasting object. An initiative was made to enumerate the sacred places of Gorakhpur. The sacred places endowed with ca.3613 plants belonging to 85 species, 77 genera and 44 families. Similarly these places comprises total of – herbs & shrubs and ornamentals belonging to 78 species, 71 genera and 38 families. The number of tree species in the descending order is *Tectona grandis* (1068), *Polyalthia longifolia*(524), *Eucalyptus citriodora*(410), *Syzygium cumini* (323), *Mangifera indica*(199) etc. It is interesting to note that these sacred places compounded with endemic species such as *Flacourtia indica* (Burm.f.)Merr., *Nepeta hindostana*(L.), *Lippia alba* (Mill.)N.E.Br.ex Britton & P. Wilson, *Phyla nodiflora* (L.). All the sacred places adorned with only 1 endangered species named *Aegle marmelos*. The efforts to identify the species specially through DNA barcoding and to establish plants tissue culture protocols to develop propagules for *ex situ* conservation through *in-vitro* germplasm conservation.

Key word: Sacred places, sacred plants, Biodiversity, Gorakhpur, Uttar Pradesh.

1 INTRODUCTION

The flora of India is one of the richest of the world due to a wide range of climate, topology and environments in the country. The first systematic account on tree species of the entire country was brought out by Brandis (1906) in his book "Indian Trees" in which he has mentioned a total of 4,400 species including trees, shrubs and woody climbers

from the British India [1]. As far as Uttar Pradesh is concerned, the province does not have any checklist or a flora of its own since publication of "Flora of Upper Gangetic Plain" By Duthie (1906) one of the most important traditional uses of sacred places was it acted as a repository for various medicines[2]. It can be used as indicators for potential natural vegetation. Sacred places or sacred trees serve as a home for



birds and mammal and hence they may be help in the conservation of living organisms. Sacred places is an old culture of our society which conserve the trees, shrub, herbs etc on the basis of people's sacred believes in relation to environment. It is most important to protect our scared places and environments.

India, a mega diversity country with only 2.4% of the land area, accounts for 7-8% of the recorded species of the world spread over 45,500 species of plants that have been documented so far. According to IUCN Red list 2008 Indian, Flora 247(2.9%) species are rare and threatened. Of these 109 species that include many medicinal plants are endangered ones or facing extinction due to biotic and anthropogenic factors. For germplasm is valuable because it contains diversity of genotypes that is related to develop new and improved genetic stocks, varieties and hybrids. Therefore, germplasm is the basic indispensable ingredient of all breeding programmes and great emphasis is placed on collection, evaluation and conservation of germplasm. The conservation of the forest and other wild plant species is often carried out through protected areas such as national parks, gene sanctuary and nature reserves. Botanical gardens can play in national biodiversity conservation strategies, such as maintaining and conserving plant material ex-situ and in contributing to the recovery of threatened and vulnerable plant species, reintroductions and other translocations. One of the major objectives of botanical gardens is to create and support collections of native taxa, and to build and maintain stocks of plants for ex situ conservation and sustainable utilization of plant resources in the world. It also looked beyond botanic gardens and addressed how to work and plan much more closely with other practitioners[3]. As far as Uttar Pradesh is concerned, the province does not have any checklist or a flora of its own since the publication of 'Flora of the Upper Gangetic Plains' by Duthie [2]. After Duthie (1906), several district floras and other publications have been brought out by different workers on plant diversity of Uttar Pradesh [4-11]. However, a separate assessment exclusively devoted to all tree wealth of the entire province has not been done so far.

As far as Uttar Pradesh is concerned, the province does not have any checklist or a flora of its own since the publication of 'Flora of the Upper Gangetic Plains' by Duthie (1906). Still the country depends on this flora written more than 100 years ago in which the plants of sub Himalayan to Siwalik ranges have been included. Although there is no doubt about the utility of this flora even in the present time, however, it has become substantially out dated due to many changes in the circumscription and nomenclature of many taxa as well as reorientation of political boundary of the state. The recent checklist by Khanna et al. has been compiled before the separation of Uttarakhand from erstwhile Uttar Pradesh and therefore it includes the plant of both provinces in amalgamated form [12]. Currently, Srivastava (2004) has presented an overview of floristic diversity of Uttar Pradesh and analysed 2711 angiosperms under 182 families and 1088 genera [13]. After Duthie (1906), several district floras and

other publications have been brought out by different workers on plant diversity of Uttar Pradesh [4-13]. However, a separate assessment exclusively devoted to all tree wealth of the entire province has not been done so far.

Of late, Kamal Kishore and his associates. have made an effort to reassess the entire tree species(wild and cultivated) found in the present political boundary of Uttar Pradesh based on literature surveyed, field visited and herbarium study [14]. All collected specimens have been deposited at National Botanical Research Institute (LWG) for future record. Their preliminary studies reveal that Uttar Pradesh. Comprises ca. 410 tree species belonging to 227 genera and 66 families out of the 2711 angiosperms. The maximum numbers of the tree species have been recorded in Leguminosae (74 spp.) followed by Euphorbiaceae (37 spp.), Moraceae (28 spp.), Rubiaceae (16 spp.), Apocynaceae (15 spp.), Sterculeaceae (13 spp.), Rutaceae (10 spp.) etc. Similarly, Ficus with 18 spp., Acacia with 13 spp., Bauhinia with 8 spp., Cassia with 7 spp., Diospyros with 7 spp. and Terminalia with 6 spp. are some of the dominant genera having maximum number of tree species. There are about 148 genera which are represented by solitary species. As far as endemism is concerned, the province is poorly represented by 10 species of angiosperms [13], out of which only 2 species (i.e. Derris kanjilalSahni& H.B. Naithani and Diospyroshoelana Gupta &Kanjilal) belong to tree. In the present study the families have been chiefly arranged following Bentham & Hooker (1862-83) classification and the genera and species alphabetically under each family [15]. To reduce the space, only a list of species name has been provided here. The comprehensive checklist and a flora of tree species of Uttar Pradesh which are presently under the preparation will be published separately with conducting more field and herbarium studies.

The present investigation was undertaken to enumerate the flora of the sacred places namely St. Joseph's Cathedral, Gorakhnath temple, Budhiya Mai temple and Gita Vatika temple of Gorakhpur Uttar Pradesh, India which endows with rich diversity. Here an attempt was made first to enumerate plant diversity in all these places with prospect of envisaging genetic diversity to validate species identification specially through DNA barcoding and to create and support collections of native taxa, and to build and maintain stocks of plants for *ex situ* conservation.

2 MATERIALS AND METHODS

2.1 Study area

Gorakhpur is a city along the banks of Rapti River in the eastern part of the state of Uttar Pradesh in India, near the Nepal border (Fig. 1). It is the administrative headquarter of Gorakhpur District and Gorakhpur Division.

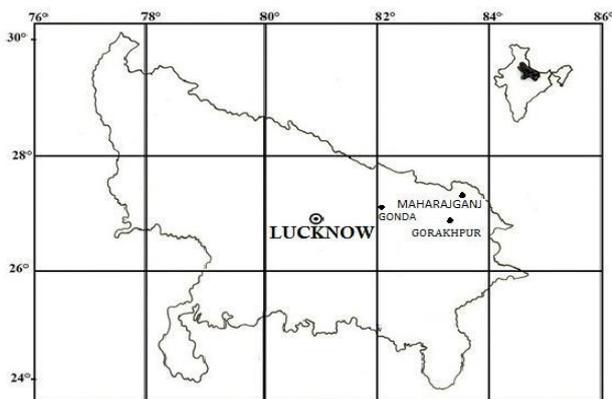


Fig.1 Study area

The district of Gorakhpur lies between Lat. 26°13'N and 27°29'N and Long. 83°05'E and 83°56'E. The district occupies the north-eastern corner of the state along with the district of Deoria, and comprises a large stretch of land lying to the north of the river Rapti, which forms the southern boundary with the Azamgarh district. Ambedkar Nagar district on the west Basti and east adjoins Deoria and the Chhoti Gandak Nadi and further south the Jharna Nala forms the dividing line. To the north it meets with Maharajganj, Padrauna and Nepal.

The present data is outcome of field work carried out during January to March 2019 in the sacred places of Gorakhpur namely St. Joseph's Cathedral, Gorakhnath temple, Budhiya Mai temple and GitaVatika temple of Gorakhpur Uttar Pradesh, India. Identification of plants in the field was made with the help of "Flora Gorakhpurensis" [16], and other experienced florists/botanists.

3 RESULTS AND DISCUSSION

3.1 Analysis of Survey

The sacred places endowed with ca.3613 plants belonging to 85 species, 77 genera and 44 families. Similarly

these places comprises total of – herbs & shrubs and ornamentals belonging to 78 species, 71 genera and 38 families. The number of tree species in the descending order is *Tectona grandis* (1068), *Polyalthia longifolia* (524), *Eucalyptus citriodora* (410), *Syzygium cumini* (323), *Mangifera indica* (199) etc. It is interesting to note that these sacred places compounded with endemic species such as *lacourtia indica* (Burm.f.) Merr., *Nepeta hindostani* (L.), *Lippia alba* (Mill.)N.E.Br.ex Britton & P. Wilson, *Phyla nodiflora* (L.). All the sacred places adorned with only 1 endangered species namely *Aegle marmelos*. The summary of the survey as follows.

- Total number of tree species: ca. 3613
- Species : 85
- Genera : 77
- Families : 44
- Herbs , Shrubs and Ornamentals
- Species : 78
- Genera : 71
- Families : 38

Sacred places are group of trees or patches of vegetation protected by the local community through religious and cultural practices evolved to minimize devastation. Some plant species are grown in sacred places because people thought that ancestors and deities reside in these plant species and protect their life. A total number of 163 plant species belonging to 82 families were recorded from the study area with Fabaceae 11 species, Asteraceae 10 species, Euphorbiaceae 09 species, Moraceae 09 species, Myrtaceae 07 species, Arecaceae 07 species, Amaranthaceae 06 species, Apocyanaceae 06 species, Rubiaceae 05 species, Malvaceae 05 species, Verbenaceae 05 species, Labiateae 04 species, Solanaceae 04 species, Rutaceae 04 species, Asparagaceae 03 species, Annonaceae 03 species, Poaceae 03 species, Polygonaceae 02 species, Brassicaceae 02 species, Sapindaceae 02 species, Meliaceae 02 species, Lythraceae 02 species, Araceae 02 species, Bignoniaceae 02 species, Sapotaceae 02 species, Anacardiaceae 01 species, Magnoliaceae 01 species, Papaveraceae 01 species, Lemnaceae 01 species, Ranunculaceae 01 species, Bombacaceae 01 species, Bixaceae 01 species, Asclepiadaceae 01 species, Acanthaceae 01 species, Ceratophyllaceae 01 species, Canabinaceae 01 species, Cappariadaceae 01 species, Rosaceae 01 species, Primulaceae 01 species, Cupressaceae 01 species, Musaceae 01 species, Loranthaceae 01 species, Pontederiaceae 01 species, Teliaceae 01 species, Hydrocharitaceae 01 species, Convulvulaceae 01 species, Nymphaeaceae 01 species, Oleaceae 01 species, Putranjivaceae 01 species, Dipterocarpaceae 01 species, Oxalidaceae 01 species, Rhamnaceae 01 species, Arucariaceae 01 species, Potomogetonaceae 01 species were collected. 83 plants are found in Gorakhnath temple & 69 plants are found in Budhiya Mai Temple in which 42 plants are common at both places.



Table-1: Enumeration of Plant Species

S.No.	BOTANICAL NAME	FAMILY	LOCAL NAME	SJC	GT	BT	GV
1	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Bel	1	2	6	7
2	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Kanghi	--	2	--	2
3	<i>Adensonia digitata</i> L.	Malvaceae	Gorakhimli/ kalpvirksh	--	2	--	2
4	<i>Annona squamosa</i> Linn.	Annonaceae	Sharifa	--	4	--	--
5	<i>Artocarpus heterophyllus</i> Lamk.	Moraceae	Kathal	1	6	--	6
6	<i>Artocarpus lakoocha</i> Roxb.	Moraceae	Barhal	--	2	--	4
7	<i>Araucaria sp</i> (Molina)K. Koch	Araucariaceae	Christmas tree	1	2	--	--
8	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Saptparni/chitawan	--	--	3	5
9	<i>Azadirachta indica</i> A. Juss	Meliaceae	Neem	2	8	2	6
10	<i>Barringtonia acutangula</i> (L.) Gaertn.	Lecythidaceae	Samudrafal	--	--	1	--
11	<i>Bombax ceiba</i> L.	Bombacaceae	Semal	1	--	1	1
12	<i>Butea monosperma</i> (Lamk.) Taub.	Fabaceae	Palash	--	2	1	1
13	<i>Bixa orellana</i> L.	Bixaceae	Sindoor	--	1	--	--
14	<i>Bauhinia variegata</i> Linn.	Caesalpinioideae	Kachnar	--	2	--	--
15	<i>Dalbergia sisso</i> Roxb.	Fabaceae	Shisham	--	4	2	2
16	<i>Delonix regia</i> (Boj.) Raf	Fabaceae	Gulmohar	2	4	--	1
17	<i>Dypsis lutescens</i> (H.Wendl) Beentj & J. Drans f	Arecaceae	Golden cane palm	3	11	--	--
18	<i>Dendrocalamus strictus</i> Nees	Poaceae	Bansh,bamboo	--	--	4	10
19	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Aawla	2	6	--	8
20	<i>Eucalyptus citriodora</i> Hook.	Myrtaceae	Eucalyptus	--	6	198	206
21	<i>Elaeocarpus ganitrus</i> Roxb.ex G. Don.	Teliaceae	Rudraksh	--	1	--	--
22	<i>Ficus benghalensis</i> Linn.	Moraceae	Bargad	--	8	1	3
23	<i>Ficus religiosa</i> Linn	Moraceae	Peepal	--	10	1	8
24	<i>Ficus glomerata</i> Roxb.	Moraceae	Gular	--	2	--	1
25	<i>Ficus infectoria</i> Roxb.	Moraceae	Pakad	--	22	1	2
26	<i>Hibiscus rosa-sinensis</i> Linn.	Malvaceae	Gurhal	3	+	10	5
27	<i>Kigelia africana</i> Lam) Benth	Bignoniaceae	Balamkheera	--	3	--	--
28	<i>Michelia champaca</i> Linn.	Magnoliaceae	Champa	--	2	--	3
29	<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae	Chikoo	2	4	--	2
30	<i>Mangifera indica</i> Linn	Anacardiaceae	Aam	19	85	33	62
31	<i>Musa paradisiaca</i> Linn.	Musaceae	Kela	--	4	10	--
32	<i>Nerium indicum</i> Mill.	Apocynaceae	Kaner	--	5	3	1
33	<i>Nerium oleander</i> L.	Apocynaceae	Oleander	2	6	--	--
34	<i>Neolamarckia cadamba</i> (Roxb) Bosser	Rubiaceae	Kadam	--	1	--	3
35	<i>Nyctanthes arbor-tristis</i> Linn.	Oleaceae	Harsingar	--	4	--	6
36	<i>Pandanus stectorius</i> Parkinson ex Du Roi	Pandanaceae	Pandanus	--	1	--	--
37	<i>Polyalthia longifolia</i> (Sonner) Thw.	Annonaceae	Ashok	14	410	--	100
38	<i>Plumeria rubra</i> L.	Apocynaceae	Gulaichin	1	10	--	4
39	<i>Psidium guajava</i> Linn.	Myrtaceae	Amrood	10	4	1	8
40	<i>Putranjiva roxburghii</i> Wall.	Putranjivaceae	Putrajeevika	--	2	--	--
41	<i>Punica granatum</i> Linn.	Lythraceae	Anar	2	3	1	--
42	<i>Saraca indica</i> Linn.	Caesalpinioideae	Sitaashok	--	12	--	2
43	<i>Schleichera oleosa</i> (Lour) Merr.	Sapindaceae	Kusum	--	--	3	--
44	<i>Shorea rubusta</i> Roxb.	Dipterocarpaceae	Shaal	--	--	482	--



45	ex. Gaertn. f. <i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamun	1	1	317	4
46	<i>Syzygium aromaticum</i> (L.) Merrill & Perry	Myrtaceae	Laung	--	1	--	--
47	<i>Streblus asper</i> Lour.	Moraceae	Sihora	--	--	4	1
48	<i>Tectona grandis</i> Linn. f.	Verbenaceae	Sagaun	13	104	951	--
49	<i>Zizyphus marutiana</i> Lamk	Rhamnaceae	Ber	--	4	2	--
50	<i>Pterospermum acerifolium</i> (L.) O.F. Cook.	Sterculiaceae	Kanak champa	--	1	--	--
51	<i>Roystonea regia</i> (Kunth) O.F. Cook.	Arecaceae	Royal palm	9	23	--	21
52	<i>Washingtonia robusta</i> H. Wendl.	Arecaceae	Fan palm	-	1	4	--
53	<i>Sena siamea</i> (Lam.) Irwin et Borneby	Fabaceae	Siamese senna	--	3	--	--
54	<i>Cassia fistula</i> L.	Fabaceae	Amaltash/ Golden rain tree	2	4	--	--
55	<i>Lagerstroemia speciosa</i> Jack.	Lythraceae	Sawni	2	4	--	--
56	<i>Phoenix dactylifera</i> L.	Arecaceae	Khajoor	--	1	4	--
57	<i>Madhuca indica</i> (J.Konig) J.F.Macbr.	Sapotaceae	mahua	--	1	--	1
58	<i>Albizia lebbek</i> (L.) Benth.	Fabaceae	Siris	1	1	--	--
59	<i>Holoptelea integrifolia</i>	Ulmaceae	Chilbil	--	--	1	--
60	<i>Haldina cardifolia</i> (Roxb.) Ridsdale.	Rubiaceae	Karma/Bahlol	--	--	6	--
61	<i>Artabotrys hexapetalus</i> (L.f) Bandari.	Annonaceae	Katahri fool	--	--	--	1
62	<i>Trema tomentosa</i> Planch. & Hewson.	Cannabaceae	Jhau/Poison peach	--	--	1	1
63	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun	--	--	1	--
64	<i>Morus alba</i> L.	Moraceae	Shahtoot	--	--	2	--
65	<i>Murraya koenigii</i> L.	Rutaceae	Curripatta	--	--	--	1
66	<i>Ficus sp.</i>	Moraceae		--	--	--	1
67	<i>Dracaena sp.</i>	Asparagaceae		--	--	--	2
68	<i>Melaleuca citrine</i> (Curtis) Dum. Cours.	Myrtaceae	Botal brush	1	--	--	1
69	<i>Litchi chinensis</i> Sonn.	Sapindaceae	Litchi	9	--	--	11
70	<i>Citrus sp.</i>	Rutaceae		2	--	--	2
71	<i>Tamarindus indica</i> L.	Fabaceae	Imli	1	--	--	1
72	<i>Carica papaya</i>	Caricaceae	Papaya	--	--	--	1
73	<i>Synzygium jambos</i> L.	Myrtaceae	Rose apple	--	--	--	2
74	<i>Syzygium sp.</i>	Myrtaceae		--	--	--	1
75	<i>Drypetes roxburghii</i> (Wall.) Hurs.	Euphorbiaceae	Kheer	--	--	--	2
76	<i>Ixora coccinea</i> L.	Rubiaceae	Jungle flame	2--	--	--	2
77	<i>Flacourtia indica</i> (Burm.f.) Merr.	Salicaceae	Paniyala	1	--	--	2
78	<i>Murrypaniculata</i> (L.)Jack	Rutaceae	Kamini	3	--	--	2
79	<i>Thuja orientalis</i> L.	Cupressaceae	Morepankhi	4	3	--	5
80	<i>Tecoma stans</i> L.	Bignoniaceae	Yellow bells	1	--	--	--
81	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Cassava/Tapioca	46	--	--	--
82	<i>Moringa oleifera</i> Lamk.	Moringaceae	Sahjan	1	--	--	--
83	<i>Melia azedarach</i> L.	Meliaceae	Bakain/mithi neem	19	--	--	--
84	<i>Cycas revoluta</i> Thumb.	Cycadaceae	Sagopalm	7	--	--	--
85	<i>Borassus flabellifer</i> L.	Arecaceae	Wine palm/ toddy palm	1	--	--	--

Table-2: Enumeration of Herbs, Shrubs and Ornamentals

1	<i>Parthenium hysterophorus</i>	Asteraceae	Congress grass	+	+
2	<i>Mazus pumilis</i>	Mazaceae	Maalatijhar	+	+
3	<i>Rorippa palustris</i>	Brassicaceae	Yellow cress	+	+
5	<i>Cestrum nocturnum</i> L.	Solanaceae	Ratrani	+	+
6	<i>Scopari aduleis</i>	Scrophulariaceae	Goat weed	+	+
7	<i>Launae anudiculis</i>	Asteraceae	Ban Gobhi	--	+
8	<i>Jasminum elongatum</i>	Oleaceae	Red kund	+	+
9	<i>Tabernaemontana corymbosa</i>	Apocynaceae	Chandni	--	+



10	<i>Gardenia jasminoides</i> J.Ellis.	Rubiaceae	Gandhraj	-			+
11	<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Shadei	+	+	+	-
12	<i>Tagetes indica</i> L.	Asteraceae	Genda	+	+	--	+
13	<i>Solanum nigrum</i> L.	Solanaceae	Makoi	+	+	+	+
14	<i>Sida acuta</i> Burm. f.	Malvaceae	Bariyar	-	+	+	
15	<i>Senseveria hyacinthodes</i> Thunb.	Asparagaceae	Naagdaun	+	+	-	
16	<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppi	-	-	+	+
17	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apamarg	+	+	+	-
18	<i>Adhatoda vasica</i> Nees.	Acanthaceae	Adush	+	+	+	-
19	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Kanghi	-	+	-	+
20	<i>Aervalanata</i> (Linn) Juss	Amaranthaceae	Gorakhbooti	-	--	+	
21	<i>Ageratum conyzoides</i> L.	Asteraceae	Gandhe	+	+	+	
22	<i>Ageratum houstonianum</i> Mill.	Asteraceae	Gandhejhar	-	--	+	
23	<i>Agave Americana</i> Linn.	Asparagaceae	Agave	-	+	--	
24	<i>Alternanthera philoxeroides</i> (Mart). Griseb.	Amaranthaceae	Elegatorweed	-	--	+	
25	<i>Alternanthera sessilis</i> (L.) DC.	Amaranthaceae	Garudi	+	+	+	
26	<i>Amaranthus viridis</i> Linn.	Amaranthaceae	Chauli	+	+	+	
27	<i>Anagalis arvensis</i> L.	Primulaceae	Dhartidhak	+	+	+	
28	<i>Anisomelesindica</i> (Linn.) Ktze	Labiatae	Kala bhranga	-	--		
29	<i>Arundodonax</i> Linn.	Poaceae	Narkat	-	--	+	
30	<i>Argemone mexicana</i> L.	Papaveraceae	Satynashi	+	+	+	
31	<i>Blumea mollis</i> (D. Don.) Merr.	Asteraceae	Jungalimooli	+	+	+	
32	<i>Cannabis sativa</i> Linn.	Canabinaceae	Bhang	-	--	+	
33	<i>Catharanthus roseus</i> (Linn.) G. Don.	Apocynaceae	Sadabhar	+	+	+	
34	<i>Cleome viscosa</i> Linn.	Capparidaceae	Pilahurhur	-	+	+	
35	<i>Clerodendron infortunatum</i> Auct.	Verbenaceae	Bhatwas	-	--	+	
36	<i>Cassia tora</i> Linn.	Caesalpinioideae	Chakwad	-	+	+	
37	<i>Cassia occidentalis</i> Linn.	Caesalpinioideae	Kasundha	-	+	+	
38	<i>Codiaeum variegatum</i> (L.) A.Juss	Euphorbiaceae	Kroton	+	+	--	+
39	<i>Celosia argentea</i> L.	Amaranthaceae	Lalmurga	-	+	+	
40	<i>Coleus blumei</i> Benth.	Labiatae	Coleus	-	+	--	
41	<i>Colocasia sp.</i> Schott	Araceae	Arvi	-	--	+	
42	<i>Ceratophyllum sp.</i> L.	Ceratophyllaceae	Hornwort	-	--	+	
43	<i>Cynodon dactylon</i> L.Pers	Poaceae	Doob	+	+	+	+
44	<i>Datura metal</i> Linn.	Solanaceae	Dhatoora	-	+	+	
45	<i>Dieffenbachia sp.</i> Schott	Araceae	Dumbcane	+	+	--	
46	<i>Dracena sp.</i> Vand.ex L.	Asparagaceae	Dracena	+	+	+	
47	<i>Duranta repens</i> Linn.	Verbenaceae	Neel kanta	+	+	--	
48	<i>Dendrophthoe falcate</i> (L.f.) Ettingsh	Loranthaceae	Bana	+	+	+	+
49	<i>Eclipta prostrate</i> (Linn)	Asteraceae	Bhrigraj	-	+	+	+
50	<i>Eichhornia crassipes</i> (Mert.)	Pontederiaceae	Jalkumbhi	-	--	+	
51	<i>Euphorbia hirta</i> Linn.	Euphorbiaceae	Dudhi	+	+	+	
52	<i>Gnaphalium indicum</i> Linn.	Asteraceae	Cudweed	+	+	+	
53	<i>Guizotia abyssynica</i> Cass.	Asteraceae	Ramtil	-	+	--	
54	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Jhangi/kureli	-	--	+	
55	<i>Ipomoea aquatic</i> Forsk.	Convolvulaceae	Kalmi sag	-	--	+	
56	<i>Nymphae anouchali</i> Burm.f.	Nymphaeaceae	Neel kamal	-	--	+	
57	<i>Malvestrum coromandelianum</i> (L.) Garcke	Malvaceae	Kharenti	-	--	+	
58	<i>Ocimum sanctum</i> Linn.	Labiatae	Tulsi	+	+	+	+
59	<i>Oldenlandia gracilis</i> Hk.f.	Rubiaceae	Paperbhed	+	+	+	
60	<i>Oxalis corniculata</i> Linn.	Oxalidaceae	Khattibuti	+	+	+	
61	<i>Phyllanthus niruria</i> auct. Non Linn.	Euphorbiaceae	Bhumiamla	-	+	+	
62	<i>Potamogeton nodusus</i> Poir	Potamogetonaceae	Pondweed	-	-	+	
63	<i>Lemna perpusilla</i> Torrey	Lemnaceae	Duckweed	-	--	+	
64	<i>Ranunculus scellaratus</i> Linn.	Ranunculaceae	Jaldhania	+	+	+	
65	<i>Rosa indica</i> Linn.	Rosaceae	Gulab	+	+	--	+
66	<i>Rumex dentatus</i> Linn.	Polygonaceae	Jungle sag	-	+	+	
67	<i>Rorippa indicum</i> (Linn.)	Brassicaceae	Chamsuru	+	+	--	+
68	<i>Nepeta hindostana</i> (L.)	Lamiaceae	Billilotan	-		+	
69	<i>Lippia alba</i> (Mill.) N.E.Br.ex Britton & P.Wilson	Verbenaceae	Bushymatgrass	-		+	+
70	<i>Phyla nodiflora</i> (L.)	Verbenaceae	Jalbuti/vasuka	-		+	
71	<i>Calotroptis procera</i> (Ait.)R.Br.	Asclepiadaceae	Madar	+			+
72	<i>Euphorbia parviflora</i> Linn.	Euphorbiaceae	Dandathaur	+	+	+	-
73	<i>Hibiscus rosasinensis</i> Linn.	Malvaceae	Gurhal	+	+	+	+
74	<i>Ricinus communis</i> Linn.	Euphorbiaceae	Arandi	-	+	+	
75	<i>Polygonum sp.</i> L.	Polygonaceae	Paniwala	-		+	
76	<i>Cryptomaria sp.</i>	Cupressaceae	Cedar	+			
77	<i>Petunia alba</i> Juss	Solanaceae	Petunia	+			
78	<i>Antirrhinum majus</i> L.	Scrophulariaceae	Snappedragon	+			



Schleichera oleosa (Lour)



Adansonia digitata L.



Dendrophthoe falcata (L.f.) Ettings



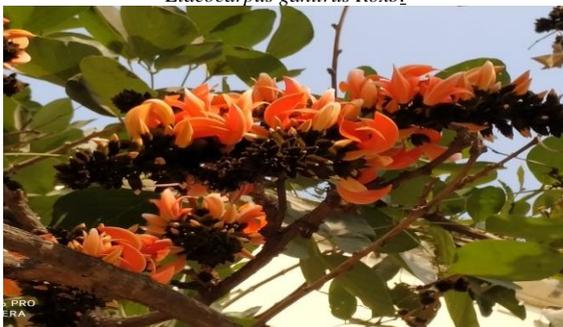
Manilkara zapota (L.)



Elaeocarpus ganitrus Roxb.



Syzygium jambos L (Alston)



Butea monosperma (Lam.) Taub.



Artabotrys hexapetalus(L.f)

Fig.2: Plant diversity of Sacred Places



Flacourtia indica (Burm.f) (Salicaceae)



Phyla nodiflora (L.) (Verbinaceae)



Lippia alba (Mill.) N.E.Br.ex.Britton & P. Wilson



Nepeta hindostana (L.) (Lamiaceae)

Fig. 3 : Endemic Plants in secreted places of Gorakhpur



Aegle marmelos (L.)(Rutaceae)

Fig. 4 : Vulnerable plant in secreted places of Gorakhpur



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