Sustainability and Biodiversity Conservation

Assessment of plant diversity in Maharaja Sriram Chandra Bhanja Deo University campus, Odisha, India

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Abstract

The Maharaja Sriram Chandra Bhanja Deo University (MSCBU) campus harbors a part of the flora of Similipal Biosphere Reserve (SBR), Odisha. It provides students, research scholars, and common people a unique opportunity to learn, wonder, and engage. The floristic diversity of MSCBU includes economically important trees, medicinal plants, ornamental plants, carnivorous plants, grasses, etc. The present study documented a total of 345 vascular plants belonging to 268 genera and 91 families. Fabaceae (36 species), Poaceae (31 species), Zingiberaceae (21 species), Asteraceae (18 species), and Malvaceae (16 species) were the most dominant families, having the maximum number of species. The descending order of life forms found to be herb (52.75%), tree (26.37%), shrub (12.17%), and climber (8.69%). About 22% of the plant diversity of Similipal Biosphere Reserve is conserved and distributed in Abdul Kalam Biodiversity Park, Botanical Garden, and Sacred Grove, established by the University. The MSCBU campus not only plays an important role in the conservation of threatened/native taxa but also provides a clean and safe oxygen-rich environment to its stakeholders.

Keywords: Biodiversity Park, Conservation, Sacred grove, University campus

Introduction

Urban biodiversity is becoming important from the ecosystem services perspective, providing a healthy, oxygen-rich environment to the local people (Zhang & Jim, 2014; Miller, 2005). In developing countries, urban green spaces are important components of the environment; however, the current land use pattern reduces the greenery area in the city (Goddard et al., 2010). Urban green ecosystems are an essential part of cities, which have many direct and indirect benefits to the people: protecting them from natural hazards, maintaining the quality of life, and safeguarding wildlife and the environment (Xie et al., 2010). Conservation and management of

urban species and green ecosystems in urban areas is a tough task in today's anthropogenic era. Green University campus in an urban area is vital for the students to explore and learn about the plants and provide cultural and aesthetic value to the whole people inside and outside the campus. Students of young minds get the opportunity to familiarize themselves with the plants and learn about their medicinal properties and uses in their daily lives. Further, students at educational institutions get acquainted with the regional biodiversity and natural experiences associated with human health (Franzolin et al., 2021).

Floristic studies gain increasing importance in developing and under-developing countries for judicious utilization of their plant resources (Vediya & Kharadi, 2011). Therefore, phytodiversity assessment is the backbone of biodiversity conservation, management, and sustainable utilization (Jayanthi & Rajenrdra, 2013). Floristic inventory and diversity studies help to understand a region's species composition and diversity status (Phillips et al., 2003), which also offer vital information for conservation (Gordon & Newton, 2006). Floristic studies have been used to explain the pattern of life forms, endemism, speciation, isolation, and evolution of different taxa (Durairaj et al., 2021). From time to time, the flora of an area changes following the change concerning climate and edaphic conditions (Ordoñez et al., 2009; Svenning & Skov, 2005). Understanding the role of biodiversity and trait composition in urban ecosystems is necessary to formulate effective strategies for biodiversity conservation and sustainable development. For the last two decades, the MSCBU campus has provided a unique environment for the successful plantation and conservation of several RET (Rare, Endemic, and Threatened) species. Due to the growing demands of the increasing population, the plant diversity distributed in different phytogeographical zones is getting over-exploited. There are mainly two types of anthropogenic activities that can be considered to act as risk of extinction for many important plant species with high use values that may include (a) habitat alteration or destruction derived from change in the use of land and (b) extraction of wild plants for trade. The recent forest fire in Similipal Biosphere Reserve is a severe threat to the biodiversity of Similipal due to anthropogenic activity, which drew international attention. Hence, it is high time to save the vanishing important plant species well before the temperature becomes worse and grow in a controlled climate to produce planting materials needed for restoration.

Because of the conservation of important species diversity, floristic assessment plays a vital role in deciding which species is the priority for conservation measures. At the national and

international levels, the baseline data of floristic assessment helps forest managers and governmental authorities make decisions and plan policies for successful conservation and proper growth of plant diversity in particular areas. There are some kinds of literature available on institutional campus floras which provide an outline for study purposes of students and researchers working in this field (Udayakumar et al., 2011; Sahu et al., 2013; Rekha et al., 2014; Rajendran et al., 2014; Irwin et al., 2015). There is also much-published literature on the flora of regional university campuses (Giles-lal & Livingstone, 1978; Gopi, 2008; Natarajan & Gopi, 2010; Parthasarathy et al., 2010). However, there is no detailed report documenting the floral diversity of the Maharaja Sriram Chandra Bhanja Deo University (MSCBU) campus. The A.P.J. Abdul Kalam Biodiversity Park was established on the campus motives to promote, preserve, and publicize the Biodiversity of Similipal Biosphere Reserve (SBR) among scholars, tribal, rural, and common citizens. Hence, an effort has been made to make a checklist of all the plant species found in the MSCBU campus, including planted and naturally growing vegetation. This study will also estimate these floristic resources' sustainable utilization and conservation.

Material and methods

Study Area

The Maharaja Sriram Chandra Bhanja Deo University (Erstwhile North Orissa University) (21°55′46″N to 86°46′06″E) is located in the Baripada city of Mayurbhanj district, Odisha (Fig.1). The Mayurbhanj district has a population of 2,519738 while in Baripada city the total population is 116,849 out of these; the average literacy is 87.26% (2011 census). To cater to the need for higher education in the region, Maharaja Sriram Chandra Bhanja Deo University (Erstwhile North Orissa University) was established in 1998 at Baripada City, the district headquarters of Mayurbhanj. This University campus is situated not far from Similipal hills. The northern part of the district has a hilly region and forest region. The climate and rainfall of the Mayurbhanj district are marked by high humidity, with an average rainfall of 1648.20 mm per annum. The summer is hot, and the maximum temperature goes up to 45°C. In winter, the minimum temperature goes down to 8ºC, and fog occasionally occurs in the morning. The dominant soil type is Red-lateritic soil distributed all over the district. Such topography and climatic conditions influence the species diversity in this district. The MSCBU campus possesses academic blocks, administrative blocks, a gymnasium, a playground, a biodiversity park, a botanical garden, an arboretum, and a mango avenue.

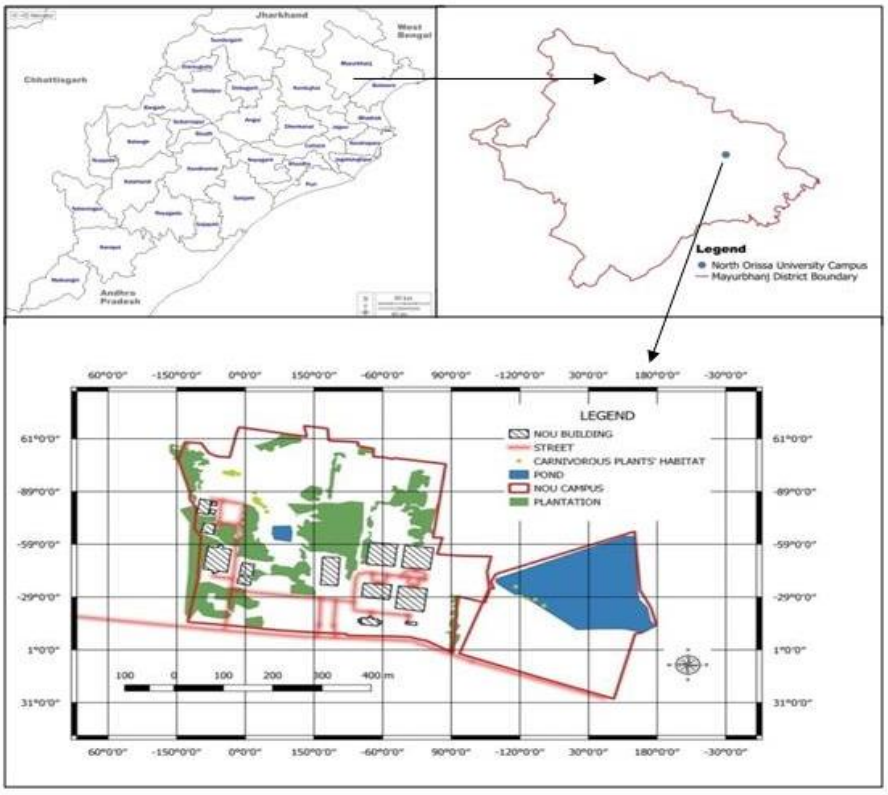


Figure 1. Map of Maharaja Sriram Chandra Bhanja Deo University (Erstwhile North Orissa University) Campus, Baripada

Data collection and analysis

The intensive periodical surveys were carried out to collect and document the plant species in the MSCB University campus during the period 2019–2022. Plant specimens were collected in sets of four, preferably in the flowering stage or at least in the fruiting stage, inside polythene bags for identification. Identification attempts were made to identify the specimens or the family in the field while the specimens were fresh. After this, a brief technical description was made for each specimen, on which basis key to the family, genus, and species were followed to identify the plant specimen. For problematic taxa, the Herbarium, like the Central National Herbarium, Howrah, was consulted (Gamble & Fischer, 1975; Haines, 1921–25; Mooney, 1950; Saxena & Brahmam, 1994–1996). The updated nomenclature of the taxa was recorded by referring to online websites such as Plants of The World Online (POWO), International Plant Names Index (IPNI), and Tropicos. Habit, Habitat, vernacular name, status, and benefits were recorded in a tabular form.

Results

The present study documented 345 plant taxa belonging to 268 genera representing 91 families, including 182 herbs, 91 trees, 30 climbers, and 42 shrubs (Table 1). The diversity of herbs counts 52.75% of the flora of campus along with 26.37% tree species, 12.17% shrubs, and 8.69% climbers (Fig. 2). Out of the 91 families, the most dominant families with number of species in the campus are Fabaceae (36), Poaceae (31), Zingiberaceae (21), Asteraceae (18), Malvaceae (16), Apocynaceae (15), Lamiaceae (13), Euphobiaceae (11), Rubiaceae (14), Acanthaceae (7), Amaranthaceae (7) etc. (Fig. 3). Some families contain only single species such as Acoraceae, Aizoaceae, Bixaceae, Dilleniaceae, Hypoxidaceae etc. Out of the total plant species diversity on the campus, the contribution of different groups of plants are medicinal plants at 24.63%, exotic plants at 19.42%, threatened plants at 3.76%, carnivorous plants at 2.02%, and others at 50.14% (Fig. 4).

The present study revealed that the campus of MSCB University is rich in natural vascular flora, and mostly, the floristic composition is dominated by angiosperms. Out of 345 species, 277 were native plants and 67 species are exotics in nature. A higher proportion of exotic flora on the University campus is represented by ornamental plants, which include *Bougainvillea spectabilis, Callistemon citrinus, Catharanthus roseus, Delonix regia, Mirabilis jalapa, Michelia champaca, Tecoma stans,* etc. These plant species help in increasing the beauty of the campus. Several exotic plants have edible fruits, such as *Annona squamosa*, *Phyllanthus emblica, Psidium guajava, Artocarpus heterophyllus, Mangifera indica,* etc. The exotic species grown as avenue plants on the university campus are represented by *Delonix regia, Pletophorum pterocarpum, Neolamrckia cadamba, Acacia mangium, Mangifera indica,* etc. Several exotic weeds dominating the campus include *Ageratum conyzoides, Alternanthera sissilis, Amaranthus spinosus, Croton sparsiflorus, Cyperus rotundus, Oxalis corniculata, Tridax procumbens,* etc. These exotic plant species are naturalized to Indian conditions and grow successfully without human assistance. The invasive exotic species such as *Parthenium hysterophorus, Lantana camara, Mikania micrantha, Chromolaena odorata,* etc. are spreading abundantly inside the campus causing a severe threat to the native biodiversity of the campus. Invasive exotic species are referred to as biological pollutants due to their destructive effect on natural and man-made ecosystems. It can be presumed that these plant species can produce higher secondary metabolites. The campus harbors some of the important climber species such as *Asparagus*

racemosus, Clitoria ternatea, Hemidesmus indicus, Ipomoea obscura, Merremia tridentata, Cuscuta reflexa, Coccinia grandis, Luffa acutangula, Ipomoea aquatic, etc.

Grasses played a major role in this flora. About 31 species of grasses were reported from the campus, among them *Heteropogoncontortus, Sporobblus indica, Eragrostis minor, Eragrostis pilosa, Eragrostis riparia, Eleusine indica, Dactyloctenium aegyptium* species were frequently distributed. Some of the medicinal plants used for the treatment of various ailments are *Abrus pecatorius, Abutilon indicum, Acacia nilotica, Andrographis paniculata, Asparagus racemosus, Azadirachta indica, Catheranthus roseus, Boerhavia diffusa, Butea monosperma, Cynodon dactylon, Cyperus rotundus, Centella asiatica, Eclipta alba, Enydra fluctuans, Evolvulus alsinoides, Glinus oppositifilius, Ipomoea aquatica, Murraya koenigi, Oxalis corniculata, Phyllanthus emblica, Pongamia pinnata, Ricinus communis, Saraca asoca, Tridax procumbens* etc. These plants are used for the treatment of a variety of diseases such as diabetes, gastrointestinal disorders, fever, gynaecology, cardiovascular disorders, skin diseases, urinary disorders, jaundice, dental care, etc. A number of edible plants such as *Alternanthera sessilis, Bacopa monneri, Boerhavia diffusa. Ipomoea aquatic, Murraya koenigii, Centella asiatica, Oxalis corniculata* are reported to have both therapeutic and dietary functions and hence are used as medicinal food remedies. The leaves of *Phoenix sylvestris* are used in many religious and socio-cultural functions in the district. The important timber and fuel-yielding plant species recorded in our study are *Alstonia scholaris, Acacia auriculoformis, Dalbergia sisso, Mangifera indica,* etc. The species used for toothache include *Acacia nilotica, Azadirachta indica, Polyalthia longifolia, Pongamia pinnata, Syzygium cumuni, Tamarindus indica*, etc. Moreover, these plant species exclude toothpaste due to caries, gum diseases, and pyorrhoea. Oils extracted from seeds of some plants like *Brassica campestris, Jatropha curcus* are applied as a lotion on inflammatory gums, and the seeds of *Solanum virginianum,* are burnt and smoked like cigarette for relief from toothache. The leaves of *Aegle marmelos* are chewed to prevent a bad smell from the mouth.

Table 1. List of plant species in MSCBU Campus, Baripada

SL. NO	BOTANICAL NAME	FAMILY	VERNACULAR NAME	HABIT	STATUS
1	*Abrus precatorius* L.	*Fabaceae*	Kaincha	Climber	Native
2	*Abutilon indicum* (L.) Sweet	*Malvaceae*	Pedipedica	Shrub	Native
3	*Acacia auriculoformis* A.Cunn. ex Benth.	*Fabaceae*	Acacia	Tree	Native
4	*Acacia mangium* Willd.	*Fabaceae*	Acacia	Tree	Exotic
5	*Acacia nilotica* (L.) Delile.	*Fabaceae*	Bubulla	Tree	Native
6	*Acalypha hispida* Burm.f.	*Euphorbiaceae*	Indramarisha	Herb	Native
7	*Acalypha indica* L.	*Euphorbiaceae*	Sibajuta	Herb	Native
8	*Achyranthes aspera* L.	*Amaranthaceae*	Apamaranga	Herb	Native
9	*Acmella paniculata* Wall. exDc.	*Asteraceae*	-	Herb	Native
10	*Acorus calamus* L.	*Acoraceae*	Ugra gandha	Herb	Native
11	*Adiantum* spp.	*Pteridaceae*	-	Herb	Native
12	*Aegle marmelos* (L.) Correa.	*Rutaceae*	Bela	Tree	Native
13	*Aerva lanata* (L.) Juss ex Schult.	*Amaranthaceae*	Paunsia	Herb	Native
14	*Agave americana* L.	*Asparagaceae*	Baramasi	Herb	Exotic
15	*Agave amica* (Medik.) Thiede & Govaerts	*Asparagaceae*	Rajanigandha	Herb	Native
16	*Ageratum conyzoides* L.	*Asteraceae*	Puksunga	Herb	Native
17	*Alangium salvifolium* (L.f.) Wang.	*Alangiaceae*	Ainso	Tree	Native
18	*Albizia lebbeck* (L.) Benth.	*Fabaceae*	Benth Sirish	Tree	Native
19	*Allamanda cathartica* L.	*Apocynaceae*	Bilati kaniari	Shrub	Native
20	*Aloe vera* (L.) Burm. f.	*Xanthorrhoeaceae*	Gheekuari	Herb	Native
21	*Alpinia calcarata* (Andrews) Roscoe	*Zingiberaceae*	Rama kedara, Toroni	Herb	Native
22	*Alpinia malaccensis* (Burm.f.) Roscoe	*Zingiberaceae*	Gara dundid	Herb	Native
23	*Alstonia scolaris* (L.) R.Br.	*Apocynaceae*	Chhutin	Tree	Native
24	*Alternanthera paronychioides* A. St.-Hil.	*Amaranthaceae*	-	Herb	Exotic
25	*Alternanthera sessilis* (L.) R Br ex DC.	*Amaranthaceae*	Madaranga	Herb	Native
26	*Alysicarpus vaginalis* (L.) DC.	*Fabaceae*	-	Herb	Native
27	*Amaranthus spinosus* L.	*Amaranthaceae*	Kantalautia	Herb	Exotic
28	*Amaranthus viridis* L.	*Amaranthaceae*	Leutia	Herb	Native
29	*Anacardium occidentale* L.	*Anacardiaceae*	Saitamba	Tree	Exotic
30	*Anacyclus pyrethrum* (L.) Lag.	*Asteraceae*	Daisy	Herb	Native
31	*Andrographis paniculata* (Burn.f.) Wall.ex Nees.	*Acanthaceae*	Bhuinimba	Herb	Native
32	*Annona squamosa* L.	*Annonaceae*	Neuwa	Tree	Native
33	*Areca catechu* L.	*Arecaceae*	Gua	Tree	Exotic
34	*Argemone mexicana* L.	*Papaveraceae*	Kantakusuma	Herb	Exotic
35	*Argyreia nervosa* (Burm.f.) Bojer.	*Convulvulaceae*	*Munda noi*	*Climber*	Native
36	*Aristida spp.*	*Poaceae*	-	Herb	Native
37	*Artocarpus heterophyllus* Lam.	*Moraceae*	Panasa	Tree	Native

38	*Asparagus racemosus* Wild.	*Asparagaceae*	Satabari	Climber	Native
39	*Azadirachta indica* L.	*Meliaceae*	Neem	Tree	Native
40	*Bacopa monnieri* (L.) Wettst.	*Plantaginaceae*	Brahmi	Herb	Native
41	*Bauhinia purpunea* L.	*Fabaceae*	Nalikanchana	Tree	Native
42	*Bambusa arundinacea* (Ret) Willd.	*Poaceae*	Kanta bsaua	Herb	Native
43	*Barleria cristata* L.	*Acanthaceae*	Banpotali	Herb	Native
44	*Barleria prionitis* L.	*Acanthaceae*	Daskarandi	Herb	Native
45	*Bauhinia variegata* L.	*Fabaceae*	Kanchana	Tree	Native
46	*Bennincasa hispida* (Thunb.) Cogn.	*Cucurbitaceae*	Panikakharu	Climber	Exotic
47	*Bixa orellana* L.	*Bixaceae*	-	Shrub	Native
48	*Boerhavia diffusa* L.	*Nyctaginaceae*	Puruni	Herb	Exotic
49	*Bombax ceiba* L.	*Bombacaceae*	Simili	Tree	Native
50	*Borassus flabellifer* L.	*Arecaceae*	Tala	Tree	Native
51	*Bougainvillea spectabilis* Willd.	*Nyctaginaceae*	Kagajifula	Shrub	Exotic
52	*Brassica campestries* Hook.f. & Thomson	*Brassicaceae*	Sorish	Herb	Exotic
53	*Brassica juncea* (L.) Czern & Coss	*Brassicaceae*	Rai sorish	Herb	Exotic
54	*Bridens pilosa* L.	*Asteraceae*	Magha latenga	Herb	Exotic
55	*Butea monosperma* (Lam) Turb.	*Fabaceae*	Palasa	Tree	Native
56	*Caesalpinia coriaria* (Jacq.) Willd.	*Fabaceae*	Dibidibi	Tree	Native
57	*Caeselpinia pulcherrima* (L.) Sw.	*Fabaceae*	Radhachuda	Tree	Native
58	*Cajanus scarabaeoides* (L.) Thouars	*Fabaceae*	Ban kandula	Climber	Native
59	*Callistemon citrinus* (Sm.) Sweet.	*Myrtaceae*	Buttle brush	Tree	Exotic
60	*Calotropis gigantea* R.Br.	*Apocynaceae*	Dhala arakha	Shrub	Exotic
61	*Canna indica* L.	*Cannaceae*	Chhita phula	Herb	Native
62	*Capsicum annum* L.	*Solanaceae*	Lanka	Herb	Exotic
63	*Carica papaya* L.	*Caricaeae*	Amrutabhanda	Tree	Native
64	*Caryota urens* L.	*Arecaceae*	Salapa	Tree	Native
65	*Casuarina equisetifolia* L.	*Casuarinaceae*	Jhaun	Tree	Native
66	*Catharanthus roseus* (L.) G Don	*Apocynaceae*	Sadabihari	Herb	Exotic
67	*Cenhchrus pedicellatus* (Trin.) Morrone.	*Poaceae*	-	Herb	Native
68	*Centella asiatica* L.	*Apiaceae*	Thalkudi	Herb	Native
69	*Chromolaena odorata* (L.) R.M.King & H.Rob.	*Asteraceae*	Poksunga	Shrub	Native
70	*Chrysanthemum indicum* L.	*Asteraceae*	Sebati	Herb	Native
71	*Chrysopogon aciculatus* (Retz.) Trin.	*Poaceae*	Guguchia	Herb	Native
72	*Cinamomum verum* J. Presl	*Lauraceae*	Dalchini	Tree	Native
73	*Cinnamomum tamala* Nees.	*Lauraceae*	Tejpatra	Tree	Native
74	*Cissampelos pareira* L.	*Menispermaceae*	Padhi	Climber	Native
75	*Cissus quadrangularis* L.	*Vitaceae*	Hadabhanga	Climber	Native
76	*Citrus aurantium* f. *deliciosa* (Ten.) M.Hiroe	*Rutaceae*	Kamala	Tree	Native

77	*Citrus limon* (L.) Osbeck	*Rutaceae*	Lembu	Tree	Native
78	*Cleome viscosa* L.	*Cleomaceae*	Anasorish	Herb	Exotic
79	*Clerodendrum indicum* L.	*Lamiaceae*	Nagri	Shrub	Native
80	*Clerodendrum infortunatum* L.	*Lamiaceae*	-	Shrub	Native
81	*Clerodendrum serratum* L.	*Lamiaceae*	Samarkand	Shrub	Native
82	*Clitoria ternatea* L.	*Fabaceae*	Aratcajita	Climber	Native
83	*Coccinea grandis* Wight. & Arn.	*Cucurbitaceae*	Kunduri	Climber	Native
84	*Colocasia esculenta* (L.) Schott	*Araceae*	saru	Herb	Exotic
85	*Combretum indicum* L.	*Combretaceae*	Madhumalati	Climber	Native
86	*Commelina beghalensis* L.	*Commelinaceae*	Kansari	Herb	Native
87	*Corchorus capcularis* L.	*Malvaceae*	Nalita	Herb	Native
88	*Corchorus aestuans* L.	*Malvaceae*	Bananalita	Herb	Exotic
89	*Coriandrum sativum* L.	*Apiaceae*	Dhaniapatra	Herb	Native
90	*Costus speciosus* (J.Koenig) Sm.	*Costaceae*	Gaigendalia	Herb	Native
91	*Costus spicatus* (Jacq.) Sw.	*Costaceae*	-	Herb	Exotic
92	*Crinum asiaticum* L.	*Amaryllidaceae*	Arsa	Herb	Native
93	*Crotolaria juncea* L.	*Fabaceae*	Chanapata	Shrub	Native
94	*Crotolaria spectabilis* Roth	*Fabaceae*	Jhumka	Herb	Native
95	*Croton bonplandianus* Baill.	*Euphorbiaceae*	Nandahuhuli	Herb	Native
96	*Cucumis sativus* L.	*Cucurbitaceae*	Kakudi	Climber	Native
97	*Curculigo orchioides* Gaertn.	*Hypoxidaceae*	Manakada pendu	Herb	Exotic
98	*Curcuma amada* Roxb.	*Zingiberaceae*	Amba-ada	Herb	Native
99	*Curcuma angustifolia* Roxb.	*Zingiberaceae*	Paluo	Herb	Native
100	*Curcuma aromatica* Salisb.	*Zingiberaceae*	Mainsia paluo	Herb	Native
101	*Curcuma caesia* Roxb.	*Zingiberaceae*	Krushna kedara	Herb	Native
102	*Curcuma longa* L.	*Zingiberaceae*	Haldi	Herb	Native
103	*Curcuma montana* Roxb.	*Zingiberaceae*	Sakuta	Herb	Native
104	*Curcuma neilgherrensis* Wight.	*Zingiberaceae*	Kaattu manjal	Herb	Native
105	*Curcuma zedoaria* (Christm.) Roscoe	*Zingiberaceae*	Jeodari	Herb	Native
106	*Cuscuta reflexa* Roxb.	*Convulvulaceae*	Nirmuli	*Climber*	Exotic
107	*Cycas revoluta* Thunb.	*Cycadaceae*	Sago	Tree	Native
108	*Cycas sphaerica* Roxb.	*Cycadaceae*	-	Tree	Exotic
109	*Cynodon dactylon* (L.) Pers.	*Poaceae*	Duba	Herb	Native
110	*Cynotis axillaris* L.	*Commelinaceae*	-	Herb	Native
111	*Cyperus rotundus* L.	*Cyperaceae*	Muthaghas	Herb	Exotic
112	*Dactyloctenium aegyptium* (L.) Willd.	*Poaceae*	Khuriya	Herb	Native
113	*Dahlia spp.*	*Asteraceae*	Dalia	Herb	Exotic
114	*Dalbergia sissoo* Roxb.	*Fabaceae*	Sisoo	Tree	Native
115	*Datura stramonium* L.	*Solanaceae*	Dadura	*Shrub*	Native
116	*Delonix regia* (Hook.) Raf.	*Fabaceae*	Krushnachuda	Tree	Native
117	*Desmodium triflorum* (L.) DC.	*Fabaceae*	Motha	Herb	Native

118	*Digitaria ciliaris* (Retz.) Koeler	*Poaceae*	-	Herb	Native
119	*Digitaria singuinalis* (L.) Scop.	*Poaceae*	-	Herb	Native
120	*Dillenia indica* L.	*Dilleniaceae*	Awoo	Tree	Native
121	*Dioscorea alata* L.	*Dioscoreaceae*	Kamba allu	Climber	Exotic
122	*Dracaena roxburghiana* (Schult &Schult.f.) Byng & Christenh.	*Asparagaceae*	Muruga	Herb	Native
123	*Drosera burmanni* Vahl	*Droseraceae*	Mukha jali	Herb	Native
124	*Drosera indica* L.	*Droseraceae*	-	Herb	Native
125	*Duranta repens* L.	*Verbenaceae*	Bilatikanta	Herb	Exotic
126	*Eclipta alba* (L.) L.	*Asteraceae*	Bhrungaraj	Herb	Exotic
127	*Ehretia laevis* Roxb.	*Ehretiaceae*	Mosania	Tree	Native
128	*Elcocharis geniculata* (L.) Roem. & Schult	*Cyperaceae*	-	Herb	Native
129	*Elephantopus scaber* L.	*Asteraceae*	Meghuchuria	Herb	Native
130	*Elettaria cardamomum* (L.) Maton	*Zingiberaceae*	Gujurati	Herb	Native
131	*Eleusine indica (*L.) Gaertn.	*Poaceae*	Ana mandia, Nandia	Herb	Native
132	*Enydra fluctuans* Lour.	*Asteraceae*	Hidmichi	Herb	Native
133	*Eragrostis gangetica* (Roxb.) Steud	*Poaceae*	Kankra Chare	Herb	Native
134	*Eragrostis aspera* (Jacq.) Nees	*Poaceae*	-	Herb	Native
135	*Eragrostis minor* Host	*Poaceae*	-	Herb	Native
136	*Eragrostis pilosa* (L.) P. Beauv	*Poaceae*	-	Herb	Native
137	*Eragrostis riparia* (Willd.) Nees	*Poaceae*	-	Herb	Native
138	*Eragrostis uniloides* (Retz.) Nees ex Steud.	*Poaceae*	Phurphuri	Herb	Native
139	*Eragrotris atrovirens* (Desf.) Trin. ex Steud.	*Poaceae*	-	Herb	Native
140	*Eucalyptus globulus* Sm.	*Myrtaceae*	Eucalypatus	Tree	Exotic
141	*Euphorbia heterophylla* L.	*Euphorbiaceae*	-	Herb	Native
142	*Euphorbia hirta* L.	*Euphorbiaceae*	Chitakuli	Herb	Exotic
143	*Euphorbia milii* Dess Moul.	*Euphorbiaceae*	-	Herb	Native
144	*Euphorbia thymifolia* L.	*Euphorbiaceae*	-	Herb	Native
145	*Evolulus alsinoides* (L.) L.	*Convulvulaceae*	Pausimari	Herb	Exotic
146	*Evolvulus nummularius* (L.) L.	*Convulvulaceae*	-	Herb	Native
147	*Ficus benghalensis* L.	*Moraceae*	Bara	Tree	Native
148	*Ficus hispida* L.f.	*Moraceae*	Dimiri	Tree	Native
149	*Ficus religiosa* L.	*Moraceae*	Aswastha	Tree	Native
150	*Fimbristylis dichotoma* (L.) Vahl	*Cyperaceae*	Baruhan	Herb	Native
151	*Glinus oppocitifolius* (L.) Aug. DC.	*Molluginaceae*	Pitasaga	Herb	Native
152	*Globba racemosa* Sm.	*Zingiberaceae*	Chhota rasna	Herb	Native
153	*Globba schomburgkii* Hook.f.	*Zingiberaceae*	-	Herb	Native
154	*Gloriosa superba* L.	*Colchicaceae*	Ognisikha	Climber	Exotic
155	*Gmelina arborea* Roxb. ex Sn.	*Lamiaceae*	Gambhari	Tree	Native
156	*Gomphrena celosioides* Mart.	*Amaranthaceae*	-	Herb	Exotic
157	*Grevillea pteridifolia* Knight	*Proteaceae*	-	Tree	Native

158	*Gymnema sylvestre* (Retz.) R.Br.ex Schult	*Apocynaceae*	Gudmari	Climber	Native
159	*Hedychium coccineum* Buch-Ham. ex Sm.	*Zingiberaceae*	-	Herb	Native
160	*Hedychium coronarium* Koenig	*Zingiberaceae*	Sugandhi	Herb	Native
161	*Hedychium flavescens* Lodd. ex Lindl.	*Zingiberaceae*	-	Herb	Native
162	*Hedyotis pruinosa* Wight. & Arn.	*Rubiaceae*	Gharpodia	Herb	Native
163	*Heliotropium indicum* L.	*Boraginaceae*	*Hatisundha*	Herb	Native
164	*Hemidesmus indicus* (L.) R Br. ex Schult.	*Apocynaceae*	Anantmula	Climber	Native
165	*Heteropogon contortus* (L.) P. Beauv.	*Poaceae*	Sinkulia	Herb	Native
166	*Hibiscus rosa- sinensis* L.	*Malvaceae*	Mandar	Shrub	Native
167	*Hibiscus sabdariffa* L.	*Malvaceae*	Takavendi	Herb	Native
168	*Hibiscus tiliaceas* L.	*Malvaceae*	Bania	Tree	Native
169	*Holarrhena pubescens* Wall. ex G. Don	*Apocynaceae*	Keruan	Tree	Native
170	*Hybanthus enneaspenmus* (L.) F. Muell	*Violaceae*	Madan mast	Herb	Native
171	*Hygrophila auriculata* (Schumach.) Heine	*Acanthaceae*	Koelekha	Herb	Native
172	*Hypericum gaitii* Haines	*Hypericaceae*	-	Shrub	Exotic
173	*Hyptis suaveolens* (L.) Poit.	*Lamiaceae*	Ganga tulsi	Herb	
174	*Ipomoea aquatica* Forssk.	*Convulvulaceae*	*Kalama saga*	*Climber*	Native
175	*Ipomoea carnea* Jacq.	*Convulvulaceae*	*Amari*	*shrub*	Exotic
176	*Ipomoea obscura* L.	*Convulvulaceae*	-	*Climber*	Native
177	*Ixora coccinea* L.	*Rubiaceae*	Rangani	Shrub	Native
178	*Jatropha curcas* L.	*Euphorbiaceae*	Jara	Shrub	Exotic
179	*Jatropha gossipiifolia* L.	*Euphorbiaceae*	Baigaba	Shrub	Exotic
180	*Juniperus spp.*	*Cupressaceae*	-	Tree	Native
181	*Justica adhatoda* L.	*Acanthaceae*	Basanga	Shrub	Native
182	*Kaempferia galanga* L.	*Zingiberaceae*	Gandha sunthi	Herb	Native
183	*Kaempferia rotunda* L.	*Zingiberaceae*	Ekangi	Herb	Native
184	*Kalanchoe pinnata* (Lam.) Pers.	*Crassulaceae*	Hemsagar	*Shrub*	Native
185	*Kyllinga nemoralis* (J.R Forst. & G. forst) Dandy ex Hutch. & Dalziel	*Cyperaceae*	Nirbishi	Herb	Native
186	*Lablab purpureus* (L.) Sweet	*Fabaceae*	Simbo	Climber	Native
187	*Lagerstroemia speciosa* (L.) Pers.	*Lytharaceae*	-	Tree	Native
188	*Lantana camara* L.	*Verbenaceae*	Gandha gauria	Shrub	Exotic
189	*Leucas aspera* (Willd.) Link.	*Lamiaceae*	Gayasa	Herb	Native
190	*Limonia acidissima* L.	*Rutaceae*	Kaitha	Tree	Native
191	*Lindernia crustacea* (L.) F. Muell.	*Scrophulariaceae*	-	Herb	Native
192	*Litchi chinensis* Sonner.	*Sapindaceae*	Litchu	Tree	Native
193	*Luffa acutangula* (L.) Roxb.	*Cucurbitaceae*	Pitatarandi	Climber	Native
194	*Malachra capitata* (L.) L.	*Malvaceae*	Ban bhendi	Herb	Exotic
195	*Mangifera indica* L.	*Anacardiaceae*	Amba	Tree	Native
196	*Marsilea tetraphylla* Thunb.	*Marsileaceae*	Sunsuni	Herb	Native

197	*Mecardonia procumbens* (Mill.) Small	*Plantaginaceae*	-	Herb	Native
198	*Melochia corchorifolia* L.	*Malvaceae*	Telpuri	Herb	Native
199	*Mentha spicata* L.	*Lamiaceae*	Pudina	Herb	Native
200	*Merremia umbellata* (L.) Hallier f.	*Convulvulaceae*	-	*Climber*	Native
201	*Mesosphaerum suaveolens* (L.) Kuntze	*Lamiaceae*	Buru pudina	Shrub	Native
202	*Michelia champaca* (L.) Bail.	*Mangoliaceae*	Champa	Tree	Native
203	*Mikania micrantha* Kunth.	*Asteraceae*	-	Climber	Native
204	*Mimosa pudica* L.	*Fabaceae*	Lajakuli	Herb	Native
205	*Mimusops elengi* L.	*Sapotaceae*	Baula	Tree	Native
206	*Mirabilis jalapa* L.	*Nyctaginaceae*	Chandrakanta	Herb	Exotic
207	*Mitracarpus hirtus* (L.) DC.	*Rubiaceae*	-	Herb	Native
208	*Mitragyna parviflora* (Roxb.) Korth.	*Rubiaceae*	Mundi	Tree	Native
209	*Mnesithea laevis* (Retz.) Kunth	*Poaceae*	Sonatuli	Herb	Native
210	*Morinda citrifolia* L.	*Rubiaceae*	Noni	Tree	Native
211	*Moringa oleifera* Lam.	*Moringaceae*	Sajana	Tree	Native
212	*Mucuna pruiens* (L.) Pierre.	*Fabaceae*	Baidanka	Climber	Native
213	*Mukia maderaspatana* (L.) Roem.	*Cucurbitaceae*	Pahari kakharu	Climber	Native
214	*Murdannia nudiflora* (L.) Brenan	*Commelinaceae*	-	Herb	Native
215	*Murraya koenigii* (L.) Spreng	*Rutaceae*	Bhrusunga	Tree	Native
216	*Murraya paniculata* (L.) Jack	*Rutaceae*	Kamini	Tree	Native
217	*Musa paradisiaca* L.	*Musaceae*	Kadali	Herb	Native
218	*Mussaenda erythrophylla* Schumach & Thonn.	*Rubiaceae*	Dhobi	Shrub	Native
219	*Neolamarckia cadamba* (Roxb.) Bosser	*Rubiaceae*	Kadamba	Tree	Native
220	*Nerium oleander* L.	*Apocynaceae*	Karabiro	Shrub	Exotic
221	*Nyctanthes arbor – tristis* L.	*Oleaceae*	Gangasiuli	Tree	Native
222	*Nymphaea nouchali* Burm.f.	*Nymphaeaceae*	Kain	Herb	Native
223	*Nymphaea pubescens* Willd.	*Nymphaeaceae*	Rangakain	Herb	Native
224	*Ocimum basilicum* L.	*Lamiaceae*	Durlava	Herb	Native
225	*Ocimum grattisimum* L.	*Lamiaceae*	Ban tulsi	Herb	Native
226	*Ocimum tenuiflorum* L.	*Lamiaceae*	Tulasi	Herb	Native
227	*Operculina turphethum* (L.) Silva Manso	*Convulvulaceae*	Dudholomo	*Climber*	Exotic
228	*Ophioglossum* spp.	*Ophioglossaceae*	-	Herb	Native
229	*Oplimenus burmanii* (Retz.) A.Camus.	*Poaceae*	Kanguria	Herb	Native
230	*Opuntia stricta* (Itaw.) *var. dillenii* (Ker Gawl.) L.D. Benson	*Cactaceae*	Nagapheni	Shrub	Exotic
231	*Oroxylum indicum* (L.) Benth. ex Kurz	*Bignoniaceae*	Phempana	Tree	Exotic
232	*Oryza rufipogon* Griff	*Poaceae*	Balunga	Herb	Native
233	*Oxalis corniculata* L.	*Oxalidaceae*	Amhiliti	Herb	Exotic
234	*Paederia foetida* L.	*Rubiaceae*	Gandha parasini	Climber	Exotic
235	*Parthenium hysterophorus* L.	*Asteraceae*	Gazargrass	Herb	Native

236	*Paspalum scrobiculatum* L.	*Poaceae*	Kodo	Herb	Native
237	*Pavonia zeylanica* (L.) Cav.	*Malvaceae*	Chitrak	Herb	Native
238	*Peltophorum pterocarpum* (DC.) Backer ex. K. Heyne	*Fabaceae*	Radhachuda	Tree	Native
239	*Perotis indica* (L.) Kuntze	*Poaceae*	-	Herb	Native
240	*Petunia spp.*	*Solanaceae*	*petunia*	Herb	Native
241	*Phoenix sylvestris* (L.) Roxb.	*Arecaceae*	Khajuri	Tree	Native
242	*Phyllanthus emblica* L.	*Phyllanthaceae*	Anola	Tree	Native
243	*Phyllanthus fraternus* Webster.	*Phyllanthaceae*	Bhui anola	Herb	Native
244	*Pilea microphylla* (L.) Liebm.	*Urticaceae*	-	Herb	Native
245	*Pilosocereus arrabidae* (Steud.) Byles & G.D. Rowley	*Cactaceae*	Deulisiju	Shrub	Native
246	*Piper betel* L.	*Piperaceae*	Pana	Climber	Native
247	*Pithecellobium dulce* (Roxb.) Benth.	*Fabaceae*	Apad kaian	Tree	Native
248	*Platycladus orientalis* (L.) Franco	*Cupressaceae*	Thuja	Tree	Exotic
249	*Plumbago zeylanica* L.	*Plumbaginaceae*	Ogni	Shrub	Native
250	*Plumeria alba* L.	*Apocynaceae*	-	Tree	Exotic
251	*Plumeria pudica* Jacq.	*Apocynaceae*	-	Shrub	Exotic
252	*Plumeria rubra* L.	*Apocynaceae*	Kathachampa	Shrub	Exotic
253	*Polyalthia longifolia* (Sonn.) Thwaites	*Annonaceae*	Debdaru	Tree	Exotic
254	*Polygala arvensis* Willd.	*Polygalaceae*	Madan mustak	Herb	Native
255	*Polygonum plebeium* R.Br.	*Polygonaceae*	Muthi saga	Herb	Native
256	*Pongamia pinnata* (L.) Pierre.	*Fabaceae*	Karanja	Tree	Native
257	*Portulaca oleracea* L.	*Portulacaceae*	Badabalbaula	Herb	Exotic
258	*Pouzolzia zeylanica* (L.) Benn.	*Urticaceae*	-	Herb	Native
259	*Prosopis julliflora* (Sw.) DC.	*Fabaceae*	Sanni	Tree	Native
260	*Psidium guajava* L.	*Myrtaceae*	Pijuli	Tree	Native
261	*Pteris* spp.	*Pteridaceae*	-	Herb	Native
262	*Pterocarpus marsupium* Roxb.	*Fabaceae*	Piasal	Tree	Exotic
263	*Pterocarpus santalinus* L.f.	*Fabaceae*	Red sandalwood	Tree	Exotic
264	*Punica grantum* L.	*Lytharaceae*	Dalimba	Shrub	Native
265	*Pyrostegia venusta* (Ker Gawl.) Miers	*Bignoniaceae*	Zinnia	Climber	Native
266	*Rauvolfia serpentina* (L.) Benth.	*Apocynaceae*	Patalagaruda	Herb	Exotic
267	*Rauvolfia tetraphylla* L.	*Apocynaceae*	Patalagaruda	Shrub	Native
268	*Ricinus communis* L.	*Euphorbiaceae*	Baigaba	Shrub	Exotic
269	*Rosa indica* L.	*Rosaceae*	Golapa	Shrub	Native
270	*Ruelia prostata* Poir.	*Acanthaceae*	-	Herb	Native
271	*Rungia pectinata* (L.) Nees	*Acanthaceae*	Sankh sago	Herb	Native
272	*Saccharum officinanum* L.	*Poaceae*	Akhu	Herb	Native
273	*Saccharum spontaneum* L.	*Poaceae*	Kashatundi	Herb	Native
274	*Salvinia* spp.	*Salviniaceae*	-	Herb	Native

275	*Samanea saman* (Jacq.) Merr.	*Fabaceae*	Chakunda	Tree	Native
276	*Santalum album* L.	*Santalaceae*	Chandan	Tree	Exotic
277	*Saraca asoca* (Roxb.) De Wilde.	*Fabaceae*	Ashoka	Tree	Exotic
278	*Schleichera oleosa* (Lour.) Oken.	*Sapindaceae*	Kusuma	Tree	Native
279	*Schrebera swietenioides* Roxb.	*Oleaceae*	Mushka	Tree	Native
280	*Scirpus articulatus* L.	*Cyperaceae*	-	Herb	Native
281	*Scoparia dulcis* L.	*Scrophulariaceae*	Chirchita	Herb	Native
282	*Senegalia catechu* (L.f.) P.J.H. Hurter & Mabb.	*Fabaceae*	Khaira	Tree	Native
283	*Senna alata* (L.) Roxb.	*Fabaceae*	Candle bush	Herb	Native
284	*Senna auriculata* (L.) Roxb.	*Fabaceae*	Sunari	Tree	Native
285	*Senna occidentalis* (L.) Link	*Fabaceae*	Kalachakunda	Herb	Native
286	*Senna tora* (L.) Roxb.	*Fabaceae*	Chakunda	Herb	Native
287	*Sesuvium portulacastum* (L.) L.	*Aizoaceae*	Godabani	Herb	Native
288	*Setaria pumila* (Poir) Roem. & Schult	*Poaceae*	Siallenguda	Herb	Native
289	*Shorea robusta* Gaertn.f.	*Dipterocarpaceae*	Sal	Tree	Native
290	*Sida acuta* Burm.f.	*Malvaceae*	Sundakhadika	Shrub	Native
291	*Sida cordata* (Burm.f.) Borss Waalk.	*Malvaceae*	Bajramuli	Herb	Native
292	*Sida rhombifolia* L.	*Malvaceae*	Bisipiri	Herb	Native
293	*Sida spinosa* L.	*Malvaceae*	Bajramuli	Herb	Native
294	*Simarouba glauca* DC.	*Simaroubaceae*	Laxmi taru	Tree	Native
295	*Solanum melangena* L.	*Solanaceae*	Baigana	Herb	Native
296	*Solanum nigrum* L.	*Solanaceae*	Tutguna	Herb	Native
297	*Solanum torvum* Sw.	*Solanaceae*	Katha koli	Shrub	Native
298	*Solanum virginianum* L.	*Solanaceae*	Bhejibaigana	Herb	Native
299	*Soymida febrifuga* (Roxb.) A. Juss.	*Meliaceae*	Saptala	Tree	Native
300	*Spathodaea campanulata* P. Beauv	*Bignoniaceae*	Scarlet bell tree	Tree	Native
301	*Spermacoce articularis* L.f.	*Rubiaceae*	Sanaghar podia	Herb	Native
302	*Spermacoce hispida* L.	*Rubiaceae*	-	Herb	Native
303	*Spermacoce lasiocarpa* R.Br.	*Rubiaceae*	-	Herb	Native
304	*Sphathoglotis plicata* Blume	*Orchidaceae*	Jhilli	Herb	Native
305	*Spondias pinnata* Willd.	*Anacardiaceae*	Salma, Amda	Tree	Native
306	*Sporobolus indica* (L.) R.Br.	*Poaceae*	Kankara chara	Herb	Native
307	*Sterculia foetida* L.	*Malvaceae*	Janglibadam	Tree	Native
308	*Streblus asper* Lour.	*Moraceae*	Sahada	Tree	Native
309	*Swetenia macrophylla* King	*Meliaceae*	Mahogany	Tree	Native
310	*Syzygium cumini* (L.) Skells.	*Myrtaceae*	Jamkuli	Tree	Native
311	*Syndrella nudiflora* (L.) Gaertn	*Asteraceae*	-	Herb	Exotic
312	*Syzygium jambos* (L.) Alston	*Myrtaceae*	Rose apple	Tree	Native
313	*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult.	*Apocynaceae*	Tagara	shrub	Native

314	*Tagetes patula* L.	*Asteraceae*	*Gendu*	Herb	Exotic
315	*Tamarindus indica* L.	*Fabaceae*	Tentuli	Tree	Exotic
316	*Tecoma stans* (L.) Kunth.	*Bignoniaceae*	Radhachuda	Shrub	Native
317	*Tectona grandis* L.	*Lamiaceae*	Saguan	Tree	Native
318	*Tephrosia purpurea* (L.) Pers.	*Fabaceae*	Banakalathi	Herb	Native
319	*Terminalia arjuna* (Roxb.ex DC.) Wight & Arn.	*Combretaceae*	Arjuna	Tree	Native
320	*Terminalia bellirica* (Gaertn.) Roxb.	*Combretaceae*	Bahada	Tree	Native
321	*Terminalia catappa* L.	*Combretaceae*	Kathachandan	Tree	Native
322	*Terminalia chebula* Retz.	*Combretaceae*	Harida	Tree	Native
323	*Thevetia peruviana* (Pers.) K.Schum.	*Apocynaceae*	Kaniyari	Shrub	Exotic
324	*Tinospora cordifolia (*Willd.) Hook.f. & Thomson.	*Menispermaceae*	Guluchi lata	Climber	Native
325	*Tragia involucrata* L.	*Euphorbiaceae*	Bichuati	Herb	Native
326	*Trichosanthes tricuspidata* Lour.	*Cucurbitaceae*	Mahakal	Climber	Native
327	*Tridax procumbens* L.	*Asteraceae*	Bisalyakarani	Herb	Exotic
328	*Triumfetta rhomboidea* Jacq.	*Malvaceae*	Jata jatia	Shrub	Native
329	*Urena lobata* L.	*Malvaceae*	Jatajatia	shrub	Native
330	*Utricularia aurea* Lour	*Lentibulariaceae*	Bhaturidala	Herb	Native
331	*Utricularia bifida* L.	*Lentibulariaceae*	Araka jhawar	Herb	Native
332	*Utricularia caerulea* L.	*Lentibulariaceae*	-	Herb	Native
333	*Utricularia hirta* Klein ex Link	*Lentibulariaceae*	-	Herb	Native
334	*Utricularia minutissima* Vahl	*Lentibulariaceae*	-	Herb	Native
335	*Vernonia cinerea* (L.) Less.	*Asteraceae*	-	Herb	Native
336	*Vitex negundo* L.	*Lamiaceae*	Begunia	Herb	Native
337	*Withania somnifera* (L.) Dunal	*Solanaceae*	Aswagandha	*Shrub*	Native
338	*Xanthium strumarium* J. Koenig ex Roxb.	*Asteraceae*	-	Herb	Exotic
339	*Zephyranthes citrina* Baker	*Amaryllidaceae*	Bhuin lilly	Herb	Native
340	*Zingiber montanum* (J. Koenig) Link ex A.Dietr.	*Zingiberaceae*	Bana ada	Herb	Native
341	*Zingiber officinale* Roscoe	*Zingiberaceae*	Ada	Herb	Native
342	*Zingiber zerumbet* (L.) Roscoe ex Sm.	*Zingiberaceae*	Gada	Herb	Native
343	*Zinnia elegans* Jacq.	*Asteraceae*	Zinnia	Herb	Exotic
344	*Ziziphus mauritiana* Lam.	*Rhamanaceae*	Barakuli	Shrub	Exotic
345	*Ziziphus oenoplia* (L.) Mill.	*Rhamanaceae*	Kankuli	Shrub	Native

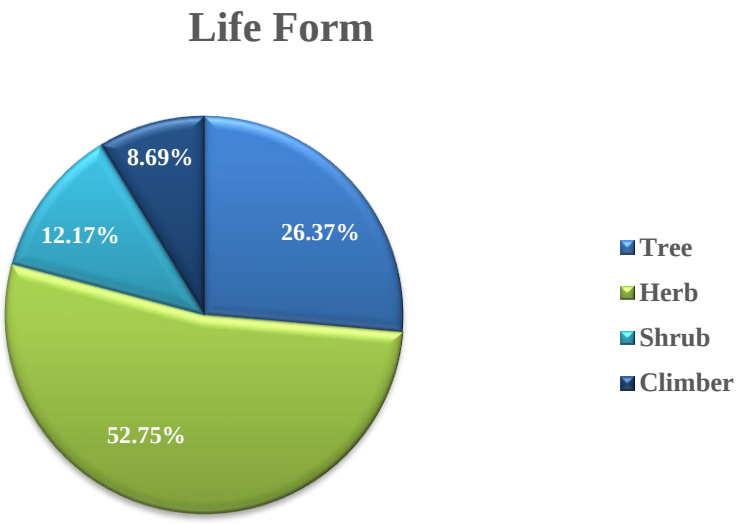


Figure 2. Life form of plant species in MSCBU Campus

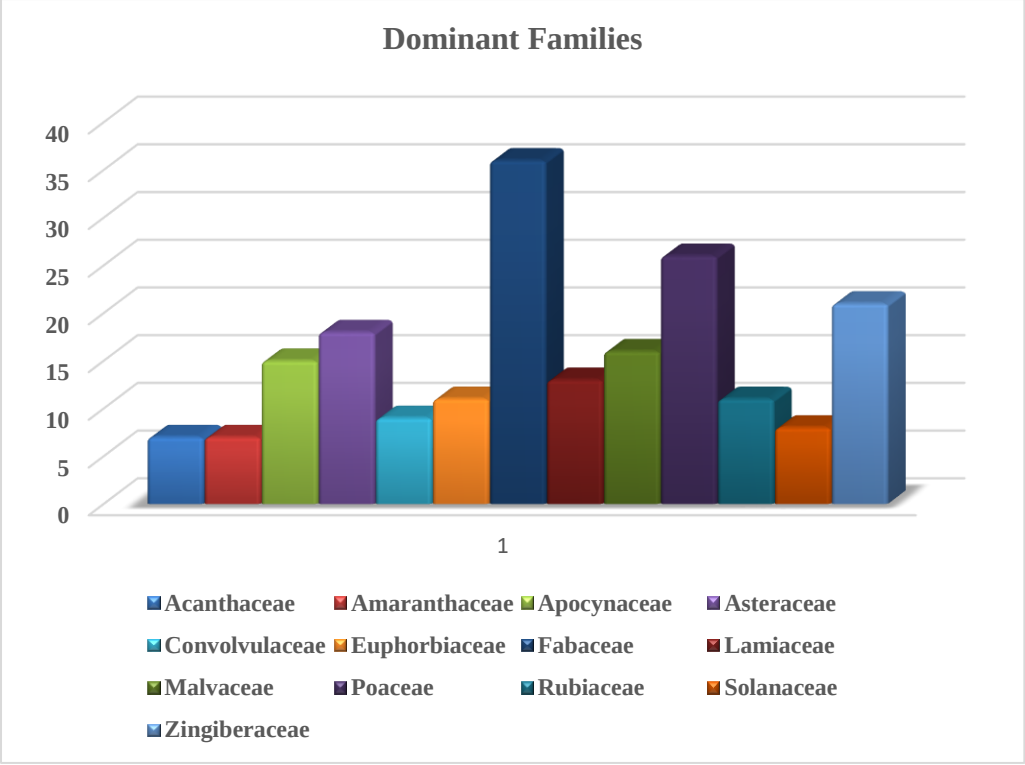


Figure 3. No. of species in dominant families

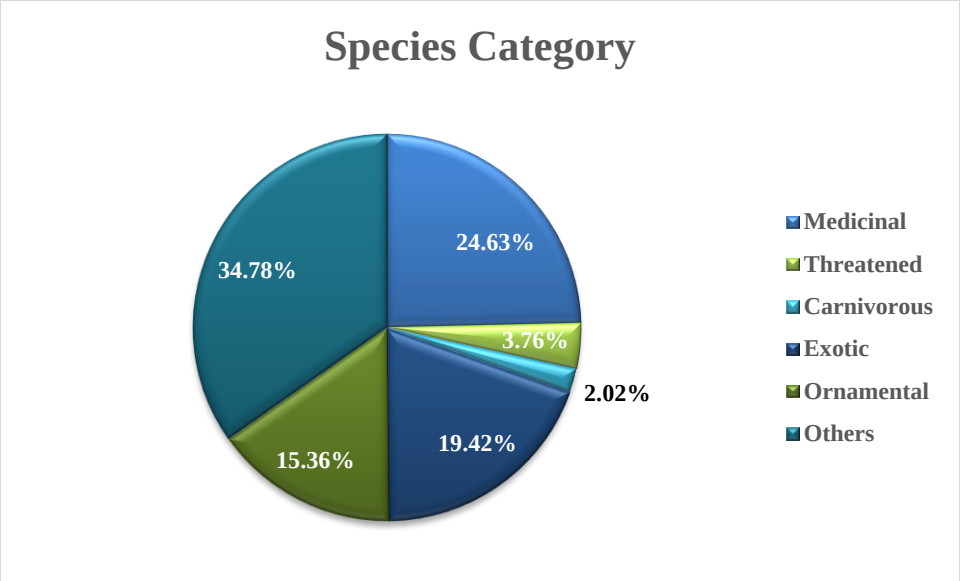


Figure 4. Percentage of species in different groups

A.P.J. Abdul Kalam Biodiversity Park

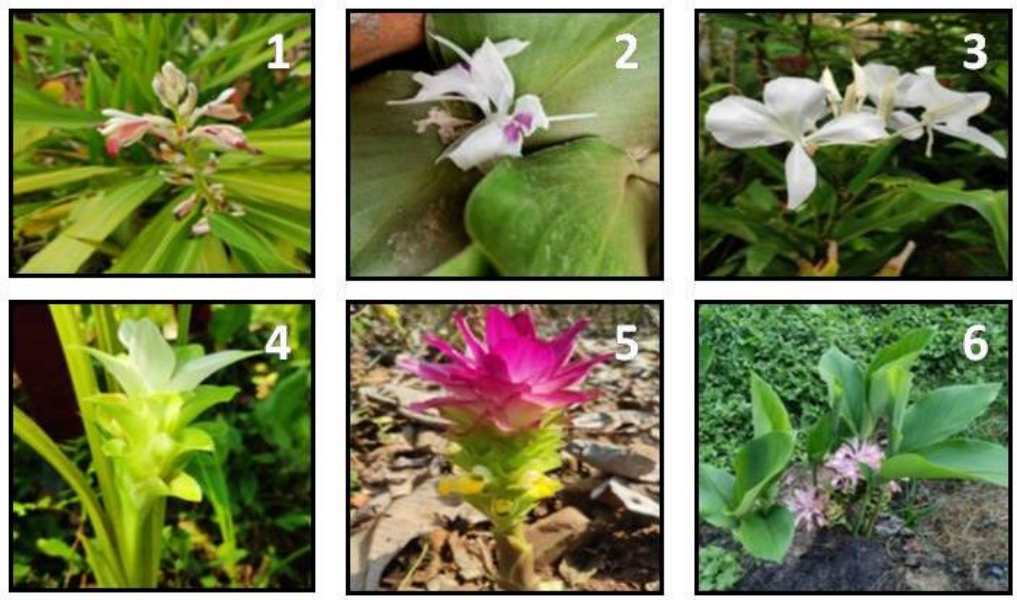
The A.P.J. Abdul Kalam Biodiversity Park of MSCBU, Baripada was established in the year 2020 to promote, preserve, and publicize Similipal biodiversity among scholars, tribal, rural, and common citizens through this Biodiversity Park on the campus. The Biodiversity Park is a living museum of regional and adjoining state flora. It possesses the whole plant diversity of the MSCBU campus except for a few ornamental plants. The Park holds 91 tree species, 182 herbs, 42 shrubs, and 30 climbers; from which 85 species have medicinal properties. It represents about 22% of the Similipal plant diversity. The plant resources are used for educational research. At the same time, the fresh air and chirruping birds provide an eco-friendly environment for wondering, learning, and engagement. The Park plays a great role in conserving several Threatened species which include *Saraca asoca, Oroxylum indicum, Gloriosa superba, Pterocarpus santalinus, Rouvolfia serpentina, Pterocarpus marsupium, Paederia foetida,* etc. and several carnivorous plants of genera *Drosera* and *Utricularia*. It is a storehouse of Hydrophytes, Gingers, Ferns, Timber, and Medicinal plants. It has one Botanical Garden with one shade net gingers greenhouse and one mist house to grow medicinal/herbal plants. Water supply with an underground tank and sprinklers are also available in this garden.

(i) The Botanical Garden

The Botanical Garden of Maharaja Sriram Chandra Bhanja Deo University, Baripada was established in the year 2004 for the sake of aesthetic as well as scientific value. This garden has

been serving generations of students and visitors as a place of learning, wonder, and engagement. Now, the Botanical Garden has a varied collection of living plant specimens not only from India but also from different parts of the Globe. It serves as a living plant museum, providing germplasm for research, education, and conservation. The Botanical Garden is full of different flowering and non-flowering plant groups starting from herbs, shrubs, and small trees to large trees. Plants for practical purposes of students' viz. Pteridophytes (*Ophioglossum, Salvinia, Marsilea, Adiantum, Pteris*) and Gymnosperms (*Cycas revoluta, Cycas sphaerica, Platycladus orientalis, Casuarina equisetifolia*) are conserved in the garden.

A shed net greenhouse is established inside the Botanic Garden to provide a conducive environment required for the growth and multiplication of gingers (Zingiberaceae) throughout the year. About 21 different species of Gingers are planted in greenhouses collected from different zones of the Eastern Ghats and Western Ghats. Among these, 12 species of Gingers are found growing in Similipal Biosphere Reserve. The important genera among them are *Alpinia, Curcuma, Elettaria, Kaempferia, Globba, Hedychium, Zingiber*) etc. (Photoplate 1). These Gingers plants are of high ornamental, economical, and medicinal value.



Photoplate 1. Species grown in Gingers house 1) *Alpinia calcarata* 2) *Kaempferia galanga* 3) *Hedychium cocronarium* 4) *Curcuma montana* 5) *Curcuma zedoaria* 6) *Curcuma aromatica*

(ii) **Carnivorous plants**

Carnivorous plants are specially adapted to trap and digest small prey as a way to supplement their nutrient requirements in poor soil conditions. Out of the five genera of carnivorous plants

found in India, the distribution of two genera namely *Utricularia* and *Drosera* have been reported from Odisha. Interestingly, both genera are found growing on this university campus. Out of the recorded 7 species, 6 species (*Drosera burmanni*, *D. indica*, *Utricularia aurea*, *U. bifida*, *U. hirta*, *U. polygaloides*, and *U. minutissima*) are Least Concern according to Red List of IUCN except *Utricularia caerulea* which is Not Evaluated (Photoplate 2).

Photoplate 2. Carnivorous plants found growing on campus 1) *Drosera burmanni* 2) *Drosera indica* 3) *Utricularia aurea* 4) *Utricularia caerulia* 5) *Utricularia bifida* 6) *Utricularia hirta*

(iii) Medicinal plants

Medicinal plants have been used in healthcare since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant-based medicines. This University campus is a heritage of different medicinal plants. The Department of Botany has a self-grown medicinal plant garden where various plants from different localities of Odisha and adjacent regions are planted. A total of 345 plant species are reported from A.P.J. Abdul Kalam Biodiversity Park of the University, of which 85 species (25%) having highly medicinal properties are well conserved in this campus which include *Saraca asoca, Rauvolfia serpentina, Hypericum gaitii, Oroxylum indicum, Pterocarpus marsupium, Tinospora cordifolia, Gloriosa superba, Costus speciosus, Curcuma spp.* (Photoplate 3) etc.

Photoplate 3. Some medicinal plants conserved in botanical garden 1) *Hypericum gaitii* 2) *Rauvolfia serpentina* 3) *Dracaena roxburghiana* 4) *Cissus quadrangularis* 5) *Tridax procumbens* 6) *Morinda citrifolia* 7) *Cycas revolute* 8) *Saraca asoca* 9) *Calotropis gigantean* 10) *Oroxylum indicum* 11) *Gloriosa superba* 12) *Centella asiatica*

(iv) Sacred Grove

Sacred groves are referred to as the "lungs" of the earth. As per the belief tying of religious ribbons in different plant patches and keeping certain idols symbolizes the deities and God. This

helps in protecting the trees found in those areas from anthropogenic actions. The sacred grove on this campus is surrounded by different tree patches like *Shorea robusta*, *Streblus asper*, *Phyllanthus emblica*, *Pterocarpus santalinus,* and *Pterocapus marsupium.* The importance of sacred groves and sacred species are not only viewed merely through economic and livelihood perspectives but also these entities are respected as the historical evidence of human relationship with nature and its components. At the sacred groove present on this campus, the ritualistic worship of deities is being done by Santali Department students of this University. The two most popular Puja such as **'**Jahira Bonga' and **'**Bidu-Chandan Bonga' related to the Santali tribe are celebrated by all students and faculties of this University.

Discussion

Plants in all ecosystems play a dominant role in determining the life stories of millions of animal species which serve as the foundation of most food webs and perform a crucial role in human welfare and economic development. In the present study, the diverse flora of MSCB University was found to be distributed in various habitats having their unique importance to the students, research scholars, and common people. The general trends of plant specimens collected in this study are concordant with previous studies in India i.e., total 231 plant species belonging to 71 families are recorded in CSIR-IMMT campus, Bhubaneswar (Sahu et al., 2013); 335 species belonging to 67 families in Bharathiar Universitycampus, Tamil Nadu (Rajendran et al., 2014); 152 species belonging to 55 families in Majajana P.G. campus, Karnataka (Renukarya et al., 2015); 534 plant species belonging to 99 families recorded in Fergusson College campus, Pune (Nerlekar et al., 2016); 85 species reported from K.M. Govt. College, Narwana (Kumar et al., 2016); 100 plant species belonging to 42 families recorded in Govt. P.G. College, Barwani, Madhya Pradesh (Jeetendra, 2019), etc. The growth forms found in the present study show the dominance of herbaceous plant species. The herbaceous communities were also reported to be dominant in other parts of the world (Arroyo-Rodríguez et al., 2009; Guido et al., 2013; Ferreira et al., 2013) and India (Irwin & Narasimhan, 2011).

The important medicinal value of listed species was well known from previous literature (Das, 1995; Sahoo et al., 2020; Padhy et al., 2020). Various researchers have investigated the use of plant specimens as an herbal remedy for the treatment of skin diseases, fever and for good health in India (Jeeva et al., 2007; Kar & Borthakur, 2008; Binu, 2009; Das et al., 2015) and Odisha (Girach et al., 1998; Misra et al., 2012; Pani et al., 2014). The documented medicinal plants from

the University campus are unique in the form of appreciating the traditional knowledge of communities about the use of plants for medicinal purposes which are given value addition by use of scientific methods of plant taxonomy and their ex-situ conservation. The University campus enables a visitor/student/scholar to experience the diversity of the Similipal Biosphere Reserve. The conserved important medicinal plants, carnivorous plants, woody trees, climbers, etc. are acting as teaching aids and also create sample scope for students and researchers to conduct their research work smoothly due to the availability of plant materials inside the campus. It also attracts school and college students to visit the garden to learn about the medicinal plants and realize the importance of herbal medicines in their daily lives. It also creates awareness of the rich tradition of plant biodiversity of Similipal Biosphere Reserve among the various communities, students, alumni, teachers, and staff of the University. The ornamental and carnivorous plants documented in the present study were another attraction to the species diversity on the MSCB University campus. The aesthetic value of each plant specimen provides peace to the intimates of campus. Another benefit of the campus flora was found to be the solution to the increasing crisis of pollution control measures and maintenance of different ecological activities. Nowadays, conservation, management, and sustainable utilization of natural resources are a great challenge to human beings across the globe. The foundation of Abdul Kalam Biodiversity Park, Botanical Garden, and the Sacred Groove on the MSCB University campus is a great initiative towards the protection and conservation of floristic diversity. In addition to this, the sacred grove of the University campus holds the cultural aspects of local tribal people which highlight the ethical value of plant diversity (Fig. 5).

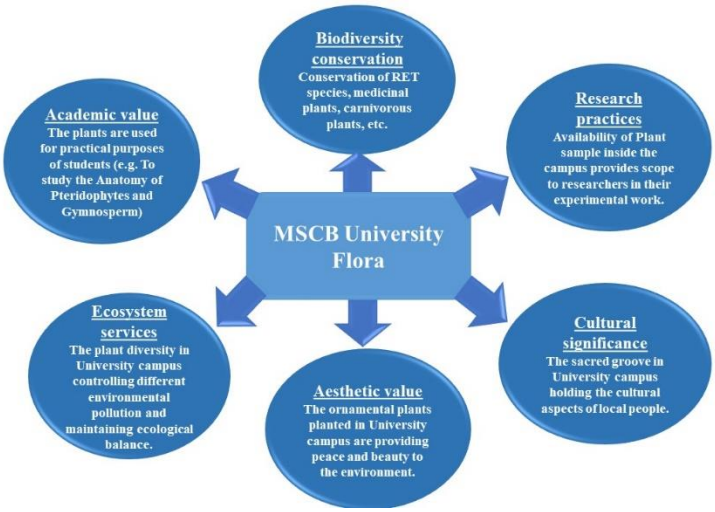


Figure 5. Benefit Model of MSCB University flora

Conclusion

The floristic diversity of Maharaja Sriram Chandra Bhanja Deo University comprises native as well exotic, introduced ornamental and cultivated plant species. Such diversity in university campuses has great aesthetic value, ecological uniqueness, and resource importance, which should be conserved judiciously. The important medicinal plants listed were known to be used by many tribals traditionally. Now-a-days, these medicinal plants are helpful in the production of medicinally potent secondary metabolites. Taking a walk around the campus would enrich the botanical knowledge, ecological consciousness, and conservation values not only of the academia but also of the common people. Besides, the MSCB University campus provides a unique opportunity for learning as an outdoor classroom exercise for students. The diversity of campus flora should be protected from threats like habitat fragmentation or construction of new buildings if any development is planned in these areas.

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