Documentation of Biodiversity Status in Mandla District of Madhya Pradesh

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1 - PROJECT DETAILS

1.1 Title of the Project

DOCUMENTATION OF BIODIVERSITY STATUS IN MANDLA DISTRICT OF MADHYA PRADESH

1.2 Project Duration : 18 Months

1.3 Project Cost : Rs. 8,23,310/-

1.4 Sponsoring Agency : M. P. State Biodiversity Board, Bhopal

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2. INTRODUCTION

Biodiversity has been defined as variety and variability of the biological components of on ecosystem. The concept of biodiversity pertains to natural communities, which constitute a well-set phenomenon in studies of environmental science. Diversity actually refers to the total variability within the entire living organisms and ecological complexes within which it exists. Diversity is essential for proper functioning of the food chain. It is also absolutely essential for the survival of human being because man has not only been benefited but has adjusted himself to the diversity. It is unfortunate that today man is the greatest enemy of biodiversity, which is well reflected in rise of human population and proportionate fall in biodiversity at global level.

The concept of biodiversity is 70 years old, yet somehow, its implications and benefits were not realized for long time. Biodiversity is actually initiated at molecular level and it reflects plurality and variability in ecosystem and habitat. It is essential that the carrying capacity of the habitat be maintained, otherwise, diversity will receive a set back. Fall in biological diversity reflects decrease in resource potential of the habitats. Greater diversity is usually expressed in such habitats where the organisms are bound by terrestrial limits. High mountains and extensive oceans sometime serve as boundaries for the organisms. Greater thrust on medicinally important plants and microbes is further responsible for dwindling of the biological diversity. Rapid loss of forest throughout the world is the main reason for loss of biodiversity on land. The biodiversity in oceans is fairly rich but recent commissioning of deep-sea trawlers for fishing purpose has became a matter of concern and threat to biodiversity. Excessive resource consumption, galloping human and cattle population, economic inequality and international trade pattern are some of the major reasons for the loss of biodiversity. With advanced techniques in plant chemistry threat to biodiversity is increasing further.

Conservation and sustainable use of biodiversity is fundamental to ecologically sustainable development. Biodiversity is part of our daily lives and livelihoods, and constitutes resources upon which families, communities, nations and future generations depend. Every country has the responsibility to conserve, restore and sustainably use the biological diversity within its jurisdiction. Biological diversity is fundamental to the fulfilment of human needs. An environment, rich in biological diversity, offers the broadest array of options for sustainable economic activity, for sustaining human welfare and for adapting to change. Loss of biodiversity has serious economic and social costs for any country. The experience of the past few decades has shown that as industrialization and economic development in the classical sense takes place, patterns of consumption, production and needs change, straining, altering and even destroying ecosystems. India, a mega biodiversity country, while following the path of development, has been sensitive to needs of conservation and hence is still rich in biological resources. Ethos of conservation and harmonious living with nature is very much ingrained in the lifestyles of India's people.

India is known for its rich heritage of biological diversity, having already documented over 91,000 species of animals and 45,500 species of plants in its 10 bio-geographic regions. Nearly, 6,500 native plants are still used prominently in indigenous healthcare systems. Thousands of locally adapted crop varieties, grown traditionally since ancient times, and nearly 140 native breeds of farm livestock, continue to thrive in its diversified farming systems. The country is recognized as one of the eight Vavilovian

Centres of Origin and Diversity of Crop Plants, having more than 300 wild ancestors and close relatives of cultivated plants still growing and evolving under natural conditions.

India has tremendous biodiversity, genetic as well as of species and ecosystems. It contains over 5 per cent of the world's biodiversity on 2 per cent of the Earth's surface. The biodiversity can be attributed to the vast variety of landforms and climates resulting in habitats ranging from tropical to temperate, and from alpine to desert.

The number of plant species in India is estimated to be over 45,000 representing about 7 per cent of the world's flora. These include over 15,000 flowering plants of which 4,900 species are endemic to the country (MoEF 1994).

India is also considered one of the world's eight centres of origin of cultivated plants. India has 51 species of cereals and millets, 104 species of fruits, 27 species of spices and condiments, 55 species of vegetables and pulses, 24 species of fibre crops, 12 species of oil seeds, and various wild strains of tea, coffee, tobacco and sugarcane (MoEF 1994).

Several hundred species of wild crop relatives are distributed all over the country, especially in the western and eastern Himalaya, the Western Ghats and the Malabar Coast, north-eastern India, the Gangetic Plains, and in the eastern part of the Deccan Plateau which is a major centre for wild rice. *Citrus indica*, the most primitive species of citrus plants, is found in the Tura hills in Meghalaya. It is believed that the cultivated varieties of citrus in India were perhaps developed from this endangered species (CSE 1985).

India's faunal wealth is equally diverse. The total number of animal species is estimated at 81,000 representing about 6.4 per cent of the world's fauna. India's known animal diversity includes about 57,000 insects, 2,546 fish, 204 amphibians, 428 reptiles, 1,228 birds and 372 mammals (MoEF 1994). It also includes about 20,000 invertebrates.

The ancient practice of domesticating animals has resulted in India's diverse livestock, poultry and other animal breeds. India has 26 breeds of cattle, 40 of sheep, 20 of goats, 8 of camels, 6 of horses, 2 of donkeys and 18 of poultry (MoEF 1994).

India also contains vast microbial diversity. Although exact numbers of viruses, microscopic algae and other microscopic organisms are not known, India has at least 850 species of bacteria and 12,500 of fungi (Bhat and Deshbandhu 1994).

The state of Madhya Pradesh is one of the richest states in terms of Biodiversity, be it wild or be it agro-biodiversity. The people of the state are dependant on agriculture and forests for their livelihood. It is also the second largest state and has varied climatic and edaphic factors that determine the distribution of wild resources as well as selection of crops for farming. Its tribal population, which is dependent on various forest resources for their subsistence as well as sustenance, plays an important role in conservation of forests. They use plants as food, fodder, medicine, fuel, in house building and other multifarious uses. The importance of medicinal plants is now well known worldwide and it will not be exaggeration if we call the present era, the era of herbal products. The use of herbs is increasing day by day not only in medicines but also in cosmetics and as food supplements and health tonics.

The importance of biodiversity needs no elaboration. Socio-cultural diversity also manifests into diversity of uses of the same species. Same species can be used differently in different places and also by different communities at the same place. Thus, in order to have complete understanding of the biodiversity, it has to be studied in its ecological and socio-cultural environment. Before deciding if harvesting of particular species in a particular locality can be continued, at the existing rate, or the rate of harvesting has to be modified or its harvesting has to be stopped altogether, it would be essential to know the present biodiversity status of the area in question. Inventory or documentation of species richness of a given area, therefore, assumes great significance. It helps in monitoring the changes likely to occur in the diversity status as a result of climatic change and developmental activities.

Mandla has rich and varied biodiversity due to its diversified toropography and variable climatic conditions. However, no documents are available on biodiversity of Mandla district; only scattered literature is available on the subject. Madhya Pradesh State Biodiversity Board, Bhopal assigned the task to SFRI to document the biodiversity of Mandla district on primary and secondary data basis.

3. OBJECTIVE

- ***Documentation of wild and domesticated biodiversity with cultural and socio-economic interactions***

4. STUDY AREA

The selected district is predominantly tribal dominated district and tribals in the district constitute more than 65 % of its total population. The district also possesses vast area under forests. The recorded forest areas in the district constitute 2769 km^2 in Mandla district. The major tribal groups residing in this district are Gond, Baiga, Maria, Bhumia, Agariya, Pardhan and Panka. The Baigas are the medicine men in most of the villages, while there are few regions where pure Baiga villages are found. The other major group is Gond. The location of this district in Madhya Pradesh is shown in **Map -1.**

Mandla district is situated in the east-central part of Madhaya Pradesh. The district lies almost entirely in the catchments of river Narmada and its tributaries. The district has a glorious history. Numerous rivers flow through the district and it is endowed with rich forests. The world's famous Tiger Reserve, Kanha National Park located in the district, is one of the hottest targets for both the domestic as well as foreign tourists. The extreme length of the district is about 133 Kms. from north to south and extreme breadth is 182 Kms from east to west. It covers a total area of 8771 Sq. Km. and has a total population of 894236. There are 9 blocks, 4 tehsils and 1247 villages in the district.

Various tehsils and development blocks and important places of district are shown in **Map - 2**. The district forms part of Satpura and Maikal hill ranges. It is the watershed area of several rivers including Narmada, Halon and its tributaries. The total area of the district is 8771 km^2. Climate of the district is characterized by hot dry summer except in monsoons. The forest cover also causes cold winter in interior areas. The population of the district as per 2001 census is given below;

Table 1: Block and population of Mandla district

S. No.	Name of Tehsil	Name of Development Blocks	Population
1	Mandla	1. Mandla	1,29,256
		2. Mohgaon	65,702
		3. Ghughri	79,060
2	Nainpur	4. Nainpur	1,14,411
3	Bichhiya	5. Bichhiya	1,48,518
		6. Mawaii	69,320
4	Niwas	7. Niwas	62,151
		8. Narayanganj	70,882
		9. Bijadandi	63,022
Total			**8,02,322**

Mandla district derives its name from the headquarters town, Mandla. Three traditions about the name Mandla are more or less prevalent in the area. Caption H.C.E. Ward recorded its puranic details and related Mandla to the Sanskrit word 'Mandal' meaning a circle; because the river Narmada almost girdles the town on three sides. According to another view, the real name of Mandla is said to have been 'Mahish-mandal', or 'Mahishmati' of ancient Sanskrit literature, which was the capital of Kartvirya of the thousand arms from whom sprung the Garha-Mandla kings. Under the clear cold light of criticism, however, the weakness of the story becomes palpable; the Mahishmati of Sanskrit legend has been proved by Dr. Fleet to be Mandhata in Nimar district, whereas

our Mandla is probably a survival of the word, 'Mandla' or feudatory state. The Brahmans identify it with Mahismati, which is said to have been one of the ancient seats of the Haihaya princes. Mandla is not probably the name of a place, as it means only a district. The original name might have been Mahishmati-Mandla, of Mahes-Mandla, which has now become simply Mandla. The third view of the probable origin of the name is that the word 'Mandla' is probably a survival of the word 'Mandal' or feudatory division of the kingdom of the Kalachuri kings of Tripuri.

Mandla district consists of a rugged high table and in the eastern part of the Satpura hills. The most important range of the Satpuras in the district is Maikal, which forms a watershed between western and eastern India. It is well known in ancient Sanskrit literature as the source of the holi Narmada. The spurs and sub-ranges of the Maikal hills divide the country in the east of the district into a number of valleys and tablelands.

According to the census report, Gonds and Baigas are the most significant tribes in the district. In comparison to the other tribes, Gonds are well settled and economically better than any other community of the area. Raja Gonds, Nagvanshi Gonds and Ravanvanshi Gonds reside mainy in this area.

Geology

The main rock formation is Gondwana covered by Deccan Trap. Rock formation is from cretaceous to Eocene. Basalt is made up of different layers of lava. In between it is intertrappean and black in colour and clay ash has immature limestone. Deccan trap, lameta bed, Archean granite and Dharwars are also found. On the rivers and nala banks, black cotton soil is made up of Dharwars, Lameta and Archean and forms deep fertile soil.

Strati-graphically, Mandla district mainly comprises Archaeans, Lametas, Deccan Trap and Recent formation. The older metamorphic rocks of the district include granite, granite gneisses, hornblende schist, quartz, mica-schist, lime-silicate rocks, Pegmatite and Charnockite. The Dharwarian rocks of the district are represented by Chilpi Ghat group, which comprises phyllite, dolomites, quartzite, pegmatite, mica schist and quartz. Arenanceous limestone of Laetite, rest horizontally on the denuded surface of schist deccan trap is the most extensively developed formation of the district. Basaltic lava flows of different thickness are at places separated by inter trappeans of clay and limestone. At many places, traps are covered by laterite in which segregation of alumina has resulted in bauxite deposit. Sometimes decomposition of traps gives block cotton soil the 'regur'.

Soil

Soils of Mandla are generally classified into four classes, Kabar or Kanbar, Morand or Mund, Sahra and Barra but as differences in value within these classes were also recognized, each was sub-divided into two and described as follows;

Kabar / Kanbar

It is a “bluish – black”, clay of extreme depth and fertility; soft and sticky when wet, very hard and heavy when dry. It is free from sand and stone and breaks with a smooth surface. Locally, it is known as gobra, badi kanbar, asli kanbar and Kichua Kabar. It is an inferior quality of the preceeding gritty, lighter in colour, less in depth and often

containing small black kanbar pebbles. It is locally known as gobra, non kanbar, choti or halki kanbar, dudh sahra and mut sahra or mota sahra.

Mund / Morand

(a) Mund I - This type of soil is the third of the four classes of black cotton soil, black or darkish, more gritty and friable than kabar and breaking into small clods with a roughish surface. It frequently contains more or less white limestone pebbles of fair size. It is locally known as mund, morand, sahra, kaitha and occasionally mutsahra.

(b) Mund II - It is an inferior varity of the preceeding type lighter in colour and outturn, sandy and often containing large quantities of white limestone which materially reduces its productivity. It is locally known as morandi, sahri or sometia.

Sahra

(i) Khisa sahra: This type is pure sand, pale yellow, friable and easily worked, unfit for rabi or spring crops, but given good rains, the rice soil par excellence; in low – lying or irrigated positions and with proper manuring, it gives extraordinarily good outturns.

(ii) Kaitha sahra: Locally known as domatia, is a very sandy variety of mund, suited only to lighter rabi, but a fairly good rice soil. This class of soil is locally known as jhigra sahra or jhigra.

Barra

(i) Mutbarra: It is not a specific soil but a comprehensive term applied to the best qualities of red or yellow soil, free from stone, capable only of growing kharif crops.

(ii) Barra: It is similarly an all embracing term including all the poorest soils incapable of rabi or rice. True barra is a red gravelly or murram soil, often extra ordinarily stony or with rock, underlying it within twelve and eighteen inches. Kachar is the rich yellow flaky deposit left after the rains on the banks of the Nerbudha (Narmada) and Banjar rivers. The soil classes enumerated above are distributed into four “kind” classes according to the crop which is normally grown upon them. The “kind” classes are gobhari or wheat land, dhanai or rice land, mutfarikat or minor cropped land, and fourthly, garden land. The approximate area of godari land is 121,000 acres, of dhanai 53,000 acres, of mutfarikat 386,000 acres and, of garland 19000 acres (Rudman 1912)

Climate

Mandla District extends over the highest plateau of the Stapura ranging from 500 meters to 500 meters above mean sea level. In comparison with the low-lying plains of Jabalpur and Raipur to the north and south it is cool and exhilarating. The climate of this district is characterized by hot summer season and moderate monsoon season except

for the general dryness in the southwest part. The year may be divided into four seasons. Winter is from December to February, followed by the summer from March to mid of June. The period from mid-June to September is the southwest monsoon season. October and November constitute the post monsoon or retreating monsoon season.

Temperature

This is observed meteorologically in the district of Mandla and the records of this observation may be taken as a fair representation of the conditions prevailing in the district. There is a steady increase in temperature after February. May is the hottest month with the mean daily maximum temperature of 41.3^0C and the mean daily minimum of 24^0C. During the summer season the day temperature may rise up to 44^0C. The highest maximum temperature recorded in Mandla was 45^0C on May 22, 1954. The lowest minimum temperature recorded was 0.6^0 C on January 25, 1954.

Forest Types

According to Champion & Seth the forest area has been classified as follows;

- **Moist Peninsular Sal Forest (3C / C2e)**
- **South Indian Sub Tropical Moist Deciduous Forest (3B)**
- **Southern Dry Mixed Deciduous Forest (3C / C3)**
- **Southern Tropical Dry Deciduous Forest (5A)**

Practically, all the well-watered valleys of the south and especially in the Banjar and Motinala forests, Sal ***(Shorea robusta)*** grows in rich profusion, unmixed with any other species, in the reserve forest. It possesses an inexhaustible reproductive power. The seeds are shed in millions, and the seedling, shooting rapidly above the danger zone of forest fires, grow straight and tall, before they begin to spread abroad its branches.

This type (common to all parts of the Central provinces) is found more particularly in the northern, central and western parts of Mandla provided the soil is suitable, any kind of tree may be found in a mixed forest, but the most important in Mandla are the Teak ***(Tectona grandis L.),*** Sal ***(Shorea robusta),*** Saj ***(Terminalia tomentosa W. & A.),*** Bija ***(Pterocarpus marsupium Roxb.),*** Lendia ***(Lagerstroemia parviflora L.),*** Mohwa ***(Madhuca longifolia var. latifolia Roxb.),*** Achar ***(Buchanania lanzan Roxb.),*** Khair ***(Acacia catechu Willd.)***, Tendu ***(Diospyros melanoxylon Roxb.)***, Harra ***(Terminalia chebula Retz.)*** and Dhawa ***(Anogeissus latifolia Bedd.).***

Mandla has Teak forest too which is of one of the best qualities available in the state. Due to gregarious flowering in bamboos, the bamboo forest is destroyed and it is found only in the areas where it has been protected. According to recent forest resource assessments made by the forest department, the composition of forest areas with reference to their density of different crop is as follows;

Table 2: Forest area of Mandla district

Density	Forest - Crop	Area (%)
Dense	Teak	16.42
	Sal	23.04
	Miscellaneous Species	16.79
		56.25
Under Stocked	Teak	0.25
	Sal	0.21
	Miscellaneous Species	20.86
		21.32
Open Forest & Other Areas		**13.31**

Tribes and Tribal Population

Mandla district is predominantly a tribal area which is declared as a scheduled area under the constitution of India. The total population of district as per 2001 census was 12,91,313. Out of the total population, the rural population of the district is 11,28,679 and urban population 9,240. The percentage of scheduled castes and scheduled tribes are 4.87& and 65.75%, respectively. The main tribes are Gond, Baiga, Pradhan and Kol. The Gond is numerically the most predominant scheduled tribe in the district Baiga population stands second, whereas Pradhan and Kol stand on 3rd & 4th positions, respectively. Other tribes like Agariya, Andh, Bhaina, Bharia, Bhumia, Paliha, Pando, Pathari and Saroti are in less percentage.

5. METHODOLOGY

During this study the information on the diversity in Mandla district was gathered from primary survey as well as from the secondary sources, such as official record and published literature.

5.1 Secondary data

The secondary data was collected for:

a. Wild fauna
b. Cattle and Livestock
c. Fisheries
d. Agricultural diversity
e. Cultural diversity.

The work was started by carrying out survey in all the blocks and forest ranges of Mandla district. During this survey secondary information were collected from the villages and local functionaries of various departments like forest, agriculture, veterinary, tribal welfare, fisheries, and also from the forestry working plans and district census, etc. The secondary data was collected by consulting libraries and documentation sections of SFRI, TFRI, JNKVV, RDVV, ICMR and ZSI. Different books, journals and reports were consulted for the same. Compilation of existing records for faunal diversity available in the regional office of ZSI, Jabalpur has been consulted. Block development offices and local bodies were also consulted. Block wise survey was done for compilation of already existing information on agro biodiversity, fisheries, live stock with cattle diversity and cultural diversity.

5.2 Primary data

The primary data was collected for;

a. Wild flora
b. Crop germplasm
c. Ethno botanical and traditional knowledge.

Field surveys were conducted to collect data for wild flora and preparation of People's Biodiversity Registers (PBR).

5.3 People's Biodiversity Register (PBR)

Data was collected on different aspects by conducting PRA exercise at village level. List of selected village are given in **Table – 3**.

Field surveys were conducted in selected villages for preparation of People's biodiversity registers. Prescribed format furnished by M.P. State Biodiversity Board has been used for the data collection. **Format – 1**

5.4 Floral Diversity

An inventory of collected plant specimens was prepared following simultaneously the identification of plant specimens. All the collected and inventoried specimens were identified with the help of Flora of Tamil Nadu" (Nair & Henry, 1983, Henry *et al.* 1987 & 1989), Flora of Bhopal (Oommachan, 1977), Flora of Jabalpur (Oommachan & Shrivastava, 1996). Name changes were confirmed from recent literature (Bennett, 1996) and finally, the specimens were arranged in their respective families following the Bentham and Hooker's system of classification (1862-1883). Herbarium of collected plant (important medicinal and rare plants) specimens was prepared following the guidelines of Jain & Rao (1984). Relevant keys, description and illustration, if any, were used to determine the family, genus and species.

A list of all plant species found during the primary and secondary data collection for the district was prepared and arranged family wise and species wises along with specifying the rare and endangered status of the species. The collected plant specimens were also categorized habit wise as large trees, medium trees, small trees, shrubs, climbers, parasites, epiphytes, grasses and herbs. List of medicinal plants was also prepared on the bases of collected primary and secondary information. Some economically important medicinal plants were collected in the vital form of whole plants, rhizomes, corns, bulbs and seeds for their *ex-situ* conservation.

5.5 Ethnobotany

During the preparation of PBRs, village level survey was conducted to document the traditional knowledge of tribal people. For Ethno-botanical studies, the participation and involvement of tribal and local inhabitants were given prime importance. Local knowledgeable persons i.e. medicine men, ojhas, vaidyas, etc were consulted regarding their traditional knowledge.

5.6 Phytosociology

In east and west Mandla forest working plans 257 and 269 grid point have been selected for status survey of regeneration. Every fifth grid point was selected for phytosociological survey. GPS used to locate the grid point. Total 52 and 54 grid points were surveyed from east and west Mandla forest divisions, respectively.

List of selected grid point from East Mandla Forest Division

Gride No.	Comptt. No.	W.C.	Range	Latitude (North)	Longitude (East)
1	1129A	Teak S.C.I.	Mehadwani	22º57'30"	80º35'00"
2	1128a	Teak S.C.I.	Mehadwani	22º56'15"	80º32'30"
3	1126	Teak S.C.I.	Mehadwani	22º55'00"	80º33'45"
4	1073	Teak S.C.I.	Mohgaon	22º47'30"	80º36'15"
5	1060	R.D.F.	Mohgaon	22º46'15"	80º38'45"
6	1623	R.D.F.	Mohgaon	22º42'30"	80º31'15"
7	1481	Teak S.C.I.	Mohgaon	22º40'00"	80º36'15"
8	1102	Teak S.C.I.	Mohgaon	22º38'45"	80º32'30"

9	1093B	Forest Village	Mohgaon	22º48’45”	80º31’15”
10	1022	R.D.F.	Ghughari	22º42’30”	80º51’15”
11	1020	R.D.F.	Ghughari	22º41’15”	80º52’30”
12	971	R.D.F.	Ghughari	22º46’15”	80º46’15”
13	1489	Teak S.C.I.	Ghughari	22º37’30”	80º38’45”
14	1494	Teak S.C.I.	Ghughari	22º35’00”	80º38’45”
15	975	R.D.F.	Motinala	22º43’45”	80º45’00”
16	1617	Teak S.C.I.	Motinala	22º40’00”	80º35’00”
17	1452	R.D.F.	Motinala	22º27’30”	80º50’00”
18	1294B	Forest Village	Motinala	22º26’15”	80º55’00”
19	1426	Sal S.C.I.	Motinala	22º23’45”	80º52’30”
20	1417	Sal S.C.I.	Motinala	22º22’30”	80º55’00”
21	1411B	Forest Village	Motinala	22º20’00”	80º56’15”
22	1384	Sal S.C.I.	Motinala	22º20’00”	81º06’15”
23	1381	Sal S.C.I.	Motinala	22º18’45”	81º03’45”
24	1393	Sal S.C.I.	Motinala	22º17’30”	81º05’00”
25	1389	Sal S.C.I.	Motinala	22º16’15”	81º05’00”
26	1280	R.D.F.	Motinala	22º28’45”	80º51’15”
27	1495A	Teak S.C.I.	Jagmandal	22º35’00”	80º37’30”
28	1500	Teak S.C.I.	Jagmandal	22º33’45”	80º37’30”
29	1568	Teak S.C.I.	Jagmandal	22º32’30”	80º33’45”
30	1575	R.D.F.	Jagmandal	22º31’15”	80º30’00”
31	1520	Teak S.C.I.	Jagmandal	22º31’15”	80º36’15”
32	1485	R.D.F.	Jagmandal	22º36’15”	80º35’00”
33	1589	Teak S.C.I.	Jagmandal	22º35’00”	80º32’30”
34	1164	Sal S.C.I.	Mawai	22º33’45”	81º08’45”
35	1163	Sal S.C.I.	Mawai	22º32’30”	81º06’15”
36	1238	Sal S.C.I.	Mawai	22º31’15”	81º01’15”
37	1229	Sal S.C.I.	Mawai	22º30’00”	81º00’00”
38	1178	Sal S.C.I.	Mawai	22º30’00”	81º07’30”
39	1227	Sal Conservation	Mawai	22º28’45”	81º00’00”
40	1186	Sal S.C.I.	Mawai	22º28’45”	81º06’15”
41	1214B	Forest Village	Mawai	22º27’30”	81º00’00”
42	1260	Sal S.C.I.	Mawai	22º35’00”	81º02’30”
43	1196A	Sal Conservation	Mawai	22º26’15”	81º02’30”
44	1198	Sal Conservation	Mawai	22º25’00”	81º01’15”
45	1343	Sal S.C.I.	Mawai	22º25’00”	81º06’15”
46	1193	Sal S.C.I.	Mawai	22º35’00”	81º07’30”
47	1527	Teak S.C.I.	Bichiya	22º30’00”	80º40’00”
48	1549	Teak S.C.I.	Bichiya	22º28’45”	80º40’00”
49	O-310	Orenge Area	Bichiya	22º27’30”	80º45’00”
50	1533	R.D.F.	Bichiya	22º26’15”	80º40’00”
51	1512	Teak S.C.I.	Bichiya	22º32’30”	80º40’00”
52	1524	Teak S.C.I.	Bichiya	22º31’15”	80º41’15”

List of selected Grid Point form West Mandla Forest Division

Gride No.	Comptt. No.	W.C.	Sheet No.	Range	Latitude (North)	Longitude (East)
1	312A	R.D.F.	108NE/4	Niwas	23º10’00”	80º23’45”
2	211	R.D.F.	108SE/1	Niwas	23º06’15”	80º17’30”
3	311	R.D.F.	108SE/2	Niwas	23º05’00”	80º20’00”
4	292	R.D.F.	108SW/3	Barela	23º01’15”	80º00’00”
5	694	R.D.F.	108SW/4	Bijadandi	23º02’30”	80º05’00”
6	260	S.C.I.	108SW/4	109NW/2	23º01’15”	80º11’15”
7	220	R.D.F.	108SE/4	Bijadandi	23º02’30”	80º18’45”
8	222	S.C.I.	108SE/4	Bijadandi	23º01’15”	80º17’30”
9	305	R.D.F.	132SW/3	Niwas	23º01’15”	80º27’30”
10	580	S.C.I.	109NW/1	Barela	22º58’45”	80º00’00”
11	281A	S.C.I.	109NW/2	Barela	23º00’00”	80º05’00”
12	256	S.C.I.	109NW/2	Bijadandi	23º00’00”	80º11’15”
13	284	S.C.I.	109NE/1	Barela	23º57’30”	80º06’15”
14	228	S.C.I.	109NE/1	Kalpi	23º00’00”	80º18’45”
15	515	S.C.I.	109NE/1	Bijadandi	22º57’30”	80º16’15”
16	118	R.D.F.	109NE/2	Kalpi	22º58’45”	80º23’45”
17	116	R.D.F.	109NE/2	Kalpi	22º57’30”	80º25’00”
18	274	R.D.F.	109NW/3	Barela	22º55’00”	80º02’30”
19	553	S.C.I.	109NW/4	Bijadandi	22º56’15”	80º11’15”
20	263	R.D.F.	109NW/4	Barela	22º53’45”	80º06’15”
21	235B	F.V.	109NE/3	Kalpi	22º56’15”	80º16’15”
22	234	R.D.F.	109NE/3	Kalpi	22º55’00”	80º18’45”
23	108	R.D.F.	109NE/4	Kalpi	22º56’15”	80º21’15”
24	114	R.D.F.	109NE/4	Kalpi	22º55’00”	80º22’30”
25	120	F.V.	109NW/3	Tikariya	22º56’15”	80º27’30”
26	562	Pro	109SW/1	Barela	22º56’15”	79º58’45”
27	188	S.C.I.	109SW/2	Kalpi	22º51’15”	80º10’00”
28	190	Pro	109SW/2	Kalpi	22º52’30”	80º21’15”
29	P38	R.D.F.	109SE/1	Tikariya	22º50’00”	80º25’00”
30	112	S.C.I.	109SE/2	Tikariya	22º52’30”	80º21’15”
31	134	S.C.I.	109SE/2	Tikariya	22º51’15”	80º26’15”
32	137	S.C.I.	109SE/2	Tikariya	22º52’30”	80º21’15”
33	205	S.C.I.	109SW/3	Kalpi	22º48’45”	80º01’15”
34	195	R.D.F.	109SW/4	Kalpi	22º48’45”	80º10’00”
35	491	R.D.F.	109SE/3	Tikariya	22º46’15”	80º17’30”
36	138	S.C.I.	109SE/4	Tikariya	22º48’45”	80º25’00”
37	749	S.C.I.	109SE/4	Tikariya	22º46’15”	80º21’15”
38	172	S.C.I.	133SW/3	Mandla	22º48’45”	80º27’30”
39	467	R.D.F.	133SW/3	Mandla	22º46’15”	80º28’45”
40	164	S.C.I.	110NE/2	Tikariya	22º45’00”	80º22’30”

41	421	Pro	110NE/2	Mandla	22º42’30”	80º20’00”
42	434	R.D.F.	134NW/1	Mandla	22º42’30”	80º30’00”
43	32	S.C.I.	110NE/3	Mahrajpur	22º40’00”	80º12’30”
44	33	S.C.I.	110NE/3	Mahrajpur	22º38’45”	80º12’30”
45	1B	Pro	110NE/4	Mandla	22º41’15”	80º20’00”
46	7	R.D.F.	110NE/4	Mandla	22º40’00”	80º26’15”
47	100	R.D.F.	110SW/1&3	Bamhani	22º36’15”	80º02’30”
48	44	R.D.F.	110SE/1	Mahrajpur	22º35’00”	80º13’45”
49	382	R.D.F.	110SE/3	Mahrajpur	22º33’45”	80º16’15”
50	P59	R.D.F.	111NW/2	Bamhani	22º30’00”	80º07’30”
51	58	R.D.F.	111NE/4	Bamhani	22º25’00”	80º22’30”
52	359	S.C.I.	111SE/2	Bamhani	22º20’00”	80º21’15”
53	366	S.C.I.	111SE/4	Bamhani	22º18’45”	80º32’30”
54	796	R.D.F.	111SE/4	Bamhani	22º16’15”	80º26’15”

Phytosociological studies were carried out by following standard ecological methods of Mishra (1968) and Smith (1980) Quadrats were laid out accordingly in different ranges of the east and west Mandla forest divisions. Selection of sites for sampling was done on the grid points already plotted by the Working Plan Officer. Quadrats of 40m x 40m size were laid out at each grid point following Nautial *et al.* (1987). This was done to get fair representation of different forest ranges. The girth at breast height (gbh.) of all trees above 20 cm gbh in each 40m x 40m size quadrat was measured and recorded species wise following Parthasarthi & Karthikeyan (1997). Three quadrats, each of size 10m x 10 m were laid within the 40m x 40m size quadrats for sampling of shrub species, while five quadrats, each of size 1m x 1m, were also laid under the 10m x 10m size quadrats for ground flora enumeration.

The IVIs of important species were calculated by using frequency, density and abundance. The various formulae used in the study are:

$$\text{Density} = \frac{\text{No. of individuals per species}}{\text{Area of plot}}$$

$$\text{Relative Density} = \frac{\text{Density of a species}}{\text{Density of all species}} \times 100$$

$$\text{Frequency} = \frac{\text{No. of plots in which species occurs}}{\text{Total no. of plots}}$$

$$\text{Relative frequency} = \frac{\text{Frequency of a species}}{\text{Frequency of all species}} \times 100$$

$$\text{Dominance} = \frac{\text{Area of canopy covering / Basal area of a sp.}}{\text{Area of sample plot}}$$

$$\text{Relative dominance} = \frac{\text{Dominance of a species}}{\text{Dominance of all species}} \times 100$$

IVI = Relative density + Relative frequency + Relative dominance

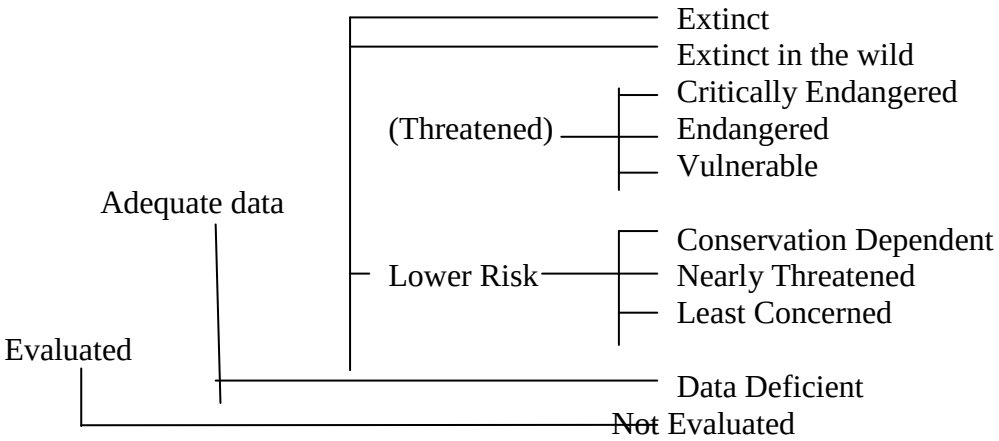
$$H = -\Sigma \left(\frac{ni}{N} \right) \log \left(\frac{ni}{N} \right)$$

Where H = Shannon Wiener Diversity Index
ni = Number of species
N = Total number of individuals
Log implies to log base 10.

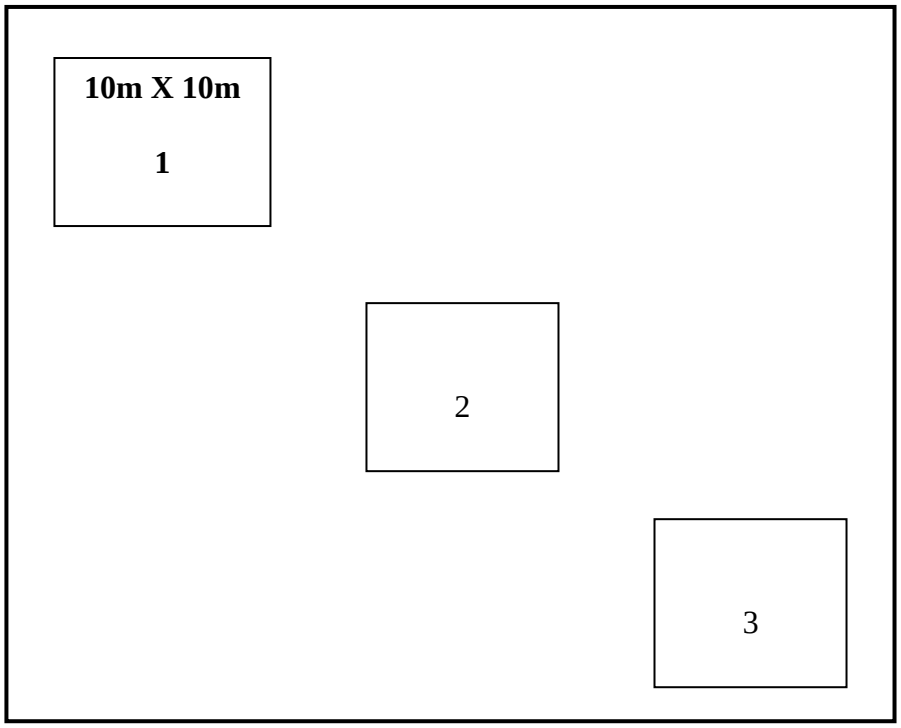
INVENTORY OF RARE AND ENDANGERED MEDICINAL PLANTS

Inventory of rare and endangered medicinal plants was prepared based on seasonal survey and available field information. Potential threats to each habitat having high diversity in medicinal and aromatic plants were listed and its degree was assessed. IUCN Red list categories for evaluating the status of medicinal plants have been followed as given below:

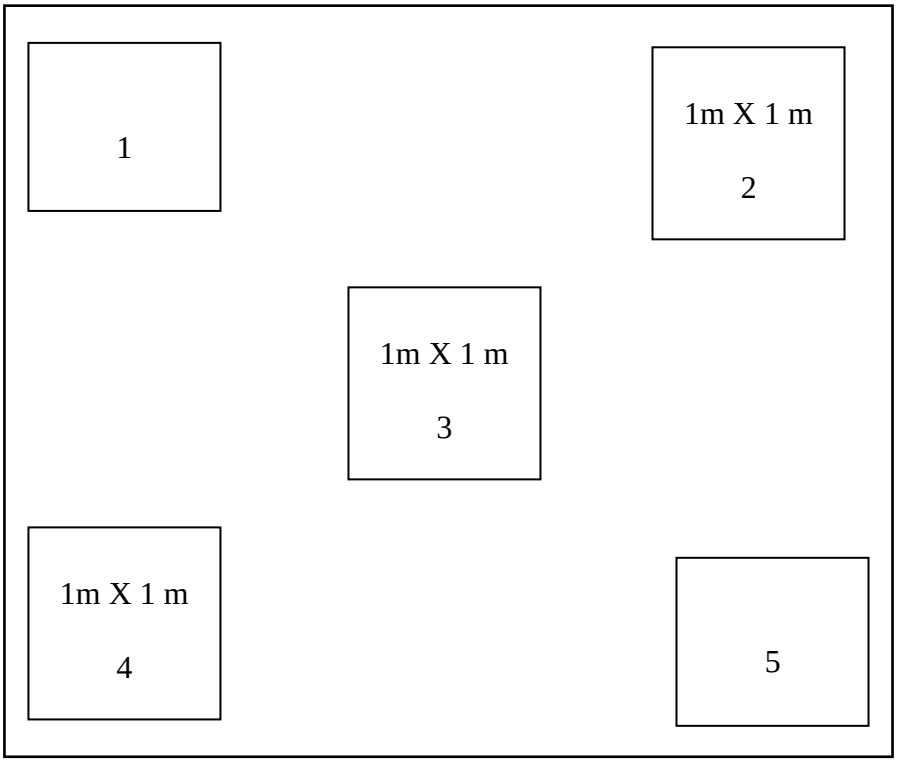
IUCN RED LIST CATEGORIES



PATTERN OF LAY OUT QUADRAT



Size of Quadrat: 40m x 40 m



Size of Quadrat: 10 x 10 m

FORMAT - 1: PEOPLE'S BIODIVERSITY REGISTER

yksd tSo fofo/krk iath izi=

1- xk¡o dh tkudkjh

xk¡o dk uke ---------- rglhy ---------- ftyk ----------

xk¡o dgka gS \ ftyk@Cykd eq[;ky; ls fdruh nwj ---------- Longitude ---------- Latitude **----------**

Hkwxksyh; lajpuk (Topography) **----------**

tyok;q (Geology) **----------**

ekSle ----------

HkkSxksfyd lajpuk (Demography) **tula[;k ---------- iq:"k ---------- efgyk ---------- cPps ---------- tutkfr ----------**

2- tSo fofo/krk ls tqM+h gekjh vkthfodk ¼jksth&jksVh½ %&

la-Ø-	**xfrfof/k;k¡**	**xfrfof/k ls fdrus ifjokj tqM+s gS**	**xfrfof/k;ksa dk pØ**	**ifjokj**	
				xk¡o okys	**ckgj ls vkus okys**
1	[ksrh ls tqM+h ,oa lacaf/kr				
2	i'kqikyu ls tqM+h ¼erL; ikyu ds lkFk½				
3	taxy ls tqM+h ,oa lacaf/kr				
4	dkjhxjh ls tqM+h				
5	vU; lsokvksa ls tqM+h 1- tSo fofo/krk laca/kh O;olk;				

3- ikfjfLFkfrdh fofo/krk (Ecosystem Diversity)

3. A. **bykdksa dk oxhZdj.k**

la-Ø-	**bykds ¼[ksrh@ty@taxy@iM+rh tehu**	**LFkkuh; uke**	**yackbZ] pkSM+kbZ vkSj xgjkbZ**	**fefYd;r**	**vkthfodk ls tqM+h xfrfof/k**

	vkfn½		**¼vuqekfur vkdkj ,oa la[;k**		

3. B **mPp izkFkfedrk okys bykds** (Landscape/Waterscape elements) **dk fooj.k**

la-Ø-	**mPp izkFkfedrk okys bykds dk fooj.k**	**LFkkuh; Hkk"kk esa uke**	**vuqekfur {ks=**	**vthfodk ls tqM+h xfrfof/k;ka**	**blls tqM+h gqbZ iztkfr**	**foxr 10 o"kksZa esa cnyko**	**cnyko dk dkj.k**

4 iztkfr vkSj mRifRrewyd fofo/krk (Species and Genetic Diversity)

4. A. **?kjsyw tSofofo/krk (Domesticated Biodiversity)**

4. A. 1 **d`f"k dh fofo/krk**

la-Ø-	**Qly ¼xsagw] pkaoy½**	**iztkfr**	**oSKkfud uke**	**fdLesa**	Germplam / landrace	**fdrus {ks= esa cksbZ tkrh gS**	**cqvkbZ dh _rq ,oa le;**	**izfr ,dM+ vuqekfur mRiknu**	**mi;ksx@fo'ks"k xq.k**

4. A. 2. **mPp izkFkfedrk okyh d`f"k iztkfr dh tkudkjh**

la-Ø-	Qly	iztkfr	oSKkfud uke	fdLesa	Character of Germplam / landrace	,xzks&DykbZesfVd tksu ftlesa Qly gksrh gS ,oa cqvkbZ dk {ks=Qy	ekSle	fdrus le; dh Qly gS	mRiknu ¼Vu½	mRikndrk ¼fdyksxzke izfr gsDVs;j½	mi;ksx ¼vkS"k/kh; mi;ksx ds lkFk½	foxr 10 o"kksZa esa cnyko@fLFkfr	

4. A. 3. **ikyrw i’kqvksa dh fofo/krk**

la-Ø-	ikyrw i’kqvksa dk uke ¼eos’kh] HkSal] cdjh] HksM+] lqvj] eqxkZ] eqxhZ vU;½	iztkfr dk LFkkuh; uke	iztkfr dk oSKkfud uke	uLysa	Non descript	tula[;k	mRiknu	lsokvksa esa mi;ksx	fLFkfr nqyZHk@foyqIrizk;@ladV esa

4. A. 4. **mPp izkFkfedrk okys ikyrw i’kqvksa dh iztkfr dh tkudkjh**

la-Ø-	ikyrw i’kqvksa dk uke ¼eos’kh] HkSal] cdjh] HksM+] lqvj] eqxkZ] eqxhZ	iztkfr dk LFkkuh; uke	iztkfr dk oSKkfud uke	uLysa	Non descript	tula[;k	mRiknu	lsokvksa esa mi;ksx	fLFkfr nqyZHk@foyqIrizk;@ladV esa

	vU;½								

4. B. **taxy dh fofo/krk %**

4. B. 1. **ouLifr dh tkudkjh ¼ouLifr isM+] ikS/ksa] >kM+h] csy] dan&ewy] ?kkal] yrk,sa vkfn½**

la-Ø-	**ouLifr dk LFkkuh; uke**	**iztkfr**	**iztkfr dk oSKkfud uke**	**Hkkx ¼fdl Hkkx dk mi;ksx gksrk gS½**	**mi;ksx ¼fdl dke esa vkrk gS½**	**mRiknu**	**fLFkfr nqyZHk@foyqIrizk;@ladV esa**

4. B. 2. **mPp izkFkfedrk okys taxy ouLifr dh iztkfr dh tkudkjh**

la-Ø-	ouLifr dk LFkkuh; uke	iztkfr	iztkfr dk oSKkfud uke	tqM+s gq;s bykds ¼taxy@[ksrh@iM+rh tehu@unh vkfn½	Hkkx ¼fdl Hkkx dk mi;ksx gksrk gS½	mi;ksx ¼fdl dke esa vkrk gS½	mi;ksxdrkZ	mRiknu	foxr 10 o"kkZsa esa cnyko	cnyko dk dkj.k

4. B. 3 **oU; izk.kh dh fofo/krk ¼Lruik;h] jsaxusokys] tyLFkypj] fpfM+;k] eNyh] dhV½**

la-Ø-	iztkfr dk LFkkuh; uke	iztkfr dk oSKkfud uke	tula[;k	fLFkfr nqZyHk@foyqIrizk;@ ladV esa

4. B. 4 **mPp izkFkfedrk okys oU; izk.kh dh iztkfr dk tkudkjh**

la-Ø-	iztkfr dk LFkkuh; uke	oSKkfud uke	tqM+s gq;s bykds ¼taxy@[ksrh@iM+rh tehu@unh vkfn½ fdl rjg ds ysaMLdsi VkbZi@lc VkbZi esa	orZeku izpqjrk ¼T;knk@e/;e@de½	foxr 10 o"kksZa esa cnyko	cnyko dk dkj.k

			ik;k tkrk gS			

5. **tSo fofo/krk vkSj laLd`fr% tSo fofo/krk ls tqM+s R;kSgkj@jhfr@fjokt**

l-Ø-	**jhfr@fjokt**	**R;kSgkj**	**eghus**	**fooj.k**	**dkSu lh iztkfr;ksa dk mi;ksx djrs gS**	**blds ihNs D;k ekU;rk gS**	**D;k izHkko gS tSofofo/krk ij**

tSo fofo/krk ls tqM+h yksd&dFkk,sa@yksdxhr@eqgkojsa@dgkorsa

6. **tkudkjh vkSj tkudkj yksx%**

la-Ø-	**tkudkj yksxksa ds uke**	**fdl rjg dk Kku**	**ck¡Vus ;ksX; Kku**	**Kku tks xqIr j[kuk pkgrs gS**

7- izca/k vkSj izca/ku ds eqn~ns% iqjkuh ijEijkxr O;oLFkk,¡ ,oa laLFkk;sa

tqM+s gq;s bykds ¼taxy@[ksrh@iM+rh tehu@unh vkfn½	**iqjkuh iajijkxr O;oLFkk**	**ekStwnk O;oLFkk**	**fdlh cnyko dh ;fn vko';drk gks**

LFkkuh; LokLF; laj{k.k ijaijk MkVk 'khV

1- tkudkj O;fDr dk uke & ----------

2- jksx dk LFkkuh; uke & ----------

3- jksx dk vaxsth uke & ----------

4- jksx dk fooj.k & ----------

'kjhj dk izHkkfor Hkkx & ----------

----

jksx dk dkj.k & ----------

----

jksx ds y{k.k & ----------

Hkkstu dk ijgst & ----------

----

oS| }kjk of.kZr jksx dh fofHkUu voLFkk,¡ & ----------

----

funkukRed y{k.k & ----------

----

izksXuksfll & ----------

1- nok dh [kqjkd & ----------

2- nok dk le; dc&dc] dSls vksj fdrus fnuksa rd & ----------

3- mipkj ds nkSjku lko/kkfu;k¡@ijgst & ----------

4- ;fn mipkj iqu% fn;k tkuk gS rks mldk fooj.k & ----------

mipkj esa mi;ksx dh xbZ vkS"kf/k dk fooj.k

Øekad	vkS"kf/k esa mi;ksx fd;s x;s fofHkUu rRoksa dk LFkkuh; uke	oSKkfud uke	Hkkx ftls mi;ksx fd;k x;k	fdruh ek=k esa mi;ksx fd;k	fo'ks"k

6. OBSERVATIONS

6.1 People's Biodiversity Register (PBR)

A set of standardized questionnaire provided by Madhya Pradesh State Biodiversity Board, Bhopal was followed and adopted for the collection of primary information with reference to preparation of People's Biodiversity Register (PBR). **(Format - 1)**

Information on population structure, land use pattern, occupation, floral, faunal, ethnobotanical and agrobiodiversity has been collected by conducting PRA method.

Total 18 PBRs were prepared and finalized. The PBR report of each village has been prepared separately. Names of villages surveyed for the preparation of PBR were given below.

Table – 3 Details of villages surveyed for PBRs preparation in Mandla district

S. No.	Name of Village	Name of Block	Name of Garm Panchayat	Name of Tehsil
1.	Bariha	Bichiya	Bariha	Bichiya
2.	Kanhari kurdh	Bichiya	Kanharikala	Bichiya
3.	Bidri	Bijadandi	Lahsar	Mandla
4.	Salhepani	Bijadandi	Salhepani	Mandla
5.	Baniya	Ghughri	Baniya	Mandla
6.	Palki	Ghughri	Duladar	Mandla
7.	Dalka	Mandla	Dalka	Mandla
8.	Jhalpani	Mandla	Jhalpani	Mandla
9.	Sathiya	Mawai	Pakhvaar	Bichiya
10.	Bargaon	Mawai	Pakhvaar	Bichiya
11.	Malpehri	Mohagaon	Githar-malpahri	Mandla
12.	Simaiya	Mohagaon	Simaiya	Mandla
13.	Sangwa	Nainpur	Alipur	Nainpur
14.	Dhanora	Nainpur	Atariya	Nainpur
15.	Bijegaon	Narayanganj	Bijegaon	Niwas
16.	Pipariya	Narayanganj	Khamariya	Niwas
17.	Majhgaon	Niwas	Majhgaon	Niwas
18.	Karondi	Niwas	Karondi	Niwas

6.2 Floral Diversity

An inventory of collected plant specimens has also been prepared. All the collected and inventoried specimens were identified with the help Flora of Tamil Nadu (Nair & Henry, 1983, Henry *et al.* 1987 & 1989), Flora of Bhopal (Oommachan, 1977) and Flora of Jabalpur (Oommachan & Shrivastava, 1996). Name changes were confirmed from recent literature (Bennett, 1996) and finally the specimens were arranged in their respective families following the Bentham and Hooker's system of classification (1862-1883).

During the field survey, an inventory of plant species available in various forest ranges, PBR villages of Mandla district was made. The plants already reported by various workers from Mandla were also incorporated during analyses of floral diversity of Mandla district. The plants were further categorized as Trees, Shrubs, Climbers, Bamboos, Parasites and Grasses. A total of 1006 plant species belonging to 310 genera of 133 families have been identified **Table – 4** & **Fig. - 1**.

Table – 4 Floristic diversity of Mandla district

Family	133
Genera	561
Species	1006

Out of total of 1006 plant species 162 tree species were identified followed by 71 species of shrubs, 681 species of herbs, 51 species of climbers, 39 species of grasses and 2 species of parasites. Mandla is rich in herbaceous species compared with other adjoining districts like Jabalpur and Seoni. **Table – 5 & Fig. – 2.**

Table – 5 Number of plant species under different habits

S. No.	Habit	Number of species
1	Tree	162
2	Shrub	71
3	Herb	681
4	Climber	51
5	Epiphytes / Parasite	2
6	Grasses / Bamboo	39
	Total	**1006**

The botanical names and families of plant species are given in **Table - 6.**

Table – 6 Name of plant species with their family

S. No.	Botanical Name	Habit	Family
1.	*Abelmoschus crinitus*	H	Malvaceae
2.	*Abelmoschus esculentus* (L.) Moench.	H	Malvaceae
3.	*Abelmoschus ficulneus* (L.) W. & A.	H	Malvaceae
4.	*Abelmoschus manihot* (Roxb.) Hochr.	H	Malvaceae
5.	*Abelmoschus moschatus* Medic.	H	Malvaceae
6.	*Abrus precatorius* Linn.	C	Fabaceae
7.	*Abutilon indicum*	H	Malvaceae
8.	*Abutilon persicum*	H	Malvaceae
9.	*Acacia Arabica*	T	Mimosaceae
10.	*Acacia auriculiformis* A. Cunn. *ex* Benth.	T	Mimosaceae
11.	Acacia caesia	T	Mimosaceae
12.	*Acacia catechu*	T	Mimosaceae
13.	*Acacia leucophloea*	T	Mimosaceae
14.	*Acacia nilotica* (L.) Willd.	T	Mimosaceae

15.	Acacia pennata	T	Mimosaceae
16.	Acacia sinuate	T	Mimosaceae
17.	*Acacia torta* (Roxb.) Criab.	T	Mimosaceae
18.	*Acalypha ciliate* Forrsk.	H	Euphorbiaceae
19.	*Acalypha indica*	H	Euphorbiaceae
20.	*Acanthospermum hispidum* DC.	H	Asteraceae
21.	*Achyranthus aspera* Linn.	H	Acanthaceae
22.	*Achyranthus bidentata* Blume	H	Acanthaceae
23.	*Acorus calamus*	H	Araceae
24.	*Acrocephalus hispidus* (Burm.) O.Ktze.	H	Lamiaceae
25.	*Actiniopteris dichotoma*	H	Actinopteridaceae
26.	*Ademwnia digitata*	H	Bombacaceae
27.	*Adenostemma angustifolium* Arn.	H	Asteraceae
28.	*Adenostemma lavenia* (Linn.) O.Ktze.	H	Asteraceae
29.	*Adhaoda vasica*	S	Acanthacea
30.	*Adiantum cappillus-veneris*	H	Adiantaceae
31.	*Adinal cordifolia*	T	Rubiaceae
32.	*Aeginetia indica* Roxb.	H	Orobranchaceae
33.	*Aegle marmelos* (Linn.) Corr.	T	Rutaceae
34.	*Aerva lanata* (L.) Juss.	H	Acanthaceae
35.	*Aerva monosonias* (L.f.) Marc.	H	Acanthaceae
36.	*Aerva sanguinolenta* (Linn.) Blume	H	Acanthaceae
37.	*Aeschynomene indica* Linn.	H	Fabaceae
38.	*Agaricus campestris*	H	Agaricaceae
39.	*Agave americana*	S	Agavaceae
40.	*Agave sissalana*	S	Agavaceae
41.	*Ageratum conyzoides*	H	Asteraceae
42.	*Ageratum houstonianum* Mill.	H	Asteraceae
43.	*Ailanthus excelsa*	T	Simaroubaceae
44.	*Alangium salviifolium*	T	Alangiaceae
45.	*Albizia amara* Boiv.	T	Mimosaceae
46.	*Albizia lebbeck*	T	Mimosaceae
47.	*Albizia odoratissima* (Linn.f.) Benth.	T	Mimosaceae
48.	*Albizia procera* Benth.	T	Mimosaceae
49.	*Alectra sessililfora* (Vahl.) Kuntze.	H	Scrophulariaceae
50.	*Allmania nodiflora* (L.) R.Br.	H	Acanthaceae
51.	*Aloe barbadensis*	H	Liliaceae
52.	*Alstonia scholaris*	H	Apocynaceae
53.	*Alternanthera pungens* H.B.K.	H	Acanthaceae
54.	*Alternanthera sessilis*	H	Amaranthaceae
55.	*Althea ludwigii* (L.) Mant.	H	Malvaceae
56.	*Alysicarpus bupleurifolius* (Linn.) DC.	H	Fabaceae
57.	*Alysicarpus hamosus*	H	Fabaceae
58.	*Alysicarpus monotifer* (L.) DC.	H	Fabaceae

59.	*Alysicarpus scariosus* Grah. *ex* Thwaites	H	Fabaceae
60.	*Alysicarpus vaginalis* (L.) DC.	H	Fabaceae
61.	*Amaranthus caudatus* Linn.	H	Acanthaceae
62.	*Amaranthus hybridus Linn.* subsp. *incruvatus* (Linn.) Thell.	H	Acanthaceae
63.	*Amaranthus spinosus*	H	Amaranthaceae
64.	*Amaranthus tricolor* Linn.	H	Acanthaceae
65.	*Amaranthus paniculatus*	H	Amaranthaceae
66.	*Amaranthus viridis* L.	H	Acanthaceae
67.	*Amberboa ramose* (Roxb.) Jeffery	H	Asteraceae
68.	*Ammania baccifera* Linn.	H	Lythraceae
69.	*Ammania multiflora* Roxb.	H	Lythraceae
70.	*Ammania tenuis* C.B.CI.	H	Lythraceae
71.	*Amorphophallus sylvaticus*	H	Araceae
72.	Ampelocissus latifolia	H	Vitaceae
73.	Ampelocissus tomentosa	H	Vitaceae
74.	*Anacardium occidentale* L.	H	Anacardiaceae
75.	*Anacyclus pyrethrum*	H	Asteraceae
76.	*Anagalis arvensis* L.	H	Primulaceae
77.	*Anaphalis sp.*	H	Asteraceae
78.	*Andrographis paniculata*	H	Acanthaceae
79.	*Andropogon intermedius*	G	Poaceae
80.	*Andropogon pumilus*	G	Poaceae
81.	*Anogeissus latifolia*	T	Combretaceae
82.	*Anisochilus carnosus* Wall.	H	Lamiaceae
83.	*Anisomeles indica* (L.) Kuntze	H	Lamiaceae
84.	*Annona reticulate*	H	Annonaceae
85.	*Annona squamosa*	S	Annonaceae
86.	*Anogeissus latifolia* (Roxb. *ex.* DC.) Wall *ex.* Bedd.	T	Combretaceae
87.	*Anogeissus pandula*	T	Combretaceae
88.	*Anotis calycina* Hk.f.	H	Rubiaceae
89.	*Anthocephalus cadamba*	T	Rubiaceae
90.	*Anthocephalus chinensis* (Lam.) A. Rich. *ex* Walp.	T	Rubiaceae
91.	*Antidesma acidum*	H	Euphorbiaceae
92.	*Antidesma diandrum*	H	Lamiaceae
93.	*Antidesma ghaesembilla*	H	Euphorbiaceae
94.	*Apluda mutica*	H	Poaceae
95.	*Ardisia solanacea* (Poir.) Roxb.	H	Myrsinaceae
96.	*Argemone maxicana*	H	Papaveraceae
97.	*Argemone ochroleuca* Sweet	H	Papeveraceae
98.	*Argostemma sarmentosum* Vahl.	H	Rubiaceae
99.	*Argyria strigosa* (Roth) Sant. & Patel	H	Convolvulaceae
100.	*Aristida funiculate*	G	Poaceae

101.	*Aristolochia bracteolata*	H	Aristolochiaceae
102.	*Aristolochia indica*	H	Aristolochiaceae
103.	*Artebotrys odoratissimus*	H	Annonaceae
104.	*Artemisia parviflora* Buch.-Ham. *ex* D.Don	H	Asteraceae
105.	*Arthraxon quartinianus*	G	Poaceae
106.	*Artocarpus heterophyllus* Lam.	T	Moraceae
107.	*Asparagus racemosus*	H	Lilliaceae
108.	*Asphodelus tenuifolius*	H	Liliaceae
109.	*Atalantia monophyla* DC.	H	Rutaceae
110.	*Atylosia scaraboides* (L.) Benth & Baker	H	Fabaceae
111.	*Azadirachta indica* A. Juss.	T	Meliacea
112.	*Bachanania lanzan*	T	Anacardiaceae
113.	*Bacopa monnieri* (L.) Penell	H	Scrophulariaceae
114.	*Bacopa procumbens* (Mill.) Greenm.	H	Scrophulariaceae
115.	*Baliospermum montanum*	T	Euphorbiaceae
116.	*Bambusa arundinacea*	G	Poaceae
117.	*Barleria cristata* Linn.	H	Acanthaceae
118.	*Barleria gibsoni* Dalzell	H	Acanthaceae
119.	*Barleria prionitis*	H	Acanthaceae
120.	*Barleria strigosa* Willd.	H	Acanthaceae
121.	*Basella rubra*	C	Basellaceae
122.	*Bauchinia purpurea* L.	T	Caesalpiniaceae
123.	*Bauhinia malabarica*	T	Caesalpiniaceae
124.	*Bauhinia purpurea*	T	Caesalpiniaceae
125.	*Bauhinia racemosa* Lamk.	T	Caesalpiniaceae
126.	*Bauhinia retusa*	T	Caesalpiniaceae
127.	*Bauhinia semla* Wunderlin	T	Caesalpiniaceae
128.	*Bauhinia vahlii*	T	Caesalpiniaceae
129.	*Bauhinia variegata* Linn.	T	Caesalpiniaceae
130.	*Begonia picta* L.	H	Begoniaceae
131.	*Bergia ammannioides* Roxb.	H	Elatinaceae
132.	*Bidens biternata* (Lour.) Merr. & Sheriff.	H	Asteraceae
133.	*Bidens pilosa*	H	Asteraceae
134.	*Biophytum reinwardtii* (Zucc.) Klotz.	H	Oxalidaceae
135.	*Biophytum petersianum* Klotz.	H	Oxalidaceae
136.	*Biophytum sensitivum*	H	Oxalidaceae
137.	*Bixa orellana* Linn.	T	Bixaceae
138.	*Blainvillea acmella* (Linn.) Philipson	H	Asteraceae
139.	*Blepharis madaraspatensis* (L.) Heyne *ex* Roth.	S	Acanthaceae
140.	*Blumea balsamifera*	H	Asteraceae
141.	*Blumea bifoliata* DC	H	Asteraceae
142.	*Blumea eriantha* DC	H	Asteraceae
143.	*Blumea fistulosa*	H	Asteraceae
144.	*Blumea fistulosa* (Roxb)	H	Asteraceae

145.	*Blumea lacera*	H	Asteraceae
146.	*Blumea laciniara* (Roxb)	H	Asteraceae
147.	*Blumea membranacea DC var. jacquemontii* (Hok.f.)Randeria	H	Asteraceae
148.	*Blumea mollis* (D.Don) Merr.	H	Asteraceae
149.	*Blumea oxydonta*DC	H	Asteraceae
150.	*Blumea virens* DC.	H	Asteraceae
151.	*Blumeopsis flava*	H	Asteraceae
152.	*Boehmeria macrophylla* (Roxb.) Gaud	H	Urticaceae
153.	*Boehmeria scabrella* (Roxb.) Gaud.	H	Urticaceae
154.	*Boerhavia diffusa* Linn.	H	Nyctaginacea
155.	*Boerhavia repens* L.	H	Nyctaginacea
156.	*Bombax ceiba* Linn.	T	Bombacaceae
157.	*Borreria stricta* (Linn.f.) C.F.W. Mey	H	Rubiaceae
158.	*Boswellia serrata*	T	Buseraceae
159.	*Bougainvillea glabra* Choisy	C	Nyctaginacea
160.	*Bouganvillea spectabilis* Willd.	C	Nyctaginacea
161.	*Brassica campestris* (L.)	H	Brassicaceae
162.	*Brassica juncea* (Linn*)*	H	Brassicaceae
163.	*Brassica napus* Linn.	H	Brassicaceae
164.	*Brassica rapa* L.	H	Brassicaceae
165.	*Briedelia retusa*	T	Euphorbiaceae
166.	*Buchanania lanzan* Spreng.	T	Anacardiaceae
167.	*Buddleja asiatica* Lour	H	Buddlejaceae
168.	*Bupleurum ramosissimum* W. & A. var. *wightii (*P.Muell.) Bennet	H	Apiaceae
169.	*Bursera serrata* Roxb.	T	Burseraceae
170.	*Butea monosperma*	T	Fabaceae
171.	*Butea parviflora* Roxb.	T	Fabaceae
172.	*Butea superba* Roxb.	C	Fabaceae
173.	*Bytteneri herbacea* Roxb.	T	Sterculiaceae
174.	*Caesalpinia bonduc* (L.) Roxb.	C	Caesalpiniaceae
175.	*Caesalpinia bonducella*	C	Caesalpiniaceae
176.	*Caesalpinia decapetala* (Roth.) Alston	C	Caesalpiniaceae
177.	*Caesulia axillaries* Roxb.	H	Asteraceae
178.	*Cajanus cajan* (Linn.) Millsp.	S	Fabaceae
179.	*Callistemon cirrinus*	T	Myrtaceae
180.	*Callistemon lanceolatus* DC.	T	Myrtaceae
181.	*Calotropis gigantean* (L.) W.T.Ait.	S	Asclepiadaceae
182.	*Calotropis procera* (Ait.) R.Br.	S	Asclepiadaceae
183.	*Calycopteris floribunda*	T	Combretaceae
184.	*Campanula benthamii* Wall. *ex.* Kitanmura	H	Campanulaceae
185.	*Canavalia gladiata*	H	Fabaceae
186.	*Canscora decurrens* Dalz.	H	Gentianaceae
187.	*Canscora decussata* (Roxb.) J.A. & J.H.	H	Gentianaceae

	Schult.		
188.	*Canscora diffusa* (Vahl.) R.Br.	H	Gentianaceae
189.	*Canthium dicoccom* (Gaertn.) Teysmamm & Binnedijk	H	Rubiaceae
190.	*Canthium parviflorum*	H	Rubiaceae
191.	*Capparis deciduas* Edgew.	C	Capparaceae
192.	*Capparis zeylanica* L.	C	Capparaceae
193.	*Capsicum annuum* L.	H	Solanaceae
194.	*Capsicum frutescens* L.	H	Solanaceae
195.	*Cardiospermum halicacabum*	C	Sapindaceae
196.	*Careya arborea*	T	Lecythidaceae
197.	*Carica papaya* Linn.	T	Caricaceae
198.	*Carissa carandus* L.	S	Caricaceae
199.	Carissa opaca	S	Apocynaceae
200.	*Carthacanthus pusilus* (Murr.) G. Don	H	Apocynaceae
201.	*Carthamus tinctorius* L.	H	Asteraceae
202.	*Cartharanthus roseus* (Linn.) G. Don	H	Apocynaceae
203.	*Carvia callosa* (Nees) Bremek.	S	Acanthaceae
204.	*Casearia elliptica*	T	Flacourtiaceae
205.	*Casearia graveolens*	T	Flacourtiaceae
206.	*Casia fistula*	T	Caesalpiniaceae
207.	*Casia siamea*	T	Caesalpiniaceae
208.	*Cassia absus* L.	T	Caesalpiniaceae
209.	*Cassia alata* L.	T	Caesalpiniaceae
210.	*Cassia auriculata* L.	T	Caesalpiniaceae
211.	*Cassia fistula* L.	T	Caesalpiniaceae
212.	*Cassia mimosoides* Linn.	H	Caesalpiniaceae
213.	*Cassia obtusifolia* L.	S	Caesalpiniaceae
214.	*Cassia occidentalis* Linn.	S	Caesalpiniaceae
215.	*Cassia pumila* Lam.	H	Caesalpiniaceae
216.	*Cassia tora* Linn.	H	Caesalpiniaceae
217.	*Cassine glauca* (Rottb.) O. Kuntze	T	Celastraceae
218.	*Casurina equisetifolia* L.	T	Casurinaceae
219.	*Catharanthus pusillus*	H	Apocynaceae
220.	*Catharanthus roseus*	H	Apocynaceae
221.	*Catunaregum nilotica* (Stapf.) Tirvengadum	T	Rubiaceae
222.	*Catunaregum spinosa* (Thonb.) Tirvengadum	T	Rubiaceae
223.	*Cayratia pedata*	C	Vitaceae
224.	*Celastrus paniculatus* Willd.	C	Celastraceae
225.	*Celosia argentea* Linn.	H	Acanthaceae
226.	*Celtis tetrandra* Roxb.	T	Ulmaceae
227.	*Cenchrus ciliaris*	G	Poaceae
228.	*Centella asiatica* (Linn.) Urban	H	Apiaceae
229.	*Centipeda minima* (Linn.)A.Br.Aschers.	H	Asteraceae
230.	*Centranthera nepalensis* D.Don.	H	Scrophulariaceae

231.	*Centrantherum anthelminticum* (Willd.)O.ktze.	H	Asteraceae
232.	*Cephalostigma hookeri* C.B.CI.	H	Campanulaceae
233.	*Ceratophyllum demersum*	H	Ceratophylla-ceae
234.	*Ceropegia hirsute* Wight & Arn.	C	Asclepiadaceae
235.	*Cestrum nocturnum* L.	H	Solanaceae
236.	*Chenopodium album* Linn.	H	Chenopodiaceae
237.	*Chionachne koenigii*	G	Poaceae
238.	*Chlorophytum arundinaceum*	H	Liliaceae
239.	*Chlorophytum tuberosum*	H	Liliaceae
240.	*Chloroxylon swietenia* DC.	T	Rutaceae
241.	*Chrozophora prostrate* Dalz. var. prostrate	H	Euphorbiaceae
242.	*Chrozophora rottleri* (Geisler) A. Juss.*ex* Spreng.	H	Euphorbiaceae
243.	*Chrysopogon montanus*	G	Poaceae
244.	*Chysanthellum americanum* (L.)Vatke	H	Asteraceae
245.	*Chysanthellum indicum* Dc.	H	Asteraceae
246.	*Cissampelos pariera* Linn.	C	Menispermaceae
247.	*Cissus quadrangularis*	H	Vitaceae
248.	*Cissus rependa*	H	Vitaceae
249.	*Citrullus colocynthis*	H	Cucurbitaceae
250.	*Citrus aurantium* Linn.	C	Rutaceae
251.	*Citrus medica* L.	S	Rutaceae
252.	*Cleistanthus collinus* (Roxb.) Muell.	H	Euphorbiaceae
253.	*Clematis gouriana* Roxb. *ex* DC.	C	Ranunculaceae
254.	*Clematis smilacifolia* Wall.	C	Ranunculaceae
255.	*Clematis triloba* Heyne *Ex* Roth	C	Ranunculaceae
256.	*Cleome chelidonii* L.	H	Capparaceae
257.	*Cleome gynandra*	H	Capparaceae
258.	*Cleome monophylla* Linn.	H	Capparaceae
259.	*Cleome viscose* Linn.	H	Capparaceae
260.	*Clerodendron viscosum*	S	Verbenaceae
261.	*Clerodendrum indicum*	S	Verbenaceae
262.	*Clerodendrum serratum*	S	Verbenaceae
263.	*Clerodendrum phlomidis*	S	Verbenaceae
264.	*Clinopodium umbrosum* (Bieb.) Koch.	H	Lamiaceae
265.	*Clinus oppositifolius* (L.) A.DC.	H	Molluginaceae
266.	*Clitoria angulata*	C	Fabaceae
267.	*Clitoria ternatea* Linn.	C	Fabaceae
268.	*Conyza canadensis*	H	Asteraceae
269.	*Coccinia grandis* (L.) Voigt.	C	Cucurbitaceae
270.	*Cocculus hirsutus*	C	Menispermaceae
271.	*Cochlospermum religiasum*	T	Cochlospermaceae
272.	*Coculus hirsutus* (L.) Diels.	C	Menispermaceae
273.	*Coffea Arabica* L.	S	Rubiaceae
274.	*Coix lacryma-jobi*	G	Poaceae

275.	*Coldenia procumbens*	H	Boraginaceae
276.	*Colebrookea oppositifolia*	S	Lamiaceae
277.	*Coleus barbatus* (Poir.) Briq.	H	Lamiaceae
278.	*Coleus scutellarioides* (L.) Benth.	H	Lamiaceae
279.	*Colocasia indica*	H	Araceae
280.	*Combretum nanum* Buch.-Ham.	C	Combretaceae
281.	*Combretum roxburghii* Spreng.	T	Combretaceae
282.	*Conyza bonariensis* L.	H	Asteraceae
283.	*Conyza japonica* Less.	H	Asteraceae
284.	*Conyza leucantha (DDon)*Ludlow&Raven	H	Asteraceae
285.	Conyza stricta *Willd*	H	Asteraceae
286.	*Conyza viscidula* wall	H	Asteraceae
287.	*Corchorus aestuans* Linn. (Forsk.)	H	Tiliaceae
288.	*Corchorus ericoides* Rettl. *ex* Willd.	H	Tamaricaceae
289.	*Corchorus fasicularis* Lamk.	H	Tiliaceae
290.	*Corchorus olitorius* Linn.	H	Tiliaceae
291.	*Cordia dichotoma* G.Forst.	T	Boraginaceae
292.	*Cordia macleodii*(Griff)	T	Boraginaceae
293.	*Cordia myxa*	T	Ehretiaceae
294.	*Cordiospermum halicacabum* L.	C	Sapindaceae
295.	*Cosmos bipinnatus* Cav.	S	Asteraceae
296.	*Cosmos sulphureus* Cav.	S	Asteraceae
297.	*Costus speciosus*	S	Costaceae
298.	*Crassocephalum crepidioides* (Benth) S.Moore	H	Asteraceae
299.	*Crepis acaulis* Hook.f.	H	Asteraceae
300.	*Crinum asiaticum*	H	Amarylideaceae
301.	*Crinum difixum*	H	Amarylideaceae
302.	*Crotalaria juncea*	H	Fabaceae
303.	*Crotolaria alata* Buch-Ham	H	Fabaceae
304.	*Crotolaria calycina* Schrank	H	Fabaceae
305.	*Crotolaria humifusa* Grah.	H	Fabaceae
306.	*Crotolaria nana* Burm.f.	H	Fabaceae
307.	*Crotolaria medicaginea* Lam.	H	Fabaceae
308.	*Crotolaria mysorensis* Roth	H	Fabaceae
309.	*Crotolaria prostate* Rottb. *ex* Willd	H	Fabaceae
310.	*Crotolaria sericea* Retz.	H	Fabaceae
311.	*Crotolaria sessiliflora* Linn.	H	Fabaceae
312.	*Crotolaria spectabilis* Roth.	H	Fabaceae
313.	*Croton roxburghii* Balakrishnana	H	Euphorbiaceae
314.	*Cryptolepis buchnanii* R. & S.	C	Asclepiadaceae
315.	*Cucumis melo* L.	C	Cucurbitaceae
316.	*Cucumis sativus* Linn.	C	Cucurbitaceae
317.	*Cucumis setosus*	C	Cucurbitaceae
318.	*Curculigo orchioides*	H	Hypoxidaceae

319.	*Curcuma amada*	H	Zingiberaceae
320.	*Curcuma angustifolia*	H	Zingiberaceae
321.	*Curcuma aromatica*	H	Zingiberaceae
322.	*Curcuma caesia*	H	Zingiberaceae
323.	*Cuscuta reflexa* Roxb.	C	Convolvulaceae
324.	*Cyathocline purpurea* (Buch. ham. ex. D. Don.) O.Ktze.	H	Asteraceae
325.	*Cyclea peltata*	H	Menispermaceae
326.	*Cylista scariosa* Ait.	H	Fabaceae
327.	*Cymbopogon martini*	G	Poaceae
328.	*Gymnema sylvestre* Wight & Arn.	C	Asclepiadaceae
329.	*Cynodon dactylon*	G	Poaceae
330.	*Cynoglossum lanceolatum* L.	H	Boraginaceae
331.	*Cyperus rotundus*	G	Cyperaceae
332.	*Cyperus scariosus*	G	Cyperaceae
333.	*Dalbergia lanceolaria* Linn.	T	Fabaceae
334.	*Dalbergia latifolia* Roxb.	T	Fabaceae
335.	*Dalbergia paniculata*	T	Fabaceae
336.	*Dalbergia sissoo* Roxb. *ex* DC.	T	Fabaceae
337.	*Dalbergia volubilis* Roxb.	T	Fabaceae
338.	*Datura metel* L.	S	Solanaceae
339.	*Datura stramonium* L.	S	Solanaceae
340.	*Delonix elata*	T	Caesalpiniaceae
341.	*Delonix regia*	T	Caesalpiniaceae
342.	*Dendrocalamus strictus*	G	Poaceae
343.	*Dendrophthoe falcata* (Linn.f.) Etting.	P	Loranthaceae
344.	*Dentella repens* J.R. & G. Forst.	H	Rubiaceae
345.	*Deophinium ajacis* L.	H	Ranunculaceae
346.	*Desmodium benthamii* Balakr.	H	Fabaceae
347.	*Desmodium dichotomum* (Willd.) DC.	H	Fabaceae
348.	*Desmodium ferrugineum*	H	Fabaceae
349.	*Desmodium gangeticum* (Linn.) DC.	H	Fabaceae
350.	*Desmodium heterocarpum* (Linn.) DC.	H	Fabaceae
351.	*Desmodium mostorium* (Houtt.) Merr.	H	Fabaceae
352.	*Desmodium pulchellum*	H	Fabaceae
353.	*Desmodium triflorum* (Linn.) DC.	H	Fabaceae
354.	*Desmodium velutinum* (Willd.) DC.	H	Fabaceae
355.	*Dichanthium annulatum*	G	Poaceae
356.	*Dicliptera verticiliata* (Forssk.) C. Christensen	H	Acanthaceae
357.	*Dicrocephala integrifolia* (Linn.f.) O.Ketze.	H	Asteraceae
358.	*Dillemia pentagyna*	T	Dilleniaceae
359.	*Dillenia aurea* Sm.	T	Dilleniaceae
360.	*Dioscorea belophylla*	C	Dioscoreaceae
361.	*Dioscorea bulbifera*	C	Dioscoreaceae
362.	*Dioscorea hispida*	C	Dioscoreaceae

363.	*Dioscorea pentaphylla*	C	Dioscoreaceae
364.	*Dioscorea puber*	C	Dioscoreaceae
365.	*Diospyros malabarica* (Ders.) Kostel	T	Ebenaceae
366.	*Diospyros melanoxylon* Roxb.	T	Ebenaceae
367.	*Diospyros sylvatica* Roxb.	T	Ebenaceae
368.	*Diplocyclos palmatus*	C	Cucurbitaceae
369.	*Dipspyros lancifolia* Roxb.	T	Ebenaceae
370.	*Dipterocanthus beddomei* C.B.Cl. & Sant.	S	Acanthaceae
371.	*Dipterocanthus prostratus* (Poir.) Nees	S	Acanthaceae
372.	*Dipterocanthus suffruticosa* (Roxb.) Voigt	S	Acanthaceae
373.	*Dodonaea angustifolia* L.f.	S	Sapindaceae
374.	*Dodonaea viscosa*	S	Sapindaceae
375.	*Dolichos uniflorus* Lam.	C	Fabaceae
376.	*Drosera burmanii* Vahl.	H	Droseraceae
377.	*Drosera indica* Linn.	H	Droseraceae
378.	*Drymaria cordata* (L.) Willd. *ex.* Roem. & Schult	H	Caricaceae
379.	*Drynaria quercifolia*	H	Polypodiaceae
380.	*Dumasia villosa* DC.	H	Fabaceae
381.	*Dyschoriste nagchana* (Nees) Bennet.	H	Acanthaceae
382.	*Eclipta alba*	H	Asteraceae
383.	*Eclipta prostrate* (Linn)	H	Asteraceae
384.	*Ehretia laevis* Rroxb.	S	Boraginaceae
385.	*Elaeodendron glaucum*	T	Celastraceae
386.	*Elatostema cuneatum* Wight	H	Urticaceae
387.	*Erigeron bonariensis*	H	Asteraceae
388.	*Elepthantopus scaber* Linn.	H	Asteraceae
389.	*Eliotis monophylia* (N. Burm.) DC.	H	Fabaceae
390.	*Elretia laevis*	T	Ehretiaceae
391.	*Embelia tsjeriam-cottam*	S	Myrsinaceae
392.	*Embelica basal* (Roem. & Schult.) A.DC.	S	Myrsinaceae
393.	*Emblica officinalis*	T	Euphorbiaceae
394.	*Emilia sonchifolia* (Linn.) DC	H	Asteraceae
395.	*Enicostema axillare* (Lam.) Raynal	H	Gentianaceae
396.	*Eragrostis tenella*	G	Poaceae
397.	*Eranthemum purpurascens* Wight *ex* Nees	H	Acanthaceae
398.	*Eriolaena candollei* Wall.	H	Sterculiaceae
399.	*Erycibe paniculata* Roxb.	H	Convolvulaceae
400.	*Erythrina suberosa* Roxb.	H	Fabaceae
401.	*Eucalyptus camaldulensis* Dehnh.	T	Myrtaceae
402.	*Eucalyptus citriodora* Hook.	T	Myrtaceae
403.	*Eucalyptus* sp.	T	Myrtaceae
404.	*Eucalyptus tereticornis* Sm.	T	Myrtaceae
405.	*Eulalia trispicata*	G	Poaceae
406.	*Eulaliopsis binata*	G	Poaceae

407.	*Euphorbia antiquorum*	H	Euphorbiaceae
408.	*Euphorbia chamaesyce* L.	H	Euphorbiaceae
409.	*Euphorbia drancunculoides* Lam.	H	Euphorbiaceae
410.	*Euphorbia heterophylla* L.	H	Euphorbiaceae
411.	*Euphorbia hirta* Linn. Marwahi	H	Euphorbiaceae
412.	*Euphorbia hyperiicifolia* L.	H	Euphorbiaceae
413.	*Euphorbia ligularia*	H	Euphorbiaceae
414.	*Euphorbia neriifolia* Linn.	H	Euphorbiaceae
415.	*Euphorbia perbracteata* Gauge	H	Euphorbiaceae
416.	*Euphorbia thymifolia* L.	H	Euphorbiaceae
417.	*Euphorbia tirucalli*	H	Euphorbiaceae
418.	*Euphorbia prostrata*	H	Convolvulaceae
419.	*Evolvulus alsinoides*	H	Convolvulaceae
420.	*Evolvulus nummularis* (L.)	H	Convolvulaceae
421.	*Exacum carinatum* Roxb.	H	Gentianaceae
422.	*Exacum pedunculatum* Linn.	H	Gentianaceae
423.	*Exacum tetragonum* Roxb.	H	Gentianaceae
424.	*Feronia limonia*	H	Rutaceae
425.	*Ficus arnottiana* Miq.	T	Moraceae
426.	*Ficus benghalensis* Linn.	T	Moraceae
427.	*Ficus benjamina* L. ssp. *comosa* (Roxb.) Panigr.	T	Moraceae
428.	*Ficus carica* Roxb.	T	Moraceae
429.	*Ficus hispida* Linn.f.	T	Moraceae
430.	*Ficus microcarpa* Linn.	T	Moraceae
431.	*Ficus mollis* Vahl.	T	Moraceae
432.	*Ficus racemosa* Linn.	T	Moraceae
433.	*Ficus religiosa* Linn.	T	Moraceae
434.	*Ficus rumphii* Blume	T	Moraceae
435.	*Ficus semicordata* Buch.-Ham. J.F. Smith	T	Moraceae
436.	*Ficus tinctoria* G.Forst. ssp. *parasitica* (Koenig *ex* Willd.) Corner	T	Moraceae
437.	*Ficus virens* Ait.	T	Moraceae
438.	*Flacourtia indica* (Borm.f.) Merr.	S	Flacourtiaceae
439.	*Flemingia macrophylla* (Willd.) Kuntze *ex* Merr.	S	Fabaceae
440.	*Flemingia nana* Roxb.	S	Fabaceae
441.	*Flemingia semialata* Roxb. *ex* Ait	S	Fabaceae
442.	*Flemingia strobilifera* (L.) W. Ait.	S	Fabaceae
443.	*Galinsoga parviflora* Cav.	H	Asteraceae
444.	*Gardenia gummifera* L.f.	T	Rubiaceae
445.	*Gardenia latifolia* Ait.	T	Rubiaceae
446.	*Gardenia resinifera* Roth.	T	Rubiaceae
447.	*Gardenia turgida* Roxb.	T	Rubiaceae
448.	*Garuga pinnata* Roxb.	T	Burseraceae

449.	*Gendurussa vulgaris* Nees	H	Acanthaceae
450.	*Geranium mascatense* Boiss.	H	Geraniaceae
451.	*Girardinia diversifolia* (Link.)	H	Urticaceae
452.	*Glinus lotoides* L.	H	Molluginaceae
453.	*Glochidion multiloculare* Voight.	H	Euphorbiaceae
454.	*Glochidion velutinum* Wight	H	Euphorbiaceae
455.	*Glochidion zeylanicum* (Gaertn.) A. Juss.	H	Euphorbiaceae
456.	*Gloriosa superba*	C	Liliaceae
457.	*Glossocarida basvellea*(L.f.)DC	H	Asteraceae
458.	*Gmelina arborea*	T	Verbenaceae
459.	*Gnaphalium affine* D.Don.	H	Asteraceae
460.	*Gnaphalium pennysylvanicum* Willd.*)*	H	Asteraceae
461.	*Gnaphalium polycaulon* Pers	H	Asteraceae
462.	*Gomphrena celosioides* Mart.	H	Acanthaceae
463.	*Gossypium arboreum* Linn.	H	Malvaceae
464.	*Grangea maderaspantana* (L.)Poir	S	Asteraceae
465.	*Grevelea excelsa*	H	Proteaceae
466.	*Grevillea robusta* A. Cunn. *ex* R.Br.	H	Proteaceae
467.	*Grewia hirsuta* Vahl.	H	Tiliaceae
468.	*Grewia rothii* DC.	H	Tiliaceae
469.	*Grewia serrulata* DC.	H	Tiliaceae
470.	*Grewia subinaequalis* DC.	H	Tiliaceae
471.	*Grewia tiliaefolia* Vahl.	H	Tiliaceae
472.	*Guizotia abyssynica* Cass	H	Asteraceae
473.	*Gymnema sylvestre*	C	Asclepiadaceae
474.	*Haldina cordifolia* (Roxb.) Hk. f. *ex* Brand.	T	Rubiaceae
475.	*Hamiltonia suaveolens*	H	Rubiaceae
476.	*Hardwickia binata*	T	Caesalpiniaceae
477.	Hedychium coronarium	S	Zingiberaceae
478.	*Hedyotis pinifolia* Wall. *ex* G.Don.	H	Rubiaceae
479.	*Helicteres isora* L.	S	Sterculiaceae
480.	*Helinus lanceolatus* Brand.	H	Rhamnaceae
481.	*Heliotropium indicum* L.	H	Boraginaceae
482.	*Heliotropium ovalifolium* L.	H	Boraginaceae
483.	*Heliotropium strigosum* Willd.	H	Boraginaceae
484.	*Hemidesmus indicus* (Linn.) Schult.	H	Asclepiadaceae
485.	*Hemigraphis latebrosa* (Heyne *ex* Roth) Nees	H	Acanthaceae
486.	*Heteropogon contortus*	G	Poaceae
487.	*Hibiscus lobatus* (J.A. Murray) O. Ktze.	S	Malvaceae
488.	*Hibiscus panduriformis* N. Burm.	S	Malvaceae
489.	*Hibiscus rosasinensis*	S	Malvaceae
490.	*Hibiscus subdariffa* L. ssp. *subadariffa* L.	S	Malvaceae
491.	*Hibiscus syriacus* Linn.	S	Malvaceae
492.	*Holarrhena antidysenterica*	S	Apocynaceae

493.	*Holarrhena pubescens* (Buch-Ham.) Wallich. *ex* G. Don	S	Apocynaceae
494.	*Holoptelea integrifolia*	T	Ulmaceae
495.	*Holostemma adakodien*	H	Asclepiadaceae
496.	*Homonoia eiparia*	H	Euphorbiaceae
497.	*Homonoia riparia* Linn.	H	Euphorbiaceae
498.	*Hoppea dichotoma* Willd.	H	Gentianaceae
499.	*Hydrocotyle sibthorpioides* Lam.	H	Apiaceae
500.	*Hygrophila auriculata* (Schum.) Heyne	H	Acanthaceae
501.	*Hygrophylla balsamica* (L.F.) Raf.	H	Acanthaceae
502.	*Hygrophylla incana* Nees	H	Acanthaceae
503.	*Hygrophylla polysperma* T.And.	H	Acanthaceae
504.	*Hygrophylla schuli* (Ham.) M.R. & S.M.	H	Acanthaceae
505.	*Hymenodictyon excelsum*	H	Rubiaceae
506.	*Hymenodictyon orixense* (Roxb.) Mabbreley	H	Rubiaceae
507.	*Hypericum laxum* (BI.) Koidzumi	H	Hypericaceae
508.	*Hyptis suaveolens* (L.) Poiteau	H	Lamiaceae
509.	*Ichnocarpus frutescens* (L.) R.Br.	H	Apocynaceae
510.	*Impatiens balsamina* Linn.	H	Balsaminaceae
511.	*Imperata cylindrica*	G	Poaceae
512.	*Indigofera astragalina* DC.	H	Fabaceae
513.	*Indigofera cassioides* Rottl. *ex* DC.	H	Fabaceae
514.	*Indigofera glabra* L.	H	Fabaceae
515.	Indigofera glandulosa	H	Fabaceae
516.	*Indigofera linifolia* (L.f.) Retz.	H	Fabaceae
517.	*Indigofera linifolia* (L.f.) Retz. Ssp. c*ampbelli* (Wt.) Panigr. *et* S.K. Murti	H	Fabaceae
518.	*Indigofera linifolia* (L.f.) Retz. Ssp. l*innaei* Ali	H	Fabaceae
519.	*Indigofera pulchella*	H	Papilionaceae
520.	*Indigofera tinctoria*	H	Fabaceae
521.	*Indigofera trifoliata* Linn.	H	Fabaceae
522.	*Indoneesiella echiolides* (L.) Sreem.	H	Acanthaceae
523.	*Ipomoea aquatica* Forsk.	H	Convolvulaceae
524.	*Ipomoea batata*	H	Convolvulaceae
525.	*Ipomoea cairica* (Linn.) Sweet	H	Convolvulaceae
526.	*Ipomoea carnea* Jacq. ssp. *fistulosa* (Mart. & Choisy)	H	Convolvulaceae
527.	*Ipomoea eriocarpa* R. Br.	H	Convolvulaceae
528.	*Ipomoea hederifolia* Linn.	H	Convolvulaceae
529.	*Ipomoea nil* (Linn.) Roth.	H	Convolvulaceae
530.	*Ipomoea obscura* (L.) Ker.-Gawl.	H	Convolvulaceae
531.	*Ipomoea palmate*	H	Convolvulaceae
532.	*Ipomoea pestigridis* L.	H	Convolvulaceae
533.	*Ipomoea purpurea*	H	Convolvulaceae
534.	*Ipomoea quamoclit* Linn.	H	Convolvulaceae

535.	*Ipomoea sinensis* (Desf.) Choisy	H	Convolvulaceae
536.	*Iseilema prostratum*	G	Poaceae
537.	*Ixora parviflora*	T	Rubiaceae
538.	*Ixora pavetta* Andrews	H	Rubiaceae
539.	*Jacaranda mimosifolia*	H	Bignoniaceae
540.	*Jasminum officianale* Linn.	H	Oleaceae
541.	*Jasminum sambac* Ait.	H	Oleaceae
542.	*Jasminum aborescens* Roxb.	H	Oleaceae
543.	*Jasminum auriculatum* Vahl.	H	Oleaceae
544.	*Jasminum brevipetiolatum* Duthie.	H	Oleaceae
545.	*Jasminum grandiflorum* Linn.	H	Oleaceae
546.	*Jasminum multiflorum* L.	H	Oleaceae
547.	*Jasminum sambac*	H	Oleaceae
548.	*Jatropha curcas* Linn.	S	Euphorbiaceae
549.	*Jatropha gossypifolia* L.	S	Euphorbiaceae
550.	*Justicia betonica* Linn.	H	Acanthaceae
551.	*Justicia diffusa* Willd.	H	Acanthaceae
552.	*Justicia quinqueangularis* Koen. *ex* Roxb.	H	Acanthaceae
553.	*Justicia simplex* D.Don.	H	Acanthaceae
554.	*Kalanchoe pinnata* (Lam.) Pers.	H	Crassulaceae
555.	*Kigelia africana*	H	Bignoniaceae
556.	*Knoxia sumattrense* (Retz.) DC.	H	Rubiaceae
557.	*Kydia calycina* Roxb.	T	Malvaceae
558.	*Lablab purpurens* L.	T	Fabaceae
559.	*Lagascea mollis* Cav.	H	Asteraceae
560.	*Lagenaria siceraria*	H	Cucurbitaceae
561.	*Lagerstroemia parviflora* Roxb.	H	Lythraceae
562.	*Laggera alata* (D.Don)Schultz-Bip	H	Asteraceae
563.	*Laggera crispa* (Vahl*)*	H	Asteraceae
564.	*Lannea grandis*	H	Anacardiaceae
565.	*Lantana camara*	S	Verbenaceae
566.	*Lathyrus sativus* L.	H	Fabaceae
567.	*launaea aspliniifolia* (Willd)Hook.f.	H	Asteraceae
568.	*Launaea nudicaulis* Less	H	Asteraceae
569.	*Lavandula bipinnata* (Roth) O. Ktze. var. *rothiana* O. Ktze.	H	Lamiaceae
570.	*Lawsonia inermis* L.	S	Lythraceae
571.	*Lecanthus peduncularis* (Wallich. *ex* Royle) Wedd.	H	Urticaceae
572.	*Leea alata* Edgew.	H	Leeaceae
573.	*Leea asiatica* (L.) Ridsdale	H	Leeaceae
574.	Leea crispa	H	Leeaceae
575.	*Leea indica* (N. Burm.) Merr.	H	Leeaceae
576.	Leea macrophylla	H	Leeaceae
577.	*Leonotis nepetifolia* (L.) R.Br.	S	Lamiaceae

578.	*Lepidagathis cristata* Willd.	H	Acanthaceae
579.	*Lepidagathis hamiltoniana* Wall. *ex* Nees	H	Acanthaceae
580.	*Lepidagathis incurve* D.Don.	H	Acanthaceae
581.	*Lepidagathis purpuricaulis* Nees	H	Acanthaceae
582.	*Lepidagathis trinervis* Wall *ex* Nees	H	Acanthaceae
583.	*lepidum sativum*	H	Brassicaceae
584.	*Leptadenia reticulate* (Retz.) Wight & Arn.	H	Asclepiadaceae
585.	*Leucaena leucocephala*	H	Mimosaceae
586.	*Leucas aspera* (Willd.) Link	H	Lamiaceae
587.	*Leucas cephalotes* (Roth) Spreng.	H	Lamiaceae
588.	*Leucas mollissima* Wall. *ex* Benth.	H	Lamiaceae
589.	*Limnophila aromatica* (Lamk.) Merrill	H	Scrophulariaceae
590.	*Limnophila chinensis* (Osbeck.) Merr.	H	Scrophulariaceae
591.	*Limnophila connata* (Buch.-Ham.) Handel.-Mazzet.	H	Scrophulariaceae
592.	*Limnophila indica* (Linn.) Druce.	H	Scrophulariaceae
593.	*Limnophila rugosa* (Roxb.)	H	Scrophulariaceae
594.	*Limonia acidissima* L.	H	Rutaceae
595.	*Lindenbergia indica* (L.) Vatke	H	Scrophulariaceae
596.	*Linderia antipoda* (L.) Alston	H	Scrophulariaceae
597.	*Lindernia anagallis* (Burm.f.) Pennell	H	Scrophulariaceae
598.	*Lindernia ciliata* (Cilsm.) Pennell	H	Scrophulariaceae
599.	*Lindernia cordifolia* (Colsm.) Merr.	H	Scrophulariaceae
600.	*Lindernia crustacea* (Linn.) F.V. Mueller	H	Scrophulariaceae
601.	*Lindernia hookeri* C.B.CI. *ex* Hk.f. var. *kumaunsis* Pennell	H	Scrophulariaceae
602.	*Lindernia hyssocpoides* (L.) Haines	H	Scrophulariaceae
603.	*Lindernia nummularifolia* (D. Don.) Wettst	H	Scrophulariaceae
604.	*Lindernia oppositifolia* (Linn.) Mukerjee	H	Scrophulariaceae
605.	*Lindernia procumbens* (Kroch.) Philcox	H	Scrophulariaceae
606.	*Lindernia sessiliflora* (Benth.) Wettst.	H	Scrophulariaceae
607.	*Linum usitatissimum* Linn.	H	Linaceae
608.	*Litchi chinensis* Sonner.	T	Sapindaceae
609.	*Litsea glutinosa* (Lour.) C.R. Robins	T	Lauraceae
610.	*Litsea monopetala* Roxb.	T	Lauraceae
611.	*Lobelia alsinoides* Lam.	H	Campanulaceae
612.	*Lobelia heyneana* R. & S.	H	Campanulaceae
613.	*Loranthus cordifolius* Wallich.	C	Loranthaceae
614.	Loranthus longiflorus	C	Loranthaceae
615.	*Loranthus parasiticus* (L.) Merr.	C	Loranthaceae
616.	*Ludwigia adscendens* (L.) Hara	H	Onagraceae
617.	*Ludwigia octovalvis* (Jacq.) Raven ssp. *sessiliflora* (Mich.) Raven	H	Onagraceae
618.	*Ludwigia perennis* Linn.	H	Onagraceae
619.	*Ludwigia prostrata* Roxb.	H	Onagraceae

620.	*Luffa cylindrical* (L.) M.J. Roem.	C	Cucurbitaceae
621.	*Lunnea coromandelica* (Houtt.) Merr.	T	Anacardiaceae
622.	*Lycopersicon esculentum* Mill.	H	Solanaceae
623.	*Lysimachia candida sub. sp.* obovata *(Cuch.-Ham.* ex Hk.f.) Kunth	H	Primulaceae
624.	*Madhuca indica*	T	Sapotaceae
625.	*Madhuca longifolia* (J. Koenig) Macbr. var. *latifolia* (Roxb.) Chavalier	T	Sapotacea
626.	*Mallotus philippensis* (Lam.) Muell.-Arg.	S	Euphorbiaceae
627.	*Malvestrum coromandelianum* (L.) Garcke.	T	Malvaceae
628.	*Mangifera indica* Linn.	T	Anacardiaceae
629.	*Manilkara hexandra* (Roxb.) Dubard	H	Sapotacea
630.	*Manilkara sapota* (L.) P. Royen	H	Sapotacea
631.	*Marsdenia hamiltonii*	S	Asclepiadaceae
632.	*Marsdenia tenacissima* (Roxb.) Moon.	S	Asclepiadaceae
633.	Marsilea quadrifolia	S	Marsileaceae
634.	*Martynia annua* Linn.	H	Pedaliaceae
635.	*Mazus delavayi*	H	Scrophulariaceae
636.	*Mazus pumilus* (Burm.f.) Steenis	H	Scrophulariaceae
637.	*Melastoma malabatricum* Linn.	H	Melastomaceae
638.	*Melia azadarach* Linn.	T	Meliacea
639.	*Melilotus abla* Desr.	S	Fabaceae
640.	*Meliotus indica* (Linn.) All.	S	Fabaceae
641.	*Melochia corchorifolia* L.	H	Sterculiaceae
642.	*Melothria heterophylla* (Lour.) Cogn.	H	Cucurbitaceae
643.	*Melothria maderaspatana* (Linn.) Cogn.	H	Cucurbitaceae
644.	*Merremia aegyptica* (L.) Urban	H	Convolvulaceae
645.	*Merremia emarginata* (N. Burm.f.) Hall	H	Convolvulaceae
646.	*Merremia hederacea* (N. Burm.f.) Hall	H	Convolvulaceae
647.	*Merremia tridentate* (L.) H. Hailer subsp. hastate	H	Convolvulaceae
648.	*Meyna spinosa* Roxb.	H	Rubiaceae
649.	*Micromeria biflora* Benth.	H	Lamiaceae
650.	*Micromeria capitellata* Benth.	H	Lamiaceae
651.	*Miliusa tomentosa* Leschn. *ex.* A.DC.	H	Annonaceae
652.	*Miliusa velutinum* (Dunal) Hook.f. & Thoms	H	Annonaceae
653.	*Milletia extensa* (Benth.) Benth. *ex* Baker	H	Fabaceae
654.	*Milletia pinnata* (L.) Panigr.	H	Fabaceae
655.	*Millettia extensa*	H	Fabaceae
656.	*Millettia racemosa*	H	Fabaceae
657.	*Millingtonia hortensis*	H	Bignoniaceae
658.	*Mimosa pudica* L.	H	Mimosaceae
659.	*Mimosa rubicaulis* Lam. ssp. *himalayana* (Gamble) Ohasi	H	Mimosaceae
660.	*Mimulus strictus* Benth.	H	Scrophulariaceae

661.	*Mimusops elengi*	H	Sapotaceae
662.	*Mingamina pariviflora*	H	Rubiaceae
663.	*Mirabilis jalapa* Linn.	H	Nyctaginacea
664.	*Mitragyna parviflora* Korth.	T	Rubiaceae
665.	*Mollugo pentaphylla* Linn.	H	Molluginaceae
666.	*Momordica dioica* Roxb. *ex* Willd.	C	Cucurbitaceae
667.	Monochoria vaginalis	H	Pontederiaceae
668.	*Morinda tinctoria*	H	Rubiaceae
669.	*Moringa concanensis* Nimmo.	H	Moringaceae
670.	*Moringa oliefera* Lam.	T	Moringaceae
671.	*Morus alba*	H	Moraceae
672.	*Morus australis* Poir	H	Moraceae
673.	*Mucuna pruriens* Hook.f.	C	Fabaceae
674.	*Mukia maderaspatana*	S	Cucurbitaceae
675.	*Murraya koenigii* (Linn.) Spreng.	S	Rutaceae
676.	*Murraya paniculata* (Linn.) Jacq.	S	Rutaceae
677.	Musa paradisiaca	T	Musaceae
678.	*Myriophyllum oliganthum* (W. & A.) F. Muell.	H	Haloragaceae
679.	*Nelsonia canescens* (Lam.) Spreng.	H	Acanthaceae
680.	*Nelumbo nucifera* J. Gaertn.	H	Nelumbonaceae
681.	*Nepeta hindostana* (Heyne. *ex* Roth) Haines	H	Lamiaceae
682.	*Nerium indicum* Mill.	H	Apocynaceae
683.	*Nicandra physalodes* (L.) Gaertn.	H	Solanaceae
684.	*Nyctanthes arbortristris* Linn.	S	Oleaceae
685.	Nymphaea nouchali	H	Nymphaeaceae
686.	*Nymphaea pubescens* Willd.	H	Nymphaeaceae
687.	Nymphea rubra	H	Nymphaeaceae
688.	*Nymphoides hydrophylla* (Lour.) Kuntze	H	Menyanthacea
689.	*Nymphoides indica* (L.) Kuntze.	H	Menyanthacea
690.	*Ochna obtusata* DC.	H	Ochnaceae
691.	*Ochna obtusata* DC. ssp. *pumila*	H	Ochnaceae
692.	Ocimum americanum	H	Lamiaceae
693.	*Ocimum basilicum* L.	H	Lamiaceae
694.	*Ocimum canum* Sims.	H	Lamiaceae
695.	Ocimum gratissimum	H	Lamiaceae
696.	Ocimum sanctum	H	Lamiaceae
697.	*Ocimum tenuiflorum* L.	H	Lamiaceae
698.	*Oenanthe javanica* (BI.) DC.	H	Apiaceae
699.	*Olax scandens* Roxb.	H	Ochnaceae
700.	*Oldenlandia affinis* (Roem. & Schult.) DC.	H	Rubiaceae
701.	*Oldenlandia corymbosa* Linn.	H	Rubiaceae
702.	*Oldenlandia diffusa* (Willd.) Roxb.	H	Rubiaceae
703.	*Oldenlandia gracilis* DC.	H	Rubiaceae
704.	*Oldenlandia ovatifolia* (Cav.) DC.	H	Rubiaceae

705.	*Operculina turpethum* (L.) Manso	H	Convolvulaceae
706.	*Opuntia elatior* Mill.	H	Cactaceae
707.	*Opuntia vulgaris* Mill.	H	Cactaceae
708.	*Oroxylum indicum (Linn)*	H	Bignoniaceae
709.	*Orthosiphon pallidus* Royle *ex* Benth.	H	Lamiaceae
710.	*Orthosiphon rubicundus* Benth.	H	Lamiaceae
711.	*Osbeckia chinensis* Linn.	H	Melastomaceae
712.	Ottelia alismoides	H	Hydrocharita-ceae
713.	*Ougeninia oojeinensis* (Roxb.) Hochreut	T	Fabaceae
714.	*Oxalis corniculata* Linn.	H	Oxalidaceae
715.	Oxalis debilis	H	Oxalidaceae
716.	*Oxalis richardiana* Babu.	H	Oxalidaceae
717.	*Pandanus tectorius*	H	Pandanaceae
718.	*Parkia biglandulosa*	H	Mimosaceae
719.	*Parkinsonia acudeata*	H	Caesalpiniaceae
720.	*Parthenium hysterophorus*	H	Asteraceae
721.	*Passiflora foetida* L.	H	Passifloraceae
722.	*Pavetta crassicaulis* Bremek.	H	Rubiaceae
723.	*Pavetta tomentosa* Rosb. *ex* Sm.	H	Rubiaceae
724.	*Peltophorum pterocapum*	H	Caesalpiniaceae
725.	*Pennisetum hokenackeri*	G	Poaceae
726.	*Pennisetum pedicellatum*	G	Poaceae
727.	*Pentanema cernua* (Dalz.)	H	Asteraceae
728.	*Pentanema indica* (L.)	H	Asteraceae
729.	*Pergularia daemia* (Forssk.) Choiv.	H	Asclepiadaceae
730.	*Perilepta auriculata* (Nees) Bremek.	H	Acanthaceae
731.	*Peristrophe paniculata* (Forssk.) Brummit	H	Acanthaceae
732.	*Perotis indica*	G	Poaceae
733.	*Petalidium barlerioides*	H	Acanthaceae
734.	*Petunia hybrida* Hort. Vilm.	H	Solanaceae
735.	*Peucedanum dhana* Buch-Ham. var. *dalzellii* C.B.CI.	H	Apiaceae
736.	*Peucedanum nagpurense* Prain	H	Apiaceae
737.	*Phaseolus aureus* Roxb	H	Fabaceae
738.	*Phaseolus radiatus Linn.*	H	Fabaceae
739.	*Pheonix sylvestris*	S	Arecaceae
740.	*Phoenix acaulis*	S	Arecaceae
741.	*Phragmites karka*	G	Poaceae
742.	*Phyllanthus airy-shawii* Brunel *ex* Roux.	H	Euphorbiaceae
743.	*Phyllanthus amarus* Schum. & Thonn.	H	Euphorbiaceae
744.	*Phyllanthus emblica* L.	H	Euphorbiaceae
745.	*Phyllanthus reticulatus* Poir	H	Euphorbiaceae
746.	*Phyllanthus urinaria* Linn.	H	Euphorbiaceae
747.	*Phyllanthus virgatus* G. Forester	H	Euphorbiaceae
748.	*Physalis divaricata* D.Don	H	Solanaceae

749.	Physalis minima	H	Solanaceae
750.	*Pimpinella bracteata* Haines	H	Apiaceae
751.	*Pimpinella diversifolia* DC.	H	Apiaceae
752.	*Pimpinella heyneana* (DC.) Benth.	H	Apiaceae
753.	*Pimpinella wallichiana* (Hoenck.) Gandhi	H	Apiaceae
754.	*Piper longum* L.	H	Piperaceae
755.	*Pithecellobium dulce*	T	Mimosaceae
756.	*Plantago exigua Juss.* ex *Murr.*	H	Plantaginaceae
757.	*Plectranthus mollis* (Ait.) Spreng.	H	Lamiaceae
758.	*Plumbago zeylanica* DC.	S	Plumbaginaceae
759.	*Plumeria rubra* L.	H	Apocynaceae
760.	*Pogostemon benghalense* (Burm.f.) O. Ktze.	H	Lamiaceae
761.	*Pogostemon cruciata* (Benth.) Kuntze.	H	Lamiaceae
762.	*Pogostemon stellatus* (L our.) O. Kantze	H	Lamiaceae
763.	*Polyalthia longifolia* (Sonner.) Thw.	H	Annonaceae
764.	*Polycarpaea corymbosa* (L.) Lam.	H	Caricaceae
765.	*Polycarpaea prostratum* (Forsk.) Aschers & Schweinf.	H	Caricaceae
766.	*Polycarpaea surea* (Wight) Wight & Arn.	H	Caricaceae
767.	*Polygala arvensis* Willd.	H	Polygalacaeae
768.	Polygala chinensis	H	Plygalaceae
769.	*Polygala crotalarioides* Buch.-Ham *ex* DC.	H	Polygalacaeae
770.	*Polygala furcata* Royle	H	Polygalacaeae
771.	*Polygala longifolia* Poir.	H	Polygalacaeae
772.	*Polygala persicarifolia* DC.	H	Polygalacaeae
773.	*Polygonum barbatum* Linn.	H	Polygonaceae
774.	*Polygonum glabrum* Willd.	H	Polygonaceae
775.	*Polygonum hydropiper* L. sub sp. *microcarpum* Danser	H	Polygonaceae
776.	*Polygonum lapathifolium* L. var. *lanatum* (Roxb.) Steward	H	Polygonaceae
777.	*Polygonum pedunculare* Wall.	H	Polygonaceae
778.	*Polygonum plebeium* R.Br.	H	Polygonaceae
779.	*Polygonum rottleri* Roth.	H	Polygonaceae
780.	*Polygonum serrulatum* Lagasc.	H	Polygonaceae
781.	*Polygonum strigosum R.Br.*	H	Polygonaceae
782.	*Pongamia pinnata* (L.)	H	Fabaceae
783.	*Porana paniculata* Roxb.	H	Convolvulaceae
784.	*Porana racemosa* Roxb.	H	Convolvulaceae
785.	Portulaca oleracea	H	Portulacaceae
786.	*Portulaca pilosa* L.	H	Portulacaceae
787.	*Posralea corylifolia* Linn.	H	Fabaceae
788.	*Pouzolzia pentandra* (Roxb.) Benn.	H	Urticaceae
789.	*Primula umbellata* (Lour.) Bentvlezen	H	Primulaceae
790.	*Prosopis juliflora*	H	Mimosaceae

791.	*Prunus persica* (Linn.) Stokes	H	Rosaceae
792.	*Psidium guajava* Linn.	H	Myrtaceae
793.	Psoralea corylifolia	H	Fabaceae
794.	*Pterocarpus marsupium* Roxb	T	Fabaceae
795.	*Pueraria tuberosa* (Roxb.ex Willd) DC	H	Fabaceae
796.	*Pulicaria crispa* Benth	H	Asteraceae
797.	*Pulicaria foliolosa* Dc.	H	Asteraceae
798.	*Punica granatum* Linn.	H	Punicaceae
799.	*Putranjiva roxburghi*	H	Euphorbiaceae
800.	*Quisqulis indica* L.	H	Combretaceae
801.	*Rademachera zyloxarpa (Roxb)K.Schum.*	H	Bignoniaceae
802.	*Randica dumetorum*	H	Rubiaceae
803.	*Raphanus sativus* L.	H	Brassicaceae
804.	*Rauwolfia sprpentina* (L.) Benth. *ex* Kurz.	H	Apocynaceae
805.	*Reinwardtia indica* Dumort	H	Linaceae
806.	*Rhamnus purpurens* Edgew.	H	Rhamnaceae
807.	*Rhamnus wightii* W. & A.	H	Rhamnaceae
808.	*Rhynchoglossum obliqum* BI. var. *parviflora* C.B.CI.	H	Gesneraceae
809.	*Rhyncosia minima* L.	H	Fabaceae
810.	*Ricinus communis* Linn.	T	Euphorbiaceae
811.	Rivea hypocrateriformis	H	Convolvulaceae
812.	*Rorippa indica* (L.)	H	Brassicaceae
813.	*Rotala indica* (Willd.) Koehne	H	Lythraceae
814.	*Rotala mexicana* Cham. & Schecht.	H	Lythraceae
815.	*Rotala rosea* (Poir.) C.D.K. Cook	H	Lythraceae
816.	*Rotala rotundifolia* (Buch.-Ham.) Koehne	H	Lythraceae
817.	*Rotala serpyllifolia* Kurz.	H	Lythraceae
818.	*Rotula aqutica* Lour.	H	Boraginaceae
819.	*Rubia manjith* Roxb. *ex* Fleming	H	Rubiaceae
820.	*Ruellia tubersoa* Linn	H	Acanthaceae
821.	*Rumex dentatus* Linn. sub sp. *klozschianus*	H	Polygonaceae
822.	*Rungia repens* (L.) Nees	H	Acanthaceae
823.	*Rungia tuberose* (Linn.)	H	Acanthaceae
824.	*Saccharum munja*	G	Poaceae
825.	*Saccharum spontaneum*	G	Poaceae
826.	*Salix tetrasperma* Roxb.	H	Salicaceae
827.	*Salvia officinalis* L.	H	Lamiaceae
828.	*Salvia plebeia* R.Br.	H	Lamiaceae
829.	*Samanea saman*	T	Mimosaceae
830.	*Sapindus emarginatus*	T	Sapindaceae
831.	*Sapindus laurifolia* Vahl.	T	Sapindaceae
832.	*Schleichera oleosa* (Lour.) Oken.	T	Sapindaceae
833.	*Schrebera sweitinoides* Roxb.	H	Oleaceae
834.	*Scoparia dulcis* Linn.	H	Scrophulariaceae

835.	*Sebastania chamaelea* (L.) Muell.-Aug.	H	Euphorbiaceae
836.	*Securinega virosa* (Roxb. *ex* Willd.) Baill.	H	Euphorbiaceae
837.	*Sehima nervosum*	G	Poaceae
838.	*Sehima sulcatum*	G	Poaceae
839.	*Semecarpus anacardium* L.	T	Anacardiaceae
840.	*Senecio nudicaulis* Buch ham	H	Asteraceae
841.	*Sersbania bispinosa* (Jacq.)Fawrr & Rendle	H	Fabaceae
842.	*Sesamum indicum* Linn.	H	Pedaliaceae
843.	*Sesbania aegyptica* Pers.	H	Fabaceae
844.	*Sesbania grandiflora*	H	Fabaceae
845.	*Shorea robusta* Gaertn. F.	T	Dipterocarpaceae
846.	*Shuteria involucrata* (Wall.)	H	Fabaceae
847.	*Sida acuta Burm. f.*	H	Malvaceae
848.	*Sida alba* L. (Syn. *S. spinosa* L.)	H	Malvaceae
849.	*Sida cordata* (Burm.f.) Borss.	H	Malvaceae
850.	*Sida cordifolia* DC.	H	Malvaceae
851.	*Sida rhombifolia* L.	H	Malvaceae
852.	*Sida veronicaefolia* Lam.	H	Malvaceae
853.	*Siegesbeckia orientalis* Linn	H	Asteraceae
854.	*Smilax zeylanica*	C	Smilaceace
855.	*Smithia conferta* J.E. Smith	H	Fabaceae
856.	*Solanum incanum* Linn.	H	Solanaceae
857.	*Solanum melongena* L.	H	Solanaceae
858.	*Solanum nigrum*	H	Solanaceae
859.	Solanum surattense	H	Solanaceae
860.	*Solanum tuberosum* Linn.	H	Solanaceae
861.	Solanum villosum	H	Solanaceae
862.	*Solanum violaceum* Ortega	H	Solanaceae
863.	*Solanum virginianum* L.	H	Solanaceae
864.	*Sonchus asper* (L.)Dc	H	Asteraceae
865.	*Sonchus brachytos* Dc.	H	Asteraceae
866.	*Sonchus oleraceus* Linn.	H	Asteraceae
867.	*Sonchus wightianus* Dc.	H	Asteraceae
868.	*Sonerila tenera* Royle	H	Melastomaceae
869.	*Sophora glauca* Leschl ex DC	H	Fabaceae
870.	*Sopubia delphinifolia* (L.) G.Don.	H	Scrophulariaceae
871.	*Sorghum halepense*	G	Poaceae
872.	*Soymida febrifuga* (Roxb.) A. Juss.	T	Meliacea
873.	*Spermacoce hispida* L.	H	Rubiaceae
874.	*Spermacoce ramanii* Sivarajan and R.V. Nair	H	Rubiaceae
875.	*Spermadictyon suaveolens* Roxb.	H	Rubiaceae
876.	*Sphaeranthus indicus* L.	H	Asteraceae
877.	*Spilanthus paniculata* L.	H	Asteraceae
878.	*Spondias pinnata* (L.f.) Kurz.	H	Anacardiaceae

879.	*Sporobolus pulchellus*	G	Poaceae
880.	*Sprobolus coromandelianus*	G	Poaceae
881.	*Stemodia viscosa* Roxb.	H	Scrophulariaceae
882.	*Sterculia urens* Roxb.	T	Sterculiaceae
883.	*Sterculia villosa* Roxb.	T	Sterculiaceae
884.	*Stereospermum personatum*	T	Bignoniaceae
885.	*Stereospermum suaveolens*	T	Bignoniaceae
886.	*Sterospermum chelonoides* (L.f.)DC.	T	Bignoniaceae
887.	*Sterospermum colais* (Dilwyn) Mabberley (Hassk.)	T	Bignoniaceae
888.	*Striga angustifolia* (D.Don.) Saldanha	H	Scrophulariaceae
889.	*Striga densiflora* (Benth.)	H	Scrophulariaceae
890.	*Strychnos nuxvomica*	H	Loganiaceae
891.	*Strychnos potatorum*	H	Loganiaceae
892.	*Stylidium kunthii* Wall. *ex* DC.	H	Stylidaceae
893.	*Stylidium tenellum* Sw.	H	Stylidaceae
894.	*Swertia angustifolia* Buch/-Ham.	H	Gentianaceae
895.	*Symplocos cochinchinensis*	H	Symplocaceae
896.	*Symplocos laurina* (Retz.) Wall.	H	Symplocaceae
897.	*Symplocos racemosa* Roxb.	H	Symplocaceae
898.	*Syzygium cumini* (Linn.) Skeels	T	Myrtaceae
899.	*Syzygium heyneanum*	T	Myrtaceae
900.	*Syzygium jambos* (Linn.) Alston	T	Myrtaceae
901.	*Syzygium nervosum* DC.	T	Myrtaceae
902.	*Tabernaemontana divaricata* (Linn.) R.Br.	H	Apocynaceae
903.	Tacca leontopetaloides	H	Taccaceae
904.	*Talinium portulacifolia* DC.	H	Portulacaceae
905.	*Tamarindus indicus* L.	T	Caesalpiniaceae
906.	Tamarix aphylla	H	Tamaricaceae
907.	*Tamarix ericoides*	H	Caesalpiniaceae
908.	Taraxacum javanicum	H	Asteraceae
909.	*Tectona grandis*	T	Verbenaceae
910.	*Tegetes erecta* L.	H	Asteraceae
911.	*Tephrosia purpurea* (L.)	H	Fabaceae
912.	*Tephrosia villosa* (L.) Pers.	H	Fabaceae
913.	*Teramnus labialis*	H	Fabaceae
914.	*Terminalia alata* Heyne *ex* Roth Ryn.	T	Combretaceae
915.	*Terminalia arjuna* (Roxb. *ex* DC.) Wight *ex* Arn.	T	Combretaceae
916.	*Terminalia bellerica* (Gaertn.) Roxb.	T	Combretaceae
917.	*Terminalia chebula* Retz.	T	Combretaceae
918.	*Terminalia tomentosa*	T	Combretaceae
919.	*Thalictrum foliolosum* DC.	T	Ranunculaceae
920.	*Thecagonum ovatifolium* (Cav.) Babu	H	Rubiaceae
921.	*Themeda arundinacea*	G	Poaceae

922.	*Themeda caudata*	G	Poaceae
923.	*Themeda quadrivalvis*	G	Poaceae
924.	*Themeda triandra*	G	Poaceae
925.	*Thespesia lampas* (Cav.) Dalz.	H	Malvaceae
926.	*Thespesia populnea*	H	Malvaceae
927.	*Thevetia peruviana* (Pers.) K. Schum.	H	Apocynaceae
928.	*Thunbergia fragrans* (Roxb)	H	Acanthaceae
929.	*Thysanolaena maxima*	G	Poaceae
930.	*Tinospora cordifolia*	C	Menispermaceae
931.	*Toona ciliata* Roem.	H	Meliacea
932.	*Trachyspermum stictocarpum* (Clarke) Wolff.	H	Apiaceae
933.	*Tragia involucrata* L.	H	Euphorbiaceae
934.	*Trapa bispinosa* Roxb.	H	Trapaceae
935.	Trapa natans	H	Trapaceae
936.	*Trema orientalis*	H	Ulmaceae
937.	*Trema orientalis* (Linn.) Blume	H	Ulmaceae
938.	Tribulus terrestris	H	Zygophylaceae
939.	*Trichodesma indicum* (L.)	H	Boraginaceae
940.	*Trichodesma zeylanicum* (N.Burm F.)R.Br	H	Boraginaceae
941.	*Trichosanthes bracteata* (Lam.) Voigt	H	Cucurbitaceae
942.	*Trichosanthes cordata* Roxb.	H	Cucurbitaceae
943.	*Trichosanthes cucumerina* L.	H	Cucurbitaceae
944.	*Tridex procumbens* Linn	H	Asteraceae
945.	*Trigonella foenium graceum* L.	H	Fabaceae
946.	*Trimfetta annua* Linn.	H	Tiliaceae
947.	*Trimfetta pentandra* A. Rich.	H	Tiliaceae
948.	*Trimfetta pilosa* Roth.	H	Tiliaceae
949.	*Triumfetta rhomboidea* Jacq.	H	Tiliaceae
950.	*Tylophora rotundifolia* Buch.-Ham. *ex* Wight	H	Asclepiadaceae
951.	*Uraria alopecuroides* A(Roxb.) Wight	H	Fabaceae
952.	*Uraria lagopus* Dc.	H	Fabaceae
953.	*Uraria picta* (Jacq.)	H	Fabaceae
954.	*Uraria rufescens* (DC)	H	Fabaceae
955.	*Urena lobata* Linn. subsp. *labata var. lobata*	H	Malvaceae
956.	*Urena repanda* Roxb.	H	Malvaceae
957.	Urginea indica	H	Smilaceace
958.	*Utricularia aurea* Lour.	H	Lentibulariaceae
959.	*Utricularia bifida* Linn.	H	Lentibulariaceae
960.	*Utricularia caerulea* Linn.	H	Lentibulariaceae
961.	*Utricularia caetulea* L. var. *graminifolia* (Vahl.) Bhattacharya	H	Lentibulariaceae
962.	*Utricularia exoleta* R.Br.	H	Lentibulariaceae
963.	*Utricularia striatula* Sm.	H	Lentibulariaceae
964.	*Vallaria cristata*	C	Acanthacea
965.	*Vallaris solanacea*	C	Apocynaceae

966.	*Vanda tessellate*	P	Orchidaceae
967.	*Ventilago denticulata* Willd	H	Rhamnaceae
968.	*Verbascum chinense*	H	Scrophulariaceae
969.	*Vernonia aspera* Buch.	H	Asteraceae
970.	*Vernonia cineria* (Linn)Less	H	Asteraceae
971.	*Vernonia divergens* L.	H	Asteraceae
972.	*Vernonia squarrosa* (D.Don.)Less.	H	Asteraceae
973.	*Veronica anagallisaquatica* L.	H	Scrophulariaceae
974.	*Vetiveria zizanioides*	G	Poaceae
975.	*Vicia sativa* L.	H	Fabaceae
976.	*Vigna radiata* (L.)	H	Fabaceae
977.	*Vigna trilobata* L.	H	Fabaceae
978.	*Vigna umbellata* (Thumb.)	H	Fabaceae
979.	Vigna vexillata (Linn)	H	Fabaceae
980.	*Viscum articulatum* N. Burm.f.	H	Loranthaceae
981.	*Viscum nepalense*	H	Loranthaceae
982.	*Vitex negundo*	S	Verbenaceae
983.	*Vitex trifolia*	S	Verbenaceae
984.	*Wahlenbergia erecta* (Roth. *ex.* Rorm & Schult.) Tyrn	H	Campanulaceae
985.	*Wahlenbergia marginata* (Thunb.) DC	H	Campanulaceae
986.	*Waltheria indica* L.	H	Sterculiaceae
987.	*Wattakaka volubilis* (L.f.) Stapf.	H	Asclepiadaceae
988.	*Wedelia urticefolia* DC.Var Wightii DC	H	Asteraceae
989.	*Wendlandia exserta*	T	Rubiaceae
990.	*Wendlandia heynei* (R. & S.) Sant. & Merch	T	Rubiaceae
991.	*Withania somnifera*	H	Solanaceae
992.	*Woodfordia crinitus* Wall.	S	Lythraceae
993.	*Woodfordia floribunda*	S	Lythraceae
994.	*Wrightia tinctoria*	T	Apocynaceae
995.	*Xanthium strumarium* Linn	H	Asteraceae
996.	*Xylia xylocarpa*	H	Mimosaceae
997.	*Youngia japonica* (Linn)DC.	H	Asteraceae
998.	Zingibar capiatum	H	Zingiberaceae
999.	*Zinnia elegans* Jacq	H	Asteraceae
1000.	*Ziziphus mauritiana* Lam. var. *fruticosa* (Haines) Seb. & Balak.	T	Rhamnaceae
1001.	*Ziziphus mauritina*	T	Rhamnaceae
1002.	*Ziziphus nummularis* (Burm.f.) Wight & Arn.	T	Rhamnaceae
1003.	*Ziziphus oenoplia* (L.) Mill.	T	Rhamnaceae
1004.	*Ziziphus rugosa* Lam.	T	Rhamnaceae
1005.	*Ziziphus xylopyra* (Retz.) Willd.	T	Rhamnaceae
1006.	*Zornia diphylla* (L.)	H	Fabaceae

Among the total 133 families recorded from the study area, 42 families represent only one species; 21 families are having two species. 14 families have three species; 8 families 4 species, 4 families 5 species and 8 families and having 6 species. Families namely, Convolvulaceae, Malvaceae, Apocynaceae, Rubiaceae, Asteraceae, Mimosaceae, Fabaceae and Poaceae are having 7, 12, 13, 15, 16, 17, 31 and 37 species, respectively, whereas Asclepiadaceae, Lamiaceae and Solanaceae are having 8 species. Fabaceae is the most dominant family and holds the first position with 96 species. Asteraceae scored second position with 83 speceis. Acanthaceae and Rubaiaceae stand third and forth positions with 53 and 42 species respectively. Forty two families identified with only 1 species, names of families with number of species and positions are given in **Table – 7 & Fig. – 3**.

Table – 7 Dominant positions of different families with their species number

Position	Number of species	Names of families	No. of families
I	96	Fabaceae	**1**
II	83	Asteraceae	**1**
III	53	Acanthaceae	**1**
IV	42	Rubiaceae	**1**
IX	41	Euphorbiaceae	**1**
V	37	Poaceae	**1**
VI	**31**	Lamiaceae, Scrophulariaceae	**2**
VII	29	Caesalpiniaceae	**1**
VIII	27	Convolvulaceae	**1**
X	26	Malvaceae	**1**
XI	21	Mimosaceae	**1**
XII	19	Solanaceae	**1**
XIII	16	Apocynaceae, Moraceae	**2**
XIV	15	Cucurbitaceae	**1**
XV	14	Asclepiadaceae	**1**
XVI	12	Combretaceae, Lythraceae, Tiliaceae	**3**
XVII	11	Apiaceae, Boraginaceae, Myrtaceae	**3**
XVIII	10	Geraniaceae, Oleaceae, Polygonaceae, Rhamnaceae	**4**
XIX	9	Rutaceae and Verbenaceae	**2**
XX	8	Anacardiaceae, Bignoniaceae and Sapindaceae	**3**
XI	7	Brassicaceae and Sterculiaceae	**2**
XXII	6	Annonaceae, Campanulaceae, Capparaceae, Caricaceae, Lentibulariaceae, Lilliaceae, Loranthaceae, Oxalidaceae, Urticaceae and Zingiberaceae	**10**
XXIII	5	Dioscoreaceae, Leeaceae, Menispermaceae, Nyctaginacea, Polygalacaeae, Ranunculaceae, Sapotaceae and Vitaceae	**8**
XXIV	4	Ebenaceae, Meliacea, Onagraceae and Ulmaceae	**4**
XXV	3	Amaranthaceae, Araceae, Buseraceae, Celastraceae, Elatinaceae,	**14**

		Flacourtiaceae, Melastomaceae, Molluginaceae, Myrsinaceae, Nymphaeaceae, Ochnaceae, Portulacaceae, Primulaceae and Symplocaceae	
XXVI	2	Agavaceae, Amarylideaceae, Arecaceae, Aristolochiaceae, Bombacaceae, Cactaceae, Cyperaceae, Dilleniaceae, Droseraceae, Lauraceae, Linaceae, Loganiaceae, Menyanthacea, Moringaceae, Papeveraceae, Pedaliaceae, Proteaceae, Smilaceace, Stylidaceae, Tamaricaceae and Trapaceae	**21**
XXVII	1	Actinopteridaceae, Adiantaceae, Agaricaceae, Alangiaceae, Balsaminaceae, Basellaceae, Begoniaceae, Bixaceae, Buddlejaceae, Casurinaceae, Ceratophyllaceae, Chenopodiaceae, Cochlospermaceae, Costaceae, Crassulaceae, Dipterocarpaceae, Gesneraceae, Haloragaceae, Hydrocharitaceae, Hypericaceae, Hypoxidaceae, Lecythidaceae, Marsileaceae, Musaceae, Nelumbonaceae, Orchidaceae, Orobranchaceae, Pandanaceae, Fabaceae, Passifloraceae, Piperaceae, Plantaginaceae, Plumbaginaceae, Plygalaceae, Polypodiaceae, Pontederiaceae, Punicaceae, Rosaceae, Salicaceae, Simaroubaceae, Taccaceae and Zygophylaceae	**42**
		Total	**133**

6.3 Ethnobotanical and traditional Knowledge

People and communities in close touch with nature have a wealth of knowledge that needs to be recognized. recorded, understood, tested and validated. Tribal and agricultural people are not only familiar with the local plant and animal species but also understand the ecological interactions of various components better than many trained natural scientists. They know which varieties of their crops are resistant to common plant diseases and pests; which can withstand droughts, which are more productive, which taste better or have a better flavour, and which have a ritual or religious significance.

Works of Ayurveda lay great emphasis on field studies and contact with people well acquainted with the use of herbs. *Susruta Samhita* mentions that "medicinal herbs plants should be recognized and identified with the help of cowherds, hermits; huntsmen forest dwellers and those who cull the fruits and edible roots of the forest" (Jain 1995).

In most traditional agricultural societies, women have been responsible for collecting, selecting and storing seeds. Over centuries they have used their deep understanding of the characteristics and value of different crops to sustain and enhance certain traits, and even to develop new varieties. As the family's primary health-care givers, i.e. women also possess considerable knowledge about medicinal properties of different plants, it is important to realize the significance of this indigenous knowledge of both men and women in the context of biodiversity conservation.

Many organizations in India have recognized this and are working towards recording this knowledge. The Foundation for the Revitalisation of Local Health Traditions (FRLHT) based in Bangalore, in collaboration with the Centre for Ecological Sciences, Bangalore, and the World Wide Fund for Nature-India, has prepared a format for a Community Register for documenting indigenous knowledge at the national level.

The relationship of plants (in particular) with humans is now studied under the name of ethnobotany. The Indian subcontinent is one of the greatest repositories of ethnobotanical knowledge. This knowledge, which may have been acquired by local communities over time, is passed down from generation to generation. Interestingly, during the last few decades, a succession of so-called "wonder drugs" have been derived from plants whose medicinal properties have been known to local communities for a long time.

Local and traditional knowledge with reference to utilization of plant species by the local population, communities and villagers has also been attempted with the help of **Format - 6.** An inventory has been prepared on the basis of Recall Method. The interviews have been conducted at individual and group levels. Ethno medicinal information was recorded during the PBR survey. Villagers especially tribal have been using many medicinal plants to cure common disease. Modes of application of different medicinal plants have been documented. It was observed that villagers are growing common medicinal plants in their backyards. Scientific validation is needed for those medicinal plants which are used in different diseases. The knowledge now available with the group is the result of their close association with the nature over the ages, passed down through generations. The reasons that they have conserved the knowledge is largely due to their realization that the edible, medicinal and crop plants are vital life sustaining sources. This knowledge of tribal people can open new doors to find alternative drug resources. Collected information was analyzed and presented with local, botanical names, parts used and modes of application. (**Table – 8)**

Table – 8 Inventory List of Ethno-Botanical Diversity

S.No.	Local Name	Scientific Name	Part used	Mode of Application
1.	vMwlk	*Adhatoda vasica*	Leaves	Juice of Adusa leaves along with honey is taken early in the morning to cure asthma and old cough.
2.	egwvk	*Madhuca longifolia*	Fruits	Asofoetida is added in the Mahua liqueur and dried. It gives relief in cough and breathing problems.
3.	banzk;u	*Iitrullus tonatus*	Seed	Indrayan seeds are burnt and its smoke is inhaled by asthmatic patients to get relief.
4.	v'kksd	*Saraca indica*	Seed	Crush the seed of Ashoka and make small balls of the size of wheat seed and take with leaves of beetle to cure ashtama disease.
5.	HkbZ vkaoyk	*Phyllanthus simplex*	Leaves	Leaves of Bhui anola are taken with a pinch of salt to cure toothache and pyrrhoea.
6.	iihrk	*Carica papaya*	Root	Dried root of Papita is soaked in water for 12 hours and its juice is extracted. Tribals take this juice with sugar in the morning to cure stone.
7.	djsyk	*Momordica dioica*	Root	15 gm. Powder of dry Karela root is taken with milk and water to dissolve the stone.
8.	xks[k:	*Xanthium strumarium*	Seed	Powder of dried Gokhru seed is taken with milk of sheep to dissolve the stone.
9.	vikekxZ	*Achyranthus aspera*	Root	For normal delivery tribals keep the apamarg root in a circular form just above the navel area.
10.	da?kh	*Abutilon indicum*	Leaves	2-3 tender leaves of Kanghi are taken early in

				the morning to cure liver, piles and all types of stomach diseases.
11.	vtqZu	*Terminalia arjuna*	Leaves	5-10 gm of Arjun bark powder is boiled with 1 cup of milk and 3 cups water. It is cooled and then taken in the morning to give strength to weak heart.
12.	v'oxa/kk	*Withania somnifera*	Bark	Ashwangandha leaves are mashed by the hand and made like a palliate and taken in the morning afternoon and evening to lose 1-3 kg weight.
13.	XokjikBk	*Aloe barbadenis*	Leaves	Juice of Gwarpatha is applied on the burnt body part. It is also useful in ailments of liver and stomach.
14.	dsyk	*Musca peradisica*	Root	Juice of Banana root with water cures problems related to spleen.
15.	f'kofyaxh	*Bhyanopris lanoiniosa*	Root	Spleen also gets cured by taking the powder of Sivlingi roots with water.
16.	gjkZ	*Terminalia chebula*	Leaves and Root	The pain in spleen is checked by taking dry roots and leaves of Harra with water.
17.	'kh'ke	*Dalbergia sissoo*	Leaves and Wood	Toothache is cured by brushing teeth with the ash of burnt leaf bark of Sheesam.
18.	vdjdjk	*Spilanthus acmella*	Leaves and Fruit	By applying the leaves and fruits of Akarkara on tooth, tooth ache is cured.
19.	ihiy	*Ficus religiosa*	Bark	Toothache is cured by brushing teeth with the powder of dry bark of Peepal.
20.	dkyh rqylh	*Ocimum sanctum*	Leaves	By grinding Kali tulsi with pepper and taking it with water reduces the effect of poison.
21.	vkd	*Calatropis gigantica*	Leaves and Bark	The flow of poison is controlled by taking the

				juice of leaves and bark of Aak.
22.	ewyh	*Raphanus sativus*	Tuber	The problems related to kidney are cured by taking 1 glass juice of Reddish with 1 tsp rock salt.
23.	iquuZZok	*Boerhavia diffusa*	Root	By taking 15 ml juice of bark of Punarnava, a kidney starts functioning again.
24.	beyh	*Terminalia indica*	Seed	Paste of Imli seed is applied on the wound or cut area.
25.	lrkoj	*Asparyus racemosus*	Root	Diseases related to kidney are cured by taking honey with the powder of Satawar roots.
26.	tkequ	*Syzygium cumini*	Seed	Diabetes is cured through intake of a pinch of powder of Jamun seeds of with water in morning.
27.	xqM+ekj	*Gymnema sylventre*	Leaves	Diabetes is also cured by taking four leaves of Gudmar daily.
28.	vijkftrk	*Clitoria ternatea*	Root	Te pain of spleen is cured by taking the juice of Aparajita roots with water in the morning.
29.	iqnhuk	*Mentha spicata*	Leaves	By taking appropriate quantity of mint, onion and ginger, dysentery is cured.
30.	Hk`axjkt	*Eclipta alba*	Leaves	Hair fall is reduced by applying the paste of Bhringraj, lemon and china rose leaves.
31.	eksFkk	*Cyperus rotundus*	Root	Joint pain is cured by taking powder of montha grass roots with water and milk.
32.	fujxqaMh	*Vitex nirgundi*	Leaves	Intake of powder of Nirgundi leaves in the morning and evening cure vat disease.
33.	/krwjk	*Datura alba*	Root	Joint pain is reduced by applying the paste of Dhatura roots.

34.	ihlkeqV~Bh	*Ageratum conzoides*	Leaves	Paste of Pisamutthi leaves acts as an antibiotic.
35.	czkEgh	*Bacopa mannieria*	Leaves	Memory is enhanced by taking powder of Bramhi leaves alongwith black pepper and honey.
36.	vjaMh	*Ricinus communis*	Leaves	Jaundice is cured by taking Arandi leaves with water.
37.	ekydkaxuh	*Celastrus paniculata*	Seed	Oil of Malkangini seeds is applied or used for massage on paralytic patients.
38.	fryikiM+k	*Vetilago denticulata*	Bark	Weakness is removed by taking the powder of Tilpapda bark with water.
39.	lQsn nwc	*Cynodon dactylon*	Root	To get rid of itching, paste of Safed doob root is applied at the place of itching.
40.	uhe	*Azadiracta indica*	Leaves	To cure skin disease, boil the tender leaves of Neem and take bath with this water.
41.	tklksu	*Hibicus rosa senensis*	Whole plant	Hibiscus is used in making medicines for jaundice and itching.
42.	ylksM+k	*Cordia macleodii*	Bark and Fruit	Its bark and fruits are used in Stomachache, vat, leprosy, asthma and uterus ailments.
43.	rsanw	*Diospyros melanaxylon*	Rood	After grinding, the roots of Tendu are taken with water to cure burning of stomach.
44.	lky	*Shorea robusta*	Gum	By drinking curd mixed with the gum of Sal controls loose motions.
45.	iFkjpVk	*Boerhavia diffusa*	Leaves	To cure chickenpox leaves of Patharchatta are eaten.
46.	xwat	*Abrus precatorius*	Root	Ground roots of Gunj are taken with water to cure loose motions.
47.	fpjkSVk	*Cassia tora*	Fruit	The Chirotta fruit is used in fever.

48.	ysafM;k	*Lagerstroemia parviflora*	Root	The roots of Lendia is used to reduce weakness.
49.	Hkqedk ¼dsodan½	*Costus speciosus*	Tuber	The tuber of Keokand is used for the treatment of animal disease.
50.	HkLedan ¼taxyh lwju½	*Amorphophallus sylvaticus*	Tuber	The tuber of Jungli suran is used to cure snake bite.
51.	xqEek	*Leucas cephalotus*	Fruit	The fruits of Gumma is used in the treatment of piles.

6.4 Important Medicinal Plants

One hundred fifty four plants species were recorded as medicinal plants in the district. Villagers collect medicinal plants from forest areas and sell them in the local markets. Some commercially important species viz. Buch, Bel, Satawar, Malkangni, Bramhi, Safed musli, Keokand, Kali musli, Van haldi, Aonla, Kalihari, Gudmar and Nirgundi are also available in the area. **Table – 9**.

Table – 9 List of medicinal plants

	Botanical name	**Local name**	**Family**
1.	*Abrus precatorius*	Gunj	Fabaceae
2.	*Abutilon indicum*	Tipari	Malvaceae
3.	*Acacia catechu*	Kair	Mimosaceae
4.	*Acacia leucophloea*	Haewer	Mimosaceae
5.	*Acacia nilotica*	Babul	Mimosaceae
6.	*Acalypha indica*	Kuppi khokhli	Euphorbiaceae
7.	*Achyranthes aspera*	Chirchira	Amaranthaceae
8.	*Acorus calamus*	Buch	Araceae
9.	*Actiniopteris dichotoma*	Mayur shikha	Actinopteridaceae
10.	*Adhatoda vasica*	Adusa	Acanthaceae
11.	*Aegle marmelos*	Bel	Rutaceae
12.	*Aerva lanata*	Chhaya	Amaranthaceae
13.	*Ageratum conyzoides*	Kaumi	Asteraceae

14.	*Alangium salviifolium*	Akol	Alangiaceae
15.	*Albizia lebbeck*	Kala siris	Mimosaceae
16.	*Albizia odoratissima*	Chichwa	Mimosaceae
17.	*Albizia procera, Benth*	Karahi	Mimosaceae
18.	*Aloe barbadensis*	Gwarpatha	Liliaceae
19.	*Alternanthera sessilis*	Gudari sag	Amaranthaceae
20.	*Amaranthus spinosus*	Kateli	Amaranthaceae
21.	*Amaranthus viridis*	Kateli	Amaranthaceae
22.	*Amorphophallus sylvaticus*	Jangli suran	Araceae
23.	*Andrographis paniculata*	Kadu chirayta	Acanthaceae
24.	*Argemone maxicana*	Bramhdanti	Papaveraceae
25.	*Aristolochia bracteolata*	Keetmari	Aristolochiaceae
26.	*Aristolochia indica*	Eeshwarmool	Aristolochiaceae
27.	*Asparagus racemosus*	Satawar	Liliaceae
28.	*Azadirachta indica*	Neem	Meliaceae
29.	*Balanites aegyptica*	Ingudi	Simaroubaceae
30.	*Baliospermum montanum*	Jamalgota	Euphorbiaceae
31.	*Barleria prionitis*	Kathsaraiya	Acanthaceae
32.	*Basella rubra*	Poi bhaji	Basellaceae
33.	*Bauhinia variegata*	Kachnar	Caesalpiniaeae
34.	*Biophytum sensitivum*	Lajjalu	Oxalidaceae
35.	*Boerhavia diffusa*	Patharchata	Nyctaginaceae
36.	*Bombax ceiba*	Semara	Bombacaceae
37.	*Boswellia serrata*	salai	Burseraceae
38.	*Buchanania lanzan*	Achar	Anacardiaceae
39.	*Butea monosperma*	Palash	Fabaceae
40.	*Caesalpinia bonducella*	Gataran	Caesalpiniaceae

41.	*Caesalpinia decapetala*	chilati	Caesalpiniaceae
42.	*Calotropis gigantea*	Akona	Asclepiadaceae
43.	*Canscora decussata*	Shankhani	Gentianacea
44.	*Capparis decidua*	Kurel	Capparaceae
45.	*Cardiospermum halicacabum*	Kanphuti	Sapindaceae
46.	*Careya arborea*	Bhuiaonla	Lecythidaceae
47.	*Cassia fistula*	Dhanbaher	Caesalpiniaceae
48.	*Cassia occidentalis*	Kashondi	Caesalpiniaceae
49.	*Cassia tora*	Chirota	Caesalpiniaceae
50.	*Catharanthus roseus*	Baramashi	Apocynaceae
51.	*Celastrus paniculata*	Malkangni	Celastraceae
52.	*Centella asiatica*	Bramhi	Apiaceae
53.	*Chenopodium album*	Bhatua	Chenopodiaceae
54.	*Chlorophytum arundinaceum*	Safed musli	Liliaceae
55.	*Chlorophytum tuberosum*	Safed musli	Liliaceae
56.	*Cissus quadrangularis*	Hadjod	Vitaceae
57.	*Citrullus colocinthis*	Indrayan	Cucurbitaceae
58.	*Cleome gynandra*	Hurhul	Capparaceae
59.	*Cleome viscosa*	Hurhul	Capparaceae
60.	*Clerodendrum indicum*	Bharangi	Verbenaceae
61.	*Clerodendrum serratum*	Bhormal	Verbenaceae
62.	*Clitoria ternatea*	Aparajita	Fabaceae
63.	*Cocculus hirsutus*	Patalgaruni	Menispermaceae
64.	*Cochlospermum religiosum*	Galgala	Cochlospermaceae

65.	*Coix lacryma-jobi*	Garu	Poaceae
66.	*Costus speciosus*	Kewkand	Costaceae
67.	*Crinum asiaticum*	Nagdamani	Amaryllideaceae
68.	*Crinum latifolium*	Brashkarni	Amaryllideaceae
69.	*Curculigo orchioides*	Kali Musli	Hypoxidaceae
70.	*Curcuma amada*	Ama Haldi	Zingiberaceae
71.	*Curcuma aromatica*	Ban Haldi	Zingiberaceae
72.	*Cymbopogon martini*	Rusa	Poaceae
73.	*Cynodon dactylon*	Doob	Poaceae
74.	*Cyperus scariosus*	Nagarmotha	Cyperaceae
75.	*Datura metel*	Kala dhatura	Solanaceae
76.	*Desmodium gangeticum*	Shailparni	Fabaceae
77.	*Desmodium triflorum*	Tinpatiya	Fabaceae
78.	*Desmostachya bipinnata*	Darbhah	Poaceae
79.	*Diplocyclos palmatus*	Shivlingi	Cucurbitaceae
80.	*Eclipta prostrata*	Bhrangraj	Compositae
81.	*Elephantopus scaber*	Bantambacoo	Asteraceae
82.	*Embelia tsjeriam-cottam*	Baibirang	Myrsinaceae
83.	*Emblica offcinalis*	Aonla	Euphorbiaceae
84.	*Emilia sonchifolia*	Hirankhuri	Asteraceae
85.	*Eranthemum purpurascens*	Ban tulsi	Acanthaceae
86.	*Euphorbia hirta*	Dudeli	Euphorbiaceae
87.	*Euphorbia thymifolia*	Chhoti dudhi	Euphorbiaceae
88.	*Evolvulus alsinoides*	Vishnukanta	Convolvulaceae
89.	*Ficus bengalensis*	Bargad	Moraceae
90.	*Ficus racemosa*	Gular	Moraceae
91.	*Gardenia gummifera*	Deekamali	Rubiaceae

92.	*Garuga pinnata*	Kekad	Burseraceae
93.	*Gloriosa superba*	Kalihari	Liliaceae
94.	*Gmelina arborea*	Gamari	Verbenaceae
95.	*Gymnema sylvestre*	Gudmar	Asclepiadaceae
96.	*Helicteres isora*	Anti	Sterculiaceae
97.	*Hemidesmus indicus*	Anantmool	Asclepiadaceae
98.	*Hiptage benghalensis*	Madhwi	Malpighiaceae
99.	*Holarrhena antidysenterica*	Kudo	Apocynaceae
100.	*Hygrophila auriculata*	Talmakhana	Acanthaceae
101.	*Ichnocarpus frutescens*	Dudhi bel	Apocynaceae
102.	*Kalanchoe pinnata*	jakhme hayat	Crassulaceae
103.	*Lannea coromandelica*	mod	Anacardiaceae
104.	*Lawsonia inermis*	mehadi	Lythraceae
105.	*Leea macrophylla*	Hathpan	Leeaceae
106.	*Madhuca indica*	Mahua	Sapotaceae
107.	*Mimosa pudica*	Lajwanti	Mimosaceae
108.	*Monochoria vaginalis*	Indiwer	Pontederiaceae
109.	*Mucuna pruriens*	Kewach	Fabaceae
110.	*Nerium indicum*	Kaner	Apocynaceae
111.	*Nyctanthes arbortristis*	Harshingar	Nyctaginaceae
112.	*Nymphaea nouchali*	Kumudni	Nymphaeaceae
113.	*Ocimum sanctum*	Tulsi	Lamiaceae
114.	*Oroxylum indicum*	Sonpadar	Bignoniaceae
115.	*Pergularia daemia*	Utaranpani	Asclepiadaceae
116.	*Phyllanthus amarus*	Bhui aonla	Euphorbiaceae
117.	*Phyllanthus urinaria*	Hajarmani	Euphorbiaceae
118.	*Plumbago zeylanica*	Chitrak	Plumbaginaceae

119.	*Pongamia pinnata*	Karanj	Fabaceae
120.	*Psoralea corylifolia*	Bawchi	Fabaceae
121.	*Pterocarpus marsupium*	Beeja	Fabaceae
122.	*Pueraria tuberosa*	Bidarikand	Fabaceae
123.	*Randia dumetorum*	Menhar	Rubiaceae
124.	*Ricinus communis*	Arandi	Euphorbiaceae
125.	*Schleichera oleosa*	Kusum	Sapindaceae
126.	*Schrebera swietenioides*	Mokha	Oleaceae
127.	*Semecarpus anacardium*	Bhilwa	Anacardiaceae
128.	*Sida cordifolia*	Mamas	Malvaceae
129.	*Smilax zeylanica*	Ram Daton	Smilaceace
130.	*Solanum nigrum*	Makoi	Solanaceae
131.	*Solanum surattence*	Kantakri	Solanaceae
132.	*Soymida febrifuga*	Rohan	Meliaceae
133.	*Sphaeranthus indicus*	Shrawni	Asteraceae
134.	*Sterculia urens*	Kullu	Sterculiaceae
135.	*Stereospermum suaveolens*	Padar	Bignoniaceae
136.	*Strychnos potatorum*	Kaya	Loganiaceae
137.	*Syzygium cumini*	Jamun	Myrtaceae
138.	*Tamarindus indica*	Imali	Caesalpiniaceae
139.	*Tephrosia purpurea*	Sarphonka	Fabaceae
140.	*Terminalia arjuna*	Koha	Combretaceae
141.	*Terminalia bellirica*	Bahera	Combretaceae
142.	*Terminalia chebula*	Harad	Combretaceae
143.	*Tinospora cordifolia*	Amarta	Menispermaceae
144.	*Tribulus terrestris*	Gokharu	Zygophylaceae
145.	*Tridax procumbens*	Mundari	Asteraceae

146.	*Ventilago denticulata*	Paper bel	Rhamnaceae
147.	*Vernonia cinerea*	Sadodi	Asteraceae
148.	*Vetiveria zizanioides*	Khas	Poaceae
149.	*Vitex negundo*	Nirgungi	Verbenaceae
150.	*Woodfordia floribunda*	Dhawai	Lythraceae
151.	*Wrightia tinctoria*	Dhobin	Apocynaceae
152.	*Xanthium strumarium*	Bada Gokharu	Asteraceae
153.	*Zingiber officinale*	Anda	Zingiberaceae
154.	*Ziziphus oenoplia*	makor	Rhamnaceae

6.5 Status of Endemic, Rare and Threatened medicinal plants

Inventory of endemic, rare and threatened medicinal plants has been prepared on the basis of seasonal survey and available field information. IUCN red list category and threat assessment methods for evaluating the status of medicinal plants have been followed as per threat area. No endemic medicinal plant species was identified from the area. 21 vulernable species, 5 endangered species, 2 near threatened species have been identified from the collected data. Status of endemic, rare and threatened medicinal plants in the district is presented in the following **Table – 10** with names of plant species, families and threat status of the species.

Table – 10: Red list categories of Medicinal Plants

S. No.	NAME OF SPECIES	FAMILY	THREAT STATTUS
1.	*Amorphophallus paeoniofolus (Denn) Nicol*	Araceae	VU
2.	*Andrographis peniculata (Burm. F) Wall.*	Acanthaceae	VU
3.	*Aristolochia bracteolate Lam.*	Aristolochiaceae	VU
4.	*Bacopa monnieri (L) Wettst.*	Scrophulariaceae	VU
5.	*Bauhinia vahlii W. & A.*	Caesalpiniaceae	NT
6.	*Centella asiatica (L) Urban.*	Apiaceae	VU
7.	*Ceropegia hirsute W. & A.*	Asclepiadaceae	EN
8.	*Chlorophytum tuberosum Baker.*	Liliaceae	VU
9.	*Clerodendrum serratum (L) Moon*	Verbenaceae	EN
10.	*Costus speciosus L.*	Zingiberaceae	VU
11.	*Curcuma zedoaria (Christ) Roscoe*	Zingiberaceae	VU
12.	*Dillenia pentagyna Roxb.*	Dilleniaceae	VU
13.	*Dioscoria bulbifera L.*	Dioscoreaceae	VU
14.	*Embelia tesjeriam-cotton*	Euphorbiaceae	VU
15.	*Equisetum ramosissimum Desf.*	Equisetaceae	EN
16.	*Gloriosa superba L.*	Liliaceae	VU
17.	*Gymnema sylvestre R.Br.*	Asclepiadaceae	VU
18.	*Litsea glutinosa (Lour) C. B. Robins*	Lauraceae	VU

19.	*Marsdenia tenacissima (Roxb.) Monn.*	Asclepiadaceae	VU
20.	*Nervilia plicata (Andr.) Schlechter*	Orchidaceae	EN
21.	*Peuraria tuberosa (Roxb. ex Willd.) DC.*	Fabaceae	EN
22.	*Phyllanthus emblica Gaertn*	Euphorbiaceae	VU
23.	*Pterocarpus marsupium Roxb.*	Fabaceae	VU
24.	*Rubia cordifolia L.*	Rubiaceae	VU
25.	*Tacca leontopetaloides (L) Kuntze*	Taccaceae	NT
26.	*Thalictrum foliolosum DC.*	Ranunculaceae	VU
27.	*Uraria picta (Jacq) Desv.ex.DC*	Fabaceae	VU
28.	*Urginea indica (Roxb.) Kunth.*	Liliaceae	VU

Areas having biodiversity potential

During the survey it was observed that some areas are rich in biodiversity. Five places viz. Mangeli, Motinala, Bhai-behan Nala, Jagmandal and Kala pahad have been identified in Bichiya block. Two places viz. Mawai and Maharshi van have been identified in Mawai block and Ghughari has been identified in Ghughari block. These areas are rich in floral, medicinal, ethno botanical and cultural biodiversity. Sacred groves are also identified from these areas. More attention should be given to these areas for biodiversity conservation especially medicinal, ethno botanical and cultural biodiversity. Important rare and threatened medicinal plants viz. *Bacopa monnieri*, *Centella asiatica*, *Costus speciosus*, *Embilia* sp., *Gloriosa superba*, *Gymnema sylvestre*, *Rubia cordifolia* and *Thalictrum foliolosum* are also found in these areas. Micro level plans can be prepared for their conservation. List of areas having biodiversity potential is given below.

S.No.	Name of potential area	Block
1	Mawai	Mawai
2	Mangeli	Bichhiya
3	Ghughari	Ghughari
4	Motinala	Bichhiya
5	Bhai Bahan Nala	Bichhiya
6	Jagmandal	Bichhiya
7	Maharshi ban	Mawai
8	Kala Pahad	Bichhiya

6.6 Phytosociology

During the ecological survey, an inventory has been made of plant species available in various forest ranges. The plants are further categorized as large, medium and small sized trees, shrubs, climbers, bamboo, parasites, grasses, etc. A total of 438 plant species belonging to 310 genera of 99 families have been identified **Table – 11**

Table – 11 Floristic diversity of Mandla district

Family	99
Genera	310
Species	438

Out of total of 438 plant species different habits, namely trees, shrubs, herbs, climbers, epiphytes / parasites and grasses/ bamboos are representing 144, 70, 121, 62, 2 and 39 plant species, respectively. **Table – 12**

Table – 12 Number of plant species under different habits

S. No.	Habit	Number of species	Percentage
1	Tree	144	32.88
2	Shrub	70	15.98
3	Herb	121	27.17
4	Climber	62	14.16
5	Epiphytes / Parasite	2	0.91
6	Grasses / Bamboo	39	8.90
	Total	**438**	**100**

The botanical names, local names and families of plant species are given in **Table - 13.**

Table – 13 Name of plant species with their local, family name and habit

S. No.	**Botanical name**	**Local name**	**Family**	**Habit**
1	*Abelmoschus crinitus*	Van bhindi	Malvaceae	Herb
2	*Abelmoschus esculentus*	Muskdana	Malvaceae	Herb
3	*Abelmoschus ficulneus*	Aamraj	Malvaceae	Herb
4	*Abelmoschus moschatus*	Muskdana	Malvaceae	Herb
5	*Abrus precatorius*	Gunja	Fabaceae	Climber
6	*Abutilon indicum*	Tipari	Malvaceae	Herb
7	*Abutilon persicum*	Tipara	Malvaceae	Herb
8	*Acacia Arabica*	Babul	Mimosaceae	Tree
9	*Acacia auricuiformis*	Australian babul	Mimosaceae	Tree
10	*Acacia caesia*	Badi chilati	Mimosaceae	Climber
11	*Acacia catechu*	Khair	Mimosaceae	Tree
12	*Acacia leucophloea*		Mimosaceae	Tree
13	*Acacia pennata*	Chilati	Mimosaceae	Climber
14	*Acacia sinuata*	Kochi	Mimosaceae	Climber
15	*Acalypha indica*	Kuppi	Euphorbiaceae	Herb
16	*Achyranthes aspera*	Chichita	Amaranthaceae	Herb
17	*Acorus calamus*	Bach	Araceae	Herb
18	*Actiniopteris dichotoma*	Mayursikha	Actinopteridaceae	Herb
19	*Ademwnia digitata*	Bilayati imali	Bombacaceae	Tree
20	*Adhaoda vasica*	Adusa	Acanthacea	Shrub
21	*Adiantum cappillus-veneris*	Hanspadi	Adiantaceae	Herb
22	*Adina cordifolia*	Haldu	Rubiaceae	Tree
23	*Aegle markmelos*	Bel	Rubiaceae	Tree
24	*Aerva lanata*	Chhaya	Amaranthaceae	Herb
25	*Agaricus campestris*		Agaricaceae	Herb

26	*Agave americana*	sisal	Agavaceae	Shrub
27	*Agave sissalana*	Ketaki	Agavaceae	Shrub
28	*Ageratum conyzoides*	Kaumi	Asteraceae	Herb
29	*Ailanthus excelsa*	Mahaneem	Simaroubaceae	Tree
30	*Alangium salviifolium*	Akol	Alangiaceae	Tree
31	*Albizia lebbeck*	Kala siris	Mimosaceae	Tree
32	*Albizia odoratissima*	Chichawa	Mimosaceae	Tree
33	*Albizia procera, Benth*	Karahi	Mimosaceae	Tree
34	*Aloe barbadensis*	Gwarpatha	Liliaceae	Herb
35	*Alstonia scholaris*	Saptparni	Apocynaceae	Tree
36	*Alternanthera sessilis*	Phulani	Amaranthaceae	Herb
37	*Alysicarpus hamosus*	Silari	Fabaceae	Herb
38	*Amaranthus spinosus*	Kateli	Amaranthaceae	Herb
39	*Amaranthus viridis*	Chaulai	Amaranthaceae	Herb
40	*Amorphophallus sylvaticus*	Jangali sooran	Araceae	Herb
41	*Ampelocissus latifolia*	Panibel	Vitaceae	Climber
42	*Ampelocissus tomentosa*	Purbel	Vitaceae	Climber
43	*Anacyclus pyrethrum*	Aqkarkara	Asteraceae	Herb
44	*Andrographis paniculata*	Kadu chirata	Acanthaceae	Herb
45	*Andropogon intermedius*	Ghonsi	Poaceae	Gr/Bam
46	*Andropogon pumilus*	Devratari	Poaceae	Gr/Bam
47	*Angogeissus latifolia*	Dhawa	Combretaceae	Tree
48	*Annona reticulate*	Ramphal	Annonaceae	Tree
49	*Annona squamosa*	Seetaphal	Annonaceae	Tree
50	*Anogeissus pandula*	Karghai	Combretaceae	Tree
51	*Anthocephalus cadamba*	Kadam	Rubiaceae	Tree
52	*Antidesma acidum*	Khatua	Euphorbiaceae	Shrub
53	*Antidesma diandrum*	Khatua	Euphorbiaceae	Herb
54	*Antidesma ghaesembilla*	Jondharila	Euphorbiaceae	Shrub
55	*Apluda mutica*	Phular	Poaceae	Gr/Bam
56	*Argemone maxicana*	Pili kateri	Papaveraceae	Herb
57	*Aristida funiculate*	Kakbahari	Poaceae	Gr/Bam
58	*Aristolochia bracteolata*	Keetmar	Aristolochiaceae	Climber
59	*Aristolochia indica*	Ishwarmool	Aristolochiaceae	Climber
60	*Artebotrys odoratissimus*	Madanmast	Annonaceae	Shrub
61	*Arthraxon quartinianus*	Basin	Poaceae	Gr/Bam
62	*Asparagus racemosus*	Narbod	Lilliaceae	Climber
63	*Asphodelus tenuifolius*		Liliaceae	Herb
64	*Azadirachta indica*	Neem	Meliaceae	Tree
65	*Bachanania lanzan*	Achar	Anacardiaceae	Tree
66	*Baliospermum montanum*	Jamalgota	Euphorbiaceae	Shrub
67	*Bambusa arundinacea*	Katang bans	Poaceae	Gr/Bam
68	*Barleria cristata*	Koranta	Acanthaceae	Shrub
69	*Barleria prionitis*	Bajradanti	Acanthaceae	Shrub

70	*Basella rubra*	Poibhaji	Basellaceae	Herb
71	*Bauhinia malabarica*	Amta	Caesalpiniaceae	Tree
72	*Bauhinia purpurea*	Kevalar	Caesalpiniaceae	Tree
73	*Bauhinia retusa*	Siharu	Caesalpiniaceae	Tree
74	*Bauhinia vahlii*	Mahul	Caesalpiniaceae	Climber
75	*Bauhinia variegate*	Kachanaar	Caesalpiniaceae	Tree
76	*Bidens pilosa*	Kuri	Asteraceae	Herb
77	*Biophytum sensitivum*	Laxmana	Oxalidaceae	Herb
78	*Bixa arellana*	Sinduri	Bixaceae	Tree
79	*Blumea balsamifera*	Kukarand	Asteraceae	Herb
80	*Blumea fistulosa*	Duggi	Asteraceae	Herb
81	*Blumea lacera*	Sidhha	Asteraceae	Herb
82	*Blumeopsis flava*	Pocha	Asteraceae	Herb
83	*Boerhavia diffusa*	Patharchata	Nyctaginaceae	Herb
84	*Bombax ceiba*	Semal	Bombacaceae	Tree
85	*Boswellia serrata*	Salai	Buseraceae	Tree
86	*Briedelia retusa*	Kasai	Euphorbiaceae	Tree
87	*Butea monosperma*	Palash	Fabaceae	Tree
88	*Butea parviflora*	Palas bel	Fabaceae	Climber
89	*Butea superba*	Palas bel	Fabaceae	Climber
90	*Caesalpinia bonducella*	Gataran	Caesalpiniaceae	Climber
91	*Caesalpinia decapetala*	Chilati	Caesalpiniaceae	Climber
92	*Callistemon cirrinus*	Bottle brush	Myrtaceae	Tree
93	*Calotropis gigantean*	Aak	Asclepiadaceae	Shrub
94	*Calotropis procera*	Safed aak	Asclepiadaceae	Shrub
95	*Calycopteris floribunda*	Kukaranj	Combretaceae	Climber
96	*Canavalia gladiata*	Van sem	Fabaceae	Climber
97	*Canscora decussata*	Shankhapuspi	Gentianaceae	Herb
98	*Canscora diffusa*	Shankhapuspi	Gentianaceae	Herb
99	*Canthium parviflorum*	Kadbar	Rubiaceae	Shrub
100	*Capparis deciduas*	Kareel	Capparaceae	Climber
101	*Cardiospermum halicacabum*	Kanphooti	Sapindaceae	Herb
102	*Careya arborea*	Bhui	Lecythidaceae	Tree
103	*Carissa opaca*	Karonda	Apocynaceae	Shrub
104	*Casearia elliptica*	Bhairo	Flacourtiaceae	Tree
105	*Casearia graveolens*	Gilchi	Flacourtiaceae	Tree
106	*Casia fistula*	Amaltash	Caesalpiniaceae	Tree
107	*Casia siamea*	samee	Caesalpiniaceae	Tree
108	*Cassia absus*	Chaksu	Caesalpiniaceae	Herb
109	*Cassia auriculata*	Tarwar	Caesalpiniaceae	Herb
110	*Cassia occidentalis*	Kasaundi	Caesalpiniaceae	Herb
111	*Cassia tora*	Chironta	Caesalpiniaceae	Herb
112	*Catharanthus pusillus*	Maya	Apocynaceae	Herb
113	*Catharanthus roseus*	Sada suhagan	Apocynaceae	Herb

114	*Cayratia pedata*	Ghodapadi	Vitaceae	Climber
115	*Cayratia pedata*	Jangli angur	Vitaceae	Climber
116	*Celastrus paniculata*	Malkangni	Celastraceae	Climber
117	*Celosia argentea*	Safed murga	Amaranthaceae	Herb
118	*Cenchrus ciliaris*	Bharsa ronda	Poaceae	Gr/Bam
119	*Centella asiatica*	Bramhi	Apiaceae	Herb
120	*Centratherum anthelminticum*	Karjeera	Asteraceae	Herb
121	*Ceratophyllum demersum*	Sevar	Ceratophylla-ceae	Herb
122	*Cestrum nocturnum*	Rat ki raani	Solanaceae	Shrub
123	*Chenopodium album*	Bhatua	Chenopodiaceae	Herb
124	*Chionachne koenigii*	Kadpi	Poaceae	Gr/Bam
125	*Chlorophytum arundinaceum*	Safed musli	Liliaceae	Herb
126	*Chlorophytum tuberosum*	Safed musli	Liliaceae	Herb
127	*Chloroxylon swietenia*	Bhirra	Rutaccae	Tree
128	*Chrysopogon montanus*	Chikula	Poaceae	Gr/Bam
129	*Cissampelos pareira*	Pahalmud	Menispermaceae	Climber
130	*Cissus quadrangularis*	Hadjod	Vitaceae	Climber
131	*Cissus rependa*	Deekar bela	Vitaceae	Climber
132	*Citrullus colocynthis*	Badi indrayan	Cucurbitaceae	Climber
133	*Cleistanthus collinus*	Karra	Euphorbiaceae	Tree
134	*Cleome gynandra*	Hurhul	Capparaceae	Herb
135	*Cleome monophylla*	Hurhul	Capparaceae	Herb
136	*Cleome viscosa*	Hurhul	Capparaceae	Herb
137	*Clerodendron viscosum*	Kalibansa	Verbenaceae	Shrub
138	*Clerodendrum indicum*	Bharangi	Verbenaceae	Shrub
139	*Clerodendrum Serratum*	Bhormal	Verbenaceae	Shrub
140	*Clerodendrum viscosum*	Kalibanta	Verbenaceae	Herb
141	*Clitoria angulata*	Koyal	Fabaceae	Herb
142	*Clitoria ternatea*	Aparajita	Fabaceae	Climber
143	*Cocculus hirsutus*	Patal garudi	Menispermaceae	Climber
144	*Coceinia grandis*	Bimb	Cucurbitaceae	Climber
145	*Cochlospermum religiasum*	Gogal	Cochlospermaceae	Tree
146	*Coix lacryma-jobi*	Garu	Poaceae	Gr/Bam
147	*Colebrookea oppositifolia*	Kalabansa	Lamiaceae	Shrub
148	*Colocasia indica*	Jangali arbi	Araceae	Herb
149	*Combretum roxburghii*	Pipar bel	Combretaceae	Climber
150	*Cordia dichotoma*	Debdaru	Ehretiaceae	Tree
151	*Cordia macleodii*	Lasudha	Ehretiaceae	Tree
152	*Cordia myxa*	Lasora	Ehretiaceae	Tree
153	*Costus speciosus*	Kewkand	Costaceae	Herb
154	*Crinum asiaticum*	Nagdamani	Amarylideaceae	Herb
155	*Crinum difixum*	Sudarshan	Amarylideaceae	Herb
156	*Crotalaria juncea*	Bansan	Fabaceae	Shrub
157	*Cryptolepis buchanani*	Kala bel	Asclepiadaceae	Climber

158	*Curculigo orchioides*	Kali musli	Hypoxidaceae	Herb
159	*Curcuma amada*	Ama haldi	Zingiberaceae	Herb
160	*Curcuma angustifolia*	Tikhur	Zingiberaceae	Herb
161	*Curcuma aromatica*	Van haldi	Zingiberaceae	Herb
162	*Curcuma caesia*	Kali haldi	Zingiberaceae	Herb
163	*Cuscuta reflexa*	Amarbel	Cuscutaceae	Ep/Para
164	*Cyclea peltata*	Patha	Menispermaceae	Climber
165	*Cymbopogon martini*	Rusa	Poaceae	Gr/Bam
166	*Cynodon dactylon*	Doob	Poaceae	Gr/Bam
167	*Cyperus rotundus*	Motha	Cyperacea	Gr/Bam
168	*Cyperus scariosus*	Nagarmotha	Cyperacea	Gr/Bam
169	*Dalbergia latifolia*	Sheesham	Fabaceae	Tree
170	*Dalbergia poniculata*	Dhobin	Fabaceae	Tree
171	*Dalbergia sissoo*	Sissoo	Fabaceae	Tree
172	*Dalbergia volubilis*	birach	Fabaceae	Climber
173	*Datura metel*	Kala dhatura	Solanaceae	Shrub
174	*Datura stramonium*	Safed dhatura	Solanaceae	Shrub
175	*Delonix elata*	Gulmohar	Caesalpiniaceae	Tree
176	*Delonix regia*	Gulmohar	Caesalpiniaceae	Tree
177	*Dendrocalamus strictus*	Bans	Poaceae	Gr/Bam
178	*Dendropthoe falcate*	Banda	Loranthaceae	Ep/Para
179	*Desmodium ferrugineum*	Jogilati	Fabaceae	Shrub
180	*Desmodium pulchellum*	Chipati	Fabaceae	Herb
181	*Desmodium triflorum*	Tinpatiya	Fabaceae	Herb
182	*Desmodium velutinum*	Chikati	Fabaceae	Shrub
183	*Dichanthium annulatum*	Marbel	Poaceae	Gr/Bam
184	*Dillemia pentagyna*	Chhota kola	Dilleniaceae	Tree
185	*Dioscorea belophylla*	Missal kand	Dioscoreaceae	Climber
186	*Dioscorea bulbifera*	Jami kand	Dioscoreaceae	Climber
187	*Dioscorea hispida*	Baichandi	Dioscoreaceae	Climber
188	*Dioscorea pentaphylla*	Musalkand	Dioscoreaceae	Climber
189	*Dioscorea puber*	Vansera	Dioscoreaceae	Climber
190	*Diospyros melanaxylon*	Tendu	Ebenaceae	Tree
191	*Diplocyclos palmatus*	Bolbilaiya	Cucurbitaceae	Climber
192	*Dodonaea viscosa*	Kharenta	Sapindaceae	Shrub
193	*Drynaria quercifolia*	Ashwakatari	Polypodiaceae	Herb
194	*Eclipta alba*	Bhrigraj	Asteraceae	Herb
195	*Elaeodendron glaucum*	Jamrasi	Celastraceae	Tree
196	*Elephantopus scaber*	Van tambaku	Asteraceae	Herb
197	*Elretia laevis*	Datrangi	Ehretiaceae	Tree
198	*Embelia tsjeriam-cottam*	Baibirang	Myrsinaceae	Shrub
199	*Emblica officinalis*	Aonla	Euphorbiaceae	Tree
200	*Emilia sonchifolia*	Hiran khuri	Asteraceae	Herb
201	*Eragrostis tenella*	Bhrbhunsi	Poaceae	Gr/Bam

202	*Eranthemum purpurascens*	Van tulsi	Acanthaceae	Shrub
203	*Erythrina suberosa*	Pengara	Fabaceae	Tree
204	*Eucalyptus spp.*	Neelgiri	Myrtaceae	Tree
205	*Eulalia trispicata*	Chunai	Poaceae	Gr/Bam
206	*Eulaliopsis binata*	Sabai	Poaceae	Gr/Bam
207	*Euphorbia antiquorum*	Dudhi	Euphorbiaceae	Herb
208	*Euphorbia hirta*	Dudhi	Euphorbiaceae	Herb
209	*Euphorbia ligularia*	Thuar	Euphorbiaceae	Tree
210	*Euphorbia thymifolia*	Chhoti dudhi	Euphorbiaceae	Herb
211	*Euphorbia tirucalli*	Kalphal	Euphorbiaceae	Shrub
212	*Evolvulus alsinoides*	Shankhapuspi	Convolvulaceae	Herb
213	*Feronia limonia*	Kaitha	Rutaceae	Tree
214	*Ficus arnottiana*	Paras peepal	Moraceae	Tree
215	*Ficus bengalensis*	Bad	Moraceae	Tree
216	*Ficus hispida*	Kathmular	Moraceae	Tree
217	*Ficus racemosa*	Gular	Moraceae	Tree
218	*Ficus religiosa*	Peepal	Moraceae	Tree
219	*Ficus rumphii*	Pakar	Moraceae	Tree
220	*Ficus tinctoria sub sp. parasitica*	Gasti	Moraceae	Tree
221	*Ficus virens*	Gasti	Moraceae	Tree
222	*Flacourtia indica*	Kahai	Flacourticaea	Tree
223	*Gardenia gummifera*	Bandar laddu	Rubiaceae	Shrub
224	*Gardenia latifolia*	Papda	Rubiaceae	Tree
225	*Gardenia resinifera*	Dikamali	Rubiaceae	Tree
226	*Garuga pinnata*	Kekad	Burseraceae	Tree
227	*Gloriosa superba*	Kalihari	Liliaceae	Climber
228	*Gmelina arborea*	Khamer	Verbenaceae	Tree
229	*Grevelea robusta*	Silver oak	Proteaceae	Tree
230	*Grewia hirsuta*	Gudsakri	Tiliaceae	Shrub
231	*Grewia rothii*	Bansuli	Tiliaceae	Shrub
232	*Grewia tiliifolia*	Dhaman	Tiliaceae	Tree
233	*Gymnema sylvestre*	Gudmar	Asclepiadaceae	Climber
234	*Hamiltonia suaveolens*	Bhormal	Rubiaceae	Shrub
235	*Hardwickia binata*	Anjan	Caesalpiniaceae	Tree
236	*Hedychium coronarium*	Gulwkabli	Zingiberaceae	Herb
237	*Helicteres isora*	Anti	Sterculiaceae	Shrub
238	*Hemidesmus indicus*	Anantmool	Asclepiadaceae	Climber
239	*Heteropogon contortus*	Sukla	Poaceae	Gr/Bam
240	*Hibiscus rosa-sinensis*	Gudhal	Malvaceae	Shrub
241	*Holarrhena antidysenterica*	Dudhi	Apocynaceae	Shrub
242	*Holoptelea integrifolia*	Chirol	Ulmaceae	Tree
243	*Holostemma ada-kodien*	Chhirbel	Asclepiadaceae	Climber
244	*Homonoia eiparia*	Jalbet	Euphorbiaceae	Tree
245	*Hygrophila auriculata*	Talmakhana	Acanthaceae	Herb

246	*Hymenodictyon excelsum*	Bhanwarsal	Rubiaceae	Tree
247	*Ichnocarpus frutescens*	Dudhi bel	Apocynaceae	Climber
248	*Imperata cylindrica*	Chhir	Poaceae	Gr/Bam
249	*Indigofera glandulosa*	Jhujharu	Fabaceae	Herb
250	*Indigofera pulchella*	Jhirola	Papilionaceae	Shrub
251	*Indigofera pulchella*	Neel	Fabaceae	Herb
252	*Indigofera tinctoria*	Neel	Fabaceae	Shrub
253	*Ipomoea batata*	Sakarkand	Convolvulaceae	Shrub
254	*Ipomoea palmate*	Railway creeper	Convolvulaceae	Climber
255	*Ipomoea purpurea*	Morning glori	Convolvulaceae	Climber
256	*Ipomoea spp.*	Beshram	Convolvulaceae	Shrub
257	*Iseilema prostratum*	Ukari	Poaceae	Gr/Bam
258	*Ixora arborea*	Lokhandi	Rubiaceae	Tree
259	*Jacaranda mimosifolia*	Jekerenda	Bignoniaceae	Tree
260	*Jasminum grandiflorum*	Chameli	Oleaceae	Climber
261	*Jasminum multiflorum*	Kunda	Oleaceae	Shrub
262	*Jasminum sambac*	Mogra	Oleaceae	Shrub
263	*Jatropha curcas*	ratanjot	Euphorbiaceae	Shrub
264	*Jatropha gossypifolia*	Ratanjot	Euphorbiaceae	Shrub
265	*Justicia betonica*	Kokandar	Acanthaceae	Herb
266	*Kalanchoe pinnata*	Jakhmehayat	Crassulaceae	Herb
267	*Kigelia africana*	Jhadphanus	Bignoniaceae	Tree
268	*Kydia calycina*	Poola	Malvaceae	Tree
269	*Lagenaria siceraria*	Kadu lauki	Cucurbitaceae	Climber
270	*Lagerstroemia parviflora*	Lendia	Lythraceae	Tree
271	*Lannea grandis*	Moyan	Anacardiaceae	Tree
272	*Lantana camara*	Raimuniya	Verbenaceae	Shrub
273	*Lawsonia inermis*	Mehndi	Lytheraceae	Shrub
274	*Leea crispa*	Hansiya dhapar	Leeaceae	Herb
275	*Leea macrophylla*	Hathapan	Leeaceae	Herb
276	*Leucaena leucocephala*	Subabul	Mimosaceae	Tree
277	*Leucas cephalotes*	Goma	Lamiaceae	Herb
278	*Litsea glutinosa*	Maida lakadi	Lauraceae	Tree
279	*Loranthus longiflorus*	Banda	Loranthaceae	Herb
280	*Madhuca indica*	Mahua	Sapotaceae	Tree
281	*Mallotus philippensis*	Roli	Euphorbiaceae	Tree
282	*Mangifera indica*	Aam	Anacardiaceae	Tree
283	*Manilkara hexandra*	Khirni	Sapotaceae	Tree
284	*Marsdenia hamiltonii*	Dudhi bel	Asclepiadaceae	Climber
285	*Marsilea quadrifolia*	Chaupatiya	Marsileaceae	Herb
286	*Melastoma malabathricum*	Polaar	Melastomataceae	Shrub
287	*Melia azedarach*	Bakayan	Meliaceae	Tree
288	*Miliusa tomentosa*	Kari	Annonaceae	Tree
289	*Miliusa vellutina*	Domsal	Annonaceae	Tree

290	*Millettia extensa*	Mas bel	Fabaceae	Climber
291	*Millettia racemosa*	Janjeenar	Fabaceae	Climber
292	*Millingtonia hortensis*	Akash neem	Bignoniaceae	Tree
293	*Mimosa pudica*	Chhui mui	Mimosaceae	Herb
294	*Mimusops elengi*	Molshree	Sapotaceae	Tree
295	*Mingamina pariviflora*	Kalam	Rubiaceae	Tree
296	*Mitragyna parvifolia*	Mundi	Rubiaceae	Tree
297	*Momordica dioca*	Van karela	Cucurbitaceae	Climber
298	*Monochoria vaginalis*	Indeewer	Pontederiaceae	Herb
299	*Morinda tinctoria*	Aal	Rubiaceae	Tree
300	*Moringa oleifera*	Munga	Moringaceae	Tree
301	*Morus alba*	Shahtoot	Moraceae	Tree
302	*Mucuna pruriens*	Kewal	Fabaceae	Climber
303	*Mukia maderaspatana*	Silkakdi	Cucurbitaceae	Climber
304	*Murraya koenigii*	Meethi neem	Rutaceae	Tree
305	*Murraya peniculata*	Madhukamni	Rutaceae	Shrub
306	*Musa paradisiaca*	Kela	Musaceae	Herb
307	*Nelumbo nucifera*	Kamal	Nymphaeaceae	Herb
308	*Nerium indicum*	Kaner	Apocynaceae	Shrub
309	*Nyctanthes arbor tristis*	Siharu	Oleaceae	Tree
310	*Nymphaea nouchali*	Kumudini	Nymphaeaceae	Herb
311	*Nymphea pubescens*	Safed kumudini	Nymphaeaceae	Herb
312	*Nymphea rubra*	Lal ratalu	Nymphaeaceae	Herb
313	*Ocimum americanum*	Kali tulsi	Lamiaceae	Herb
314	*Ocimum basilicum*	Babui tulsi	Lamiaceae	Herb
315	*Ocimum canum*	Van Tulsa	Lamiaceae	Herb
316	*Ocimum gratissimum*	Ram tulsi	Lamiaceae	Herb
317	*Ocimum sanctum*	Tulsi	Lamiaceae	Herb
318	*Olax scandens*	Harduli	Oleaceae	Climber
319	*Operculina turpethum*	Nisodh	Convolvulaceae	Climber
320	*Orosylum indicum*	Jaimangal	Bignoniaceae	Tree
321	*Ottelia alismoides*	Van singhada	Hydrocharita-ceae	Herb
322	*Ougeinia oogeinsis*	Tinsa	Fabaceae	Tree
323	*Oxalis corniculata*	Amarool sak	Oxalidaceae	Herb
324	*Oxalis debilis*	Amarool sak	Oxalidaceae	Herb
325	*Pandanus tectorius*	Kewda	Pandanaceae	Tree
326	*Parkia biglandulosa*	Shivalingi	Mimosaceae	Tree
327	*Parkinsonia acudeata*	Parkinsoniya	Caesalpiniaceae	Tree
328	*Parthenium hysterophorus*	Gajar ghans	Asteraceae	Herb
329	*Peltophorum pterocapum*	Kodachinta	Caesalpiniaceae	Tree
330	*Pennisetum hohenackeri*	Mawai	Poaceae	Gr/Bam
331	*Pennisetum pedicellatum*	Deena nath	Poaceae	Gr/Bam
332	*Pergularia daemia*	Utaranpani	Asclepiadaceae	Climber
333	*Perotis indica*	Perotis	Poaceae	Gr/Bam

334	*Petalidium barlerioides*	Murmudi	Acanthaceae	Shrub
335	*Pheonix sylvestris*	Chhind	Arecaceae	Tree
336	*Phoenix acaulis*	Chhind	Arecaceae	Shrub
337	*Phragmites karka*	Nal	Poaceae	Gr/Bam
338	*Phyllanthus amarus*	Bhui aonla	Euphorbiaceae	Herb
339	*Physalis minima*	Chirponta	Solanaceae	Herb
340	*Pithecellobium dulce*	Jangal jalebee	Mimosaceae	Tree
341	*Plumbago zeylanica*	Chitrak	Plumbaginaceae	Herb
342	*Plumeria rubra*	Champa	Apocynaceae	Tree
343	*Pogostemon benghalensis*	Kora	Lamiaceae	Shrub
344	*Polyathia longifolia*	Ashok	Annonaceae	Tree
345	*Polygala chinensis*	Beejnori	Plygalaceae	Herb
346	*Polygonum barbatum*	Jalbet	Polygonaceae	Shrub
347	*Pongamia pinnata*	Karanj	Fabaceae	Tree
348	*Portulaca oleracea*	Khursa	Portulacaceae	Herb
349	*Prosopis juliflora*	Prosopis	Mimosaceae	Tree
350	*Psoralea corylifolia*	Babchi	Fabaceae	Herb
351	*Pterocarpus marsupium*	Beejasal	Fabaceae	Tree
352	*Pueraria tuberose*	Bidari kand	Fabaceae	Climber
353	*Putranjiva roxburghi*	Jiyapoot	Euphorbiaceae	Tree
354	*Quisqualis indica*	Rangoon ki bel	Combretaceae	Climber
355	*Randica dumetorum*	Mainhar	Rubiaceae	Tree
356	*Rauvolfia serpentina*	Sarpgandha	Apocynaceae	Herb
357	*Ricinus communis*	Arandi	Euphorbiaceae	Shrub
358	*Rivea hypocrateriformis*	Kaukhaja	Convolvulaceae	Herb
359	*Saccharum munja*	Munj	Poaceae	Gr/Bam
360	*Saccharum spontaneum*	Kans	Poaceae	Gr/Bam
361	*Samanea saman*	Samaaniya	Mimosaceae	Tree
362	*Sapindus emarginatus*	Reetha	Sapindaceae	Tree
363	*Scheichera oleosa*	Kusum	Sapindaceae	Tree
364	*Schrebera swietenioides*	Mocha	Oleaceae	Tree
365	*Sehima nervosum*	Sheda	Poaceae	Gr/Bam
366	*Sehima sulcatum*	Paonia	Poaceae	Gr/Bam
367	*Semecarpus anacardium*	Bhilwa	Anacardiaceae	Tree
368	*Sesbania grandiflora*	Agasi munga	Fabaceae	Tree
369	*Shorea rabusta*	Sal	Dipteriocarpaceae	Tree
370	*Sida acuta*	Kharenta	Malvaceae	Shrub
371	*Sida cordifolia*	Mamaas	Malvaceae	Shrub
372	*Smiax zeylanica*	Ram daton	Smilaceace	Climber
373	*Solanum nigrum*	Bhatkataiya	Solanaceae	Shrub
374	*Solanum surattense*	Chhoti ketki	Solanaceae	Herb
375	*Solanum villosum*	Makoi	Solanaceae	Herb
376	*Sorghum halepense*	Baru	Poaceae	Gr/Bam
377	*Soymida febrifuga*	Rohan	Meliaceae	Tree

378	*Sphaeranthus indicus*	Gorakhmundi	Asteraceae	Herb
379	*Spondias pinnata*	Amera	Anacardiaceae	Tree
380	*Sporobolus pulchellus*	Bhurbhunsi	Poaceae	Gr/Bam
381	*Sprobolus coromandelianus*	Chhoti bhurbhunsi	Poaceae	Gr/Bam
382	*Sterculia urens*	Kullu	Sterculiaceae	Tree
383	*Sterculia villosa*	Adal	Sterculiaceae	Tree
384	*Stereospermum personatum*	Sonpadar	Bignoniaceae	Tree
385	*Stereospermum suaveolens*	Padar	Bignoniaceae	Tree
386	*Strychnos muxvomica*	Kuchla	Loganiaceae	Tree
387	*Strychnos potatorum*	Kaya	Loganiaceae	Tree
388	*Symplocos cochinchinensis*	Lodh	Symplocaceae	Tree
389	*Syzygium cumini*	Jamun	Myrtaceae	Tree
390	*Syzygium heyneanum*	Kathjamun	Myrtaceae	Tree
391	*Tabernaemontana divaricata*	Chandni	Apocynaceae	Shrub
392	*Tacca leontopetaloides*		Taccaceae	Herb
393	*Tamarindus indica*	Imli	Caesalpiniaceae	Tree
394	*Tamarix aphylla*	Jhhau	Tamaricaceae	Herb
395	*Tamarix ericoides*	Jhau	Caesalpiniaceae	Shrub
396	*Taraxacum javanicum*	Kanphooli	Asteraceae	Herb
397	*Tectona grandis*	Sagaun	Verbenaceae	Tree
398	*Tephrosia purpurea*	Bajradanti	Fabaceae	Shrub
399	*Terminalia arjuna*	Koha	Combretaceae	Tree
400	*Terminalia bellirica*	Bahera	Combretaceae	Tree
401	*Terminalia chebula*	Harad	Combretaceae	Tree
402	*Terminalia tomentosa*	Saja	Combretaceae	Tree
403	*Themeda arundinacea*	Dekhana	Poaceae	Gr/Bam
404	*Themeda caudata*	Gunhar	Poaceae	Gr/Bam
405	*Themeda quadrivalvis*	Gunhar	Poaceae	Gr/Bam
406	*Themeda triandra*	Gunair	Poaceae	Gr/Bam
407	*Thespesia lampas*	Ban kapas	Malvaceae	Shrub
408	*Thespesia populnea*	Pars peepal	Malvaceae	Tree
409	*Thevetia peruviana*	Peela kaner	Apocynaceae	Shrub
410	*Thysanolaena maxima*	Phulbahari	Poaceae	Gr/Bam
411	*Tinospora cordifolia*	Giloy	Menispermaceae	Climber
412	*Trapa natans*	Singhada	Trapaceae	Herb
413	*Trema orientalis*	Dhandhali	Ulmaceae	Shrub
414	*Tribulus terrestris*	Gokharu	Zygophylaceae	Herb
415	*Triumfetta pilosa*	Chikti	Tiliaceae	Shrub
416	*Triumfetta rhomboidea*	Anduli	Tiliaceae	Shrub
417	*Urginea indica*	Jangli pyaj	Smilaceace	Herb
418	*Vallaria cristata*	Karanta	Acanthacea	Tree
419	*Vallaris solanacea*	Dudhibel	Apocynaceae	Climber
420	*Vanda tessellate*	Rasna	Orchidaceae	Ep/Para
421	*Ventilago denticulate*	Paper bel	Rhamnaceae	Climber

422	*Vernonia divergens*	Mohati	Asteraceae	Shrub
423	*Vetiveria zizanioides*	khas	Poaceae	Gr/Bam
424	*Viscum nepalense*	Banda	Loranthaceae	Ep/Para
425	*Vitex negundo*	Nirgundi	Verbenaceae	Shrub
426	*Vitex trifolia*	Pani ka sambhalu	Verbenaceae	Shrub
427	*Waltheria indica*	Halduli	Sterculiaceae	Shrub
428	*Wendlandia exserta*	Tilban	Rubiaceae	Tree
429	*Withania somnifera*	Ashwagandha	Solanaceae	Shrub
430	*Woodfordia floribunda*	Dhawai	Lythraceae	Shrub
431	*Wrightia tinctoria*	Dudhi	Apocynaceae	Tree
432	*Xanthium strumarium*	Bada gokharu	Asteraceae	Herb
433	*Xylia xylocarpa*	Suarbaal	Mimosaceae	Tree
434	*Zingibar capiatum*	Banala	Zingiberaceae	Herb
435	*Ziziphus mauritina*	Ber	Rhamnaceae	Tree
436	*Ziziphus nummularia*	Ber	Rhamnaceae	Shrub
437	*Ziziphus oenoplia*	makod	Rhamnaceae	Climber
438	*Ziziphus xylopyra*	Ghont	Rhamnaceae	Tree

Among the total 99 families recorded from the study site, 42 families are representing only one species. 13 families are having two species, 7 families are having three species, 8 families 4 species, 4 families 5 species, 8 families are having 6 species. Malvaceae, Apocynaceae, Rubiaceae, Rubiaceae, Asteraceae, Mimosaceae, Fabaceae and Poaceae are having 7, 12, 13, 15, 16, 17, 31 and 37 species. whereas 3 families viz. Asclepiadaceae, Lamiaceae and Solanaceae; 4 families viz. Acanthaceae, Combretaceae, Moraceae and Verbenaceae and 2 families viz. Caesalpiniaceae and Euphorbiaceae are having 8, 9 and 20 species respectively. Poaceae is the most dominant family and holds the first position with 37 species. Other families with their numbers of species and dominant positions are given in **Table – 14**

Table – 14 Dominant positions of different families with their species number

Position	Number of species	Name of families	No. of family
I	37	Poaceae	1
II	31	Fabaceae	1
III	20	Caesalpiniaceae and Euphorbiaceae	2
IV	17	Mimosaceae	1
IX	9	Acanthaceae, Combretaceae, Moraceae and Verbenaceae	4
V	16	Asteraceae	1
VI	15	Rubiaceae	1
VII	13	Apocynaceae	1
VIII	12	Malvaceae	1
X	8	Asclepiadaceae, Lamiaceae and Solanaceae	3
XI	7	Convolvulaceae	1
XII	6	Amaranthaceae, Annonaceae, Bignoniaceae, Cucurbitaceae, Lilliaceae, Oleaceae, Vitaceae and Zingiberaceae	8

XIII	5	Anacardiaceae, Dioscoreaceae, Rhamnaceae and Tiliaceae	4
XIV	4	Capparaceae, Ehretiaceae, Menispermaceae, Myrtaceae, Nymphaeaceae, Rutaceae, Sapindaceae and Sterculiaceae	8
XV	3	Araceae, Flacourticaea, Loranthaceae, Meliaceae, Oxalidaceae, Lythraceae and Sapotaceae	7
XVI	2	Agavaceae, Amarylideaceae, Arecaceae, Aristolochiaceae, Bombacaceae, Buseraceae, Celastraceae, Cyperacea, Gentianaceae, Leeaceae, Loganiaceae, Smilaceace and Ulmaceae	13
XVII	1	Actinopteridaceae, Adiantaceae, Agaricaceae, Alangiaceae, Apiaceae, Basellaceae, Bixaceae, Ceratophyllaceae, Chenopodiaceae, Cochlospermaceae, Costaceae, Crassulaceae, Cuscutaceae, Dilleniaceae, Dipteriocarpaceae, Ebenaceae, Hydrocharitaceae, Hypoxidaceae, Lauraceae, Lecythidaceae, Marsileaceae, Melastomataceae, Moringaceae, Musaceae, Myrsinaceae, Nyctaginaceae, Orchidaceae, Pandanaceae, Papaveraceae, Plumbaginaceae, Polygalaceae, Polygonaceae, Polypodiaceae, Pontederiaceae, Portulacaceae, Proteaceae, Simaroubaceae, Symplocaceae, Taccaceae, Tamaricaceae, Trapaceae and Zygophylaceae	42
		Total	**99**

Table – 15 shows the total number of tree, shrub and herb species recorded from different ranges of east Mandla forest division. Details of plant species collected under different habits are presented with their frequency, density, IVI and diversity index in **Annexure 1 to 18.**

Maximum 202 species have been identified from Mawai range and minimum 64 species from Jagmandal range. Data revealed that ground flora diversity is maximum in Mawai range (132 species) followed by Motinala (68 species) and Ghughari (48 species) in tree species diversity Mohgaon range attained first position with 28 species and Mawai range stored second with 26 species. **(Table -15)** It was also observed that Jagmandal range had minimum species of tree, shrub and herbs as compared with other ranges. It was also observed during the survey that Jagmandal range is having more biotic pressure resulting in the decreasing of plant diversity.

Table – 15 Plant diversity of different habit in east Mandla forest division

S. No.	Range	Tree species	Shrub species	Herb species	Total
1	**Bichhiya**	22	15	43	80
2	**Ghughari**	22	22	48	92
3	**Jagmandal**	16	9	39	64
4	**Mawai**	26	44	132	202
5	**Mohgaon**	28	12	44	84
6	**Motinala**	22	25	68	115

The tree density was maximum in Motinala range (448.61/ha) while Mawai recorded minimum value 308.65/ha density. Mawai range scored maximum density for

shrubs 24532.08/ha and 1236133.33/ha for herbaceous species. The biodiversity index was found maximum (4.78) for Mawai range while Jagmandal range recorded the lowest 3.66 value of diversity index. (Table – 16) Diversity index of tree species ranges between 2.50 to 3.06 of shrub species ranges between 1.32 to 3.55 and of herbaceous species ranges between 3.62 to 4.78. Data revealed that East Mandla division having 2.70 diversity index for tree species, 2.36 for shrub species and 3.90 for herbaceous species. Species showed good diversity in East Mandla forest division is Bichhiya and Mawai blocks are also having more potential for biodiversity. **(Figure -4, 5, 6, 7)**

Table – 16 Phytosociological attributes of plant species diversity in East Mandla forest division

S. No.	Range	Tree		Shrub		Herb	
		d/ha	DI	d/ha	DI	d/ha	DI
1	**Bichhiya**	382.81	2.83	3766.67	1.67	326000.00	3.45
2	**Ghughari**	359.38	2.76	10444.44	2.40	137666.67	3.75
3	**Jagmandal**	310.42	2.50	13288.89	2.10	68019.10	3.66
4	**Mawai**	308.65	2.68	24523.08	3.55	1236133.33	4.78
5	**Mohgaon**	445.54	3.06	8552.38	1.32	532000.00	3.62
6	**Motinala**	448.61	2.40	14429.63	3.09	598444.44	4.14
Average		375.90	2.70	12500.85	2.36	483044	3.90

Annexure - 1 Phytosociological attributes of Tree species diversity in Bichhiya range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Shorea robesta	25.00	15.63	9.90	0.11
Acacia catechu	12.50	4.69	3.24	0.05
Acacia leucophloea	62.50	3.91	8.89	0.10
Anogeissus latifolia	62.50	28.13	22.08	0.19
Buchanania lanzan	12.50	3.91	2.80	0.04
Butea monosperma	37.50	17.19	13.56	0.14
Dalbergia paniculata	12.50	4.69	2.98	0.05
Diospyros melanoxylon	37.50	22.66	14.64	0.15
Lagerstoemia parviflora	37.50	17.97	10.89	0.12
Madhuca latifolia	50.00	25.00	19.57	0.18
Miliusa tomentosa	12.50	3.91	2.90	0.04
Ougeinia oogeinensis	12.50	3.13	2.78	0.04
Tectona grandis	75.00	35.16	24.68	0.21

Terminalia alata	62.50	41.41	35.41	0.25
Terminalia bellirica	50.00	23.44	16.98	0.16
Terminalia chebula	75.00	48.44	33.05	0.24
Terminalia arjuna	25.00	8.59	6.29	0.08
Pterocarpus marsupium	25.00	13.28	10.81	0.12
Syzygium cumini	50.00	26.56	25.33	0.21
Emblica officinalis	25.00	10.16	9.62	0.11
Caseasia graviolence	12.50	2.34	2.36	0.04
Schlecheria oleosa	50.00	22.66	21.25	0.19
	825.00	**382.81**	**300.00**	**2.83**

Annexure - 2 Phytosociological attributes of Shrub species diversity in Bichhiya range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Acacia arabica	12.50	116.67	19.41	0.18
Acacia nilotica	37.50	700.00	56.20	0.31
Agave sissalna	50.00	1116.67	76.71	0.35
Butea monosperma	4.17	33.33	12.25	0.13
Calotropis procera	25.00	500.00	47.51	0.29
Carrica opaca	25.00	633.33	57.51	0.32
Casia fistula	25.00	166.67	22.50	0.19
Cassia spinarum	12.50	150.00	23.52	0.20
Diospyros melanoxylon	25.00	283.33	31.25	0.24
Helicteres isora	66.67	983.33	70.65	0.34
Lantana camara	75.00	1483.33	93.35	0.36

Sygium cumuani	37.50	383.33	37.56	0.26
Vitex negundo	37.50	566.67	48.35	0.29
Woodfordia frulicau	12.50	183.33	27.64	0.22
Zyzipus mariutiana	20.83	166.67	22.45	0.19
	250.00	**3766.67**	**300.00**	**1.67**

Annexure - 3 Phytosociological attributes of Herb species diversity in Bichhiya range of East Mandla forest division

Botanical Name	F%	Density/ ha	IVI	DI
Achyranthes aspara	57.50	17000.00	11.87	0.13
Alloteropsis cimicina	12.50	9500.00	8.54	0.10
Alternanthera fiscodes	12.50	3750.00	4.16	0.06
Alternanthera sessilis	37.50	7750.00	7.06	0.09
Amorphophallus sylvaticus	12.50	11000.00	9.69	0.11
Andrographis paniculata	17.50	3750.00	4.11	0.06
Andropogon contortus	30.00	14500.00	9.68	0.11
Anthrax cilliaris	10.00	2500.00	3.27	0.05
Bleumea lacera	10.00	3000.00	3.72	0.05
Boerhavvia diffusa	45.00	14750.00	10.27	0.12
Bothrichloa intermedia	25.00	12500.00	8.81	0.10
Bulbostylis barbata	17.50	10750.00	8.39	0.10
Cassia tora	55.00	15500.00	11.17	0.12
Cenerum difusa	12.50	5000.00	5.11	0.07
Coculus hirsutus	42.50	12250.00	9.16	0.11
Cynodon dactylon	27.50	7000.00	6.17	0.08
Cyperus bifaria	7.50	1750.00	2.73	0.04
Cyperus iria	65.00	21000.00	13.76	0.14
Cyperus nivens	32.50	11000.00	8.17	0.10
Cyperus pumulus	10.00	3500.00	4.17	0.06

Cyperus triceps	20.00	6000.00	5.46	0.07
Desmodium febrifusium	12.50	2500.00	3.20	0.05
Desmodium tifolium	47.50	20750.00	12.64	0.13
Dicanthium annulatum	10.00	3000.00	3.72	0.05
Dioscorea daemona	12.50	5000.00	5.11	0.07
Eragrostis biferia	10.00	1750.00	2.60	0.04
Eragrostis tenella	30.00	7000.00	6.28	0.08
Euphorbia hirta	25.00	8000.00	6.57	0.08
Gardenia lucida	7.50	2750.00	3.85	0.06
Hemidesmus indicus	17.50	5250.00	5.02	0.07
Heteropogon contortus	27.50	6500.00	5.93	0.08
Hyptis suaveolens	10.00	3500.00	4.17	0.06
Indigofera pulchelli	12.50	8750.00	7.97	0.10
Leucas aspera	12.50	8500.00	7.78	0.09
Ocimum canum	25.00	9500.00	7.32	0.09
Oxalis corniculata	7.50	1500.00	2.45	0.04
Parthenium hetrosporium	27.50	6000.00	5.69	0.08
Saccharum spontanium	17.50	4500.00	4.56	0.06
Sida acuta	20.00	7750.00	6.44	0.08
Tridax procumbens	35.00	10500.00	8.06	0.10
Triumfetta rhombodia	10.00	2750.00	3.50	0.05
Ziziphus jujuba	10.00	2250.00	3.05	0.05
Zornia gibbosa	17.50	4250.00	4.41	0.06
	965.00	**326000.00**	**275.81**	**3.45**

Annexure - 4 Phytosociological attributes of Tree species diversity in Ghughari range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Shorea robesta	16.67	7.29	9.29	0.11
Anogeissus latifolia	83.33	31.25	29.31	0.23
Butea monosperma	66.67	29.17	18.90	0.17
Diospyros melanoxylon	100.00	51.04	33.87	0.25
Haldinia cordifolia	33.33	19.79	18.36	0.17
Lagerstoemia parviflora	100.00	85.42	48.80	0.30
Mangifera indica	16.67	1.04	2.83	0.04
Miliusa tomentosa	16.67	1.04	2.27	0.04
Ougeinia oogeinensis	16.67	1.04	2.36	0.04
Semecarpus anacarium	66.67	10.42	11.16	0.12
Tectona grandis	66.67	25.00	26.53	0.21
Terminalia alata	50.00	22.92	17.45	0.17
Terminalia chebula	16.67	2.08	2.42	0.04
Pterocarpus marsupium	16.67	3.13	2.91	0.04
Syzygium cumini	16.67	6.25	7.70	0.09
Emblica officinalis	50.00	7.29	9.92	0.11
Casia fistula	50.00	19.79	13.71	0.14
	33.33	3.13	6.01	0.08
Mitragyna parviflora	33.33	9.38	9.84	0.11
Milliutes auriculata	50.00	11.46	14.29	0.15
Caseasia graveolence	16.67	4.17	3.48	0.05
Schleichera oleosa	50.00	7.29	8.58	0.10
	966.67	**359.38**	**300.00**	**2.76**

Annexure - 5 Phytosociological attributes of Shrub species diversity in Ghughari range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Acacia arabica	16.67	200.00	10.27	0.12
Acacia nilotica	27.78	511.11	18.21	0.17
Agave sissalna	27.78	733.33	23.38	0.20
Butea monosperma	22.22	222.22	10.99	0.12
Calotropis gigantica	16.67	88.89	6.67	0.08
Casia fistula	27.78	400.00	15.63	0.15
Cassia spinarum	5.56	22.22	3.00	0.05
Helicteres isora	66.67	1533.33	38.61	0.26
Lantana camara	100.00	4466.67	82.52	0.36
Mukia madasarpentesis	11.11	133.33	8.37	0.10
Nyctanthus arbortristis	27.78	466.67	17.18	0.16
Vitex negundo	33.33	555.56	19.24	0.18
Woodfordia fruticosa	27.78	488.89	17.70	0.17
zyzipus jujuba	11.11	155.56	9.34	0.11
Zyzipus oneophlea	16.67	466.67	18.90	0.17
	438.89	**10444.44**	**300.00**	**2.40**

Annexure - 6 Phytosociological attributes of Herb species diversity in Ghughari range of East Mandla forest division

Botanical Name	F%	Density/ ha	IVI	DI
Abutilon indicum	43.33	4333.33	8.81	0.10
Achyranthes aspara	76.67	7666.67	12.82	0.13
Alloteropsis cimicina	26.67	2666.67	5.79	0.08
Alternanthera fiscodes	10.00	1000.00	2.61	0.04
Alternanthera sessilis	16.67	1666.67	4.01	0.06
Amorphophallus bulbifer	40.00	4000.00	8.00	0.10
Andrographis paniculata	26.67	2666.67	5.36	0.07
Bynopsis laciniosa	16.67	1666.67	4.20	0.06
Blepharis maderaspatensis	16.67	1666.67	6.38	0.08
Boerhavvia diffusa	16.67	1666.67	4.11	0.06
Cassia tora	80.00	8000.00	14.04	0.14
Cassia spinosa	16.67	1666.67	4.40	0.06
Commelina bengghalensis	16.67	1666.67	5.99	0.08
Coculus hirsutus	16.67	1666.67	4.80	0.07
Cynodon dactylon	96.67	9666.67	17.31	0.16
Cyperus iria	66.67	6666.67	11.69	0.13
Cyperus nivens	16.67	1666.67	5.99	0.08
Cyperus squarrosus	16.67	1666.67	5.99	0.08
Cyperus triceps	43.33	4333.33	7.71	0.09
Desmodium febrifusium	6.67	666.67	2.21	0.04
Desmodium valutinum	33.33	3333.33	6.58	0.08
Desmodium tifolium	70.00	7000.00	12.27	0.13
Dicanthium annulatum	10.00	1000.00	2.94	0.05
Eclipta alba	10.00	1000.00	2.77	0.04
Eragrostis biferia	33.33	3333.33	6.68	0.08
Eragrostis tenella	46.67	4666.67	8.62	0.10
Evolvulus alsinoides	16.67	1666.67	4.40	0.06

Euphorbia hirta	6.67	666.67	2.45	0.04
Gardenia gummifera	16.67	1666.67	5.19	0.07
Gardenia lucida	33.33	3333.33	6.58	0.08
Grewia hirsuta	13.33	1333.33	3.18	0.05
Gymnema sylvestre	26.67	2666.67	5.36	0.07
Hemidesmus indicus	43.33	4333.33	7.67	0.09
Heteropogon contortus	3.33	333.33	1.47	0.03
Hyptis suaveolens	16.67	1666.67	5.89	0.08
Indigofera pulchelli	16.67	1666.67	5.89	0.08
Justica prostrata	16.67	1666.67	6.09	0.08
Ocimum canum	56.67	5666.67	10.27	0.12
Oxalis corniculata	6.67	666.67	4.44	0.06
Parthenium hetrosporium	16.67	1666.67	3.91	0.06
Saccharum spontanium	16.67	1666.67	4.01	0.06
Sida acuta	60.00	6000.00	10.56	0.12
Sida spinosa	23.33	2333.33	5.65	0.07
Tridax procumbens	46.67	4666.67	8.65	0.10
Triumfetta rhombodia	20.00	2000.00	4.47	0.06
Xanthium strumarium	16.67	1666.67	3.91	0.06
Ziziphus jujuba	16.67	1666.67	3.91	0.06
Zornia gibbosa	16.67	1666.67	4.01	0.06
	1376.67	**137666.67**	**300.00**	**3.75**

Annexure - 7 Phytosociological attributes of Tree species diversity in Jagmandal range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Shorea robesta	50.00	40.63	32.91	0.24
Anogeissus latifolia	83.33	31.25	32.79	0.24
Butea monosperma	33.33	10.42	10.40	0.12
Diospyros melanoxylon	83.33	34.38	27.70	0.22
Lagerstoemia parviflora	83.33	28.13	27.08	0.22
Ougeinia oogeinensis	83.33	18.75	20.17	0.18
Tectona grandis	66.67	64.58	51.95	0.30
Terminalia alata	83.33	27.08	29.91	0.23
Emblica officinalis	16.67	2.08	3.23	0.05
Casia fistula	16.67	1.04	2.43	0.04
	66.67	15.63	17.70	0.17
Milliutes auriculata	66.67	16.67	21.66	0.19
Caseasia graviolence	16.67	1.04	2.45	0.04
Bauhinia malabarica	16.67	7.29	5.97	0.08
Schleichera oleosa	16.67	1.04	2.44	0.04
Sterospermum suaveolence	16.67	4.17	5.04	0.07
	16.67	6.25	6.19	0.08
	816.67	**310.42**	**300.00**	**2.50**

Annexure - 8 Phytosociological attributes of Shrub species diversity in Jagmandal range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Adhatoda vasica	4.76	533.33	18.97	0.17
Agave sissalna	14.29	1622.22	35.32	0.25
Bridelia retusa	4.76	577.78	20.22	0.18
Calotropis procera	4.76	488.89	17.72	0.17
Cassia spinarum	28.57	3355.56	60.74	0.32
Holorhhena antidisentrica	4.76	644.44	22.09	0.19
Lantana camara	28.57	3000.00	56.85	0.32
Pheonix sylvestre	14.29	1600.00	35.00	0.25
Zyzipus oneophlea	14.29	1466.67	33.08	0.24
	119.05	**13288.89**	**300.00**	**2.10**

Annexure - 9 Phytosociological attributes of Herb species diversity in Jagmandal range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Ageratum conyzoides	15.87	1587.30	7.30	0.09
Amorphophallus bulbifer	13.89	1388.89	7.10	0.09
Anthrax cilliaris	27.78	2777.78	9.67	0.11
Apluda mutica	22.73	2272.73	8.52	0.10
Blepharis maderaspatensis	13.89	1388.89	7.10	0.09
Bothrichloa intermedia	14.29	1428.57	7.13	0.09
Bracharia racemosa	17.11	1710.53	7.48	0.09
Bulbostylis barbata	16.95	1694.92	7.45	0.09
Cassia tora	16.67	1666.67	7.41	0.09

Commelina bengghalensis	13.51	1351.35	7.07	0.09
Curcuma angustifolia	18.52	1851.85	7.71	0.09
Cynodon dactylon	14.71	1470.59	7.17	0.09
Cyperus esculantus	16.67	1666.67	7.41	0.09
Cyperus iria	13.51	1351.35	7.07	0.09
Cyperus nivens	11.90	1190.48	7.02	0.09
Cyperus pumulus	14.29	1428.57	7.13	0.09
Cyperus triceps	11.90	1190.48	7.02	0.09
Desmodium febrifusium	31.25	3125.00	10.53	0.12
Desmodium tifolium	13.33	1333.33	7.06	0.09
Dicanthium annulatum	14.29	1428.57	7.13	0.09
Digitaria cillaris	15.63	1562.50	7.27	0.09
Dioscrorea bulbifera	13.89	1388.89	7.10	0.09
Eragrostis pilosa	15.38	1538.46	7.24	0.09
Eragrostis uniloides	16.13	1612.90	7.34	0.09
Evolvulus alsinoides	16.13	1612.90	7.34	0.09
Euphorbia hirta	14.29	1428.57	7.13	0.09
Fimbrystylis barbeta	18.52	1851.85	7.71	0.09
Gardenia gummifera	25.00	2500.00	9.03	0.11
Heteropogon contortus	27.03	2702.70	9.50	0.11
Imperata cylindrica	17.24	1724.14	7.50	0.09
Indigofera pulchelli	13.89	1388.89	7.10	0.09
Justica simplex	13.89	1388.89	7.10	0.09
Oxalis corniculata	21.74	2173.91	8.32	0.10
Panicum repens	13.89	1388.89	7.10	0.09
Sida spinosa	14.29	1428.57	7.13	0.09
Themeda quadivlvis	18.75	1875.00	7.75	0.09
Triumfetta rhombodia	14.29	1428.57	7.13	0.09
Valaris colanous	27.78	2777.78	9.67	0.11
Xanthium strumarium	29.41	2941.18	10.07	0.11
	680.19	**68019.10**	**300.00**	**3.66**

Annexure - 10 Phytosociological attributes of Tree species diversity in Mawai range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Shorea robesta	100.00	108.17	83.95	0.36
Anogeissus latifolia	7.69	1.92	2.24	0.04
Bridellia retusa	7.69	1.92	2.37	0.04
Buchanania lanzan	38.46	11.54	12.05	0.13
Butea monosperma	7.69	3.37	3.04	0.05
Diospyros melanoxylon	46.15	15.87	15.36	0.15
Haldinia cordifolia	15.38	4.81	5.28	0.07
Lagerstoemia parviflora	46.15	13.46	13.27	0.14
Madhuca latifolia	76.92	30.77	31.06	0.23
Miliusa tomentosa	61.54	18.27	19.92	0.18
Semecarpus anacarium	7.69	1.92	2.14	0.04
Terminalia alata	38.46	11.06	12.14	0.13
Terminalia bellirica	38.46	10.10	11.44	0.12
Terminalia chebula	46.15	15.38	15.39	0.15
	7.69	0.48	1.93	0.03
Ficus glomarata	7.69	0.48	1.65	0.03
Terminalia arjuna	30.77	8.65	10.85	0.12
Bombax ceiba	15.38	4.33	4.70	0.07
Pterocarpus marsupium	23.08	6.25	7.14	0.09
Syzyzium cumini	15.38	5.29	5.69	0.08
Emblica officinalis	53.85	15.38	16.57	0.16
Casia fistula	38.46	11.54	11.97	0.13
Bahunia variagata	15.38	4.33	4.71	0.07
Boswellia serrata	7.69	0.96	1.71	0.03
Manilkara hexandra	7.69	0.96	1.55	0.03
Mitragyna parviflora	7.69	1.44	1.84	0.03
	769.23	**308.65**	**299.95**	**2.68**

Annexure - 11 Phytosociological attributes of Shrub species diversity in Mawai range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abormia augsta	7.69	266.67	4.70	0.065158557
Adhatoda vasica	30.77	1251.28	12.51	0.132489551
Agave angustifolia	7.69	235.90	4.29	0.060745593
Agave sissalna	30.77	1056.41	11.26	0.123195215
Argemone maxicana	7.69	338.46	5.67	0.075000177
	2.56	20.51	1.03	0.019529893
Barleria cristata	38.46	1282.05	13.23	0.137623008
Barleria priontis	7.69	256.41	4.57	0.063701592
Blepharis repens	23.08	800.00	9.12	0.106178846
Bridelia scandence	15.38	533.33	6.91	0.086863977
Calotropis gigantica	7.69	307.69	5.26	0.070855425
Calotropis procera	30.77	933.33	10.47	0.11708931
Canthiun parviflorum	7.69	256.41	4.57	0.063701592
Cassia obtusifolia	7.69	235.90	4.29	0.060745593
Cassia occidantalis	23.08	748.72	8.75	0.103084793
Cassia spinarum	30.77	1569.23	14.55	0.146774887
Clerodendron serratum	7.69	338.46	5.67	0.075000177
Clerodendron viscosum	23.08	974.36	10.37	0.116337079
Crotolaria umbellata	7.69	369.23	6.08	0.079044244
Dedonia viscosa	46.15	1589.74	15.68	0.154262635
Desmodium febrifugium	30.77	1200.00	12.18	0.130085895
Duranta repens	7.69	246.15	4.43	0.062230748
	5.13	307.69	6.32	0.081351237
	5.13	61.54	1.86	0.031538983
Gardenia gumifera	15.38	502.56	6.64	0.084356764
	2.56	10.26	0.70	0.014193681
Grewia hirsuta	15.38	482.05	6.46	0.082665117

Hamilton soveolence	7.69	235.90	4.29	0.060745593
Helicteres isora	23.08	953.85	10.23	0.115169538
Holorhhena antidisentrica	38.46	1682.05	15.61	0.153781938
Jatropha curcas	15.38	420.51	5.92	0.077488277
	5.13	41.03	1.49	0.02634659
	5.13	30.77	1.30	0.023638425
	2.56	10.26	0.70	0.014193681
Lantana camara	69.23	2717.95	23.99	0.201987649
	5.13	61.54	1.86	0.031538983
Mimosa pudica	12.82	307.69	4.85	0.066677585
	12.82	410.26	5.84	0.076718542
Risinus cumune	7.69	225.64	4.15	0.059245666
	5.13	30.77	1.30	0.023638425
Vitex negundo	7.69	246.15	4.43	0.062230748
Wrightia tinctoria	7.69	420.51	6.77	0.085578838
Zyzipus mariutiana	7.69	338.46	5.67	0.075000177
Zyzipus oneophlea	7.69	215.38	4.01	0.057730477
	687.18	**24523.08**	**300.00**	**3.555515701**

Annexure - 12 Phytosociological attributes of Herb species diversity in Mawai range of East Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abrus precatorius	13.33	10133.33	2.42	0.04
Acacia leucophloea	6.67	9733.33	2.56	0.04
Achyrynthus aspera	6.67	7333.33	2.04	0.03
Aerva lanata	6.67	10666.67	2.76	0.04
Alloteropsis cimicina	33.33	26533.33	5.15	0.07
Amorphophallus sylvaticus	6.67	6800.00	1.93	0.03
Andropogan ascinoides	6.67	5066.67	1.55	0.03
Andropogan intermedius	26.67	21733.33	4.33	0.06
Andropogan pumulus	6.67	6000.00	1.75	0.03
Apluda mutica	26.67	25066.67	4.71	0.07
Argyreia sericea	6.67	8266.67	2.24	0.04
Aristida funiculata	20.00	17066.67	3.52	0.05
Aristolochia indica	6.67	4666.67	1.47	0.03
Arthaxon cilliaris	20.00	15333.33	3.31	0.05
Arthraxon quartinianus	6.67	7600.00	2.10	0.03
Bathrichloa passiflora	6.67	5866.67	1.73	0.03
Blemea lacera	13.33	11066.67	2.56	0.04
Bothrichloa intermedia	26.67	22800.00	4.45	0.06
Bothrichloa pertusa	13.33	10000.00	2.40	0.04
Brachiaria racemasa	13.33	14000.00	2.99	0.05
Brachiaria repatans	6.67	5866.67	1.73	0.03
Bryopsis lociona	6.67	2000.00	0.89	0.02
Buchanania lanzan	6.67	5066.67	1.55	0.03
Buddleja madagascariensis	6.67	3466.67	1.21	0.02
Bulbostylis barbata	20.00	21200.00	4.04	0.06
Caesalpinia bonduc	6.67	5066.67	1.55	0.03
Cayratia pedeta	6.67	6133.33	1.78	0.03
Cenchrus ciliris	6.67	4933.33	1.52	0.03

Cenchrus setigerus	12.00	6800.00	1.89	0.03
Chloris virgata	32.00	28400.00	5.30	0.07
Chrysopogon montanus	6.67	5333.33	1.61	0.03
Citrullus colocinthus	12.00	9200.00	2.26	0.04
Coculus hirsutus	6.67	5200.00	1.58	0.03
Coix gigantea	6.67	5066.67	1.55	0.03
Coix lacryma-jobi	6.67	3200.00	1.15	0.02
Costus spaciosus	25.33	22800.00	4.40	0.06
Curcuma angustifolia	21.33	17066.67	3.57	0.05
Curcuma aromatica	13.33	13600.00	2.94	0.05
Curcuma caesia	2.67	533.33	0.41	0.01
Cuscuta reflexa	6.67	9333.33	2.47	0.04
Cyanotis fasciculata	6.67	8800.00	2.36	0.04
Cynodon dactylon	6.67	4666.67	1.47	0.03
Cyperus esculantus	6.67	5733.33	1.70	0.03
Cyperus flavidus	13.33	10400.00	2.46	0.04
Cyperus iria	26.67	23866.67	4.57	0.06
Cyperus kallinga	13.33	11733.33	2.66	0.04
Cyperus niverus	13.33	12533.33	2.78	0.04
Cyperus pumius	6.67	5333.33	1.61	0.03
Cyperus squarrosus	6.67	3066.67	1.12	0.02
Cyperus tenuispica	6.67	6133.33	1.78	0.03
Cyperus triceps	20.00	16800.00	3.49	0.05
Dalbergia paniculata	6.67	6666.67	1.90	0.03
Desmodium trifolium	13.33	8666.67	2.20	0.04
Dicanthium annulatum	13.33	11333.33	2.60	0.04
Dichanthium aristatum	13.33	15200.00	3.17	0.05
Dicliptera bupleuroides	6.67	6933.33	1.96	0.03
Digera muricata	6.67	5200.00	1.58	0.03
Digitaria chenensis	13.33	10933.33	2.54	0.04
Digitaria setigera	13.33	10133.33	2.42	0.04

Digitaria stricta	6.67	6133.33	1.78	0.03
Digitaria ternata	20.00	17066.67	3.52	0.05
Dimeria ornithopoda	6.67	6533.33	1.87	0.03
Dioscorea daemona	6.67	4800.00	1.49	0.03
Dioscorea pubera	6.67	7333.33	2.04	0.03
Eragrostiella bifaria	6.67	4666.67	1.47	0.03
Eragrostis cillans	6.67	5733.33	1.70	0.03
Eragrostis gangetica	6.67	5200.00	1.58	0.03
Eragrostis pilosa	20.00	16533.33	3.46	0.05
Eragrostis tenella	26.67	22800.00	4.45	0.06
Eragrostis uniloides	6.67	6533.33	1.87	0.03
Eragrostis viscosa	6.67	6533.33	1.87	0.03
Eranthemum purpurascens	6.67	6400.00	1.84	0.03
Eriocaulon montana	6.67	5333.33	1.61	0.03
Eulaliopsis binata	6.67	6666.67	1.90	0.03
Euphorbia hirta	20.00	15200.00	3.29	0.05
Fimbristylis dichotoma	6.67	5733.33	1.70	0.03
Fimbristylis Falcata	6.67	5466.67	1.64	0.03
Fimbristylis obtusata	6.67	6000.00	1.75	0.03
Flacourtia indica	6.67	5866.67	1.73	0.03
Gardenia indica	6.67	6533.33	1.87	0.03
Gloriosa superba	12.00	3866.67	1.43	0.03
Goniocaulon indicum	6.67	8800.00	2.36	0.04
Habenaria commelniifolia	6.67	6400.00	1.84	0.03
Hackelochola granularis	26.67	19333.33	4.05	0.06
Haldinia cordifolia	6.67	4933.33	1.52	0.03
Hamiltonia suaveolens	6.67	7066.67	1.98	0.03
Heliotropium indicum	4.00	1466.67	0.72	0.01
Heteropogon contortus	20.00	17066.67	3.52	0.05
Hibiscus lobatus	6.67	7200.00	2.01	0.03
Hyptis suaveolens	9.33	6000.00	1.71	0.03

Ichnocarpus frutescens	6.67	8000.00	2.19	0.04
Imperata cylindrica	46.67	42133.33	7.43	0.09
Indigofera astragalina	6.67	6933.33	1.96	0.03
Indigofera grabra	13.33	12533.33	2.78	0.04
Ipomoea quamoclit	6.67	8800.00	2.36	0.04
Isachne globosa	6.67	5333.33	1.61	0.03
Ischaemum duhiei	6.67	4933.33	1.52	0.03
Ischaemum indicum	6.67	4666.67	1.47	0.03
Iseilema laxum	13.33	11600.00	2.64	0.04
Iseilema prostratum	18.67	9733.33	2.54	0.04
Leucas aspera	6.67	533.33	0.57	0.01
Ocimum canum	13.33	10800.00	2.52	0.04
Oxalis corniculata	13.33	12400.00	2.76	0.04
Panicum brevifolium	6.67	4666.67	1.47	0.03
Panicum notatum	6.67	2400.00	0.98	0.02
Panicum prostratum	20.00	17866.67	3.62	0.05
Panicum repense	20.00	20266.67	3.93	0.06
Paspalidium scrobiculatum	6.67	6400.00	1.84	0.03
Peristrophe paniculata	6.67	2666.67	1.03	0.02
Perotis indica	13.33	10666.67	2.50	0.04
Petalidium barlerioides	6.67	4400.00	1.41	0.03
Phyllanthus virgatus	6.67	4800.00	1.49	0.03
Polycarpaea corymbosa	13.33	13733.33	2.95	0.05
Portulaca oleracea	5.33	1200.00	0.67	0.01
Saccharum spontanium	6.67	6533.33	1.87	0.03
Scleria levis	13.33	10533.33	2.48	0.04
Scoparia dulcis	6.67	1733.33	0.83	0.02
Sehima nervosum	6.67	6933.33	1.96	0.03
Seirpus articulatus	6.67	5200.00	1.58	0.03
Semecarpus anacardium	4.00	1466.67	0.72	0.01
Setaria intermeda	13.33	9200.00	2.28	0.04

Setaria pumulla	13.33	13466.67	2.92	0.05
Sida alba	6.67	4666.67	1.47	0.03
Sida cordata	2.67	400.00	0.35	0.01
Sida veronicifolia	6.67	7333.33	2.04	0.03
Smilax zeylanica	6.67	7333.33	2.04	0.03
Themeda arundinacea	26.67	23200.00	4.49	0.06
Themeda quadrivalvis	13.33	10933.33	2.54	0.04
Themeda triandra	6.67	7066.67	1.98	0.03
Tridax procumbens	6.67	6666.67	1.90	0.03
Triumfetta annua	6.67	8800.00	2.36	0.04
Urochola panicoides	13.33	11866.67	2.68	0.04
	1454.67	**1236133.333**	**300**	**4.78**

Annexure - 13 Phytosociological attributes of Tree species diversity in Mohgaon range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Aegle marmelos	42.86	11.61	8.57	0.10
Anogeissus latifolia	42.86	13.39	8.07	0.10
Buchanania lanzan	14.29	15.18	6.39	0.08
Butea monosperma	28.57	17.86	12.71	0.13
Diospyros melanoxylon	71.43	58.04	24.04	0.20
Ficus religiosa	28.57	11.61	7.25	0.09
Adina cordifolia	57.14	23.21	20.53	0.18
Lagerstoemia parviflora	85.71	25.89	17.03	0.16
Madhuca latifolia	71.43	25.89	26.81	0.22
Miliusa tomentosa	42.86	19.64	14.13	0.14
Ougeinia oogeinensis	28.57	13.39	8.38	0.10
Semecarpus anacarium	42.86	18.75	12.76	0.13
Tectona grandis	85.71	55.36	30.53	0.23
Terminalia alata	85.71	35.71	28.85	0.23
Terminalia arjuna	28.57	14.29	10.06	0.11
Pterocarpus marsupium	14.29	3.57	2.63	0.04
Syzigium cumini	14.29	8.04	3.80	0.06
Casia fistula	28.57	11.61	6.16	0.08
	42.86	12.50	8.29	0.10
Mitragyna parviflora	14.29	8.04	4.39	0.06
Milliutes auriculata	14.29	5.36	3.47	0.05
Schlechera oleosa	14.29	2.68	3.12	0.05
Exora arborea	14.29	5.36	3.37	0.05
Ficus glomarata	28.57	10.71	14.72	0.15
Eugenia heyneana	14.29	4.46	3.12	0.05

Flacourtia indica	14.29	4.46	3.09	0.05
Randia dumatorum	14.29	3.57	2.95	0.05
Soymida febrifuga	14.29	5.36	4.73	0.07
	1000.00	**445.54**	**300.00**	**3.06**

Annexure - 14 Phytosociological attributes of Shrub species diversity in Mohgaon range of East Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Acacia nilotica	42.86	590.48	35.95	0.25
Adina cordifolia	28.57	647.62	34.88	0.25
Agave sissalna	71.43	1409.52	63.00	0.33
Butea monosperma	38.10	552.38	33.61	0.25
Calotropis gigantica	42.86	590.48	35.95	0.25
Casia fistula	14.29	95.24	12.02	0.13
Cassia spinarum	71.43	3085.71	96.42	0.36
Lantana camara	71.43	5923.81	153.03	0.34
Mukia madasarpentesis	14.29	400.00	28.16	0.22
Vitex negundo	66.67	1009.52	53.29	0.31
Woodfordia frulicau	47.62	1123.81	50.31	0.30
Zyzipus mariutiana	4.76	95.24	15.23	0.15
	204.76	**8552.38**	**300.00**	**1.32**

Annexure - 15 Phytosociological attributes of Herb species diversity in Mohgaon range of East Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Abrus precatorius	31.43	8571.43	5.64	0.07
Abutilon indicum	11.43	3428.57	3.41	0.05
Achyranthes aspara	31.43	6285.71	4.73	0.07
Alternanthera fiscodes	14.29	3142.86	3.04	0.05
Alternanthera sessilis	11.43	10285.71	8.60	0.10
Andropogon contortus	40.00	13428.57	7.57	0.09
Andropogon cilliaris	17.14	2285.71	2.53	0.04
Anthrax cilliaris	22.86	8000.00	5.42	0.07

Bynopsis laciniosa	5.71	1142.86	1.92	0.03
Bleumea lacera	28.57	6857.14	4.90	0.07
Boerhavvia diffusa	57.14	18571.43	9.70	0.11
Cassia tora	54.29	38571.43	15.76	0.15
Coculus hirsutus	51.43	21142.86	10.33	0.12
Curcuma angustifolia	8.57	2571.43	3.05	0.05
Cynodon dactylon	85.71	70285.71	24.69	0.21
Cyperus iria	71.43	30571.43	13.65	0.14
Cyperus nivens	37.14	13714.29	7.64	0.09
Cyperus pumulus	25.71	7714.29	5.24	0.07
Cyperus triceps	51.43	19714.29	9.88	0.11
Cyperus unicoides	8.57	3428.57	3.86	0.06
Desmodium equtifolium	8.57	3714.29	4.13	0.06
Desmodium febrifusium	22.86	6571.43	4.74	0.07
Desmodium valutinum	25.71	7714.29	5.24	0.07
Desmodium tifolium	45.71	12285.71	7.33	0.09
Dioscorea daemona	14.29	5142.86	4.33	0.06
Eragrostis biferia	20.00	5428.57	4.22	0.06
Eragrostis tenella	37.14	8000.00	5.57	0.07
Euphorbia hirta	62.86	19714.29	10.25	0.12
Euphorbia pulchella	14.29	2857.14	2.86	0.04
Gardenia lucida	57.14	16857.14	9.18	0.11
Gymnema sylvestre	51.43	13714.29	8.00	0.10
Hacklocloa pestusa	8.57	2000.00	2.51	0.04
Hemidesmus indicus	28.57	6285.71	4.66	0.06
Hyptis suaveolens	25.71	15714.29	8.77	0.10
Ocimum canum	51.43	22857.14	10.87	0.12
Oxalis corniculata	25.71	6285.71	4.61	0.06
Parthenium hetrosporium	65.71	24000.00	11.60	0.13
Saccharum spontanium	22.86	7428.57	5.15	0.07
Sida acuta	22.86	8571.43	5.69	0.08

Sida veronicifolia	11.43	3428.57	3.41	0.05
Tridax procumbens	45.71	24857.14	11.48	0.12
Ventilego denticulata	37.14	12000.00	7.02	0.09
Xanthium strumarium	11.43	4000.00	3.84	0.06
Zornia gibbosa	11.43	2857.14	2.98	0.05
	1394.29	**532000.00**	**300.00**	**3.62**

Annexure - 16 Phytosociological attributes of Tree species diversity in Motinala range of East Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Anogeissus latifolia	55.56	18.06	12.84	0.13
Buchanania lanzan	33.33	13.19	7.58	0.09
Butea monosperma	33.33	13.19	7.47	0.09
Diospyros melanoxylon	33.33	24.31	9.43	0.11
Emblica officinalis	88.89	14.58	14.78	0.15
Ficus religiosa	11.11	0.69	3.01	0.05
Haldinia cordifolia	22.22	1.39	4.22	0.06
Lagerstoemia parviflora	77.78	41.67	19.37	0.18
Madhuca latifolia	77.78	28.47	26.18	0.21
Miliusa tomentosa	11.11	5.56	3.00	0.05
Ougeinia oogeinensis	22.22	6.94	4.65	0.06
Shorea robesta	100.00	184.72	111.23	0.37
Syzium cumini	66.67	13.89	12.84	0.13
Terminalia alata	88.89	33.33	24.70	0.21
Terminalia bellirica	11.11	2.08	1.88	0.03
Terminalia chebula	55.56	8.33	9.00	0.11
Pterocarpus marsupium	11.11	10.42	7.99	0.10
Mitragyna perviflora	22.22	14.58	7.54	0.09
Milliutes auriculata	22.22	6.94	4.95	0.07
Scheichera oleosa	22.22	1.39	3.05	0.05
Terminalia arjuna	11.11	0.69	1.49	0.03
Casia fistula	11.11	4.17	2.80	0.04

	888.89	**448.61**	**300.00**	**2.40**

Annexure - 17 Phytosociological attributes of Shrub species diversity in Motinala range of East Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Acacia arbarica	11.11	133.33	4.78	0.0659387
Acacia nilotica	22.22	488.89	10.77	0.1194341
Adhatoda vasica	22.22	414.81	9.71	0.1110322
Agave amaricana	22.22	622.22	12.68	0.1337009
Agave sissalna	33.33	785.19	14.96	0.1495503
Aspargus racimosus	11.11	133.33	4.78	0.0659387
Barleria cristata	22.22	740.74	14.37	0.1455717
Blepharis madarspatus	11.11	355.56	9.60	0.1101303
Blepharis repens	18.52	400.00	9.46	0.108991
Bridelia scandence	11.11	400.00	10.56	0.1178212
Calotropis gigantica	11.11	355.56	9.60	0.1101303
Calotropis procera	11.11	311.11	8.63	0.1021162
Cassia obtusifolia	11.11	370.37	9.92	0.1127283
Cassia spinarum	55.56	1407.41	23.34	0.1986801
Chloroxylan swatorria	3.70	29.63	2.15	0.0353402
Clerodendron serratum	11.11	355.56	9.60	0.1101303
Dedonia viscosa	22.22	725.93	14.16	0.1441261
Desmodium febrifugium	22.22	459.26	10.35	0.1161171
Helicteres isora	59.26	918.52	18.97	0.1745829
Lantana camara	66.67	2488.89	34.69	0.2494638
Nyctanthus arbortistis	48.15	844.44	16.90	0.1620674
Pheonix spp.	11.11	355.56	9.60	0.1101303
Syzygium cumini	22.22	444.44	10.13	0.114437
Vitex negundo	29.63	577.78	12.23	0.1304721
Woodfordia fruticosa	18.52	311.11	8.06	0.0971347
	588.89	**14429.63**	**300.00**	**3.095766**

Annexure - 18 Phytosociological attributes of Herb species diversity in Motinala range of East Mandla forest division

Botanical Name	F%	IVI	DI
Achyrynthus aspera	28.89	5.01	0.07
Aerva lanata	11.11	4.54	0.06
Ageratum houstonianum	11.11	4.36	0.06
Alternanthera ficoidials	6.67	1.95	0.03
Alternanthera sessilis	51.11	9.08	0.11
Andrographis paninculata	22.22	4.72	0.07
Andropogan contortus	26.67	6.28	0.08
Aristida funiculata	11.11	5.33	0.07
Arthaxon cilliaris	11.11	4.10	0.06
Aspargus racemosus	11.11	4.27	0.06
Boerhavvia diffusa	11.11	2.51	0.04
Bothrichloa intermedia	11.11	4.19	0.06
Bulbostylis barbata	11.11	4.36	0.06
Canscora diffusa	8.89	2.32	0.04
Cardammine trichocarpa	6.67	1.34	0.02
Cassia tora	15.56	3.40	0.05
Coculus hirsutus	11.11	2.51	0.04
Curcuma angustifolia	15.56	4.14	0.06
Cynodon dactylon	37.78	6.20	0.08
Cyperus iria	40.00	8.87	0.10
Cyperus kallinga	22.22	6.53	0.08
Cyperus niverus	28.89	5.01	0.07
Cyperus pumulus	24.44	4.70	0.07
Cyperus triceps	11.11	4.80	0.07
Desmodium velutinum	8.89	2.83	0.04
Desmodium feorifugium	17.78	3.90	0.06
Desmodium trifolium	28.89	4.95	0.07
Dicanthium annulatum	22.22	6.03	0.08

Digitaria ternata	11.11	5.77	0.08
Dioscorea bulbifera	8.89	3.03	0.05
Dioscorea daemona	11.11	4.54	0.06
Eragrostiella bifaria	28.89	4.95	0.07
Eragrostis sessalans	8.89	2.32	0.04
Eragrostis pilosa	11.11	5.24	0.07
Eragrostis tenella	31.11	5.49	0.07
Euphorbia hirta	33.33	6.50	0.08
Evolvulus alsinoides	11.11	4.54	0.06
Fimbristylis dichotoma	11.11	4.27	0.06
Fimbristylis Falcata	11.11	4.36	0.06
Fimbristylis obtusata	11.11	5.07	0.07
Gardenia gummifera	11.11	4.27	0.06
Gloriosa superba	8.89	1.82	0.03
Hemidesmus indicus	24.44	4.21	0.06
Heteropogon contortus	26.67	7.51	0.09
Hyptis suaveolens	6.67	1.95	0.03
Imperata cylindrica	22.22	7.41	0.09
Indigofera grabra	11.11	4.10	0.06
Iseilema laxum	11.11	4.36	0.06
Leea macrophylla	11.11	4.45	0.06
Lindernia hirsuta	11.11	4.10	0.06
Leucas aspera	11.11	4.63	0.06
Ocimum canum	6.67	1.95	0.03
Oxalis corniculata	11.11	4.54	0.06
Panicum repense	33.33	9.04	0.11
Parthenium hetrosprum	11.11	3.04	0.05
Perotis indica	11.11	4.45	0.06
Rungia repens	8.89	2.02	0.03
Saccharum spontanium	22.22	5.40	0.07
Setaria pumulla	11.11	4.98	0.07

Tephrosia purpurea	6.67	2.07	0.03
Themeda indicus	4.44	1.56	0.03
Tribulus terrestris	11.11	4.80	0.07
Tridax procumbens	26.67	4.35	0.06
Triumfetta pentandra	11.11	2.42	0.04
Triumfetta rhombodia	11.11	2.42	0.04
Urena lobata	11.11	4.72	0.07
Vantilego danticulata	11.11	3.13	0.05
Xanthium strumarium	22.22	5.97	0.08
	1100.00	**300.00**	**4.14**

Table – 17 shows the total number of tree, shrub and herb species recorded from different ranges of West Mandla forest division. Number of plant species collected under different habits are presented. Maximum 104 species are identified from Kalpi range and mimimum 35 species from Mandla range. Data revealed that Kalpi and Beejadandi range are having good plant biodiversity but other ranges Bamhni, Barela, Maharajpur, Mandla, Niwas and Tikariya ranges are having between 50 to 35 plant species. It shows that these ranges are having more biotic pressure and more habitation with development activity, which resulted into less species diversity.

Table – 17 Phytosociological attributes of plant diversity of different habits in west Mandla forest division

S. No.	Range	Tree species	Shrub species	Herb species	Total
1	**Bamhni**	20	12	14	46
2	**Barela**	20	14	16	50
3	**Beejadandi**	25	37	28	90
4	**Kalpi**	42	18	44	104
5	**Maharajpur**	23	7	8	38
6	**Mandla**	10	7	18	35
7	**Niwas**	14	6	21	41
8	**Tikariya**	21	9	16	46

Average 240.78 trees/ha were observed in West Mandla.. Kalpi range is having maximum 448.75 trees/ha and minimum 38.39 trees/ha were recorded in Niwas range. Mandla and Maharajpur ranges are having similar tree density. Data also revealed that density for herbs is also maximum in Kalpi range (517800/ha) but shrub density is maximum in Beejadandi range (2755.56/ha). Maximum diversity index was found in Kalpi range (3.51) and minimum (1.97) in Maharajpur range **(Table - 18).** Average density index was found 2.7 which shows less diversity in the area. According the data became say that West Mandla forest division is having more biotic pressure resulting into less diversity in the area. **(Figure - 8, 9, 10, 11)**

Table – 18 Phytosociological attribute of plant species diversity in **West Mandla forest division**

S. No.	Range	Tree		Shrub		Herb	
		d/ha	DI	d/ha	DI	d/ha	DI
1	Bamhni	206.25	2.46	3488.89	1.94	192666.67	2.34
2	Barela	295.54	2.41	14952.38	2.42	394571.43	2.53
3	Beejadandi	358.33	2.85	27555.56	3.39	499666.67	3.02
4	Kalpi	448.75	3.36	11026.67	2.63	517800.00	3.51
5	Maharajpur	173.44	2.77	4733.33	1.58	6400.00	1.97
6	Mandla	176.04	2.11	8933.33	1.69	197333.33	2.71
7	Niwas	38.39	2.40	6833.33	1.67	202500.00	2.96
8	Tikariya	229.46	2.75	8247.62	1.96	218285.71	2.70
Average		240.78	2.64	10721.39	2.163	278652.98	2.72

When we compare East Mandla forest division with West Mandla forest division in reference to diversity of species, we find that East Mandla forest ranges are having more species than ranges of West Mandla forest division. **(Table – 15 & 17)** Data also revealed that diversity index of species is more in East Mandla (2.70) than in West Mandla (2.64). Diversity index of shrubs and herbs in East Mandla scored higher (2.36 & 3.95) than West Mandla (2.16 & 2.72). Over all floral diversity is higher in East Mandla forest division than in West Mandla Forest division. Phytosociological attributes of tree, shrubs and herbs in various ranges are given in **Annexure – 19 - 42**.

Annexure - 19 Phytosociological attributes of Tree species diversity in Bamhni range of West Mandla forest division

Botanical Name	F%	Density/ha.	IVI	DI
Aegle marmelos	16.67	1.04	3.24	0.05
Anogeissus latifolia	83.33	31.25	43.20	0.28
Buchanania lanzan	33.33	4.17	7.72	0.09
Butea monosperma	16.67	1.04	3.06	0.05
Casia fistula	16.67	2.08	3.42	0.05
Diospyros melanoxylon	83.33	18.75	22.11	0.19
Emblica officinalis	50.00	7.29	13.13	0.14
Haldinia cordifolia	16.67	5.21	6.94	0.09
Lagerstoemia parviflora	66.67	12.50	17.07	0.16
Madhuca latifolia	33.33	4.17	16.14	0.16
Miliusa tomentosa	16.67	1.04	4.29	0.06

Mitragyna parviflora	16.67	1.04	3.10	0.05
Tectona grandis	66.67	66.67	60.49	0.32
Terminalia alata	83.33	34.38	61.18	0.32
Terminalia bellirica	16.67	5.21	5.30	0.07
Pterocarpus marsupium	33.33	4.17	10.05	0.11
Milletia auriculata	33.33	3.13	8.90	0.10
Choroxylon tuberosum	16.67	1.04	2.89	0.04
Acacia caesia	16.67	1.04	4.23	0.06
	733.33	**206.25**	**300.00**	**2.46**

Annexure - 20 Phytosociological attributes of Shrub species diversity in Bamhni range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Carissa opaca	5.56	22.22	6.47	0.08
Eranthemum purpurascens	44.44	2422.22	136.41	0.36
Indigofera indica	5.56	44.44	10.72	0.12
Jatropha gossypifolia	5.56	22.22	6.47	0.08
Lantana camara	100.00	1822.22	108.68	0.37
Mimosa pudica	27.78	200.00	23.34	0.20
Dodonaea viscosa	33.33	266.67	28.20	0.22
Pheonix acaulis	33.33	600.00	46.78	0.29
Sida spinosa	11.11	244.44	31.31	0.24
Sida cordifolia	11.11	177.78	23.99	0.20
Woodfordia frulicau	5.56	22.22	6.47	0.08
zyzipus jujuba	16.67	88.89	14.03	0.14
	250.00	**3488.89**	**300.00**	**1.94**

Annexure - 21 Phytosociological attributes of Herb species diversity in Bamhni range of West Mandla forest division

Botanical Name	F%	Density/ ha	IVI	DI
Canscora diffusa	6.67	1333.33	5.78	0.08
Cassia tora	3.33	333.33	2.72	0.04
Chrysopogon aciculatus	10.00	3000.00	9.19	0.11
Coix gigantea	13.33	3333.33	9.42	0.11
Cynodon dactylon	76.67	62666.67	66.44	0.33
Cyperus iria	23.33	8000.00	16.03	0.16
Cyperus rotundus	26.67	35000.00	47.01	0.29
Desmodium tifolium	63.33	20333.33	32.69	0.24
Eragrostis biferia	10.00	4333.33	12.09	0.13
Eragrostis tenella	60.00	19666.67	31.57	0.24
Euphorbia hirta	43.33	18333.33	28.04	0.22
Phyllanthus niruri	13.33	2333.33	7.65	0.09
Triumfetta rhombodia	16.67	9333.33	18.56	0.17
	10.00	4666.67	12.82	0.13
	376.67	**192666.67**	**300.00**	**2.34**

Annexure - 22 Phytosociological attributes of Tree species diversity in Barela range of West Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Anogeissus latifolia	100.00	27.68	28.21	0.22
Butea monosperma	42.86	6.25	9.01	0.11
Casia fistula	100.00	33.04	27.29	0.22
Ficus religiosa	14.29	0.89	4.04	0.06
Ficus tomentosa	42.86	3.57	8.89	0.10
Haldinia cordifolia	14.29	0.89	2.23	0.04
Lagerstoemia parviflora	100.00	60.71	39.12	0.27
Mangifera indica	14.29	0.89	9.76	0.11
Miliusa tomentosa	28.57	6.25	7.99	0.10
Mitragyna parviflora	57.14	6.25	10.64	0.12
Tectona grandis	100.00	116.96	80.76	0.35

Terminalia alata	100.00	20.54	40.34	0.27
Terminalia indica	14.29	0.89	4.15	0.06
Pterocarpus marsupium	14.29	0.89	3.09	0.05
Malinkara hexandra	28.57	1.79	4.80	0.07
Milletia auriculata	42.86	3.57	6.83	0.09
Azadiracta indica	14.29	0.89	2.23	0.04
Pongamia pinnata	14.29	0.89	4.04	0.06
Miliusa velutina	14.29	0.89	2.04	0.03
Garuga pinnata	28.57	1.79	4.54	0.06
	885.71	**295.54**	**300.00**	**2.41**

Annexure - 23 Phytosociological attributes of Shrub species diversity in Barela range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Agave sissalna	28.57	666.67	15.86	0.16
Argemone maxicana	14.29	323.81	10.60	0.12
Aspargus racemosus	4.76	19.05	2.05	0.03
Carissa opaca	28.57	342.86	10.88	0.12
Eranthemum purpurascens	71.43	4323.81	57.96	0.32
Ipomea palmata	4.76	438.10	26.70	0.22
Lantana camara	100.00	3295.24	49.84	0.30
Mimosa pudica	28.57	609.52	14.98	0.15
Dodonaea viscosa	38.10	609.52	15.52	0.15
Pheonix acaulis	57.14	552.38	17.31	0.16
Sida acuta	33.33	1333.33	25.39	0.21
Sida cordifolia	47.62	1523.81	27.48	0.22
Vitex negundo	33.33	514.29	13.81	0.14
zyzipus jujuba	19.05	400.00	11.63	0.13
	509.52	**14952.38**	**300.00**	**2.42**

Annexure - 24 Phytosociological attributes of Herb species diversity in Barela range of West Mandla forest division

Botanical Name	**F%**	**Density/ ha**	**IVI**	**DI**
Abelnoschus crinutus	5.71	2285.71	5.33	0.07
Amorphophallus bulbifer	17.14	12285.71	13.11	0.14
Bacopa moneri	17.14	16000.00	15.97	0.16
Cuscuta reflexa	22.86	21428.57	18.61	0.17

Cynodon dactylon	71.43	64000.00	39.46	0.27
Cyperus iria	42.86	34571.43	25.08	0.21
Cyperus rotundus	14.29	9142.86	11.03	0.12
Desmodium tifolium	68.57	69142.86	41.14	0.27
Euphorbia hirta	77.14	80571.43	46.19	0.29
Evolvulus alsinoides	51.43	36857.14	26.70	0.22
Holorrheyam antidisentrica	11.43	5714.29	8.31	0.10
Parthenium hetrosporium	17.14	25714.29	23.42	0.20
Phyllanthus niruri	5.71	1142.86	3.28	0.05
Sporobolus pulchellus	8.57	2285.71	4.77	0.07
Themeda caudia	20.00	8285.71	10.05	0.11
Vitevaria zizanoides	14.29	5142.86	7.55	0.09
	465.71	**394571.43**	**300.00**	**2.53**

Annexure - 25 Phytosociological attributes of Tree species diversity in Bijadandi range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Acacia leucophloea	16.67	4.17	2.90	0.04
Aegle marmelos	50.00	3.13	5.17	0.07
Anogeissus latifolia	100.00	31.25	27.32	0.22
Bridellia retusa	33.33	5.21	4.76	0.07
Buchanania lanzan	100.00	25.00	19.84	0.18
Butea monosperma	66.67	22.92	13.75	0.14
Casia fistula	100.00	55.21	34.51	0.25
Diospyros melanoxylon	100.00	39.58	25.10	0.21
Emblica officinalis	50.00	7.29	6.86	0.09
Haldinia cordifolia	33.33	2.08	3.90	0.06
Lagerstoemia parviflora	100.00	39.58	26.74	0.22
Madhuca latifolia	33.33	3.13	9.22	0.11
Mitragyna parviflora	33.33	7.29	6.23	0.08
Ougeinia oogeinensis	50.00	6.25	6.82	0.09
Semecarpus anacarium	33.33	3.13	9.12	0.11
Syzygium cumini	33.33	7.29	6.88	0.09
Tectona grandis	100.00	55.21	44.39	0.28
Terminalia alata	100.00	18.75	19.06	0.18
Terminalia arjuna	50.00	4.17	7.35	0.09
Pterocarpus marsupium	16.67	1.04	2.50	0.04
Milletia auriculata	16.67	3.13	3.55	0.05
Casearia graviolence	16.67	1.04	1.73	0.03

Schleichera oleosa	50.00	4.17	5.47	0.07
Sterospermum xylocarpus	16.67	4.17	4.16	0.06
Bridellia retusa	16.67	4.17	2.68	0.04
	1316.67	**358.33**	**300.00**	**2.85**

Annexure - 26 Phytosociological attributes of Shrub species diversity in Bijadandi range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abormia augsta	5.56	22.22	1.16	0.02
Acacia arabica	33.33	866.67	10.01	0.11
Acacia leucophloea	5.56	44.44	2.00	0.03
Acacia nilotica	27.78	111.11	2.79	0.04
Adhatoda vasica	27.78	400.00	5.80	0.08
Adina cordifolia	44.44	622.22	7.51	0.09
Aegle marmelos	22.22	133.33	2.92	0.05
Agave sissalna	55.56	577.78	7.32	0.09
Anogeissus latifolia	55.56	1488.89	13.72	0.14
Argemone maxicana	50.00	377.78	5.73	0.08
Barleria cristata	44.44	1333.33	13.11	0.14
Bridelia retusa	38.89	311.11	4.92	0.07
Buchanania lanzan	66.67	511.11	7.21	0.09
Butea monosperma	72.22	688.89	8.54	0.10
Carissa opaca	55.56	288.89	5.29	0.07
Casia fistula	55.56	444.44	6.38	0.08
Cassia spinarum	33.33	1066.67	11.87	0.13
Dedonia viscosa	27.78	666.67	8.58	0.10
Dendrocalamus strictus	5.56	88.89	3.67	0.05
Diospyros melanoxylon	88.89	1666.67	14.80	0.15
Eranthemum purpurascens	72.22	3800.00	27.96	0.22
Helicteres isora	44.44	288.89	4.88	0.07
Indigofera indica	27.78	355.56	5.34	0.07
Lantana camara	100.00	1422.22	13.71	0.14
Mimosa pudica	44.44	333.33	5.23	0.07
Dodonaea viscosa	66.67	2044.44	17.12	0.16
Parthenium hetrosporium	94.44	3000.00	22.42	0.19

Pheonix acaulis	38.89	266.67	4.54	0.06
Sida spinosa	50.00	1044.44	10.67	0.12
Sida cordifolia	66.67	1244.44	11.95	0.13
Sygium cumuani	44.44	266.67	4.71	0.07
Semecapus anacardium	33.33	177.78	3.61	0.05
Tectona grandis	72.22	711.11	8.67	0.10
Terminalia alata	44.44	288.89	4.88	0.07
Woodfordia frulicau	66.67	466.67	6.92	0.09
zyzipus jujuba	11.11	44.44	1.57	0.03
Zyzipus oneophlea	11.11	88.89	2.48	0.04
	1705.56	**27555.56**	**300.00**	**3.39**

Annexure - 27 Phytosociological attributes of Herb species diversity in Bijadandi range of West Mandla forest division

Botanical Name	F%	Density/ ha	Abundance/ ha	IVI	DI
Abelnoschus esculantus	6.67	2000.00	30000.00	3.84	0.06
Abrus precatorius	3.33	333.33	10000.00	1.33	0.02
Abutilon indicum	13.33	4000.00	30000.00	4.92	0.07
Acacia catechu	6.67	3000.00	45000.00	5.42	0.07
Acacia leucophloea	76.67	66000.00	86086.96	28.97	0.23
Achyranthes aspara	13.33	7000.00	52500.00	7.59	0.09
Aerva sanguinolenta	10.00	4333.33	43333.33	5.88	0.08
Aeschynomene aspera	60.00	19666.67	32777.78	13.09	0.14
Aeschynomene indica	43.33	18333.33	42307.69	12.00	0.13
Ageratum conyzoides	13.33	2333.33	17500.00	3.44	0.05
Alloteropsis cimicina	40.00	15666.67	39166.67	10.83	0.12
Alternanthera sessilis	50.00	18000.00	36000.00	12.03	0.13
Canscora diffusa	40.00	16666.67	41666.67	11.26	0.12
Cassia tora	33.33	8333.33	25000.00	7.38	0.09
Centella asiatica	26.67	5666.67	21250.00	5.82	0.08
Coculus hirsutus	56.67	16666.67	29411.76	11.84	0.13
Cynodon dactylon	80.00	82666.67	103333.33	34.24	0.25
Cyperus iria	46.67	13333.33	28571.43	10.07	0.11
Cyperus nivens	20.00	4666.67	23333.33	5.13	0.07
Cyperus triceps	43.33	9000.00	20769.23	8.15	0.10
Desmodium tifolium	53.33	16000.00	30000.00	11.42	0.12
Dicanthium annulatum	16.67	3000.00	18000.00	3.96	0.06
Eclipta alba	36.67	12000.00	32727.27	9.16	0.11

Eragrostis tenella	50.00	11333.33	22666.67	9.47	0.11
Helicteres isora	80.00	123666.67	154583.33	47.15	0.29
Heteropogon contortus	33.33	11666.67	35000.00	8.97	0.10
Imperata cylindrica	13.33	2666.67	20000.00	3.74	0.05
Ocimum canum	10.00	1666.67	16666.67	2.89	0.04
	976.67	**499666.67**	**1087652.12**	**300.00**	**3.02**

Annexure - 28 Phytosociological attributes of Tree species diversity in Kalpi range of West Mandla forest division

Botanical Name	**F%**	**Density/Ha**	**IVI**	**DI**
Acacia leucophloea	20.00	1.25	1.59	0.03
Aegle marmelos	60.00	11.25	7.99	0.10
Albizia Lebbeck	20.00	3.75	2.55	0.04
Anogeissus latifolia	80.00	26.25	19.65	0.18
Bahunia variagata	20.00	3.75	2.31	0.04
Bombax ceiba	20.00	7.50	3.19	0.05
Bridellia retusa	20.00	7.50	3.43	0.05
Buchanania lanzan	20.00	5.00	2.76	0.04
Butea monosperma	60.00	12.50	7.76	0.09
Careya arborea	20.00	3.75	2.63	0.04
Cassine glauca	20.00	2.50	2.03	0.03
Diospyros melanoxylon	20.00	6.25	8.61	0.10
Emblica officinalis	60.00	8.75	6.73	0.09
Feronia limonia	20.00	1.25	1.73	0.03
Ficus religiosa	20.00	1.25	1.60	0.03
Ficus tomentosa	40.00	8.75	6.15	0.08
Flacourtia indica	20.00	1.25	1.59	0.03
Haldinia cordifolia	40.00	3.75	5.10	0.07
Lagerstoemia parviflora	80.00	50.00	18.70	0.17
Miliusa tomentosa	60.00	27.50	17.34	0.16
Mitragyna parviflora	40.00	8.75	5.07	0.07
Ougeinia oogeinensis	40.00	11.25	6.31	0.08
Shorea robesta	20.00	5.00	5.91	0.08
Tectona grandis	100.00	86.25	40.31	0.27
Terminalia alata	100.00	28.75	28.15	0.22
Terminalia arjuna	60.00	11.25	7.80	0.09
Terminalia bellirica	20.00	10.00	5.06	0.07
Terminalia chebula	20.00	5.00	2.79	0.04
Pterocarpus marsupium	20.00	1.25	1.73	0.03
Milletia auriculata	60.00	21.25	12.14	0.13

Shleichera oleosa	40.00	7.50	6.83	0.09
Sterculia urens	40.00	5.00	4.05	0.06
Flacourtia indica	40.00	7.50	4.60	0.06
Grawia tiliaefolia	40.00	11.25	5.64	0.07
Azadiracta indica	60.00	6.25	5.73	0.08
Erythrina variagata	20.00	5.00	2.56	0.04
Pterocarpus sp.	40.00	3.75	7.82	0.10
Pongamia pinnata	40.00	5.00	4.14	0.06
Bahunia variagata	40.00	3.75	4.52	0.06
Ailanthus excelsa	20.00	1.25	7.12	0.09
Alangium salvifolium	20.00	2.50	3.21	0.05
	1640.00	**448.75**	**300.00**	**3.36**

Annexure - 29 Phytosociological attributes of Shrub species diversity in Kalpi range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Agave sissalna	26.67	266.67	9.48	0.11
Antidesma ghaeremeilla	10.00	306.67	10.47	0.12
Argemone maxicana	13.33	346.67	10.61	0.12
Calotropis gigantica	3.33	53.33	4.13	0.06
Carissa opaca	30.00	320.00	10.74	0.12
Dedonia viscosa	10.00	306.67	10.47	0.12
Eranthemum purpurascens	33.33	2320.00	40.56	0.27
Lantana camara	86.67	2906.67	49.52	0.30
Mimosa pudica	20.00	266.67	8.81	0.10
Pheonix acaulis	13.33	93.33	4.75	0.07
Sida acuta	16.67	1653.33	36.81	0.26
Sida cordifolia	10.00	533.33	16.77	0.16
Solonum nigrum	3.33	186.67	12.82	0.13
Vitex negundo	13.33	653.33	17.69	0.17
Woodfordia frulicau	23.33	320.00	10.01	0.11
zyzipus jujuba	40.00	373.33	12.92	0.14
Zyzipus oneophlea	13.33	80.00	4.45	0.06
	146.67	40.00	28.99	0.23

	513.33	**11026.67**	**300.00**	**2.63**

Annexure - 30 Phytosociological attributes of Herb species diversity in Kalpi range of West Mandla forest division

Botanical Name	F%	Density/ ha	IVI	DI
Abelnoschus crinutus	4.00	3000.00	3.92	0.06
Abrus precatorius	2.00	200.00	0.68	0.01
Abutilon indicum	50.00	43600.00	18.27	0.17
Achyranthes aspara	14.00	5400.00	4.33	0.06
Alternonthera sessile	16.00	15400.00	8.69	0.10
Adhatoda vasica	4.00	800.00	1.43	0.03
Alloteropsis cimicina	4.00	1400.00	2.11	0.03
Amaranthus spinosus	26.00	8600.00	6.32	0.08
Andrographis paniculata	4.00	600.00	1.21	0.02
Bacopamoneri	6.00	4400.00	4.39	0.06
Boerhavvia diffusa	22.00	15000.00	8.35	0.10
Bothrichloa intermedia	2.00	1400.00	3.16	0.05
Cassia tora	20.00	24000.00	11.77	0.13
Costus speciosis	4.00	1200.00	1.88	0.03
Cuscuta reflexa	12.00	7400.00	5.32	0.07
Cynodon dactylon	54.00	26200.00	13.99	0.14
Cyperus iria	50.00	46600.00	19.08	0.18
Cyperus rotundus	28.00	14400.00	8.40	0.10
Desmodium gangeticum	26.00	17400.00	9.29	0.11
Desmodium tifolium	84.00	62200.00	25.84	0.21
Diplocyclos palmatus	2.00	400.00	1.09	0.02
Elephantopus scaber	10.00	7800.00	5.75	0.08
Embelia tsjertom-cotom	4.00	1000.00	1.66	0.03
Eragrostis tenella	12.00	13400.00	8.36	0.10
Euphorbia hirta	56.00	31800.00	15.64	0.15
Evolvulus alsinoides	58.00	43000.00	18.72	0.17
Hemidesmus indicus	26.00	20800.00	10.44	0.12
Heteropogon contortus	8.00	2800.00	2.91	0.04
Holorrheyam antidisentrica	12.00	8200.00	5.73	0.08
Ichnocarpus frutescens	4.00	3200.00	4.15	0.06
Imperata cylindrica	8.00	3000.00	3.04	0.05
Indigofera titoriya	14.00	10000.00	6.45	0.08
Mucuna puraria	8.00	2800.00	2.91	0.04
Phyllanthus niruri	6.00	4600.00	4.56	0.06

Saccharum spontanium	10.00	2400.00	2.68	0.04
Sida acuta	8.00	2600.00	2.77	0.04
Sida cordifolia	18.00	14000.00	7.99	0.10
Sperobulus pulchellus	8.00	4200.00	3.83	0.06
Themeda caudata	10.00	7000.00	5.30	0.07
Tribulus terrestris	12.00	12400.00	7.85	0.10
Ventilego denticulata	10.00	5800.00	4.61	0.06
Vertiveria zizanoides	6.00	5800.00	5.54	0.07
Vitex negundo	8.00	6400.00	5.29	0.07
Vernoria cineria	10.00	5200.00	4.27	0.06
	760.00	**517800.00**	**300.00**	**3.51**

Annexure - 31 Phytosociological attributes of Tree species diversity in Maharajpur range of West Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Aegle marmelos	25.00	3.13	6.18	0.08
Anogeissus latifolia	25.00	1.56	5.43	0.07
Buchanania lanzan	25.00	1.56	4.61	0.06
Butea monosperma	25.00	3.13	5.88	0.08
Casia fistula	75.00	7.81	14.07	0.14
Dalbergia sissoo	25.00	3.13	9.26	0.11
Diospyros melanoxylon	50.00	14.06	18.18	0.17
Emblica officinalis	50.00	4.69	10.15	0.11
Ficus tomentosa	25.00	1.56	6.89	0.09
Lagerstoemia parviflora	75.00	17.19	20.45	0.18
Miliusa tomentosa	50.00	3.13	9.09	0.11
Ougeinia oogeinensis	25.00	3.13	15.55	0.15
Tectona grandis	100.00	64.06	65.86	0.33
Terminalia alata	75.00	14.06	25.40	0.21
Terminalia arjuna	25.00	3.13	13.12	0.14
Terminalia indica	25.00	1.56	4.30	0.06
Milliutes auriculata	75.00	12.50	23.57	0.20
Shleichera oleosa	25.00	7.81	17.54	0.17
Sterospermum xylocarpus	25.00	1.56	12.86	0.14
Chloroxylon tuberosum	25.00	1.56	3.98	0.06
Bridelia retusa	25.00	1.56	3.79	0.06
	900.00	**173.44**	**300.00**	**2.77**

Annexure - 32 Phytosociological attributes of Shrub species diversity in Maharajpur range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Carissa opaca	8.33	66.67	13.96	0.14
Dedonia viscosa	16.67	100.00	15.56	0.15
Jatropha gossypifolia	8.33	33.33	8.59	0.10
Lantana camara	75.00	1566.67	86.48	0.36
Parthenium hetrosporium	75.00	2266.67	112.15	0.37

Zyzipus jujuba	25.00	133.33	18.71	0.17
	50.00	566.67	44.54	0.28
	258.33	**4733.33**	**300.00**	**1.58**

Annexure - 33 Phytosociological attributes of Herb species diversity in Maharajpur range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Anthrax cilliaris	15.00	80.00	9.44	0.11
Cynodon dactylon	55.00	1380.00	54.72	0.31
Cyperus iria	35.00	1160.00	48.94	0.30
Cyperus triceps	45.00	1440.00	56.12	0.31
Desmodium tifolium	50.00	860.00	40.41	0.27
Eragrostis tenella	25.00	200.00	16.27	0.16
Euphorbia hirta	10.00	400.00	32.33	0.24
Heteropogon contortus	55.00	880.00	41.77	0.27
	290.00	**6400.00**	**300.00**	**1.97**

Annexure - 34 Phytosociological attributes of Tree species diversity in Mandla range of West Mandla forest division

Botanical Name	**F%**	**Density/Ha**	**IVI**	**DI**
Aegle marmelos	33.33	8.33	15.51	0.15
Anogeissus latifolia	100.00	28.13	47.63	0.29
Lagerstoemia parviflora	66.67	21.88	31.84	0.24
Miliusa tomentosa	33.33	16.67	26.34	0.21
Ougeinia oogeinensis	50.00	10.42	22.40	0.19
Tectona grandis	83.33	46.88	76.17	0.35
Terminalia alata	83.33	23.96	41.86	0.27
Terminalia arjuna	33.33	6.25	14.77	0.15
Boswellia serrata	33.33	10.42	17.25	0.16
Milliutes auriculata	16.67	3.13	6.24	0.08
	533.33	**176.04**	**300.00**	**2.11**

Annexure - 35 Phytosociological attributes of Shrub species diversity in Mandla range of West Mandla forest division

Botanical Name	**F%**	**Density/ha**	**IVI**	**DI**
Agave sissalna	33.33	644.44	30.18	0.23
Carissa opaca	27.78	311.11	19.97	0.18
Cassia spinarum	16.67	466.67	26.64	0.22
Dedonia viscosa	27.78	644.44	30.20	0.23
Eranthemum purpurascens	66.67	4377.78	109.57	0.37
Lantana camara	77.78	2377.78	72.34	0.34
Zyzipus jujuba	16.67	111.11	11.10	0.12
	266.67	**8933.33**	**300.00**	**1.69**

Annexure - 36 Phytosociological attributes of Herb species diversity in Mandla range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abelmoschus crinitius	16.67	9000.00	15.82	0.16
Abelmoschus moschutus	13.33	6000.00	12.30	0.13
Abutilon indicum	10.00	2000.00	6.03	0.08
Achyranthes aspara	16.67	5333.33	10.87	0.12
Ageratum conyzoides	60.00	21000.00	28.79	0.22
Alternanthera sessilis	30.00	9000.00	15.39	0.15
Amaranthus viridus	13.33	4666.67	10.22	0.12
Biophytum sensitivium	13.33	3666.67	8.66	0.10
Cassia occidantalis	13.33	4666.67	10.22	0.12
Cassia tora	50.00	18333.33	25.47	0.21
Clitoria angulata	13.33	4666.67	10.22	0.12
Cynodon dactylon	46.67	58666.67	57.67	0.32
Cyperus iria	33.33	12000.00	18.49	0.17
Desmodium tifolium	40.00	12333.33	19.40	0.18
Eclipta alba	13.33	3333.33	8.14	0.10
Eragrostis tenella	36.67	8000.00	15.20	0.15
Sida acuta	16.67	9000.00	15.82	0.16
Xanthium strumarium	16.67	5666.67	11.32	0.12
	453.33	**197333.33**	**300.00**	**2.71**

Annexure - 37 Phytosociological attributes of Tree species diversity in Niwas range of West Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Anogeissus latifolia	14.29	4.46	40.47	0.27
Casia fistula	4.76	1.49	9.53	0.11
Diospyros melanoxylon	9.52	5.06	35.24	0.25
Emblica officinalis	4.76	0.60	6.54	0.08
Haldinia cordifolia	4.76	1.49	10.69	0.12
Lagerstoemia parviflora	9.52	2.68	22.54	0.19
Miliusa tomentosa	9.52	2.68	21.83	0.19
Mitragyna parviflora	4.76	1.49	12.56	0.13
Ougeinia oogeinensis	4.76	1.19	10.20	0.11
Tectona grandis	14.29	8.04	50.67	0.30
Terminalia alata	14.29	5.65	48.79	0.30
Millutes auriculata	4.76	1.49	15.12	0.15
Caseasia graviolence	4.76	0.89	7.15	0.09
Schleichera oleosa	4.76	1.19	8.68	0.10
	109.52	**38.39**	**300.00**	**2.40**

Annexure - 38 Phytosociological attributes of Shrub species diversity in Niwas range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Acacia arabica	41.67	900.00	43.90	0.28
Acacia nilotica	25.00	400.00	26.76	0.22
Agave sissalna	100.00	1800.00	72.56	0.34
Carissa opaca	25.00	400.00	26.76	0.22
Cassia spinarum	25.00	600.00	36.20	0.26
Lantana camara	100.00	2733.33	93.81	0.36
	316.67	**6833.33**	**300.00**	**1.67**

Annexure - 39 Phytosociological attributes of Herb species diversity in Niwas range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abelnoschus esculantus	4.76	7500.00	12.30	0.13
Abutilon indicum	2.86	4500.00	9.05	0.11
Acacia catechu	2.86	4500.00	9.05	0.11
Achyranthes aspara	7.62	14000.00	18.86	0.17
Alloteropsis cimicina	3.81	6000.00	10.68	0.12
Alternanthera sessilis	6.67	11000.00	16.00	0.16
Boerhavvia diffusa	3.81	4500.00	8.89	0.10
Cassia tora	8.57	13500.00	18.80	0.17
Cynodon dactylon	8.57	18500.00	22.82	0.20
Cyperus iria	12.38	31500.00	33.80	0.25
Cyperus nivens	3.81	7000.00	11.86	0.13
Desmodium tifolium	7.62	17000.00	21.39	0.19
Dicanthium annulatum	3.81	6000.00	10.68	0.12
Eclipta alba	3.81	4500.00	8.89	0.10
Euphorbia hirta	3.81	13000.00	19.00	0.17
Heteropogon contortus	3.81	8000.00	13.05	0.14
Imperata cylindrica	2.86	4500.00	9.05	0.11
Perotis indica	3.81	5000.00	9.49	0.11
Phyllanthus niruri	4.76	9500.00	14.40	0.15
Saccharum spontanium	3.81	7500.00	12.46	0.13
Xanthium strumarium	3.81	5000.00	9.49	0.11
	107.62	**202500.00**	**300.00**	**2.96**

Annexure - 40 Phytosociological attributes of Tree species diversity in Tikariya range of West Mandla forest division

Botanical Name	F%	Density/Ha	IVI	DI
Aegle marmelos	42.86	7.14	11.65	0.13
Anogeissus latifolia	57.14	25.00	29.24	0.23
Buchanania lanzan	14.29	4.46	11.28	0.12
Casia fistula	28.57	15.18	13.80	0.14
Cassine glauca	14.29	3.57	4.98	0.07
Diospyros melanoxylon	42.86	24.11	22.14	0.19
Emblica officinalis	14.29	1.79	3.37	0.05
Haldinia cordifolia	28.57	8.04	12.88	0.14
Lagerstoemia parviflora	42.86	16.96	17.07	0.16
Madhuca latifolia	42.86	13.39	23.20	0.20
Miliusa tomentosa	28.57	8.04	9.95	0.11
Mitragyna parviflora	14.29	3.57	5.04	0.07
Ougeinia oogeinensis	14.29	3.57	4.22	0.06
Semecarpus anacarium	14.29	1.79	3.25	0.05
Tectona grandis	100.00	45.54	51.80	0.30
Terminalia alata	85.71	24.11	34.71	0.25
Terminalia chebula	28.57	4.46	7.53	0.09
Baswellia serrata	28.57	8.04	13.80	0.14
Milliutes auriculata	42.86	7.14	11.66	0.13
Sapindus laurifolius	14.29	2.68	4.35	0.06
Sterculia urens	14.29	0.89	4.08	0.06
	714.29	**229.46**	**300.00**	**2.75**

Annexure - 41 Phytosociological attributes of Shrub species diversity in Tikariya range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Acacia arabica	14.29	438.10	24.48	0.20
Agave sissalna	42.86	971.43	36.38	0.26
Carissa opaca	71.43	1885.71	58.47	0.32
Cassia spinarum	14.29	571.43	30.52	0.23
Dendrocalamus strictus	14.29	114.29	9.80	0.11
Lantana camara	100.00	3238.10	86.93	0.36
Woodfordia frulicau	28.57	666.67	28.38	0.22
zyzipus jujuba	9.52	57.14	6.62	0.08
	14.29	304.76	18.43	0.17
	309.52	**8247.62**	**300.00**	**1.96**

Annexure - 42 Phytosociological attributes of Herb species diversity in Tikariya range of West Mandla forest division

Botanical Name	F%	Density/ha	IVI	DI
Abutilon indicum	48.57	9714.29	15.65	0.15
Ageratum conyzoides	28.57	11428.57	16.81	0.16
Alternanthera sessilis	40.00	7714.29	13.25	0.14
Boerhavvia diffusa	25.71	5142.86	9.95	0.11
Canscora diffusa	37.14	7714.29	13.06	0.14
Cassia tora	71.43	24285.71	28.40	0.22
Centella asiatica	14.29	12000.00	22.61	0.19
Coculus hirsutus	48.57	12000.00	17.52	0.17
Cynodon dactylon	68.57	32000.00	33.72	0.25
Cyperus iria	22.86	10285.71	16.27	0.16
Desmodium tifolium	54.29	16857.14	21.77	0.19
Eragrostis tenella	42.86	18285.71	22.68	0.20
Euphorbia hirta	48.57	27142.86	29.98	0.23
Helicteres isora	40.00	11428.57	16.60	0.16
Phyllanthus niruri	17.14	2571.43	6.53	0.08
Sida acuta	25.71	9714.29	15.19	0.15
	634.29	**218285.71**	**300.00**	**2.70**

6.7 Agrobiodiversity

Different crop varieties are adapted to different environmental conditions. For example, a species of rice grown in the hills could develop characteristics to suit the region, such as the ability to tolerate cooler temperatures of the uplands. The same species grown in the plains would evolve characteristics such as stalks more resistant to the stronger winds that blow across the plains, or develop roots and leaves adaptive to more or less rainfall and sunlight. Thus two varieties of rice would evolve. A conservation programme called Navdanya has identified over 150 different varieties of rice in the Western Ghats alone, each variety often from a different ecosystem or ecozone (Navdanya 1993).

Innovation and scientific endeavour are very much part of traditional societies. Perreira (1992) points out that the Warli tribals of Maharashtra grow several varieties of rice for different water and soil conditions. These varieties have varying periods of maturity, are resistant to different diseases, and are used during different cultural events. New varieties have been developed by scientists from traditional varieties.

During the field survey in various tehsils, development blocks and selected villages for PBRs in Mandla district various agricultural crops, spices; vegetables, cereals, etc. were recorded with their botanical, local and family names. Total 8 species are cultivated as Kharif crop and 8 species are in Rabi crop. Paddy, Kodo, Kutki, Maize and Soyabeen are the major crops in Kharif. Wheat, Gram, Musturd, Linseed and Niger are the major crops in Rabi season. Five species of pulses cultivated by the villagers for their daily needs. Villagers are cultivating four species of oil seeds. Sesamum, Mustard and Linseed are cultivated for daily use and Soyabean for sale purpose. Few farmers are also cultivating sugarcane. 31 species of vegetables are cultivated by the villagers in their

backyards for daily use and they also sell vegetables in local village markets. They are not cultivating vegetables for commercial purposes. It was also observed that 10 species of fruit bearing plants are also planted at farm bunds and in backyards. 6 species of spices were also observed in the area. Some farmers are cultivating onion, garlic and ginger for commercial purpose and they sell them in the nearby town area. **(Fig. – 12)** The recorded agro diversity was further classified and separate lists of inventories under above mentioned groups have been prepared and are given below;

Table - 19 Agriculture crops sown during Kharif season

S.No.	Name of Crop	Scientific Name	Family
1	Paddy	*Oryza sativa*	Graminae
2	Millet	*Hordium vulgare*	Graminae
3	Kodo	*Pospalum scorbiculatum*	Graminae
4	Kutki	*Picrorhiza kurroa*	Graminae
5	Maize	*Zea maize*	Graminae
6	Ragi	*Eleusine coracana*	Graminae
7	Urad	*Vigna mungo*	Paplionaceae
8	Soyabeen	Glycine max	Paplionaceae

Table - 20 Agriculture crops sown during Rabi season

S.No.	Name of Crop	Scientific Name	Family
1	Wheat	*Triticum astivum*	Graminae
2	Gram	*Cicer aretenum*	Paplionaceae
3	Pea	*Pisum sativum*	Paplionaceae
4	Mustard	Brassica compastris	Crucirerae
5	Lentil	*Lens esculanta*	Paplionaceae
6	Lin seed	Linum uritatissimum	Linaceae
7	Pigeon pea	*Cajanus cajan*	Paplionaceae
8	Ramtil	Guijotia abyssinica	Paplionaceae

Table - 21 PULSES

1	Pigeon pea	Cajanus cajan	Paplionaceae
2	Urad	Vigna Mungo	Paplionaceae
3	Gram	Cicer aretenum	Paplionaceae
4	Pea	Pisum sativum	Paplionaceae
5	Lentil	Lens asculanta	Paplionaceae

Table - 22 OIL SEEDS

1	Sesamum	Guijotia abyssinica	Paplionaceae
2	Soyabeen	Glycine max	Paplionaceae
3	Mustard	Brassica compastris	Crucirerae
4	Lin seed	Linum aritatissimum	Linaceae

Table - 23 OTHERS

1	Sugar cane	Saccharum officinarum	Graminae

Table - 24 VEGETABLE

S.No.	Local Name	*Scientific Name*	Family
1	Potato	*Solanum tuberosum*	Solanaceae
2	Tomato	*Lycopersicum asculentum*	Solanaceae
3	Green Pea	*Psium sativum*	Paplionaceae
4	Cabbage	*Brassica oleracea*	Cruciferae
5	Brinjal	*Solanum malengina*	Solanaceae
6	Lady finger	*Abelmoschus asculantus*	Malvaceae
7	Guard	*Luffa achinata*	Cucurbitaceae
8	Pumpkin	*Lagenaria sicceraria*	Cucurbitaceae
9	Beans	*Vigna unguiaculata*	Paplionaceae
10	Kundru	*Boswellia serrata*	Bursaceae
11	Bean	*Dolichas lablab*	Paplionaceae
12	Bitter gourd	*Momordica charantia*	Cucurbitaceae
13	Spinach	*Spinacia oleratia*	Chenopodiaceae
14	Lal bhaji	*Amaranthus gangeticum*	Amaranthaceae
15	Amaranthus	*Chenopodium album*	Chenopodiaceae
16	Maithi	*Trigonella foenum*	Paplionaceae
18	Coriander	*Coriandrum sativum*	Umbaliferae
19	Raddish	*Raphanus sativum*	Cruciferae
22	Cucumis	*Cucumis utilissimus*	Cucurbitaceae
23	Cucumber	*Cucumis sativus*	Cucurbitaceae
24	Sooran	*Amorphophallus campanulatus*	Aracaceae
25	Ghiya	*Colocassia esculenta*	Aracaceae
27	Mint	*Mentha arvensis*	Labiatae
29	Luffa gourd	*Luffa cylindrica*	Cucurbitaceae
30	Drum stick	*Moringa oleifera*	Moreingaceae
31	Poi sag	*Basella alba*	Basellaceae

Table - 25 EDIBLE FRUITS

S.No.	Local Name	Scientific Name	Family
1	Mango	*Mangifera indica*	Anacardiaceae
2	Goose berry	*Emblica officinalis*	Euphorbiaceae
3	Guava	*Psidium guajava*	Myrtaceae
4	Banana	Musa paradisiaca	Musaceae
5	Papaya	Carica papaya	Caricaceae
6	Lemon	Citrus aurantifolia	Rutaceae
7	Jack fruit	Artocarpus hetrophyllus	Moraceae
8	Orange	Citrus auram	Rutaceae
9	Black berry	Syzygium cumini	Myrtaceae

10	Tamarind	Tamarindus indica	Caesalpiniaceae

Table - 26 SPICES CROPS

S.No.	Local Name	Scientific Name	Family
1	Coriander	*Coriendrum sativum*	Umbelliferae
2	Chilly	*Capiscun annum*	Solanaceae
3	Turmeric	*Curcuma aromatica*	Zingiberaceae
4	Onion	*Allium cepa*	Liliaceae
5	Garlic	*Allium sitivum*	Liliaceae
6	Ginger	*Zingiber officinalis*	Zingiberaceae

Varities of various agriculture crops also cultivated in the Mandla district are given as follows;

S. No.	Crop	Botanical name	Varities
1	Paddy	*Oryza sativa*	JR-201, Doobraj, HMT, swarna, MTU – 1010, Hybrids, IR – 64, Luchai, Mahamaya, PS – 3
2	Maize	*Zea mays*	JM – 12, JM – 8
3	Arhar	*Cajanus cajan*	Asha
4	Urid	*Phaseolus mungo*	JU – 2, JU - 3
5	Soybean	*Glycine max*	JS - 335, NRC – 37, Js – 90-41
6	Niger	*Guizotia abyssinica*	Ootacmand, IGP – 76
7	Wheat	*Triticum aestivum*	WH – 147, LOK – 1, Sujata
8		*Triticum durum*	GW – 273, JW – 17, HD – 2004
9	Gram	*Cicer areitinum*	JG – 74, JG – 315
10	Field Peas	*Pisum sativum*	JP – 885
11			

Germplasm

Total 58 species were observed as germplasm in the Mandla district. Villagers are cultivating and maintaining their germplasm for future. They stored the seeds of different species for next year cultivation. Now a days villagers are also adopting hybrid varieties of different species which are provided by the Krishi Vigyan Kendra.

Table – 27 Distribution of crop germplasm

Name of Crop	Scientific Name	Cultivation status in 18 PBRs (in %)
Paddy	*Oryza sativa*	100
Millet	*Hordium vulgare*	100
Kodo	*Pospalum scorbiculatum*	100
Kutaki	*Picrorhiza Kurroa*	100
Maize	*Zea maize*	68.75
Rogi	*Eleusine coracana*	62.50
Urad	*Vigna Mungo*	33.25

Soyabeen	Glycine max	12.50
Wheat	*Triticum astivum*	93.75
Gram	*Cicer aretenum*	37.50
Pea	*Pisum sativum*	37.50
Mustard	Brassica compastris	19.75
Lentil	*Lens esculanta*	75
Lin seed	Linum uritatissimum	43.75
Pigeon pea	*Cajanus cajan*	87.50
Ramtil	Guijotia abyssinica	81.25
Sugar cane	Saccharum officinarum	6.25
Potato	*Solanum tuberosum*	75
Tomato	*Lycopersicum asculentum*	81.25
Cabbage	*Brassica oleracea*	81.25
Brinjal	*Solanum malengina*	81.25
Lady finger	*Abelmoschus asculantus*	81.25
Guard	*Luffa achinata*	81.25
Pumpkin	*Lagenaria sicceraria*	81.25
Bens	*Vigna unguiaculata*	81.25
Kundru	*Carrisa opaca*	81.25
Bean	*Dolichas lablab*	81.25
Bittle guard	*Momordica charantia*	81.25
Spinach	*Spinacia oleratia*	81.25
Lal sag	*Amaranthus gangeticum*	81.25
Chaulai sag	*Chenopodium album*	81.25
Fenneracid	*Trigonella foenum*	81.25
Coriander	*Coriandrum sativum*	81.25
Riddish	*Raphanus sativum*	81.25
Cucumis	*Cucumis utilissimus*	81.25
Cucumber	*Cucumis sativus*	81.25
Sooran	*Amorphophallus campanulatus*	50
Ghuiya	*Colocassia esculenta*	6.25
Mint	*Mentha arvensis*	50
Luffa guard	*Luffa cylindrical*	25
Drum stick	*Moringa oleifera*	68.75
Poisag	*Basella alba*	75
Mango	*Mangifera indica*	100
Goose berry	*Emblica officinalis*	75
Guava	*Psidium guajava*	100
Banana	Musa paradisiacal	75
Papaya	Carica papaya	100
Lemon	Citrus aurantifolia	100
Jack fruit	Artocarpus hetrophyllus	100
Orange	Citrus auram	12.50
Black berry	Syzygium cumini	100
Tamarind	Tamarindus indica	100
Coriander	*Coriendrum sativum*	100
Chilly	*Capiscun annum*	100
Turmeric	*Curcuma aromatica*	37.50

Onion	*Allium cepa*	75
Garlic	*Allium sitivum*	75
Ginger	*Zingiber officinalis*	50

6.7 Domesticated biodiversity (Cattle and Livestock Diversity)

When we think of biodiversity, we tend to think only of wild plants and animals. But there is also considerable diversity among domesticated plants and animals. Domesticated biodiversity is the result of:

- The manipulation by humans of genetic diversity within species to produce new varieties of crops and new breeds of domestic animals, and
- Adaptation of crops and domestic animals to different climatic and geophysical conditions.

Since the dawn of agriculture, people in different parts of the world developed different plant and animal varieties to meet certain needs and conditions. These included higher productivity, better taste, resistance to pests or diseases, and the ability to withstand adverse conditions like floods, drought or frost.

India also has a large number of breeds of cattle, poultry and other domesticated animals. The Kankrej cow, for example, is adapted to survive in semi-arid conditions. India's eight breeds of buffaloes represent the entire range of the genetic diversity of buffaloes in the world (MoEF 1994). India's Murrah, Nili-Ravi and Surti buffaloes are being used to improve the breed of buffaloes in many countries.

An inventory of all the domestic animals has been made during the field survey in Mandla district. Only 11 species of different domesticated animals are documented from the area. No hybrid of cow, bafallo, goat or pig was observed. Only local breed is domesticated by the villagers. No other breed of domesticated animal has been recorded. Total 19 species of Pisces are documented form the area on the basis of secondary literature. **(Table – 29).** Among them, only 3 species of Pisces i.e. Catla, Mahul and Rahu are reared by the villagers. The recorded species were catalogued at the spot and these are given below with their scientific, local and family names.

Table – 28 Domesticated Animal Diversity

English Name	Breeds	Scientific Name	Family	Distribution %
Cow	Local	*Bos indicus*	Bovidae	100
Ox	Local	*Bos indicus*	Bovidae	100
Bafallo	Local	*Bubalus bubalus*	Bovidae	100
Goat	Local	*Capra indica*	Cervidae	100
Chiken	Local	*Gallus gallus*	Phasianidae	100
Rabbit	Local	*Leapus nigricolis*	Leporidae	50
Pig	Local	*Sus indica*	Suidae	50
Dog	Local	*Canis familiaris*	Canidae	100
Cat	Local	*Felis domestica*	Felidae	100
Pigeon	Local	*Columba livia*	Columbidae	33.25

Parrot	Local	*Psittecula cremerii*	Psittacidae	50

Fisheries Diversity

Table – 29 List of Pisces

S.No	Zoological Name	English Name
	Order : Cypriniformes	
	Family : Cyprinidae	
1	*Aspidopariya jaya*	-
2	*Barilius bendelisis bendelisis*	-
3	*Catla catla*	Catla
4	*Chela cachius*	Chela
5	*Chela laubuck*	Winged Rasbora
6	*Cirrhinus reba*	Reba
7	*Danio devario*	Danio
8	*Danio rerio*	-
9	*Esomus danricus*	Flying Barb
10	*Garra lamta*	Stone Sucker
11	*Garra mullaya*	Stone Sucker
12	*Puntius amphibious*	Scarlet Banded Barb
13	*Puntius chola*	Green Barb
14	*Puntius conchonius*	Stigma Barb
15	*Puntius punjabensis*	-
16	*Puntius sophore*	Stigma Barb
17	*Puntius ticto*	Fire Fin Barb
18	*Rasbora rasbora*	-
19	*Tor putitora*	Mahur

6.9 Cultural Diversity

Tribal Mosaic

The state of Madhya Pradesh represents a vast emporium of ethno-botanical wealth. It has the largest population of tribals (12 million) in the country constituting about 25% of the total population of the state. There are 46 scheduled tribes comprising 161 tribal subgroups in the state. Madhya Pradesh has 50 districts among which the tribals are found in 45 districts (Map 5.1). The population of tribals of Jhabua district is 86.8% of the total population. There are also other districts with a high tribal population e.g. Barwani (67.0%), Dindori (64.5%), Mandla (57.2%) and Dhar (54.5%). The Gond (44.60%), Bhil and Bhilala (20.84%) and Kanwar (4.67%) are the three largest tribal groups of the state. The central region is predominantly inhabited by Gond, Korku and Baiga. The major concentration of these tribes is in Mandla, Balaghat, Chhindwara and Seoni districts.

Cultural Complexity

By its geographical position, Madhya Pradesh has remained exposed to cultural influences. The central region of the state was directly under the Indo-Aryan cultural influence. The Vindhyas sheltered primitive tribes since the early dawn of history. No communication was possible with the south from the north because their existence was an effective barrier until the Marathas entered Malwa and its nearby territories. On account of the sturdy barrier of these mountainous ranges, all the racial movements, incursion and migration took place in central Madhya Pradesh from the Gangetic plain, from Rajasthan and from Gujarat through the gap in one of its arm. Fertile lands of the state have drawn people from distant directions but their movements always spent their force against the Vindhyan ranges for many centuries.

Since the early days we find two distinct cultures in Madhya Pradesh. Some of the older races, which were forced to take refuge in the hills and forests, vainly struggled against the culture of the plain.

Religion and Magic

The religion of most of the tribes living in Mandla centres around traditional beliefs, economy and festivities. There is a belief that every being is endowed with some kind of a living spirit. Superstitions and the cult of worship are more varied and have been absorbed in numerous ways in the folklore. The prevalence of the ritual idiom in common to all the societies, those depending upon the Hindu pattern of living and the communities which do not have the established village economy. Magic and crude medicine have their own existence rooted in deep faith. Wherever literacy has not touched the core of society, sorcery and witchcraft are not uncommon. Omens and forecastings seem to be of lasting importance even in the developing communities despite social reforms. Totemism is one the characteristics of the tribal sector of the district. To injure or kill the clan totem is a taboo. The folklore of the region is not devoid of all such things. References to magic provide a wide range of beliefs that have a bearing on tradition-bound associations.

Marriage Custom

Marriage is conceived as a sanskar wherein an individual is made to perform an important task of perpetualising his patriline. By attaining marital status, he fulfils the essential which Manu has recommended.

The actual marriage ceremony ranges from the most lengthy and elaborate practices to very simple ones, but the essential rites are the same. Use of turmeric and oil and the perambulation of the sacred fire or the pole and all such rituals emphasize the unity of the couple, which is desired everywhere, beginning with the feasting, drinking and dancing to ceremonial consummation of the marriage.

Marriages of Gonds

There are four major types of marriages of Gonds observed in Mandla district:-

1. **Lamsena marriage:** Lamsena is termed for that youth who works as labourer in the field of his father-in-law for a definite period. As soon as his duty period is over, his father-in-law marrys his daughter to the lamsena on his own expenditure.
2. **Haldipani marriage or Semvarri negana** : It is purely a swayamvar. The girl selects a youth as her husband by her own choice in her heart. She dissolves haldi in a mug full of water thoroughly and then throws it on and then sits on the backside of the boy. After this custom, she becomes the wife of that boy.
3. **Aato Saato marriage:** This type of marriage is performed in between two families who have boy and girl in their families. Boy of one family marries the girl of other family and vice versa the girl of first family marries the boy of other family.
4. **Charh marriage**: In this type of marriage, all the ceremonies of marriage are celebrated in the bridegrooms house. When the groom side is rich and bride side is poor or when the age of the bride is much than the normal marriageable age and the relatives of groom side extend the date of marriage several times, in such a situation, this type of marriage is performed. In this type of marriage, the girl forcebily enters the house of the groom. For few days the girl is insulted by all the members of the groom side and after some time all things become normal.

Jog Dekhana or Lagoun Nikalana: To fix the date of marriage is called jog dekhana or lagun nikalana. For this ceremony, the relatives of groom side do some totems. It they get success in their totems, they believe that marriage should be setteled.

They keep on earthen pot full of water on the square of their house. Two pieces of grass are kept parallel at the mouth of this pot. The peeled grains of paddy (*Oryza sativa* L.) are thrown between the two pieces of bhod grass (*Themeda triandra* Forsk). Inside the pot, if the grain of paddy floats on the surface of water, it is assumed that the relation shall be finalised. At the same time, selection of priest is also done. For this, two grains of rice is thrown inside the pot from the two ends of the bhod grass. The name of priest is uttered when these grains of rice are thrown in the water of pot. At that time when these two grains dash each others the name of the person which was uttered at the same time was selected as priest.

When the groom side is sure that marriage could be fixed up, they go to the house of bride side. The relatives of groom side visit the house of bride side with band. They bring with them some clothes, grain, coconut and wine. The groom side has to bear all the expenses at this time. They drink wine before fixing up all the terms of marriage. Groom

side also bears the expense of feast which was given at that time. The feast is known as pangat. In pangat kundai, rice, daal, salt and wine are served.

Phaldaan: it is a pre- marriage ceremony. During the celebration of this ritual, the mother of groom laps her daughter in law and the mother of brid claps her son in law. After this, they prepare a square and ask the groom and bride to sit in front of each other. Then two dauna made up of belpatri and mohline(Bauhania) are filled with milk and another filled with mustard oil are kept in front of the bride and groom. Then their legs are touched with the doob (*Cynodon dactylon*.L.) grass.

Lagun: In this ceremony, the groom side gives the clothes, haldi, gur, wine, and bunch of mahul to the bride. After this, haldi ceremony is celebrated.

Haldi: Five pieces of haldi are put in a pot which is full of water. The mouth of the pot is tied with the leaves of mahul. When this haldi is inflated, it is ground. First, it is pasted on mata maai whose abode is peepal tree. After this ritual this haldi is pasted to bride and groom.

Mandap or manda : For marriage ceremony, mandap is made. A big and main pillar of Salai (*Boswellia serrata* Colebr) or mahua (M*adhuca longifolia* Koen macbr.) is fixed. Roof of the mandap is made up of jamun (Syzigium cumini Skeels.) leaves. On the main gate of the Mandap, mango (*Mangifera indica* L.) leaves are hung which is known as Toran. The central pillar of Salai or Mahua is known as Mangrohi. The meaning of Mangrohi is Mandva.

Baraat: The relatives and friends of groom side go to the bride's place on the fixed marriage date. This is known as baraat. As soon as the baraat reaches the ceremony of marriage is started. In the mandap Durva (*Cynodon dactylon* L.) and earthen pots full of water are kept. A square of flour is made. Hawan is performed with pure ghee. Painting is done on the earthen pot and at the same time, folk songs are also sung by the ladies. Kangans are tied on the hands of both the bride and groom. After this oil is put in the hair and haldi is pasted on the hands of bride. Then, the bride's father takes her in the mandap. After this the groom enters with his brother in law and all the relatives and baraaties in mandap. Then, the main civility which is known as Bhanwar, is started. The purohit asks the bride and groom to take three rounds around the mangrohi. After this. the bride is asked to sit behind the baraatis. When this ritual is over, the bride is taken to groom's home. Both the groom and bride are asked to sit in the mandap. Then, they are asked to take four bhanwar or rounds around the mangrohi, then their clothes are tied. After this, the seventh bhanwar is taken. All seven bhanwars together are called Saptapadi. After Saptapadi, marriage ceremony is over.

Marriages of Baigas

Char Vivah: In this type of marriage, the parents of bride groom meet the parents of bride and talk about the matrimonial relationship, when both the parties agree, the parents of bridegroom offers wine, cereals and some money to the parents of bride and an auspicious day for marriage is fixed which is intimated to all the relatives and friends. The function of marriage goes on for five days. On the first day, lagun ceremony is celebrated in the bride groom's home and the bride groom is dressed in ritual dress. In this ceremony all people of that village are invited. As per their custom, a bronze utensil filled with water is kept

there and the boys and girls are asked to put two grains of rice inside the utensil. If the two grains of rice come in contact, it is believed that their married life will be happy. On second day, the ceremony of lagun is celebrated in the bride's home and mandapacchadan is done in the bride grooms home. On third day, mandacchadan is observed in the bride's home. On the same day, barat also arrives. Relatives and friends of both the sides start singing and dancing. The relatives of bride's side throw fragments of stones on the baratees. On the fourth day, farewell is given to the baraat and the baraatees depart to their village. On the fifth day, after returning their home the bhanwar ceremony is celebrated at bride groom's home. Bride and bride groom takes seven bhanwars. After fifteen days, the bride groom takes his wife to his in law's home. This ritual is known as Dehri Khundana. It means coming and going of the bride to her home will be continued.

Pathoni Vivah: In this type of marriage the bride groom and baraat do not go to the bride's home instead, the bride's parents come to the bridegroom's home and leave the girl there and go back to their homes.

Lamsena Vivah: In this type of marriage where the monetary condition of bride groom is not good, the bride groom has to serve in bride's home without taking any salary and in turn, he gets only meals. After serving for a fixed period, he became entitled to marry the girl.

Haldi Vivah: When a girl falls in love with a boy she dissolves haldi in water contained in a mug. Then, she throws that solution of haldi on the boy. Then the society allows them for arranged marriage. To settle a matrimonial relationship, "Jog baithana" ceremony is observed. Parents of both the sides sit in front of each other. They fill fresh water in a plate or platter. Then, they take peeled paddy grains and by taking the names of the boy and girl put the grains of paddy one by one in water. If both the grains come in contact in the water, the marriage is considered to be fixed. This is known as "Jog baithana". When the marriage is settled, the relatives of bride groom sides go with band party to the residence of bride with some clothes and cereals. They call it "Kharchi Kudai". After offering the "Kharchi Kudai", the ceremony of engagement is performed and in this only the marriage programme is planned.

In marriage, certain rituals like mandap, oil and haldi are observed. In this society there is no pandit to perform the marriage ceremony. Their mukhia, whom they call "Diwar", performs all the auspicious rituals. It is a custom, in this society that they do not give any preintimation of reaching the baraat to the brides residence. The parents of bride side do not give "Janvasa" (Residential accommodation) to the barratees. The baraat stays under the shadow of a big tree near the bride's residence and plays band and trumpet to intimate the relatives of bride side that they have reached. As soon as the relatives of bride side come to know that the baraat has reached, they come to receive the baraatees and invite them to reach the bride's residence. All the baraatees along with bridegroom gather near the house of bride. The relatives and friends of both the sides have pharsa, laathi and tangiya with them. They draw a border line in between both the parties. On one side of this border line the father of bridegroom and on the other side father of bride sit. Both have wine, paan (*Piper betle* L.), Supari (*Areca catechu* L.) with them. Diwar or mukhiya worships the weapons which are kept on the border line with the wine, paan and supari. As soon as the puja is over, the people of both the sides welcome by embracing each other. They eat and drink by exchanging their drinks and edible things. This ritual is known is "pardhoni". After the "pardhoni", the bridegroom along with his younger brothers and

brother in law goes to the mandap. The bridegroom touches the mandap with a fan made up of bamboo (*Dendrocalamus strictus* Nees). This custom is known as "Mandap maarna".

They believe that the welcome of baraat should be done by sitting on the back of the elephant. To complete this ritual, they make a symbol of elephant by putting a blanket on two stakes. The bride and bridegroom throws laaee of paddy (*Oryza sativa* L.) on each other. At this time, only the parents of bride give dowry to the bridegroom. After completing the ceremony of "mandap maarna", the parents of bride give "janvasa" to the baraatees. In janvasa meal is served only to the bridegroom. The meal is served to other baraatees only after all the ceremonies of marriage are over. Another specialty of Baiga marriage is that they observe three Bhanwars in the mandap of bride's home and the rest four bhanwars are taken in the mandap of bridegroom after returning their home. They believe that the marriage is auspicious only when the bhanwars are observed in both the mandaps. After all the ceremonies of marriage are over, the new couple is asked to take bath. After taking bath they visit to worship the "Dulhadev" and "Khermaai". After worshipping these god and goddess, they are allowed to start their married life.

Tribal Festivals

Bidri: It is performed in the month of Jyaistha to find out "how the monsoon will turn out". The sowing season begins in Gondwana with the sacrifice of a goat and thakur deo is propitiated in the bidri ceremony.

Hareli: It falls on the day of Sravana Amavasya. In Mandla, it is celebrated on the new moon day of the same month. It is a festival of greenness. On this day, all peasants and farmers offer puja to their implements. No one works the whole day. Paddy seedlings are stuck over the doors of houses by Dewar priests in Mandla. Men go and plant green twigs in the fields with certain rites, wishing to have good crops. The goddess of crops kutki dai or anadai is worshipped on this occasion to ensure a better harvest.

Kajri Navami: On the ninth day of the waxing moon fortnight of Sravana falls the kajri festival. Only those women observe this festival who are blessed with sons. Their worship-ritual continues till the full moon day of the same month which happens to be raksha bandhan. This day is also recognised as Karjri Purnima and Savani. On the Sravana Shukla Navami, the women go to a particular field and bring earth from there. This is kept in leaf-cups and in these leaf-cups is sown wheat or barley. These cups are kept in an inner room of the house devoid of air and sunrays. The sprouts assume a vellowish colour because of absence of chlorophyll. In the room, where these cups are kept, the floor is washed with cattle-dung and a part of wall is also coated with the cattle-dung solution. On this part, a design is made with rice-solution (aipan). Also drawn near this design are the figures of a house, a child in cradle, a mongoose and a woman with a pitcher. It is this folk art which is known as Navmi. Due worship of this is performed before sowing the wheat or barley seedlings. Everyday, the worship ritual is repeated till the fifteenth day and in the evening of this purnima day, the cups are taken for immersion. The ladies form a procession, each carrying the leaf-cups on her head and go singing to some tank where they are immersed.

Karam: The festival of the Oraon, Baiga, Binjhawar and Majhwar tribes is celebrated in the month of Bhadra, just at the climax of the monsoon. The centre of the ritual consists in

the cutting of three branches of karam (*Adina cordifolia* HK & F.) tree and their installation in the akhara or dancing ground. After the installation, karam dancers revolve round the "karam raja" through the night. The following morning the branches are garlanded and the karam legend is recited. Flowers are then thrown over the Raja and offerings of curd and rice are made. Red karam baskets full of grain are also put before the branches, and some ceremonially nurtured barley seedlings are distributed among the boys and girls who put the yellow blades in their hair. The blessing of "karam raja" is then sought and the branches are taken up and carried by women through the village.

Bhojali: It is observed in the month of Bhadra following Raksha Bandhan. About a week before the actual Bhojali day, i.e. on the day of Nagpanchami, wheat (*Triticum aestivum* L.), rice (*Oryza sativa* L.) or Kondo (*Paspalum scrobiculatum* L.) seeds are sown in earthen pots and manured to grow into green shoots. These seeds are watered everyday with a view to ensure crop in abundance. The women folk of the countryside holding the Bhojali seedlings in their hands or keeping the earthen pots containing the green growth on their heads, go in groups to nearby rivers or tanks. When the sprouts are submitted to the water, the concluding songs generally refer to Bhojali as a deity, close to the mother-goddess.

Kujlaya: On the full-moon day of Bhadra, the festival of kujlaya is celebrated to commemorate the reunion of the legendary queen, Malhana Devi with her daughter who had been married to the son of a hostile king-the murderer of her father. Nine days before the khujlaya, wheat or barley is sowed in black soil and manure-filled in small baskets. Then, on the full-moon day, women of the locality assemble at some one's place and tie rakhi to their brothers and nearest relatives. The following day, the baskets of wheat or barley seedlings are taken out in procession to a riverside to sink their contents, excepting the green shoots which they distribute among themselves in the name of Malhana Devi.

Mamulla and Sanja: In the month of Asvina, the festivities of sanja run consecutively for sixteen days. The ritual is associated with figures and designs made by girls on smeared portions of mud walls through medium of cattle dung, in thick relief. Everyday new designs and figures are made, and in the evening, songs are recited in chorus before them. Corresponding to the Sanja, the girls worship Mamulia. Mamulia represented by branch is adorned with a coloured skirt and a wimple. Wild flowers are attached in each thorn of the branch and dry fruits and sweets are hung around it. Music is played round the branch, and later, it is taken to a pond for immersion.

Navrata: The first nine nights preceding Dussehra are called Navrata. The festivals of Dussehra start on the first day of "Ashwani Shukl". On that day the ceremony "kalash sthapana" is performed and the statue of Durga mata is placed .The tribals observe this festival altogether in a different manner than urban people.

On the first day, the tribals place the statue of devi Durga in their villages at a proper place. After placing the statue of Devi Durga, the ceremony of Jaware sowing start. Persons who can keep fast for ten days are involved in this practice. On that day, they purchase an earthen concave lid on the mouth of that pitcher. Then they bring soil form their crop field and put in the concave lid. After that they tie the kaans (*Saccharum officinarum* L.) on the outer surface of the rim of pitcher. Then, they sow some wheat grain in the soil which is kept in the concave lid. This practice gives water to the grains every day. Other person who does this practice gives water to the grains every day. Other

persons who do not keep fast are not allowed to see the Jaware atleast for five days. The person who keeps fast does not take cereals as his food for nine days. For a week, they worship the goddess by offering flowers and coconut. On the eight day, they cook new rice and Torai (*Luffa cylindrica)*(L.Roem.) without mixing the salt in it. Then they take seven leaves of Saja (*Termenalia tomentosa* Roxb.) and put the cooked rice and Torai and first offer it to Baradeo (God) then they distribute it to people as a 'Prasad'. On the ninth day, they throw the Jaware in the river or pond. On the same day, kanya bhoj is also held. On the tenth day i.e. on Dashehra, the non-vegetarians sacrifice goat to the Durga mata and vegetarians instead of giving sacrifice of goat first prepare a chowk (Squae place*)* in the home then they take a kaddu (*Cucurbita maxima* Duch) and put four sticks in it like legs to give it a shape of goat then put it on the chowk and worship it through pan (*Piper betle* L.), Kattha (*Accacia catechu (*L.f.) wild), suprati (*areca catechu* L.) and wheat (*Triticum aestivum* L.) grain. Then they put a mark on the kaddu by Haldi. After worshipping it they offer it to Durga mata .On the tenth day Dashera is celebrated. After that, they immerge the statue of Durga mata in a river or pond.

Dussehera: In October, Dussehera is celebrated. Its importance is mainly due to the bida ceremony associated with it. Village parties exchange visits and organise dance performance on reciprocal basis. In the hope of getting a good crop, tribals indulge in heavy drinking. Dances are resumed on Dussehra day.

Navanna: A soon as Diwali is over, the feast of Navanna is celebrated. It depends on the full riping of corns. Only then the day for Navanna is fixed. On this day cows are fed with cakes prepared out of new corns. No one takes his food until this rite is done. The Gonds first of all perform offering of green paddy to the Saj tree (*Termenalia alata* Roxb.) and then to Bhavani mata, Holera dev (the cattle deity), Narayan dev and Rat mai (night mother), who is believed to live in the verandah of every house.

Phag: The festival is celebrated on the full moon day, in March. It is a post-harvest festival of colours and fires. Tribals drink mahua liquor during the phag.

Pola: after two months of harali, Pola festival is celebrated. Baigas burn some twigs near the stream, believing that the smoke will take away disease from their village.

Non tribal Festivals:

(1) Shathtila Ekadashi : The festival is celebrated in 'Krishna paksh' of Magh(Jan-Feb) for worshipping Lord Vishnu. Til (*Sesamum indicum* L).is offered to Lord, denoted to Brahmins. The festival is celebrated with the belief that by fasting and worshipping on this day, a man gets cured of sins, disease, etc. and is blessed with son and money.

(2) Basant Panchami: The festival is celebrated on the fifth day of 'Shuki oaksh' of January. The tribals perform their pooja by offering small bunches of flowers of mango (*Mangifera indica* L.) tree called Amra manari, spikelets of wheat (*Triticum* aestivum L.) and Jai (Avena sativa L.) to Lord Srikrishna and goddess Saraswati.

(3) Makar Sankranti: on this day (14 January) Til is offered to God. Laddus are prepared by mixing gur or sugar with Til *(Sesamum indicum L).*A person who observe this 'Vrata' (fast) is believed go to heaven after death.

(4) **Janki Navmi :** Nineth day of the dark half of the Feb-March month is observed as Janki navmi. On this day, Mata Janki is worshipped and food like Rice (*oryza sativa* L.), Jai (*Avena sativaI* L.) and Til *(Sesamum indicum L.)* are offered. Wifehood of a lady who worships Mata Sita on this day is maintained and she has having sons and grandsons.

(5) Vijay –Ekadashi : Eleventh day of the black half of the Feb-March month is called Vijaya- Ekadashi. On this day, a pitcher is filled with seven types of grains like wheat (*Triticum aestivum L.*), Jai (*Avena sativaI* L.), Rice (*oryza sativa* L.), Til *(Sesamum indicum L.),*Arhar (*Cajanus cajan* (L.), Jwar (*Sorghum vulgare* (L.) and Maize (*Zea mays* L.) A statue of god Vishnu is placed in this pitcher and worshipped. By observing this 'Vrata', peace, all round prosperity and fortune increase and the person receives salvation from sins.

(6) Mahashivratri : This festival is celebrated on the fourteenth day in the dark half of the Feb-March month. On this day, Til *(Sesamum indicum L.)*is put in water and then bath is taken with this water. The leaves of Belpatra (*Aegle marmelos* L.) kaner (Nerium indicum Mill) and Madar (*Calotropis procera* Br.) are offered to Lord Shiv. By observing the 'Vrata' receives salvation from sins.

(7) Aayal Ekadashi: On the eleventh day of black half of Feb-March is observed 'Aayal Ekadashi'. It is a firm beleif that God rests in Aonla (*Emblica officinalis* Gaertn) tree. On this day, Aonla fruits are eaten and donated, to have triumph in every field of life.

(8) Navratra Durga Poojan : This festival starts from the first day of moon let March- April month and ends on Ramnavmi. During this festival the devotees now Jai on the first day are devi ghasthapan. On the day of Ramnavami jai is taken upto a well or pond with a procession and then immerged into the well or pond ceremoniously. The person who grows Jai keeps fast upto Ramnavmi. It is believed that of increases happiness and affluence and ensures that there are problems and troubles for children.

(9) Tisua somvar :All the four Mondays of March –April month are observed as tisua Somvar. On these day, the doors of Jagdish Jee and bamboo are worshipped. At the time of worship, the doors of Jagdish Jee are kept as wooden plank and the bamboo is washed and put straight in a pitcher of water with the help of wall. The door & the bamboo are worshipped with Chandan (*Santalum album L.*). Inflorescences of mango (*Mangifera indica* L.) & Jai (*Avena sativaI* L.) and flowers of palash (*Butea monosperma* L.) and garlands are offered. Grains of rice (*Oryza sativa* L.) are also offered on the bamboo.

(10) Basora or Holi: The Holi festival is celebrated on the full moon of Phagun Shukl Paksh. The 'Vrata' of Basora is observed on the first Monday or Thursday which falls just after the Holi. On this day, Sheetla mata is worshipped. First, a day before coarse pearl millets is drenched with water. Next day early in the morning after taking bath a wall of the house is washed with water and then all the five fingers of hand are drenched with pure ghee and pearl millet Baazra (*Pennisetum typhoides* Rich) and then this ghee and grains of pearl millets ae put on the washed wall. Then rice with sugar is cooked so that the rice becomes sweet. After performing all these rituals, the sweet rice, curd, sugar, water, kumkum, husk of (*Phaseolus radiatus* L.) urad and incense sticks are taken in a plate and then offered to Sheetla mata. By observance of this 'vrata' saves of persons from any type of loss and trouble.

(11) Aasmaai ki pooja: The worship of Aasmai is observed on any Sunday which falls in the month of Baisakh (April-May), Aasarh (June-July). On uotkr leaf of Pan (*Piper betle* L.) uotkr puppet is made from white chandan on which four cowries are placed then a square is prepared. It is kept on a wooden piece and then worshipped. After worship, over all the material is thrown off. A women who worships Aasmaai never becomes restless in bereavement of son and she receives well mannered daughter in law. This 'vrata' is also observed on any day between the first to eighth day of the black half of (Feb-March) month. On this day, seven types of grains viz. wheat (*Triticum vulgare* L.), Jai (*Avena sativa* L.), Rice (*Oryza sativa* L.), Til (*Sesmum indicum* L.), Arhar (*Cajanus cajan* (L.) Mill), Jawar (*Sorghum vulgare (*L.) Pers), and Maize (*Zea mays* L.) are kept on a wooden plank at seven places and seven pitchers full of water, are placed on different heaps of grains. Then seven grains of wheat are taken into hand and worshipping of Aasmata is done. On the second day all these things are immerged into a river. It is believed that peace is maintained in the family by observing this 'vrata'.

(12) Vat savitri poojan: On the 15th day of the dark-half of month of Jyesth (May-June) women worship Bargad (*Ficus bengalensis* L.) tree. This worship is known as "Bat savitri pooja" to commemorate the memory of savitri. To maintain the wifehood, this 'vrata' is observed by the ladies.

(13) Mangala Gauri: This 'vrata' is observed on every Tuesday in the month of July-August. That is why this 'vrata' is called Mangla gouri. On this day, a white and a red cloth are placed. On a wooden plank on the white cloth nine heaps of rice (*Oryza sativa* L.) and on the red cloth, sixteen heaps of wheat (*Triticum vulgare* L.) are placed. On the same plank, some rice grains and a statue of Lord Ganesh are placed. In one corner, some wheat grains are kept on which a pitcher full of water is kept. Then four mouthed earthen lamp is made and increase stick is lighted. In the worship of Ganesh Chandan (*Santalum album* L.), Supari (*Araca catechu* L.) Lavang (*Syzygium aromaticum* L.), Pan (*Piper betle* L.) Rice (*Oryza sativa* L.), fruits, Ilaichee (*Elettaria cardimomum* (L.) Maton), Bel patra (*Aegle marmelos (*L.) Corr) and dry fruits are offered. After this, the pitcher is worshipped . Mango (*Mangifera indica* L.) leaf is put on the pitcher. Flour is kept in the earthen pot and betle nuts are placed on it. Then belpatra is offered. The heaps of wheat are called "Shadish Matrika" and the heaps of rice are called "Navgraha".

(14) Hal Shasthi : On the sixth day in the black half of the August-September month is "Hal Shasthi" is observed. It is observed by the mothers who have sons. On this day brushing of teeth is done several times and they never take milk and such food which is grown through the plough. In the morning courtyard is plastered with cow dung and small pit is made there. Then branches of Ber (*Zizyphus jujba* auct non Mill), Palash (*Butea monosperma* (Lam) Taub), Goolar (*Ficus glomerata* L.), Doob (*Cynodon dactylon* L.), are placed in that pit. Seven types of cereals are offered, such as wheat (*Triticum vulgare* L.), Gram (*Cicer arietinum* L.), Paddy (*Oryza sativa* L.), Maize (*Zea mays* L.), Jawar (*Sorghum vulgare* (L.) Pers), Arhar (*Cajanus cajan* L.), Pearl millet (*Pennisetum typhoides* Rich). Then a cloth dye a with haldi (*Curcuma longa* L.) and wifehood material are offered. For the welfare of the children and to maintain the wifehood, this 'vrata' is observed by the ladies.

(15) Kushopaatni Amavasya: The amavasaya of (August-September) months inobserved as "Kushopaatni amavasya". On this day kush (*Cynodon dactylon* L.) is brought to the home.

(16) Aonla Navmi: On the eight day of the moonlight half of Oct-Nov months, this festival is observed. By worshipping the Aonla (*Emblica officinalis* Gaertn) tree, people stand under on Aonla tree facing opposite side of east. First circumbulation on the root of the tree is done by pouring the milk. Then, thread is tied on the stem by making seven cirumbulations.

(17) Devothan Ekadashi: It is observed on the eleventh day of moonlight half of Oct-Nov months. This 'vrata' is observed to please different Gods. Aonla (*Emblica officinalis* Gaertn) is also worshipped on this day.

(18) Tulsi Vivah: On the eleventh day of moonlight half of Oct-Nov month Tulsi 'vivah' (marriage) is celebrated. Ladies observe the marriage of Shaligram and Tulsi (*Ocimum sanctum* L.).

Folk Music

The heritage of folk music and community dances continues to be an integral part of the rural and tribal inhabitants of Mandla district. The Muria seem to distinguish tunes and songs mainly by the different rhythms of their choruses. The Relo is remarkable type of Muria song. They may sing the Relo on any occasion. Bhatra and Panka tribals sing Leja songs. The Leja probably has its origin with the sending of ritual to some dear one. Literally, the 'Leja' means 'take it' which would have been the initial wish of the 'send off' ritual. The Dadaria has a pattern of rhythming lines. They are also called Ban-bhajans or Salho. Sung by both men and women, Dadaria has a style of question-answer rendering.

The folk music of Mandla has certain predominant features. The people seldom confine themselves to their own songs except when singing ritualistic songs and the ones related to wedding ceremonies. The peasant class has no taboo to sing popular songs of other racial groups singing by participation if instinctive and unavoidable. As compared to the seasonal songs, the Saire, the Rawle-and the children's songs-the Mamulia and the Suwta-the music is not of much antiquity. Then, there are the romantic led and the Pai songs. The pai is associated with the Saira dance of the rainy season. The music of the songs sung at the time of sacrifice-rituals in remote villages gives rise to an own, while tunes of the Jhoola songs clearly convey the swinging motion.

Folk Arts

In Madhya Pradesh, the countryside women make interesting patterns of flowers, creepers, trees and human figures. Stephen Fuchs has seen in Mandla an Agaria (Village smith) using a bamboo tube for making coloured patterns with mixed flour on the ground around the wedding booth. A bamboo tube is first drilled with several holes. Then it is filled with turmeric powder (yellow), wheat flour (white) and gram flour (orange). After this, it is rolled for drawing designs over the ground. The mixed flour emits out from the holes making different kinds of patterns. Verandas and inner rooms of the houses are decorated with bold designs. Swirling designs are worked out on main entrances of the houses. When lagan (wedding) is performed, the design of chauk is drawn on a seat with acher (geru mati). This figure is basically a cross surrounded by circles.

Tattooing

It is a fact that people all over the world are still following and observing the old traditional adivasi customs. The tattooing custom of Indian aborigines is very old. It is an old belief in Indian aborigines culture that tattooing is a must for every women. It is a firm belief in the adivasees that after the death of a woman, the God asks a question from that woman what is the proof that you belonged to the earth or "Mrityulok". When she shows the tattoo mark on her body to God, she is permitted to live in the heaven.

Among the male, "Saraa" or "Tarra" custom is very common. In the younger stage, a mark is made on the wrist by burning with candle. This mark remain permanent throughout the life. This mark is also essential to get a place in the heaven. The verbal meaning of tattooing is making unshaped figures which has no meaning. The real meaning of tattooing is Go+danaa = Godanna. Among the aboriginal society, the value of tattooing is equivalent to that of giving cow.

Among the girls tattooing is done between the age of 9 to 18 years. Tattooing is performed by the person of Baadi cast. The woman which performes the tattooing is known as Badaniya. On the day on which tattooing is performed special meals are pre pared in the home. At this time, women sing folksongs. Tattooing is done on the backside of hand, on shoulders, on thigh, chest breast, on nose, checks, eyebrows, head, neck, calf, forehead, ankles, knees and beard. There are three main types of tattooing:

1. Small sized in the form of bindi or dot. This type of tattooing is done on nose, neck, eyebrow and head in the form of one to three dots.
2. In the form of figures- Figures of flowers and creepers or name of Shree Ram or lovers name are tattooed on the wrist and arms.
3. Big sized tattooing – The figures of scorpion, duck, peacock, tiger and different birds or scene of Ram Laxman Vanvaas and figure of Sitaji are tattooed on the chest, head, arms and calf.

Four or five needles are tied together for tattooing. The person who does this work strike, the body by these needles and makes the desired shapes. Blood comes out from that part of the body. The dye obtained from the beeja (*Pterocarus marsupium* Roxb.) wood is filled in that part of the body from where blood is coming out. The dye is blue in colour and it gives blue impression on the tattooing area. It is allowed to dry. After drying this blue color which is mixed with the blood, gives dark blue or black impression on the tattooed part of the body.

It is believed that after tattooing some diseases like cough and cold, skin disease, arthritis and polio cannot arrest the body. It is a social tradition that a person who is tattooed cannot enter in the grain storage to bring out the grain and cannot put the seeds in the storage. Person who is tattooed also cannot enter the field to cut the crops. By his entering in these places, the crop comes in grip of weevil.

Following folk songs of local communities were sung during various socio - cultural activities, ceremonies and festivals;

Phag song

eu Mksys js eu Qkxquok , jl ?kksys js eu Qkxquok
jktk cjkscj yxs eksj vkek, ijlk ljh[ks eu Qqyok
eu Mksys js eu Qkxquok , iqjobZ;k vkos cjksnk mM+kos

ihij yksxs vksj egqvk Mksyksx, eLrh esa nks pkj egqvk Mksyksx
esyk eaMy ?kqpsxsa pekpe, jkuh ljh[ks ijlk Qqyok
eu Mksys js eu Qkxquok

The heart of heroine is full of joy in the month of February and March. Heroine is saying amm is just like a king and my heart is just like the flowers of Palash. Dust is blowing with the wind coming from eastern side. From this eastern wind new leaves are coming out from the trees and flowers of mahua are dropping. This is the time when fete and festivals are observed, people begin to sing and dance and Palash flowers are blooming just like a queen.

Blossoming song

ckjs esa cu esa xksjh /kkus uhank ys gks xbZ gks ds nks nks js iku
ckjs toku esa csVk cgys Qsjs eap ij gkFk dh gks x,
nks nks jh iku

In this song comparison of youth with grown paddy is shown. As the paddy grows and becomes fully grown up after some time, likewise the child become fully grown up in youth after sometime. (Locality: Niwari, Mandla)

rsUnw ikuk rksM+s yk tkok Mksxjh ek js ykgqvk tkok pkj ikok rsUnw [kkoks
dkjs tokjk Mksaxjh esa

The people are discussing that we will go soon to break up the leaves of tendu and there, we will eat char and tendu fruits. (Locality : Tikariya, Mandla)

vke [kk;s tke [kk;s vksj [kk;s dsyk js
eS;k vksj [kk;s dsyk js taxyok ds ;gha djrok gS
gs jsye jsyk js

In this song the description of such fruits like mango, guava and banana which are found in forests is given. (Locality: Sarangpur, Mandla)

Solo song (Bhakti song)

;equk ds rhjs ek rhu isM+ gS csj] ihiy] ,d vke js
mlds uhps rhu ewfrZ gS y{e.k] lhrk jke js
pkj ids rsUnw dqekjh js xjeh fjrq esa gks cSlk[k ds efguk esa pkj izd`fr :i cnyh js

Three trees are situated on the bank of Yumuna river, Ber, Peepal and Aam. Under these trees there are found three statues of Laxman, Seeta and Ram. In summer season the fruits of char are ripening and tendus are withering. The nature is changing in the month of May and April. (Locality: Pipariya, Jabalpur)

cj rjh czEgk ihij rjh fo".kq js lqvkuk Qsj nsork ek ikuh yk p<+k;k

Bargad tree is abode of Lord Bramha and Peepal tree is refuge of Lord Vishnu. Therefore, offer water to these gods. (Locality: Sukha, Jabalpur)

t; x.ks'k] t; x.ks'k] t; x.ks'k nsok ekrk lrh ikjorh] firk egknsok
iku p<+s] Qwy p<+s vkSj p<+s esok t; x.ks'k] t; x.ks'k] t; x.ks'k nsok

This song is being song at the time of worship of lord Ganesh in Ganesh Chaturthi. (Locality: Tewar, Jabalpur)

Solo song

esjk gn; [kkyh gS jke ds fcuk ljlksa ds [ksr esa cksy jgh xksjS;k
figw figw cksyrk gs e;wj

My heart is empty without my beloved. Sparrow is chirping in mustard field and the peacock utters pihu pihu. (Localtiy: Jodhpur, Jabalpur)

vk;h cj[kk cgkj]veqok dh Mky ij iju yxsxh tqykgk;s
vk tkos] vk tkos] vefj;k ds rhj vks xksjh vk tkos] vk;h cj[kk cgkj

With the splashes of rain, swinging roapes have started hanging on branches of mango tree. Oh ! damsel with this rain you also come to the mango grove. (Localtiy: Amgava, Jabalpur)

gekj Vksyk js] vk;s ijnsf'k;k gekj Vksyk js] lkou chrk Hkknks chrk] chr x;k pkSeklk
vcdh ljlksa figkj Qwys js] /khj /kjks fnu]
pkjk yk, ds Qwy dk Mksyk js ge vk, ijnsf'k;k rqEgkj Vksyk js

Oh ! Stranger when will you be coming to my place. Seasons after season is passing away now with the flowering of mustard in my mothers house. I will come to your place with a basket of flowers. (Localtiy: Harra-tola, Mandla)

c[kkjh ds rqek ukj cjkcj eu Mksys js

My heart is waving like the creeping branches of tuma (Lauki) in my orchard garden. (Locality: Kuda, Jabalpur)

vk, psrh lu vkrh tkok mBkbZ ds cktkj
fdle fdle ds [kksok feBkbZ vksj ys ysuk [kq'kh;kj ¼xkuk½

The hero is saying to heroine that we will go to the village market. There, we will eat different kinds of sweets and purchase sugar-cane also. (Locality: Umaria, Mandla)

Mksxjh esa cksyr gS e;wj] eksj gjn; pSu fcu jke js]
ljlksa ds [ksrksa esa cksys eksjs gkj fijkuk figw figw cksyr gS e;wj

In the present song, the description of separation of heroine from her hero has been shown. She is saying that peacock is crying in the field of sarson (mustard). Even then my hero has not come. (Locatlity: Koyaliya, Jabalpur)

Rina song

rjuh dks ukuk js uk] rjuh dk dks uk uk js] uk uk js uk]
pkj ikd rsUnw tkequ jlk ys tkequ jlk ys]
yky Hkkth >wes >dk tksj js lqbZuk xasnk Qwys pS= gks lqbZuk rjuh dks ukuk js uk

In this song the description of char, tendu, jamun and lal bhaji in the month of Baisakh has been given. (Locality: Barikheri, Mandla)

ljlksa Qwy :e >qe] xsank Qwys psr gks] lqavk eksjs
yky Hkkth >wes >dk tksj] lqavk j]s yky Hkkth >wes >dk tksj]
vsgh ykyHkkth yk] [kkcu ugha ikoks js] lqavk eksjs] vk, x, gS llqvk eksj fyok;s js lqavk gks]
llqj ds lax lax eS ugha tkma js] lqavk eksjs] csjh csjh fi;k yk ijk, eksj lqavk js
vk, x, gS llqvk ekjs fyok;s] eksj lqavk js] llqvk ds lax lax eSa ugha tkma js] lqavk js]
csjh csjh ?kjh yk rks ns] eksj lqavk js] nkslj efguk tk chrs ugha ik, js] lqavk eksjs
vk, x, tsV eksj fyok;s eksj lqavk js] tsV ds lax eSa ugha tkma js] lqavk eksj
frlj efguk tks chrs ugha ik, js] lqavk eksj vk x, ifr eksj fyok;s] js lqavk js
ifr ds lax lax ga'kh [kq'kh tk,s] js lqavk eksj ljlksa Qwys :e >qe

A married adivasi woman wishes to go to her husband's home. Weather is pleasant. She imagines that her husband will come to take her back. Then, she will not be satisfied to go to her husband's home with her father in law and elder brother of her husband. She will be satisfied and enjoy the journey only with her husband. In this song the weather of Kwar and Kartik has also been described. (Locality: Bamhni, Mandla)

Karma Jhoomar song

>wy ds etk yk dgka ikos] vkek dh pkuh] >wy ds etk yk ikos]
VV~Vk VV~Vk uxj tksrs] VkV dysok [kk;s
rjbZ;k ds rhj esa Bk.ks uksuh] vkiu eu eq'dk;s] vkek dh pkuh]
cMs+ cfguh;k okys ysds] uxj tkru tk;s ujok ds rhj ek Bk.ks ckcw dsyk [kksjk;sxk
vkek dh pkuh]
vkjk VV~Vk ukxj tksrs] cksuh ygjk, ewan esa cks>k Mkjds HkS;k] ukfxu dkl ygjk,
vkek dh pkuh

The world 'Jhool' is used for silver chain which hangs from the lower portion of the ear ornament termed as 'Dhaare'. The meaning of word chain is pieces. The meaning of 'Aama ke chani' is pieces of aama. (Locality: Devari, Jabalpur)

Marriage group song (Magar Mati Song)

dkSu rkjh 'kknh djs] cbZ;k rkjh 'kknh djs] dkSu U;kSrk ns]
lc nsru dks U;kSrk] eSa lgk;rk nwa] [kSjksifr nso fuea=.k nwa]
/kku ds isM+ksa dks eSa U;kSrk nwa] dksnksa dgs eksgs U;kSrk nks dkSu rkjh 'kknh djs-

The bridesmaids sing song when they go to bring the soil from the ridge of the field to fix up the 'mangrohi' (Mandap). In this song, they ask from the bride her who will arrange her marriage. She replies to her friends that her mother will arrange her marriage, she prays together with the gods, kheropati will also be given invitation and in this work, she will give her services. She will also give invitation to the paddy crop because in the marriage food is prepared from the rice. On this, kondo says that she should also be invited. (Locality : Simariya, Mandla)

Welcome song

ddM+h] [khjk [kkds eksj [kkl [kkl iku eS maok mikl ds dke
vjlh [kkds eksj Qqy dtjk eksj dkBh esa nwc efj;k
mM+n [kkds eksj ij dfj;k jksor y,ds ys cqyck;k
dndks [kkds eksj QqMdw ekj jke jke lsxk rgwayk tksgkj
tksgkjh [kkds eksj QM+dk ij lef/k lef/k ds gksr gS HksaV

This song is sung at the time of arrival of baarat. (Locality: Simariya, Mandla)

xksM+h cSxk esa nsjk js] egkjkt futke'kh dqVdh dks ist ja/kk;s] egy dks Mksuk
Mksuk Mksuk ist ik, taxy dks tkuk egqvk js chus] rsUnw js chus js
fHkyok chuu esa dkjh js dkSu ifgy vkaxk] dkSu ifgy Hkkaxk
ge ifgy vkaxk] vksma rw ifgy Hkkaxk xksM+h] cSxk eSa nsjk js] egkjkt futke'kh
xksM+h] cSxk esa nsjk js

The present folksong is of that time when the clothes and ornaments have been offered to the girl (bride). The make up of bride is being done. In this song, the females of bridegroom side describe the eagerness of bridegroom about much time the bride will take to come. The females could not bear the delay of bride's arrival. In this song, the bride has been compared as a black cobra. (Locality: Mehandwani, Mandla)

Marriage song (Song at the time of building Mandap)

dsdj chrk ,l rs eunk ds lqrk, jktk ds chrk ,l rs eunk ds lqrk,
lwrh lwrk er djks js eunk ds lqrk, dkgs ds rs [kaHk xM+k,
egqvk ds rs [kaHk xM+k, eunk ds lqrk, ca/kh ds csVk ,l rs [kke xfn;k
vkx vkx ikoZrh ihNs egknso tkequ ds pko cus gS rwuh cus gS lkt ds
egqvk ds cus exjks vkek ds cus rksju eank ds lqrk,

The song is sung at the time when the mandap is built. The mandap is built up on twelve pillars of saja and decorated with the flowering twigs of mango tree and shaded by the twigs of jamun tree and the mando is made up of mahua wood. This song is sung by two parties. (Locality: Simariya, Mandla)

Marriage song (Song at the time of Haldi ritual)

dqegkj ?kj esa fy;k vorkj dgk u gYnh veku tkequ
cfu;k ?kj esa fy;ks vorkj ikap :i;k ds gYnh ekaxok
,d gYnh nqYgu dks p<+koks ,d gYnh nsoru dk p<+koks
gkFkksa esa daXku ekFkksa esa ykxh gS ckalksa dks eqdV

The bridesmaids sing this song when haldi is pasted to the bride. They sing with description that bride has bangles in her hand and bridegroom has put on a diadem potters and grocer's house. In your marriage we have to cause to bring haldi of five rupees. First, haldi will be pasted to the god. Than, haldi will be pasted to you. (Locality: Sonpur, Jabalpur)

Rina - group song

rjfu;k dks ukuh] eksj ukuk js ukuh HkkHkth rkjh gYnh p<+okgs
vktk fnu gks, HkkbZ rksjs HkkbZ cus dsjk dEHkgk
HkkHkth cus gS dsoy Qwy dksnks ds pbZ;k ydkyd gks,
vpkj ds pbZ;k ft;kjs t:k, rjfu;k dks ukuh

The bride maids sing this song at the time when haldi is pasted to the bride. They say to bride that your bhabhi (Sister in law) is pasting haldi to you. Many days passed your brother is standing quietly like banana tree and your bhabhi is calm and quite just like the banana flower. When the weather becomes hot in the wrestling arena at that time too the cool shadow of the veilor border of bhabhis cloth gives coolness to my heart. (Locality: Dindori, Mandla)

Marriage group song (Bhanwar song)

/khjks /khjks pybZ;k js nqYgk ,d Hkofj;k fQj x, nqYgk
viuh Hkofj;k ds lkFk vksj gekjh nqYgfu;k fQj x,
gfj;kj eank ds lkFk

When brde and bridegroom takes seven rounds the friends of bride say to the bridegroom in a joking manner that the bridegroom has taken one round with the tent made up of green jamun wood. (Locality: Bargaon, Mandla)

Marriage group song

dgka ykxks ?kkuk dsjk ,s lktu vkt feyu dh csyk
ckjh ykxks ?kkuk dsjk vks lktu vktk feyu dh csyk
dgka ykxks ?kkuk dsjk ?kkasph ¼vkaxu½ ykxks ?kkuk dsjk
vjs vkaxu yk;ks ?kkuk ikuh xk lktu ik;ks /kk;ks
dy'k esa dy'k feyk;ks vks f'kokflu vk;ks feyu dh csyk
Hkqtk ls Hkqtk feyk;ks vks lktu vktk feyu dh csyk

When the bridegroom reaches the house of bride, the ladies sing this song and say where the dense shadow is available for the members of bridegroom party under which the arrangement is made for their stay. In the garden, there is dense shadow of banana tree where the arrangement has been made for their stay. The feet of the members of marriage party will be washed with cold water and then they will be embraced. (Locality: Jhara, Mandla)

Marriage solo song

lkl xkjh nsos] uun dksjs ykos nsoj ckcw eksj fi;k xkjh nsos
iMkslh ne ysos] djkj xsank Qwy dsjk ckjh esa Msjk ns pkyh ds csjk gks,

In this song the bride is taunting to the family members of her husband. She is saying that I she is going to that garden where the genda flowers are blooming and banana trees are also found there. That garden is also the shelter of God. (Locality: Niwas, Mandla)

Table – 30 Plants used in folk songs

S.No.	Botanical Name
1.	*Allium cepa* L.
2.	*Bauhinia vahlii* Wight & Arn.
3.	*Brassica campestris* L.
4.	*Buchanania lanzan* spreng
5.	*Butea monosperma* (Lamk) Taub.
6.	*Cucumis melo* L.
7.	*Cucumis sativus* L.
8.	*curcuma longa* L.
9.	*Digera alternifolia* (L.) Aschers.
10.	*Diospyros melanoxylon* Roxb.
11.	*Ficus benghalensis* L.
12.	*Ficus religiosa* L.
13.	*Lagenaria vulgaris* Ser.
14.	*Linum usitatissimum* L.
15.	*Madhuca longifolia* (Koen) Macbr.
16.	*Mangifera indica* L.
17.	*Musa paradisiaca auct.*
18.	*Oryza sativa* L.
19.	*Panicum psilopodium* Trin
20.	*Paspalum scrobiculatum* L.
21.	*Phaseolus radiatus* L.
22.	*Piper betle* L.
23.	*Saccharun officinarum* L.
24.	*Semecarpus anacardium* L.f.
25.	*Syzygium cuminii* Skeels.
26.	*tegetus erecta* L.

Sacred Groves

Sacred groves consist of a bunch of old trees. These are patches of forest or part of large forests left untouched by the local people and all interference into it was a taboo. It is usually dedicated to a diety of mother goddess who is supposed to protect and punish the intruders will be punished. The sacred groves are generally located at the outskirts of villages. The tribal people believe that nature's reactions have to be protected because it is inhabited by various deities and spirits. The clearing of such groves involves a disturbance to them. The destruction would be met with punishment. The faith, belief and firm determination of these aboriginal people have helped in the protection and preservation of these natural ecosystems. The sacred groves of these primitive human societies have become part of the "Biosphere reserves". Such tribal beliefs have survived several forests in India in its pristine glory. Several trees, herbs, bushes, grasses and creepers enjoy importance as an object of divinity and sacredness and their destruction is sacrilegious. Beliefs, faith and tradition and superstitions have undoubtedly played significant role in the protection, conservation and preservation of these groves.

A total of 30 sacred groves in district Mandla have been identified (**Table 30A)**. They were identified on the basis of the beliefs of the tribals in these places as well as their

faith in the deity they identify at this place. At least 50% of these places are still in very good condition and can provide a very good *in situ* conservation sites for threatened species. One of the most important features found at sacred groves is that almost all these areas have a perennial water source within the very premises of worship while at other places; water body is present near by. The other important aspect is the presence of some threatened species, especially tree species.

Table – 31: Details of sacred groves found in Mandla District

S. No.	Name of SG	Name of Block	Name of nearest village	Size of the SG	Major tree associate	Deity involved
1.	Babapat	Anjania	Bagrodi	>10m	Bhilwa, Saja, Ber, Dhawa	Siddha baba
2.	Baiga baba	Nainpur	Paili	<50m	Ixora,Aonla, Char, Malkangni, Mahua	Bhole baba
3.	Bakramundi	Bichhia	Mawai	>50m	Sal, Salhein	Banjari mata
4.	Banjari mata	Bichhia	Bhua bichhia	<10m	Bargad, Neem	Banjari mata
5.	Banjari mata	Bichhia	Bichhia	>10m	Teak, Ber, Ghont, Tendu	Banjari mata
6.	Banjari mata	Bichhia	Mawai	50m	Sal,Saja, Tendu, Aonla,Khassi	Banjari mata
7.	Banjari mata	Bichhia	Saida	<50m	Aam, Saj, Amaltas	Banjari mata
8.	Banjari mata	Mandla	Aherwada	50m	Kosum,Aonla,Dhawa,Saja	Banjari mata
9.	Banjari mata	Mandla	Mohania patpara	>50m	Aam, Saj, Amaltas, Sissoo	Banjari mata
10.	Barhapat	Nainpur	Dhanora, comp. 93	>100m	Neem,Teak,Kosum,Dhawa,	Siddha baba
11.	Behar	Bichhia	Medatal	<50m	Saja,Palas, Keked, Neem,Chirol	Baba deo
12.	Belpat	Anjania	Anjania	<50m	Teak,Tendu, Saj	Banjari mata
13.	Chitrahi Pat	Nainpur	Ataria	>100m -500m	Bel, Aonla,Mahua,Kala siris,Saja	Bada Maharaj
14.	Devi madiya	Nainpur	Chaugan	>10m	Bad	Banjari mata, Dhuni baba
15	Hanuman madiya		Bhua madiya	>50m	Pipal, Jamun	Mahavir
16	Hanuman tekri	Bichhia	Sijhora	100m	Am, Neem	Mahavir
17	Jagdambani ashram	Mandla	Devgaon	-	Am, Neem, Bargad	Various deity
18	Jhijham ashram	Bichhia	Rajo karanjia	100m	Pakhri,Bad, Katjamun, Aonla,Umar, Palas	All deities
19	Jungwani baba	Nainpur	Nainpur	50-100m	Beeja,Koha, Bel,Katjamun,Tendu	Shivji, Nagdevta
20	Kamdhenu	Mandla	Mohgaon	>100m	Pakhri,Bad,	Hanuman,

				on slope	Arjun,Palas, Umar,Aonla, KatJamun	KamdhenuCow, Bade baba
21	Khairati	Bichhia	Lohta	>5km in radius	Abroma,Bel, Dhawai, Grewia	Bada deo
22	Kurlupat	Nainpur	Imlitola	>10m	Harra,Kosum, Beeja, Bel, Kaim,	Vandevi
23	Mudiya pat	Bichhia	Amwar	>50m	Sal,Saja, Tendu	Banjari mata
24	Navnadar	Bamhani banjar	Jarga	>100m	Dikamali, Mundi,Kural, Hadua, Bandarladdoo,Semra	Siddha baba
25	Shankarghat	Mandla	Devri	>100m	Peepal,Saj	Shivji
26	Shivji ka mandir	Mandla	Devgaon	>50m	Bad,Bel, Peepal,Neem	Shivji
27	Sidha baba	Mandla	Podilinga	>100m on slope	Dhawa,Beeja,Lendia,Peepal,Garari	Narmada maiya, Babadev, Shardadevi Narmada
28	Sitaraptan	Mandla	Sitaraptan	>100m	Neem, Bargad	Badebaba
29	Surajkund	Bichhia	Bilgaon	>1km in radius	Sal, Saja, Asoca,Aam, Mahua	Siddhapat, Chousat h yogini
30	Upka	Mohgaon	Chabi	>100m	Neem, Pipal	Budi mata

The identified grove are variable in size from $10m^2$ to $>100m^2$ area. They were devoted to different deities such as Banjari mata, Budi mata, Thakur deo, Bada Deo, Mahadev, Narmada maiya *etc*., From the names of the deities, we can understand that they revere all natural gods. Banjari mata is the protector of forests. They worship river Narmada as a goddess Narmada maiya, while Bada deo is none other than Mahadev or Lord Shiv. All their beliefs are related with their interaction, dependence and reverence for the nature and its produce. The fundamental principle behind the concept is seen very much in place in this part of the state.

6.10 Faunal Diversity

Faunal diversity represents 32 wild animals, 63 birds, 4 fishes and 9 reptile species respectively. These lists of wild animals have been prepared on the basis of indirect / direct evidence during the field survey. Hindi and zoological names are given in the lists shown in **Table – 31 to 32 & Fig. - 13.**

Table – 32 Wild animals

1. ANIMALS

Vernacular (Name in Hindi)	Name in English	Name in Latin	Family
yaxwj	Common Langur	Presbytis entellus	Colobidae
canj	Rhesus macaque	Macaca mulatto	Circopthecidae
fxjfxV	Logered Hedgehog	Hemiechinus auritus	Erinaceidae
NaNwnj	Grey Musk-shrew	Suncus	Trupaiidae
pexknM+	Short nosed fruit bat	Cynopteus sphinx	Pteropodidae
mM+u pexknM+	Flying fox	Pteropus ginganteus	-
flyw ctjk@fdV lwjteq[kh	Indian Pangolin Scaly ant eater Flying fox	Manis Crassicaudata	
Hkkyw] jhN	Sloth bear	Malursus ursinus	Ursidae
'ksj] ukgj] ck?k	Tiger	Panthera tigris	Felidae
xqyck?k@rsanqvk	Panther or leopard	Panthera pardus	Felidae
taxyh fcYyh	Jungle Cat	Felis chaus	Felidae
taxyh dqRrk	Wild Dog	Caen alpinues	Felidae
ydM+cXxk	Striped hyena	Hyaena hyaena	Hyaenidae
usoyk	Common Mongoose	Herpestes edwardsi	Hyaenidae
fcTtw	Indian Ratel or Honey Badger	Mellivora capensis	Mustelidae
Ånfcykc@ikuh dqRrk	Smooth Indian otter	Lutra perspicillata	Mustelidae
xhnM+@flikj	Jackal	Canis aureus	Canidae
ykseM+h	Indian Fox	Vulpus bengalensis	Canidae
fxygjh	Fivestriped Palmsqurrel	Funambulus pennanti	Sciuridae
pwgk	Indian Mole Rat	Bandicota indica	Muridae
lsgh	Indian Porcupine	Hystrix indica	Hystricidae
[kjxks'k	Indian hare	Lepus nigricollis	leporidae
lqvj	Indian Wild Boar	Sus Scrofa	Suidae
filksjk	Mouse Deer	Tragulus meminna	Traguklidae
phry	Spotted Deer	Axis axis	Cervidae
e`x	Black buck or Indian antelope	Antilop cervicapra	Antilopinae
uhyxki	Blue bull	Boselaphus tragocamelus	Antilopinae
pkSflaxk	Four horned antelope	Tetracerus quadricornis	Antilopinae
dksVjh HksM+dh	Indian Muntjac,	Muntiacus muntjak	Cervidae

	Barking deer		
lkaHkj	Sambhar	Cervus unicolour	Cervidae
xkSj	Baisen	Bos gaurus	Cervidae

Table – 33 Birds

Vernacular (Name in Hindi)	Name in English	Name in Latin	Family
iu dkSvk	Little cormorant	Phalacrocorax niger	Phlacro coracidae
vatu	Grey Heron	Ardea cinerea	Ardeidae
va/kk cxyk	Paddy Bird, pond heron	Ardeloa grayii	Ardeidae
xk; cxyk	Cattle egret	Bubulcus idis	Ardeidae
cM+k cxyk	Large egret	Egretta alba	Ardeidae
fdpfyik	Little egret	Egretta garzetta	Ardeidae
nks[k] ta?khy	Painted stork	Ibis leucocephalus	Ciconiidae
uksa/khyk	Openbilled stork	Anastomus oscitans	Ciconiidae
ydyd	Whiteneck stork	Ciconia episcopus	Ciconiidae
ydyd	White stork	Ciconia ciconia	Ciconiidae
gjftyk <sd	Adjutant stork	Liptoptilos dubius	Ciconiidae
lQsn ckt	White ibis	Threskiornis	Threskiornithidae
lhYgh	Lesser whistling Teal or Tree Duck	Dendrocygna javanica	Anatidae
lqj[kkc	Brahminy Duck	Tadorna ferruginea	Anatidae
dsjk	Common Teal	Anas crecca	Anatidae
[kSjk	Blue winged teal	Anas querquedula	Anatidae
iukc frykjh	Shoveller	Anas clypeata	Anatidae
ysflj ykyflj	Red crested pochard	Netta rufina	Anatidae
dqjfpik	White eyed pochard	Aythya nyroca	Anatidae
xqjxqjh iuMqCch	Cotton teal	Nettapus coromon delianus	Anatidae
udVk	Nokta duckar/comb duck	Sarkidiomis	Anatidae
nqckjh	Tufted Pochard	Athyya Fuligula	Anatidae
diklh	Blackwinged kite	Elanus caeruleua	Accipitridae
phy	Common pariah kite	Milvus migrans	Accipitridae
f'kdjk	Shikra	Accipiter badius	Accipitridae
'kkgckt	Crested Hawk Eagle	Spizaetus	Accipitridae
vksdkc	Tawny eagle	Aquila rapax	Accipitridae
fx)	Whitebacked Vulture	Gyps bengalensis	Accipitridae
lQsn fx)	White scavenger	Neophron perocopterus	Accipitridae

	Vulture or Paraoh's chicken		
jktk fx)	King Vulture	Torgos calvus	Accipitridae
dks:fVik	Kestrel	Falco tinnunculus	Accipitridae
Mksxjk phy	Crested serpent Eagle	Spilornis cheela	Accipitridae
dkyk rhrj	Black Partridge	Francolinus franco linus	Phasianidae
lQsn rhrj	Grey partridge	Francolinus pondicerianus	Phasianidae
cVsj	Common Or grey quail	Coturnix conturnix	Phasianidae
dkyk rhrj	Painted partridge	Francolinus pictus	Phasianidae
ykok	Jungle bush quail	Perdicula asiatica	Phasianidae
NksVh taxyh eqxhZ	Red spur fowl	Galloperdix spadica	Phasianidae
taxyh eqxhZ	Red jungle fowl	Gallus gallus	Phasianidae
eksj] eiwj	Common Pea fowl	Pavo cristatus	Phasianidae
cxqyk lkjl	Common crane	Grus grus	Gruidae
lkjl	Saurus crane	Grus antigone	Gruidae
dyhe	Purple moorhen	Porphyrio parphyrio	Rallidae
ty eqxkZ	Indian moorhen	Gallinula chloropus	Rallidae
figqvk	Pheasant tailed Jacana	Hydrophasiannus chirurgus	Jacanidae
ihih	Bronze winged Jacana	Metopidius indicus	Jacanidae
vksgknzh	Pained Snipe	Rostratula benghalensis	Rostratulidae
xtikSu	Black winged Stilts	Himantopus himantopus	Recurvirostridae
cjfljh	Stone Curlew	Bursinus oedicnemius	Burhinidae
NksVk cVku	Golden Plover	Pluviaslis dominica	Charadriidae
lqjek	Rat Shank	Tringa tetanus	Charadriidae
frrqjh	Red wattled lapwing	Vanellus indicus	Charadriidae
cjfljh	Yellow wattled lapwing	Vendllus malabaricum	Charadriidae
pgk	Fantail Snipe	Capella gallingo	Charadriidae
rsgjh dqjjh	Indian Whiskereditem	Chlidonias hibrida	Laridae
gfjiy	Common green pigeon	Treron phoenicoptera	Columbidae
dcwrj	Black rock pigeon	Columba livia	Columbidae
<ksjQk[rk	Ringh Dove	Streptopelia decaocto	Columbidae
fpVVk Qk[rk	Spotted Dove	Streptopelia chinensis	Columbidae
fxjoh Qk[rk	Red turtle Dove	Streptopelia tranquevarica	Columbidae
jkirksrk	Large Indian Parakeet	Psittacula eqpatria	Psittacidae
rksrk	Roseringed Parakeet	Psittacula krameri	Psittacidae
VqbZik¡ rksrk	Blossomheaded Parakeet	Psittacula cyanocephala	Psittacidae

Table – 34 Fishes

Vernacular (Name in Hindi)	Name in English	Name in Latin
dryk	Catla	Catla catla
xkxjk	Large marel	Ophicephelus marulias
egs'kh	Large marel	Tortor
jksgw	Rahu	Laberrohita

Table – 35 Reptiles

Vernacular (Name in Hindi)	Name in English	Name in Latin
vtxj	Pithon	Pithon molurus
fNidyh	Lizzard	gecko gecko
nks cksbZ;k	Russil viper	Vippera russelli
/kkeu	Dhaman	Lycodon aulicus
fxjfxV	Chamelion	Colones carsicolor
xksg	Monitor lizzard	Varenus benulensis
ukx	Cobra	Naja naja
dNqvk	Tortoies	Geomidatrojuga
exjePN	Crocodile	Crocodylus Pulustris

On the basis of secondary information collected during review of literature, following wild animals were reported by various workers from Kanha National Park, Mandla.

Table - 36 - BUTTERFLIES

S.No.	Name of Species	Distribution	Occurrence in months	Host plants
1.	Lemon butterfly *Papilio demoleus* Linn.	Kisli & Kanha	August-September	*Citrus spp., Aegle marmelos, Chloroxylon, swietenia, Glyosmis*
2.	Common Mormon, *Papilio Polytes* romulus (Cramer)	Kanha & Supkhar	October	*Oranges, Aegle marmelos*
3.	The spot swordtail, *Pathysa (Papilio nomius (Esper)*	Advar, Mukki & Kisli	March-June	*Polyalthia longifolia Saccopetalum tomentosum*

Table - 37 - LEPIDOPTERA: DANAIDAE THE DANAIDA

4.	The Plain Tiger, *Danaus chrysippus* (Linnnaeus)	Entire area of the park	September-October	*Asclepias curassavica, Calotropis procera, C. gigantean*
5.	Striped Tiger, *Danaus genutia* (Cramer)	Kanha & Kisli	September-October	*Ceropeigia aculata, C. intermedia, Cynananchum dalhousie, Raphistemma pulchellum*
6.	The Blue Tiger, *Tirumala (Danaus)*	Kanha & Kisli	September	*Asclepias curassavica, Holarrhena*

	limniace Cramer			*antidysenterica Calotropis spp., Marsdenia tenacissima, Hoya sp. Wattakaka valubilis*
7.	The Common Indian Crow, *Euploea core core* (Cramer)	Entire area of the park	Throughout the year	*Nerium oleander, N. indicum, Holarrhena pubena pubescens, Ichnocarpus frutescens. Ficus bengalensis, F. religiosa, F. racemosa, F. elastica, Streblus asper, Hemidesmus indicus, Cryptolepis elegans, C. buchanani*

LEPIDOPTERA: SATYRIDAE THE BROWNS

8.	The Tamil Tree Brown, *Lethe drypetis Hew.*	Supkhar	March	Bamboos
9.	Common Tree Brown *Lethe rohria* (Fab.)	Kanha	October	Bamboos
10.	The Common Evening Brown, *Melanitis leda* (Drury)	Supkhar & Bhaisanghat	September-October	*Oryza sativa, Hetropogon contortus* & other grass
11.	Dark Brand Bush Brown *Mycalesis mineus* (Linn.)	Mukki, Kisli & Supkhar	September	Grasses
12.	Long Brand Bush Brown, *Mycalesis visala* Moore	Advar, Mukki, Supkhar	October-December & March	Grasses
13.	The Common Threering *Ypthima asterope* M.	Advar	December	Grasses
14.	Jewel Fourring *Ypthima avanta* Fd.	Supkhar & Kisli	September-December	Grasses
15.	Common Fivering, *Ypthima baldus* Evans	Mukki	March	Grasses

LEPIDOPTERA: NYMPHALIDAE THE NYMPHALIDS

16.	The Great Eggfly, *Hypolimnas bolina* (Linnaeus)	Kisli, Kanha & Bhaisanghat	September-November	*Elatostemma cuneatum (Urti) Fleurya*

				interrupta, Portulal
17.	The Danaid Eggfly, *Hypolimnas misippus* (Linn)	Kisli, Kanha & Bhaisanghat	June-September	*Abutileon sp., Hibiscus sp., Portulaca oleracea (Portulacaceae)*
18.	The Commander, Laminitis procis (Cramer)	Supkhar	September	*Cinchona sp., Mussanda frondosa, Anthocephalus cadamba, Mitragyna parvifolia*
19.	The Common Leopard, *Phalanta Phalanta* (Drury)	Kanha	September	*Flacourtia Montana, F. ramontchii, Salix sp., Populus sp.*
20.	The Short Banded Sailer, *Phaedyma* (*Neptis*) *columella* (Cram)	Kanha	April	*Dalbergia sp.*
21.	The Common Sailer, Neptis hylas Moore	Mukki	March	*Helicteres isora, Gravia sp., & Leguminous, Malvaceous plants*
22.	The Chestnut streaked Sailer Neptis *jumbah* Moore	Kanha, Mukki & Supkhar	December-March	Plant species of Leguminosae and Malvaceae etc.
23.	*Neptis ophiana* Moore	Kanha	April	Plant species of Leguminosae & Malvaceae
24.	The Sullied Sailor, *Neptis soma* Moore	Supkhar, Kisli & Bhaisanghat	September	Castor and tree legumes
25.	Common Sailor *Neptis varmona* Moore	Kisli, Mukki	April-June	Larvae feed on leguminous plants
26.	Yerbury's Sailer *Neptis yerburi*	Mukki	March	*Celtis australis*
27.	The Common sergeant *Pantaporia perius* (Linnnaeus)	Advar, Kanha	December	*Glochidion sp., Terminalia paniculata*
28.	The Staff Sergeant *Pantaporia selenophora* (Kollar)	Kanha & Mukki	April	-
29.	The Baronet *Symphaedra (syn. Euthalia) nais* Forster	Kisli & Mukki	September-April	Leaves of Diospyros *melanoxylon,*

				Shorea robusta
30.	Painted Lady *Vanessa lrdi* (Linn.)	Mukki, Advar, Kanha, Bhaisanghat	January-February	*Artemisia sp., Bhumea sp., Urtil sp. and Zorina diphylla*

LEPIDOPTERA: NYMPHALIDAE PANSIES

31.	The Peacock Pansy, *Precis almanac* (Linnaeus)	Kanha	October	*Barleria sp., Osbeckia sp.*
32.	The Gray Pansy, *Precis atlities* (Johanssen)	Supkhar, Mukki & Bhaisanghat	September-October	*Asteralntha longifolia, Barleria sp. Hygrophyla auriculata*
33.	The Yellow Pansy, *Precis hierta* Fab.	Bhaisanghat, Mukki, Supkhar,	September-January March-June	*Asteralntha longifolia, Barleria sp. Hygrophyla auriculata*
34.	The Chocolate Pansy *Precis iphita* (Cramer)	Supkhar & Kanha	September-October	*Justicia sp., Hygrophyla auriculata*
35.	The Lemon Pansy, *Precis lemonias* (Linn.)	Kanha & Mukki	August-September	*Hygrophyla auriculata, Nelsonia lnescens, Corchorus olitorius, Lepidagathis sp., Sida rhombifolia*
36.	The Blue Pansy, *Precis arithya* (Linn.)	Kisli	October	*Justicia procumbens, J. milntha, Lepidagathis prostrate*

LEPIDOPTERA: LYLCNIDAE THE BLUE

37.	The Large oakblue, *Amblypodia amantes* Hewiston	Kanha Kisli & Advar, Bhaisanghat	August-October	*Hopea jucanda Lagerstroemia speciosa, L. microcarpa, Shorea robusta, Terminalia catappa, T. tomentosa*
38.	The Gram Blue *Euchrysops cnejus* (Fabricius)	Supkhar	October	*Butea monosperma, Acacia sp.,* Peas, Bean and Grams
39.	The Plains cupid *Euchrysops pandava* (Horsefield)	Mukki & Bhaisanghat	September	*Bauhinia retusa, V. varigata, Xylia dolarbriformis*

40.	The Angled Pierrot, Ca*stalius culeta* (Hewitson)	Kanha	October	*Ziziphus rugosa*
41.	The Common Pierrot, Ca*stalius rosimon* (Feb.)	Mukki	October	*Ziziphus spp.*
42.	The Pea Blue *Lampides boeticus* (Linna.)	Kanha	September	Peas, Grams, Beans, *Butea monosperma & Xylia dolabriformis*

LEPIDOPTERA: HESPERIIDAE THE SKIPPERS

43.	The Tricolour Pied Flat *Coladenia indrani* Moore	Kisli, Mukki	September	*Bridelia retusa, Dalbergia latifolia & D. sissoo*
44.	Small Branded Swift *Pelopidas* (Syn. Baoris) *Mathias*	Supkhar	October	*Grasses*
45.	The Grass Demon *Udaspes folus* (Cramer)	Kisli & Supkhar	September	Wild turmeric (*Curcuma* Spp.) Ginger Lily (*Hedychium Spp.)* Grasses

LEPIDOPTERA ERYCINIDAE THE ERYCINIDS

46.	The Plum Judy *Abisara echerius* (Stoll)	Bhaisanghat, Mukki	October	*Ardisia sp. Emeblia robusta*

LEPIDOPTERA: PIERIDAE THE WHITES AND YELLOW

47.	The common Emigrant, Ca*topsilia crocale* (Cramer)	Kisli, Kanha, Supkhar	July-November	*Albizia spp., Bauhinia racemosa, Butea monosperma, Cassia fistula, C. javanca, C. occidentalis, C. siamea, C. tora*
48.	The Lemon Emigrant *C. Pomona* (Fab.)	Kisli, Kanha, Mikki & Bhaisanghat	July-April	*Lssia sp.*
49.	The Mottle Emigrant *C. pyranthe* (Linnaeus)	Kisli, Kanha, Mikki & Bhaisanghat	August-November	*Lssia tora, C. auriculata, C. occidentalis, Sesbania grandiflora*
50.	The Common Jezebel, *Delias eucharis*	Bhaisanghat	January-March	*Dendropthoe sp.*

	(Drury)			
51.	Common Grass Yellow, *Terias helbe (syn. Eurema helbe)* (Linn.)	Entire area of the park	August-February	*Cassia fistula, Pithacelobium dulce, Albizia spp., Sesbania aculeate, Ceasalpinia spp.*

Table - 38 - MOTHS

52.	Lstor semi-looper, *Achaea janata* Linn, (Lep. Noctuidae)	Kanha, Kisli & Supkhar	August-September	Polyphagous species feeds on many agricultural and forestry species
53.	The Indian Moon Moth *Actias selene* Hubn. (Lep. Saturniidae)	Kanha & Kisli	August-September	*Lagerstroemia lanceolata, Lannea grandis, Mungifera indil, Terminalia tomentosa*
54.	*Agathodes astntalis* Hubn (Lep. Pyralidae)	Kisli	September	*Erythrina lithosperma*
55.	*Altha nivea* Wlk. (Lep. Limacodidae)	Kisli, Kanha & Mukki	September-October	*Bombex ceiba, Polyalthia longifolia, Terminalia tomentosa T. myriolrpa*
56.	*Ambulyx* (Syn. *Oxyambulyx) substrigilis* Westw (lep. Spigidae	Mukki & Kisli	December-March	*Aglaia littoralis, Dipterolrpus ruberculatus*
57.	*Amsacta lactinea C*ram (Syn. *Cretonotus lactineus* Cram) (Lep. Arctiidae)	Kanha, Kisli & Mukki	July-September	*Clerodendron viscosum, Sterculia urens, Tectona grandis, Vitex Sp.*
58.	*Wild Silk moth Antheraea mylitta Drury (Lep. Saturniidae)*	Kisli, Mukki & Kanha	August-September & June	*Careya arborea, Dalbergia sissoo, Lagerstroemia speciosa, Shorea robusta, Syzizium cumini, Terminalia spp., Ziziphus jujube*
59.	*Aporandria specularia* Guenee (Lep. Geometridae)	Mukki	September	*Acacia ltechu, Mangifera indil, Terminalia paniculata*
60.	*Argina argus* Koll (Lep. Arctiidae)	Advar & Kisli	February, June	*Crotolaria spectabilis*
61.	*Argina cribraria* Clerck (Lep.	Kanha & Supkhar	September	Bores in pods and defoliate leaves of

	Acrtiidae)			*Crotolaria incana. C. sericea*
62.	*Ascotis selenaria* Hubn. (syn. *Ascotis imparata) (*Lep. Geometridae)	Mukki and Supkhar	March and October	*Acacia farnesiana. Albizia lebbek, A. procera, Dalbergia sissoo, Lantana aculeate, Melia azadirach, Santalum album*
63.	*Asata lriale* Fab. (Lep. Hypsidae)	Kisli & Kanha	July-August	*Ficus religiosa*
64.	*Biston (*Buzura) bengaliaria Guen (Lep. Geometridae)	Kisli	April	*Camellia sinensis*
65.	*Biston (uizura) suppressaria Guen.* (Lep. Geometridae)	Kisli	August	*Alcia ltechu, Bauhinia variegata, Cassia auriculata, Dalbergia sissoo, Lagerstroemia indil, Tectona grandis*
66.	*Biston (Buzura) suppressaria Guen.*(Lep. Geometridae)	Kisli	October	-
67.	*Botvodes asialis Guen.* (Lep. Pyralidae)	Kisli, Mukki & Supkhar	September-October	*Caseria glomerata, Casuarina graceolens, C. tomentosa, Michelia champal, Urena lobata*
68.	*Collaspistria placodoides Guen,* (Lep. Noctuidae)	Kisli & Mukki	September-October	Fems
69.	*Cerura liturata* Wlk. (Lep. Notodontidae)	Kisli	September	*Terminalia tomentosa*
70.	*Chaerocampa (Theretra) alecto Linn.* (Lep. Sphingidae)	Advar and Bhaisanghat	October	*Tectona grandis*
71.	*Cleapa latifascia* Wlk. (Lep. Notodontidae)	Supkhar	September	-
72.	*Cretonotus emittens* Walk. (Lep. Arctiidae)	Mukki	September	*Crops*
73.	*Creatonotus gangis* Linn. (Syn. *C. interruptus* Moore) (Lep. Arctiidae)	Kisli, Kanha, Mukki and Advar	October-March	*Ficus religiosa, Lantana comara, Toona ciliate*
74.	*Cretonotus transiens* Walker (*syn. Phissama transiens* Walk) (Lep.	Kisli, Kanha, Advar & Mukki	October-March	*Analrdium occidentale, Bucklandia*

	Arctiidae)			*populnea Mangifera indil, Schleichera oleosa*
75.	*Cretonotus transiens form vacillancs* Walker (Syn. *Phissama transiens)* (Lep. Arctiidae)	Kisli & Kanha	February-march and October	Flowers and leaves of *Ficus religiosa and Lantana camara*
76.	*Cyana peregrine* Walk. (Lep. Arctiidae)	Kisli & Kanha	September-October	Lichens
77.	*Utethesia (Deiopia) pulchelloides Ham (Lep. Arctiidae)*	Kanha	September	Sann. hemp, G*irardinia heterophylia*
78.	*Dixoa albrtalis Swinh.* (Lep. Thyrididae)	Kisli	October	-
79.	*Episparis varialis* Wlk. (Lep. Epermeridae)	Kisli	August-September	*Adina cordifolia*
80.	*Estigena pardalis* Wlk. (Lep. Lasiolmpidae)	Kanha & Mukki	August-September	*Camellia sinensis*
81.	*Estigemene perrotteti* Guen. (Lep. Arctidae)	Kanha & Mukki	September	*Citrus sp., ground nut*
82.	*Euproctis bimaculata* Wlk. (Lep. Lymantriidae)	Kisli	February	*Tectona grandis*
83.	*Euproctis digramma* Guen. (Lep. Lymantriidae)	Mukki	August-September	*Melastoma normale*
84.	*Euprotis fraterna* Moore (Lep. Lymantriidae)	Kanha, Mukki & Supkhar	September-October	*Mangifera indil, Shorea robusta, Tectona grandis, Terminalia tomentosa, Trewia nudiflora, Ziziphus jujuba*
85.	*Euproctis icilia* Stoll. (Lep. Lymantriidae)	Advar	February	*Loranthus sp.*
86.	*Euproctis latifascia* Wlk. (Lep. Lymantriidae)	Advar	March	*Shorea robusta*
87.	*Euproctis lunata* Wlk. (Lep. Lymantridae)	Kisli	October	*Acacia nilotil, Mangifera indil, Morus sp., Terminalia tomentosa, Ziziphus jujube*
88.	*Euproctis plagiata* Walk. (Lep.	Kisli & Kanha	September-October	-

	Lymantriidae)			
89.	*Euproctis semisignata* Wlk. (Lep. Lymantriidae)	Kanha	September	-
90.	*Eupterote undata* Blanch. (Lep. Dupterotidae)	Mukki	September	*Bambax ceiba, Gmelina arborea, Tectona grandis, Toona ciliate*
91.	*Eusemia adulatrix* Koll. (Lep. Agaristidae)	Kisli & Bhaisanghat	August-September	*Dioscorea pentaphylla*
92.	*Teak skeletonizer Eutectona machaeralis* Wlk. (Lep. Pyralidae)	Kisli, Mukki, Advar	September-October	*Teak leaves*
93.	*Grammodes geometril* (Feb.) (Lep. Noctuidae)	Kisli & Mukki	August-September	*Diospyros montana grasses various shrubs & herbs*
94.	*Herese (Protoparse) convolvuli (L)* (Lep. Sphingidae)	Kanha	September	Green gram, sweet potato, Tobacco, *Tectona grandis, Vitis vinifera*
95.	*Hippotion (Chaerocampa) boerhaviae* Feb. (Lep. Sphingidae)	Kanha & Kisli	September	-
96.	Teak defoliator *Hyblaea puera* Cram (Lep. Hyblaeidae)	Advar & Mukki	March-April-August	Teak leaves, *Tectona undulate, Terminalis chebula, Vitex negundo*
97.	*Hypocala rostrata* Fab. (Lep. Noctuidae)	Entire area	April-November	*Diospyros melanoxylon and its allied species like D. ehretioides, D. Montana, D. tomentosa Barringonia acutangula, Erioglossus rubiginosum, Glochidion lanceolarium, Solanum sp. and Spondias mangifera*
98.	*Hyposidra successaria* WIk.(Lep. Geometridae)	Supkhar	October	*Acacia nilotil, Eugenia jambolana. Varringtonia acutangula,*
99.	*Hyposidra ta/al*	Kisli &.	October	*Acacia ltechu.*

	(Wlk.) .(Lep. Geometridae)	Supkhar		*Bombax ceiba, Lssia 3pp., Dalbergia sissoo. Ficus parasiticus, Lantana aculeata, Shorea robusta, Tectona grandis*
100.	*Lebeda nobilis* Walk. (Lep. Lasiolmpidae)	Kisli	October	*Pinus roxburghii, Thysanolaena agrostis*
101.	*Leucophlebia emittens* Walk. (Lep. Sphingidae)	Kanha	August	-
102.	*Leucophlebia lineata* (Westwood) (Lep. . Sphingidae)	Kanha	August	Sugarcane, maize and grasses
103.	*Lymantria mathura* Moore (Lep. Lymantriidae)	Kisli & Kanha	August	*Eugenia jambolana. Shorea robusta. Terminalia arjuna*
104.	*Lymantria sobrina* Moore (Lep. Lymantriidae)	Kanha &. Mukki	August- . September	-
105.	*Maruca testulalis* (Geyer) (Lep. Pyralidae)	Supkhar	October	*Casuarina equisitifolla , Derris elliptica, Xylia dolafriformis*
106.	*Melanastria repanda* Wlk.(Lep. Lasiolmpidae)	Kanha	October	*Bischofia javanil, Eugelfia jambolana, Terminalia* spp.
107.	*Micronia aculeata* (Guen.) (Lep. Uraniidae)	Kisli	September	*Gymnema sylvestre*
108.	*Nemeta (Belippa) apicata* Moore (Lep. Limacodidae)	Kanha	September	Defoliates *Terminalia bellerica*
109.	*Nephele hespera* Fab. (Lep.: Sphingidae)	Kisli & Advar	April & June	*Carissa carandos*
110.	*Nepita conferta* Wlk. (Lep.: Arctiidae)	Kisli &. Kanha	September	Lichens
111.	*Norraca longipennis* Moore (Lep.: Notodontidae)	Kanha, Kisli &. Mukki	September	-
112.	*Ophideres (Otheris) materna* (Linn.) (Lop.: Noctuidae)	Kanha, Kisli	August-September	*Tinospora cordifolia*
113.	*Parallelia*	Kisli & Mukki	September	-

	arctotaenia Guen. (Lep.: Noctuidae)			
114.	*Parallelia joviana* Stoll. (Lep.: Noctuidae)	Supkhar	September	*Glochidion arborium, Phyllanthus* sp.
115.	*Parasa pastoralis* _ Butl. (Lep.: Limaeodidae)	Kanha and Kisli	September	*Camellia sinensis*
116.	*Pericallia (Arctia) ricini* var. *clavatus* Fab. (Lep.: Arctiidae)	Mukki	September	*Ceiba pentandra, Lantana*
117.	*Pericallia (Arctria) ricini* var. *zerah* Cram. (Lcp.: Aretiidae)	Kanha & Mukki	September	*Ceiba pentandra, Lantana, Ricinus communis*
118.	*Perina nuda* (Fabr.) (Lep.: Lymantriidae)	Advar Mukki	October-December	*Artocarpus intigrifolia.Ficus spp. Mangifera indica*
119.	*Perina pura* Fabr. (Lep.: Lymantriidae)	Mukki	March	-
120.	*Phalera raya* Moore (Lop. Notodontidae)	Kisli & Kanha	August-September	*Hibiscus esculentus*
121.	*Pheosia strigata* Moore (Lep.: Notodontidae)	Kisli & Mukki	September-October	-
122.	*Philagria entclla* Cr.(Lep.: Arctiidae)	Kanha, Mukki & Advar	September , October, March	-
123.	*Polyptychus dentatus* (Cr.) (Lep.: Sphingidae)	Kanha, Mukki	May, July-September	*Cordia myxa. Ziziphus* spp.
124.	*Marumba (Polyptychus) dyra.v* Wlk. (Lep.: Sphingidac)	Advar, Mukki & Kanha	June, September	*Kydia calycina*
125.	*Polyptychus indicus* Wlk. (Lep.: Sphingidae)	Kanha	August	-
126.	*Polytela gloriosa* Moore (Lep.: Noctuidae)	Kanha	August-September	Lily *(Crinum* sp.)
127.	*Prodenia littoralis* Boisd.. (Lep.: Noctuidae)	Kisli	September	Wide range of wild and cultivated plants including *Tectona grandis*
128.	*Psilogramma (Pseudosphinx) menephron* (Cram...)	Kisli	August-September	*Gmelina arborea.Melia azaderach, Tectona*

	(Lep.: Sphingidae)			*grandis, Vitex negundo*
129.	*Pygospila tyres* (Cr.) (Lep.: Pyralidae)	Kisli & Kanha	September	*Holorrihea antidysenterica*
130.	*Remigia arehesia* Cr.(Lep.: Noctuidae)	Mukki, Kisli & Supkhar	September-October	*Wrightia tinctoria*
131.	*Spilosoma obliqua* WIle. ab. *confiua* Buth. (Lep.: Arctiidae)	Kanha	September	*Tectona grandis, Toona ciliata*
132.	*Spiramo retorta* Cr. (Lei). : Noctuidae)	Kanha & Kisli	August-September	*Albizia lebbek. A. procera, Cassia* glauca
133.	*Sylepta balteata* Fabr. (Lep.: Pyralidae)	Mukki, Supkhar	September-October, June	*Boswellia serrata, Boehmeria malabarica, Garga pinnata, Lannea grandis, Shorea robusta, Sterculia urens*
134.	*Thalassodes quadrina* Green (Lep.: Geometridae)	Kisli	October	*Anacardium occidentale, Calophyllum inophyllum, Polyalthia longifolia, Xylia dolabriformis*
135.	*Theretra clotho clotho* (Drury) (Syn *Chaerocampa butus* Hamp.) (Lep.: Sphinaidae)	Advar & Kanha	June-September	Hibiscus mutabilis, Vitis vinifera
136.	*Theretra oldenlandiae* (Fab.) (Lep.: Sphingidae)	Kisli	September	*Careya arborea, Vitis vinifera and other leguminous plants*
137.	*Trigonodus hyppasia* (Cramer) (Lq).: Noctuidae)	Mukki	December, February	
138.	*Xyleutes persona* (L'e guillou) (syn. *X. leuconotus* Walk.) (LeD.: Cossidae)	Kanha, Kisli & Mukki	September	-
139.	*Xyleute. slrix* (Linn.) (Lep.: Cossidae)	Mukki	September	-

Table - 39 - BEETLES

140.	*Acanthophorus serraticornis* Oliv. (Co!.: Cerambycidae)	Supkhar	June	*Tectona grandis*
141.	*Alaus* (syn. *Conoderus) sordidus* (LeConte) (Cot.: Elateridae)	Mukki & Kanha	August-September	Predator on larvae of Cerambycids.
142.	*Anomala cantori* Hope. (Co!.: Scarabaeidae)	Mukki	September	-
143.	*Anomala dimidiata* Hope. (Col.: Scarabaeidae)	Kanha	July-August	Polyphagous, grape vine
144.	*Anomala monochroa* Bates. (Col.: Scarabaeidae)	Kanha	August	-
145.	*Anomala rufiventris* Redt. (Col.: Scarabaeidae)	Mukki	September	Grub occurs in nursery. Roots of grasses, seeds and plants.
146.	*Anthia Kolapurien* Vaishali J. Patil and T. Y. Sathy (Col.: Carabidae)	Advar	September-October	Beetles predate on larvae and pupae of grasshoppers and defoliators
147.	*Aulacophora foviecollis* Lucans (Col.: Chrysomelidae)	Supkhar	June	Tectona grandis, Ziziphus jujube, Dalbergia latifolia
148.	*Catharcius molossus* Linn. (Col.: Copridae)	Kanha	July	Pyrus malus
149.	*Celosterna scabrator* Fab. (Col.: Cerambycidae)	Kanha	July-September	*Acacia catechu, A. nilotica, Cassia siamea, Eucalyptus, Tectona grandis, Pithecellobium dulce, Ziziphus sp.*
150.	Tiger beetle. *Cicindela Sexpunctata* Linn. (Col.: Cicindelidae)	Mukki	August	Predator on insect species like sapsucker *Leptocorisa acuta.*
151.	*Heliocopris bucephailus* Fab. (Co!.: Scarabaeidae)	Supkhar	September	Feeds on animal dung

152.	Sal heartwood borer, *lIoploceramhyx spinicornis* Newman (Co!.: Cerambycidae)	Mukki& Kanha	September	*Duabanga grandiflora. Hevea brasiliensi.. Shorea robusta*
153.	*Lophosternus indicus* Hope. (Col.: Cerambycidae	Kisli & Mukki	June	-
154.	*Macrotoma crenata* Fab. (Col.: Cerambycidae)	Supkhar & Advar	June	*Bombax ceiba. Eucalyptus. Mangifera indica. Shorea robusta.*
155.	*Macrotoma spinosa* Fab. (Col.: Cerambycidae)	Supkhar, Advar	June	*Casuarina equiselifolia. Lannea grandis*
156.	*Mimela macleayana* Burn. (Col.: Scarabaeidae)	Mukki	June-July	Larva feeds on roots of seedlings
157.	Blister beetle. *Mylahris pustulata* Thumb. (Co!.: Meloidac)	Advar	August-September	Flowers of leguminous plants, *Anacordium occidentate, Cassia angustifolia. Lantana aculeale.Ponj!amia pinnata.* etc.
158.	*Stromatium barbatum* fao. (Co!.: Cerambycidae)	Kisli	June	Borer of felled wood of many Species, *Tectona grandis.*
159.	*Xylotrechus suhscutellatus Chevrolat (Col. Ceambycide*	Advar	March	Sapwood Borer of dead *Dalbergia latifolia. Pterocarpus marsupium, Tectona grandis and Vitex spp.*

Table - 40 - BEES, WASPS AND ANTS

160.	Indian bee, *Apis indica* Fab. (Hymen.: Apidae)	Advar	February-March	Nectar from flowers
161.	*Dorylus labiatus* Schuck. (Hymen.: Formicidae)	Kisli, Kanha, Advar & Mukki	March, April & August	Ants, tubers and roots of Cocos nucifera (NariyaJ)
162.	Red ant, *Oecophylla smaragdina* Fabr. (Hymen.: Formicidae)	Kisli, Kanha, Supkhar and Mukki	January-April and Nov.-Dec.	Predator
163.	Vespoid digger wasp. *Scolia aureipennis* Lepe. (Hymen.: Scoliidae)	Kisli	September	*Holotrichia consanguineo*
164.	Carpenter bee, *Xylocopa* sp. (Hymen.: Xylocopidae)	Kanha	August	Bores wood and form tunnels.. Collects nectar from flowers.

Table - 41 GRASS HOPPERS

165.	*Acrida gigantea* Hbst. (Drth.: Acrididae)	Bhaisanghat	October	*Shorea robusta*
166.	*Aularches punctatus.*, Drury .(Orth: Acrididae)	Supkhar	September	Forest nursery pest
167.	*Cyrtacanthacris ranacea Stoll* (Orth.: Acrididae)	Kisli & Mukki	August-September	*Ricinus communis.* Castor and ground nut
168.	*Gastrimargus transverses* Thunberg (Orth.: Acrididae)	Advar, Mukki, Bhaisanghat & Supkhar	October & March	-
169.	*Hieroglyphus nigrorepletus* Bolivar Qrth.: Acrididae)	Kisli	August	Forest nursery pest
170.	*Holochlora albida* Brun. (Orth.: Tettigoniidae)	Kisli & Mukki	September	--
171.	*Sathrophyllia rugosa* Linn. (Orth.: T ettigoni idae)	Kisli, Kanha, Mukki	August-September	*Butea monosperma*
172.	*Schistocerca talarica* L. (Orth.: Acrididae)	Advar	March	Polyphagous

Table - 42 - CRICKETS

173.	Mole cricket- *Gryllolalpa africana,* Palisot. (Orth.: Gryllidae)	Kisli, Kanha & Mukki	June-September	*Bischofia javanica. Cinnamomum cecidodephune*
174.	House cricket, *Gryllus domesticus* L. (Orth.: Gryllidae)	Advar, Kisli, Kanha & Supkhar	June-July and February-June	*Omnivorous. Gossypium* spp.
175.	*Liogryllus bimaculatus* De Gueer (Orth.: Gryllidae)	Kanha & Advar	March, August	Omnivorous, *Oryza saliva*
176.	*Tarbinskiellus (Brachytrypes) portentosus* (Licht.) (Orth.: Gryllidae)	Mukki	June-July	*Dalbergia sissoo. Mangifera indica. Oryza sativa, Tectona grandis. Casuarina equisetifolia*

Table - 43 - MANTIDS

177.	*Creobroter unbana* Fab. (Orth.: Mantidae)	Kisli	June	Predators on the young larvae of defoliators of teak, sissoo and Cassia
178.	*Eremoplana microptera* Walk. (Orth.: Mantidae)	Kisli, Kanha and Mukki	July-August.	Predator on small insects
179.	*Hierodula ventralis* (H. westwoodi Sss.) (Orth.: Mantidae)	Advar & Mukki	May, June & September-November	Predator on larvae of defoliators of teak and sissoo
180.	Phyllothelis westwoodi Stoll. (Orth.: Mantidae)	Mukki	August	Predator on small insects

Table - 44 - BUGS

181.	Red bug, *Dysdcrcus cingulatus* Fab. (Heter.:Pyrrhocoridae)	Kanha, Mukki	May, August	*Abelmoschus crinitus. Bombax ceiba. Pongamia pinnata, Lantana. Sola*num, *vervacijolium.* serious pest of cotton,
182.	*Erthesina fullo* (Thun.) (lieter.:Pentatomidac)	Kanha	July	Feeds on Vegetable & Gmelina arborea
183.	The Giant water bug, *Lithocerus* (*Belostoma*) indica	Advar	June	Predator on insects, tadpoles & fishes

	Lep. & Servo (Heter.:Belostomidae)			
184.	Green stink bug, *Nezara viridula* Linn. (Heter.: Pentatomidae)	Bhaisanghat	October	Many agricultural and forest tree species like *Santalum album*, etc.
185.	*Plautia crossota* Dollas (Heter.: Pentatomidae)	Advar	March	*Morus alba*
186.	*Physopelta gutta* Burn. (Heter.: Pyrrhocoridae)	Advar	March-April	--

Table - 45 - TERMITES (Isoptera: Termitidae)

187.	Mound building termite *Odontotermes obesus* Ramb	Supkhar, Kanha, Kisli, Mukki & Bhaisanghat	Throughout the year	*Shorea robusta*

Kanha National Park

World famous Kanha Tiger Reserve is situated in Mandla district. Kanha is famous for Tiger and Barasingha. Kanha has numerous species of insects, butterflies, reptiles, fishes and other lesser life forms. Important mammals, birds, reptiles, crustaceans, amphibians, insects, mollusks and fishes found in Kanha National Park are listed below. List also contains the rare and endangered species found in the park.

Mammals

1. Madras Tree Shrew (*Anathana ellioti pallida*)
2. House Shrew (*Suncus murinus murinus*)
3. Pygmy Shrew (*Suncus etruscus perrotteit)*
4. Anderson's Shrew (*Suncus stoliczkanus)*
5. Indian Fulvous Fruit Bat (*Rousettus leschenaulti)*
6. Indian Flying Fox (*Pteropus gogamteis)*
7. Short-nosed Fruit Bat (*Cynopterous sphinx)*
8. Long-armed Sheath-tailed Bat (*Taphozous longimanus)*
9. Naked-bellied Tomb Bat (*Taphozous nudiventris kachhensis)*
10. Black-bearded Tomb Bat (*Taphozous melanopogon)*
11. Pouch-bearing Bat (Saccolaimus saccolaimus*)*
12. Indian False Vampire (*Megaderma lyra*)
13. Lesser Rat-tailed Bat (*Rhinopoma hardwicket*)
14. Rufous Horse-shoe Bat (*Rhinolophus rouxi*)
15. Little Indian Horse-shoe Bat (*Rhinolophus lepidus*)
16. Kelaart's Leaf-nosed Bat (*Hipposideros lankadiva*)
17. Wrinkle-lipped Bat (*Tadarida plicate*)
18. Indian Pipistrelle (*Pipistrellus coromandra*)
19. Indian Pygmy Pipistrelle (*Pipistrellus mimus*)
20. Kelaart's Pipistrelle (*Pipistrellus ceylonicus chrysothrix*)
21. Lessor Yellow Bat (*Scotophilus kuhli*)

22. Smooth-coated Otter (*Lutra perspicillata*)
23. Ruddy Mongoose (*Herpestes smithi*)
24. Leopard Cat (*Felis bengalensis*)
25. Mouse Deer (*Tragulus meminna*)
26. Hispid Hare (*Caprolagus hispidus*)
27. Common Giant Flying Squirrel (*Petaurista petaurista philippensis*)
28. Indian Palm Squirrel (*Funambulus palmarum robertsoni*)
29. Five-Striped Squirrel (*Funambulus pennanti*)
30. Indian Giant Squirrel (*Ratufa indica centralis*)
31. Indian Long-tailed Tree Mouse (*Vandeluria oleracea*)
32. Blanford's Rat (*Cremnomys blanfordi*)
33. Dark-bellied House Rat (*Rattus rattus rufescens*)
34. White-bellied House Rat (*Rattus rattus wroughtoni*)
35. Little Indian Field Mouse (*Mus booduga booduga*)
36. Brown Spiny Mouse (*Mus platythrix*)
37. Indian Bush Rat (*Golunda ellioti*)
38. Lesser Bandicoot Rat (*Bandicota bengalensis*)
39. Indian Gerbil (*Tatera indica*)

Birds

1. Indian Pitta (*Pitta brachyuran*
2. Purple Heron (*Ardea purpurea*)
3. Pond Heron or Paddy Bird (*Ardeola grayii*)
4. White necked Stork (*Ciconia episcopus*)
5. Common Teal (*Anas crecca*)
6. Black winged Kite (*Elanus caeruleus*)
7. Shikra (*Accipiter badius*)
8. White-eyed Buzzard (*Butastur teesa*)
9. Crested Hawk Eagle (*Spizaetus cirrhatus*)
10. White backed Vulture (*Gyps bengalensis*)
11. Pied Harrier (*Circus melanoleucos*)
12. Crested Serpent Eagle (*Spilornis cheela*)
13. Red Jungle fowl (*Gallus gallus*)
14. Common Peafowl (*Pavo cristatus*)
15. Bronzewinged Jacana (*Metopidius indicus*)
16. Red wattled Lapwing (*Vanellus indics*)
17. Common Green Pigeon (*Treron phoenicoptera*)
18. Roseringed Parakeet (*Psittacula krameri*)
19. Common Hawk-Cukoo or Brainfever Bird (*Cuculus varius*)
20. Indian Cuckoo (*Cuculus micropterus*)
21. Crow Pheasant or Coucal (*Centropus sinensis*)
22. Barred Jungle Owlet (*Glaucidium radiatum*)
23. White breasted Kingfisher (*Halcyon smyrnensis*)
24. Black capped Kingfisher (*Halcyon pileata*)
25. Small Green Bee-eater (*Merops orientalis*)
26. Indian Roller or Blue Jay (*Coracias bengalensis*)
27. Hoopoe (*Upupa epops*)
28. Common Grey Hornbill (*Tockus birostris*)
29. Large Green Barbet (*Megalaima zeylancia*)

30. Crimson breasted Barbet or Coppersmith (*Megalaima haemacephala*)
31. Lesser Golden backed Woodpecker (*Dinopium bengalense*)
32. Rufous backed Shrike (*Lanius schach*)
33. Brown Shrike (*Lanius cristatus*)
34. Black headed Oriole (*Oriolus xanthornus*)
35. Golden Oriole (*Oriolus oriolus*)
36. Racket-tailed Drongo (*Dicrurus paradiseus*)
37. Tree Pie (*Dendrocitta vagabunda*)
38. Jungle Crow (*Corvus macrorhynchos*)
39. Scarlet Minivet (*Pericrocutus flammeus*)
40. Jungle Babbler (*Turdoides striatus*)
41. Verditer Flycatcher (*Muscicapa thalassina*)
42. Shama (*Copsychus malsbaricus*)
43. Indian Tree Pipit (*Anthus hodgsoni*)
44. Red Munia or Avadavat (*Estrilda amandoava*)
45. Blossom headed Parakeet (*Psittacula cyanocephala*)
46. Bush Lark (*Mirafra assamica*)
47. Spotbill Duck (*Anaspoecilorhyncha*)
48. Common lora (*Aegithina tiphia*)
49. Brahminy Myna (*Sturnus pagodarum*)
50. Pied Myna (*Sturnus contra*)

Reptiles

1. Brook's Gecko (*Hemidactylus brooki*)
2. Wall Lizard (*Hemidactylus flaviviridis*)
3. Collegal Rock-gecko (*Cyrtodactylus collegalensis*)
4. Common Garden Lizard (*Calotes versicolor*)
5. White-banded Lizard (*Sitana ponticeriana*)
6. Fan-throated Lizard (*Sitana ponticeriana*)
7. Blandford's Rock Lizard (*Psammophilus blanfordanus*)
8. Bronzen Skink (*Mabuya macularia*)
9. Common Keeled Grass Skink (*Mabuya carinata*)
10. Snake Skink (*Riopa albopunctata*)
11. Monitor Lizard (*Varanus bengalensis*)
12. Brahminy Blind Snake (*Ramphotyphlops braminus*)
13. Indian Rock Python (*Python molurus*)
14. Common Wolf Snake (*Lycodon aulicus*)
15. Cantor's Black-headed Snake (*Sibynophis sagitarius*)
16. Dhaman/Rat Snake (*Ptyas mucosus*)
17. Banded Racer (*Argyrogena fasciolatus*)
18. Common Krait (*Bungarus caeruleus*)
19. Spectacled Cobra (*Naja naja*)
20. Russell's Viper (*Vipera russelli*)
21. Saw-scaled Viper (*Echis carinatua*)
22. Indian Egg-eating Snake (*Elachistodon westermanni*)
23. Indian Dragon (*Draco dussumieri*)
24. Chamaeleon (*Chamaeleon zeylanicus*)

Crustaceans

1. *Strandesia weberi*
2. *Strandesis purpurascens*
3. *Cypris subglobosa*
4. *Hemicypris pyxidata*
5. *Tanyucypris pellucida*
6. *Stenocypris major*
7. *Pseudocypretta maculate*

Amphibians

1. Common Asian Toad (*Bufo melanostictus*
2. Indian Rice Frog (*Rana limnocharis*)
3. Indian Skipper Frog (*Rana cyanophlyctis*)
4. Common Frog (*Rana tigerina*)
5. Ornate Frog (*Microhyla ornata*)

Insects

Isoptera (termites)

1. *Coptotermes heimi*
2. *Speculitermes sinhalensis*
3. *Euhamitermes kanhaensis*
4. *Eurytermes boveni*
5. *Synhamitermes quadriceps*
6. *Microcerotermes beesoni*
7. *Dicspiditermes obtusus*
8. *Pericapritermes tetrophilus*
9. *Odontotermes assmuthi*
10. *Odontotermes bhagwatii*
11. *Odontotermes bguptai*
12. *Odontotermes horni*
13. *Odontotermes microdentatus*
14. *Odontotermes obesus*
15. *Microtermes obesi*
16. *Microtermes unicolor*

Lepidoptera (butterflies and moths)

1. Common Wanderer Butterfly (*Valeria valeria hippia*)
2. The Lemon Emigrant (*Catopsilia pomona*)
3. Grass Yellow (*Eurema hecabe simulata*)
4. Blue Tiger Butterfly (*Danaus limniace leopardus*)
5. Wanderer (*Danaus plexippus plexippus*)
6. Common Crow Butterfly (*Euploea core core*)
7. Common Palmfly (*CMelanitis leda ismene*)
8. Plain Tiger (*Danais (Limns) chrysippus)* (Linn.)
9. Baronet (*Symphaedra nais*)

10. The Lemon Pansy (*Precis lemonias)* (Linn.)
11. Common Emigrant (Catopilia crocale) (Cram.)
12. Mottled Emigrant (*Catopsilia pyranthe)* (Linn.)
13. Danaid Eggfly (*Hypolimnas misippus)* (Linn.)
14. Lemon Butterfly (*Papilio demoltus)* (Linn.)
15. Croton Caterpillar (*Achaea janata)* (Linn.)
16. Moon Moth (*Actias selene)* (Hubn.)
17. Hairy Caterpillar (*Amsacta lactened)* (Cram.)
18. Silk Moth (*Antheraea mylitta)* (Drury.)
19. Tiger Moth (*Asota caricae)* (Fab.)
20. Tiger Moth (*Argina cribraria)* (Clerck.)
21. Cucumber Moth (*Botyodes asialis)* (guen.)
22. Teak Defoliator (*Hyblaea puera)* (Gram.*)*
23. Tendu Defoliator (*Hypocala rostrata) (*Fab.)
24. Gypsy Moth (*Lymantria mathura)* (Moore.)
25. Armyworm (*Pericallia ricini)* (Fab.)
26. Noctuid Moth (*Polytela glariosa)* (Moore.)
27. Owlet Moth (*Spirama retorta)* (Cr.)
28. Carpenter Moth (*Xyleutes ceramica)*

Beetles

1. Root and Shoot Borer (*Celosterna scabrator)* (Fab.)
2. Cockchafer Beetle (*Anomala dimidiate(* (Hope.)
3. Cockchafer Beetle (*Anomala dorsalis)*
4. Sal Heart-wood Borer (*Hoplocerambyx spinicornis)* (Mewman.)
5. Predator (*Alaus* (Syn. *Conoderus) sordidus)* (Leconte.)
6. Tiger Beetle (*Cicindela sexpunctata- Mylabris pustulata)* (Thungerg.)

Bugs

1. Gandhi Bug (*Lentocorisa vasicornis)*
2. Pentatomid Bug (*Erthesina fullo)*
3. Pentatomid Bug (Cathericona sp.*)*
4. Red Bug (*Disdercus cingulatus)*

Crickets and Grasshoppers

1. Mole Cricket (*Gryllotalpa sp.)*
2. Preying Mantis (*Eremoplana microptera)*

Orthopterans

1. *Atractomorpha crenulata crenulata*
2. *Chrotogonus (Chrotogonus) tr. trachypterus*
3. *Spathosternum p. prasinigerum*
4. *Eyprepocnemis sp.*
5. *Eyprepocnemis rosea*
6. *Stenocatantops splendens*
7. *Teratodes sp.*

8. *Acrida exaltat*
9. *Phlaeoba infumata*
10. *Aiolopus thalassinus tamulus*
11. *Dittopternis venusta*
12. *Gastrimargus africanus africanus*
13. *Oedaleus abruptus*
14. *Trilophidia annulata*
15. *Aulacobothrus sp.*
16. *Aulacobothrus strictus*
17. *Mesopsis cylindricus*
18. *Gryllus bimaculatus*
19. *Gryllodes sigillatus*
20. *Modicogryllus confirmatus*
21. *Telegryllus mitratus*
22. *Pteronemobius fascipes*
23. *Oecanthus indicus*

Arachinids (spiders)

1. *Haplodrassus sataraensis*
2. *Thomisus pugilis*
3. *Thomisus cherapungeus*
4. *Argiope aemula*
5. *Argiope pulchella*
6. *Cyclosa hexatuberculata*
7. *Araneus nympha*
8. *Neoscona bengalensis*
9. *Hersilia savignyi*
10. *Hippasa pisaurina*
11. *Hippasa partita*
12. *Pardosa annandalei*
13. *Pardosa sumatrana*
14. *Pardosabirmanica*

Molluscs

1. Fresh water Snail (*Pilia virens)*
2. Snail (*Thiara) (Tarebia) lineata)*
3. Snail (*Thiara) (Melanoides) tuberculate)*
4. Pond Snail (*Lymnaea acuminata)*
5. Pond Snail (*Lymnaea luteola)*
6. Snail (*Indoplanorbis exustus)*
7. Landshell (*Ariophanta laevipes)*
8. Mussel (*Lamellidens marginalis)*
9. Bivalve (*Parreysia corrugata)*
10. Fresh water Bivalve (*Corbicula sriatella)*
11. Bivalve (*Corbicula occidens)*

Fishes

1. Small Fish Punti (*Puntius sophore)*
2. Giant Danio (*Danio (D)aequipinnatus)*
3. Zebra Fish (*Danio (B) rerio)*
4. Common Rasbora (*Rasbora daniconius)*
5. Flying Barb (*Esomus danricus)*
6. River Loach (*Noemacheilus sikmaiensis)*
7. Guntea Loach (*Lepidocephalus (L) guntea)*
8. Mud-perches (*Badis badis)*
9. Brown Snake-head (*Channa orientalis)*
10. Green Sanke-head (*Channa punctata)*

Some of the animals which figured in the 1988 IUCN Red List, and found in the tiger reserve are:

Mammals

1. Bengal Fox (*Vulpes bengalensis)*
2. Dhole (*Cuon alpinus)*
3. Gaur (*Bos gaurus)*
4. Leopard (*Panthera pardus)*
5. Sloth Bear (*Melursus ursinus)*
6. Smooth-Coated Otter (*Lutra perspicillata)*
7. Swamp Deer (*Cervus duvauceli branderi)*
8. Tiger (*Panthera tigris tigris)*

Birds

1. Green Munia (*Estrilda Formosa)*
2. Lesser Florican (*Sypheotides indica)*

Reptiles

1. Indian Rock Python (*Python molurus)*

Insects

Kanha has been quoted as the only source of the following species of termite in Madhya Pradesh:

Euhamitermes kanhaensis
Eurytermes boveni
Pericapritermes tetraphilus
Odontotermes bhagwatti