

# ETHNOBOTANY OF THE PRATAPGARH TEHSIL OF RAJASTHAN



## THESIS Submitted to the **University of Kota** For the degree of **Doctor of Philosophy** (BOTANY)

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# **CERTIFICATE**

This is to certify that the thesis entitled “**Ethnobotany of the Pratapgarh Tehsil of Rajasthan**” is an original work carried out by **Mr. Vinay Kuamr Meena** under my supervision for the degree of **DOCTOR OF PHILOSOPHY** in Botany, University of Kota, Rajasthan, India.

I further certify that no part of this thesis has been submitted for any degree or diploma to any other university. This is also certified that he has attended the laboratory for more than 100 days per year during his research tenure.

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*I*nfluence of environment on human culture started with the dawn of civilization. The basic instinct of the primitive man to seek food, drive him towards plants and animals. By years of experience and survival through successive generation he learned to distinguish the poisonous substances from the wild plants. The early man also got acquainted with the knowledge of certain roots, leaves, stems, fruits or seeds which on consumption, result into a particular metabolic disorder. This effective judging since ages gave birth to home remedies. The plants used in home remedies were considered divine and often kept as a close secret. The use and cultivation of plants and their products for nourishment, shelter and protection by the early man suggest a very long history of Ethnobotany (Harshberger, 1895). Unknown of the composition of plant products, they have been used since ages to preserve the art, tradition and culture of the community. Ethnobiology and human ecology are two important disciplines and have a great significance for the welfare of human beings and animal world. Ethnobiology which records and documents the age old knowledge and wisdom of the traditional people about the miraculous properties of diverse plant and animal species (biodiversity), is now emerging as holistic segment of Ecology (Jain, 1991).

Ethnobiology is the study of past and present, natural and traditional, association, interaction and interrelationship between any group of people and the surrounding environment.

Ethnobotany deals with traditional and natural relationship between human societies and plants. It has been recognized as a multidisciplinary science comprising many interesting and useful aspects of plant sciences, history, anthropology, culture and literature. Such a study in India was promoted by the pioneer work of Jain (1961) who is known as “Father of Indian Ethnobotany”. The term Ethnobotany was coined by John W. Harshberger (1895), a botanist in Pennsylvania University to study the existing relationship between the plants and the aboriginal communities. The aborigines of India are called tribes. The American Scientist Powers (1875) coined the term “aboriginal botany” in his description of plants used by Neeshenam Indians of the Bear River, California, for medicine, food, textile, fabrics, ornaments *etc.* According to Schultes (1962), Ethnobotany is “the study of relationship which exists between people of primitive societies and their plant environment”. Ethnobotany brings to light numerous known or unknown uses of plants which have potential of wider usage. It has relevance also in conservation of genetic resources. It helps to search new sources of drugs, food, fodder and other life supporting species found in nature (Meena, 2012a; Meena, 2012b and Kotia *et al.*, 2015).

The term is not new even to India, Kirtikar and Basu (1935) stated. “The ancient Hindus should be given credit for cultivating what is now Ethnobotany”. Its importance has been realized chiefly in respect of the varied economic uses of plants among the primitive human societies. Since it was believed that everything in nature has some sort of power and spirit. Likewise each plant has its own

properties. Ethnobotany brings to light numerous known or unknown uses of plants which have potential of wider usage. It has relevance also in conservation of genetic resources. It helps to search new sources of drugs, food, fodder and other life supporting species found in nature.

Number of plants species were used in different culture for magical purposes used to ward-off evil eye and spell. Since men first utilized wood for fire, tools and other purposes, certain tree species held a special significance as both practical providers and powerful spiritual presence. Such type of particular trees varied among different culture and geographical regions (Jain, 1981; Joshi, 1995b; Baghel, 2002 and Sahu *et al.*, 2013).

The tribal people and ethnic groups throughout the world have developed their own culture, customs, religious rites, taboos, totems, legend and myths, folklores and songs, food, medicinal practices *etc.* Numerous wild and cultivated plants play a very important and vital role among these cultures and this interrelationship has evolved over generations of experience and practices (Baghel, 2002).

Though organized study or research in Ethnobotany is recent, many earlier publications contain valuable material of ethnobotanical importance. Ethnologies on tribes living in different parts of the world, works on indigenous medicine and botany and sometimes even forestry and travel accounts contain data of ethnobotanical significance (Jain, 1991).

Various definitions of Ethnobotany were proposed by many well known scientists as given below:

According to Jones (1941) “Ethnobotany is the study of the interrelationship between man and vegetation.”

Faulks (1958) considered it as “The total relationship between man and vegetation.”

Gadgil and Vartak (1976) considered it as, ‘Branch of economic botany which deals with the role of plants in life and culture of aboriginals and tribal people.

Jain (2001) defined it as, ‘It deals with the study of total natural and traditional interrelationship between man and plants and his domesticated animals’.

There has been an increase in recent years in medical Ethnobotany mainly because of the renewed interest in traditional herbal medicine, particularly the “tribal medicine”. The revival of interest in natural drugs, especially those derived from plants, started in the last decades mainly because of the widespread belief that ‘*green medicines*’ are healthier and safer than the synthetic ones. Ever since the WHO in its 29th Assembly (1976 and 1977) gave formal recognition to the traditional medicine and recommended to associate the traditional healers in the rational health care program, the herbal medicine of ancient times practiced during the Vedic period (5000-3000 B.C.) and which was temporarily subdued under the impact of modern medicine, have staged a comeback and a ‘*herbal renaissance*’

is blooming across the world. WHO has estimated that approx 80 per cent of peoples in the world rely on traditional medicine for primary health care needs (Kala *et al.*, 2006)

World health organization (WHO), Food and Agricultural Organization (FAO) and United Nations Industrial Development Organization (UNIDO) emphasized the fact that more than 90% of world's population, particularly in China, Africa, and India are exclusively dependant on herbalists and traditionalist. According to a survey conducted by WHO, uses of herbal medicines and herbal treatment of diseases are increasing even in the developed countries especially among younger generations. Australia, Sweden, Switzerland and Canada are leaders among them. Herbal renaissance is blooming in these countries. Demands for herbal health products *viz.* herbal tea, herbal cosmetics, essential oils and flavors are growing even these are proving costlier than the corresponding inexpensive synthetic ones (Reddy *et al.*, 2011 and Kotia *et al.*, 2015).

The invaluable role of the ethnic groups in the conservation of resources has now been well recognized. Various ethnic groups have provided several miracle plants of immense food and medicinal value to modern civilization. Number of plant species obtained from ethnic people, who preserve these, are still very important. About 250 million people- one in every 20 on earth belongs the ethnic culture. The original inhabitants of their lands, they uniquely know how to live in harmony with nature, ethnic people are scattered over the fact of the earth around 70 countries. Among them over 150 millions are living in Asia; two thirds in China and India. There are at least 30 million in

Central and South America. There are 250,000 ethnic people in Australia called, “Aborines”, 300,000 In New Zeland called “Maoris” and some 10,000 ethnic people called “Eskimos” or “Inuits” in the Artic countries in Sweden the ethnic people called “Lapps” made up less than 0.1 per cent of the population and Amazonian Indians comprise the same proportion of the people of Brazil. The ethnic society of Greenland also called “Inuits” make up 90 per cent of its population and the Indian make up two thirds of the people of Bolivia. (Sinha, 1996; Kotia *et al.*, 2008 and 2015)

Many of the ethnic societies are highly primitive and still lives in “Stone – Age” culture virtually cut off from the modern civilization. The Dani Tribe of Indonesia, the Onges and Jarawas of India still lives naked as the Stone Age culture and did not know what a wheel is?.

### **Ethnobotanical contribution of the Tribals of India**

1. Landraces of important crop plants.
2. Useful domesticated plants.
3. Useful wild plant as a source of food and herbal medicine.
4. Wild relatives of economically important cultivated crop plants.

Over 9,500 wild plant species used by tribals for meeting their various requirements have been recorded so far. Out of 7,500 wild plant species used by the tribals for medicinal purpose, about 950 are found to be new claims and worthy of scientific investigation. Out of 3,900 or more wild plant species used as food by tribals and traditional

communities about 800 are new claims and at least 250 are worthy of consideration for development as alternative sources of nutritive food which modern civilization might need in the near future. Approx 525 wild plant species used by the tribals for making cordage and fiber, 5 have commercial potential. Out of 400 plant species used as fodder, 100 are worth recommending for wider use. The tribals of India have also been using about 300 wild plant species as “pesticides” and “piscicides” of which atleast 175 have the potential to be developed as safe biopesticides.

Recently a major program in Ethnobotany and sustainable use of wild plant resources has been launched by WWF, UNESCO and the Royal Botanical Garden, Kew under the heading “people and plants initiative” its objectives are three dimensional:

- (a) To undertake survey of wild plant resources and to work with the local people to identify conservation issue and seek remedies.
- (b) To empower local communities so that they are more fully involved in land planning and land management and, for their sustainable growth and development.
- (c) To increase the number of ethnobotanists (especially from developing countries) actively working with local communities on conservation issue.

Deforestation, urbanization, industrializations, transmigration, colonization and other developmental activities have threatened not

only the biological resources but also the traditional culture and ethnobotanical knowledge (Singh and Pandey, 1998; Kotia *et al.*, 2008; Kumar and Kotia, 2014).

Hence, here is an urgent need to record and preserve the age long folklore and practices before the valuable ethnobotanical data gets disappeared.

**STUDY AREA PRATAPGARH TEHSIL:**

**GEOGRAPHICAL LOCATION:**



Figure 1.1: Shows the location of study area in Rajasthan and India

Pratapgarh is located at 24.03° N 74.78° E with an average elevation of 580 meters, this is said to be the second highest place in Rajasthan after Mount Abu. The District is situated on the junction of the Aravali mountain ranges and the Malwa plateau, with a unique location of transjunction of geological characteristics of two different habitats. The geographical area of Pratapgarh is 4, 11736 hectares, out of which forest area in 1, 20976 hectares (FIS, 2012) showing in Figure 1.1 to 1.3.



Figure 1.2: The Pratapgarh District showing all Tehsil

**CLIMATE, SOIL, TOPOGRAPHY AND RIVER:**

The climate of Pratapgarh is characterized by sub-tropical dry climate with distinct hot summer, cold winters and rainy monsoon. The highest temperature reached above 43° C in May- June, and lowest up to 6° C in December January. The District also experience average rainfall during the period from June-September. The average annual rainfall is 856 mm with maximum 951 mm and minimum 517 mm.

Table- 1.1- Table showing statistics of Pratapgarh District land area (Source-Census 2011)

| <b>S. No.</b> | <b>Particulars</b>          | <b>Figure in hectare</b> |
|---------------|-----------------------------|--------------------------|
| 1             | Total area                  | 411736                   |
| 2             | Forest                      | 121003                   |
| 3             | Other then agriculture land | 10916                    |
| 4             | Charageha (permanent)       | 22735                    |
| 5             | Actual sown area            | 178228                   |
| 6             | Agriculture use             | 27587                    |
| 7             | Padat                       | 9147                     |
| 8             | Trees and gardens           | 194                      |

The study area Pratapgarh town and its neighborhood comes under the geographical entity of Aravali scarpland. This scarpland having an average elevation between 350~580~ and Mahi and Jakham rivers developed main drainage system. The adjoining Districts of Pratapgarh are Dungerpur, Banswara, Chittorgarh and Udaipur. In Pratapgarh and Chittorgarh Districts most of the area is either uneven and under cultivation or it is in the form of ravines and gravelly surface therefore totally useless for any sort of agricultural practices. The land use statistics of the District is showing in table 1.1.

### **SOIL TYPES**

The distribution of soil types has been observed, during the course of systematic hydrogeological survey (Dhir and Jain 1982). The soil is mainly highly fertile black cotton soil made of magma of volcanoes in District. Following three categories of soils were observed:

- i. **Red soil:** This is iron rich sedimentary rock. Usually this type is poor growing soils, low in nutrients. Generally this soil is found one of the largest soil groups of India.
- ii. **Black loam soil:** This group of soil contains more nutrient, moisture and humus and rich in oxidized ions.
- iii. **Clay loam soil:** This type of soil is rich in clay particles with traces of metal oxides and organic matter and this soil is good for plant growth.

**RIVER SYSTEM**

Mostly rivers system of Pratapgarh District is create by Mahi Basin and main rivers of this system are includes: Mahi, Jakham, Som, Moran and Anas with other seasonal rivers are Era, Karmai. Most of the all rivers flow to Arab Sagar.

- i. **MAHI RIVER:** River Mahi originates from the northern slope of the Vindhyan ranges in 500 meter elevation, near the Bhopawer village, Sardarpur Tehsil in Dhar District of Madhya Pradesh. Mahi river is flows southwards for about 120 km in Madhya Pradesh before entering Banswara District of Rajasthan. This river is also called as golden line of Wagad and Khantal region. The important of this river is that it crosses two times of the tropic of cancer. The total catchment area of this river is 16985 km<sup>2</sup>, the Tributaries River of the Mahi river are Eru, Nori, Chap, Som, Jakham, Anas, Moran.
- ii. **JAKHAM RIVER:** River Jakham originates southwest of the hills near Chotisadri in Pratapgarh District of Rajasthan. Jakham River is flows through the hilly region of Udaipur District in South-Western direction and joins with Som River near Ranglei. The sub basin is situated in Chittorgarh and Udaipur District. Total catchment area of this is 2318km<sup>2</sup> and the Tributaries Rivers are Karmani and Sukhi (Fig. 1 and Fig. 2, Plate-1)
- iii. **SOM RIVER:** This originates hills near the village of Kherwada Tehsil of Udaipur District in Rajasthan. This river is

flows South-East through the hilly region and joins with Mahi river near the village Baneshwer. Mostly the catchment area is lies in Udaipur and Dungarpur District of Rajasthan. The total catchment area of this river is 6443km<sup>2</sup>; the Tributaries Rivers are Tidi, Gomti, Jakham.

- iv. **MORAN RIVER:** Moran originates in the Southern hills of Dungepur Town, this river flow through Dungepur District and joins with Mahi River near Galiyakot village. Total catchment area of this river is 6047 km<sup>2</sup> and the Tributaries Rivers are Karmai and Sukhi.
- v. **ANAS RIVER:** This River originating in the hills south of Kanguwa Village in Dungepur and joins with the Mahi River. The total catchment area of Anas River is 6047 km<sup>2</sup>.

## **VEGETATION OF PRATAPGARH DISTRICT**

The vegetation comprises tropical to sub tropical dry deciduous forests, savannah woodland and tropical thorn forest (Fig. 1 to Fig. 3, Plate-2). The forest fall under tropical dry deciduous vegetation of area is mostly composed of mixed deciduous type of forests which is cover around 121003 ha area (Champion and Seth, 1968).

The *Anogeissus latifolia* and *Anogeissus pendula* is the dominant species according to landmark viz. hills and plateau, *Boswellia serrata* occupies hill crests of Aravallis, *Terminalia arjuna* and *Syzygium heyneanum* forms riparian forests. *Sterculia urens* is not so common

but distributed throughout area and *Anogeissus latifolia* is mainly found in open forest of hill range or plateau in study area. The main tree species found in this region which mainly associates with *Anogeissus* species are *Tectona grandis*, *Lannea coromandelica*,

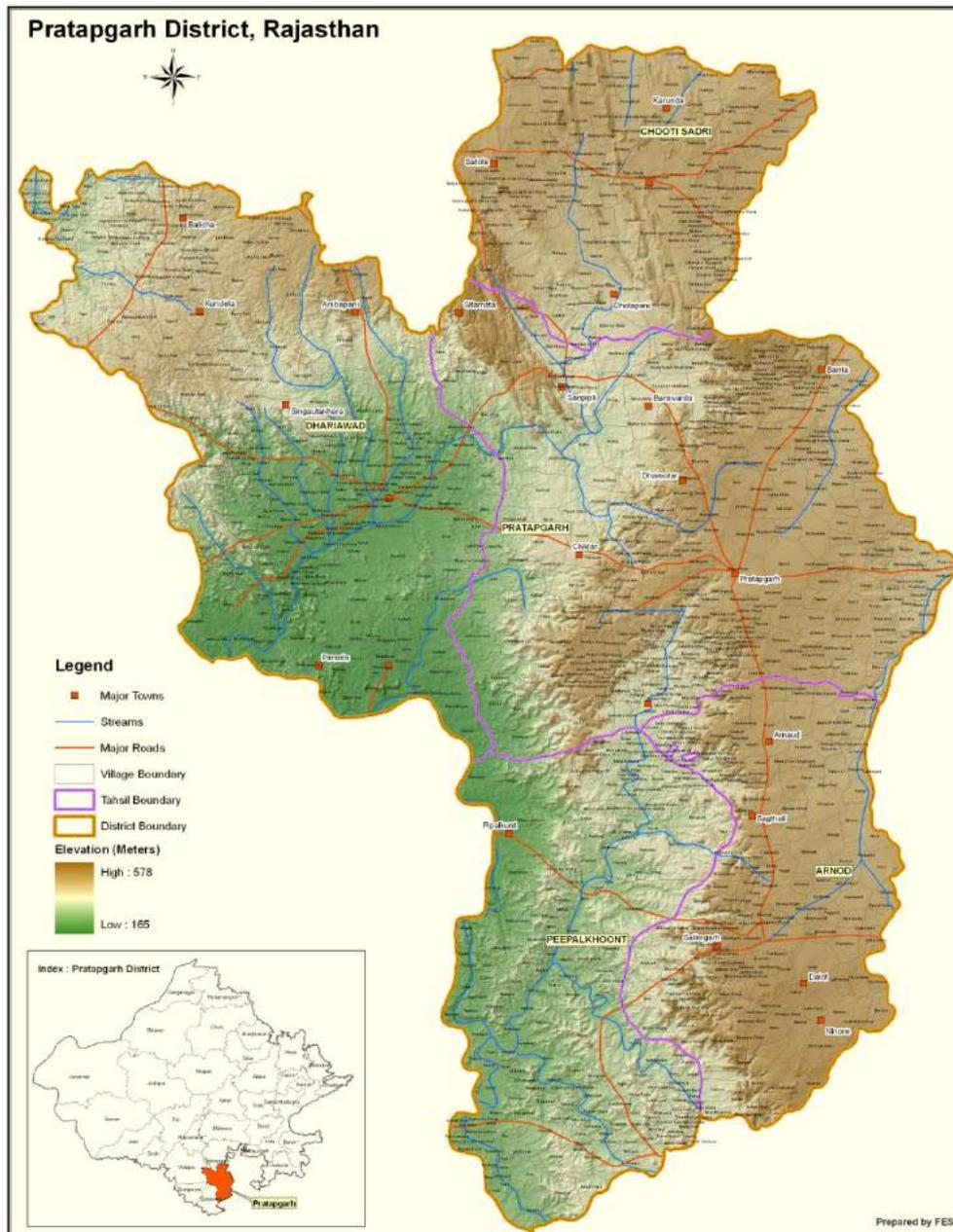


Figure: 1.3- Shows the forest cover of the Pratapgarh District

*Diospyros melanoxylon*, *Sterculia urens*, *Mitragyna parviflora*, *Butea monosperma*, *Acacia ctechu*, *Emblica officinalis*, *Boswellia serrata*, *Bridelia squamosa*, *Hardwickia binata*, *Buchanania lanzan*, *Cassia fistula*, *Schrebera swietenoides*, *Pterocarpus marsupium*, *Holoptelea integrifolia*, *Terminalia tomentosa*, *Terminalia bellirica*, *Adina cordifolia*, *Schleichera oleosa*, *Careya arborea*, *Madhuca indica*, *Syzygium cumini*, *Bridelia retusa*, *Miliusa tomentosa* *Ougeinia oojeinensis*, *Lagerstroemia parviflora* and *Kydia calycina*, *Mangifera indica*, *Mallotus philippensis*, *Cochlospermum religiosum*, *Flacourtia indica*, *Bauhinia racemosa*, *Albizia procera*, *Albizia leback*, *Albizia odoratisima*, *Aegle marmelos*, *Acacia leucophloea*, *Ziziphus xylopyrus*, *Ziziphus mauritiana*, *Capparis zeylanica*, and *Ficus religiosa*, *Ficus benghalensis*, *Ficus semicordata*, *Ficus rumphii*, *Ficus arnottiana*, *Dichrostachys cinerea*, and *Ziziphus mauritiana* (Sharma and Tiagi 1979, Shetty and Singh 1987).

Species composition of the study area at shrub and ground layer is common as in other semiarid part of Rajasthan, the common shrub species included: *Adhatoda vasica*, *Woodfordia fruticosa*, *Flemingia semialata*, *Clerodendrun indicum*, *Clerodendrun viscosum*, *Indigofera cassioides*, *Bauhinia vahlii*, *Millettia extensa*, *Mimosa hamata*, *Helicteres isora*, *Nyctanthes arbor-tristis*, *Grewia flavescens*, *Carissa carandas*,. A few climbers of this area include species of *Cryptolepis buchanani*, *Ichnocarpus frutescens*, *Rhynchosia minima*, *Atylosia scarabaeoides*, *Cocculus hirsutus*, *Cissampelos pareira*, *Ipomoea*, *Pergularia daemia*, *Pueraria tuberosa*, *Tinospora cordifolia*, *Asparagus racemosus* and *Ceropegia bulbosa*, (Kotia et al., 2008).

The common herb species of this area are *Alysicarpus tetragonolobus*, *Celosia argentea*, *Crotalaria hirsuta*, *Ipomoea indica*, *Bacopa monnieri*, *Sarcostemma acidum*, *Tridax procumbens*, *Curculigo orchioides*, *Chlorophytum arundinaceum* and *Centella asiatica*. Following some species are occur in the boundaries of fields, gardens and orchards these some species included *Cardiospermum halicacabum*, *Coccinia grandis*, *Momordica dioica*, *Mukia maderaspatana* etc. *Utricularia aurea* is the insectivorous representatives of the area.

### **Grasslands in study area:**

The grasslands of such habitats are dominated by tall gasses like *Aristida adscensionis*, *Bothriochloa pertusa*, *Cenchrus ciliaris*, *Chloris barbata*, *Cymbopogon martinii*, *Dichanthium caricosum*, *Digitaria adscendens*, *Dinebra retroflexa*, *Eragrostis uniolooides*, *Heteropogon contortus*, *Iseilema laxum*, *Pennisetum hordeoides*, *Sehima nervosum*, *Themeda quadrivalvis*, *Tripogon jacquemontii* etc.

Generally the grasslands occupy large, open undulating rocky terrain, these grasslands are deteriorated for want of protection against grazing and also due to the spread of undesirable thorny bushes and a number of weeds. The most common grasses of these habitats are: species of *Aristida*, *Cenchrus ciliaris*, *Chloris montana*, *Cynodon dactylon*, *Dactyloctenium aegyptium*, species of *Eragrostis*, *Melanocenchris jacquemontii*, *Setaria tomentosa*, *Sporobolus tenuissimus*, *Tetrapogon villosus*, *Tragus roxburghii*, *Tripogon purpurascens*, *Urochloa panicoides* etc.

**Vegetation of wastelands:**

Wasteland vegetation is almost identically uniform in the area depending on its physiography, mostly semixerophytic vegetation occurs. The common trees in the wastelands are *Acacia nilotica*, *Azadirachta indica*, *Prosopis juliflora*, *Salvadora persica* and *Balanites aegyptiaca* etc. The progressive regeneration of most of the trees both by seeds and stocks is negligible due to great biotic pressure on them. *Prosopis juliflora* is the only species which shows highest survival percentage under adverse climatic and biotic conditions.

The wasteland habitats are more favourable for shrubs and undershrubs which form a comparatively dense layer. The most common shrubs are: *Abutilon indicum*, *Acacia farnesiana*, *Calotropis procera*, *Capparis decidua*, *Capparis sepiaria*, *Clerodendrum phlomidis*, *Dichrostachys cinerea*, *Ficus palmata*, *Kirganelia reticulata*, *Lantana camara*, *Leptadenia pyrotechnica*, *Mimosa hamata*, *Opuntia elatior* and *Ziziphus nummularia* etc. These shrubs usually grow in clumps with trees in vacant spaces.

A large number of undershrubs also grow in the wastelands, the most common ones are: *Cassia auriculata*, *Cassia occidentalis*, *Desmodium gangeticum*, *Malvastrum coromandelianum*, *Pavonia zeylanica*, *Pupalia lappacea*, *Sida cordifolia*, *Sida ovata*, *Triumfetta pentandra* and *Xanthium strumarium* etc.

The common climbers of this habitat is viz. *Abrus precatorius*, *Cissampelos pareira*, *Cocculus hirsutus*, *Cryptostegia grandiflora*,

*Leptadenia reticulata*, *Pergularia daemia*, *Rivea hypocrateriformis* etc. They usually grow among the trees and shrubs, particularly on the boundaries of fields and gardens.

Besides this, a large number of annual and perennial herbs are encountered in the wastelands. With the advent of the winter season a considerable number of compositaceous meadow herbs, in association with *Acalypha ciliata*, *Achyranthes aspera*, *Argemone mexicana*, *Leucas cephalotes*, *Nepeta hindostana*, *Solanum nigrum* etc.

The most common compositaceous herbs are: *Ageratum conyzoides*, *Echinops echinatus*, *Eclipta alba*, *Lagascea mollis*, *Launaea procumbens*, *Pulicaria angustifolia*, *Sonchus oleraceus* and *Sphaeranthus indicus*. The last mentioned species often forms dense mats at certain places.

The dry meadow herbs appearing during summer months are cover with following some species e.g. *Chrozophora rottleri*, *Solanum surattense*, *Tridax procumbens* and *Dipcadi serotinum* which possesses underground bulbs and become visible above the ground only during the summers.

During the rainy season, the area presents a glorious appearance of a green carpet of semi-xerophytes and meadow herbs which help in increasing the humus content of the soil and extend the vegetation to the barren areas. The life-cycle of most of the herbs comes to close before the winter sets in. The rainy season herbs are dominated by leguminous plants like species of *Alysicarpus*, *Cassia*, *Indigofera*, *Tephrosia* etc. The common associates of the above are *Borreria*

*articularis*, *Cleome gynandra*, *Cleome viscosa*, *Convolvulus prostratus*, *Evolvulus alsinoides*, *Glossocardia bosvallea*, *Merremia tridenlata*, *Polygala erioptera*, *Tridax procumbens* and several grasses among which the species of *Aristida*, *Cenchrus*, *Chloris*, *Eragrostis*, *Tragus*, *Urochloa* etc. are more common.

A few sciophytic humus and shade loving herbs fairly distributed in the gardens, orchards and other similar habitats are: *Baliospermum montanum*, *Biophytum sensitivum*, *Chenopodium album*, *Corchorus olitorius*, *Euphorbia hirta*, *Hybanthus enneaspermus*, *Lindernia crustacea*, *Oldelliandia corymbosa*, *Oxalis corniculata*, *Phyllanthus fraternus*, *Physalis minima* and *Solanum nigrum* etc.

Inhabiting semi-demolished walls of ancient buildings and monuments, there are well recognizable associations of meadow herbs like *Bidens biternata*, *Euphorbia hirta*, *Glossocardia bosvallea*, *Indoneesiella eehioides*, *Lindenbergia indica*, *Tridax procumbens* etc. The seedlings of *Ficus benghalensis* and *F. religiosa* cause damage to the buildings by sending their roots deep down into the walls.

### **Weeds and Alien:**

As for the recently survey and based on the literature survey the following two exotic species of woody angiosperms such as *Prosopis juliflora* (tree) and *Lantana camara* (shrub) are making a rapid encroachment in the area. These species are not only spreading at a fast rate in the ravines and gravelly places of the area but also, these are establishing their dominance in the forest areas. These plant

replacing the natural vegetation of the area. Probably these species may be treated as the resultant of secondary succession.

A large number of weeds grow with the crops. Most of them are well equipped for dissemination by wind, water, man and animals. In the winter season the highest weed density may be noted during the months of January and February. The typical weeds of the winter crops are: *Ageratum conyzoides*, *Anagallis arvensis*, *Asphodelus tenuifolius*, *Chenopodium album*, *Cynodon dactylon*, *Euphorbia dracunculoides*, *Fumaria indica*, *Lepidium sativum*, *Lathyrus aphaca*, *Melilotus alba*, *Melilotus indicus*, *Oxalis corniculata*, *Polypogon monspeliensis*, *Striga angustifolia* etc.

The typical weeds associated with the summer crops are *Gomphrena celosioides*, *Solanum nigrum*, *Solanum surattense*, *Tribulus terrestris*, *Ziziphus nummularia* etc. The paucity in the number of summer weeds is due to unfavorable climatic and soil conditions.

The density and frequency of rainy season weeds is higher due to high moisture content during this period. The common weeds of Kharif crop are *Alysicarpus longifolius*, *Ammannia baccifera*, *Caesulia axillaris*, *Celosia argentea*, *Commelina benghalensis*, *Corchorus aestuans*, *Corchorus olitorius*, *Corchorus trilocularis*, *Cyperus rotundus*, *Digera muricata*, *Euphorbia hirta*, *Launaea procumbens*, *Leucas cephalotes*, *Oldenlandia corymbosa*, *Oxalis corniculata*, *Trianthema portulacastrum* and *Vernonia cinerea* etc.

**THE TRIBALS**

Tribal's are the oldest ethnological groups which live away from the civilized world, preferably in forest areas, follows primitive customs and occupation, have, common language and social culture and are economically dependent on each other. India has over 67 million of 227 ethnic groups. In habiting in about 5000 forest villages or leading of numeric life in the forever. About people belonging to 550 tribal which communities representing 7.78 per cent of the total Population of the country, it is spread over 18.7% of total area of the country. They have typical problems of their own due to their socioeconomic status, environment, historical experiences and extent of political articulations, on account of these factors ethnically as well as economically and culturally, tribals are at different stages of socio-psychological orientation and politico-economic development, The total tribal population of Rajasthan state is 92,38534 which is 13.5% percent of the total population of this state. The tribal of Rajasthan constitute about 8.85% of the total population of tribal in India. There is a significant percentage (53%) of Meena tribal in Rajasthan. The literacy of tribal is in Rajasthan is 10.27% only. The Scheduled tribes have attained a decadal change of 43.6 % during the period (2001-2011) and present (Census, 20011).

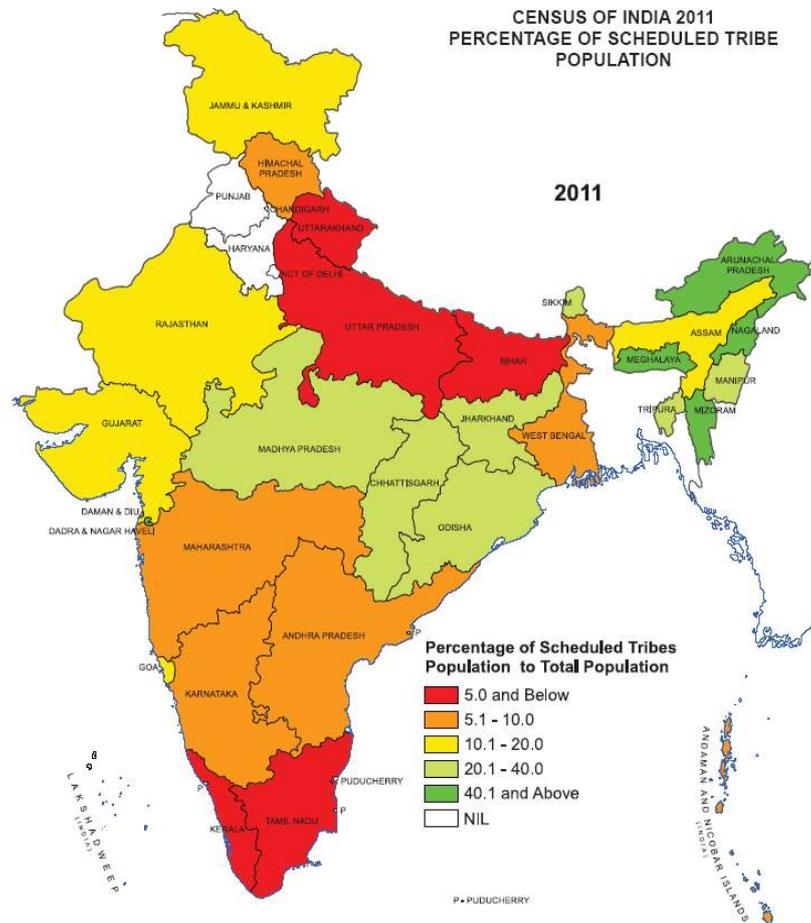


Figure- 1.4: Showing the scheduled tribe population of India

Several tribes inhabited in the state of Rajasthan *viz.* Bhils, Bhil-Meena, Meena, Damor, Garasia, Sehariya (major tribes), Dhanka, , Kathodia,, Patelia, Naikda, Koli Dhor, Kokna (minor tribes) Besides these, there are some nomadic, seminomadic and denotified communities also found, Nomadic communities are Sansi, Kanjar, Kalbelia Bauri, Bagri *etc.*, whereas Semi-nomadic communities are

Rebari, Jogi, Masani, Bhat *etc.* and denotified communities include Gadia Lohar "Banjara, which wander from place to place within the state as well as other parts of the country and have their own cultural, social and economic status.

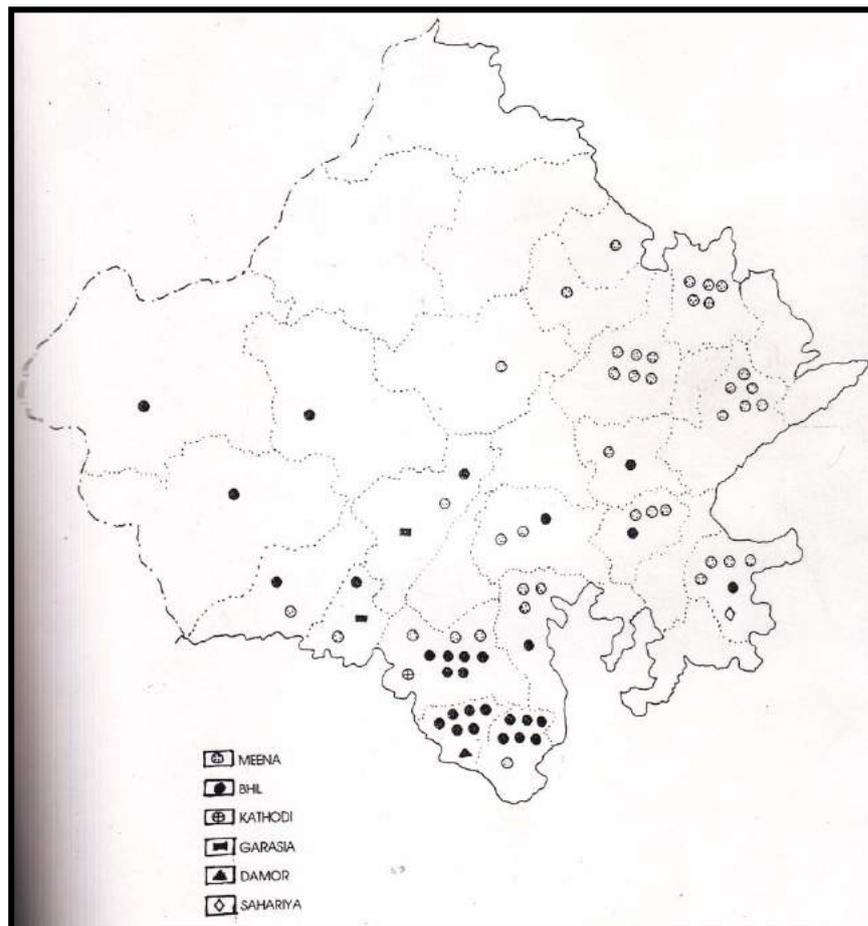


Figure- 1.5: Showing the scheduled tribe population of Rajasthan

In view of significant data installed, including their population occupied and their dependency on plants are almost setters of life. The proposed plan of work has been designed in order to ethnobotanical studies of important plants of Pratapgarh tehsil of Rajasthan. The

details of Tehsil has been summarized as under which will reveal the importance of this type of study for the welfare of humanity.

The tribes commonly presents in Pratapgarh tehsil are Mina, Bhils, Bhil Mina, and Damor (major tribes). Nomadic communities viz. Gadia Lohar, Jogi, Banjara, Kanjar, Bhat, Nut, are also present in Pratapgarh District (Plate-3 and 4). The Meenas, Bhil Mina, and Bhil represent the largest population among the other tribe present in the tehsil. The details of all tribes are discussed below:

**Bhil:** Bhil are primarily Vanvasi or Adivasi belongs to forest they are forest hunter even in Rajasthan some are of them known as bandits particularly in Kumbhalgarh and Mountabu area. Bhils are resident in the most of Central India (Gujarat, Madhaya Pardesh, Chhattisgarh, Maharastra and Rajasthan), in Rajasthan they are distributed abundantly in Southern Rajasthan (Chittorgarh, Udaipur, Banswara and Partapgarh). Historically they are employed of royal families of Rajputs for their knowledge of forest mainly hunting and habitat also local medicine. They also fought against the Mughal Empire for support to Maharana Pratap in Rajasthan. Some of literature brief about the mythological relationship of Lord Rama Viz. Devi Shabari who offered the eaten Jujubes (*Ziziphus murutiana*) and Kevet who helped them to cross the river.

**Meena :** Meena tribe represents about 50 percent population of tribals in Rajasthan. According to 'Min Puran" the word "Meena" originated from fish and consider their ancestors as fishermen, the word Meena is synonyms to matshya (fish) in Sanskrit language. Some authors

believe that they are derived from Hoons or Sithiyans. Some authors believe that they are remains of Mohan-Jodaro prove the existence of this community before Aryans in India. The substances of Meena are closely allied to Rajpoots. On the basis of social organization Meena are divided into two main categories. Jamindar Meena and Chaukidar Meena.

**Garasia:** Garasia is resident in the forest areas of the Rajasthan and Gujarat states. Garasia are important tribe of Rajasthan after the Bhil tribe. The name 'Garasia' has been derived from *garas* meaning mouthful, implying the cultivation land they acquired for their subsistence. They are categories in to the three groups Rajput Garasia, Adiwasi Garasia and Bhil Garasia. This tribe mainly distributed in the Pali, Sirohi and Udaipur area. Agriculture is the prime occupation of this tribe and maize and pearl millet the staple crop. They live in villages consisting of single roomed huts, within fields or on hill slopes overlooking the same. The garasias are renowned for their love for dances and songs, fairs and festivals and sports. On the whole they lead a more colorful life than other tribes in Rajasthan.

**DAMOR:** The population of Damor in Rajasthan is mainly concentrated in Dungarpur District (also found in small numbers in Banswara and Pratapgarh and Chittorgarh and Udaipur Districts). Established agriculture confers on this tribe a greater prosperity than other tribes. The main cash crop in Damor villages are cotton, oilseeds, sugarcane *etc.* working as laborers is looked down upon by Damors. The Damor tribe is divided in to clans; clan endogamy has

been reported from them. Many of the higher Damor clan names seem to have Rajput etymology *e.g.* Parmar, sisodia, Rathor, Chauhan and Solanki *etc.* sisodia damors feel that their ancestry lies with the sisodia rulers of Chittorgarh. Like the Bhils the Damors have a scattered hamlet pattern. The mukhi is the hereditary chieftain of the village enjoying power and prestige. Damors in their religious faith are more close to Hindus than with other tribes. The rite to a large extent resemble the Hindu ones, and but for minor variations their customs resemble those of the Bhils.

**Bhil Meena:** Bhil-Meena tribe is believed to be a product of cross between Bhils and Meenas. Some people consider it as a subtribe of Meenas or Bhils. They are more concentrated in Ajmer, Banswara or Dungepur districts. By all standards they seem to be a section of Bhil community which during the course of last 60 years have started styling themselves as Bhil-Meena with a view to establish their proximity to Meenas and thereby attaining higher social status in the region. They profess Hindu religion and their main occupation is farming and to work as agricultural labour. Their main language is Marwari, however, those settled in southern parts of the state speak Bagri dialect. In comparison to original Bhils, their literacy rate is higher both in males and females. Jain (1981) has thrown some light on the social status of this tribe (Fig. B, Plate-3)

# Plate- 1



**Plate -1:** Figure A showing the valley of Jakham river with hilly vegetation, Figure B showing the Jakham river and Figure C showing the wetland near the Gautameshwer Mahadev pilgrim

## Plate- 2



**Plate -2:** Figure A and B showing the dry deciduous forest and C showing mixed forest type of *Anogeissus latifolia* with *Diospyros melanoxylon* and *Butea monosperma*

## Plate- 3



**Plate -3:** Figure A showing the Kathodi tribal women, Figure B showing the Bhil Meena lady cooking *Pania*, Figure C showing the Bhil women with children

## Plate- 4



**Plate 4:** Showing tribal man selling articles, Figure A Bhil man, Figure B Garaysia man

**E**thnobotany is the study of the relationship between plants and people. "Ethno" means study of people and "botany" stands for study of plants as described by Harshberger (1895) and Faulks (1958). Before the urbanization the people depended on the wild plants and around 15000 plant species were used by Indian tribes as per the records of Sanskrit literature (Baghel, 2002). Ethnobotany is considered as a branch of Ethnobiology. Ethnobotany deals with the complex relationships between (uses of) plants and cultures. The focus of Ethnobotany is on how plants have been or are used, managed and perceived in human societies. It includes plants used for food, fodder, fuel, medicine, intoxication, cosmetics, dyeing, for building, tools, currency, clothing, rituals, agricultural and social life implements, *etc.* (Baghel, 2002; Sharma, 2006; Jain and Jain, 2012).

Greece and Rome also contributed to the knowledge of ancient medicinal plants. Theophrastus, a pupil of Plato and Aristotle in about 340 B.C. wrote 'Historia Plantarum' describing some five hundred food and medicinal plants. Dioscorides, around the same period also wrote a book on medicinal plants. Roman botanists Pliny the Elder wrote 'Natural History' describing thousands of medicinal plants around 1<sup>st</sup> century A.D.

## REVIEW OF RESEARCH IN INTERNATIONAL STATUS

Francisco Hernandez, in his capacity as the personal physician to King Philip II of Spain (1570 to 1575) undertook the survey on the flora, fauna and minerals of Mexico. With coining of the word "Ethnobotany" in 1895 by Harshberger, the subject Ethnobotany came in light. 'An Introduction to Ethnobotany' by Faulks (1958) was the first book on the subject though it covers economic botany too.

Schultes and Hofmann (1987) published a book on hallucinogenic plants. Schultes and Raflauf (1989) worked on medicinal plants of Amazon. Hussain (2003) collected ethnobotanical information about fruit plants of Chitral and listed about nineteen cultivated fruit plant species.

Ethnobotanical survey has been carried out worldwide by various workers like Oyedemi, *et al.*, (2009) worked on medicinal plants used by tribes in South Africa region. Ajaib *et al.*, (2010) worked on shrub species used for medicinal purpose in Pakistan region. Etuk *et al.*, (2010) carried out survey of medicinal plants used by tribes for the treatment of diabetes in North Western region of Nigeria. Soladoye, *et al.*, (2011) investigated about the ethnobotanical survey on plants used for the treatment of Haemorrhoids in South Western, Nigeria; Yirga (2010) had studied the medicinal plants of Alamata, Southern Tigray, and Northern Ethiopia region. Jan *et al.*, (2011) conducted survey on Ethanobotnical plants of Dir Koshitan valleys in Pakistan region. Marwat *et al.*, (2011) Medico-ethnobotanical studies of edible wild fruit plants from the North

Western Pakistan. Mustafa *et al.*, (2012) carried out the ethnobotanical survey of the Gollak region in Kosovo.

Similarly, Hussain (2007) documented the uses of 111 plants of Mastuj and recently Gruyal *et al.*, (2014) describes the ethnomedicinal uses of plants used by residents in North Surigao Del Sur (Philippines). Kabir *et al.*, (2014) conducted a survey of medicinal plants used by the Deb-Berma Clan of the Tripura tribe of Moulvibazar District, Bangladesh. Singab *et al.*, (2014) from University of Abbassia, Cairo (Egypt) has described medicinal plants with potential anti-diabetic activity and their assessment. Limenih *et al.*, (2015) studied traditional medicinal plants of Amhara region of North Ethiopia and same studies were carried out by Oran and Dawud, (2015) in Jordan. Truyen *et al.*, (2015) studied about the Ethnobotany of aroid plants. Ritter *et al.*, (2015) performed biblio-metric analysis on ethnobotanical research for Brazil tribes. Koleva *et al.*, (2015) studied ethnomedicinal plants of Bulgaria and Niduche *et al.*, (2015) studied about the plants of Nigeria, which are useful in human fertility.

Since, plants have influenced the intellectual and the materlistic culture of man; their references have appeared in ballads, tales, songs, legends, myths, rhymes, riddles and proverbs since ancient times. 1960 onwards, there were several publications on herbal medicines. Schultes (1960) the father of Ethnobotany wrote, "Trapping our Heritage of ethnobotanical Lore" creates a great sense of urgency for the studies and researches into folklore medicine. Dr. Schultes who was Professor of Natural Science at Harvard (US) warns that we must not overlook the role played by the laymen in the past and in the

present, in the discovery of new drugs from plant sources a fact which was recognized by Charak and Sushruta long ago. Recently Gruyal *et al.*, (2014) worked on the ethnomedicinal uses of plants in Philippines; similarly Kabir *et al.*, (2014) conducted a survey of ethnomedicinal plants used in Bangladesh. The major works on ethnotherapeutics uses of medicinal plants in Eastern Nigeria was carried out by Adachukwu and Yusuf (2014); whereas Falang *et al.*, (2014) worked out on single plant *Garcinia kola* for its anti-pyretic activity in Nigeria.

### **REVIEW OF RESEARCH IN NATIONAL STATUS**

In India ethnobotanical knowledge is very old and deep seated. Sacred Vedas dating back from 3500 B.C. to 800 B.C. are our oldest Vedic literature resources. They contain valuable information regarding the use of different plants and give many references of medicinal plants. For identification of 'Soma' as *Amanatia muscaria*, Wasson (1971) relied on the hymens of Rig-Veda. Sharma (1968) enlisted 248 botanical drugs.

'Ayurveda' the practice of herbal medicine was recorded in Sanskrit by legendary figures of Indian medicine Charak Sushruta, Nagarjuna, Atreya *etc.* According to Weiss (1987) Ayurveda is an integral part of Indian culture. Two monumental works "Charak Samhita" and 'Sushruta Samhita' appeared in between 400 A.D. to 500 A.D., said to be the "Golden age" of Indian culture. Charak Samhita mentions – "The goat-herds, cowherds, shepherds and the tribals are acquainted with identification of medicinal herbs".

In India organized study and research of Ethnobotany with emphasis on tribal system of medicinal and culture are of recent origin, initiated in the middle of the last century. Since 1960 ethnobotanical research in India has been intensified at different regional offices of Botanical Survey of India, research centers like Central Drug Research Institute, Lucknow apart from several university centers throughout the country.

Ammal (1978) popularized ethnobotanical research in India. In early sixties, Ammal pioneered the ethnobotanical research in India. In late sixties Jain who initiated the ethnobotanical research in well organized way, started from such studies on the central Indian tribes.

Jain (1964a, b, 1967 and 1987a, b) wrote about the scope and importance of Ethnobotany for the food plants, development of new drugs widening the use of little known plants and conservation of plant diversity. The first book on Ethnobotany in India was published in 1981 under the title 'Glimpses of Indian Ethnobotany' edited by Jain (1981). The book contains a wide range of information, covering more or less all the aspects of the subject. Earlier Ammal (1978) outlined the development trends in Ethnobotany in India. Jain (1997) revised and enlarged this publication in the form of 'Contribution to Indian Ethnobotany' which proposed different categories under which ethnobotanical work has been carried out in India.

The 'Bibliography of Ethnobotany' (Jain *et al.*, 1984) compiles important works on Ethnobotany, economic botany, medicinal plants and floristic works with local uses of plants. The 'Dictionary of Indian

Folk Medicine and Ethnobotany' (Jain, 1992) is a monumental work culminating ethnobotanical research during last three decades. The proceedings of the IV International Congress on Ethnobiology (India), has been published under the title "Ethnobiology in Human Welfare" which contains nearly 110 articles, this work has again been edited by Jain (1996). Saklani and Jain (1994) published "Cross Cultural Ethnobotany of North-East India", which contains important information of different cultural regions of North-East India, about ethnobotanical knowledge.

Arora and Pandey (1996), Tarafdar (1983 and 1984), Duke (1986), Martin (1995), Jain (1987c, 1989) and Jain and Mudgal (1999) provides important information regarding methodology for study of Ethnobotany. Pushpangadan (1995) written about the Ethnobiology of India.

Arora (1987) described the role of Ethnobotany in domestication of wild plants for improving our food resources. Maheshwari *et al.* (1981) and Goel *et al.* (1984) published their ethnobotanical studies carried in different regions of Uttar Pradesh and Bihar. Rao and Henry (1996) published the "Ethnobotany of Eastern Ghats in Andhra Pradesh". Ethnobotanical Research in India got further impetus when the Department of Environment and Forest, Government of India launched the multidisciplinary 'All India coordinated Research project on Ethnobiology (AICRPE-1982-1987) in 1982 with a view to conduct exhaustive survey and survey of plants and animals used by various tribal population in India. Trivedi (2002) edited a book entitled "Ethnobotany" which provides information on

various aspects of the subject having latest references. CCRUM, AYUSH Central Research Institute of Unani medicine, Hyderabad focused on adulteration and substitution in endangered ASU (Ayurvedic Siddha Unani) medicinal plants of India. Senthil *et al.*, (2014) described medicinal plants being used by traditional healers and Malayali tribe in Jawadhu hills of Eastern Ghats, Tamilnadu, India.

A note on herbal medicine of India was written by Kamboj (2002); then Kumar and Srivastava (2002) carried out a detailed work on herbal research in the Garhwal Himalay; Kalita and Deb (2002); Singh (2003 and 2006) had worked on the medicinal plants of Himalayan tract of Uttranchal region and this work is focus on Bhoxa tribe.

Khan and Ali (2003) focused their ethnobotanical work in single family of Acanthaceae in Uttar Pradesh region, similarly Mahendrawaria (2007) worked on Acanthaceae plant species used in ethnobotanical purpose by different tribes of Rajasthan; Tripathi (2003) worked on the traditional knowledge and its significance and implications in India. Tamuli and Saikia (2004) deliberated on ethnomedicinal plants used in Assam region; Devi *et al.*, (2005) on ethnomedicinal plants used in Manipur region; Khan and Khan (2005) worked on plants used in Gynecological problems in Uttar Pradesh.

Behera (2006) worked on plants used in Gynecological problems in Orissa region. Currently many workers also focus on ethnomedicinal plants like Chandrakumar *et al.*, (2015); Chowdhury

and Karmakar (2015); Gritto *et al.*, (2015); Patharaj and Kannan, (2015); Sen *et al.*, (2015) and Singh and Singh, (2015).

Takhar, (2004); Salahuddin, (2013); Mittal and Batra (2014); Kumar *et al.*, (2015); Dutta, (2015) and Vijigiri and Bembrekar, (2015) are few other notable workers who published on different aspects of the Ethnobotany subject.

### **REVIEW OF RESEARCH IN RAJASTHAN STATE LEVEL**

The first doctoral thesis on Ethnobotany in Rajasthan was submitted by Sebastian (1985) entitled "ethnobotanical Survey in Some Forest Areas of Rajasthan" covering the Districts of Sirohi, Udaipur, Banswara and Dungarpur and the dealt tribes were Bhils and Garasias. Shekhawat (1986) carried out detailed research work on Indian Thar Desert.

In Rajasthan, King (1869 and 1870) was the first person to record the wild plants which are used as famine food and vegetable products as food in the Desert zones of the state. On the general publications of Ethnobotany, Joshi (1982) made a preliminary study on the ethnobotanical study of Bhils. He described plant uses and the facts of Bhil life like totem and clan, food habits, uses of plants in daily life as in medicine, weapons, constructions, firewood, cultural practices and recreation, fiber, fishing *etc.* He also gave a note on the forest products as a source of income. This was the first comprehensive paper on general Ethnobotany of any tribe in the state. Maheshwari (1983 and 1995) gives a detailed knowledge about

general view on development of Ethnobotany, there after he described the Ethnobotany of hot arid region of India.

Most of the papers published in Rajasthan in the area of Ethnobotany are on medicinal aspects of the tribals. Joshi (1995a) gave an overview of the ethnomedicine of tribal Rajasthan. Paper by Singh and Pandey (1980) on the medicinal plants lore of the tribals of Eastern Rajasthan can be adjudged as the first work of a substantial nature in the field of the ethnomedicine of Rajasthan. The paper gives an account of 123 plant species used in several diseases. Pandey (1989) worked on floristic and ethnobotanical studies on Pali District, Rajasthan. Khandelwal (1998) investigated Bhil tribe in Rajasthan and record their ethnobotanical information in detail. Similarly Meena and Yadav (2010) carried out a detailed investigation on Garasia tribe of Sirohi District of Rajasthan.

Joshi (1983) gave an ethnobotanical inventory of the tribal material medica of Rajasthan Bhils. He covered aspects like general health, the tribal doctor, the evil-eye and beliefs on plants. Sebastian and Bhandari (1984a) published on the Medico-Ethnobotany of Mount Abu; the work gives information that could perhaps be useful. Sebastian and Bhandari (1988) published some medicinal plant lore of Udaipur District enumerating 73 species from Gogunda in the west and Kherwara in the South of the District Udaipur. Joshi (1989, 1991, and 1993) reported herbal drugs used in child birth and child care and for the treatment of snake bite and scorpion stings. Mishra *et al.* (1992) and Katewa and Guria (1997) worked out on ethnomedicine of Ajmer forest division and Aravali hills of Rajasthan respectively.

Nargas and Trivedi (1999) reported ethnomedicinal importance of *Azadirachta indica*. Recently Shekhawat *et al.* (2006) and Sharma and Kumar (2006) published different articles on ethnomedicinal plants of District Jaipur and Rajasthan respectively. Beside these Meena *et al.*, (2014) reported 24 flowering plants used as ethnomedicine from Pratapgarh District (Rajasthan). Sharma and Kumar (2011) focused on ethnobotanical studies on medicinal plants of Rajasthan. Mishra *et al.*, (2014) documented 31 plants belonging to 23 families, used for different medicinal properties by indigenous people of Shekhwati region, Rajasthan. *Tinospora cordifolia* is described as a multipurpose medicinal plant in recent research done by Mittal and Batra (2014).

Jain and Jain (2012) explored a detailed literature in the Rajasthan ethnobotanical research. They recorded around 400 different research articles in various journals and books *etc.* among them around ninety-nine different articles which cover a general account about all the criteria of the tribals based on the wild plants. Similarly they also recorded around thirty-seven different research articles with some valuable information about the tribal role for conservation of biodiversity as they preserve their sacred grove and sacred plants species.

There are some publications in the field of fertility regulation among the tribals. Billore and Audichya (1978) described some oral contraceptive of tribals. Khan *et al.* (1998) also described plant abortifacients in the flora of Banswara District and four plant species of them have been indicated to be used by the Bhils. Joshi and Joshi

(1992) gave an enumeration of the traditional drugs in fertility regulation from Rajasthan.

Two papers have been published by Sebastian (1984) and Sebastian and Bhandari (1984b) on veterinary medicines, galactagogues and fodder in the forest areas of Rajasthan. Chaudhary and Thakar (2004) published a paper on folk herbal veterinary medicines of southern Rajasthan. Shekhawat *et al.* (2006) published an article on ethnoveterinary plants of Jaipur District, Rajasthan, India. Choudhary *et al.*, (2008) studied in brief on ethnobotanical status in Rajasthan. Meena and Rao (2010) carried out a detailed study on herbal medicines used by Meena community. Kapoor and Kishor (2013) worked out on the ethnobiological uses of tree species of Shekhawati region. Recently Kapoor and Kumar (2015) studied about medicinal plants of Sirohi District. Hada and Katewa (2015) studied about the medicinal plants of Jhalawar District.

Plants used in magico-religious beliefs and in rituals and rites by different tribal societies of the state have been discussed by Kothari (1984a) on Bhopas of the state, Sebastian and Bhandari (1984c) on Magicoreligious beliefs of Bhils of Udaipur, Singh and Pandey (1998) enumerated 83 plants species used in religion and magicoreligious beliefs of different tribes of Rajasthan, Kothari (1984b, 1985) discussed the tribal festivals like "*Gangaur*" and "*Holi*" Palat (1984, 1985) reported the plants used in marriage ceremony of tribals.

Around twenty-nine various publications are available which cover the edible plants of the Rajasthan tribal people. The Kingh

(1869 and 1870) was the first person to record the wild plants used as famine food and vegetable in Rajasthan Desert region. Sebastian and Bhandari (1990) enumerated the edible wild plants of the forest areas of Rajasthan, covering the areas of Mt. Abu in Sirohi, Udaipur and Banswara. Similarly the Joshi and Awasthi (1991), Nag (1999 and 2006), Katewa (2003), and Shekhawat (2010) *etc.* are worked on ethno-edibles plants of the Rajasthan State.

Kulhari (1992) gave his findings in the Ethnobotany on field fencings in Western Rajasthan. The communities cover sixty-nine plant species used for fencings along with their Ethnobotany. Only two papers are published for the ethno-dye yielding plants *e.g.* Sen *et al.*, (2000) wrote about the dye plant used by tribals of Rajasthan. Jain and Jain, (2012) listed around thirty-five different articles published in different journal and books, those are described as the plants species used by tribals of Rajasthan for their various cultural activity. Similarly they also reviewed fifteen different articles which documented the economically valuable plants species used by the tribes of the Rajasthan. Total number of publications on plants usage by tribes of Rajasthan includes only one publication in fiber yielding, two papers on fodder species, six articles are on poisonous and obnoxious plants being used by tribals.

Samar (1957, 1979) and Kothari (1964, 1968) have dealt with the musical instrument used by the people of state including tribals. The importance of 'Mahua', *Madhuca indica* flowers in tribal life have been given by a social scientist, Bairathi (1984).

Contributions of some less studied aspects of Ethnobotany have also been made in the states as on folk adornment amongst the tribes of Aravali. Joshi (1986) gave a comprehensive account of fish stupefying plants employed by the tribals of southern Rajasthan enumerating nineteen plants, definitely a result of an intensive and extensive probe in this area.

A pioneer publication in the field which can be termed as ethnometerology was made by Joshi in 1985 on the weather indicating plants among the Bhils, Garasia and Kathodia tribals of Southern Rajasthan.

Joshi and Awashthi (1992) gave an interesting account of tribal devices and techniques against pest and farm enemies in Rajasthan describing, items like scare crows, cattle alarm system method of driving away pests in the farm like rat, porcupines, gerbils, crows, insects and birds.

The father of Indian Ethnobiology Dr S. K. Jain had contributed a lot in the Ethnobiology with his publication in different years expanding in 1963, 1964, 1965, 1967, 1971, 1975, 1984, 1987a, 1987b, 1987c, 1987d, 1989, 1991a, 1991b, 1995, 1996, 1997 and 2001. Some other important publications with his coworkers are Jain and Tarafdar (1970), Jain, Mudgal and Banerjee (1984), Jain, Sinha and Saklani (1990) and Jain and Mudgal (1999). Dr Katewa, Dr Jain and the coworkers had covered mostly all branches of Ethnobiology and published extensive research work in various journals and books.

Besides the above mentioned literature, a number of workers have recorded ethnobotanical information. There are many important books covering all aspects of Ethnobotany published by Faulks (1958), Wallis (1967), Ford (1978), Maheshwari and Painuli (1988), Sikarwar and Painuli (1992 and 1993), Hembrom (1994), Saklani and Jain (1994), Schultes and Reis (1995), Joshi (1995a), Martin (1995), Cotton (1996), Jain and Sharma (1996), Singh and Pandey (1998), Sikarwar (1996), Sinha and Sinha (2001), Trivedi (2002, 2004 and 2006) but most of these research work were confined to medicinal plants only.

Jain and Jain (2012) have carried out a detailed review of the ethnobotanical work of Rajasthan, they recorded that around thirty seven Ph.D. thesis are published in the different ethnobotanical studies. The doctoral work for Ethnobotanical aspect has been carried out mainly in the Rajasthan University, Jodhpur University, Mohanlal Sukhadia University and Kota University. Most of thesis covers all the essential aspects in Ethnobotany of Rajasthan *viz.* traditional medicinal plants information, culture, socio-economic plants, food plants, fodder plants *etc.* These works covered almost all parts of Rajasthan like Desert, Shekhawati, Hadoti, South-East and Aravali region which cover mostly Ajmer, Bundi, Bhilwara, Dausa, Jaipur, Jhunjhunu, Rajsamand, Sawaimadhapur, Udaipur, Karoli, Kota, Banswara, Dungarpur, Chhitorgarh District of Rajasthan. Some extensive works have been carried out by Vyas (1987), Guria (1998), Khandelwal (1998), Baghel (2002) and Sharma (2006). Most of the part of Rajasthan State is covered by various workers but the

Partapgarh District still remains to be carried out in ethnobotanical research works.

Some books also have been published in ethnobotanical research of Rajasthan. Mostly these cover all the aspect of Ethnobotany, they included Joshi (1995b), Singh and Pandey (1998), Pandey (1998), Jain (1991 and 1999), Trivedi (2002 and 2006), Katewa and Jain (2006), Nag (2006), Jain *et al.*, (2007) and Katewa *et al* (2010).

As the medicinal and aromatic plant (MAP) sector developed internationally, people became more focused towards research in the medicinal plant area. This is a major reason that ethnobotanists are working in the ethnomedicinal plants area i.e. most of the publications are available in the ethnomedicinal plants or traditional medicinal plants field. Around 151 research publications in various journals are available for ethnomedicinal plants used by different tribes of Rajasthan in different regions of State. These publications are available in form of specific tribal information bases, area specific bases and specific disease bases.

Joshi (1991) gave his findings on the herbal drugs used in Guineaworm disease from the tribals of South Rajasthan. Joshi (1993) enumerated seven plants used as antidote to snake bite and plants used against scorpion stings being used by tribals of Rajasthan.

In the last decade, ethnobotanical survey of India ranging different wild plants has been carried out to treat various diseases and also for economical uses by Balakrishnan *et al.*, (2009), Meena and Rao (2010), Sankaranarayan *et al.*, (2010), Kumar *et al.*, (2011),

Nandagoplan *et al.*, (2011), Neelima *et al.*, (2011), Reddy *et al.*, (2011), Elavarasi and Saravanan (2012), Shanmugam *et al.*, (2012), Singh and Dubey (2012). Salahuddin *et al.*,(2013), Batra *et al.*, (2011), Kumar and Kotia (2014) and Meena *et al.*, (2014), Mishra *et al.*, (2014) worked in detailed for Ethnobotany of Shekhawati region.

Jain, *et al.*, (2010) explored the plant species which are useful in curing of snakebite with ethnobotanical aspects.

Around twenty five different research articles are published for detailed information about the plants, those used as veterinary medicine. Galav *et al.*, (2005, 2010, 2011a and 2011b), had done an extensive work on ethnoveterinary plants species used by various tribes of Rajasthan.

Gadgil and Vartak (1976); Mahlotra *et al.*, (1997) and Hughes and Chandra (1998) have a great contribution for conserving sacred groves of India and about their knowledge to enlighten up to scholars of this field.

A review of available literature reveals that practically no work has been done on Ethnobotany of Pratapgarh District. Pratapgarh Tehsil is still in its cradle from ethnobotanical point of view.

But an elaborate ethnobotanical study has to be undergone in Pratapgarh Tehsil and related areas. This study will aim to provide a good deal of information about the ethnobotanically valued plants which are used by the tribes of this area.

**M**ost of the surveys were carried out in Pratapgarh Tehsil and its surrounding area of Rajasthan. Besides the surveys, information's were also gathered through secondary sources from the study area. The localities covered in the present work are shown in Table- 3.1 and are 40 in number.

**Table 3.1: List of localities surveyed**

| <b>TEHSIL</b>     | <b>LOCALITIES/ VILLAGE</b>   |
|-------------------|--|
| <b>PRATAPGARH</b> | Rana, Talaipal, Khalel, Patiya-pol, Talab, Kesharpura, Raghunathpura, Untakhera, Chirwa, Bhairoghati, Padampura, Kanakpura, Gopalpura, Naya-tapra, Kheejankhera, Anoppura, Karmakhera, Boradi, Teela, Bhagwanpura, Amlikhera, Peeloo, Panmodi, Dhamoter, Hingoriya, Angora, Bori, Ambamata, Bajni, Gadola, Palthan, Amlawad, Dabra, Mokhampura, Awleshwer, Gordhanpura, Gopalpura, Chhoti-bambori, Semli, Ramgarh. |

## DATA COLLECTION

### TYPES OF DATA

Various kinds of information collected on tribal and traditional communities can be categorized as under-

(a) Qualitative data

e.g. uses of plants

(b) Quantitative data

e.g. qualities of drugs given as medicine

(c) Descriptive data

Information's as on rites and rituals, festivals *etc.*

(d) Supportive data

Information other than ethnobotanical, such as socio-economic conditions, occupation and pastimes, vegetation and flora can be included in this category.

### SURVEY

The surveys were primarily of two types *viz.* intensive (involving detailed studies of one or two villages at a time by staying there for a week or so) and extensive (making a village as a camp and doing extensive work within several villages or localities in its radius). The data were collected by interviews, observations and participation. In surveys besides tribal people and traditional communities, their medicine men and women,

local *Vaids, Bhopas, Gotheeyas etc.* were interviewed. The information was also collected from non-tribal people like forest officials, government physicians, nurses, veterinary doctors, NGOs, college students from rural areas *etc.* who have enough knowledge regarding ethnobotanical uses of plants due to their long association with tribal's and long stay in the rural areas.

### **FIELD KIT**

The following articles were carried out during field surveys:

#### **Equipments for collecting plants specimens:**

- Plant press
- Blotting sheets and old news papers
- Empty fertilizer bags
- Polythene bags of different sizes
- Secateurs
- Digger
- Rubber bands
- Knife
- Scissors
- String

**Documentation Equipments:**

- Field diaries
- Tape recorder, with external microphone
- Audio cassettes
- Camera
- Photographic film rolls
- Batteries
- Extension cord (Electric)
- Note book and writing pads
- Slip pads

**Stationary:**

- Paper ream
- Pen
- Pencil
- Sharpener
- Thread roll
- Measuring tape
- Pocket lens
- Stapler
- Cello tape roll

**Literature:**

- Flora of the area
- Map and toposheet of the area
- List of the local plants of the area (derived from forest work plan of the area)
- List of local names of plants of the area ( prepared during previous surveys)
- Text on vegetation, people, ethnography *etc.* taken from the district Gazetteers
- Anthropological publications on the tribe/ community
- Ethnobotanical publications on the area/ community to be surveyed ( if available )

**Miscellaneous:**

- Haversacks
- Hunter shoes
- Torch
- Medicines ( for common problems)
- Candles and match boxes
- Chocolates and biscuits *etc.*
- Bag for keeping articles enlisted above

## OBSERVATIONS

On reaching a village or locality, rapport was established with one or two persons, preferably the chief and contact was then established with other members of the locality.

An excursion of the village was undertaken to note the shelter patterns, farms, shrines *etc.* and observations were made. Enquiries were made on the plant material used in different artifacts seen and notes were taken.

## INTERVIEWS

Generally two types of interviews were taken, firstly of individuals and secondly of groups.

In case of individuals, persons were selected at random on the way or those entering a hut to find out knowledge individuals from the village alongwith the *Gotheeya* (village priest) or the headman.

In group interviews, more than one individual were approached, our purpose explained and interviews taken.

The women first hesitated and then took part with keen interest.

Interviews at different localities were taken as and when situations demanded. In forests, with ambient vegetation before them, the tribals were prompted to remark on utility of species, especially when accompanied by a group. Interviews yielding good results could also be obtained at the headman's hut or a common place. The interview at

labors sites generally were short as the tribals used to be in a hurry to return to their work (Plate 5 and 6).

### **Duration of interview / size of Groups**

The optimum duration of an interview at a time after formal introductions and explanations is of 1-1/ ½ hour duration and sometimes up to 2 hours, the group size detail is present in Table- 3.2.

**Table 3.2: Effectivity of size of groups**

| <b>SIZE OF GROUP<br/>(no. of informer)</b> | <b>FREQUENCY</b> | <b>RANKING</b> |
|--|------------------|----------------|
| 2-4  | Frequent         | Good           |
| 5-10                                       | Frequent         | Excellent      |
| 20-25                                      | Common           | Fair           |
| Around 50                                  | Rare             | Fair/ Poor     |

### **MODE OF INTERVIEWS**

- 1- Handy checklist of plants likely to be occurring in the locality, based on personal experience, working plans of the forest department and regional floras with local names, were taken to ask about their uses.

- 2- A list of local plants was prepared by enquiring tribals or from a prior excursion with a tribal or two accompanying and enquiries on the enlisted plants were made.
- 3- An excursion into the forest was made before interviews for collecting specimens of all possible species and then after showing them specimen, information was collected.
- 4- An interview was initiated at random covering all the possible aspects and plants figuring in the same were noted, which were collected later taking two or more participants in the forest.
- 5- A group of tribals was taken to the forest and specimen of ethnobotanically important species were collected alongwith notes.

If plants could not be collected, as they were not available, details of their local names, gross morphology, habitat *etc.* were taken in different seasons in subsequent surveys.

### **SUBJECTS OF ENQUIRY/ INTERVIEW**

The questions posed before tribals were of the following types:

- (a) Plant based
- (b) Object/Subject based
- (c) Random
- (d) Systematic- aspect followed by aspect.

(e) Prior / on the spot prepared questionnaire based on desired areas/ goals before visiting the locality or after taking personal observations within a locality.

(f) On certain points only- especially when the time was short.

### EXCERPTS FROM INTERVIEW

Subject: Opening of an interview

**Q.** What is this?

**A.** **Negad**

**Q.** Is this useful?

**A.** Yes

**Q.** How?

**A.** Leaves are boiled in earthen pot water and used orally twice a day beneficial in rheumatism.

**Q.** Are seeds useful?

**A.** No

**Q.** Any other use?

**A.** Oh yes, 100 gm root powder of **Negad** mixed with 200 gm root powder of **Safed moosli** and this mixture is taken orally with milk in sexual disability.

**Q.** Any other information about it?

**A.** No I haven't

Village- Paanmodi

Date- 24 /02/2013

## **SECONDARY SOURCES**

Some facts were gathered from forest officials, personnels of the Tribal Research and Training Institutes of Udaipur and Bhartiya Lok Kala Mandal.

## **LITERATURE AS A SOURCE**

Besides information collected during surveys, it was also drawn from published sources in the field of social science, besides those of Botany and Ethnobotany in particular.

## **DOCUMENTATION OF DATA**

Almost all activities in the field were recorded. The important ones are enumerated here:

## **BOTANICAL**

During field work, plant specimens and materials (e.g. roots, bark, fruits, seeds, grain, gums *etc.*) including propagules (e.g. corms, tubers, bulbils, culms *etc.*) were collected for herbarium specimens.

## **ETHNOBOTANICAL**

### **Field Diaries**

Information of plant uses collected during field survey was entered in the field diaries for each plant alongwith date and actual place of interview/enquiry, names of informants, the tribe/community to which they belong and cassette number in which it was recorded.

### **Audio Cassettes**

A portable tape recorder/ mobile phone voice recorder were used for recording conversation during interviews.

### **Writing pads/ Note books**

For documenting the observations and related sketches, notebooks/writing pads were taken on field.

### **Photographs and Transparencies**

Photographs were taken on several subjects relevant to the present study.

### **Data sheets**

Data sheets were designed for the work carrying details as field no. of voucher plant specimen, botanical name, family, local names, major and minor categories and locality/village, tehsil, state, informer and ethnic community (Figure-3.1 and 3.2). The data have been divided into seventeen major categories which are described in chapter no.4

observation and results. In all categories 3268 datasheets have been prepared for this work including those from literature.

### PLANT IDENTIFICATION

Floras on the study area were helpful in identification of plant species enumerated below:

| <b>TITLE</b>                   | <b>AUTHER AND YEAR</b>     |
|--------------------------------|----------------------------|
| Flora of Upper Gangetic plains | Duthie (1903-1929)         |
| Flora of Indian Desert         | Bhandari (1990)            |
| Flora of Rajasthan-vol. 1-3    | Sheety and Singh (1987-93) |
| Flora of North-East Rajasthan  | Sharma and Tyagi (1979)    |
| Flora of Banswara              | Singh, V. (1983)           |

Published materials *viz.* books, journals and magazines and unpublished ones *viz.* technical reports and thesis on Ethnobotany and economic botany greatly helped in understanding the flora and vegetation of the regions studied.

**ETHNOBOTANICAL SURVEY OF**

PRATAPGARH Tehsil PRATAPGARH Distt. RAJASTHAN State

|   |   |     |
|---|---|-----|
| Locality <u>Suktreshwar Mahadev</u>                         | Soils: Sand<br>Savel<br>Loam<br>Clay              | 225 |
| Habitat <u>Hilly</u>  | Frequency: Rare<br>Frequent<br>Common<br>Abundant | 225 |
| Association <u>Acacia spp. &amp; Anogeissus spp.</u>        |   | 225 |
| Habit <u>Tree</u>   |   | 225 |
| Flower <u>Orange Red.</u> <u>March.</u>                     | Colour Odour Period Infl.                         | 225 |
| Fruit <u>Green</u> <u>Pod</u> <u>(10-15 c.m.)</u>           | Colour Kind Period Size                           | 225 |
| Bot. Name <u>Butea monosperma</u>                           |   |     |
| Local Name <u>Chhala</u> Collected by <u>Kinay K. Meena</u> |   | 225 |
| No <u>225</u> Date <u>23 Mar. 2012</u>                      |   |     |

|  |   |
|--|---|
| <p style="text-align: center;"><b>Documentation</b></p> <p>1. Cassette No. <u>12.B</u></p> <p>2. Negative No. _____</p> <p>3. _____</p> <p>Ethnic community <u>meena</u></p> | <p>Camp <u>Awleshwar</u></p> <p>HQ. <u>Pratapgarh</u></p> <p>Informers <u>Hirano</u><br/><u>Pravat Singh</u><br/><u>Rambabu</u><br/><u>Harkunjo</u></p> |
|--|---|

Notes Kameskas. (plant gum is used by tribal, local & traditional communities to form laddoo for inner strength in ladies after delivery.

**Figure 3.1: Showing the Sample Page of Field Diary**

|               |                              |                |         |
|---------------|------------------------------|----------------|---------|
| Field No.     |                              | Major Category | E. med. |
| Bot. Name     | <u>Zingiber officinalis.</u> | Minor Category | Cold.   |
| Family        | <u>Zingiberaceae.</u>        |                |         |
| Local name(s) | <u>Adarakh, Sunth.</u>       |                |         |

Rhizome boiled in the milk and add sugar & eaten in the cold & cough.

---

|        |                   |        |                    |                  |                   |
|--------|-------------------|--------|--------------------|------------------|-------------------|
| Loc.   | <u>Paan modi</u>  | Thesil | <u>Pratapgarh.</u> | Informer/Lix     | <u>Ratru bai</u>  |
| Disst. | <u>Pratapgarh</u> | State  | <u>Rajasthan</u>   | Ethnic Community | <u>Bhil meena</u> |

Figure 3.2: Showing the Sample Page of Data Sheet

## Plate- 5



**Plate -5:** Figure A and B showing author observing the wild plant species (*Miliusa tomentosa*), Figure C interview with a village Bhopa

# Plate- 6



**Plate -6:** Figure A and B interview with tribal people of study area

*I*n the Pratapgarh tehsil of Rajasthan, large varieties of plants are found in different localities. These plants were collected and studied in detail with the help of experts and then their different uses are discussed with the tribals or traditional communities of local area, time to time. The observations and results of these plants are summarized under following headings:

### **I. CULTIVATED EDIBLE PLANTS**

With the tremendous increasing population and exploitation of nature as a whole, the importance of ethnobotanical knowledge has been realized very recently in order to identify the new sources of food and pharmaceutical drugs. The aboriginals inhabiting the forests are consuming a number of wild plants which are unknown and inaccessible to urban elite class. Numerous food and non-food crops have been adopted by the tribals in agriculture. However, majority of them depend on the rain crops (Kharif) for their survival and have lesser dependence on the winter crop (Rabi).

Although some of the tribals of the area have acquired new agricultural techniques considerably and they grow new, fast growing varieties of the cereals, but still, the maximum crops produced are obtained from wild varieties including local land varieties adapted to specific local environment. These local varieties are more palatable and tasty.

The study of wild edible plants is important, not only to identify the potential sources which could be utilized as alternative food in times of scarcity but to select promising types for domestication.

It has been observed that the following crop plants are grown by the tribals in Pratapgarh tehsil:

### 1. CEREALS AND MILLETS

*Hordeum vulgare*, *Pennisetum americanum*, *Sorghum vulgare*, *Triticum aestivum* and *Zea mays*.

### 2. PULSES

*Cicer arietinum*, *Glycine max*, *Lablab purpureous*, *Pisum sativum*, *Vigna angularis*, *Vigna radiata*, *Vigna unguiculata subsp. cylindrica*, *Cajanus cajan*, *Cyamopsis tetragonoloba* and *Vigna aconitifolia*.

### 3. VEGETABLE CROPS

*Abelmoschus esculantus*, *Allium cepa*, *Allium sativum*, *Brassica oleracea* var. *sarson*, *Brassica oleracea* var. *botrytis*, *Brassica oleracea* var. *capitata*, *Capsicum annum*, *Citrullus fistulosus*, *Cucumis melo*, *Cucumis melo* var. *utilissimus*, *Cucumis melo* var. *agrestis*, *Cucumis callosus*, *Cucumis sativus*, *Cucurbita maxima*, *Cucurbita moschata*, *Cyamopsis tetragonoloba*, *Daucus carota*, *Lagenaria siceraria*, *Luffa cylindrica*, *Lycopersicon esculentum*, *Momordica charantia*, *Raphanus sativus*, *Solanum melongena*,

*Trigonella foenum-graecum*, *Chenopodium album*, *Spinacia oleracea*, *Amaranthus caudatus* and *Cicer arietinum*.

#### 4. SOURCES OF SPECIES AND CONDIMENTS

*Capsium annum*, *Coriandrum sativum*, *Cuminum cyminum*, *Foeniculum vulgare*, *Trachyspermum ammi*, *Trigonella foenum-graecum*, *Brassica nigra*, *Curcuma longa* and *Mentha spicata*.

#### 5. EDIBLE FRUITS

*Aegle marmelos*, *Annona squamosa*, *Carica papaya*, *Citrus limon*, *Cordia dichotoma*, *Cucumis melo*, *Cucumis sativus*, *Cucumis melo var utilissimus*, *Mangifera indica*, *Morus alba*, *Psidium guajava*, *Musa paradisiaca*.

#### 6. EDIBLE OILS

*Brassica campestris var. dichotoma*, *Brassica campestris var. sarson*, *Brassica campestris var. toria*, *Brassica juncea*, *Brassica nigra*, *Eruca sativa*, *Arachis hypogaea* and *Sesamum indicum*.

## II. WILD EDIBLE FOOD PLANTS

Though there is good transport and communication facilities are developing day by day but still some people are following the trend which they learned from their ancestors, like uses of wild plants from the forest habitat. During the present investigation observation were

made, that the following wild plant species parts are used by the tribal of Pratapgarh Tehsil (Plate -7, Table -4.1 and Figure- 4.1).

**Table- 4.1: The wild plants used by tribals of Partapgarh Tehsil**

| S.No. | Botanical Name                | Part Uses  |
|-------|-------------------------------|--|
| 1     | <i>Aegle marmelos</i>         | Fruit pulp consumed directly   |
| 2     | <i>Acacia nilotica</i>        | Gum is use for sweets, immature pods use as vegetable                                      |
| 3     | <i>Acacia senegal</i>         | Gum is use for Sweets, Immature pods use as vegetable, seeds also use to mixd in vegetable |
| 4     | <i>Achyranthes aspera</i>     | Seeds are cooked in milk   |
| 5     | <i>Alangium salvifolium</i>   | Fruits direct eat  |
| 6     | <i>Aloe barbadensis</i>       | Leaf Pulp and young pods use as vegetable  |
| 7     | <i>Amaranthus caudatus</i>    | Green leaves cooked as vegetable   |
| 8     | <i>Amaranthus spinosus</i>    | Green leaves cooked as vegetable   |
| 9     | <i>Amaranthus tricolor</i>    | Green leaves cooked as vegetable   |
| 10    | <i>Annona squamosa</i>        | Fruits are eaten directly  |
| 11    | <i>Asparagus racemosus</i>    | roots cooked as vegetable  |
| 12    | <i>Asphodelus tenuifolius</i> | Leaves used as vegetable   |
| 13    | <i>Azadirachta indica</i>     | tender leaves cooked as vegetable, some time ripen fruits pulp is eaten by children        |
| 14    | <i>Bauhinia purpurea</i>      | Flower buds used as vegetable  |
| 15    | <i>Bauhinia racemosa</i>      | Flower, young pods and ripen pods cooked as vegetable                                      |
| 16    | <i>Bauhinia variegata</i>     | Flower buds used as vegetable  |
| 17    | <i>Boswellia serrata</i>      | Rosted seeds are eaten   |
| 18    | <i>Capparis zeylanica</i>     | Fruits are cooked as vegetable or pickled  |
| 19    | <i>Carrisa congesta</i>       | Fruits are cooked and pickled  |
| 20    | <i>Cassia fistula</i>         | Inflorescence cooked as vegetable  |
| 21    | <i>Cassia tora</i>            | Green juvenile leaves cooked as vegetable  |

|    |  |   |
|----|--|---|
| 22 | <i>Celosia argentea</i>                        | juvenile leaves cooked as vegetable and Seeds cooked in milk as tonic   |
| 23 | <i>Chenopodium album</i>                       | Leaves (Fresh whole plant) cooked with buttermilk and used as vegetable |
| 24 | <i>Chenopodium murale</i>                      | Leaves cooked as vegetable  |
| 25 | <i>Commelina beghalensis</i>                   | Leaves cooked as vegetable  |
| 26 | <i>Cordia dichotoma</i>                        | Fruits are cooked as vegetable or pickled                               |
| 27 | <i>Cordia gharaf</i>                           | Ripen fruits eaten directly   |
| 28 | <i>Cucumis melo</i> Linn. var. <i>agrestis</i> | Fruits cooked as vegetable  |
| 29 | <i>Cucumis callosus</i>                        | Fruits cooked as vegetable  |
| 30 | <i>Dendrocalamus strictus</i>                  | Young Stem used during cooking rice for flavour of it                   |
| 31 | <i>Pongamia pinnata</i>                        | Flowers cooked as vegetable   |
| 32 | <i>Dioscorea bulbifera</i>                     | Tubers are cooked as vegetable  |
| 33 | <i>Dioscorea tomentosa</i>                     | Tubers are cooked as vegetable  |
| 34 | <i>Ehretia laevis</i>                          | Fruits are consumed directly  |
| 35 | <i>Ficus benghalensis</i>                      | Fruits are consumed directly or as a vegetable                          |
| 36 | <i>Ficus racemosa</i>                          | Young Fruits use as vegetable and ripen directly consume                |
| 37 | <i>Flacourtia indica</i>                       | Ripen Fruits consumed directly  |
| 38 | <i>Grewia flavescens</i>                       | Ripen Fruits consumed directly  |
| 39 | <i>Holoptelea integrifolia</i>                 | Dried Seeds eaten by childrens  |
| 40 | <i>Ipomoea aquatica</i>                        | Leaves and Stem cooked as vegetable                                     |
| 41 | <i>Luffa cylindrica</i>                        | Fruits used as vegetable  |
| 42 | <i>Mangifera indica</i>                        | Ripen and unripe Fruits consumed directly or as vegetable               |
| 43 | <i>Mimusops elengi</i>                         | Ripen dry Fruits consumed directly                                      |
| 44 | <i>Momordica dioica</i>                        | Fruits are cooked as vegetable  |
| 45 | <i>Moringa oleifera</i>                        | Pods and flowers used as vegetable                                      |
| 46 | <i>Mucuna pruriens</i>                         | Pods cooked as vegetable  |
| 47 | <i>Opuntia elatior</i>                         | Ripen Fruits consumed directly  |

|    |                                  |   |
|----|----------------------------------|---|
| 48 | <i>Phoenix sylvestris</i>        | Fresh riped fruits and dried fruit also eaten                 |
| 49 | <i>Phyllanthus emblica</i>       | Fruits used as vegetable or as pickle                         |
| 50 | <i>Pithecellobium dulce</i>      | Ripen Fruits cooked as vegetable as well as consumed directly |
| 51 | <i>Portulaca oleracea</i>        | Whole plant used as vegetable                                 |
| 52 | <i>Psidium guajava</i>           | Fruits consumed directly                                      |
| 53 | <i>Sesbania sesban</i>           | Flowers buds and young pods used as vegetable                 |
| 54 | <i>Sterculia urens</i>           | Roasted seeds and gum eaten                                   |
| 55 | <i>Syzygium cumini</i>           | Ripen Fruits consumed directly                                |
| 56 | <i>Syzygium heyeanum</i>         | Ripen Fruits consumed directly                                |
| 57 | <i>Tamarindus indica</i>         | Leaves andFruits used in vegetable for sour flavour           |
| 58 | <i>Trianthema portualcastrum</i> | Whole plant used as vegetable                                 |
| 59 | <i>Wrightia tinctoria</i>        | Young leaves, Sap cooked as food                              |
| 60 | <i>Ziziphus mauritiana</i>       | Dried and freshFruits are eaten raw                           |
| 61 | <i>Ziziphus nummularia</i>       | Dried and fresh Fruits are eaten raw                          |

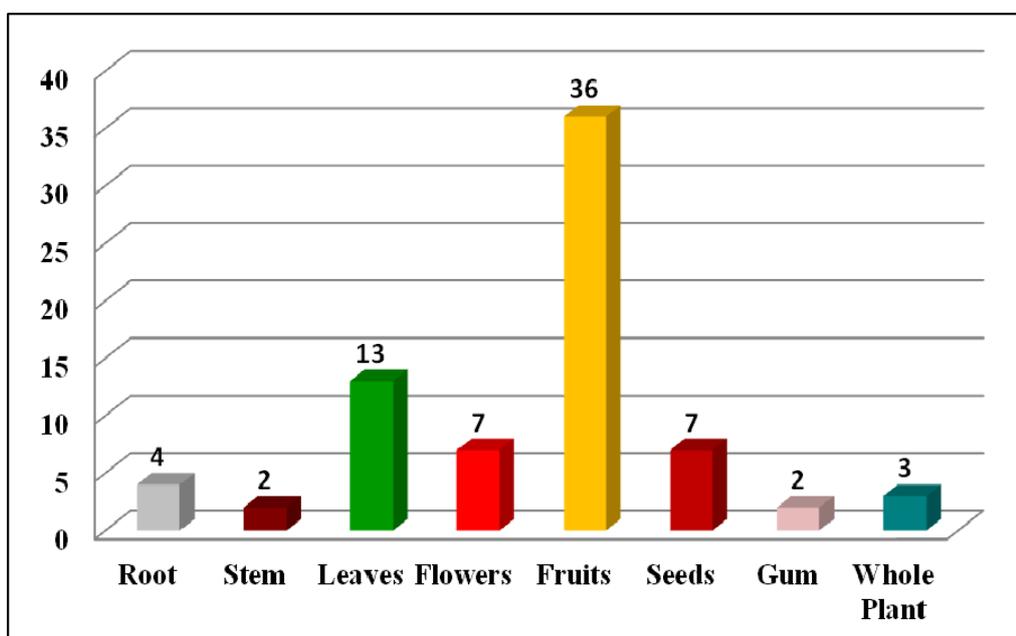


Figure 4.1: Showing the wild edible plant parts

**Conclusion:**

During the present investigation observations were made and sixty one plants belonging to thirty five families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant families are Fabaceae, Amaranthaceae and Cucurbitaceae.

These sixty one plants are used in portions, partially or fully, by the tribes of investigated area. Thirty-six plants are being used by them for their fruits; thirteen plants are being used for their leaves, seven plants are being used for their flower-buds. Four plants are variedly used for their roots, other two plants are differently used for their stem, and additionally two different plants are used for their gums. Three plant families hold importance in totality as all the parts in some way or other are being used by tribal people, showing in Figure 4.1.

**III. PLANTS USED AS FODDER**

Tribals and traditional communities of Pratapgarh tehsil collect and store the dried clumps and leaves of crop plants for their pet animals after harvesting the crop. More than hundred plant species (herb, shrub & trees) are used as source of fodder for grazing the pet animals. The major fodder sources are annual and perennial grasses, sedges or herbs, shrubs and trees. Legumes like *Medicago sativa* and *Trifolium alexandrinum* are also grown for fodder purpose. The fodder plant species using by tribals of the Tehsil presented in the Table 4.2 and Figure 4.2.

**Table-4.2: The fodder plants species used by tribal of Partapgarh Tehsil**

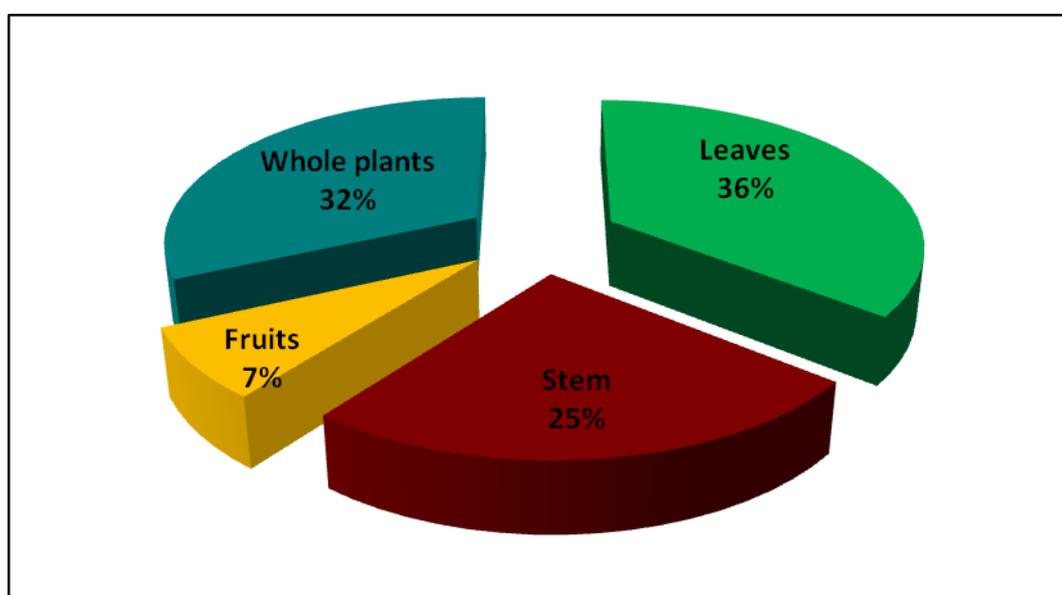
| S.No. | Botanical Name                | Useful part           |
|-------|-------------------------------|-----------------------|
| 1     | <i>Abelmoschus ficulneus</i>  | Leaves and Stem       |
| 2     | <i>Abelmoschus manihot</i>    | Leaves and Stem       |
| 3     | <i>Abelmoschus moschatus</i>  | Leaves and Stem       |
| 4     | <i>Abrus precatorius</i>      | Fresh leaves          |
| 5     | <i>Acacia catechu</i>         | Leaves and Pods       |
| 6     | <i>Acacia farnesiana</i>      | Leaves and Pods       |
| 7     | <i>Acacia leucophloea</i>     | Green leaves and pods |
| 8     | <i>Acacia nilotica</i>        | Green leaves and pods |
| 9     | <i>Acacia senegal</i>         | Leaves and Pods       |
| 10    | <i>Acalypha indica</i>        | Leaves and Stem       |
| 11    | <i>Ailanthus excelsa</i>      | Leaves                |
| 12    | <i>Alhagi maurorum</i>        | Leaves and Stem       |
| 13    | <i>Alternanthera pungens</i>  | Leaves and Stem       |
| 14    | <i>Alysicarpus vaginalis</i>  | Leaves and Stem       |
| 15    | <i>Amaranthus caudatus</i>    | Whole plant           |
| 16    | <i>Amaranthus spinosus</i>    | Leaves and Stem       |
| 17    | <i>Amaranthus tenuifolius</i> | Leaves and Stem       |
| 18    | <i>Amaranthus tricolor</i>    | Leaves and Stem       |
| 19    | <i>Amaranthus viridis</i>     | Leaves and Stem       |
| 20    | <i>Anogeissus latifolia</i>   | Leaves                |
| 21    | <i>Anogeissus pendula</i>     | Leaves                |
| 22    | <i>Apluda mutica</i>          | Leaves and Stem       |
| 23    | <i>Aristida adscensionis</i>  | Leaves and Stem       |

|    |                               |                   |
|----|-------------------------------|-------------------|
| 24 | <i>Aristida funiculata</i>    | Leaves and Stem   |
| 25 | <i>Aristolochia indica</i>    | Fresh whole plant |
| 26 | <i>Bidens biternata</i>       | Leaves and Stem   |
| 27 | <i>Boerhavia diffusa</i>      | Leaves and Stem   |
| 28 | <i>Bothriochloa pertusa</i>   | Fresh whole plant |
| 29 | <i>Brachiaria ramosa</i>      | Leaves and Stem   |
| 30 | <i>Bulbostylis barbata</i>    | Leaves and Stem   |
| 31 | <i>Cassia absus</i>           | Leaves and Stem   |
| 32 | <i>Cassia obtusifolia</i>     | Leaves and Stem   |
| 33 | <i>Cassia occidentalis</i>    | Leaves and Stem   |
| 34 | <i>Cassia pumila</i>          | Leaves and Stem   |
| 35 | <i>Cassia siamea</i>          | Leaves and Stem   |
| 36 | <i>Cenchrus biflorus</i>      | Leaves and Stem   |
| 37 | <i>Cenchrus ciliaris</i>      | Leaves and Stem   |
| 38 | <i>Chloris virgata</i>        | Leaves and Stem   |
| 39 | <i>Citrullus lanatus</i>      | Whole plant       |
| 40 | <i>Coccinia cordifolia</i>    | Whole plant       |
| 41 | <i>Coccinia grandis</i>       | Whole plant       |
| 42 | <i>Commelina erecta</i>       | Leaves and Stem   |
| 43 | <i>Corchorus aestuans</i>     | Leaves and Stem   |
| 44 | <i>Corchorus capsularis</i>   | Leaves and Stem   |
| 45 | <i>Corchorus depressus</i>    | Leaves and Stem   |
| 46 | <i>Corchorus olitorius</i>    | Leaves and Stem   |
| 47 | <i>Corchorus tridens</i>      | Leaves and Stem   |
| 48 | <i>Crotalaria medicaginea</i> | Fresh whole plant |
| 49 | <i>Cynodon dactylon</i>       | Whole plant       |

|    |                                 |                              |
|----|---------------------------------|------------------------------|
| 50 | <i>Cyperus bulbosus</i>         | Whole plant                  |
| 51 | <i>Cyperus rotundus</i>         | Whole plant                  |
| 52 | <i>Dactyloctenium aegyptium</i> | Whole plant                  |
| 53 | <i>Desmodium repandum</i>       | Whole plant                  |
| 54 | <i>Desmodium triflorum</i>      | Whole plant                  |
| 55 | <i>Desmodium gangeticum</i>     | Whole plant                  |
| 56 | <i>Desmostachya bipinnata</i>   | Whole plant                  |
| 57 | <i>Dichanthium annulatum</i>    | Whole plant                  |
| 58 | <i>Digera muricata</i>          | whole plant                  |
| 59 | <i>Digitaria pennata</i>        | Fresh whole plant            |
| 60 | <i>Diospyros montana</i>        | Leaves and fruits            |
| 61 | <i>Echinochloa colona</i>       | Fresh whole plant            |
| 63 | <i>Echinochloa crus-galli</i>   | Whole plant                  |
| 62 | <i>Emilia sonchifolia</i>       | Whole plant                  |
| 64 | <i>Eragrostis ciliaris</i>      | Whole plant                  |
| 65 | <i>Ficus benghalensis</i>       | Fruits                       |
| 66 | <i>Gisekia pharanceoides</i>    | Whole plant                  |
| 67 | <i>Grewia flavescens</i>        | Young twigs and green leaves |
| 68 | <i>Grewia tenax</i>             | Young twigs and Green leaves |
| 69 | <i>Helicteres isora</i>         | Green leaves                 |
| 70 | <i>Heteropogon contortus</i>    | Whole plant                  |
| 71 | <i>Hibiscus cannabinus</i>      | Whole plant                  |
| 72 | <i>Indigofera caerulea</i>      | Whole plant                  |
| 73 | <i>Indigofera cordifolia</i>    | Whole plant                  |
| 74 | <i>Indigofera linifolia</i>     | Whole plant                  |

|     |                                  |                              |
|-----|----------------------------------|------------------------------|
| 75  | <i>Indigofera tinctoria</i>      | Whole plant                  |
| 76  | <i>Ipomoea pes- tigridis</i>     | Whole plant                  |
| 77  | <i>Medicago sativa</i>           | Whole plant                  |
| 78  | <i>Melilotus alba</i>            | Whole plant                  |
| 79  | <i>Mollugo cerviana</i>          | Whole plant                  |
| 80  | <i>Mollugo nudicaulis</i>        | Whole plant                  |
| 81  | <i>Mollugo pentaphylla</i>       | Whole plant                  |
| 82  | <i>Panicum maximum</i>           | Whole plant                  |
| 83  | <i>Paspalidium flavidum</i>      | Fresh whole plant            |
| 84  | <i>Perotis indica</i>            | Whole plant                  |
| 85  | <i>Portulaca oleracea</i>        | Whole plant                  |
| 86  | <i>Portulaca pilosa</i>          | Whole plant                  |
| 87  | <i>Saccharum bengalense</i>      | Whole plant                  |
| 88  | <i>Saccharum spontaneum</i>      | Whole plant                  |
| 89  | <i>Sesbania sesban</i>           | Young twigs and Green leaves |
| 90  | <i>Setaria verticillata</i>      | Whole plant                  |
| 91  | <i>Sida veronicifolia</i>        | Whole plant                  |
| 92  | <i>Sonchus oleraceus</i>         | Whole plant                  |
| 93  | <i>Sporobolus diander</i>        | Whole plant                  |
| 94  | <i>Tephrosia purpurea</i>        | Whole plant                  |
| 95  | <i>Terminalia tomentosa</i>      | Leaves                       |
| 96  | <i>Tetrapogon tenellus</i>       | Whole plant                  |
| 97  | <i>Themeda triandra</i>          | Whole plant                  |
| 98  | <i>Trianthema portulacastrum</i> | Whole plant                  |
| 99  | <i>Tribulus terrestris</i>       | Whole plant                  |
| 100 | <i>Tridax procumbens</i>         | Whole plant                  |

|     |                            |                             |
|-----|----------------------------|-----------------------------|
| 101 | <i>Vigna trilobata</i>     | Whole plant                 |
| 102 | <i>Wrightia tinctoria</i>  | Young twigs                 |
| 103 | <i>Ziziphus mauritiana</i> | Fresh and dry leaves        |
| 104 | <i>Ziziphus nummularia</i> | Fresh leaves and dry Fruits |
| 105 | <i>Ziziphus xylopyrus</i>  | Leaves and fruits           |



**Figure 4.2: Showing the fodder plants**

### **Conclusion:**

Total one hundred and five plants belonging to twenty four families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant families are Poaceae, Fabaceae, Amaranthaceae and Tiliaceae.

These one hundred and five plants are used in portions, partially or fully, by the tribes of investigated area. Twelve plants are being used by them for their fruits and fifty-six plants are being used for their leaves. Thirty nine plants are differently used for their stem. Fifty plants hold importance in totality as all the parts in some way or other are being used by tribal people, showing in Table 4.2 and Figure 4.2.

Beside this some tribal people cultivate different crop plants and their remains mostly store by them, these used as storage fodder. These are *Cajanus cajan*, *Cicer arietinum*, *Hordeum vulgare*, *Lablab purpureous*, *Pennisetum americanum*, *Pisum sativum*, *Sorghum vulgare*, *Triticum aestivum*, *Vigna angularis*, *Vigna radiata*, *Vigna unguiculata subsp. cylindrical* and *Zea mays*.

#### IV. PLANTS USED AS FAMINE FOOD

For an adequate growth and development of an organism including human beings the basic requirement is food, fodder and water. The source of water for irrigation and drinking is dependent mainly on rainfall. In case of no average rainfall, the underground water level goes down and scarcity of water is realized. Many times the state of Rajasthan has also been subjected to a severe famine due to the absence of regular rainfall during rainy season. The history reveals that there had been such severe famine during 1868-1870 and 1899-1901 which were termed as *Trikal* and *Chappania Akkal* respectively. Since there was no food, fodder and adequate water for

drinking, about one million human beings and cattle died due to hunger and thirst.

There are reports, during Vikram Samvat almost each and every village, tehsil and taluka of the state of Rajasthan were severely affected with the scarcity of food, fodder and drinking water and this resulted into a very significant migration of people from one place to the other in search of their basic requirements.

The wild plants of the famine affected area were also badly damaged and people exclusively remained dependent on such wild plants which were being used during famine period.

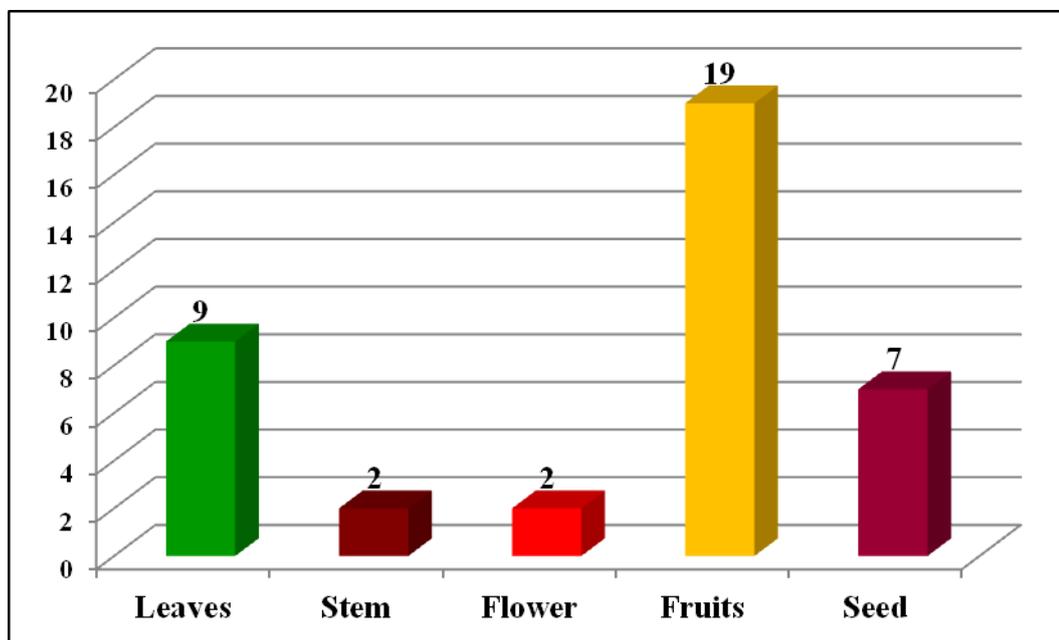
The details of wild plants which were being frequently used during famine period in Pratapgarh Tehsil are presented in Table 4.3.

**Table- 4.3: The plants species used in famine period by tribal of Partapgarh**

| S. No | Botanical Name                | Uses                                     |
|-------|-------------------------------|--|
| 1     | <i>Acacia leucophloea</i>     | Stem bark is powdered and mix with flour |
| 2     | <i>Acacia nilotica</i>        | Pod used as vegetable                    |
| 3     | <i>Acacia senegal</i>         | Seeds and pods are used as vegetable     |
| 4     | <i>Achyranthes aspera</i>     | Seeds are powdered and mixed with flour  |
| 5     | <i>Asparagus racemosus</i>    | Roots used as vegetable                  |
| 6     | <i>Asphodelus tenuifolius</i> | Leaves used as vegetable                 |
| 7     | <i>Bauhinia racemosa</i>      | Pods are eaten                           |
| 8     | <i>Butea monosperma</i>       | Young leaves are used as vegetable       |

|    |                                |   |
|----|--------------------------------|---|
| 9  | <i>Cassia tora</i>             | Young leaves are used as vegetable  |
| 10 | <i>Celosia argentea</i>        | Leaves are used as vegetable  |
| 11 | <i>Ceropegia bulbosa</i>       | Leaves and tuberous roots are eaten   |
| 12 | <i>Cyperus rotundus</i>        | Rhizome are mixed with flour  |
| 13 | <i>Dendrocalamus strictus</i>  | Seeds used as famine food directly  |
| 14 | <i>Diospyros melanoxylon</i>   | Fruits eaten as raw   |
| 15 | <i>Ehretia laevis</i>          | Stem bark powder consumed   |
| 16 | <i>Euphorbia hirta</i>         | Shoot used as vegetable   |
| 17 | <i>Ficus benghalensis</i>      | Fruits eaten directly but in famine condition the dry fruits are mixed with flour |
| 18 | <i>Ficus carica</i>            | Fruits eaten directly but in famine condition the dry fruits are mixed with flour |
| 19 | <i>Ficus hispida</i>           | Fruits eaten directly but in famine condition the dry fruits are mixed with flour |
| 20 | <i>Ficus mollis</i>            | Fruits eaten directly but in famine condition the dry fruits are mixed with flour |
| 21 | <i>Ficus racemosa</i>          | Fruits eaten directly but in famine condition the dry fruits are mixed with flour |
| 22 | <i>Grewia hirsuta</i>          | Dried Fruits stored and eaten in famine condition                                 |
| 23 | <i>Grewia teliifolia</i>       | Dried Fruits eaten raw  |
| 24 | <i>Grewia villosa</i>          | Dried Fruits in starvation condition  |
| 25 | <i>Holoptelea integrifolia</i> | Seeds are mixed with flour and cooked   |
| 26 | <i>Madhuca indica</i>          | Corolla use directly and seed oil used  |
| 27 | <i>Manilkara hexandra</i>      | Dried fruit are stored  |
| 28 | <i>Momordica balsamina</i>     | Leaves and fruits used as vegetable   |

|    |                             |   |
|----|-----------------------------|---|
| 29 | <i>Moringa oleifera</i>     | Flowers and Pod used as vegetable               |
| 30 | <i>Mucuna pruriens</i>      | Roasted seed are eaten                          |
| 31 | <i>Physalis minima</i>      | Dried Fruit stored and eaten                    |
| 32 | <i>Sesbania seban</i>       | Flowers and young pods are used as vegetable    |
| 33 | <i>Sonchus oleraceus</i>    | Young and fresh leaves used as vegetable        |
| 34 | <i>Tamarindus indica</i>    | Roasted seed are powdered and mixed with flower |
| 35 | <i>Terminalia bellirica</i> | Roasted seeds are eaten                         |
| 36 | <i>Wrightia tinctoria</i>   | Juvenile leaves used as vegetable               |
| 37 | <i>Ziziphus mauritiana</i>  | Dried fruit powder used to make sauce           |
| 38 | <i>Ziziphus nummularia</i>  | Dried fruit pericarp used to make sauce.        |



**Figure 4.3: Showing plant species used in famine conditions**

**Conclusion:**

Around thirty eight plants belonging to twenty-three families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant families are Fabaceae, Moraceae and Tiliaceae.

These thirty eight plants are used in portions, partially or fully, by the tribes or traditional communities and other peoples of investigated area. Nineteen plants are being used by them for their fruits and nine plants are being used for their leaves. Two plants are differently used for their stem, or other are being used by tribal people, showing in Table 4.3 and Figure 4.3.

**V. PLANTS USED AS ETHNOMEDICINE**

During the present investigation observations were made to identify the medicinal plants of the Partapgarh Tehsil used by the tribal for their local used in various diseases. Total One hundred eleven plants belonging to fifty seven different families of angiosperm are being used by the tribes or traditional communities for ethnomedicinal value. The details of their plant part used for the particular disease are given in the Table 4.4. One hundred eleven plants are here in detail, for their medicinal use.

1. ***Abrus precatorius***: Leaves are chewed for 2-5 days to cure blisters in the mouth, and seeds are used as an antifertility drug both by male and female. Two to four seeds orally taken with water during

menstruationes prevent conception forever, an effective contraceptive.

2. ***Abutilon indicum***: Leaves are grounded with milk and given orally to cure dysentery. Decoction of leaves is given for urinary troubles.
3. ***Acacia catechu***: The gum is used to make *laddoo*. The pellets made with katha are taken in stomachache. Gum powder is mixed with ghee and unrefined sugar is kept in an earthen pot for 5-7 days. This is taken three days before menses for conception.
4. ***Acacia leucophloea***: Crushed stem bark is soaked in water overnight and given orally in the morning to increase sexual potency in males and for menstrual complaints in females.
5. ***Acacia nilotica***: Bark and leaf paste is applied on cuts and wounds. The stem bark is chewed orally with salt or boiled in water & taken orally or gargled to cure cough and mouthsores. The pod paste mixed with raw sugar is taken empty stomach in the morning by ladies to cure leucorrhoea. Stem bark crushed with *Dalbergia sissoo* leaves and sugar/batasha, is stored in an earthenpot overnight and taken empty stomach in the morning to get relief in menorrhagia.
6. ***Actinopteris radiata***: Whole plant dipped in water for 12 hours is pounded with milk and taken to avoid nocturnal emission and also as tonic. Leaf juice is taken against acidity (Plate-8).

7. ***Adansonia digitata***: Pulp of fruit is sour in taste so it is preferable as a vegetable directly and acid-alkaline balance can be maintained in body.
8. ***Adhatoda zeylanica***: The leaf sap contains very important alkaloid (vacanine). Leaves of this plant contain insecticidal properties. The decoction of leaves is given orally to cure asthma and cough.
9. ***Adina cardifolia***: Fresh bark is ground with brown sugar and taken for stomachache. Fresh stem bark juice is taken in rheumatism; leaves are applied over swollen portion to remove pain and swelling.
10. ***Aegle marmelos***: Fruit pulp is taken to cure constipation, chronic diarrhoea and dysentery. Leaf ash mixed with curd and black salt, is given orally to cure dysentery. Root crushed with sugar and eaten by women against protrusion of uterus. The pulp of unripe fruits is cut into pieces; dried, powdered and 1 tsp powder is taken twice a day to cure diarrhoea.
11. ***Ageratum conyzoides***: Dried powdered plant paste applied locally on burns and skin eruptions. Leaf juice is given orally with water in conjunctivitis.
12. ***Alangium salvifolium***: Root extract and juice is an abortifacient. It helps in reducing blood pressure, so it is preferable for high blood pressure patients, by using 2 tsp bark powder with cold water for a month continuously. Stem bark of plant is crushed with

*Bombax* flowers and this mixture is taken 2 times a day orally in suitable amount to cure protrusion of uterus.

- 13. *Albizia lebbbeck*:** Fresh leaves are fermented in an earthen pot and used to wash eyes for treating conjunctivitis (eye flu) and this plant also has pesticidal properties. Paste of stem bark and leaves is applied locally on ulcer, insect bite and scorpion sting. The seeds are crushed into paste and applied in eyes to get rid from cataract.
- 14. *Allium sativum*:** Crushed bulbs are given twice a day for seven days in fever and cough. The bulblets are eaten raw in arthritis, rheumatism and high blood pressure. Paste of bulblets is applied locally to the painful part of body and ringworm. The leaf juice is applied locally on ringworm. Bulblets are crushed into paste with the leaves of *Holoptelia integrifolia* and add 2-3 drops of lemon juice or tobacco's water is tied locally on ringworm.
- 15. *Aloe barbadensis*:** Pulp of leaves is used in liver disease and for reducing unwanted deposition of fat in the body. Pulp is mixed with turmeric powder, made into poultice and tide locally for healing cuts, wounds, boils and pimples. Crushed leaves applied locally on Guinea worm.
- 16. *Amaranthus caudatus*:** Seed are cooked like rice and relished by the tribals. Leaves of this plant eaten as vegetable, which helps to cure constipation problem.
- 17. *Ammannia baccifera*:** Fresh leaves are bruised and applied to burnt parts of the body.

18. ***Annona squamosa***: Plant seeds in powdered form along with leaves of *Plumbago zeylanica* are used to cause abortion. The bark powder is applied externally for wound healing.
19. ***Anogeissus latifolia***: Bark directly eaten for stomachache and bark extract is taken orally by the tribals as antivenom in snake bite. The gum is used during winter season as well as after delivery in the form of *Laddoo*, to cure the damaged tissue during delivery.
20. ***Antigonon leptopus***: Seeds are edible like popcorn, so it is used as a famine food. Leaves are crushed with sugar and applied on blisters twice or thrice for a day.
21. ***Argemone mexicana***: Leaves decoction is used to cure malaria fever, ulcer and skin problems. The juice of the plant is used in jaundice and skin problems. Decoction of stem and leaves is given thrice a day to treat gastralgia, asthma and cough. Paste of seed is smeared over fractured bone or seed powder mixed with oil and massaged on affected area. Seed paste applied on swollen bodypart to confirm fracture.
22. ***Aristolochia indica***: Paste of fresh leaves is applied in acute rheumatic pain, sting of scorpion and insect bite. Root paste is taken orally with water against collapse and snake bite.
23. ***Azadirachta indica***: Decoction of leaves is used to wash affected eyes thrice a day for treating conjunctivitis till cured. Juvenile leaves are eaten directly in month of March is very effective for blood purification. The leaves are boiled in water and used for

bathing to cure scabies, boils, pimples, eczema and other skin diseases. Juvenile leaves crushed with the leaves of *Lawsonia*, black pepper and smeared over forehead to get rid of headache. The gum mixed with honey and smeared on chest to relieve pain. The smearing of warm gum is effective against pneumonia and skin diseases. The bark is boiled in water and this water is used for bathing to cure prickly heat.

**24. *Barleria cuspidata*:** The twig of plant is used as a tooth brush for strengthen teeth and gums. Leaf juice of this plant mixed with cooking oil and rubbed on painful areas, it relieves from muscular pain.

**25. *Barleria prionitis*:** Leaf decoction is given during cough. Roots and leaves are chewed to relieve toothache and blisters. Fresh leaves boiled and made into a paste is tied with a cotton bandage and filtrate is poured on affected part twice a day for a month for treating “lakwa” (paralysis). Paste of roots mixed with goatmilk is given to treat rheumatic fever (Plate-12).

**26. *Bauhinia purpurea*:** Decoction of flower buds used orally for constipation problems, while tender bark paste is applied on small pox externally.

**27. *Bauhinia variegata*:** The flowers are used to cure diarrhoea and both leaves and flowers are eaten. Plant bark is used for the treatment of leprosy. Bhil tribe uses its leaves as a laxative. Leaf powder is mixed with mustard oil and applied externally on infection behind the flowing ears.

- 28. *Boerhavia diffusa*:** Aerial parts are given orally for 5 days in urine problem. The leaves are consumed as vegetable in case of kidney stones. The root paste is taken orally to cure jaundice. The extract of plant is considered as a good diuretic, given in controlling urinary trouble, jaundice, and other liver complications. The ash obtained from the plant is called *punernawa ksher* and is considered as a good diuretic. Leaf paste with ghee is helpful to cure snake bite. Crushed roots are boiled with cloves and thick paste is applied locally on boils and pimples. Extract of leaves, stem and roots is used to treat dropsy.
- 29. *Bombax ceiba*:** The gum is well known astringent and used for surgical dressing in the case of wounds. Fruits are expectorant and diuretic and the leaves are used for skin eruptions. Sugar mixed in the infusion of flowers and given orally in acidity and urinary problems. Root bark is mixed with honey and given as a tonic for children as well as adults. The root powdered with those of *Chlorophytum*, *Capparis sepiaria* and fruits of *Pedaliium murex* are taken with water as tonic to calm body heat. Root bark extract is given as tonic in case of sexual debility and also nervine tonic.
- 30. *Boswellia serrata*:** Stem bark (extract of 200gm) is taken orally twice a day to cure stomachache. Powder of stem bark is mixed with ghee and this paste is useful on bleeding wounds. The bark boiled in water and mixed with honey and sugar is given in diarrhoea.

- 31. *Buchanania latifolia*:** An ointment made from the kernels is used to relieve itch and prickly heat and also to remove facial blemishes. The powder of the stem bark blend with *Syzygium cumini* and this powder are given to treat infants.
- 32. *Butea monosperma*:** Laddu prepared from the gum, known as *Kamarkas*, are eaten after child delivery. Flower juice is given to children during fever and cold. Crushed seeds are given to newly born child in case of diarrhoea. Twigs are used as tooth brush in toothache. The stem bark is ground finely and taken with cow milk to avoid infertility in woman and as tonic to treat impotency in man. Ash of stem bark is said to be diuretic and laxative.
- 33. *Calotropis gigantea*:** Warmed leaves are applied 3 times a day in swelling. One or two flower buds are eaten for intoxication. Root bark and leaves are mixed with cow urine and applied against wasp and scorpion sting and to wounds caused by snake bite.
- 34. *Calotropis procera*:** The vital role of this plant is in curing cough and skin diseases. The bark powder is taken with honey 1tbsp three times a day. Bark can be blended with mustard oil and used as a mask in curing itching. Eye flu can be cured by applying the latex of leaves on thumbs of the feet 2-3 times a day. For the treating of fistula, fresh latex is collected, dried and made up pills one pill is given daily to the patient before sleeping at night for a week. Wood is burnt in warm ash of dried cow dung and smoke is applied externally on teeth in case of toothache, pyorrhea. The treatment is repeated till cured (Plate-9).

- 35. *Cannabis sativa*:** Leaves are used as a fumigative alkaloid and paste of leaves is useful in piles. Bruised fresh leaves are boiled with coconut milk and consumed in stomachache.
- 36. *Cardiospermum halicacabum*:** Plant extract is taken orally against constipation, flatulence and colic. Seeds powder is taken orally in rheumatic pain with water or cow milk.
- 37. *Cassia fistula*:** Crushed stem bark is soaked in water overnight and given orally in the morning for five days in diarrhoea. Leaf juice is given orally and also massaged on paralysed part of body. Fresh or dried fruit pulp is used as laxative. Bark powder is given orally along with dried ginger powder twice daily for the treatment of lumbago (Plate-8).
- 38. *Cassia occidentalis*:** Leaves crushed in egg albumin are applied with goat milk on fractured bone. Fresh leaves are used locally and chewed in oral and gum problems.
- 39. *Cassia tora*:** Crushed seeds are soaked in water overnight and are given orally in the morning for 15 days in galactagogue. Seed paste is used on ringworm. Tea is prepared from seeds and given to patients of asthma. Young leaves are eaten raw to avoid throat infection and to increase vision.
- 40. *Catharanthus roseus*:** Crushed leaves are used to stop bleeding from wounds. Application of this paste can also help in relieving symptoms of skin conditions like acne, eczema. Bark paste with

consumed orally with cow milk, it helps in regulating menstrual periods in those who suffer from excessive or irregular bleeding.

41. ***Celastrus paniculata***: Seed oil is employed in rheumatic pain. The powdered seeds are used as a brain tonic to increase memory. Crushed stem bark apply locally on snake bite. Pulp of fruit and seed powder blended with local wine and consumed for 7 days in case of dropsy.
42. ***Centella asiatica***: Leaf paste and brown sugar is helpful in improving memory. The sap of leaves and stem is very effective in diuretic disease and also helpful in curing leprosy.
43. ***Ceropegia bulbosa***: The tubers are eaten raw for relieving stomachache. The dried tuber is rubbed on stone and applied against scorpion sting.
44. ***Chlorophytum tuberosum***: Tubers are used in animea and rheumatism. Dried fasciculate roots are used in the preparation of *laddoo* with *Dhwara* gum, and are taken during winter season, against body heat and sexual debility in man and woman.
45. ***Chrozophora rottleri***: Crushed leaves are applied on the face in facial swelling from sunburn and sun stroke.
46. ***Cissampelos pareira***: Root extract is taken orally to treat dyspepsia, pneumonia, bronchitis, diarrhoea and liver congestion.
47. ***Cissus quadrangularis***: Plant is eaten regularly to develop strong skeleton. Plant juice is taken orally with milk to cure asthma,

epistaxis and fractured bone and also used in otitis media. The stem is crushed into paste and taken with cow milk thrice a day to cure fractured bone. Stem is crushed into paste or plant juice is smeared over fractured bone. In some areas, stem is made into paste, mixed with turmeric powder and castor oil and smeared over fractured bone for early cure.

**48. *Citrus aurantifolia*:** Juice of 200 ml of lemons mixed with 21 cowries and kept till dissolution, filtered and one spoon is taken daily to cure asthma.

**49. *Citrus medica*:** Fruit slices are mixed with turmeric powder, alum and made into a poultice, warmed and fomented on fractured bone. Fruit juice and water is mixed in 1:1 ratio stirred till it becomes like a jelly and applied to cure eczema, ringworm and scabies. Lemon juice is mixed with warmed tea water and taken as a drink against constipation.

**50. *Cleome gynandra*:** Plant is crushed into paste, squeezed and extract is applied in skin disease. Extract of fresh leaves are given orally to cure diarrhoea, dyspepsia, colic and in intestinal worms. Decoction of bruised fresh leaves is mixed with sesame oil and dropped in ears in case of ear complaint.

**51. *Cleome viscosa*:** Paste of fresh leaves and stem is applied locally on scabies and ringworm. Syrup is prepared from root extract and candy and given orally as a remedy for colic, flatulence and dyspepsia.

- 52. *Cocculus hirsutus*:** The leaf extract taken orally along with milk for treatment of control/ regularization of menstrual cycle in females. The extract of root taken orally twice a day and as well as massaged over paralyzed part of the body. Crushed whole plant is given orally for 7 days as lactagogue. Leaf extract is mixed in water to form a thick jelly, which is applied locally in eyes to cure conjunctivitis.
- 53. *Convolvulus microphyllus*:** Whole plant and leaves is used to reduce mental tension and used as a brain tonic. It is also useful in the treatment of diabetes. The leaves are useful in urinary disease, fever, cough, and anorexic condition.
- 54. *Cordia dichotoma*:** The immature fruits are picked and used as a vegetable. The seed kernel has medicinal properties (anti bacterial) and laxative properties. Ash of mature leaves is mixed with coconut or musterd oil and used as ointment on inflamed skin for early healing. Leaves are made into paste and mixed with curd and given orally to cure diarrhoea in children.
- 55. *Cuscuta reflexa*:** Seeds are used in treatment of bilious disorders. The whole plant is purgative. The juice of plant, mixed with sugar cane is used in the treatment of jaundice.
- 56. *Datura innoxia*:** Fresh leaves made into paste with the leaf of *Ficus racemosa* and applied locally on boils. Leaves are cooked with rice flour and taken to relieve swelling and rheumatic pain. Leaves are burnt and fumes inhaled or smoked in *chilam* against respiratory diseases.

- 57. *Datura stramonium*:** Fruitss are crushed into paste with the leaves of *Tulsi* and sugar candy and given orally for three days to cure diarrhoea. Crushed seeds are boiled with *pongamia* oil and this oil used as a medicine in rheumatic pain. Crushed leaves smeared locally on infected body part to cure guinea-worm.
- 58. *Dalbergia sisso*:** Crushed leaves sap is used to cure eye disease and gonorrhoea. The wood oil relieves the burning sensation of the body. Leaves also have laxative property.
- 59. *Desmodium velutinum*:** whole plant is used in the treatment of dysentery and stomachache. Crushed leaf paste is locally applied on wound and other skin problem. The stem paste is applied to fractures and snake bites. Tribals use whole plant to treat stomachache and abdominal problems.
- 60. *Diospyros melanoxylon*:** Decoction of stem bark is given to malarial patient. Fruit pulp is eaten for instant relief in dysentery.
- 61. *Eclipta alba*:** This magical herb is used as a hair tonic for rejuvenation of hair and prevention of hair fall. The root paste applied to the scalp. The root powder of *bhringraj* has been used for liver disorders. It also provides relief from piles, treat infection and kidney disorders.
- 62. *Enicostemma littorale*:** *Enicostemma* leaves extract is used to cure stomachache, bitter tonic, and carminative to reduce fever and as a tonic for appetite loss. It reduces blood sugar level in diabetic

patients naturally. The root is crushed into paste, mixed with curd and given in fever.

**63. *Ficus benghalensis*:** Latex of this plant is given to children with sugar for their proper health. Leaf extract is taken orally in case of diarrhoea. Leaves are smeared with warmed oil cake of *Sesamum indicum* and tide to treat colic. The extract of juvenile leaves is given orally to cure diarrhoea.

**64. *Ficus racemosa*:** The stem bark decoction is given in case of diarrhoea. Dried fruit powder (5gm) mixed with latex and given thrice a day to treat dysentery.

**65. *Grewia abutilifolia*:** To treat fractured bone dried root powder/ decoction is given. Warmed leaves tied over swollen body part to relieve.

**66. *Grewia asiatica*:** The root bark paste is used by tribals in rheumatism. The leaves are used as an application to pustule eruptions. The fruits are eaten as liver tonic.

**67. *Holoptelea integrifolia*:** Paste of the fresh leaves is applied to cure ringworm. Leaves are crushed with garlic bulblets, mixed with 2-3 drops of lemon juice and applied on ringworm to cure completely. Leaf paste is applied on eczema, scabies and skin diseases. The leaves are chewed to cure mouthsores.

**68. *Heliotropium indicum*:** The extracted juice from the pounded leaves of the plant is used to cure wounds, skin ulcers. The juice is dropped in eyes to cure conjunctivitis

- 69. *Hemidesmus indicus*:** Roots are boiled in water and administered as regular tonic (Plate-10).
- 70. *Hibiscus rosa-sinensis*:** Decoction of flowers is used with raw sugar in early morning with 2gm butter is helpful in growth of hairs and also beneficial for eyesight. Decoction of flowers is helpful in eye problems.
- 71. *Holarrhena antidysenterica*:** Extract of bark crushed with *Diospyros melanoxylone* stem bark extract taken orally to cure malaria, cough and cold. The decoction of stem is taken twice a day for relief in heart diseases. The plant leaves and stem latex is used as substitute of milk in tea (Plate-10).
- 72. *Hygrophila spinosa*:** The seeds are used as tonic to purify blood and in fever. The seeds are ground to a paste and given with buttermilk for diarrhoea. The ash of the plant is also used in dropsy and gravel.
- 73. *Lantana camara*:** Leaf paste is applied locally to cure of rheumatism and itching.
- 74. *Launaea procumbens*:** The plant is used in the preparation of a cooling *Sharbat* The inner layer of stem is crushed and squeezed over cuts to check bleeding.
- 75. *Lawsonia inermis*:** Paste of leaves used locally twice a day for relief on painful external areas. The leaf is also recommended in giddiness and vertigo. Dried leaf powder applied as coolant and

conditioner for hairs. Leaf paste is applied on soles and palms to cool down body heat and fevers.

**76. *Madhuca indica*:** The flowers and fruits are eaten raw or cooked, the flower can be compressed in to laddus, and seeds are enriched with edible oil, which is used for cooking purposes. Latex of mahua mixed with turmeric powder is useful in cold, cough and bronchitis. Seed oil is laxative and oil is applied to itchy skin. Decoction of stem bark is taken in diabetes. Corollas are fried in ghee and taken to cure piles. Seed oil is used to massage the body to relieve muscular and rheumatic pain and taken orally to cure constipation.

**77. *Mimosa pudica*:** Leaf paste is applied on wounds for faster wound healing process. Leaf juice is given alongwith goat milk to children in case of bronchitis.

**78. *Moringa oleifera*:** Crushed bark are soaked in water overnight and given orally in the morning to relieve rheumatic pain. The stem bark is rubbed on stone with water and taken orally to cure stomachache and smeared locally on swelling. Dried pods are powdered with *ajwain* seeds, garlic bulblets and boiled in whey and eaten to cure of low blood pressure. Roots or leaves are crushed with lime and smeared against dog bite and snake bite.

**79. *Musa paradisiaca*:** Fresh leaves are given orally twice a day for 3 days in diarrhoea while ripe fruit eaten in constipation.

- 80. *Nerium indicum*:** Leaves and flowers paste with brown sugar and goat milk is used to treat malaria, also used as abortifacient. The decoction is used externally to reduce swelling and scabies.
- 81. *Nyctanthes arbor-tristis*:** Leaves are used as laxative and in rheumatism and fever. The leaf juice is used as diaphoretic and diuretic. The powdered seeds are used for scurvy and infections of the scalp. Decoction of stem bark is prepared with the bark of *Ricinus communis*, taken orally for 7 days and fomented as analgesic in rheumatic pain.
- 82. *Ocimum basilicum*:** The inflorescence, leaves and soft stem are blended to make a paste, mixed with cooking oil and heated on a light flame, applied on the painful areas of appendix. Seeds are also useful in vomiting.
- 83. *Origanum majorana*:** It is useful in promoting and regulating menstruation. If taken in the form of an infusion, also promoting the secretion and flow of milk in nourishing mothers. The oil of marwa is beneficial in skin disorders and it can be applied externally in case of bruises, sprain, stiff and paralytic limbs. The herb is beneficial in the treatment of typhoid (Plate-12).
- 84. *Oxalis corniculata*:** The whole plant is edible and used in salads to be eaten raw. Extract of whole plant is useful remedy for hookworm and leaves extract used externally to apply on skin rashes and eruptions, insect bites and burns. Extract of leaves is taken to stimulate appetite.

- 85. *Pandanus fascicularius*:** The tree leaves are often used for flavoring sweet dishes and are also said to have medicinal properties especially in liver disorders.
- 86. *Phoenix sylvestris*:** The sap relief in hurtburn. Root bark paste with sugar is used in jaundice.
- 87. *Phyllanthus emblica*:** Pickles, murrabas and jam are formed by fruit and this helps to improve digestion and also vitality. Amla tea may ameliorate diabetic neuropathy, because it reduces blood sugar, glucose in diabetic patients. Leaves bark or fruits are chewed to cure mouthsores. Fruit powder is mixed with salt, which is taken to improve digestion.
- 88. *Pithecellobium dulce*:** Bark extract is used against dysentery and bark and twig used as a tooth medicine by chewing it.
- 89. *Plumbago zeylanica*:** Juice of 5-10 leaves is taken orally as an antidote in snake bite. Paste of fresh root is applied locally once a day for two days to cure ringworm. Root bark sap, locally apply in haemorrhage and rashes.
- 90. *Pongamia pinnata*:** Whole plant used as a digestive and laxative and to treat inflammation and wounds. Seed powder reduces fever and helps in treating bronchitis and whooping cough. Stem and twigs used as a tooth brush for oral hygiene and for freshness. Crushed root and stem bark is boiled in mustard oil and this medicated oil is used to massage the body to relieve rheumatic pain and applied on boils.

- 91. *Ruellia tuberosa*:** Tuber powder up to 5-10 gm is given with milk for checking abdominal pain after delivery.
- 92. *Ricinus communis*:** Fresh leaves are given orally twice a day for 3 days in vermifuge and seeds have laxative property also. But it leads to infertility in women so it is not recommended for females. Leaves are smeared with ghee or oil, warmed and tide locally on lowar part of stomach to remove fallopian tube blockage. Decoction of root is used against rheumatism and lumbago.
- 93. *Santalum album*:** Sandal wood paste is great for skin. It can be used to improve skin texture, sooth bernt skin and treat eczema and rashes. It can also be used to sooth prickly heat effects.
- 94. *Sida rhombifolia*:** The root powder is used in the treatment of rheumatism and leucorrhoea. Seeds are crushed with the root of *Chlorophytum tuberosum* and *Pedaliium murex*, made into laddoos and given to ladies suffering from leucorrhoea.
- 95. *Solanum nigrum*:** Leaves are used as vegetable regularly and are beneficial in liver diseases. The fruits are eaten against diarrhea and conjunctivitis. Leaves are chewed orally to cure mouthsores. Seeds are eaten to cure liver problem. Dried root is rubbed on stone and applied against snake bite.
- 96. *Syzygium cumini*:** Seed powder and bark powder are used in diabetes. The tender leaves are used to control vomiting. Extract of leaves is given in diarrhoea, 2 leaves are crushed into paste and mixed in curd and suspension is taken orally. Decoction of bark is

used to cook rice and eaten in dysentery. Fresh fruits or powder is taken with salt in case of indigestion.

**97. *Syzygium heyneanum*:** Paste of bark is applied locally to cure wound.

**98. *Tamarindus indica*:** Stem bark decoction is given twice a day for diarrhoea. Juice made from the pulp mixed with lemon juice is taken 2-3 times in a day for dysentery. Leaf paste is mixed with turmeric powder alongwith termitary soil and smeared over fractured bone. Ash of bark is mixed with ghee and applied locally on boils.

**99. *Tephrosia purpurea*:** Root is chewed slowly twice a day to cure toothache. The application is repeated if required. Paste of leaves is made with leaves of *Cannabis sativa* and applied locally to check pile bleeding.

**100. *Terminalia arjuna*:** Leaf decoction is taken for flatulent distension of abdomen. It is applied as a paste on pimples and other minor skin eruptions. Seeds are used as an external application to parasitic skin diseases. Stem bark powder is used as tea with milk for high blood pressure.

**101. *Terminalia bellirica*:** Pulp of fruit is helpful in curing dropsy, leprosy and diarrhoea. Fruit powder is taken against cough, throat problems, stomachache and enlarged spleen (Plate-12).

**102. *Tinospora cordifolia*:** Fresh stem/ crushed stem bark is soaked in water overnight and given orally in the morning for 7 days as

blood purifier. Stem decoction is used for chronic fever. Leaves are smeared with oil or ghee, warmed and tide over fractured bone to cure early. Plant juice is given to cure of malaria and jaundice.

**103. *Trapa natans*:** Seed powder is used to prepare laddoes and eaten by women to cure leucorrhoea.

**104. *Tribulus terrestris*:** Seed powder mixed with the flour of wheat to make bread with high nutritive value. The fruit powder is also used as a remedy for urinary disorders and impotency. Seeds are used in preparation of laddoes and eaten as refrigerant in summers.

**105. *Tridax procumbens*:** The leaf juice is dropped on wounds and cuts to stop bleeding. Roots and leaves used to cure sexual weakness, cough, dropsy and diuretic condition. Plant juice is taken thrice a day to cure fever, diarrhoea and dysentery. Juice with candy is taken six times a day in flatulence. The half glass of plant juice is mixed with cow milk and sugar taken from 4<sup>th</sup> day of menses to menopause and from 4<sup>th</sup> day of menses for three days as contraceptive. Leaf paste is given with milk to woman in the morning for 8 days to stop bleeding during pregnancy time.

**106. *Typha angustata*:** The inflorescence is split in to the two halves length-wise and one half is tied as dressing over deep wounds for early healing.

**107. *Vernonia cinerea*:** Stem bark and leaves are used to treat intermitted fever, blisters boils and vaginal discharges. Its fresh

juice is given to children to treat urinary incontinence. Plant leaves can be eaten like a vegetable. Young leaves are used for the treatment of tonsils. Plant juice is mixed with black pepper powder and candy and taken as a refrigerant during summers.

- 108. *Vitex negundo*:** Leaf extract is poured in the eyes to cure conjunctivitis. Leaves are boiled in earthen pot and used orally twice a day, it is beneficial in rheumatism. Mixture of 100 gm root powder of *negal*, 200 gm tuber powder of *Chlorophytum* species (market supplement) and 100 gm powder of *Eulophia* species (market supplement) is prepared. One tbsp of this powder is taken orally by the tribal men with milk to overcome sexual debility.
- 109. *Withania somnifera*:** The tuberpowder is given to check constipation. One tea spoon full of root powder is given with 250 ml milk, twice a day in rheumatism. Mature leaves are smeared with ghee or oil warmed and tide locally on boils, pimples and around the neck to relieve tonsils. Leaf juice is applied locally against skin diseases. Root powder is used to make laddoes and given orally to relieve rheumatic pain.
- 110. *Ziziphus mauritiana*:** Leaf paste is applied locally against insect bite and as styptic.
- 111. *Ziziphus nummularia*:** Crushed root bark is soaked in water overnight and given orally in the morning to cure abortifacient. Tribal ladies chewed the root after delivery. Leaf paste is applied locally against scorpion sting, boils, pimples, skin diseases and hair

falling. The leaf powder is mixed with curd or leaf paste of *Commelina* and given thrice a day to cure diarrhoea and dysentery.

**Table- 4.4: The plants Ethnomedicinal plants of the Partapgarh**

| S. No. | Botanical Name               | Plant Part            | Medicinal Uses                                       |
|--------|------------------------------|-----------------------|--|
| 1      | <i>Abrus precatorius</i>     | Leaves/<br>Seeds      | Blisters, Antifertility,<br>Contraceptive            |
| 2      | <i>Abutilon indicum</i>      | Leaves                | Dysentery, Urinary<br>troubles                       |
| 3      | <i>Acacia catechu</i>        | Gum                   | Stomachache  |
| 4      | <i>Acacia leucophloea</i>    | Stem bark             | Sexual weakness,<br>menstrual cycle<br>complications |
| 5      | <i>Acacia nilotica</i>       | Bark/<br>Leaves       | Healing wounds                                       |
| 6      | <i>Actiniopteris radiata</i> | Laves                 | Stone, Ulcer   |
| 7      | <i>Adansonia digitata</i>    | Fruit pulp            | Acidity  |
| 8      | <i>Adhatoda zeylanica</i>    | Leaf sap              | Cough  |
| 9      | <i>Adina cardifolia</i>      | Stem bark             | Stomachache  |
| 10     | <i>Aegle marmelos</i>        | Fruit pulp            | Constipation,<br>Diarrhoea                           |
| 11     | <i>Ageratum conyzoides</i>   | Leaf                  | Blood clotting                                       |
| 12     | <i>Alangium salvifolium</i>  | Root extract/<br>Bark | Abortifacient, High<br>blood pressure                |
| 13     | <i>Albizia lebbeck</i>       | Leaves                | Conjunctivitis                                       |
| 14     | <i>Allium sativum</i>        | Bulbs                 | Fever, Cough   |
| 15     | <i>Aloe barbadensis</i>      | Pulp of<br>leaves     | Liver disease, Skin<br>problems                      |
| 16     | <i>Amaranthus caudatus</i>   | Seeds                 | Constipation<br>problems                             |
| 17     | <i>Ammannia baccifera</i>    | whole plant           | Fever, guinea worm                                   |
| 18     | <i>Annona squamosa</i>       | Seeds                 | Wound healing,<br>body coolant                       |
| 19     | <i>Anogeissus latifolia</i>  | Bark extract          | Antivenom, damaged<br>tissue repair                  |
| 20     | <i>Antigonon leptopus</i>    | Leaves                | Blisters   |

|    |                                      |                                     |  |
|----|--------------------------------------|-------------------------------------|--|
| 21 | <i>Argemone mexicana</i>             | Leaves<br>decoction                 | Malaria fever, Ulcer,<br>Skin problems,<br>Jaundice                                    |
| 22 | <i>Aristolochia indica</i>           | Leaves/ Root                        | Rheumatism and<br>Snake bite   |
| 23 | <i>Azadirachta indica</i>            | Leaves/Stem/<br>Bark                | Blood purification,<br>Chronic fever, Skin<br>diseases,                                |
| 24 | <i>Barleria cuspidata</i>            | Leaves/<br>Root/ Stem               | Toothache, mouth<br>sores, teeth problem   |
| 25 | <i>Barleria prionitis</i>            | Leaf<br>decoction                   | Cough, Toothache,<br>Blisters  |
| 26 | <i>Bauhinia purpurea</i>             | Flowers/<br>Leaves/ Bark            | Diarrhoea, Leprosy,<br>Laxative  |
| 27 | <i>Bauhinia variegata</i>            | Flowers/<br>Leaves/ Bark            | Diarrhoea, Leprosy,<br>Laxative  |
| 28 | <i>Boerhavia diffusa</i>             | Leaves/ Root                        | Diuretic, Jaundice,<br>Liver complications,<br>Snake bite                              |
| 29 | <i>Bombax ceiba</i>                  | Gum/ Leaves/<br>Root bark           | Diuretic, Skin<br>disease, tonic for<br>children's                                     |
| 30 | <i>Boswellia serrata</i>             | Stem bark                           | Stomachache,<br>Bleeding wounds  |
| 31 | <i>Buchanania latifolia</i>          | Kernels/<br>Stem bark               | Prickly heat, Facial<br>blemishes, Diarrhoea   |
| 32 | <i>Butea monosperma</i>              | Gum/ Stem<br>bark/ Seeds/<br>Leaves | Chronic dysentery,<br>guinea worm, sprain,<br>fracture, (after<br>delivery - Kamarkas) |
| 33 | <i>Calotropis gigantea</i>           | Bark/ Latex                         | Cough, Skin<br>disease, Eye flu  |
| 34 | <i>Calotropis procera</i>            | Leaves/Stem/<br>Bark                | Swelling, Skin<br>disease, Coughing  |
| 35 | <i>Cannabis sativa</i>               | Leaves                              | Piles  |
| 36 | <i>Cardiospermum<br/>halicacabum</i> | Paste of plant                      | Earache, rheumatism  |
| 37 | <i>Cassia fistula</i>                | Stem bark                           | Diarrhoea  |
| 38 | <i>Cassia occidentalis</i>           | Leaves                              | Fractured bone,<br>Oral, Gum problems  |

|    |                                 |                              |  |
|----|---------------------------------|------------------------------|--|
| 39 | <i>Cassia tora</i>              | Seeds                        | Galactagogue, Ring worm, Asthma                    |
| 40 | <i>Catharanthus roseus</i>      | Leaves                       | Bleeding wounds, Acne, Eczema                      |
| 41 | <i>Celastrus paniculata</i>     | Stem bark/<br>Fruit/Seeds    | Snake bite, Dropsy                                 |
| 42 | <i>Centella asiatica</i>        | Leaves/<br>Stem              | Brain tonic, Diuretic, Leprosy                     |
| 43 | <i>Ceropegia bulbosa</i>        | Bulb                         | Ethnomedicine                                      |
| 44 | <i>Chlorophytum tuberosum</i>   | Tubers/<br>Fasciculate roots | Anemic condition, Body strength                    |
| 45 | <i>Chrozophora rottleri</i>     | Leaves                       | Sun burn   |
| 46 | <i>Cissampelos pareira</i>      | Root                         | Pneumonia, Diarrhoea, Bronchitis                   |
| 47 | <i>Cissus quadrangularis</i>    | Whole plant                  | Asthma, Strong skeleton                            |
| 48 | <i>Citrus aurantifolia</i>      | Fruit juice                  | Asthma   |
| 49 | <i>Citrus medica</i>            | Fruit/ Leaves                | Blisters, Stomachache, eczema, ringworm            |
| 50 | <i>Cleome gynandra</i>          | Whole plant                  | Skin diseases, diarrhea                            |
| 51 | <i>Cleome viscosa</i>           | Leaves/ Stem                 | Scabies, ringworm, boils                           |
| 52 | <i>Cocculus hirsutus</i>        | Whole plant                  | Menstrual Cycle disorders, Paralysis, Galactagogue |
| 53 | <i>Convolvulus microphyllus</i> | Whole plant/<br>Leaves       | Mind tonic, Diabetes, Fever, cough                 |
| 54 | <i>Cordia dichotoma</i>         | Fruit/ Seed<br>Kernel        | Anti bacterial, Laxative                           |
| 55 | <i>Cuscuta reflexa</i>          | Whole plant                  | Bilious disorder, Purgative, Jaundice              |
| 56 | <i>Datura innoxia</i>           | Leaves                       | Pus, Boil  |
| 57 | <i>Datura stramonium</i>        | Fruits/ Seeds                | Diarrhoea, Rheumatic Pain                          |

|    |                                   |                                |   |
|----|-----------------------------------|--------------------------------|---|
| 58 | <i>Dalbergia sisso</i>            | Leaves                         | Laxative value  |
| 59 | <i>Desmodium velutinum</i>        | Whole plant                    | Dysentery, Snake bite, Stomachache, Skin problems, Abdominal pain |
| 60 | <i>Diospyros melanoxylon</i>      | Stem bark decoction            | Malaria   |
| 61 | <i>Eclipta alba</i>               | Whole plant                    | Hair tonic, Liver disorder, Piles, Kidney disorders               |
| 62 | <i>Enicostemma littorale</i>      | Whole plant                    | Fever, Stomachache, Diabetes                                      |
| 63 | <i>Ficus benghalensis</i>         | Leaf extract/ Latex            | Diarrhoea, Health tonic   |
| 64 | <i>Ficus racemosa</i>             | Stem bark/ Fruit               | Health tonic  |
| 65 | <i>Grewia abutilifolia</i>        | Root powder/ Leaves            | Bone fracture, Swelling   |
| 66 | <i>Grewia asiatica</i>            | Root powder/ Leaves            | Rheumatism, Skin problems   |
| 67 | <i>Holoptelea integrifolia</i>    | Leaves                         | Ringworm  |
| 68 | <i>Heliotropium indicum</i>       | Leaves                         | Wounds, Skin ulcers, Conjunctivitis                               |
| 69 | <i>Hemidesmus indicus</i>         | Roots                          | Health tonic  |
| 70 | <i>Hibiscus rosa-sinensis</i>     | Flower decoction               | Hair tonic  |
| 71 | <i>Holarrhena antidysenterica</i> | Stem/ Latex/ Decoction/ Leaves | Heart disease, Herbal tea   |
| 72 | <i>Hygrophila spinosa</i>         | Whole plant                    | Tonic, Blood disorders, Fever, Diarrhoea                          |
| 73 | <i>Lantana camara</i>             | Leaves                         | Rheumatism, Itching   |
| 74 | <i>Launaea procumbens</i>         | Leaf                           | Anti Inflammatory, Herbal sherbet                                 |
| 75 | <i>Lawsonia inermis</i>           | Leaves                         | Coolant, Conditioner, Giddiness, Vertigo                          |

|    |                                      |   |   |
|----|--------------------------------------|---|---|
| 76 | <i>Madhuca indica</i>                | Flower/<br>Fruits/ Latex                  | Cold, Cough,<br>Bronchitis, Itchy<br>Skin                         |
| 77 | <i>Mimosa pudica</i>                 | Leaves                                    | wounds, Skin<br>problems,<br>Gynecological<br>disorders           |
| 78 | <i>Moringa oleifera</i>              | Pod/ Bark                                 | Rheumatic pain  |
| 79 | <i>Musa paradisiaca</i>              | Leaves/ Fruit                             | Diarrhoea,<br>Constipation  |
| 80 | <i>Nerium indicum</i>                | Leaves/<br>Flowers                        | Malaria, Swelling,<br>Scabies,<br>Anticancerous                   |
| 81 | <i>Nyctanthes arbor-<br/>tristis</i> | Leaves/<br>Seeds                          | Laxative,<br>Rheumatism, Fever,<br>Diuretic, Scurvy               |
| 82 | <i>Ocimum basilicum</i>              | Inflorescence<br>/Flower/<br>Leaves/ Stem | Pain, Sprain,<br>Appendix, Vomit<br>Effect                        |
| 83 | <i>Origanum majorana</i>             | Essential leaf<br>oil                     | Rheumatism pain,<br>Skin disorders,<br>Sprain, Paralytic<br>limbs |
| 84 | <i>Oxalis corniculata</i>            | Whole plant/<br>Leaves                    | Hookworm, Skin<br>rashes, Insect bite,<br>Burn                    |
| 85 | <i>Pandanus fascicularius</i>        | Leaves/ Bark                              | Liver disorders   |
| 86 | <i>Phoenix sylvestris</i>            | Fruit/ Sap                                | Tooth,<br>Gum problems  |
| 87 | <i>Phyllanthus emblica</i>           | Whole plant                               | Diabetes,<br>Skin diseases  |
| 88 | <i>Pithecellobium dulce</i>          | Bark/Stem                                 | Dysentery,<br>Toothache   |
| 89 | <i>Plumbago zeylanica</i>            | Leaves/ Root                              | Antidote of snake<br>bite, Ring worm                              |
| 90 | <i>Pongamia pinnata</i>              | Seed oil                                  | Rheumatic pain,<br>Boils, Dental caries                           |
| 91 | <i>Ruellia tuberosa</i>              | Tuber                                     | Abdominal pain  |
| 92 | <i>Ricinus communis</i>              | Leaves/ Oil                               | Laxative, Vermifuge   |

|     |                             |                     |  |
|-----|-----------------------------|---------------------|--|
| 93  | <i>Santalum album</i>       | Wood/ Oil           | Skin disorders, Sooth, Burnt, Eczema, Rashes, Prickly heat                 |
| 94  | <i>Sida rhombifolia</i>     | Leaves/ Root        | Rheumatism, Leucorrhoea, Anti bacterial activities, Skin disease, Diuretic |
| 95  | <i>Solanum nigrum</i>       | Leaves              | Liver diseases   |
| 96  | <i>Syzygium cumini</i>      | Bark/ Leaves/ Seeds | Diabetes, Vomiting   |
| 97  | <i>Syzygium heyneanum</i>   | Bark                | Wound healing  |
| 98  | <i>Tamarindus indica</i>    | Stem bark           | Diarrhoea, Dysentery   |
| 99  | <i>Tephrosia purpurea</i>   | Root                | Toothache  |
| 100 | <i>Terminalia arjuna</i>    | Leaves/ Seed        | Abdomen pain, Skin eruptions, High blood pressure                          |
| 101 | <i>Terminalia bellirica</i> | Whole plant         | Dropsy, Leprosy, Diarrhoea, Antibiotic properties                          |
| 102 | <i>Tinospora cordifolia</i> | Stem                | Blood purification, Chronic fever, Fever, painful lactation                |
| 103 | <i>Trapa natans</i>         | Seeds/Fruit         | Leucorrhoea  |
| 104 | <i>Tribulus terrestris</i>  | Seeds/ Fruit        | Refrigerant, urinary stone, health tonic                                   |
| 105 | <i>Tridax procumbens</i>    | Leaf/ Roots         | Wound healing, Sexual weakness, Cough, Dropsy, Diuretic                    |
| 106 | <i>Typha angustata</i>      | Inflorescence       | Wound healing  |
| 107 | <i>Vernonia cinerea</i>     | Whole plant         | Fever, Blisters, Boils, Urinary infection in children's, Tonsils           |
| 108 | <i>Vitex negundo</i>        | Leaf/ Root          | Conjunctivitis, Rheumatism, Sexual impotency                               |

|     |                            |             |   |
|-----|----------------------------|-------------|---|
| 109 | <i>Withania somnifera</i>  | Whole plant | Constipation,<br>Rheumatism,<br>Stronger nerves<br>system |
| 110 | <i>Ziziphus mauritiana</i> | Leaf        | Insect bite, styptic                                      |
| 111 | <i>Ziziphus nummularia</i> | Root bark   | Abortifacient,<br>Laxative                                |

### DATA ANALYSIS

**(1) Data as on medicinal plants were considered to be reliable if:**

- a. The same information was received more than once or from more than one person not in contact with each other.
- b. Same information was received at two or more different places within a village.
- c. The same information was received from other localities.
- d. Information was received in-group.

**(2) The credibility of information was established by using following criteria:**

- a. When narrated as a personal earlier experience of the informer.
- b. By pluralistic uses in other communities of Rajasthan or other states in India.
- c. By some or allied uses in literature or same uses of allied species in other regions.

**(3) The morden medical equivalent of diseases identified by tribals were ascertained in following ways:**

- a. From available staff with experience in the same area in PHCs or Ayurvedic dispensaries.
- b. On the basis of symptoms noted from medical literature.
- c. On the basis of symptoms noted, confirming with qualified medical personnel with whom in touch.

## PLANTS AND DISEASES

The medicinal plants have been categorized on the basis of diseases in which they are used:

**Blisters:** *Abrus precatorius*, *Barleria prionitis* *Citrus medica*,  
*Antigonon leptopus* and *Vernonia cinerea*

**Antifertility:** *Abrus precatorius*

**Contraceptive:** *Abrus precatorius*

**Dysentery:** *Pithecellobium dulce*, *Desmodium velutinum*, *Abutilon indicum*, *Tamarindus indica* and *Butea monosperma*

**Urinary problems:** *Abutilon indicum*, *Tribulus terrestris* and *Vernonia cinerea*

**Stomachache:** *Acacia catechu*, *Adina cardifolia*, *Citrus medica*,  
*Desmodium velutinum* and *Enicostemma littorale*

**Sexual weakness:** *Acacia leucophloea*, *Tridax procumbens* and *Vitex negundo*

**Menstrual problem:** *Acacia leucophloea* and *Cocculus hirsutus*

**Wound healing:** *Acacia nilotica*, *Boswellia serrata*, *Catharanthus roseus*, *Heliotropium indicum*, *Mimosa pudica*, *Syzygium heyneanum*, *Tridax procumbens* and *Typha angustata*

**Stone:** *Tribulus terrestris* and *Actiniopteris radiata*

**Ulcer:** *Actiniopteris radiata*, *Argemone Mexicana* and *Heliotropium indicum*

**Acidity:** *Adansonia digitata*

**Cough:** *Adhatoda zeylanica*, *Allium sativum*, *Convolvulus microphyllus*, *Madhuca indica* and *Tridax procumbens*

**Constipation:** *Aegle marmelos*, *Amaranthus caudatus*, *Musa paradisiacal* and *Withania somnifera*

**Diarrhoea:** *Aegle marmelos*, *Boerhavia diffusa*, *Cissampelos pareira*, *Cleome gynandra*, *Datura stramonium*, *Desmodium velutinum*, *Ficus benghalensis*, *Hygrophila spinosa*, *Terminalia bellirica* and *Cassia fistula*

**Blood clotting:** *Ageratum conyzoides*

**Abortifacient:** *Alangium salvifolium* and *Ziziphus nummularia*

**Blood pressure:** *Terminalia arjuna* and *Alangium salvifolium*

**Conjunctivitis/ Eye flu:** *Albizia lebbeck*, *Calotropis gigantean*,  
*Heliotropium indicum* and *Vitex negundo*

**Fever:** *Allium sativum*, *Amaranthus caudatus*, *Argemone mexicana*,  
*Azadirachta indica*, *Convolvulus microphyllus*,  
*Enicostemma littorale*, *Hygrophila spinosa*, *Nyctanthes*  
*arbor-tristis*, *Tinospora cordifolia* and *Vernonia cinerea*

**Liver disease:** *Solanum nigrum*, *Pandanus fascicularius*, *Eclipta*  
*alba*, *Boerhavia diffusa* and *Aloe barbadensis*

**Skin problems:** *Aloe barbadensis*, *Argemone mexicana*, *Cleome*  
*gynandra*, *Desmodium velutinum*, *Grewia asiatica*, *Mimosa*  
*pudica*, *Origanum majorana*, *Oxalis corniculata*,  
*Phyllanthus emblica*, *Santalum album* and *Catharanthus*  
*roseus*

**Guinea worm:** *Butea monosperma* and *Ammannia baccifera*

**Prickly heat/ Body coolent:** *Annona squamosa*, *Buchanania latifolia*,  
*Lawsonia inermis* and *Santalum album*

**Antivenom/ Snake bite:** *Anogeissus latifolia*, *Aristolochia indica*,  
*Boerhavia diffusa*, *Celastrus paniculata*, *Desmodium*  
*velutinum*, *Plumbago zeylanica*

**Tissue repair:** *Anogeissus latifolia*

**Malaria:** *Argemone Mexicana*, *Diospyros melanoxylon* and *Nerium*  
*indicum*

**Jaundice:** *Argemone Mexicana*, *Boerhavia diffusa* and *Cuscuta reflexa*

**Rheumatism:** *Datura stramonium*, *Cardiospermum halicacabum*, *Aristolochia indica*, *Grewia asiatica*, *Lantana camara*, *Origanum majorana*, *Pongamia pinnata*, *Sida rhombifolia*, *Vitex negundo* and *Withania somnifera*

**Blood purification:** *Tinospora cordifolia*, *Hygrophila spinosa* and *Azadirachta indica*

**Toothache:** *Barleria cuspidata*, *Barleria prionitis*, *Pithecellobium dulce* and *Tephrosia purpurea*

**Leprosy:** *Terminalia bellirica*, *Centella asiatica*, *Bauhinia purpurea* and *Bauhinia variegata*

**Laxative:** *Bauhinia purpurea*, *Bauhinia variegata*, *Cordia dichotoma*, *Delbergia sisso*, *Nyctanthes arbor-tristis*, *Ricinus communis* and *Ziziphus nummularia*

**Diuretic:** *Tridax procumbens*, *Nyctanthes arbor-tristis*, *Sida rhombifolia*, *Boerhavia diffusa*, *Bombax ceiba* and *Centella asiatica*

**Health tonic:** *Bombax ceiba*, *Chlorophytum tuberosum*, *Ficus benghalensis*, *Ficus racemosa*, *Hemidesmus indicus*, *Hygrophila spinosa* and *Tribulus terrestris*

**Facial blemishes:** *Buchanania latifolia*

**Sprain:** *Butea monosperma*, *Ocimum basilicum* and *Origanum majorana*

**Bone fracture:** *Butea monosperma*, *Cassia occidentalis*, *Grewia abutilifolia*

**Swelling:** *Grewia abutilifolia*, *Nerium indicum* and *Calotropis procera*

**Piles:** *Cannabis sativa* and *Eclipta alba*

**Oral and Gum problems:** *Cassia occidentalis* and *Phoenix sylvestris*

**Galactagogue:** *Cocculus hirsutus* and *Cassia tora*

**Ring worm:** *Cassia tora*, *Citrus medica*, *Cleome viscosa*, *Holoptelea integrifolia* and *Plumbago zeylanica*

**Asthma:** *Cassia tora*, *Cissus quadrangularis* and *Citrus aurantifolia*

**Eczema:** *Citrus medica*, *Catharanthus roseus* and *Santalum album*

**Dropsy:** *Terminalia bellirica*, *Tridax procumbens* and *Celastrus paniculata*

**Anemia:** *Chlorophytum tuberosum*

**Sunburn:** *Chrozophora rotleri* and *Santalum album*

**Pneumonia:** *Cissampelos pareira*

**Bronchitis:** *Cissampelos pareira* and *Madhuca indica*

**Scabies:** *Nerium indicum* and *Cleome viscosa*

**Boils and Pimples:** *Cleome viscosa*, *Datura innoxia*, *Phoenix sylvestris* and *Vernonia cinerea*

**Acne:** *Catharanthus roseus*

**Paralysis:** *Cocculus hirsutus* and *Origanum majorana*

**Diabetes:** *Phyllanthus emblica*, *Syzygium cumini*, *Enicostemma littorale* and *Convolvulus microphyllus*

**Purgative:** *Cuscuta reflexa*

**Abdominal pain:** *Desmodium velutinum*, *Ruellia tuberosa* and *Terminalia arjuna*

**Kidney disorders:** *Eclipta alba*

**Heart disease:** *Holarrhena antidysenterica*

**Itching:** *Lantana camara* and *Madhuca indica*

**Anti-inflammatory:** *Launaea procumbens*

**Coolant:** *Lawsonia inermis*, *Santalum album*, *Tribulus terrestris* and *Annona squamosa*

**Hair conditioner:** *Hibiscus rosa-sinensis* and *Lawsonia inermis*

**Giddiness:** *Lawsonia inermis*

**Vertigo:** *Lawsonia inermis*

**Cold:** *Madhuca indica*

**Gynecological disorders:** *Mimosa pudica*

**Vomit effect:** *Ocimum basilicum* and *Syzygium cumini*

**Hookworm:** *Oxalis corniculata*

**Insect bite:** *Oxalis corniculata* and *Ziziphus mauritiana*

**Vermifuge:** *Ricinus communis*

**Leucorrhoea:** *Sida rhombifolia* and *Trapa natans*

**Painful lactation:** *Tinospora cordifolia*

**Urinary stone:** *Tribulus terrestris*

**Sexual weakness:** *Tridax procumbens* and *Vitex negundo*

**Tonsils:** *Vernonia cinerea*

**Urinary infection:** *Vernonia cinerea*

### MODE OF ADMINISTRATION

Around one hundred eleven plant species are used by tribal and traditional communities for 77 diseases. Most common diseases are abdominal disorders, cough and cold, diarrhoea, skin diseases, rheumatic pain, dysentery, fever, toothache and wounds.

**The various modes of administration are as follows:**

- (1) Plant part made edible either by powdering, burning or frying and mixing with other ingredient or food.
- (2) Raw plants/ parts/ products.
- (3) Extract by crushing or pounding fresh drug or slicing it.
- (4) Juice /simple rubbing of plant part.
- (5) Poultices.
- (6) Decoction/ gargle.
- (7) Ash of plant.
- (8) Paste.
- (9) As tooth brush/ chewing.
- (10) Suppositories.
- (11) Herbal bath (bath with water in which the drug is crushed or boiled).
- (12) Tying drug to body part.
- (13) Vapour bath by burning/ boiling drug.
- (14) Oils.
- (15) Cooking as vegetables, laddoes *etc.*

**Most common plants which used in various diseases are:**

*Acacia nilotica, Aloe vera, Annona squamosa, Azadirachta indica, Boerhavia diffusa, Enicostemma littorale, Haloptelea integrifolia, Hibiscus rosa-sinesis, Holarrhena antidysenterica, Lawsonia inermis, Madhuca indica, Ocimum basilicum, Phoenix sylvestris, Phyllanthus emblica, Ricinus communis Tinospora cordifolia, Vernonia cinerea etc.* (Table 4.4 and Plate- 8 to12).

Some highly medicinal plants which have high value of medicinal property are growing in this area such as *Curculigo orchioides, Gloriosa superba, Helicteres isora* and *Echinops echinatus* (Plate-9 and 11), some of them also categorised threatened species for this region. The tribal medicinal system is an elaborate one. It must be efficacious, since tribal and traditional communities in seclusion have been surviving since ages without aid of modern medicine. Before they are fully acculturized, there is an urgent need of an organized multidisciplinary probe into the ethnomedicine of tribals. There is enough scope of amalgamation of ethnomedicine in the mainstream of prevalent medicinal system, following their phytochemical and biological screening together with clinical trials.

## **VI. VETERINARY MEDICINE**

Before prehistoric period domestic animals started to act under the direction of man. Horse was perhaps the first domesticated animal for the service of mankind. Domestic animals played a very significant role in tribal life for food, milk, leather, fat transport *etc.* these all

domesticated animals are mentioned in *Vedas and upnishad*. In this part of chapter observations were made that how tribal and rural people cure their domestic animals by using different plant species which are follows as Table 4.5.

**Table 4.5: The plants used as veterinary medicine by the Partapgarh tribal**

| S.No. | Botanical Name               | disease                 | Mode of treatment and useful part   |
|-------|------------------------------|-------------------------|---|
| 1     | <i>Abrus precatorius</i>     | Arbespectares           | Seeds are given orally  |
| 2     | <i>Acacia catechu</i>        | Scabies                 | Catechu is smeared locally  |
| 3     | <i>Acacia sinuata</i>        | Retention of placenta   | Stem bark with root of <i>Z. nummularia</i> is boiled in water given orally |
| 4     | <i>Aegle marmelos</i>        | Body heat and Diarrhoea | Fruit pulp is given   |
| 5     | <i>Allium sativum</i>        | Fever                   | Bulblets and jaggery are boiled with milk and given                         |
| 6     | <i>Aloe barbadensis</i>      | Boil                    | Leaf paste is given with fodder   |
| 7     | <i>Azadirachta indica</i>    | Foot and mouth disease  | Leaves are boiled in water, used to wash mouth and hooves                   |
| 8     | <i>Butea monosperma</i>      | Prolapsus of uterus     | Roots are crushed, boiled in water and given.                               |
| 9     | <i>Cicer arietinum</i>       | Diarrhoea               | Flour is given with butter milk   |
| 10    | <i>Cissus quadrangularis</i> | Bone fracture           | Paste of stem is given and smeared/ tied                                    |
| 11    | <i>Citrus medica</i>         | Indigestion             | Crushed leaves are  |

|    |                               |                             |  |
|----|-------------------------------|-----------------------------|--|
|    |                               |                             | given  |
| 12 | <i>Cleome gynandra</i>        | Maggots                     | Plant juice is sprayed locally   |
| 13 | <i>Cocculus hirsutus</i>      | Diarrhoea                   | Whole plant is given   |
| 14 | <i>Cordia dichotoma</i>       | Tumpley                     | Dried fruit is given with water  |
| 15 | <i>Curcuma amada</i>          | Muscular pain               | Boiled rhizome powder is given with ghee or oil.   |
| 16 | <i>Curcuma longa</i>          | Retention of placenta       | Turmeric powder is given with jaggery and oil  |
| 17 | <i>Diospyros melanoxyton</i>  | Foot and mouth disease      | Fruit juice is applied locally   |
| 18 | <i>Euphorbia hirta</i>        | Diarrhoea, Intestinal worms | Leaf paste is given with water   |
| 19 | <i>Gloriosa superba</i>       | Mastitis, Swelling          | Crushed root is given with liquor  |
| 20 | <i>Gymnema sylvestre</i>      | Exposure to disease         | Warmed paste of leaves is given  |
| 21 | <i>Ichnocarpus frutescens</i> | Prolapsus of uterus         | Leaf paste is mixed with dry ginger, boiled and given  |
| 22 | <i>Launaea procumbens</i>     | Diarrhoea                   | Crushed root is given with curd  |
| 23 | <i>Lawsonia inermis</i>       | Body heat                   | Leaf paste is given with butter milk.  |
| 24 | <i>Madhuca indica</i>         | Swelling, Tumour            | Stem bark is rubbed on stone and applied locally in tumour, while in swelling stem bark boiled in water with jaggery is given orally |
| 25 | <i>Nicotiana tabacum</i>      | Tumpley                     | Leaves are mixed in water and filtered, This   |

|    |                             |                               |   |
|----|-----------------------------|-------------------------------|---|
|    |                             |                               | water is given with fodder  |
| 26 | <i>Ocimum canum</i>         | Diarrhoea, Insect repellent   | Seed paste is given with whey, Leaves are rubbed over body to keep away insects   |
| 27 | <i>Pedaliium murex</i>      | Body heat and Diarrhoea       | Plant is soaked in water for 4-5 hours. This medicated water is given to drink.   |
| 28 | <i>Pithecellobium dulce</i> | Boils                         | Warmed leaves with leaves of castor are tied  |
| 29 | <i>Ricinus communis</i>     | Scabies                       | Oil is applied over affected area   |
| 30 | <i>Solanum nigrum</i>       | Exposure to disease           | Leaves are crushed into paste and given   |
| 31 | <i>Tribulus terrestris</i>  | Body heat                     | Crushed seeds are given in cattle food.   |
| 32 | <i>Tridax procumbens</i>    | Retention of placenta, Wounds | Paste of 20-30 gm leaves are mixed with cowdung cake and given with water, while in wounds plant juice is dipped over affected area |
| 33 | <i>Ziziphus nummularia</i>  | Conjunctivitis                | Leaf juice is dropped in eyes   |

**CONCLUSION:** Present findings indicate that different folk inhabitants of the area are conscious for the health of their livestock, as they depend on them to substantiate their livelihood. Most common diseases amongst these animals are parasitic diseases that may be ecto or endoparasitic. Main parasites are tape worm; hook worm, lice, ticks, liver flukes *etc.* Indigestion and diarrhoea are the major diseases related to diet. Infection in hooves and retention of placenta after

delivery are very common amongst animals. Plants like *Pithecellobium dulce*, *Butea monosperma*, *Cordia dichotoma*, *Abrus precatorious*, and *Lawsonia inermis* are used similarly by other tribal and traditional communities in other parts of country. The traditional knowledge of above plant species to cure a particular ailment of livestock is confined to primitive people and passes from one generation to another. Therefore, detailed phytochemical and pharmacological studies are required for positive exploitation and wider application of these ethnoveterinary drugs.

## VII. PLANTS USED FOR SHELTER

The tribal people construct their dwellings artistically near sources of water supply or their agriculture fields. Traditionally the huts are built on a separate place outside the village or on a separate forest hillock or ridge, thatched them in sloping style with straw or plant twigs or leaves along with half-baked tiles. In the areas where temperature rise upto 48°C and the annual rainfall is more they construct their houses using mud, unbaked bricks and stone for the wall and grasses, leaves of bamboos and tiles for the roof. Most of the houses in the plains, are 'Kachha' and rectangular. The roof is either thatched or covered with baked mud tiles.

### Tribal Shelter

Four walls of hut are made up of mud bricks, plastered with clay and cow dung. There are four poles at four corners of the hut to support the wall as well as the roof. The poles may be of the following

plant species included: *Acacia nilotica*, *Anogeissus latifolia*, *Ficus religiosa*, *Ficus benghalensis*, *Prosopis cineraria*, *Prosopis juliflora*, *Terminalia tomentosa* and *Wrightia tinctoria* etc (Plate- 13 and 14).

Mostly tribal huts have sloping roof covered with thatching material. The slender dried twigs of following plant species are commonly used for thatching - *Acacia nilotica*, *Anogeissus pendula*, *Bauhinia racemosa*, *Calotropis procera*, *Pennisetum americanum*, *Prosopis cineraria*, *Prosopis juliflora*, *Saccharum bengalense*, *Saccharum spontaneum*, *Tecomella undulata*, *Ziziphus nummularia*. The wooden slender twigs and branches of few plants are used in the construction of wooden network.

The thatching material mainly consists of culms, leaves and inflorescence of *Saccharum bengalense*. The culms and leaves of *Pennisetum americanum*, *Typha angustata* and *Desmostachya bipinnata* are also used for it. The thatched roof (Chhan) is constructed separately on the ground and later placed on the network. The ropes used for construction of thatching material are made up of *Pennisetum americanum* and *Saccharum bengalense*.

Three beams used for the support of the roof are made up of *Acacia nilotica*, *Anogeissus pendula*, *Azadirachta indica*, *Anogeissus latifolia* and *Terminalia tomentosa*. The first longer one running longitudinally in the centre of two sloping parts of the roof, all along their length and remaining two smaller running horizontally to support the first beam.

The doors of tribal shelter are made up of *Acacia nilotica*, *Azadirachta indica* and *Prosopis cineraria* wood. In huts and hamlets made up of plant twigs and shoots, no hinge gates made of wood were seen. A rectangular screen of *Leptadenia* or *Saccharum* spp. with bamboo or *Acacia* frame was however seen which was tied along one end to a pole for shutting the opening.

### **Gadia Lohar Shelter**

Gadia Lohar lives in the carts, which are made up of *Acacia nilotica* wood. Its specialty of construction lies in its *Thalia* and *Pheechla* formation. The *Thalia* is large triangular shaped cup-board, covering on all sides with wooden planks and having a small door at the back side.

The *Pheechla* is the middle and rear portion of the cart. It is open above and is surrounded by *Pankhales* (wooden boards for protection) on three sides.

For the protection from sun and rains, they use *Sirki* which is made up of culms of *Saccharum bengalense*. In extreme heat, a *Sirki* is pulled over two bamboos supported by two standing cots under which they take rest along with their animals.

### **Temporary shelter**

The tribals travel long distances in groups for earning their livelihood. They build up temporary shelters to protect them from extreme weather conditions. The frame work of these shelters consists of the *Acacia nilotica*, *Cassia fistula*, *Butea monosperma* and *Prosopis cineraria* wood. A few thorny branches of *Prosopis juliflora*

and *Capparis decidua* are employed to make some sort of a boundary at the entrance.

### **Jhuupa**

Some tribals for their residence or for storing fodder build rounded structures called *Jhuupa*. Its basal cylindrical portion is of almost 2 m in height and made up of thin twigs of *Acacia nilotica*, *Anogeissus pendula*, *Prosopis juliflora* or *Ziziphus mauritiana*. The upper pyramidal thatched roof is made up of *Saccharum bengalense*, *Sorghum vulgare* and *Typha angustata*.

## **VIII. ROLE OF PLANTS AS INTOXICANTS AND MASTICATORIES**

Intoxification plays an important role in the life of tribal world, the only exception being the adherents of the 'Bhagat movement who have rejected this along with partaking animal flesh. The important intoxicification observed in this area are liquor and the tribal people like Meena, Kanjar Bhil and Bhil Meena *etc.* are engaged in liquor making. Mostly tribals are engaged in liquor making since time immemorial, following traditional and crude methods of wine making. Besides this, *Nicotiana tabacum*, *Cannabis sativa etc.* are the other important plant species used for intoxicification purposes in this area.

Masticatories though not intoxicative but tribals use various wild plant species as masticatories which are chewed and smoked for physical satisfaction. Plants used for intoxication in the studied area are (Table- 4.6)

1. *Nicotiana tabacum*: Tobacco smoking habit is very common throughout the tribal population and rural community. Men, women and even the children are fond of tobacco smoking. The middle leaves containing the highest nicotine content are cut along with their petioles and twisted to give them the shape of head-rest before drying under shade. Tobacco is consumed in many ways as:

(i) **Bidi**: Tobacco is rolled in the leaves of *Diospyros melanoxylon*. On urge to smoke, the 'bidis' are rolled on the spot and lit. In many areas leaves of *Wrightia tinctoria* are used for wrapping 'bidi' instead of *Diospyros melanoxylon*.

(ii) **Chilam**: It is a smoking pipe made of clay or wood. It is generally made up of *Dalbergia sissoo* or *Acacia nilotica* wood. Sometimes freshly plucked leaves of *Calotropis procera* or *Ficus religiosa* are used for making disposable *chilam*.

(iii) **Hukka**: Offering of Hukka is a sign of hospitality and brotherhood among the tribals. Though they are of various shape and size employing different material, a typical simple Pratapgarh hukka is made of *Cocus nucifera* shells with the slender smoking pipe of a thin hollow bamboo or *Dalbergia sissoo* (a hole drilled through the axis when in green stage). The hollow pipe is attached to the upper end of the shell of *Cocus nucifera* and the other end of the pipe is attached to 'Chilam' made of clay. The 'Chilam' contains the burning tobacco.

2. *Cannabis sativa*: Dried leaves are used as 'Bhang' and unfertilized inflorescence of female plant is commonly used as 'ganja'. The former is taken with sweets or is drunk; the latter is smoked with tobacco.

3. ***Calotropis* spp:** One or two flower buds of *Calotropis gigantea* and *Calotropis procera* are eaten for intoxication.

4. ***Datura* spp:** Seeds of *Datura metel* and *Datura innoxia* are used in smoking with tobacco.

**Following some wild species are used as masticatories and the detail is given below about the uses (Table- 4.6):**

- ***Boswellia serrata:*** The bark and dried twigs are kept in mouth and chewed, it is a common masticatory lip colourant.
- ***Cordia gharaf:*** A common practice observed was the chewing of *Cordia gharaf*. A strip of the bark is peeled chewed fondly like the betel pan. This bark is also said to kill germs and clean teeth.
- ***Piper betle:*** Chewing leaves of *Pan* smeared with lime and solution of *Kattha* (Heartwood product of *Acacia catechu*) with nuts of *Acacia catechu* is a popular masticatory. They are bought from market.
- ***Tamarindus indica:*** The seeds are kept in mouth and chewed for hours by children and womenfolk (during pregnancy) especially.
- ***Ziziphus nummularia:*** In some places tribal ladies chew the root of *Ziziphus nummularia* after delivery as masticator.
- ***Ehretia levis:*** The tribals chewed the leaves of the tree to give the pinkish color appearances to lips.

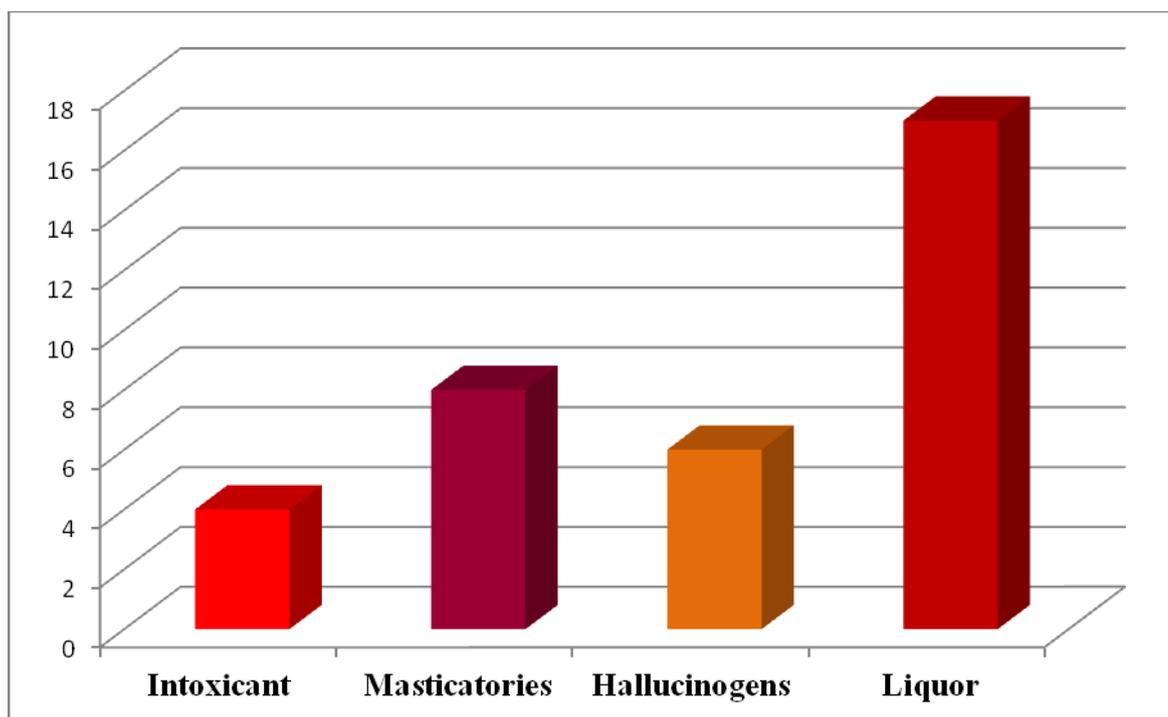
**Table- 4.6: The plants species used as Intoxicants and Masticatories**

| S. No. | Botanical Name               | Uses and Useful Plant part          |
|--------|------------------------------|-------------------------------------|
| 1      | <i>Acacia catechu</i>        | Masticatories (Stem)                |
| 2      | <i>Acacia nilotica</i>       | Masticatories (Bark)                |
| 3      | <i>Areca catechu</i>         | Masticatories (Endosperm)           |
| 4      | <i>Boswellia serrata</i>     | Masticatories (Bark & Twigs)        |
| 5      | <i>Calotropis gigantea</i>   | Intoxicant (Flower bud)             |
| 6      | <i>Calotropis procera</i>    | Intoxicant (Flower bud)             |
| 7      | <i>Cannabis sativa</i>       | Hallucinogens (Flower bud & Leaves) |
| 8      | <i>Cordia gharaf</i>         | Masticatories (Bark)                |
| 9      | <i>Datura innoxia</i>        | Hallucinogens (Seeds)               |
| 10     | <i>Datura metel</i>          | Hallucinogens (Seeds)               |
| 11     | <i>Diospyros melanoxylon</i> | intoxicant (Leaves)                 |
| 12     | <i>Ehretia laevis</i>        | Masticatories (Leaves)              |
| 13     | <i>Nicotiana tabacum</i>     | Hallucinogens (Leaves)              |
| 14     | <i>Papaver somniferum</i>    | Hallucinogens (Latex and Leaves)    |
| 15     | <i>Piper betle</i>           | Masticatories (Leaves)              |
| 16     | <i>Tamarindus indica</i>     | Masticatories (Roasted Seeds)       |
| 17     | <i>Wrightia tinctoria</i>    | Masticatories (Leaves)              |
| 18     | <i>Ziziphus nummularia</i>   | Masticatories (Root)                |

**Liquor:** Usually the raw materials used in the preparation of *Deshi sharab* are locally available in the area *Madhuca indica* is important plant for the liquor preparation. Some other plant material like old black jaggery, root bark of *Ziziphus nummularia* and grains of *Hordeum vulgare* are most prevalent raw materials for liquor preparation. The detailed about the plant species used for liquor preparation are given in the Table 4.7, Figure 4.4 and Plate-15. This liquor is locally known as ‘Deshi Daroo’.

**Table- 4.7: The plants species used in Liquor preparation**

| S. No. | Botanical Name                   | Plant part          |
|--------|----------------------------------|---------------------|
| 1      | <i>Acacia leucophloea</i>        | Root Bark           |
| 2      | <i>Acacia nilotica</i>           | Root Bark           |
| 3      | <i>Albizia lebbek</i>            | Stem bark           |
| 4      | <i>Azadirachta indica</i>        | Root Bark           |
| 5      | <i>Balanites aegyptiaca</i>      | Stem bark           |
| 6      | <i>Butea monosperma</i>          | Root Bark           |
| 7      | <i>Datura fastuosa</i>           | Root and Seeds      |
| 8      | <i>Datura innoxia</i>            | Root and Seeds      |
| 9      | <i>Datura metel</i>              | Root and Seeds      |
| 10     | <i>Datura stramonium</i>         | Root and Seeds      |
| 11     | <i>Hordeum vulgare</i>           | Seeds               |
| 12     | <i>Imperata cylindrica</i>       | Rhizome and Root    |
| 13     | <i>Madhuca indica</i>            | Corolla             |
| 14     | <i>Phyllanthus emblica</i> Linn. | Fruits              |
| 15     | <i>Syzygium cumini</i>           | Bark                |
| 16     | <i>Terminalia tomentosa</i>      | Stem bark           |
| 17     | <i>Ziziphus nummularia</i>       | Root bark and Fruit |



**Figure 4.4: Showing plants species used in masticatories, hallucinogens, Intoxicant and liquor**

### **Conclusion:**

During the present investigation observations were made that around total seventeen plants belonging to twelve different families of angiosperm are being used by the tribes of Pratapgarh Tehsil as intoxicants and masticatories plants. Among them the dominant families are Solanaceae, Fabaceae and Asclepiadaceae.

These seventeen plants are used in portions, partially or fully, by the tribes of investigated area. Only one plant is being used by them for its fruits and three plants seeds are used seven plants are being used for their leaves, three plants are being used for their flower-buds. Five plants are differently used for their stems are being used. Fruit latex of *Papaver somniferum* is important hallucinogen. Around seventeen

plants belonging to the ten different flowering plants families are used by the tribe to make liquor (desi daroo), showing in figure 4.4.

## IX. FIBRE PLANTS

Though the plastic product reduces the dependency on natural fibers but still some people of local tribes are used existing plant species surrounding their vicinity for fibre following some plants species are persended in Tabal 4.8 with their local name and part uses.

**Table- 4.8: The plants species used for fibre purpose**

| S.No. | Name of Plant                  | Useful plant part         |
|-------|--------------------------------|---------------------------|
| 1.    | <i>Abutilon indicum</i>        | Stem bark                 |
| 2.    | <i>Acacia nilotica</i>         | Stem bark                 |
| 3.    | <i>Acacia senegal</i>          | Root                      |
| 4.    | <i>Azadirachta indica</i>      | Root                      |
| 5.    | <i>Bauhinia racemosa</i>       | Stem bark and root fibers |
| 6.    | <i>Butea monosperma</i>        | Root                      |
| 7.    | <i>Calotropis gigantea</i>     | Stem bark and floss       |
| 8.    | <i>Calotropis procera</i>      | Root and fruit            |
| 9.    | <i>Cordia gharaf</i>           | Stem bark                 |
| 10.   | <i>Pongamia pinnata</i>        | Stem bark                 |
| 11.   | <i>Desmostachya bipinnata</i>  | Whole plant               |
| 12.   | <i>Ficus benghalensis</i>      | Stem bark                 |
| 13.   | <i>Ficus religiosa</i>         | Stem bark                 |
| 14.   | <i>Helicteres isora</i>        | Stem bark                 |
| 15.   | <i>Holoptelia integrifolia</i> | Root                      |
| 16.   | <i>Phoenix sylvestris</i>      | Rachis and leaves         |
| 17.   | <i>Saccharum bengalense</i>    | Leaves and Culms          |
| 18.   | <i>Saccharum spontaneum.</i>   | Culm                      |

During the present investigation observations were made that around total eighteen plants belonging to ten different families of angiosperm are being used by the tribes of Pratapgarh Tehsil for fibers product. Among them the dominant families are Fabaceae, Poaceae and Asclepiadaceae

## **X. PLANTS USED AS SOURCES OF NON-EDIBLE OIL, GUM AND RESIN, TANNIN, DETERGENTS AND FISH POISONING PLANTS**

### **1. Source of Non-edible Oils**

*Azadirachta indica, Ricinus communis, Argimone mexicana, Pongamia pinnata.*

### **2. Gum and Resin Producing Plants**

*Acacia nilotica, Acacia senegal, Anogeissus latifolia, Azadirachta indica, Prosopis cineraria, Moringa oleifera, Acacia catechu, Butea monosperma and Sterculia urenes.* Gum of *Acacia catechu, Acacia nilotica* and *Anogeissus latifolia* is commonly used making for laddoos. Whereas *Boswellia serrata* and *Commiphora wightii* are the two important resin and gum producing plants in the study area (plate-16).

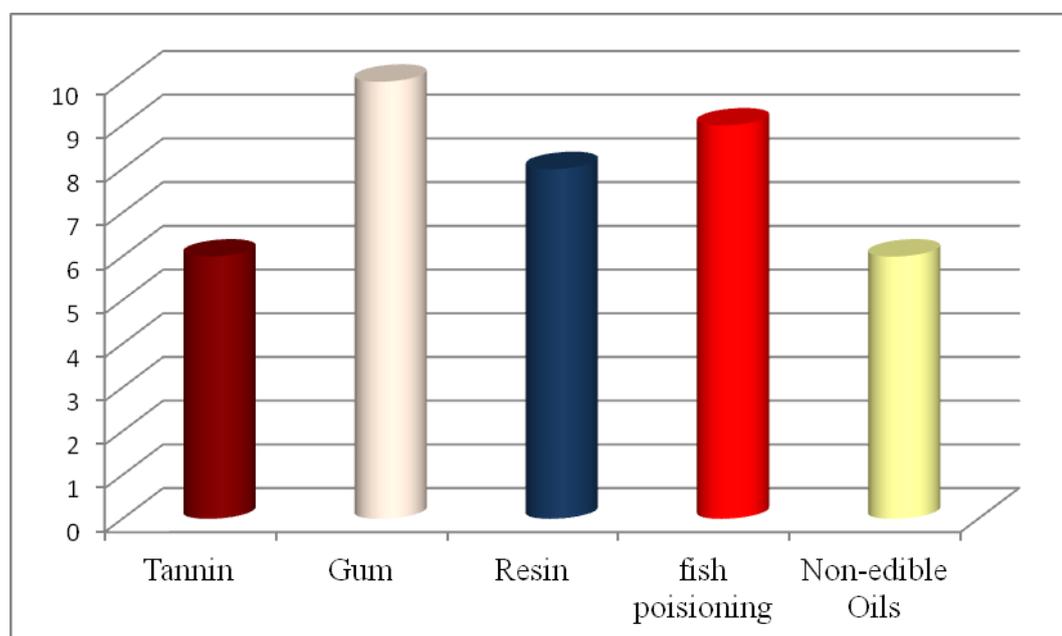
### **3. Source of Tannins**

Plant species used as source of tannins by tribal people are – *Anogeissus pendula, Acacia nilotica, Acacia senegal, Tamarindus*

*indica*, *Tamarix aphylla*, *Ziziphus nummularia* etc. Tannin obtain from inner wood of stem and root of plants.

#### 4. Plants as a source of Detergent

These plants are commonly used as source of detergent in the Pratapgarh tehsil: *Azadirachta indica*, *Pongamia pinnata* oil is use to make soap where *Balanites aegyptiaca* and are used by directly applying to wash the cloth.



**Figure 4.5: Showing plants species used as non-edible oil, gum and resin, tannin**

**Table 4.9: The plants species used as non-edible oil, gum and resin, tannin and detergents by tribal of Partapgarh**

| S.No. | Botanical Name              | Plant part            |
|-------|-----------------------------|-----------------------|
| 1     | <i>Acacia catechu</i>       | Tannin, Gum and Resin |
| 2     | <i>Acacia nilotica</i>      | Tannin, Gum and Resin |
| 3     | <i>Acacia senegal</i>       | Tannin, Gum and Resin |
| 4     | <i>Anogeissus latifolia</i> | Gum and Resin         |
| 5     | <i>Anogeissus pendula</i>   | Tannin                |
| 6     | <i>Azadirachta indica</i>   | Gum and Resin         |
| 7     | <i>Bombex ceiba</i>         | Gum                   |
| 8     | <i>Boswellia serrata</i>    | Gum and Resin         |
| 9     | <i>Butea monosperma</i>     | Gum                   |
| 10    | <i>Commiphora wightii</i>   | Gum and Resin         |
| 11    | <i>Moringa oleifera</i>     | Gum and Resin         |
| 12    | <i>Tamarindus indica</i>    | Tannin                |
| 13    | <i>Ziziphus nummularia</i>  | Tannin                |

**Conclusion:**

During the present investigation observations were made. Total thirteen plants are categories to harvesting of non-edible oil, gum and resin, tannin and detergents, belonging to seven different families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant family is Fabaceae.

The ten different plants identified by tribale for collection of gum product and eight different plants are used by tribal to collect the resin product and seven plant species are for tannin, showing in Table-4.9 and Figure 4.5.

**Table- 4.10: The plants species used for fish poisoning**

| S.No. | Botanical Name                 | Plant part           |
|-------|--------------------------------|----------------------|
| 1     | <i>Aegle marmelos</i>          | Root bark            |
| 2     | <i>Balanites aegyptiaca</i>    | Fruits and Stem bark |
| 3     | <i>Blumea lacera</i>           | Whole plant          |
| 4     | <i>Butea monosperma</i>        | Stem bark            |
| 5     | <i>Casearia tomentosa</i>      | Unripe fruits        |
| 6     | <i>Cassia auriculata</i>       | Stem bark            |
| 7     | <i>Chrozophora rottleri</i>    | Leaves               |
| 8     | <i>Pongamia pinnata</i>        | Seeds                |
| 9     | <i>Holoptelea integrifolia</i> | Stem bark and Leaves |

Around nine plants belonging to the seven different flowering plants families are identified as fish poisoning plants. The dominant family is Fabaceae among others. The stem of five different plants, leaves and roots of two different plants and one of each fruit, seed and whole plant used for fish poisoning plant (Table- 4.10).

## **XI. AGRICULTURAL, KITCHEN AND DOMESTIC ARTICLES**

### **A. AGRICULTURAL IMPLEMENTS**

**1. Axe:** Its handle is made up from the wood of *Acacia catechu*, *Acacia nilotica*, root of *Acacia leucophloea* or *Tecomella undulata* wood (Table- 4.11 and Plate-17).

**2. Darrasi or Tadia:** A sharp iron knife fixed on one end of the bamboo to cut branches *etc.* from trees at a height.

**3. Jeli:** It is used for moving harvested crops to the threshing place and also used for collecting the fodder and dried stocks. It is made up of *Acacia nilotica*, *Acacia leucophloea* or *Prosopis cineraria* wood. Forked end of 'Jeli' has two or four arms.

**4. Levellar (Medada or Pata):** The levellar is a thick rectangular block of 10 feet in length and one feet in breadth. It is used for leveling the ground evenly so as to maintain and preserve the moisture content of the field. A levellar is also employed for covering seeds after broadcasting. Normally *Acacia nilotica* and *Mangifera indica*, strunk is used for levellar (Tbale- 4.11 and Plate-17).

**5. Plough (Hal):** Wood of *Acacia nilotica*, *Dalbergia sissoo*, *Prosopis cineraria* or *Ziziphus nummularia* is used to make the yoke of the plough. The beam of plough is made up of *Acacia nilotica* wood. The upper vertical portion of the beam is made from the wood of *Acacia leucophloea* (Plate-17).

**6. Seed Drill:** A beautiful seed sowing device made of hollow bamboo is used. One end is sliced into several parts, with the help of a ring the separated parts are shaped into a circular rim of the cone or funnel so formed sewing leather on the inside is an optional reinforcement. It is tied behind the plough and seeds are dropped into the conical mouth, trickle down to the furrows.

**7. Sickle:** Its handle is made from the wood of *Acacia nilotica*, *Acacia leucophloea*, *Anogeissus pendula*, *Prosopis cineraria* and *Ziziphus mauritiana* (Plate-17).

**8. Pulley (Bhuun):** A pulley (Bhuun) is used to draw water from the well. It is made up of *Acacia nilotica* or *Prosopis cineraria* wood. The

pulley is mounted on two obliquely placed poles of *Acacia nilotica*, *Anogeissus pendula* or *Tecomella undulata* converging at the upper end where it is fixed and held in place by two upright sticks. The 'patia' (a wide slab of wood) raised above ground over the mouth of well with the aid of two pillars called *Khambas* made of *Dalbergia sissoo*, *Acacia nilotica*, *Prosopis cineraria* or *Tecomella undulata*. The sticks assisting the pulley are fixed on these *Khambas*.

**9. Juaa or Juda:** It is made up of *Acacia nilotica*, *Anogeissus pendula* or *Prosopis cineraria* wood and used to run the plough with the help of two oxen by putting it on their necks

**Table- 4.11: The plants species used to prepare agricultural implements**

| S.No. | Botanical Name                | Particular   |
|-------|-------------------------------|--|
| 1     | <i>Acacia catechu</i>         | Handle of axe  |
| 2     | <i>Acacia leucophloea</i>     | Plough, Hanotia, Naii, Jeli and Mejada/Pata                        |
| 3     | <i>Acacia nilotica</i>        | Axe, Yoke of Plough, Majada/Leveller, Kudi, Bainsso, Jeli and Juda |
| 4     | <i>Anogeissus latifolia</i>   | Handler and Aankadi  |
| 5     | <i>Anogeissus pendula</i>     | Hanotia, Juda, Kudi and Bainsso                                    |
| 6     | <i>Bauhinia racemosa</i>      | Plough   |
| 7     | <i>Dendrocalamus strictus</i> | Seed drill-Orna  |
| 8     | <i>Diospyros melanoxylon</i>  | Yoke of Plough   |
| 9     | <i>Mangifera indica</i>       | Axe, Plough and Naii   |
| 10    | <i>Tecomella undulata</i>     | Axe  |
| 12    | <i>Terminalia tomentosa</i>   | Mejada/leveler   |
| 13    | <i>Ziziphus nummularia</i>    | Yoke of Plough   |

**Conclusion:**

Total thirteen plants are collected for agricultural implements, belonging to eight different families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant family is Fabaceae and Combretaceae. Plants parts, which are useful for implements, showing in Table 4.11 and Plate-17.

**B. KITCHEN ARTICLES**

**1. Cup and Saucer ('Doona' and 'Pattal'):** 'Doona' and 'Pattal' are made up of the leaves of *Butea monosperma* which are used in feasts. Two or more leaves are sewn with the thorn of *Acacia nilotica* or petiole of *Azadirachta indica* to make broad cups called 'doona' in which liquid food can be served. Tribals also use *Butea monosperma*, *Ficus benghalensis* and *Diospyros melanoxylon* leaves for making cup and saucer. The fresh leaves of *Nymphaea* spp., *Luffa acutangula* etc. are also used as 'Pattal'.

**2. Churning Rod (Rali):** Region wise the size of this device varies upto hand height but the wood, of which it is made, is usually of *Anogeissus pendula*, *Prosopis cineraria*, *Wrightia tinctoria* or *Ziziphus mauritiana*. A long stick is chiselled smooth with a tapering end where two wooden blocks with the lower surfaces carved round are fixed crosswise. This portion is immersed in curd while the long stalk is swirled clockwise and anti clockwise by hands or using a string. The smaller sized churning rod is called 'Raii' and bigger sized is called 'Jherna' (Plate-18).

**3. Domestic hand flour mill (Chakki):** It consists of two circular slabs of stone with a hole in the centre and placed one above other in which a 'myani' or 'chakhali' made up of *Ziziphus mauritiana* or *Anogeissus latifolia* is fixed. It is used for grinding and crushing cereals, millets, pulses and many other articles. The handle fixed on the upper slab of stone rotates this part on the pivot. The handle is made from the wood of *Acacia nilotica*, *Balanites aegyptiaca*, *Ziziphus mauritiana*, *Anogeissus latifolia* or *Dichrostachys cinerea*.

**4. Hanging Pot Rest (Chinka):** It is woven out from fibers of *Grewia flavescens* or *Bambu* species and suspended from the ceiling of the roof. It is used to protect bread, butter, fruits, milk *etc.* from cats and dogs.

**5. Mortar and Pestle (Oonkhali and Musal):** Pestle is a solid cylindrical structure made up of *Anogeissus latifolia*, *Terminalia tomentosa* wood. Though it is light in weight but does not crack on pounding. The mortar is either of stone or wood hollowed inside and embedded in the floor of the hut. It is made from the wood of *Acacia nilotica* or *Acacia catechu* (Table- 4.12 and Plate-17).

**6. Pastry board (Chakla) and Roller (Bellan):** *Chakla* and *Bellan* are used for rolling the bread. The *chakla* has three legs which are round in shape and the wood of *Adina cordifolia*, *Mitragyna parviflora*, *Acacia nilotica*, *Dalbergia sissoo*, *Mangifera indica* or is used for making this. The *bellan* is carved out of *Anogeissus latifolia* or *Terminalia tomentosa* wood.

**7. Scrubber:** The mesocarp (Coir) of *Cocus nucifera* fruits are used for scrubbing pots and scraping away the remnants. The dried fruit of *Luffa cylindrica* is also used as scrubber.

**8. Spice box (Masaldani):** It is a cuboid box with 6 to 8 partitions to keep powder of the spices. It is made from wood of *Adina cordifolia*, *Dalbergia sissoo*, *Mitragyna parviflora*, or *Wrightia tinctoria*.

**9. Spoon (Chatu):** *Chatu* is a big sized wooden spoon used by the tribals, which are mostly made up of *Adina cordifolia*, *Butea monosperma*, *Dalbergia sissoo*, *Mitragyna parviflora*, or *Wrightia tinctoria*.

**10. Winnowing pan (Chhajala):** *Chhajala* is woven out of culms of *Saccharum bengalense* or of bamboo strips.

**Table- 4.12: The plants species used to prepare of kitchen articles**

| S.No. | Botanical Name               | Particular                             |
|-------|------------------------------|--|
| 1     | <i>Acacia catechu</i>        | Oonkhal-Musal                          |
| 2     | <i>Acacia nilotica</i>       | Chakki, Oonkhal-Musal and Chakla-Belan |
| 3     | <i>Adina cardifolia</i>      | Chakla-belan, Masaldani and Chatu      |
| 4     | <i>Anogeissus latifolia</i>  | Chakki, Oonkhal-Musal and Chakla-Belan |
| 5     | <i>Anogeissus pendula</i>    | Raii                                   |
| 6     | <i>Balanites aegyptiaca</i>  | Chakki                                 |
| 7     | <i>Butea monosperma</i>      | Doona- Pattal and Chatu                |
| 8     | <i>Cocus nucifera</i>        | Juna                                   |
| 9     | <i>Dalbergia sissoo</i>      | Chakla-Belan, Masaldani and Chatu      |
| 10    | <i>Dichrostachys cinerea</i> | Chakki                                 |
| 11    | <i>Diospyros melanoxylon</i> | Dona-Pattal                            |
| 12    | <i>Ficus benghalensis</i>    | Dona –Pattal                           |
| 13    | <i>Grewia flavescens</i>     | Chinka                                 |
| 14    | <i>Luffa acutangula</i>      | Dona-Pattal                            |

|    |                             |                                   |
|----|-----------------------------|-----------------------------------|
| 15 | <i>Luffa cylindrica</i>     | Juna                              |
| 16 | <i>Mangifera indica</i>     | Chakla-Belan                      |
| 17 | <i>Mitragyna parviflora</i> | Chakla-Belan, Masaldani and Chatu |
| 18 | <i>Nelumbo nucifera</i>     | Dona-Pattal                       |
| 19 | <i>Nymphaea nauchali</i>    | Dona-Pattal                       |
| 20 | <i>Saccharum bengalense</i> | Chhajala                          |
| 21 | <i>Terminalia tomentosa</i> | Oonkhal-Musal and Chakla-Belan    |
| 22 | <i>Wrightia tinctoria</i>   | Raii, Masaldani and Chatu         |
| 23 | <i>Ziziphus mauritiana</i>  | Raii and Chakki                   |

### Conclusion:

Total twenty three plants are collected to make kitchen implements, belonging to fifteen different families of angiosperm are being used by the tribes of Pratapgarh Tehsil. Among them the dominant family is Fabaceae, Combretaceae, Cucurbitaceae and Rubiaceae. Plants using are listed in Table- 4.12 and Plate-18.

### C. DOMESTIC ARTICLES

**1. Baskets (Daliya):** Culms of *Saccharum bengalense* and branches of *Grewia tenax*, *G. flavescens*, *Sida ovata*, *Corchorus* species, *Rhus mysurensis* and *Ziziphus nummularia* are used for making basket for household and agricultural use.

**2. Carpets and Brooms (Chatai & Buhara):** Leaves of *Phoenix sylvestris*, *Desmostachya bipinnata*, *Saccharum bengalense*, *Sida ovata* and *Abutilon indicum* are used in making 'Chatai' and "Buhara'.

**3. Cots:** The legs of cots are made from the wood of *Acacia leucophloea*, *Acacia nilotica*, *Azadirachta indica*, *Anogeissus latifolia*,

*Terminalia tomentosa* and the frame of cot made from the wood of *Acacia nilotica*, *Anogeissus pendula*, *Balanites aegyptiaca*, *Butea monosperma*, *Dichrostachys cinerea*, *Diospyros melanoxylon*, *Mangifera indica* and *Miliusa tomentosa*.

**4. Hand Fan (Bijno):** The fan is generally of rectangular shape. The hand fan is commonly woven from bamboo strips, leaves of *Phoenix sylvestris* or culms of *Saccharum bengalense*.

**5. Head Rest and Pot Rest (Heendi and Haree):** Leaves and shoot system of *Desmostachya bipinnata* or *Saccharum bengalense* are used to make *Heendi* and '*Haree*'. They are rolled and folded to form circular cushions over which the women place their pots and stacks of fuel wood and fodder or pots storing milk, curd, water *etc.*

**6. Mallet (Thapi):** It is made from the wood of *Acacia leucophloea*, *Acacia nilotica*, *Anogeissus latifolia*, *Dalbergia sissoo* or *Terminalia tomentosa*. It is used for cleaning the dirty clothes.

**7. Pen Holders:** The culms of *Saccharum bengalense* are used for making pen holders by primary school children. One of its ends is made into a fine and tough point suitable enough for writing purpose to decorate toys.

**8. Stake (Khoonta) and Wooden Peg (Khoonti):** These are made from the wood of *Acacia nilotica* or *Anogeissus pendula*. *Khoonta* is used for tying the cattle with a rope and *khoonti* is used for hanging the clothes *etc.*

**9. Storage Pots:** Dried fruits of *Lagenaria siceraria* are used for the storage of grains, seeds, coins and other small articles.

**10. Dhakula (Fodder box):** This is a wooden box used as fodder receptacle for cattle and is made of *Acacia nilotica*, *Acacia leucophloea*, *Azadirachta indica*, *Lannea coromandelica* or *Adina cordifolia* wood.

**Table- 4.13: The plants species used to prepare the domestic articles**

| S.No. | Botanical Name                | Uses                                    |
|-------|-------------------------------|---|
| 1     | <i>Abutilon indicum</i>       | Mat and Broom                           |
| 2     | <i>Acacia leucophloea</i>     | Cot and Thapi                           |
| 3     | <i>Acacia nilotica</i>        | Khaat, Thapi, pegs, Khunti and basket   |
| 4     | <i>Adina cordifolia</i>       | Dhakola                                 |
| 5     | <i>Anogeissus latifolia</i>   | Khaat and Thapi                         |
| 6     | <i>Anogeissus pendula</i>     | Cot and Pegs small pegs                 |
| 7     | <i>Azadirachta indica</i>     | Cot and Baskets                         |
| 8     | <i>Balanites aegyptiaca</i>   | Cot                                     |
| 9     | <i>Boswellia serrata</i>      | Baskets                                 |
| 10    | <i>Butea monosperma</i>       | Cot                                     |
| 11    | <i>Cajanus cajan</i>          | Cot                                     |
| 12    | <i>Corchorus capsularis</i>   | Baskets                                 |
| 13    | <i>Dalbergia sissoo</i>       | Cot and Thapi                           |
| 14    | <i>Pongamia pinnata</i>       | Baskets                                 |
| 15    | <i>Desmostachya bipinnata</i> | Mat , Broom and Haandi                  |
| 16    | <i>Dichrostachys cinerea</i>  | Cot                                     |
| 17    | <i>Diospyros melanoxylon</i>  | Cot                                     |
| 18    | <i>Grewia flavescens</i>      | Baskets                                 |
| 19    | <i>Grewia tenax</i>           | Baskets                                 |
| 20    | <i>Lagenaria siceraria</i>    | Storage pot                             |
| 21    | <i>Lannea coromandelica</i>   | Baskets                                 |
| 22    | <i>Mangifera indica</i>       | Cot                                     |
| 23    | <i>Phoenix sylvestris</i>     | Mat, Broom and Bijano                   |
| 24    | <i>Saccharum bengalense</i>   | Daliya, Ma , Broom, Hand fan and Haandi |
| 25    | <i>Sida ovata</i>             | Baskets, Mat and Broom                  |
| 26    | <i>Terminalia tomentosa</i>   | Cot and Thapi                           |

**Conclusion:** Total twenty six plants are collected to make domestic articles belonging to thirteen different families of angiosperm are being used by the peoples of Pratapgarh Tehsil. Among them the dominant family is Fabaceae, Combretaceae and Tiliaceae. Plants using are listed in Table 4.13.

## **XII. ROLE OF PLANTS IN VARIOUS CEREMONIES AND FESTIVALS**

When the life of a human being becomes stable in the natural environment, he gets socialized and centralized. And make some traditions or rituals for his or her belongings. The primitive men have certain ceremonies along with his basic need of food and shelter. Such ceremonies include the event of marriage, birth and death which followed by a number of other ceremonies, with the advancement of culture and civilization. Ceremonies advanced to occasions such as crop harvesting, special days around which myths and lores evolved, taking shape of festivals, involving celebration which are characteristic of some ethnic groups and others subsequently adapted from more advanced alien group. From the immediate vicinity, the fauna fairly and the flora substantially together with their products were picked up to enter the life of man in a ceremonial role.

Primitive man acquired a rich cultural life by evolving and being nurtured in the rich natural environment. Modern times witness the withering values of the flora and fauna in their once prosperous natural surroundings everywhere and also their lives within. The cultural traditions of tribals are clearly visible in the festivals, fairs and

different ceremonies, from the birth till death. Religious festivals are major source of amusement for folks, which apart from frolic and fun provide them an opportunity to empower and reinforce the stream of fraternity.

Number of fairs and congregations are an essential part of social fabric cultural life and amusement of the tribals in the country site and at same time are the meeting grounds of many ethnic groups and their culture. They serve as the markets of their livestock and agricultural commodities, their tools and appliances and forum for exchange of ideas regarding their crafts and motifs, skill and workmanship. Their vanishing practices of the past, their adaptability to new techniques, local variations and trends of their future are the common features observed during these fairs. In the present study, number of plant materials used during these ceremonies and festivals are recorded from tribal and remote areas of the Tehsil.

### **LIFE RITES**

The birth, marriage and death are observed in the pattern of the tribal customs and traditions. The cultural cycle commences at conception passes through birth, marriage and continues even after death.

#### **(A) Tribal customs and traditions during birth**

The tribal people consider bareness as a great misfortune for a family. Propitiations are made to please the God treatments are taken from wizards and Ojhas, talismans worn round necks, ants fed daily in

the morning with a mixture-jaggery or sugar, flour of *Triticum aestivum*, *Pennisetum americanum*, *Hordeum vulgare*, *Zea mays*, etc. *Ficus religiosa* tree watered daily and many other devices like taking milk of *Ficus benghalensis* by male daily in Patasa (prepared by sugar) are used to get a child. Once the pregnancy is established, all precautions are taken to protect the prospective mother from evil influences. Charms are fastened around the neck and waist and a knife is put under her pillow at night. For charms, nomadic people like Sansis and Banjara use seeds of *Abrus precatorius*, while **Gadia Lohar** frequently used roots of *Ficus benghalensis* for this purpose. During pregnancy proximity of certain trees by the lady, cutting and growing things by the father are tabooed. Pregnant ladies are not allowed to go near *Prosopis cineraria* and *Tamarindus indica* tree, where spirits are believed to reside. Just after child birth the anal cord is cut and smeared with powdered rhizome of *Curcuma longa* (Haldi). Nomadics make a dilute solution of jaggery mixed with fruit powder of *Terminalia ballirica* and given to new born baby. A solution prepared from *Trachyspermum ammi* is given to the new born baby. At the time of child birth, the leaves of *Azadirachta indica* are hung at the gate of abode. It gives the signal of child birth to community. Mother takes bath with water of boiled neem leaves. A regular bath is given on the sixth or seventh day when she is dressed ceremoniously and is brought out from the delivery room by the younger brother of her husband to worship their deity. The baby anointed with *Sesamum indicum* oil and 'Kajal' (lamp-black) is put on the eye line and a red or blue string is tied round child's waist. Both are then taken in a

procession to the village well for worship. At this time new mother carries a branch of *Azadirachta indica* to keep away the 'evil spirit'.

The diet of mother after child birth is altered for atleast one month. Ladies prepare laddoos from dried rhizome powder of *Zingiber officinale*, flour of *Triticum aestivum* and ghee and give to the mother. Fruits of *Trachyspermum ammi* and root bark powder of *Ziziphus nummularia* is also used for preparation of these ladoos. A month after child birth the mother keeps a 'Laddoo' offering below a *Prosopis cineraria* tree. The local people keep the new born child on a winnowing pan (Chhajala) made of *Dendrocalamus strictus* (Bamboos) and *Saccharum bengalense* (Moonj) with a belief that child will be blessed with a long and prosperous life. Just after child birth, some grains of *Sorghum vulgare* or *Pennisetum americanum* or *Hordeum vulgare* kept on a clay disc are placed below a shrub of *Ziziphus nummularia*. This is done to appease the evil spirits which are believed to be harboured on the shrub and the new born would be left alone subsequently. The pods of *Cassia fistula* are kept under the pillow of children with a belief that it will help in preventing them from getting frightened.

#### **(B) Tribal customs and traditions during marriages**

It is considered to be most important that before going to bride's house, groom is required to visit a temple and then to go round a *Prosopis cineraria* tree. A twig of the same plant or *Azadirachta indica* or *Ziziphus nummularia* is struck on 'Toran' which is hanged on gate of the bride's residence, before entering the gate. An

agricultural implement made from wood of *Tecomella undulata* is kept between the bride and groom at the time of marriage with a belief to protect them from evil spirits during their wedded life. The winnowing of fan made from *Saccharum bengalense* and *Dendrocalamus strictus* is also done for worshipping and welcoming the groom at the time of garlanding (varmala) ceremony by gathering present during the ceremony.

It is also customary that tribals settle the marriage outside their clan or sub-caste. 'Aata-sata' custom is socially accepted in which sister of boys of two families are exchanged. A widow in Meena community is generally married to the younger brother of the husband by 'Nata custom'.

About a week before marriage, boys and girls are smeared with "peethi" which consists of *Curcuma longa* powder and grain of *Hordeum vulgare* mixed with oil of *Sesamum indicum*. To safeguard the boy and girl from evil eye, a charm "kankad-dora" is tied on the wrist of both. This charm contains piece of lac, small shell (Kaudi), seeds of *Abrus precatorius* and *Brassica campestris*.

When the bride groom's party departs for the place of bride at auspicious hour, a number of charms are done in the form of curious customs in both nomadic as well as tribal people using grains and seeds of number of plant species.

### (C) Tribal customs and traditions during death

The disposal of the dead body of tribals is achieved by cremation. The dead body is placed in a corner of the house which is

cleaned and given a fresh coating of cow dung mixed with cow urine. 'Gangajal' and leaf of *Ocimum sanctum* is put in the mouth of the dead person. If death occurs at night lit an earthen lamp towards the head side of the dead body.

For carrying the dead body, a stretcher or a bier is fabricated, bamboo is the material almost universally employed. The bier is a framework prepared by tying two long bamboos to five small ones with strings made up of *Saccharum bengalense*. Wood of *Ficus religiosa* or *Ziziphus nummularia* is also used for bier. The corpse is placed on the bier and covered by cloth, white for men, red or yellow for women and tied with strings over which some powder of *Curcuma longa* is sprinkled. Priest performs number of ceremonial rites at this time. The priest makes balls of flour of *Hordeum vulgare* and seeds of *Sesamum indicum*, known as 'Pinda'. These pindas in different numbers are put on bier during different ceremonies of the dead person.

After performing all customs and traditions, four relatives of dead person take out the bier on their shoulders. During procession a barber carries the dead fire, burning dried cow dung pieces in an earthen pot with strings of *Saccharum bengalense* and a dried plant of *Ocimum sanctum*.

On mid way of the cremation ground, the procession takes rest for a while. *Tamarindus indica* and *Ziziphus* spp. are other plant species where this ritual is carried out. At the cremation ground, a pyre is prepared by the wood brought by the people. The corpse is cremated with the wood of *Ficus religiosa*, *Prosopis cineraria*,

*Capparis decidua* and *Ziziphus nummularia*. The leaves and culms of grasses are spread on the floor and it is covered by more wood, and pyre is lit by the closest relative. The culms of *Saccharum bengalense* are used for raising fire. When the neck of the body gets completely burnt, the nearest relative performs an important ceremony, called 'Kapaal kriya'. In this ceremony, bamboo is spilled at cue end and a fruit of coconut are fixed on it with ghee and gently hits on skull to break open the skull, when the body is completely burnt, relatives return back to home with a twig of *Azadirachta indica*.

The bones and ash of the dead body after cremation are collected in a clay pot on third day to be dropped in the auspicious river "Ganga". The death feast called "Nukta" or "Kharch" is organised on the twelfth day in honour of the dead.

The leaves of *Calotropis procera*, or *Cordia dichotoma* or *Ficus benghalensis* or *Ricinus communis* are used as dishes on death anniversary day of the ancestors (Shradh day) and on the occasion of a ceremony to mark the 12<sup>th</sup> day of the dead (Barah Brahmin day) for feeding the crows with a belief to satisfy the soul of the dead person.

A child after death is buried in a cremation ground and the grave is marked by the spiny branches of *Acacia nilotica* or *Ziziphus nummularia* or *Prosopis cineraria*. This warns any way farer of the grave who otherwise might step over it and thereby a danger of being possessed by the spirit of the dead. The scavenging jackals *etc.* are also thus prevented from digging and carrying away the dead body. After death of a child, for three days goat milk is placed in a clay pot (Sakora) kept under *Ziziphus nummularia* shrubs, believing that the

spirit of the dead would be able to consume it. Likewise after cremation of 15 days a small cot made of *Prosopis cineraria* or *Acacia nilotica* wood is placed near the site assuming that the spirit of dead one would be able to sleep on a cot in the other world.

### TRIBALS AND FESTIVALS

It has been observed that mostly tribals have faith in Hindu mythology. Bringing life, gaiety and merrymaking, the festivals descend on the tribal villages dispelling the monotony. Taking together the number of festivals is quite large the major ones being few. Festivals like Durgasthami, Ramnavami, Ganesh Chaturthi, Janmasthanami *etc.* are celebrated as in other parts of the country. The main festivals celebrated by the tribals include the following

**(i) Makar Sankranti:** It is celebrated on 14<sup>th</sup> January when sun enters in Zodiac sign 'Makar'. On this festival people fly kites in the sky. From mythological point of view, this festival is very important, which leads one to heaven. The roasted seeds of *Sesamum indicum* mixed with jaggery, to form in laddoos are eaten on this day. The seeds of *Hordeum vulgare* and *Triticum aestivum* or *Pennisetum americanum* are distributed to poor beggars and green fodders are provided to cows and other cattle. Thin strips of bamboos are used to make kites.

**(ii) Mahashivratri:** It is associated with worshipping Lord Shiva. The plant of *Datura innoxia* has long been associated with the worship of Shiva. During "Mahashivratri Poojan" flowers and fruits of *Datura*

*innoxia* along with flowers of *Calotropis procera* and trifoliate leaves of *Aegle marmelos* are offered to “Shiv Ling”. Devotees also offer raw fruits of *Ziziphus nummularia*, fruits of *Raphanus sativus*, *Daucus carota* and other seasonal fruits. Tribals prepare syrup from leaves of *Cannabis sativa* and sometimes they also mix the seeds of *Datura innoxia* in it.

**(iii) Holi :** The enthusiasm and happiness of this colourful festival begins approximately a fortnight before the actual day, evident by the “Ger” or “Gindar” songs and dances coinciding with the blossoming flora in nature and the resulting colour and fragrance e.g. *Butea monosperma*, *Mangifera indica*, *Tecomella undulata* and *Capparis decidua*.

A pole made up of the *Prosopis cineraria* or *Acacia leucophloea* or *Acacia nilotica* is used in this festival to commemorate the victory of virtue over the evil. It is planted nearly a month before the festival day. Idol of “Prahalad” made from stem branch of *Prosopis cineraria* or *Ziziphus nummularia* is kept in the centre of Holi pile and is removed when roll is lit by the young ones (who are newly married), believing that their married life will be happy and prosperous.

The cobs or ears of *Hordeum vulgare* or *Triticum aestivum* from fresh harvest are roasted, offered to others and eaten. Colour throwing takes place on the second day. Tribals throw coloured water on each other and smear “Gulal” made from flowers of *Butea monosperma*. Presently natural plant colours are replaced by synthetic ones from the market.

(iv) **Sheetla Asthami** - This festival is locally known as "Basoda" and celebrated on the eighth day of Chaitra. This festival is celebrated for deity of small-pox known as "Sheetla Mata" and this deity is associated with *Azadirachta indica* tree. All the tribes and nomads celebrate this festival on large scale. No freshly prepared food is taken and no hot drinks are consumed on this day. Women worship deity with "rabri" prepared from *Pennisetum americanum* flour, boiled grains of *Pennisetum americanum* and rhizome of *Curcuma longa*. 'Rabri' of *Zea mays* flour is also used for worshipping the deity.

(v) **Sharad Poornima**: Just at the start of winter, when a full moon night 'Poornima' occurs, this festival is celebrated in moon light. On this day moon-rays are believed to improve eyesight, tribals put thread in needle in moon light. Small pieces of *Cocus nucifera* fruits, 'Kheer' (prepared from milk and grains of *Oryza sativa*) are kept overnight in moon light and consumed later to keep eyes healthy.

(vi) **Dussehra**: The festival is celebrated on the 10th day of Shuklapaksha of Asoj to commemorate the victory of Rama over Ravana, as narrated in the epic. This is also considered as a symbolic victory of 'Good' over Evil. An effigy of Ravana is prepared, the final act of the epic is enacted and the effigy is burnt. On this occasion people worship the tree of Khejri (*Prosopis cineraria*).

(vii) **Diwali**: This festival falls on the Amavasya of Kartik month and is celebrated for obtaining the favour of 'Lakshmi' the goddess of wealth. Every body cleans the house. Every dwelling is outlined with burning oil lamps. The potters wheel revolve for weeks to bring out

tiny earthen lamp called 'diya' with which every home illuminate itself on this great occasion. Oil of *Brassica campestris* or *Sesamum indicum* is used for lighting purpose and *Gossypium* spp. are used for making cotton wicks. At an auspicious hour, the goddess is worshipped. All the edibles or grains of cash crops are essential offerings in 'Laxmi Poojan'. Ladies cook grains of *Vigna radiata* and *Oryza sativa* and treat with 'Dal' or 'Khata' prepared from seeds or flour of *Cicer arietinum* respectively.

**(ix) Govardhan:** This festival celebrated on the next day of Diwali. Govardhan pooja is carried out in the open portion of the house. Women prepare an image of 'govardhan' using cowdung, which consists of 'Lord Krishna' laying on his back. Fruit of *Ziziphus nummularia*, parched grains of *Sorghum vulgare* and *Oryza sativa*, which the women offered on the night of Diwali, are placed in the center of mage. A burning earthen lamp is also placed in the centre. They also decorate the calf and cow by printing hand marks of *Lawsonia inermis*.

In evening, women cook all the new vegetables of the season together known as 'gadda' along with boiled grains of *Triticum aestivum*, *Pennisetum americanum* and offer to God in temple on this particular day which is known as 'Annkut'.

Other festivals of some importance are 'Akhateej', Basant Panchami, Navaratra, Ganesh Chowth, Ramnavami, Teej, Dev Uthani Gyaras etc, and there are also being celebrated by the tribals time to time. It has been invariably noticed that all above festivals are

judiciously celebrated by the tribals with full of enthusiasm and zeal by performing customary traditions.

### **XIII. PLANTS AND MUSICAL INSTRUMENTS**

The significant role of various musical instruments for joy and happiness, celebrating festivals and functions, expressing sentiments and recreation has been realized since ancient time throughout the world. Large number of variety of such instruments are being designed and fabricated in the past and still such sophisticated devices are continuously made available for music purposes. Plants have played an important role in making such musical instruments. Either the complete musical instrument is made up of wood, fibre or other parts of the plant or for number of other components and ingredients of the musical instrument the various parts of the plants are used.

The history reveals that tribals are using musical instruments since ancient times and this race has been a source of inspiration for others in this respect. The availability of more sophisticated instruments for playing music these days have also been designed on the basis of old instruments.

The plant ingredients contributed to the instruments and thus to the sounds of music that became characteristically unanimous with the tribals of Pratapgarh Tehsil.

**Bansuri:** The flute (Bansuri) is unique as air is blown by a mouthpiece in centre, which passing towards its two opposite ends produces notes at both the ends and the combined effect is very sweet. The audible range in terms of distance too is undoubtedly increased as the larger number of reverberations can be heard clearly at far. It is made of hollow bamboo having length of one to two feet. One end of this bamboo is closed by obliquely cut wooden piece while the other end is left open.

**Dholak:** It is a barrel shaped instrument consisting of a hollow wooden cylinder with nearly equal sides over which leather parchment is tightly stretched. The wood commonly used for preparation of Dholak is of *Ailanthus excelsa*, *Azadirachta indica*, *Boswellia serrata*, *Ficus religiosa*, *Ficus benghalensis* or *Mangifera indica*. With the aid of strings or cords passing through leather hoops or metal rings, the parchment is held. The tension on the cords is altered as per needed by inserting wooden blocks.

**Dhol:** Dhol is a big sized wooden cylindrical instrument and have thicker parchment in comparison with Dholak. The wood commonly used for its construction may be of *Mangifera indica*, *Azadirachta indica* or *Ficus benghalensis*. It is played by the sticks made of *Ziziphus nummularia* or *Dichrostachys cinerea*.

**Ghunghroo:** The dried pods of *Acacia nilotica* are strung around the feet and serve as an ornament as well as ‘ghunghroo’.

**Papaiya:** The procedure of producing whistling sounds from a ‘papiya’ implies folding the leaf, placing it between lips and blowing air. The leaves of *Ficus racemosa*, *Pongamia pinnata*, *Ficus*

*benghalensis*, *Ficus religiosa*, *Phoenix sylvestris*, *Holoptelea integrifolia*, *Ailanthus excelsa*, *Cassia tora* and corolla of *Argemone maxicana* are used by children for making Papiya

**Poongi:** It is also known as 'Been' and more popular in Jogi and other nomadic tribes. A dry fruit of *Lagenaria siceraria* and Bamboo pipes are used for its construction. The dry fruit of *Lagenaria siceraria* is fitted with the two finger holed bamboo pipes at the lower portion. The upper portion of the gourd (Fruits of *Lagenaria siceraria*) is manipulated in to the blow pipe and sealing is done by wax.

The inner empty portion of the gourd forms the air chamber. Air is blown into the blow pipe and the fingers on the holes of a pipe regulate the sound.

**Ravanhattha:** The main body of the instrument is consists of bamboo. The instrument has 3 pegs. The belly is made of a coconut shell over which parchment is spread and tied. The chamber made by the coconut shell becomes a resonator. The bamboo is fixed perpendicular to it. The strings (intestine of goat) are tied to the pegs directly coming from bridge holes.

The strings are plucked and sound moves from bridge to the parchment and from parchment to hollow belly causing the reverberations.

**Sarangi:** It consists of a single wood block of *Grewia tenax* or *Dalbergia sissoo*. It has a head and pegs carved out from the wood of

*Tectona grandis*. The body is arched to some extent. Towards the basal portion of the body is an immovable wooden bridge. The instrument is generally hollow on the reverse side the belly is covered by parchment. The four horse hair wires are tied on the underside of the instrument to a wooden piece and from there they are stretched through the wooden bridge to the head where pegs are present. It is played by a bamboo which is rhythmically moved over the wires.

**Table 4.14: The plants species used for making musical instruments**

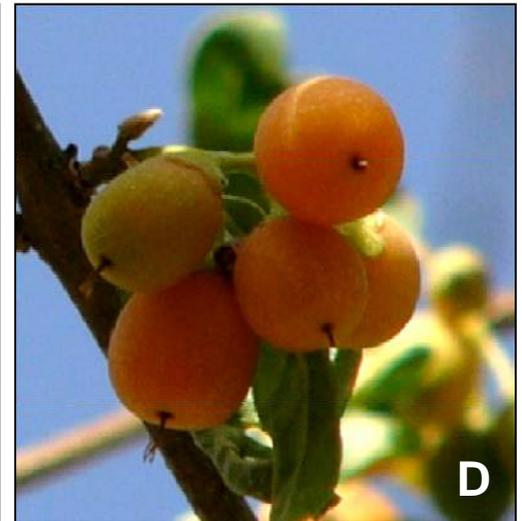
| S.No. | Botanical Name                | Part        | Particulars                            |
|-------|-------------------------------|-------------|--|
| 1     | <i>Acacia leucophloea</i>     | Wood        | Dhol                                   |
| 2     | <i>Acacia nilotica</i>        | Pods        | Ghungaroo                              |
| 3     | <i>Ailanthus excelsa</i>      | Wood        | Dholak, Chang                          |
| 4     | <i>Argemone mexicana</i>      | Petals      | Papaiiya                               |
| 5     | <i>Azadirachta indica</i>     | Wood        | Dholak, Dhol                           |
| 6     | <i>Boswellia serrata</i>      | Wood        | Dholak, Tambura                        |
| 7     | <i>Butea monosperma</i>       | Wood        | Dholak                                 |
| 8     | <i>Cassia tora</i>            | Leaves      | Papaiiya                               |
| 9     | <i>Cocus nucifera</i>         | Fruit shell | Ravanhatta                             |
| 10    | <i>Dalbergia sissoo</i>       | Wood        | Dhol, Sarangi                          |
| 11    | <i>Dendrocalamus strictus</i> | Stem        | Bansuri, Sticks,<br>Poongi, Ravanhatta |
| 12    | <i>Ficus benghalensis</i>     | Leaves      | Papaiiya                               |
| 13    | <i>Ficus racemosa</i>         | Leaves      | Papaiiya                               |
| 14    | <i>Ficus religiosa</i>        | Leaves      | Papaiiya                               |

|    |                                |        |              |
|----|--------------------------------|--------|--------------|
| 15 | <i>Grewia tenax</i>            | Wood   | Sarangi      |
| 16 | <i>Holoptelea integrifolia</i> | Leaves | Papaiiya     |
| 17 | <i>Lagenaria siceraria</i>     | Leaves | Papaiiya     |
| 18 | <i>Mangifera indica</i>        | Wood   | Dhol, Dholki |
| 19 | <i>Phoenix sylvestris</i>      | Leaves | Papaiiya     |
| 20 | <i>Sterculia urens</i>         | Wood   | Chang        |
| 21 | <i>Ziziphus nummularia</i>     | Wood   | Sticks       |

**Conclusion:**

During the present investigation observations were made. Total twenty-one plants are using by tribals for making musical instruments for their various ceremonies and rituals, belonging to thirteen different families of angiosperm are being used by tribes of Pratapgarh Tehsil. Among them the dominant families are Fabaceae and Moraceae. Plant are used for musical instruments are listed in Table 4.14.

## Plate- 7



**Plate -7:** Showing wild edible plants Figure A *Ficus racemosa*, Figure B *Flacourtia indica*, Figure C *Diospyros melanoxylon*, Figure D *Cordia gharaf*, Figure E *Alangium salvifolium* and Figure F *Mimusops elengi*

## Plate- 8



**Plate -8:** Showing medicinal plants  
Figure **A** *Cassia fistula* and Figure **B** *Actiniopteris radiata*

## Plate- 9



**Plate -9:** Showing medicinal plants  
Figure **A** *Calotropis procera* and Figure **B** *Curculigo orchoides*

## Plate- 10



**Plate-10:** Showing medicinal plants  
Figure **A** *Holarrhena antidysenterica* and Figure **B** *Hemidesmus indicus*

## Plate- 11



**Plate - 11:** Showing medicinal plants  
Figure A *Echinops echinatus*, Figure B *Gloriosa superba* and Figure C *Helicteres isora*

## Plate- 12



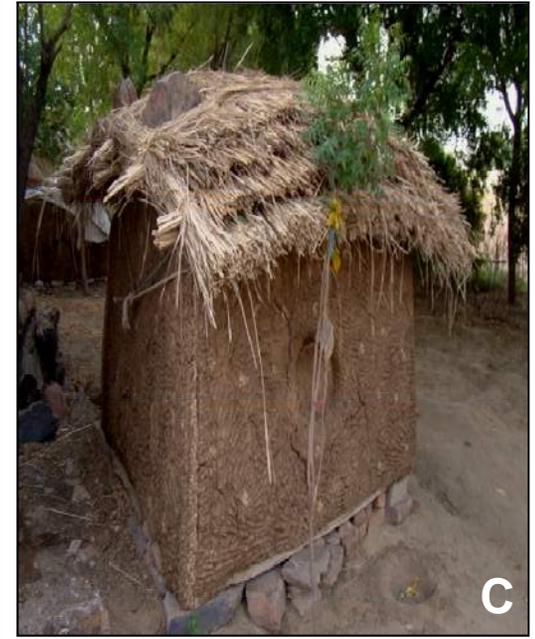
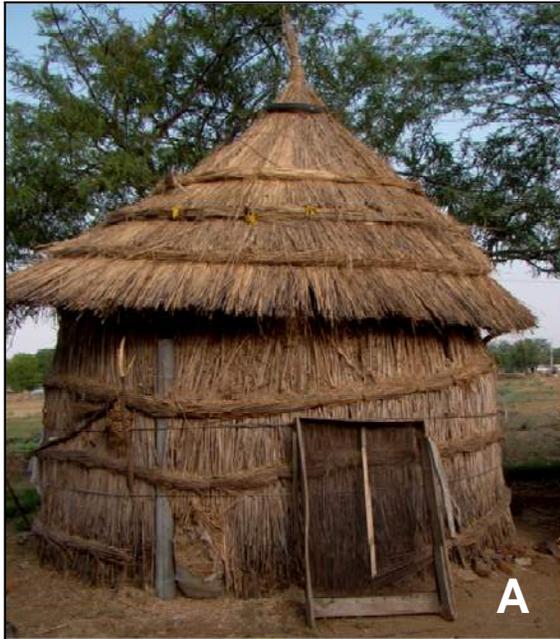
**Plate - 12:** Showing medicinal plants  
Figure **A** *Origanum majorana* , Figure **B** *Barleria prionitis* and Figure **C** *Terminalia bellirica*

## Plate- 13



**Plate 13:** Showing Tribal hut and shelter Figure **A** tribal hut having wall made of *Anogeissus latifolia* and Figure **B** A view of cattle shelter

## Plate- 14



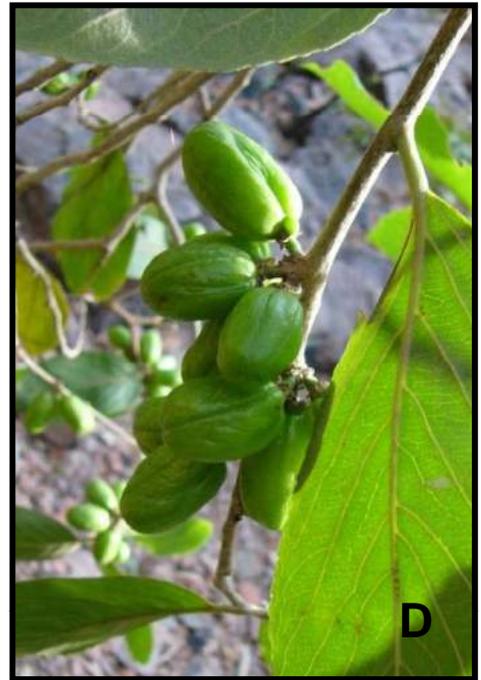
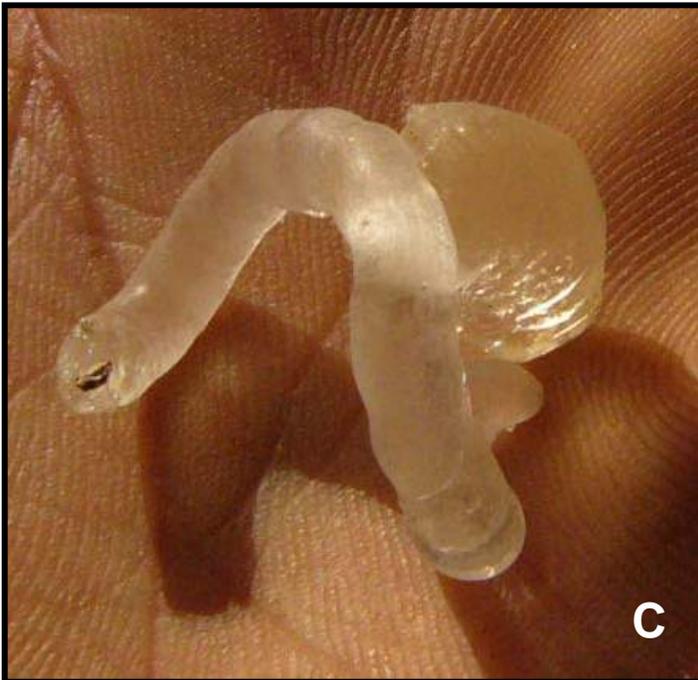
**Plate - 14:** Showing Figure A husk and fodder storage hut, Figure B Crop remain and Figure C Dung storage

## Plate- 15



**Plate 15:** Figure A showing dry flower of *Madhuca indica* for market selling and Figure B Liquor formation by local tribal

## Plate- 16



**Plate 16:** Showing the gum yielding plants Figure A *Sterculia urens*, Figure B *Butea monosperma*, Figure C *Anogeissus latifolia* and Figure D *Casearia tomentosa* (a fish poisoning plant)

## Plate- 17



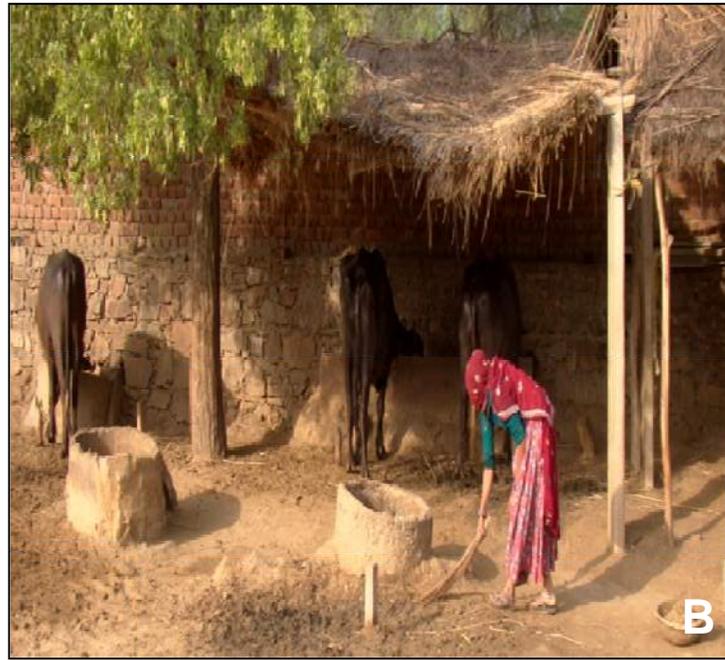
**Plate 17:** Showing the various agriculture implements Figure A Hal (Plough), Figure B Favada, Figure C Aankdi/Zedi and Dantali, Figure D Darant (Sickle) and Khurpa, Figure E Kharwadi (Axe) and Figure F Mezada (Leveller)

## Plate- 18



**Plate 18:** Showing the various type of kitchen articles Figure **A** and **B** Churning Rod (Bilowani/Rai), Figure **C** Mortar and Pestle (Ookhadi and Moosal), Figure **D** Winnowing pan (Chhajada), **E** Basket (Dhakola) and Figure **F** Broom (Bhuara)

## Plate- 19



**Plate - 19:** Showing Figure **A** Dhakala (Basket), Figure **B** Animal shelter and Figure **C** liquid medicine pipe/Neadu

## Plate- 20



**Plate 20:** Showing the various articles and toys for market sale Figure A and B toys and knife cover, Figure C Pestle, Figure D Round Dough Board and Roller, E Sickle and Figure F Arrow

*“Abraham planted a grove in Beersheba and called there the name of God”*

**Genesis 21:33”**

Sacred groves, as above mentioned, have Biblical existence and mentions, making mythological relevance in various cultures throughout the world. Sacred groves are any grove or orchard of trees having special religious importance to a particular culture. Applied Environment Research Foundation puts sacred groves as “relic forest patches, traditionally protected by communities in reverence of a deity”. Sacred groves were prominently found in Ancient Near East and prehistoric Europe. They had a huge significance in Celtic, Baltic, Germanic, ancient Greek, Near Eastern, Roman, and Slavic polytheism. Alike these, they were vital fractions of mythological landscape and cult practice of India, Japan and West Africa (Gadgil and Vartak 1976).

Nature worship has been integral part of mankind. Socio-religious and anthropological aspects of society reveal the worship of natural resources in various cultures. In the modern and post-modern times of industrialization and colonizing, deforestation is a prominent challenge to the ecosystem. In the wake of mass deforestation, these sacred groves structure main repositories of forest biodiversity. Also they provide a refuge to various animal and plant species for conservation significance. India has over 13000 documented sacred groves.

These protected groves which still remain undisturbed, scattered in patches in all over the country, spread only about 1000 square kilometers in India. The concept of sacred groves in India is rooted right from antiquity even before Vedic age. These groves, due to their religious and spiritual values to their preserver communities, as per the definition provided by IUCN are also considered as “Sacred Natural Sites”. Indian sacred groves documented from North-east Himalayan region, Western Ghats, Eastern Ghats, Coastal region, Central Indian Plateau and Western Desert.

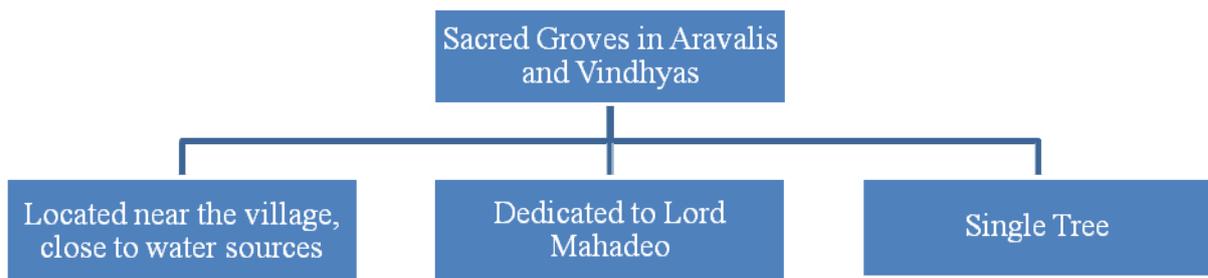
A huge diversity lies among Indian groves. Some contain only few trees, while others are spread in hundreds of acres, sometimes they overlap with forested areas while others exist in open plains or desert. Their names too vary region to region. Most of the sacred groves in the country are associated with almost 40,000 endogamous groups within Hindu caste system and other major religions such as Buddhism and Islam, along with other communities and tribal groups. Most of these groups offer prayers to these trees and ensure health and wellness of family and community (Hughes and Chandran 1998).

Sacred groves are scattered in all over India. In the country these groves were earlier reported from Himalayas, North-east India, highlands of Bihar, Orissa, Madhya Pradesh, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.

**Sacred Groves in Rajasthan:**

According to an estimate, about 15000 sacred groves varying in size, between 0.1 h to 500 h exist in Rajasthan. These sacred groves are vividly known as *deora, malvan, deorai, rakhat bani, Oran; sacred corridors: deo ghats; temple forests: mandir van and sacred gardens baugh.*

Sacred groves in Vindhya and Aravali can be classified in three major groups:



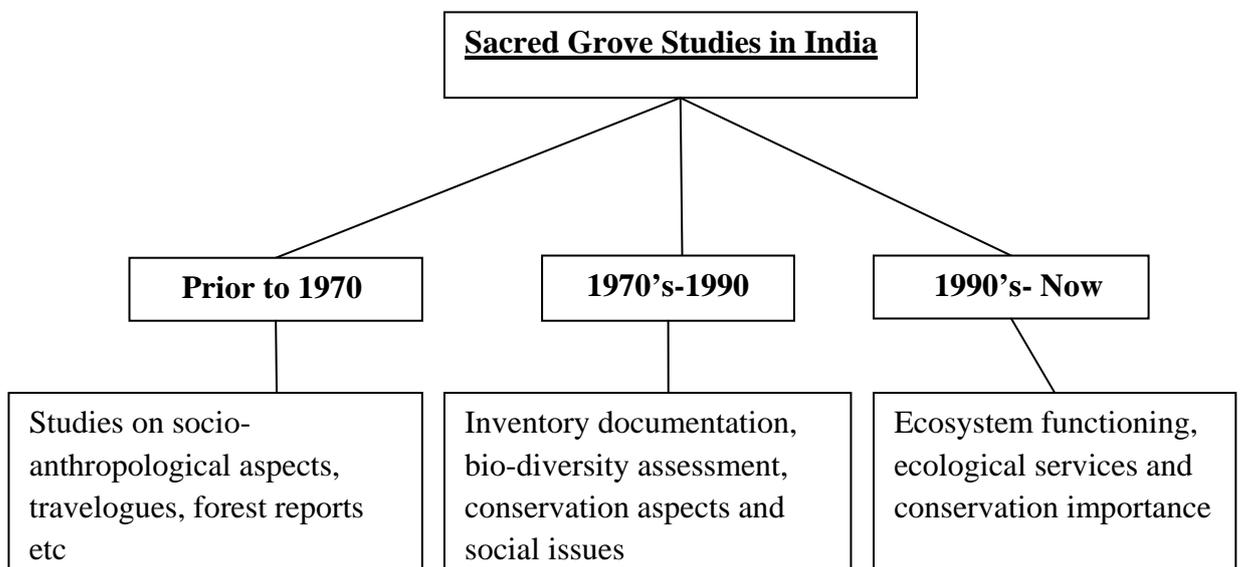
The first group, close to water resources in village or at the top of small hillocks in Aravallis, has the worshippers of Bheruji, Bawsi and Mataji. Khanpa Bheruji, Kukawas Bheruji, Badi Roopan Mata etc. in Udaipur is such sites as examples. In Vindhya, these groves can be found in Kota, Bundi, Baran and Jhalawar.

The second group of groves is dedicated to Lord Mahadeo. Sometimes entire or parts of vegetation in watershed is often protected as groves. Their major characteristics are large trees and a water source near-by. Ubeshwarji, Kamalnath, Gautameshwarji,

Taneshwarji, Jhameshwarji are prominent examples of these open and step wells (Bawdi) water sources.

The third type, a single tree can be exemplified by mentioning Kotra forest range, where several large trees of *Ficus benghalensis* can be seen. These trees look like groves because of the development of their aerial and prop roots. Not only in Rajasthan but in all over India, there is a tradition of protecting single trees like Peepal (*Ficus religiosa*), Gular (*Ficus racemosa*), and Bargad (*Ficus benghalensis*). This tradition is also accounted from other Asian and African countries (Malhotra *et al.*, 2011)

On the basis of previous researches and studies, sacred grove studies in India can be categorized into three time periods with the mention of what fields have been worked upon in those years:



Apart from these thrust areas, in comparison to biodiversity and documentation literatures, ecosystem functioning and services are yet to be explored specifically.

Sacred groves are small patches of native vegetation traditionally protected and managed by local communities. In other words, sacred groves are the refuge of certain plant species preserved on religious grounds which can satisfy the aesthetic, scientific, cultural, and recreational needs of mankind (Bhakat, 1990). India ranks 10<sup>th</sup> in the list of most forested nations in the world with 76.87 million hectare of the forests and tree cover i.e. 20.6 percent forest of the total geographical area of the country (ICFRE, 2013).

### **STUDY SITE**

The study was carried out in the forest fragments represented by sacred groves in Pratapgarh Tehsil, Rajasthan state, it is estimated that over 20 percent of the geographical area of the state are under forest with much of the remaining area converted in to agriculture land. Peoples do not cut or damage the trees which are planted in sacred groves and their surrounding environment. They perform various traditional religious rituals inside these groves. Six sacred grove has been identified in Pratapgarh Tehsil and these are Gupteshwer mahadev, Deepeshwer Mahadev, Gautameshwer Mahadev, Yogeshwer Mahadev, Jatashanker Mahadev and Neelkhanteshwer Mahadev. A detailed study has been carried in these sacred groves. The main plant species found in the region are sub tropical and deciduous.

Sacred groves are very rich in biodiversity these are the source of several non timber forest products as well as multiple use livelihood goods. Plants found in these groves are good source of fodder, fruits, timber wood, seeds and ethnomedicine (Pandey) although the Aravali region is very rich in biodiversity and several sacred groves are reported, inspite of this, the elaborative information of these groves is not available. Keeping the above fact in view, a field survey was carried out to explore the plant diversity in Gupteshwar mahadev and to evaluate the medicinal use of local plants to provide the efficiency information for peoples. The southern part of Rajasthan is rich in plant diversity due to little moisture in compare to northern region. This cause the majority of the forest covers the state under southern region. Afford the western prescription alternatives, to encourage the preservation of culture, tradition, conservation and sustainable utilization of plant wealth occurring in this sacred grove (Meena and Yadav, 2010).

**Table- 5.1: Showing the Sacred grove of study area with associate tribal communities**

| S.No. | Name of Sacred grove    | Location            | Dedicated to | Protected by    |
|-------|-------------------------|---------------------|--------------|-----------------|
| 1     | Gupteshwer-Mahadev      | Pratapgarh          | Lord Shiva   | Bhil and Minas  |
| 2     | Gautameshwer-Mahadev    | Arnod               | Lord Shiva   | Bhil and Minas  |
| 3     | Jatashanker-Mahadev     | Bagvas - Pratapgarh | Lord Shiva   | Damor and Minas |
| 4     | Neelkhanteshwer-Mahadev | Pratapgah           | Lord Shiva   | Local peoples   |

|   |                    |            |                        |                 |
|---|--------------------|------------|------------------------|-----------------|
| 5 | Yogeshwer-Mahadev  | Pratapgarh | Lord Shiva and Hanuman | Bhil and Minas  |
| 6 | Deepeshwer-Mahadev | Pratapgarh | Lord Shiva             | By Local people |

**Table- 5.2: The common plants species planted in sacred grove of study area**

| S.No. | Plant Species               | Associated with rituals  |
|-------|-----------------------------|--|
| 1.    | <i>Anogeissus latifolia</i> | Trees not cut on religious ground.   |
| 2.    | <i>Azadirachta indica</i>   | Worshipped during Navaratri for happiness and keep evil eye and spirits away.                        |
| 3.    | <i>Butea monosperma</i>     | Worshipped in marriages.   |
| 4.    | <i>Calotropis gigantea</i>  | Worshipped on Monday in favor of Lord Shiva.   |
| 5.    | <i>Ficus benghalensis</i>   | Worshipped by married women on 'Bada Mawas' in Jyestha month for happiness and prosperity of family. |
| 6.    | <i>Ficus religiosa</i>      | Totemic plant worshipped at this place by certain Bhils.   |
| 7.    | <i>Mitragyna parviflora</i> | Dedicated to Lord Krishna.   |
| 8.    | <i>Musa paradisiaca</i>     | Worshipped on Thursday by women for prosperity and good life.  |
| 9.    | <i>Ocimum sanctum</i>       | Worshipped to keep evil spirits away and also for prosperity and happiness of family.                |
| 10.   | <i>Sterculia urens</i>      | People believe about this plant as protector of groves.  |
| 11.   | <i>Terminalia bellirica</i> | Local saint Bhagat ji are worshipped here by local peoples.  |
| 12.   | <i>Vitex negundo</i>        | Dedicated to Lord Shiva.   |

**Plants used in sacred pyre:**

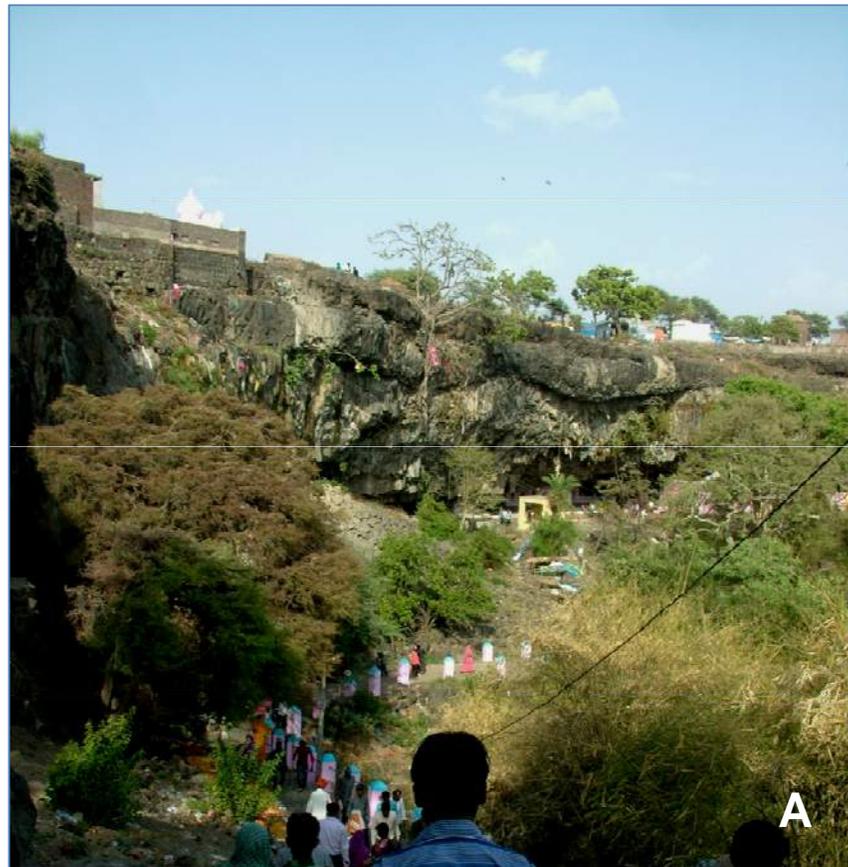
1. *Achyranthes aspera*
2. *Acacia catechu*
3. *Butea monosperma*
4. *Ficus racemosa*
5. *Santalum album*
6. *Mangifera indica*
7. *Ficus religiosa*

**Conclusion:**

Sacred groves are valuable in society, just because of their ethno medicinal and conservative values in biodiversity point of view and cultural point of view also. Particular areas are restricted by local communities due to their rituals and orthodox traditions, by this act they go near to the nature and protect the local environment from human perturbations. Plants have a vital role in religious and social ceremonies of local and tribal communities. Their religious and superstitious beliefs about these plants prevent their destruction. Plants and their parts hold an importance in various religious ceremonies, for worshipping or other rituals by tribal people. In observations, 12 plant species are sacred which are worshipped on special occasions or on daily basis, while seven plant species are used in sacred pyre.

There are several legends and myths associated with certain plants related to deities and ancestors. Sacred groves around temples of gods and goddesses and local deities are rich in natural flora. They represent small centers or patches of bio-diversity consisting of trees, shrubs, herbs etc. Thus they have been rescued from destruction because of their taboos and beliefs. Modernization has come as a big bane to these grooves as day-by-day. These beliefs are being forgotten by people, which give a big threat to their existence.

# Plate- 21



**Plate 21:** Showing Sacred Groves in Prtapgarh Tehsil  
Figure A Gautameshwer Mahadev and B Gupteshwer Mahadev Sacred Grove

*E*thnobotany is the study of past and present, natural and traditional, association, interaction and inter-relationship among the aboriginals and the surrounding environment. Since ages the ethnic groups are living in close proximity of nature acquiring unique knowledge of thousands of wild plants and preserving the traditions by oral means. The rising intrusion of modern industrialization has taken the ancient culture on the verge of extinction. Hence there is an urgent need to record and preserve the age-long folklores and practices before the valuable ethnobotanical data get lost in near future.

The thesis consists of ethnobotanical studies of Pratapgarh tehsil in Rajasthan. Meena tribal and traditional communities inhabiting this area are Meena, Bhil-Meena, Bhil, Damor, Garasiya etc. Meena and Bhil constitute the major bulk of total tribal population in Rajasthan. They are widely distributed, in eastern part and southern part of Rajasthan. Tribal and traditional communities living close to nature have unique knowledge about the use of wild flora, most of which are not known to the outside world. Present study deals with local uses of plant by tribals and traditional communities.

The entire thesis is divided in five chapter's covering various aspects of tribal life *Vis-a –Vis* uses of plant species growing in their surroundings.

Chapter one introduces with the subject of ethnobotany and tribal population in India and Rajasthan, and its scope in southern Rajasthan. Lights on origin, history, distribution of tribal and traditional communities along with their settlement pattern, dress, ornaments, social life, economy, historical background and about geographic location, physiography, drainage system and vegetation of area are also described in brief.

A critical review of available literature published on Ethnobotany in the World, Country and State is presented in chapter two.

Methodology used for collecting data during field surveys is described in chapter 3. Informations from 40 villages/ localities of study area were gathered. Besides, informations were also collected with assistance of NGOs, ANMs working in the interior areas and college students of the rural areas studying in Government College, Pratapgarh.

About 3268 datasheets were prepared from the findings made during study period, collected plants were deposited in the Herbarium of Rajasthan University, Botanical Laboratory (RUBL), Jaipur. The local terms which were collected are given with the related topics to enable the researchers for further study of tribe.

Plants uses in day to day life of tribal and traditional communities have been classified into 15 subheads in chapter four. In this chapter sixty one plants are used as wild edible plants and thirty eight plants are used in famine condition. One hundred and five plants are in fodder; while one hundred and eleven plants are used to cure several disease treated using plant-based formulations are body heat, boils, pimples, cough, diarrhoea, fever, mouth sore, dysentery, rheumatism, scorpion sting, toothache and wounds. Most of the plants surveyed for medicinal values in the study area are used singly. The various modes of administration like decoction, juice, ash of plants, poultice, paste, powder and extracts by crushing fresh plant material or slicing are used. In certain diseases, warmed leaf smeared with oil/ ghee is applied directly over the affected body part. Similarly, plant products such as latex are used. The herbal preparation is taken orally/applied locally/ boiled in water and is used for bathing. Some plants are used to prepare *laddoes* and eaten as medicine for strength. Thirty three plants are used in Ethnoveterinary diseases in this area.

Songs and music add spice to tribal life. They possess a large variety of musical instruments, chiefly made of nineteen plant species.

Fiber from eighteen plant species are used for making ropes, strings, tying thatch, carrying fuel wood, loads, weaving coats and cradles etc.

Twenty six plants in domestic articles, thirteen plants in agricultural implements and twenty three plants in kitchen articles are used in daily and regular life of rural and tribal areas which have indispensable values and importance of daily basis life.

Approx twenty five plant species are used as construction materials for permanent and temporary shelters. They are used in preparation of household articles used in day to day life.

Seventeen plant species are used in vices as liquor and eighteen plant species are used in intoxicants and masticatories. Thirteen plant species are related with gum, resin, tannin production and nine plants are fish poisoning plants, which makes a great value in tribal daily life. Chapter five is about sacred groves of Pratapgarh tehsil. During present investigation we found six sacred groves, which are enriched with protected vegetation by local peoples and twelve plant species are sacred which are worshipped either on special occasions or daily, while seven plant species are used in sacred pyre.

In the present study all aspects of ethnobotany have been taken into consideration. However, the surveyed area being limited to a tehsil leaves a vast scope for hunting out further ethnobotanical treasure from the tribes. The quantitative phytochemical analysis of medicinal and nutritional plants can further enrich the drug industry with new drug resources and sources of high nutrition for the benefit of mankind.

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### Systematic Enumeration of Plants used by tribal and traditional communities of Pratapgarh Tehsil

| S. No. | Plant Species   | Local Name                  | Family             | RUBL  |
|--------|---|-----------------------------|--------------------|-------|
| 1      | <i>Abelmoschus esculentus</i> (Linn.) Moench.           | Bhindi                      | Malvaceae          | -     |
| 2      | <i>Abelmoschus ficulneus</i> (Linn.) Wt. & Arn.         | Raan bhindi                 | Malvaceae          | -     |
| 3      | <i>Abelmoschus manihot</i> (Linn.) Med.                 | Raan bhindi                 | Malvaceae          | -     |
| 4      | <i>Abelmoschus moschatus</i> Med.                       | Jungli bhindi               | Malvaceae          | -     |
| 5      | <i>Abrus precatorius</i> Linn.                          | Chirami/Chanboi             | Fabaceae           | 19634 |
| 6      | <i>Abutilon indicum</i> (Linn.) Sweet.                  | Kanghi/Dabi dablya          | Malvaceae          | 20011 |
| 7      | <i>Acacia catechu</i> (Linn.f) Willd.                   | Khair                       | Mimosaceae         | 19513 |
| 8      | <i>Acacia farnesiana</i> (Linn.) Willd                  | Gandhi babool               | Mimosaceae         | -     |
| 9      | <i>Acacia leucophloea</i> (Roxb.) Willd.                | Babool/Boliya               | Mimosaceae         | 19508 |
| 10     | <i>Acacia nilotica</i> (Linn.) Del.                     | Babool                      | Mimosaceae         | 19506 |
| 11     | <i>Acacia raddiana</i> Savi.                            | Bamoor                      | Mimosaceae         | -     |
| 12     | <i>Acacia senegal</i> (Linn.) Willd.                    | Koomata/Kumatio             | Mimosaceae         | 19979 |
| 13     | <i>Acacia sinuata</i> (Lour.) Merr.                     | Sikakai                     | Mimosaceae         | -     |
| 14     | <i>Acalypha indica</i> Linn.                            | Kuppi/Kholi                 | Euphorbiaceae      | -     |
| 15     | <i>Achyranthes aspera</i> Linn.                         | Adalio kato/<br>Oondhokanto | Amaranthaceae      | 20016 |
| 16     | <i>Acrachne recemosa</i> (Heyne ex Roem & Schult.) Ohwi | Ghass                       | Poaceae            | -     |
| 17     | <i>Actiniopteris radiata</i> (J. Koenig ex Sw.) Link.   | Morpagi                     | Actiniopteridaceae | -     |
| 18     | <i>Adansonia digitata</i> Linn.                         | Kalp-Varksha                | Bombacaceae        | -     |

|           |  |                                 |               |       |
|-----------|--|---------------------------------|---------------|-------|
| <b>19</b> | <i>Adhathoda vasica</i> Nees.                                    | Bansor                          | Acanthaceae   | -     |
| <b>20</b> | <i>Adhatoda zeylanica</i> Medic.                                 | Adusa/Safe bansoda              | Acanthaceae   | 19450 |
| <b>21</b> | <i>Adina cardifolia</i> (Willd. ex Roxb.) Hook.<br>f. ex Brandis | Haldu                           | Rubiaceae     | -     |
| <b>22</b> | <i>Aegle marmelos</i> (Linn.) Corr.                              | Bel/Beel                        | Rutaceae      | 19977 |
| <b>23</b> | <i>Aerva javanica</i> (Burm.f.) Juss.ex Schult.                  | Gedua ki chhach                 | Amaranthaceae | 19982 |
| <b>24</b> | <i>Aerva lantana</i> (Linn.) Juss.ex Schult.                     | Gedua ki chhach                 | Amaranthaceae | -     |
| <b>25</b> | <i>Agave americana</i> Linn.                                     | Gul bans                        | Agavaceae     | -     |
| <b>26</b> | <i>Agave cantala</i> Roxb.                                       | Gul bans                        | Agavaceae     | -     |
| <b>27</b> | <i>Ageratum conyzoides</i> Linn.                                 | Dochuntry/Uchanty               | Asteraceae    | -     |
| <b>28</b> | <i>Ailanthus excelsa</i> Roxb.                                   | Ardu/Aldoo                      | Simaroubaceae | 19560 |
| <b>29</b> | <i>Alangium salvifolium</i> (L.f.) Benth.                        | Aankol                          | Alangiaceae   | -     |
| <b>30</b> | <i>Albizia lebeck</i> (Linn.) Benth.                             | Siris                           | Mimosaceae    | -     |
| <b>31</b> | <i>Alhagi maurorum</i> Medic.                                    | Jawasa                          | Fabaceae      | -     |
| <b>32</b> | <i>Allium cepa</i> Linn.   | Piaz/Kando                      | Liliaceae     | -     |
| <b>33</b> | <i>Allium sativum</i> Linn.                                      | Lasann/Lahsun                   | Liliaceae     | -     |
| <b>34</b> | <i>Aloe barbadensis</i> Mill.                                    | Gwarpatha/Rambans               | Liliaceae     | -     |
| <b>35</b> | <i>Alternanthera pungens</i> Kunth.                              | Santhi                          | Amaranthaceae | -     |
| <b>36</b> | <i>Alysicarpus vaginalis</i> (Linn.) DC.                         | Chorai                          | Fabaceae      | -     |
| <b>37</b> | <i>Amaranthus caudatus</i> Linn.                                 | Chulai                          | Amaranthaceae | 19423 |
| <b>38</b> | <i>Amaranthus gangeticus</i> Linn.                               | Kangani                         | Amaranthaceae | -     |
| <b>39</b> | <i>Amaranthus spinosus</i> Linn.                                 | Kanta chulai/<br>Kantili chulai | Amaranthaceae | 19432 |
| <b>40</b> | <i>Amaranthus tenuifolius</i> Willd.                             | Chua/ Chimra                    | Amaranthaceae | -     |

|           |  |                                     |                  |       |
|-----------|--|-------------------------------------|------------------|-------|
| <b>41</b> | <i>Amaranthus tricolor</i> Linn.                                     | Chua/Chorai                         | Amaranthaceae    | -     |
| <b>42</b> | <i>Amaranthus viridis</i> Linn.                                      | Seta Ghas/Tandula/<br>Jangli chorai | Amaranthaceae    | -     |
| <b>43</b> | <i>Ammannia baccifera</i> Linn.                                      | Jal bhangra                         | Lythraceae       | -     |
| <b>44</b> | <i>Amorphophallus commutatus</i> Engler                              | Suran kand/ Suar kand               | Araceae          | -     |
| <b>45</b> | <i>Ampelocissus latifolia</i> (Roxb.)Planch                          | Ramchana bel/<br>Aman dhora         | Vitaceae         | 20017 |
| <b>46</b> | <i>Anisomeles indica</i> (Linn.) O.Kuntze                            | Bhainsa pata                        | Lamiaceae        | -     |
| <b>47</b> | <i>Annona squamosa</i> Linn.   | Sitaphal                            | Annonaceae       | 19447 |
| <b>48</b> | <i>Anogeissus latifolia</i> (Roxb.ex DC.) Wall.<br>ex Guill. & Perr. | Dhau/Dhok                           | Combretaceae     | 19614 |
| <b>49</b> | <i>Anogeissus pendula</i> Edgew.                                     | Dhauk/dhok/Dhaukara                 | Combretaceae     | -     |
| <b>50</b> | <i>Anogeissus sericea</i> Brand.                                     | Gurji dho                           | Combretaceae     | 20012 |
| <b>51</b> | <i>Antigonon leptopus</i> Hook. & Arn.                               | Jhumka bel                          | Polygonaceae     | -     |
| <b>52</b> | <i>Apluda mutica</i> Linn.   | Bhongta/poleda                      | Poaceae          | -     |
| <b>53</b> | <i>Arachis hypogaea</i> Linn.  | Muphadi                             | Fabaceae         | -     |
| <b>54</b> | <i>Areca catechu</i> Linn.   | Supari                              | Arecaceae        | -     |
| <b>55</b> | <i>Argemone mexicana</i> Linn.                                       | Satyanashi/Pili Kateli              | Papaveraceae     | 19980 |
| <b>56</b> | <i>Aristida adscensionis</i> Linn.                                   | Lamp                                | Poaceae          | -     |
| <b>57</b> | <i>Aristida funiculata</i> Trin. & Rupr.                             | Lamp                                | Poaceae          | 20010 |
| <b>58</b> | <i>Aristolochia indica</i> Linn.                                     | Hukkabel                            | Aristolochiaceae | -     |
| <b>59</b> | <i>Artocarpus heterophyllus</i> Lamk.                                | Katel                               | Moraceae         | -     |
| <b>60</b> | <i>Asparagus racemosus</i> Willd.                                    | Satabar/Sitabar                     | Lilaceae         | -     |
| <b>61</b> | <i>Asphodelus tenuifolius</i> Cav.                                   | Pyaji                               | Liliaceae        | 19978 |
| <b>62</b> | <i>Azadirachta indica</i> A. Juss.                                   | Neemdo/Neem                         | Meliaceae        | 19568 |

|           |   |                 |                  |       |
|-----------|---|-----------------|------------------|-------|
| <b>63</b> | <i>Bacopa monnieri</i> (Linn.) Wettst.                    | Brahmi/Jal buti | Scrophulariaceae | -     |
| <b>64</b> | <i>Balanites aegyptiaca</i> (Linn.) Del.                  | Hingota         | Simaroubaceae    | 19568 |
| <b>65</b> | <i>Barleria cuspidata</i> Linn.                           | Bajradanti      | Acanthaceae      | -     |
| <b>66</b> | <i>Barleria prionitis</i> Linn.                           | Piya bansoda    | Acanthaceae      | 19451 |
| <b>67</b> | <i>Basella alba</i> Linn.                                 | Poi             | Basellaceae      | 19986 |
| <b>68</b> | <i>Bauhinia purpurea</i> Linn.                            | Kachnar         | Caesalpiniaceae  | -     |
| <b>69</b> | <i>Bauhinia racemosa</i> Lam.                             | Sainto, Santa   | Caesalpiniaceae  | 19470 |
| <b>70</b> | <i>Bauhinia variegata</i> Linn.                           | Kachnar         | Caesalpiniaceae  | 20015 |
| <b>71</b> | <i>Benincasa hispida</i> (Thumb.) Cogn.                   | Petha           | Cucurbitaceae    | -     |
| <b>72</b> | <i>Bidens biternata</i> (Lour.) Merr. & Sherff ex Sherff  | Chitakni        | Asteraceae       | -     |
| <b>73</b> | <i>Blumea lacera</i> (Burm. F.) DC.                       | Phatkadi        | Asteraceae       | -     |
| <b>74</b> | <i>Boerhavia diffusa</i> Linn.                            | Santhi          | Nyctaginaceae    | 19983 |
| <b>75</b> | <i>Bombex ceiba</i> Linn.                                 | Semal/Sanwal    | Bombacaceae      | 19985 |
| <b>76</b> | <i>Boswellia serrata</i> Roxb. ex Cocl.                   | Salar           | Bursaceae        | 19987 |
| <b>77</b> | <i>Bothriochloa pertusa</i> (Linn.) A.Camus               | Ghass           | Poaceae          | -     |
| <b>78</b> | <i>Brachiaria ramosa</i> (Linn.) Stapf.                   | Kuri Korachinki | Poaceae          | -     |
| <b>79</b> | <i>Brassica campestris</i> Linn.                          | Sarson          | Brassicaceae     | -     |
| <b>80</b> | <i>Brassica juncea</i> (Linn.) Czern. and Coss.           | Rai             | Brassicaceae     | -     |
| <b>81</b> | <i>Brassica nigra</i> (Linn.) Koch.                       | Kali Rai        | Brassicaceae     | -     |
| <b>82</b> | <i>Brassica oleracea</i> Linn. var. <i>botrytis</i> Linn. | Phool Gobi      | Brassicaceae     | -     |
| <b>83</b> | <i>Brassica oleracea</i> Linn. var. <i>capitata</i> Linn. | Bandh Gobi      | Brassicaceae     | -     |
| <b>84</b> | <i>Bridelia retusa</i> (Linn.) Spreng.                    | Laapno          | Euphorbiaceae    | -     |

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|------------|--|-----------------------|-----------------|-------|
| <b>85</b>  | <i>Buchanania latifolia</i> Roxb.                  | Chironji              | Anacardiaceae   | -     |
| <b>86</b>  | <i>Bulbostylis barbata</i> (Rottb.) Clarke         | Chuhe ki Mooch        | Cyperaceae      | -     |
| <b>87</b>  | <i>Butea monosperma</i> (Lam.) Taub.               | Chheela/Chhola        | Fabaceae        | 19984 |
| <b>88</b>  | <i>Cajanus cajan</i> (Linn.) Millsp.               | Aarer                 | Fabaceae        | -     |
| <b>89</b>  | <i>Calotropis gigantea</i> (Linn.) R. Br.          | Safed Akdo            | Asclepiadaceae  | 19558 |
| <b>90</b>  | <i>Calotropis procera</i> acut. non (Ait.) Ait. f. | Aakdo/Aak/Akra        | Asclepiadaceae  | -     |
| <b>91</b>  | <i>Cannabis sativa</i> Linn.                       | Bhang                 | Cannabinaceae   | 20001 |
| <b>92</b>  | <i>Capparis decidua</i> (Forsk.) Edgew.            | Kair/Tainti           | Capparaceae     | 20003 |
| <b>93</b>  | <i>Capparis sepiaria</i> Linn.                     | Karil/ Kair/Tainti    | Capparaceae     | 20002 |
| <b>94</b>  | <i>Capparis zeylanica</i> Linn                     | Aradanda              | Capparaceae     | -     |
| <b>95</b>  | <i>Capsicum annuum</i> Linn.                       | Mirch                 | Solanaceae      | -     |
| <b>96</b>  | <i>Cardiospermum halicacabum</i> Linn.             | Kanphuti              | Sapinadaceae    | -     |
| <b>97</b>  | <i>Carica papaya</i> Linn.                         | Arand kakri           | Caricaceae      | -     |
| <b>98</b>  | <i>Carrisa congesta</i> Wight.                     | Karonda               | Apocynaceae     | -     |
| <b>99</b>  | <i>Casearia tomentosa</i> Roxb.                    | Mojal/ Monja          | Flacourtiaceae  | -     |
| <b>100</b> | <i>Cassia absus</i> Linn.                          | Chiksi                | Caesalpiniaceae | -     |
| <b>101</b> | <i>Cassia auriculata</i> Linn.                     | Anwal/Aval            | Caesalpiniaceae | -     |
| <b>102</b> | <i>Cassia fistula</i> Linn.                        | Amaltas/Barr-bharavan | Caesalpiniaceae | 19468 |
| <b>103</b> | <i>Cassia obtusifolia</i> Linn.                    | Pamar                 | Caesalpiniaceae | -     |
| <b>104</b> | <i>Cassia occidentalis</i> Linn.                   | Ratua/Kasondi         | Caesalpiniaceae | 19997 |
| <b>105</b> | <i>Cassia pumila</i> Lam.                          | Chamedian             | Caesalpiniaceae | -     |
| <b>106</b> | <i>Cassia siamea</i> Lam.                          | Syama                 | Caesalpiniaceae | -     |
| <b>107</b> | <i>Cassia tora</i> Linn.                           | Pamad                 | Caesalpiniaceae | 20000 |
| <b>108</b> | <i>Catharanthus roseus</i> (Linn.) G. Don          | Sadaphuli             | Apocynaceae     | -     |

|            |   |                   |                |       |
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| <b>109</b> | <i>Cayratia trifolia</i> (Linn.) Domin                  | Rachani           | Vitaceae       | 19988 |
| <b>110</b> | <i>Celastrus paniculata</i> Willd.                      | Malkangni         | Celastraceae   | -     |
| <b>111</b> | <i>Celosia argentea</i> Linn.                           | Surela/lambi      | Amaranthaceae  | 19996 |
| <b>112</b> | <i>Cenchrus biflorus</i> acut. non Roxb.                | Bharoot           | Poaceae        | -     |
| <b>113</b> | <i>Cenchrus ciliaris</i> Linn.                          | Dhaman            | Poaceae        | -     |
| <b>114</b> | <i>Centella asiatica</i> (Linn.) Urban.                 | Brahmi Buti       | Apiaceae       | -     |
| <b>115</b> | <i>Ceropegia bulbosa</i> Roxb.                          | Khedula, Parpanda | Asclepiadaceae | -     |
| <b>116</b> | <i>Cestrum nocturnum</i> Linn.                          | Raat ki rani      | Solanaceae     | -     |
| <b>117</b> | <i>Chenopodium album</i> Linn.                          | Bathua            | Chenopodiaceae | -     |
| <b>118</b> | <i>Chenopodium murale</i> Linn.                         | Chieva            | Chenopodiaceae | -     |
| <b>119</b> | <i>Chloris virgata</i> Sw.                              | Chhoto eranio     | Poaceae        | -     |
| <b>120</b> | <i>Chlorophytum tuberosum</i> (Roxb.) Baker             | Safed Moosli      | Liliaceae      | 19611 |
| <b>121</b> | <i>Chrozophora rottleri</i> (Geis.) A. Juss. ex Spreng. | Subali            | Euphorbiaceae  | -     |
| <b>122</b> | <i>Cicer arietinum</i> Linn.                            | Chana             | Fabaceae       | -     |
| <b>123</b> | <i>Cissampelos pareira</i> auct. non Linn.              | Kalipar           | Menispermaceae | -     |
| <b>124</b> | <i>Cissus quadrangularis</i> Linn.                      | Hadjoori          | Vitaceae       | 19993 |
| <b>125</b> | <i>Citrullus colocynthis</i> (Linn.) Schrad.            | Gartoomba/Tommba  | Cucurbitaceae  | 19999 |
| <b>126</b> | <i>Citrullus lanatus</i> (Thunb.) Matsumura & Nakai     | Matira            | Cucurbitaceae  | -     |
| <b>127</b> | <i>Citrus aurantifolia</i> (Christmann) Swingle         | Kagji nibu        | Rutaceae       | -     |
| <b>128</b> | <i>Citrus aurantium</i> Linn.                           | Nibu              | Rutaceae       | -     |
| <b>129</b> | <i>Citrus limon</i> (Linn.) Burm.f.                     | Neembu/Khatta     | Rutaceae       | -     |
| <b>130</b> | <i>Citrus maxima</i> (Burm.) Merr.                      | Bijoda            | Rutaceae       | -     |

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|------------|--|---------------------|----------------|-------|
| <b>131</b> | <i>Citrus medica</i> Linn.                         | Nibu                | Rutaceae       | -     |
| <b>132</b> | <i>Cleome gynandra</i> Linn.                       | Safed Bagroo/Hulhul | Cleomaceae     | -     |
| <b>133</b> | <i>Cleome viscosa</i> Linn.                        | Singali/Pili-hulhul | Cleomaceae     | -     |
| <b>134</b> | <i>Clerodendrum phlomidies</i> Linn. f.            | Arani               | Verbenaceae    | 19591 |
| <b>135</b> | <i>Coccinia cordifolia</i> (Linn.) Cogn.           | Teedori/Tidori      | Cucurbitaceae  | -     |
| <b>136</b> | <i>Coccinia grandis</i> (Linn.) J.O.Voigt          | Gol Kakri/Kinduri   | Cucurbitaceae  | -     |
| <b>137</b> | <i>Cocculus hirsutus</i> (Linn.) Diels.            | Bajarbel/Jaljamani  | Menispermaceae | 19969 |
| <b>138</b> | <i>Cocculus pendulus</i> (J.R. & G. Forst.) Diels. | Bajarbel /Jaljamni  | Menispermaceae | -     |
| <b>139</b> | <i>Cocus nucifera</i> Linn.                        | Khopra              | Arecaceae      | -     |
| <b>140</b> | <i>Colocasia esculenta</i> (Linn.) Schott          | Arai                | Araceae        | -     |
| <b>141</b> | <i>Commelina benghalensis</i> Linn.                | Kana gokna          | Commelinaceae  | 19989 |
| <b>142</b> | <i>Commelina erecta</i> Linn.                      | Kana gokna          | Commelinaceae  | -     |
| <b>143</b> | <i>Commiphora wightii</i> (Arn.) Bhandari          | Gugar/Guggal        | Burseraceae    | -     |
| <b>144</b> | <i>Convolvulus microphyllus</i> Sieb. ex Spreng.   | Sankahuli           | Convolvulaceae | 19573 |
| <b>145</b> | <i>Corchorus aestuans</i> Linn.                    | Jute                | Tiliaceae      | -     |
| <b>146</b> | <i>Corchorus capsularis</i> Linn.                  | Jute                | Tiliaceae      | -     |
| <b>147</b> | <i>Corchorus depressus</i> (Linn.) Stocks.         | Khuroond/Bauphali   | Tiliaceae      | 19990 |
| <b>148</b> | <i>Corchorus olitorius</i> Linn.                   | Okra/Chamghas       | Tiliaceae      | -     |
| <b>149</b> | <i>Corchorus tridens</i> Linn.                     | Kaua ki chonch      | Tiliaceae      | 20089 |
| <b>150</b> | <i>Cordia dichotoma</i> Forst. f.                  | Lisora/Lehsua       | Ehretiaceae    | 20005 |

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| <b>151</b> | <i>Cordia gharaf</i> (Forsk). Ehr. ex Asch.                  | Goondee            | Ehretiaceae    | 20004 |
| <b>152</b> | <i>Coriandrum sativum</i> Linn.                              | Dhanno/Dhaniya     | Apiaceae       | -     |
| <b>153</b> | <i>Crinum asiaticum</i> Linn.                                | Sukhdarshan        | Amaryllidaceae | -     |
| <b>154</b> | <i>Crinum defixum</i> Ker- Gawl                              | Sukhdarshan        | Amaryllidaceae | -     |
| <b>155</b> | <i>Crotalaria burhia</i> Buch. Ham. ex Benth.                | Jhunda/Lagrya      | Fabaceae       | -     |
| <b>156</b> | <i>Crotalaria juncea</i> Linn.                               | San                | Fabaceae       | -     |
| <b>157</b> | <i>Crotalaria medicaginea</i> Lam.                           | Jhojhru            | Fabaceae       | 19998 |
| <b>158</b> | <i>Cucumis callosus</i> (Rott.) Cogn.                        | Kachra/Kachari     | Cucurbitaceae  | -     |
| <b>159</b> | <i>Cucumis melo</i> Linn.var.melo sensu Chakravarty          | Kachra/Kachari     | Cucurbitaceae  | -     |
| <b>160</b> | <i>Cucumis melo</i> Linn. var agrestis Naud.                 | Kachra/Kachari     | Cucurbitaceae  | -     |
| <b>161</b> | <i>Cucumis melo</i> Linn. var utilissimus Duthie and Fuller. | Kakadi             | Cucurbitaceae  | -     |
| <b>162</b> | <i>Cucumis sativus</i> Linn.                                 | Kheera             | Cucurbitaceae  | -     |
| <b>163</b> | <i>Cucurbita maxima</i> Duch. ex Lam.                        | Lal Kola           | Cucurbitaceae  | -     |
| <b>164</b> | <i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir      | Danger vela/kolais | Cucurbitaceae  | -     |
| <b>165</b> | <i>Cuminum cyminum</i> Linn.                                 | Jeera              | Apiaceae       | -     |
| <b>166</b> | <i>Curculigo orchioides</i> Gaertn.                          | Kali Moosli        | Hypoxidaceae   | -     |
| <b>167</b> | <i>Curcuma amada</i> Roxb.                                   | Ama Haldi          | Zingiberaceae  | -     |
| <b>168</b> | <i>Curcuma longa</i> Linn.                                   | Haldi              | Zingiberaceae  | -     |
| <b>169</b> | <i>Cuscuta reflexa</i> Roxb.                                 | Amarbel            | Cuscutaceae    | 19599 |
| <b>170</b> | <i>Cyamopsis tetragonoloba</i> Linn. Taub.                   | Guwar              | Papilionaceae  | -     |
| <b>171</b> | <i>Cynodon dactylon</i> (Linn.) Pers.                        | Daubri/Doob        | Poaceae        | -     |
| <b>172</b> | <i>Cyperus bulbosus</i> Vahl                                 | Motha              | Cyperaceae     | 19956 |

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|------------|---|--------------------|---------------|-------|
| <b>173</b> | <i>Cyperus rotundus</i> Linn.                   | Motha/Mothia       | Cyperaceae    | 19957 |
| <b>174</b> | <i>Dactyloctenium aegyptium</i> (Linn.)Willd.   | Makro/Makra grass  | Poaceae       | 20009 |
| <b>175</b> | <i>Dalbergia sissoo</i> Roxb.                   | Tali/Seesham       | Fabaceae      | 20018 |
| <b>176</b> | <i>Datura fastuosa</i> Linn.                    | Kalo dhaturu       | Solanaceae    | 19627 |
| <b>177</b> | <i>Datura innoxia</i> Mill.                     | Dhaturu            | Solanaceae    | -     |
| <b>178</b> | <i>Datura metel</i> Linn.                       | Daturi/Kala datura | Solanaceae    | -     |
| <b>179</b> | <i>Datura stramonium</i> Linn.                  | Datura             | Solanaceae    | -     |
| <b>180</b> | <i>Daucus carota</i> Linn.                      | Gajar              | Apiaceae      | -     |
| <b>181</b> | <i>Dendrocalamus strictus</i> (Roxb.) Nees      | Bans               | Poaceae       | 19440 |
| <b>182</b> | <i>Desmodium gangeticum</i> (Linn.) DC.         | Khareti/Salparni   | Fabaceae      | -     |
| <b>183</b> | <i>Desmodium repandum</i> (Vahl) DC.            | Kudaliya           | Fabaceae      | -     |
| <b>184</b> | <i>Desmodium triflorum</i> (Linn.) DC.          | Kudaliya           | Fabaceae      | -     |
| <b>185</b> | <i>Desmodium velutinum</i> (Willd.) DC.         | Chitkiboota        | Fabaceae      | -     |
| <b>186</b> | <i>Desmostachya bipinnata</i> Linn. Stapf       | Dab/Kush           | Poaceae       | 20008 |
| <b>187</b> | <i>Dichanthium annulatum</i> (Forsk.) Stapf     | Makad gass         | Poaceae       | -     |
| <b>188</b> | <i>Dichrostachys cinerea</i> (Linn.) Wt. & Arn. | Birbira/kolai      | Mimosaceae    | -     |
| <b>189</b> | <i>Digera muricata</i> (Linn.) Mart.            | Lesua              | Amaranthaceae | 20006 |
| <b>190</b> | <i>Digitaria pennata</i> (Hochst.) T.Cooke      | Ghass              | Poaceae       | -     |
| <b>191</b> | <i>Dioscorea bulbifera</i> Linn.                | Ratalu             | Dioscoreaceae | 19619 |
| <b>192</b> | <i>Dioscorea tomentosa</i> Heyne                | Ratalu             | Dioscoreaceae | -     |
| <b>193</b> | <i>Diospyros melanoxylon</i> Roxb.              | Timru/ Tendu       | Ebenaceae     | 19618 |
| <b>194</b> | <i>Diospyros montana</i> Roxb.                  | Bistendu           | Ebenaceae     | -     |
| <b>195</b> | <i>Diplocyclos palmatus</i> (Linn.) Jeffrey     | Shivlingi          | Cucurbitaceae | -     |
| <b>196</b> | <i>Echinochloa colona</i> (Linn.) Link          | Sama/Swank         | Poaceae       | -     |

|            |   |                             |                |       |
|------------|---|-----------------------------|----------------|-------|
| <b>197</b> | <i>Echinochloa crus-galli</i> (Linn.) P. Beauv. | Samali/samaak               | Poaceae        | -     |
| <b>198</b> | <i>Echinops echinatus</i> Roxb.                 | Oont-katela                 | Asteraceae     | 19485 |
| <b>199</b> | <i>Eclipta alba</i> (Linn.) Hassk.              | Kala Bhangra                | Asteraceae     | 20084 |
| <b>200</b> | <i>Eclipta prostrata</i> Linn.                  | Bhringraj                   | Asteraceae     | -     |
| <b>201</b> | <i>Ehretia laevis</i> Roxb.                     | Tambolan/Gundi/<br>Tamoliya | Ehretiaceae    | 20088 |
| <b>202</b> | <i>Emilia sonchifolia</i> (Linn.) DC.           | Sahdei                      | Asteraceae     | 19937 |
| <b>203</b> | <i>Enicostema littorale</i> Acut. non Blume     | Kadwa chiryata/ Namae       | Acanthaceae    | -     |
| <b>204</b> | <i>Eragrostis ciliaris</i> (Linn.) R.Br.        | Siteo/Jhura                 | Poaceae        | -     |
| <b>205</b> | <i>Eruca sativa</i> Mill.                       | Taramira                    | Brassicaceae   | -     |
| <b>206</b> | <i>Eucalyptus alba</i> Reinw.                   | Safeda/Reva chini           | Myrtaceae      | -     |
| <b>207</b> | <i>Euphorbia granulata</i> Forsk.               | Choti dudhi                 | Euphorbiaceae  | 20086 |
| <b>208</b> | <i>Euphorbia heyneana</i> Spreng.               | Choti dudhi/ Godni          | Euphorbiaceae  | -     |
| <b>209</b> | <i>Euphorbia hirta</i> Linn.                    | Dudhi                       | Euphorbiaceae  | 20085 |
| <b>210</b> | <i>Euphorbia neriifolia</i> Linn.               | Dandathor                   | Euphorbiaceae  | -     |
| <b>211</b> | <i>Euphorbia parviflora</i> Acut. non Linn.     | Dudhi                       | Euphorbiaceae  | -     |
| <b>212</b> | <i>Euphorbia thymifolia</i> Linn.               | Doodhi                      | Euphorbiaceae  | -     |
| <b>213</b> | <i>Evolvulus alsinoides</i> Linn.               | Neel shankhpushpi           | Convolvulaceae | -     |
| <b>214</b> | <i>Feronia limonia</i> (Linn.) Swingle          | Keth                        | Rutaceae       | -     |
| <b>215</b> | <i>Ferula asafoetida</i> Linn.                  | Hing                        | Apiaceae       | -     |
| <b>216</b> | <i>Ficus benghalensis</i> Linn.                 | Bad/Badla                   | Moraceae       | 19581 |
| <b>217</b> | <i>Ficus carica</i> Linn.                       | Anjir                       | Moraceae       | 20079 |
| <b>218</b> | <i>Ficus hispida</i> Linn.f.                    | Khirkhira                   | Moraceae       | 20080 |
| <b>219</b> | <i>Ficus mollis</i> Vahl.                       | Kathbad                     | Moraceae       | -     |

|     |   |                      |                |       |
|-----|---|----------------------|----------------|-------|
| 220 | <i>Ficus racemosa</i> Linn.                       | Gular                | Moraceae       | 19579 |
| 221 | <i>Ficus religiosa</i> Linn.                      | Pipali/Pipal         | Moraceae       | 20082 |
| 222 | <i>Flacourtia indica</i> (Burm.f.) Merrill.       | Kankeran/Kakunya     | Flacourtiaceae | 20083 |
| 223 | <i>Foeniculum vulgare</i> Mills.                  | Saunf                | Apiaceae       | -     |
| 224 | <i>Gisekia pharanceoides</i> Linn.                | Sureli               | Molluginaceae  | -     |
| 225 | <i>Gloriosa superba</i> Linn.                     | Ladokari             | Liliaceae      | 19552 |
| 226 | <i>Gossypium herbaceum</i> Linn.                  | Kapas                | Malvaceae      | -     |
| 227 | <i>Grewia abutilifolia</i> Vent. ex Juss.         | Gangchi / hadjod     | Tiliaceae      | -     |
| 228 | <i>Grewia asiatica</i> Acut. non Linn.            | Phalsa / Falsa       | Tiliaceae      | -     |
| 229 | <i>Grewia flavescens</i> A. Juss.                 | Jadhkher             | Tiliaceae      | 19945 |
| 230 | <i>Grewia hirsuta</i> Vahl                        | Chabeni              | Tiliaceae      | -     |
| 231 | <i>Grewia subinaequalis</i> DC.                   | Phalsa               | Tiliaceae      | 19968 |
| 232 | <i>Grewia teliifolia</i> Vahl                     | Chabeni              | Tiliaceae      | 19651 |
| 233 | <i>Grewia tenax</i> (Forsk.) Fiori                | Gangeran             | Tiliaceae      | -     |
| 234 | <i>Grewia villosa</i> Willd.                      | Gudchandiya          | Tiliaceae      | 19960 |
| 235 | <i>Gymnema sylvestre</i> (Retz.) R. Br.ex Schult. | Gudmar               | Asclepiadaceae | -     |
| 236 | <i>Helicteres isora</i> Linn.                     | Marodphali/Amlı      | Sterculiaceae  | 19566 |
| 237 | <i>Heliotropium europaeum</i> Linn.               | Oont Kameda          | Boraginaceae   | 20077 |
| 238 | <i>Heliotropium indicum</i> Linn.                 | Hathsura             | Boraginaceae   | -     |
| 239 | <i>Heliotropium marifolium</i> Retz.              | Hoth rachani         | Boraginaceae   | 20066 |
| 240 | <i>Heliotropium strigosum</i> Willd               | Hoth rachani         | Boraginaceae   | 19962 |
| 241 | <i>Hemidesmus indicus</i> (Linn.) R. Br.          | Anantmool            | Asclepiadaceae | -     |
| 242 | <i>Heteropogon contortus</i> (Linn.) P. Beauv.    | Loth/Kali-lamp/Lapda | Poaceae        | -     |

|            |   |                                |                |       |
|------------|---|--------------------------------|----------------|-------|
|            | ex Roem. & Schult.  | Ghas                           |                |       |
| <b>243</b> | <i>Hibiscus cannabinus</i> Linn.                            | San                            | Malvaceae      | -     |
| <b>244</b> | <i>Hibiscus rosa-sinensis</i> Linn.                         | Gurhal                         | Malvaceae      | -     |
| <b>245</b> | <i>Holarrhena antidysenterica</i> (Linn.)<br>Wall.ex A. DC. | Koorwa/Dudhi                   | Apocynaceae    | -     |
| <b>246</b> | <i>Holoptelea integrifolia</i> (Roxb.) Planch.              | Bander ki Rotee<br>/Banderbati | Ulmaceae       | 20078 |
| <b>247</b> | <i>Hordeum vulgare</i> Linn.                                | Jow                            | Poaceae        | -     |
| <b>248</b> | <i>Hygrophila spinosa</i> T. Anders.                        | Neeli- kateli                  | Acanthaceae    | -     |
| <b>249</b> | <i>Ichnocarpus frutescens</i> (Linn.) R. Br.                | Apho                           | Apocynaceae    | 20039 |
| <b>250</b> | <i>Imperata cylindrical</i> Linn.                           | Kans                           | Poaceae        | -     |
| <b>251</b> | <i>Indigofera cordifolia</i> Heyne ex Roth                  | Bekar                          | Fabaceae       | -     |
| <b>252</b> | <i>Indigofera caerulea</i> Roxb.                            | Khanjora                       | Papilionaceae  | -     |
| <b>253</b> | <i>Indigofera linifolia</i> (L.f.) Retz.                    | Jhunjhani ghas                 | Fabaceae       | -     |
| <b>254</b> | <i>Indigofera tinctoria</i> Linn.                           | Neel                           | Fabaceae       | -     |
| <b>255</b> | <i>Ipomoea aquatica</i> Forsk.                              | Sag                            | Convolvulaceae | -     |
| <b>256</b> | <i>Ipomoea batatas</i> (Linn.) Lam.                         | Sakarkand                      | Convolvulaceae | -     |
| <b>257</b> | <i>Ipomoea carnea</i> Jacq.                                 | Besharm                        | Convolvulaceae | 20076 |
| <b>258</b> | <i>Ipomoea pes- tigridis</i> Linn.                          | Dabg dahela                    | Convolvulaceae | -     |
| <b>259</b> | <i>Ipomoea purpurea</i> (Linn.) Roth                        | Dhang-dala                     | Convolvulaceae | -     |
| <b>260</b> | <i>Ipomoea turbinata</i> Lag.                               | Chakchelua                     | Convolvulaceae | 20054 |
| <b>261</b> | <i>Jasminum arborescens</i> Roxb.                           | Chameli                        | Oleaceae       | -     |
| <b>262</b> | <i>Jasminum grandiflorum</i> Linn.                          | Chameli                        | Oleaceae       | -     |
| <b>263</b> | <i>Jatropha gossypifolia</i> Linn.                          | Ratan Jhad                     | Euphorbiaceae  | -     |

|     |  |                           |                  |       |
|-----|--|---------------------------|------------------|-------|
| 264 | <i>Lablab purpureus</i> (Linn.) Sweet                  | Sem                       | Fabaceae         | -     |
| 265 | <i>Lagenaria siceraria</i> (Molina) Standl.            | Tumba, Lauki, Ghiya       | Cucurbitaceae    | -     |
| 266 | <i>Lannea coromandelica</i> (Houtt.) Merr.             | Gurjen                    | Anacardiaceae    | 20073 |
| 267 | <i>Lantana camara</i> Linn.                            | Jhermari                  | Verbenaceae      | 19943 |
| 268 | <i>Launaea procumbens</i> (Roxb.) Ramayya & Raja gopal | Rookhadi/<br>Jungli ghobi | Asteraceae       | 19964 |
| 269 | <i>Lawsonia inermis</i> Linn.                          | Mehandhi                  | Lythraceae       | 20071 |
| 270 | <i>Leptadenia pyrotechnica</i> (Forsk.) Decne.         | Khimp/Khimpadi            | Asclepiadaceae   | -     |
| 271 | <i>Lindenbergia indica</i> (Linn.) Vatke               | -----                     | Scrophulariaceae | -     |
| 272 | <i>Luffa acutangula</i> (Linn.) Roxb.                  | Kadvi torai               | Cucurbitaceae    | 19965 |
| 273 | <i>Luffa cylindrica</i> (Linn.) M. Roem.               | Ghiya Turai               | Cucurbitaceae    | -     |
| 274 | <i>Lycopersicon lycopersicum</i> (Linn.) Karst.        | Tamatar                   | Solanaceae       | -     |
| 275 | <i>Madhuca indica</i> J. F. Gmelin                     | Mahua                     | Sapotaceae       | 20069 |
| 276 | <i>Mallotus philippensis</i> (Lamk.) Muell. Arg.       | Sinduri/Kamla             | Euphorbiaceae    | -     |
| 277 | <i>Mangifera indica</i> Linn.                          | Aam/Amba/Kairi            | Anacardiaceae    | -     |
| 278 | <i>Manilkara hexandra</i> (Roxb.) Dub.                 | Khirni                    | Sapotaceae       | 20075 |
| 279 | <i>Martynia annua</i> Linn.                            | Billi/Bichhu/Kanto        | Martyniaceae     | 19457 |
| 280 | <i>Maytenus emarginatus</i> (Willd.) Ding Hou          | Gwank                     | Celastraceae     | 20067 |
| 281 | <i>Medicago sativa</i> Linn.                           | Rizka                     | Fabaceae         | -     |
| 282 | <i>Melia azedarach</i> Linn.                           | Bakan                     | Meliaceae        | -     |
| 283 | <i>Melilotus alba</i> Medix. ex Desr.                  | Jangli methi              | Fabaceae         | -     |
| 284 | <i>Melochia corchorifolia</i> Linn.                    | Bakain                    | Sterculiaceae    | -     |
| 285 | <i>Mentha spicata</i> Linn.                            | Pudina                    | Lamiaceae        | -     |
| 286 | <i>Miliusa tomentosa</i> (Roxb.) J. Sinclair           | Umb/Umbio                 | Annonaceae       | -     |

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|------------|--|----------------------------------|---------------|-------|
| <b>287</b> | <i>Mimosa hamata</i> Willd.                | Alai/Jinjanio                    | Mimosaceae    | -     |
| <b>288</b> | <i>Mimosa pudica</i> Linn.                 | Chui-mui                         | Mimosaceae    | -     |
| <b>289</b> | <i>Mimusops elengi</i> Linn.               | Molsiri                          | Sapotaceae    | -     |
| <b>290</b> | <i>Mitragyna parviflora</i> (Roxb.) Korth. | Kaim                             | Rubiaceae     | 20045 |
| <b>291</b> | <i>Mollugo cerviana</i> (Linn.) Ser.       | Chiddi ka Bajara/<br>Chirio-Ghas | Molluginaceae | -     |
| <b>292</b> | <i>Mollugo nudicaulis</i> Lam.             | Chirmora                         | Molluginaceae | -     |
| <b>293</b> | <i>Mollugo pentaphylla</i> Linn.           | Chirmora                         | Molluginaceae | -     |
| <b>294</b> | <i>Momordica balsamina</i> Linn.           | Kheep/Murela Karela              | Cucurbitaceae | 20056 |
| <b>295</b> | <i>Momordica charantia</i> Linn.           | Karela                           | Cucurbitaceae | -     |
| <b>296</b> | <i>Momordica dioica</i> Roxb. ex Willd.    | Kakoda                           | Cucurbitaceae | -     |
| <b>297</b> | <i>Moringa oleifera</i> Lam.               | Sainjna                          | Moringaceae   | 19578 |
| <b>298</b> | <i>Morus alba</i> Linn.                    | Shahtoot                         | Moraceae      | 20042 |
| <b>299</b> | <i>Mucuna pruriens</i> (Linn.) DC.         | Kaunch/Kirmich                   | Fabaceae      | 20068 |
| <b>300</b> | <i>Murraya koenigii</i> (Linn.) Spreng.    | Meetha neem                      | Rutaceae      | -     |
| <b>301</b> | <i>Musa paradisiaca</i> Linn.              | Kela/Kell                        | Musaceae      | -     |
| <b>302</b> | <i>Nelumbo nucifera</i> Gaertn.            | Kamal                            | Nelumbonaceae | -     |
| <b>303</b> | <i>Nerium indicum</i> Mill.                | Kaner                            | Apocynaceae   | -     |
| <b>304</b> | <i>Nicotiana tabacum</i> Linn.             | Tambaku                          | Solanaceae    | -     |
| <b>305</b> | <i>Nyctanthes arbor-tristis</i> Linn.      | Harsingar                        | Nyctanthaceae | -     |
| <b>306</b> | <i>Nymphaea nauchali</i> Burm. f.          | Kudaiya                          | Nymphaeaceae  | -     |
| <b>307</b> | <i>Nymphoides indica</i> (Linn.) Kuntze    | Kamodni                          | Menyanthaceae | -     |
| <b>308</b> | <i>Ocimum basilicum</i> Linn.              | Marwa                            | Lamiaceae     | 19394 |
| <b>309</b> | <i>Ocimum canum</i> Sims.                  | Jangli tulsi                     | Lamiaceae     | 20053 |

|            |   |                     |                 |       |
|------------|---|---------------------|-----------------|-------|
| <b>310</b> | <i>Ocimum gratissimum</i> Linn.               | Dona maruwa         | Lamiaceae       | -     |
| <b>311</b> | <i>Ocimum sanctum</i> Linn.                   | Ram Tulsi           | Lamiaceae       | -     |
| <b>312</b> | <i>Ocimum tenuiflorum</i> Linn.               | Tulsi/ Tursi        | Lamiaceae       | -     |
| <b>313</b> | <i>Opuntia elatior</i> Mill.                  | Nagphani/Thapa thor | Cactaceae       | -     |
| <b>314</b> | <i>Origanum majorana</i> Linn.                | Marwa               | Lamiaceae       | -     |
| <b>315</b> | <i>Oryza sativa</i> Linn.                     | Dhan                | Poaceae         | -     |
| <b>316</b> | <i>Oxalis corniculata</i> Linn.               | Khatti Buti         | Oxalidaceae     | 19949 |
| <b>317</b> | <i>Pandanus fascicularis</i> Lam.             | Kevra               | Pandanaceae     | -     |
| <b>318</b> | <i>Panicum maximum</i> Jacq.                  | Ginighas            | Poaceae         | -     |
| <b>319</b> | <i>Papaver somniferum</i> Linn.               | Afim/Amal           | Papaveraceae    | -     |
| <b>320</b> | <i>Parkinsonia aculeata</i> Linn.             | Kikar               | Cacsalpiniaceae | -     |
| <b>321</b> | <i>Paspalidium flavidum</i> (Retz.) A.Camus   | Chapri/Samo/Samli   | Poaceae         | -     |
| <b>322</b> | <i>Pedaliium murex</i> Linn.                  | Dakhano gokhroo     | Pedaliaceae     | 20020 |
| <b>323</b> | <i>Pennisetum americanum</i> (Linn.) Leeke.   | Bajara              | Poaceae         | -     |
| <b>324</b> | <i>Perotis indica</i> (Linn.) O. Ktze.        | Lampali             | Poaceae         | -     |
| <b>325</b> | <i>Phoenix sylvestris</i> (Linn.) Roxb.       | Khajoor             | Arecaceae       | 19537 |
| <b>326</b> | <i>Phyllanthus emblica</i> Linn.              | Anwla               | Euphorbiaceae   | -     |
| <b>327</b> | <i>Phyllanthus niruri</i> Acut. pl. non Linn. | Bhoomi Anwla        | Euphorbiaceae   | 20049 |
| <b>328</b> | <i>Physalis minima</i> Linn.                  | Charpoti            | Solanaceae      | 20046 |
| <b>329</b> | <i>Piper betle</i> Linn.                      | Pan                 | Piperaceae      | -     |
| <b>330</b> | <i>Piper longum</i> Linn.                     | Pipalmool           | Piperaceae      | -     |
| <b>331</b> | <i>Piper nigrum</i> Linn.                     | Kali mirch          | Piperaceae      | -     |
| <b>332</b> | <i>Pisum sativum</i> Linn.                    | Matar               | Papilionaceae   | -     |
| <b>333</b> | <i>Pithecellobium dulce</i> (Roxb.) Benth.    | Jungle jalebi       | Mimmosaceae     | 20043 |

|     |  |                 |                |       |
|-----|--|-----------------|----------------|-------|
| 334 | <i>Plumbago zeylanica</i> Linn.              | Chakwad/Seetrok | Plumbaginaceae | -     |
| 335 | <i>Pongamia pinnata</i> (Linn.) Pierre       | Karanj          | Fabaceae       | -     |
| 336 | <i>Portulaca oleracea</i> Linn.              | Kulfa           | Portutacaceae  | -     |
| 337 | <i>Portulaca pilosa</i> Linn.                | Lunkia/kulfa    | Portutacaceae  | -     |
| 338 | <i>Prosopis cineraria</i> (Linn.) Druce.     | Khejari/Jati    | Mimosaceae     | 20019 |
| 339 | <i>Prosopis juliflora</i> (Swartz.) DC.      | Vilayati Kikar  | Mimosaceae     | -     |
| 340 | <i>Psidium guajava</i> Linn.                 | Amrood          | Myrtaceae      | -     |
| 341 | <i>Punica granulata</i> Linn.                | Anar            | Punicaceae     | -     |
| 342 | <i>Raphanus sativus</i> Linn.                | Muli/Moora      | Brassicaceae   | 20021 |
| 343 | <i>Rhus mysurensis</i> G. Don                | Khatta          | Anacardiaceae  | -     |
| 344 | <i>Ricinus communis</i> Linn.                | Arand/Arandi    | Euphorbiaceae  | 20022 |
| 345 | <i>Rivea ornata</i> Choisy                   | Gwal Kakri      | Convolvulaceae | -     |
| 346 | <i>Ruellia tuberosa</i> Linn.                | Neeli phooli    | Acanthaceae    | -     |
| 347 | <i>Saccharum bengalense</i> Retz.            | Moonj/Kuncha    | Poaceae        | -     |
| 348 | <i>Saccharum officinarum</i> Linn.           | Ganna/ Gande    | Poaceae        | -     |
| 349 | <i>Saccharum spontaneum</i> Linn.            | Kans            | Poaceae        | -     |
| 350 | <i>Santalum album</i> Linn.                  | Chandan         | Santalaceae    | -     |
| 351 | <i>Sesamum indicum</i> Linn.                 | Til             | Pedaliaceae    | 19995 |
| 352 | <i>Sesbania sesban</i> (Linn.) Merr.         | Dhandhoon       | Fabaceae       | -     |
| 353 | <i>Setaria italica</i> Linn.                 | Kakun           | Poaceae        | -     |
| 354 | <i>Setaria verticillata</i> (Linn.) P. Beau. | Chruchida       | Poaceae        | -     |
| 355 | <i>Sida ovata</i> Forsk.                     | Barah/Kharanti  | Malvaceae      | -     |
| 356 | <i>Sida rhombifolia</i> Linn.                | --              | Malvaceae      | -     |
| 357 | <i>Sida veronicifolia</i> Lam.               | Kharanti        | Malvaceae      | -     |

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| <b>358</b> | <i>Solanum indicum</i> Auct. non Linn.             | Bhata katela                | Solanaceae      | -     |
| <b>359</b> | <i>Solanum melongena</i> Linn.                     | Baigan/bhtta                | Solanaceae      | -     |
| <b>360</b> | <i>Solanum nigrum</i> Linn.                        | Kali chirpoti               | Solanaceae      | 20027 |
| <b>361</b> | <i>Solanum surattense</i> Burm. f.                 | Gulari                      | Solanaceae      | -     |
| <b>362</b> | <i>Sonchus oleraceus</i> Linn.                     | Ankhali                     | Asteraceae      | -     |
| <b>363</b> | <i>Sorghum vulgare</i> Pers.                       | Jowar                       | Poaceae         | -     |
| <b>364</b> | <i>Sporobolus diander</i> (Retz.) P. Beauv.        | Ghass                       | Poaceae         | -     |
| <b>365</b> | <i>Sterculia urens</i> Roxb.                       | Kadaya/Karah                | Sterculiaceae   | 19567 |
| <b>366</b> | <i>Syzygium cumini</i> (Linn.) Skeels.             | Jamun                       | Myrtaceae       | 19459 |
| <b>367</b> | <i>Syzygium heyneanum</i> (Duthie) Wall. ex Gamble | Kath Jamun                  | Myrtaceae       | 20029 |
| <b>368</b> | <i>Tamarindus indica</i> Linn.                     | Imali                       | Caesalpiniaceae | 19467 |
| <b>369</b> | <i>Tamarix aphylla</i> (Linn.) Karst.              | Farash                      | Tamaricaceae    | -     |
| <b>370</b> | <i>Tecomella undulata</i> (Sm.) Seem.              | Rohida/Rohido               | Bignoniaceae    | 20030 |
| <b>371</b> | <i>Tectona grandis</i> Linn.f.                     | Sagwan/Hagwan/ Nakta        | Verbenaceae     | -     |
| <b>372</b> | <i>Tephrosia purpurea</i> (Linn.) Pers             | Jhojhru                     | Fabaceae        | 19973 |
| <b>373</b> | <i>Terminalia arjuna</i> (Roxb. ex DC.) W.& A.     | Arjun,Koara                 | Combretaceae    | -     |
| <b>374</b> | <i>Terminalia bellirica</i> (Gaertn.) Roxb.        | Guter/ Baheda               | Combretaceae    | 19616 |
| <b>375</b> | <i>Terminalia tomentosa</i> (DC.) Wight & Arn.     | Sadad                       | Combretaceae    | -     |
| <b>376</b> | <i>Tetrapogon tenellus</i> (Koen. ex Roxb.) Chiov. | Lal ghas                    | Poaceae         | -     |
| <b>377</b> | <i>Themeda triandra</i> Forsk.                     | Pahadi ghas                 | Poaceae         | -     |
| <b>378</b> | <i>Thevetia peruviana</i> (Pers.) Merr.            | Pili Kaner                  | Apocynaceae     | -     |
| <b>379</b> | <i>Tinospora cordifolia</i> (Willd.) Miers.        | Giloy/ Neem Giloy/ Adharbel | Menispermaceae  | 19561 |

|     |   |                        |                |       |
|-----|---|------------------------|----------------|-------|
| 380 | <i>Trachyspermum ammi</i> (Linn.) Sprangue.       | Ajwain                 | Apiaceae       | -     |
| 381 | <i>Trapa natans</i> Linn.                         | Singara                | Trapaceae      | -     |
| 382 | <i>Trianthema portulacastrum</i> Linn.            | Satee/santa/Bish kapra | Aizoaceae      | 19975 |
| 383 | <i>Tribulus terrestris</i> Linn.                  | Kanti/Gokhroo/Bhakadi  | Zygophyllaceae | 20031 |
| 384 | <i>Tridax procumbens</i> Linn.                    | Khoon datani/Rookhari  | Asteraceae     | 20032 |
| 385 | <i>Trifolium alexandrinum</i> Linn.               | Barseem                | Fabaceae       | -     |
| 386 | <i>Trigonella foenum-graceum</i> Linn.            | Methi                  | Fabaceae       | -     |
| 387 | <i>Triticum aestivum</i> Linn.                    | Gehun                  | Poaceae        | -     |
| 388 | <i>Typha angustata</i> Bory & Chaub               | Patera                 | Typhaceae      | 19399 |
| 389 | <i>Vernonia cinerea</i> (Linn.) Less.             | Sahadevi               | Asteraceae     | 20033 |
| 390 | <i>Vigna angularis</i> (Willd.) Ohwi & Ohashi.    | Urad                   | Fabaceae       | -     |
| 391 | <i>Vigna radiata</i> (Linn.) Wilczek              | Moong                  | Fabaceae       | -     |
| 392 | <i>Vigna trilobata</i> (Linn.) Verd.              | Jungli moth            | Fabaceae       | 19938 |
| 393 | <i>Vigna unguiculata</i> (Linn.) Walp.            | Chaula Moth/Chola      | Fabaceae       | -     |
| 394 | <i>Vitex negundo</i> Linn.                        | Nagad/Nirgund          | Verbenaceae    | -     |
| 395 | <i>Withania somnifera</i> (Linn.) Dunal.          | Padalsik/Asgandha      | Solanaceae     | 20034 |
| 396 | <i>Wrightia tinctoria</i> (Roxb.) R.Br.           | Khirni/Hirani          | Apocynaceae    | 20035 |
| 397 | <i>Xanthium strumarium</i> Linn.                  | Adhasisi               | Asteraceae     | 20036 |
| 398 | <i>Zea mays</i> Linn.                             | Makka                  | Poaceae        | -     |
| 399 | <i>Zingiber officinale</i> Roscoe.                | Adrak/Sunthh           | Zingiberaceae  | -     |
| 400 | <i>Ziziphus mauritiana</i> Lam.                   | Bordi/Pemli Bor        | Rhamnaceae     | 20037 |
| 401 | <i>Ziziphus nummularia</i> (Brum.f.) Wight & Arn. | Jhar Beri              | Rhamnaceae     | 20038 |
| 402 | <i>Zizyphus xylopyrus</i> (Retz.) Willd.          | Ghat Bor               | Rhamnaceae     | -     |

