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ETHNO-BOTANICAL PLANTS AND PRACTICES IN TRADITIONAL MEDICINE

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PREFACE

Traditional medicine is defined as indigenous medicine that is used to maintain health and to prevent, diagnose, and treat physical and mental illnesses differently from allopathic medicine based on theories, beliefs, and experiences. Traditional medicine has been used for thousands of years with great contributions made by practitioners to human health, particularly as primary health care providers at the community level and has maintained its popularity worldwide. Recently, WHO (World Health Organization) estimated that 80 percent of people worldwide rely on herbal medicines for some aspect of their primary health care needs. According to WHO, around 21,000 plant species have the potential for being used as medicinal plants. The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka, Thailand, and Korea. In China, traditional medicine accounts for around 40% of all health care delivered and is used to treat roughly 200 million patients annually.

Traditional systems of medicine continue to be widely practised on many accounts. Population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several synthetic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments.

Among ancient civilisations, India has been known to be rich repository of medicinal plants. The forest in India is the principal repository of large number of medicinal and aromatic plants, which are largely collected as raw materials for manufacture of drugs and perfumery products. About 8,000 herbal remedies have been codified in AYUSH systems in INDIA. Ayurveda, Unani, Siddha and Folk (tribal) medicines are the major systems of indigenous medicines. Among these systems, Ayurveda and Unani Medicine are most developed and widely practised in India.

Medicinal plants play vital roles in disease prevention and their promotion and use fit into all existing prevention strategies. However, conscious efforts need to be made to properly identify, recognise and position medicinal plants in the design and implementation of these strategies. These approaches present interesting and emerging perspectives in the field of medicinal plants. Recommendations are proposed for strategising the future role and place for medicinal plants in disease prevention.

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Anita Jeph

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CHAPTER-1

General Introduction

The term biodiversity is an abridged from of Biological diversity which was first used by Raymond F. Dasmann. The term "Biodiversity" was first coined by W.G. Rosen in 1985 while planning the "National forum on Biological Diversity" (1986) organized by the National Research Council (NRC) (Singh and Singh, 2010). According to Bruce A. Wilex, Biological diversity in the variety of life forms at all levels of biological system. (I.e. molecular, organism, population, species, ecosystem.)

"Variation of life at all levels of biological organization (Gaston and Spicer, 2004). Levels of Biodiversity- Biodiversity is the degree of variation of life is assessed in different ways. Traditionally three levels of biological diversity have been identified.

1. Species diversity
2. Ecosystem diversity
3. Genetic diversity

Campbell (2003) identified a fourth i.e. Molecular diversity-

1. **Species diversity-** Species diversity is the number of different species that are represented in a given community. It includes both species richness and evenness**.**
2. **Ecosystem diversity** - Ecological diversity is the variation in the ecosystems found in a region or variation in ecosystems over the whole planet. It includes the variation in both terrestrial and marine ecosystem. Ecological is determined by level of species and genetic diversity.

3. **Genetic diversity-** Genetic diversity is the variation at the level of genes. In a population genetic diversity includes most of the possible alleles for each particular gene locus. Frankham *et al*., (2002) defined genetic diversity as the verity of alleles and genotypes present in a population and which is manifested in morphological physiological and behavioral differences between individual populations.

Diversity at the level of ecosystem exists along there levels (Whittaker, 1960). These are based on consideration spatial scale- 1. (Alpha) diversity 2. (Beta) diversity 3. (Gamma) diversity.

1. **(Alpha) diversity-** Alpha diversity is defined as the species diversity within a community or habitat. Alpha diversity comprises two components i.e. species richness and species evenness.

2. **(Beta) diversity (or between habitat diversity) -** It is defined as change or turn over in species composition between two distinct communities. It refers to response of organisms to spatial heterogeneity. Beta diversity provides quantitative measure of diversity of communities that experience changing environments.

3. (Gamma) diversity- It is defined the richness in species of a range of habitats in a geographically area. It depends on the alpha diversity of the individual communities and the range of differentiation or beta diversity among them.

Biodiversity, the vast array of species of plants, animals and microorganisms created by nature is the 'foundation of human life' on the earth. They have provided the basic necessities of our social, cultural, economic and biological life. Human life on earth would be simply 'impossible' if there were to be no microorganism, no wild plants, and animal and insects species. Human life depends upon their survival and is linked in a complex chain of food web. If the chain becomes 'weak' (by extinction of species) at any point it will be translated all along the chain. If the chain continues to become weaker at several points as it is becoming today due to large scale extinction of species, the chain of life on earth would finally break and disintegrate.

The North - Western part of the state Rajasthan is a part of Thar Desert and it lies between 23° 3' to 30°12' North latitude and 69°3' to 78° 17' East

longitudes. It covers an area of about 3, 42,239 sq km, representing nearly 11% of total area of Indian sub-continent. About 61% of the total hot arid zone of country lies in Western Rajasthan (Singh and Narayan, 1986). It spreads over 12 out of 32 districts namely Barmer, Bikaner, Churu, Sri Ganganagar, Hanumangarh, Jalore, Jaisalmer, Jhunjhunu, Jodhpur, Nagaur, Pali, and Sikar. Physiographically, it is the extension of Sahara-Thar desert covered by shifting and fixed sand deposits.

The forests are distributed in unequally the various districts. Most of the forests spreads over the hilly areas i.e. in Rajsamand, Kota, Udaipur, Baran, Chittorgarh, Sirohi, Sawai Madhopur, Banswara Bundi, Alwar, and Jhalawar districts (Forest Survey of India, 2011).

Some common vegetation on sand dunes of Thar Desert including *Aerva persica, Aerva pseudotomentosa, Aerva javanica, Acacia jacqumontii, Boerhavia diffusa, Calligonum polygonoides, Cenchrus setigerus, Cenchrus ciliaris, Crotalaria burhia, Cyperus rotundus, Gisekia pharnaceoides, Mollugo cerviana, Lasiurus sindicus, Panicum turgidum, Pedalium murex, Tephrosia purpurea* can be observed during monsoon period (Godara *et al.,* 2015).

The dominant tree of the Thar is *Prosopis cineraria.* However, in some areas of the desert, other tree flora including *Salvedora oleoides, Salvedora persica, Zizyphus mauritiana, Tecomella undulata, Balanites aegyptiaca, Acacia senegal, Acacia nilotica, Acacia tortilis* etc are in co-existence with *Prosopis cineraea* (IPCC, 2007).

Some climbers including *Asparagus racemosus, Citrullus colocynthis, Cucumis callosus, Cucumis profetarum, Ipomoea pestigridis, Ipomoea eriocarpa, Mukia maderaspatana* and *Pergularia daemia* can be observed in the Thar Desert (Bhandari, 1978).

The dominant vegetation of desertare *Aristida funiculata, Arnebia hispidisima, Aerva javanica, Aerva persica, Aerva pseudotomentosa, Convolvulus deserti, Crotalaria burhia, Cappais decidua, Calotropis procera, Cymbopogon jawarncusa, Dactyloctenium sindicum, Eragrostis ciliaris, Eragrostis minor, Eragrostis pilosa, Evolvulus alsinoides, Fagonia cretica, Farsetia hamiltonii, Heliotropium bacciferum, Indigofera cordifolia, Indigofera*

linnaei, Leptedenia pyrotechnica, Octhocloa compressa, Pulicaria crispa, Tribulus terrestris, Tephrosia purpurea, Zizyphus nummularia1 (Richardson *et al.*, 2000; IPCC 2007; Godara *et al.*, 2015).

This region of Rajasthan suffers periodic droughts and comprised of isolate and dreary regions which are occupied by fixed or mobile dunes. The vegetation consists of xerophytes which are stundent or prickly shrubs and perennial herbs capable of drought resistance. Many artiodactyls, insects' pests and rodents are the main groups of those animals who are responsible for the destruction of plant diversity and identification of desertic conditions. In the Thar Desert around 10% of the existing plant diversity is endangered. Among the flora the medicinal plants like Thumba (*Citrullus colocynthis*) Rohida (*Tecomella undulata*), Khejri (*Prosopis cineraria*), Babool (*Acacia senegal*), Kankero (*Maytenus emarginata*), Bordi (*Ziziphus glabarata*), Jal (*Salvadora oleoides*), Kair (*Capparis decidua*), Nagauri Ashwagandha (*Withania somnifera*), Guggal (*Commiphora wightii*), Bhur hingani (*Solanum surattense*), Andho Khimp (*Ephedra foliata*), *Urgina indica* etc. are depleting and becoming endangered (Sinha, 1997). In these regions the plants diversity is subjected to intense population pressure. Tree's shrubs and even their roots are mercilessly exploited by human beings for fuel fodder, fencing constructions and use in medicinal purpose.

Vegetation of Western Rajasthan, which is pre-dominantly xerophytic and quit sparse, but occurs on a great variety of habitats for various economic plants. Blatter and Hallberg (1919-21) termed the vegetations types of the Rajasthan as (iii) Gravel (iv) Rock and (v) Ruderal. Latter on Champion (1936) classified the arid Zone vegetation into four types which were subsequently reclassified into eight forest types (Champion and seth, 1964). Gupta (1975) enlarged the five vegetation types Satyanarayana (1964) into six type which were later on, slightly modified by Saxena (1977) but the original six types has been maintained. The six vegetation types are (i) Mixed xeromorphic thorn forest, (ii) Mixed xeromorphic wood land (iii) Mixed xeromorphic thorn forest (iv) Lithophytic scrub desert (v) Psammophytic scrub desert and (vi) Halophytic scrub desert.

In arid region plants are adapted to soil moisture stress, dryness of air and high atmospheric temperature. Arid zone plants show morphological adaptation that enables them to survive under lack of moisture and prolonged periods of drought.

Indigenous knowledge is as old as human civilization. But the term Ethnobotany was first coined by an American botanist, John Harshburger, in 1896 to study of plants used by the primitive and aboriginal people, since then, it has been defined as the traditional knowledge of indigenous communities about surrounding plant diversity, and as the study of how the people of a particular culture and region make use of indigenous plants.

"Ethnobotany is the study of direct interrelationship between human and plant" (Johes, 1941). 'The total relationship between man and vegetation." (Faulks, 1958).

'Branch of economic botany which deals with the role of plants in life and culture of aboriginals and tribal people." (Vartak and Gadgil, 1980).

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

"Ethnobotany is the total natural and traditional relationships and interaction between men and his surrounding environment or plant wealth" (Jain, 1989).Ethno botany is the study of relationship between plants and human being and relationship of man with plants includes mainly the material use such as in food, medicine, house-building, agricultural operations, other domestic uses, trade of barter, plants in fine arts and culture like paintings, carvings and house decoration and the acts of domestication, conservation, improvement or destruction of plants. Relationship of man with plants includes faith in the good or bad powers of plants, taboos, avoidances, sacred plants, worship and folklore.

Ethno botany is also considered as a branch of ethno biology. Ethno botanical studies deal with the inter relationships between plants, cultures and human being. The ethno botanists explore how plants are used for food, shelter, medicine, clothing, hunting, religious ceremonies etc. it is the science which

deals with the relationship between a given society and its environment, in particular the plant word. The study of direct interaction between human and plant population through its culture, learning the use of plants, human impact on the plant communities with which they interact etc. are the main aspects which are focused in ethnobotany.

Ethnobotany is the study in which we can see the direct, traditional and natural relationship between plants and human societies. Ethnobotany has been recognized as well as popularised as a multidisciplinary science comprising many useful and interesting aspects of plant's sciences, history, anthropology, traditions, culture and literature. Its importance has been realized mainly in respect of the various economic uses of plants among the primitive human societies and in modern age also. It was believed that everything in nature has some sort of power and spirit according the literature of herbal medicines. Likewise every plant has its own property and uses as well. Ethnobotany focus on numerous known or unknown uses of plants which have potential of their unlimited usage.

Many plant's species were used in different culture for religious purpose to worship of god and goddess of different religions. As far as first use of plant is concern, men utilized wood for fire, tools and other purpose and certain tree species held a special significance for their special uses which depends on need of area, locality and awareness. Likewise, a particular tree also varied between different culture and geographical regions.

According to a survey conducted by WHO, use of herbal medicines and herbal treatment of diseases are increasing even in the developed countries especially among younger generations also. Australia, Sweden, Switzerland, Germany and Canada are leaders among them. The herbal renaissance is blooming in these countries since last two decades. Demands of herbal health products like herbal tea, herbal shop, herbal tooth pest, herbal shampoo, herbal paints, essential oils and flavors are growing while other synthetic as well as allopathic products are more costlier than herbal products. All these things are the symbol of importance of herbal products and their use.

The invaluable role of the ethnic group in the conservation of genetic resources has now been well recognized. Some ethnic groups have provided several miracle plants of immense food and medicinal value for modern civilization. Ethnic people provided number of plant's species, who preserve these species, are still very significant.

Recently, WWF, UNESCO and the Royal Botanical Garden launched a major programme in ethno botany and sustainable use of wild plant resources, under the heading "people and plants initiative." Its objectives are three dimensional:-

(a) To undertake survey of wild plant's resources and to work with the local people to identify conservation issues and seek related remedies.
(b) To empower local communities so that they are more fully involved in the planning of land and it's management.
(c) To increase the number of ethno botanists (especially from developing countries; like-India) actively working with as well as deal with local communities on conservation issues.

Biological resources, the traditional culture and the ethno botanical knowledge has been threatened by the activities like- Deforestation, urbanization, industrialization, transmigration, colonization and other development activities (Singh and Pandey, 1998). Hence, there is an urgent need to record and to preserve the age long folklore and practices before the valuable ethno botanical data gets disappeared.

Ethno botany is the study of indigenous plants of a particular culture and region. The ethno botanists explore how plants are used for food, shelter, medicine, clothing, hunting, religious ceremonies etc. It is the science which deals with the relationship between a particular society and its environment regarding enhance use of particular plant. The study of direct interaction between human being and plant's population through its culture, learning the use of plants, human impact on the plant's communities with which they interact etc. are the main aspects which are focused as well as discussed in ethno botany.

Recently, many earlier publications contain valuable information and material regarding ethno botanical importance according organized study or

research in ethno botany. Tribe living in different parts of world and ethno botanist works on indigenous medicine system and by accounting the data in travel which contains of ethno botanical significance.

Objectives of Present Study

The main objectives of the proposed study are as under:

1. To observe and collect the selected medicinal plant species from study area.
2. To observe the eco-climatic conditions of the study area.
3. To study physico-chemical analysis of soils collected from two different sites of study area.
4. To study morpho-taxonomical aspects of selected medicinal plant species of study area.
5. To collect information related to ethno medicinal aspects from local people, tribal communities and experts of Ayurveda.
6. To study phytochemical aspects of selected medicinal plant species of study area.

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CHAPTER-2

Review of Literature

Arid region of Rajasthan is characterized by its xeric flora and fauna due to extreme climatic conditions. Xeric flora includes various varieties of herbs, shrubs and trees. Plants of arid and semi-arid zones are good and potential source of nutritional and medicinal compounds. These plants serve as an important source of feed and food for livestock and human beings residing in this area. During summer when there is scarcity of water, these few xeric plants are the only source of their survival.The arid region of Rajasthan is characterized by sparse and highly variable rainfall, extreme variation in diurnal and annual temperatures and high evaporation. One of the interesting feature of this desert is its high relative humidity.

Medicinal plants of arid zone are good source of phytochemically important compounds. However, the supplies of these plants are becoming difficult due to their limitation in conservation of the environment, technical and economical problem in cultivation and labour costs.

The medicinal plants of the region are utilized by the local inhabitants as well as in indigenous system of medicine. In last few decades, there is growing demand of medicinal plants by pharmaceutical companies. This increasing demand if properly utilized can help in boosting the village economy as well as will open new avenues of employment. The per hectare income generated from growing medicinal plant is much more than any other crop. However, it depends upon the quality and market demand of the concerned species/crop. On the other side, the lands which are not suitable for other crop cultivation may be utilized for cultivation of species which is suitable to that

habitat. Even the wastelands and other areas lying unused around the villages can also be utilized for it. For example, the farmers can utilize the boundary of their fields without affecting the yield of crop by introducing the species which are suitable for it. Some of the medicinal herbs occur as weed of cultivated field and these may be exploited. The cultivation of medicinal plants will not only improve the economic condition of the local people but also encourage them to conserve the medicinal wealth of the arid region.

Some important herbaceous plants used in herbal drugs found in western Rajasthan are: Ashwagandha (*Withania somnifera* (Linn.) Dural), Atibala (*Abutilon indicum* (Linn.) Sweat.), Bala (*Sida cordifolia* Linn.); Dhamasa (*Fagonia indicum* Burm. f.), Dhatura (*Datura stramonium* Linn.), Gwarpatha (*Aloe barbadensis* Mill.), Gokhru (*Tribulus terrestris* Linn.) and Tumba (*Citrullus colocynthis* Linn.).

India has a vast and inexhaustible resource of drugs of plant origin. A number of important medicinal and aromatic plants prescribed by Vaids and Hakims have been carefully investigated from every point of view. Economic importance revealed that there are several plant species which have great potential to be used in drug and pharmaceutical industries, perfumeries, petroleum industries, oil, soap and dye industries.

Ayurveda, the science of life, dates back to the days of Charaka Samhita and Sushruta Samhita (1200 AD). A balance between the two is a recurring theme of Ayurveda and, to achieve this goal, medicinal plants have been accepted for centuries (Chopra *et al.,* 1956). Medicinal plants are used for the treatment of human diseases since ancient times. The Sacred Vedas in India between 3500 BC and 800 BC make many references to medicinal plants which is one of the remotest works in traditional herbal medicine Vrikshayurveda, compiled by Surapala even before the beginning of ancient India and the Christian era formed the basis of medical studies. The two memorable works of Charaka Samhita and Sushruta Samhita (400-500 AD) are called the "Golden Age" of Indian culture (Jain, 1968).

According to the report of WHO, over 80% of people in developing countries depend on traditional medicines for their primary Health care and need

of Herbal medicines are going on most demanding in developed and the developing countries. Due to lower and no side effect of herbal medicine, it have great efficacy in primary health care. In India, to cure various type of disease for existence of the traditional system of medicine namely, Siddha, Ayurvedic and Unani for several centuries. This traditional system of medicine together with homeopathy and folklore medicine continue to play a significant role largely in the health care system of the population (Trivedi, 2007).

Ayurveda system of medicine has uniqueness in treatment of patients because it depends on root cause and symptoms. Consumers have a positive opinion towards Ayurvedic system of medicine due to no side effects, natural ingredient and less surgical practices. Due to more side effects of some allopathic products, herbal products are demanding in the world market and because is the belief that all natural products are safe for our body (Zheng *et al.,* 2019). Ayurvedic medicinal system in form of herbal drugs are widely known to be popular among the urban and rural communities of India (Samiee *et al.,* 2005). Herbal products are prepared as remedies derived from plants. These products are largely used as supplements to improve health and well-being as well as for other therapeutic purposes. Herbal products are available as capsules, teas, powders, tablets, extracts, among others. (Jibril, *et al*., 2019). Interestingly, the production and consumption of these herbal products have boosted both the global and local production herbal market (Verma and Singh, 2008).

This time, the industry of herbal product is undeniably a business in the world market, with countries as India, China, Malaysia and Singapore lucrative having some portion of total economic revenue generated from this industry. These countries and many others have made great investments in their herbal research industries with the view of boosting their overall economies (Brown, 1999; Kotler and Gertner, 2002). The competitive advantage of using herbal products has shifted gradually over the years from synthetic to herbal medicine used in a move described as "Return to Nature" due to highly valued in all over the world as a rich source of natural prevention of and cures for diseases and ailments (Samiee *et al.,* 2005; Sharma *et al.,* 2008). According to Semenya *et al.,* (2012). Medicinal plants have used not only because these substances are far less expensive, but also because better compatibility with the human body, enjoy

greater cultural acceptability and on minimal side effects compared to synthetic medicines and treatments (Pal and Shukla, 2003).

In the current scenario, according to WHO (World Health Organization) in their COVID-19 analysis that medicinal plants are pay most important role to boost the immunity to fight againt coronavirus they suggest the world population to consume immunity boosting foods. Therefore, the demand for medicinal plant extracts carrying properties of boosting human immunity is at the surge in the pharmaceuticals industry (WHO, 2020a).

During in the worldwide lockdown has also affected the farming practices which has highly impacted the supply of raw materials of medicinal plant extracts. Moreover, COVID-19 impact to logistics also contribute to the increased prices of raw materials which increases the cost for medicinal plant extracts manufacturers. Due to barriers to cross-border transportation of commodities in this pandemic situation. Thus, the increased raw material prices followed by high demand for medicinal plant extracts would lead to an increased price of medicinal plant extracts for next few years (WHO, 2020a). In India on April 2020, According to the Jawaharlal Nehru Tropical Botanical Garden and Research Institute (JNTBGRI) in Thiruvananthapuram district's Palade has received the approval of Indian Council of Medical Research (ICMR), the nodal agency dealing with COVID-19 in India, to test whether extraction from plants could be effective in the treatment of the virus. Thus, these on-going research on medicinal plant extracts as a remedy to COVID-19 is contributing to the market growth of medicinal plant extracts (Philip, 2021).

Medicinal plant extracts are one of the substances which are majorly as well as widely used for treating Respiratory diseases as cold, cough, pneumonia, bronchitis, lung cancer they are used in medicines and in primary health care. Among the constant fear and panic of COVID-19 pandemic, consumers are highly concerned of keeping a check on their health which is expected to increase the sales of dietary supplements across the globe. Moreover, consumer shift to plant-derived supplements is influencing the growth of medicinal plant extracts in the medicinal products.

Magico-religious beliefs can be defined as a system of faith and worship of super natural beings and attributing everything good or bad in this

universe as acts of trees. Instance of ridding the evil spirit with some plant part have already been mentioned by Hajra (1995). However, the Warlis associated very few plants with superstitions and their connection with witchcraft is not known. This does not correspond with Gupta's (1991) finding where in a large number of plants are said to be used against witchcraft in India. Flora Motifs of *Agle marmelos Borassus flabellifer* adorning the idols of Gods in temples have already been studied (Gupta, 1991) there is a striking similarity between the plants used for worship by the warlis and other. Tribes. The flower is associated with Worship of Hindu god Lord Shiva. *Datura* is said to be associated with magico-religious beliefs of tribal people all over the world. It has been mentioned in ancient Sanskrit Literature like Amarkosa, Matsya-Purana and Kamasutra (Hajra, 1995). With reference to ethnobotanical similarities between Warlis and other tribes, a corollary could be drawn between them and other tribes. A detailed account on Indian Folk life enumerating plants used for various purpose as food. Clothing etc. has been reported by Mittre (1991) fruits of reetha (*Sapindus mukorossi)* are used as a substitute for soap by the Miris of Assam plains (Hajra and Bashiya, 1991) the tribals are generally used to alcoholic beverages, Warlis are not exception to the rule. These beverages are brewed (Chaturvedi, 1991). The folk paintings are a vibrant celebration of the very substance and fabric of life. The promotion of the Warli art has lead to its wide spread commercialization. Its versatility and uniqueness stands as a testimony to its enormous popularity Wallis celebrate the season of paddy cultivation. In three steps, viz. "koli-bhaji" the season of sowing, followed by festival of "Navbhat" i.e. arrival of new crop, followed by the harvest feast. Usually the wedding ceremonies take place during this time (Dandekar, 1998).Today, the wallis find themselves in a state of transition. This transition is vividly reflected in the seasonal cycle and in the life-style that the wallis have been forced to adopt (Dandekar, 1998). The forest laws of the colonial State affected the communities occupying the different eco-niches. The wallis too were severely affected by the laws and this had a cascading effect on their ecosystem (Sahlins, 1963). The chenchus (Haimendrof, 1943) and the baigas (Elwin, 1939) were some of the instances of other communities which suffered due to the colonial forest laws.

The indigenous use of plants for various medicinal purposes could be popularized as a part of traditional system of healing. It has been claimed that development of renewable plant-based products in the Amazon could form the basis of new economic activities in the region (Myers, 1983). An effort in this direction is already being made in context to the wallis, too. The international Institute for sustainable Future, Mumbai, in collaboration with BSES, ltd., has proposed a tribal medicine canter at Dahanu, Where the collected species would be pharmaceutically analysed and cultivated on a large scale. This initiative would generated job opportunities for the Warlis It has been said the ethno-pharmacological research and lead to several beneficial outcomes at global as well as national level besides being a financial help for the indigenous populations (Elisabetsky and Nunes, 1990) Unfortunately, the recent spate of industrialization in the wada Mokhada areas of Warli inhabitations has created a threat to the age old Warli tradition and culture.

Medicinal plants have their values in substances present in various plant tissues. The more important of these substances are alkaloids, compounds of carbon, hydrogen and nitrogen. Besides these substances glucosides, essential and fatty oils, resins, gums, mucilage tannins are also of large use. Tribal knowledge about the use of plant species depends on the surrounding plants for various purposes (Reddy *et al.,* 2010). Plants and other living organisms have a great potential to treat human diseases (Subbu and Prabha, 2009). Medicinal plants play an imported role in providing cure diseases. It is clear that Indian people use herbal medicines and they use health related problems. The demand for medicinal plants is increasing and the bulk of their physical business is still from wild plants. Cancer is an abnormal development of cells in any tissue or body part, which can cause death. Cancer cells usually attack and destroy normal cells. These cells are born due to imbalance in the body and correcting this imbalance. A cancerous growth is called fatal tumor (Kaur *et al.,* 2011). There is cancer with human diseases treated with medicinal plants, which is probably the most important genetic disease. Every year, millions of people are diagnosed with cancer, which leads to death in most cases (Srinivas and Afolayan, 2011). Every year the death caused by cancer is 2-3% of the annual death reported worldwide. Thus, cancer kills around 3500 million people worldwide. Many

chemo preventive agents are used for the treatment of cancer, but they cause poisoning which prevents their use (Kathyrsen *et al*., 2006). The procedure of cancer metastasis is found in a series of sequential interpersonal stages, each of which is limited. Some of them are going through a clinical trial with chemicals loaded with chemically protective activities. The species of these plant species has the potential to be used in medicines and pharmaceutical industries. The purpose of the present study is to create awareness about the use of ethno-medicinal value of plants and their use to attract the attention of pharmacologists, phytochemicals and pharmaceuticals (Kapoor and Kishore, 2013).

Selected and carefully used plants can definitely be in the management of anti-cancer therapy and cancer cans. There are many conventional systems of medicine in the world, each with different collaborative cultural origins. Some of these, such traditional medicine, traditional medicines are increasingly used in many different areas of the world. This paper will focus on the treatment of herbal medicines related to traditional medicines. Ayurveda is the most widely practiced of Indian traditional medicine systems.

Herbal medicines are used throughout the world as a traditional system of medicine, and herbs have been the basic source for most medicines. There are many types of chemical compounds in medicinal plants which are the main source of anti-cancer agents to cure cancer. Now the day's discovery and progress is going on in herbal medicine, which increases the health care of mankind. Various medicinal plants such as *Aloe Barbadensis* (Mill), *Terminalia arjun* (Roxan) Wight and Arn, *Allium cepa* (L.), *Ocimum sanctum* (L.) *Zingiber officinalis* (R) etc. are traditionally used for the treatment of cancer.

In organized manner, the Ethno-Botany work was started in 1969 by the Botanical Survey of India. Since then, the use of plants by the tribal is being registered for various purposes (Jain, 1981). Significant work has been done on many aspects of plants like- Ethno medicine, colour, Tan, narcotics, fibre, wood etc. (Bhandari (1974); Singh and Pandey (1980); Katewa and Guria (1997); Nargas and Trivedi (1999).

All over the world, many people are suffering from various type of oral diseases affecting adversely on the health of teeth, tongue, gums and prevalent

oral health are: dental caries and pre dental diseases (Gingivitis and pyorrhea), which are usually followed by malocclusion and oral cancer (Gandhi, 1994). Out of a number of preventive measures like oral hygiene, optimal use of fluoride and nutritional restrictions, regular brushing of teeth and cleaning the tongue are the primary requirements for good oral health. This has been the usual practice in rural India for ages (Punjani, 1998; Rao *et al.,* 1996).

According to the world health organization (WHO), approximately 80% of the world's population depandes on traditional medicine for health care (Simbo, 2010; Singh *et al.,* 2012). The practice of on medicinal plants is widely spread in India, Japan, China, Srilanka, Pakistan, and Thailand (Krishnamoorthi *et al*., 2015). In India, medicinal plants and aromatic plants are used since many years. It has been estimated that out of 15,000 higher plants occurring in India, in which 7,500 are used as medicinal, 3,900 are are used as edible, 700 are used as culturally important, 525 are used as fibre, 400 for used as fodder, 300 are used as pesticide and insecticide, 300 are used as gum, resin and dye and 100 plants are used as incense and perfume (Rajendran *et al.,* 2008).

Blatter and Hallberg (1918-21) studied the flora of Indian desert. Joshi (1956) studied the vegetation of the Bikaner and its adjacent areas. Sarup (1957) studied the common plants of Bikaner and its neighborhoods. Nair (1988) observed sand-dune vegetation of Pilani and its environs. Bhandari (1995) have observed vegetational adaptations in the extreme arid regions of the Indian desert. Some arid zone medicinal plants have been studied for their ecological, ethnomedicinal and phytochemical aspects by Gaur (2002), Kapoor and Ranga (2005), Khatri and Madans (2005).

Many workers have done on Ethnobotanical plants (Jain, 1981, 1991, 2002, 2004; WHO, 2002; WHO, 2003; Kumar and Chouhan 2005; Hemborm and Geol, 2005; Upadhyay and Singh, 2005; Limenih *et al.,* 2015).

From the view of worldwide prospective, India is a veritable emporium of medicinal and aromatic plants. In terms of the plants material for traditional medicine, it is estimated that local communities use over 7,500 species plants. Various medical system like Ayurveda, Unani Siddha and Homeopathy have been utilizing plants of their preparation and have now assumed great

importance owing to side effect to synthetic drugs. Indian flora has innumerable medicinal plants, which are collected from forest by the tribal villagers. Many of them are also being exported to developed countries to earn handsome foreign exchange (Anonymous, 1992 – 1993). Since ancient time, all over the world mankind has been dependent on the plants to meet its needs for medicines, food shelter, fragrance, and flavors. Indian sub-continent is blessed with most varied and diverse soil and climate conditions suitable for the growth of variable plant species. From medicinal and aromatic plants and their derivatives. The country is earning nearly 200 crores annually apart from meeting its domestic requirement. There is further a considerable scope for India to contribute towards the increasing worldwide demand on the for medicinal and aromatic plant product (Indian council of forestry research and education, 2002).

The Main aim of the study is to enlist the important species of plant used in medicine in the study area and to draw the attention of biochemistry and pharmacologist for further critical and scientist study it is also aimed to encourage the farmers to go cultivation of medicinal plants species in this agro climatic region.

Due to extreme arid climatic conditions, medicinal plants of this area adapt themselves morphologically and physiologically. They not only provide food, wood, fiber and fuel to the human beings but are also good source of medicinally important compounds.

So, the present study was made to find out the ethno medicinal and phytochemical aspects especially of medicinal plants. The immense medicinal value of selected plant species shows that they can be utilized in drug and pharmaceutical industries. The demand of these drug yielding plants is increasing day by day.

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CHAPTER-3

Material and Method

3.1 Physiography of Study Area

Sujangarh Tehsil is the part of Rajasthan. The Churu district lies in the north-east part of Rajasthan where mostly desert conditions prevail. This district also falls in the desert tract known as 'Thar'. The area remained undeveloped for centuries due to the extreme climatic conditions. It is located at latitude of 28° 18' north and longitude 74° 58' east at a height of about 286 meters from the mean sea level (Jeph, 2007). The Climate is hot and arid with large variation in temperature. Rainfall is scanty. The average temperature variation in summers and winters are 37.58° to 24.94°C and 29.05° to 9.15°C respectively. The maximum and minimum temperature recorded are south-west monsoon season, recording in average annual rainfall of 377mm. Churu also experiences occasionally post-monsoon storms or depressions. Dust storms and thunder storms occur in the hot season. Thunder storms occur in the south-west in hot season. Mean relative humidity is 60%. The predominant wind direction is from west and south-west. The relative humidity is minimum in the hot weather months and maximum in monsoon months (Jeph, 2007). Summer temperature are always high and the diurnal range exceeds even 20°C during the day. The summer temperature may be as high as 49°C but in the night, the temperature may fall, to less than 20°C.

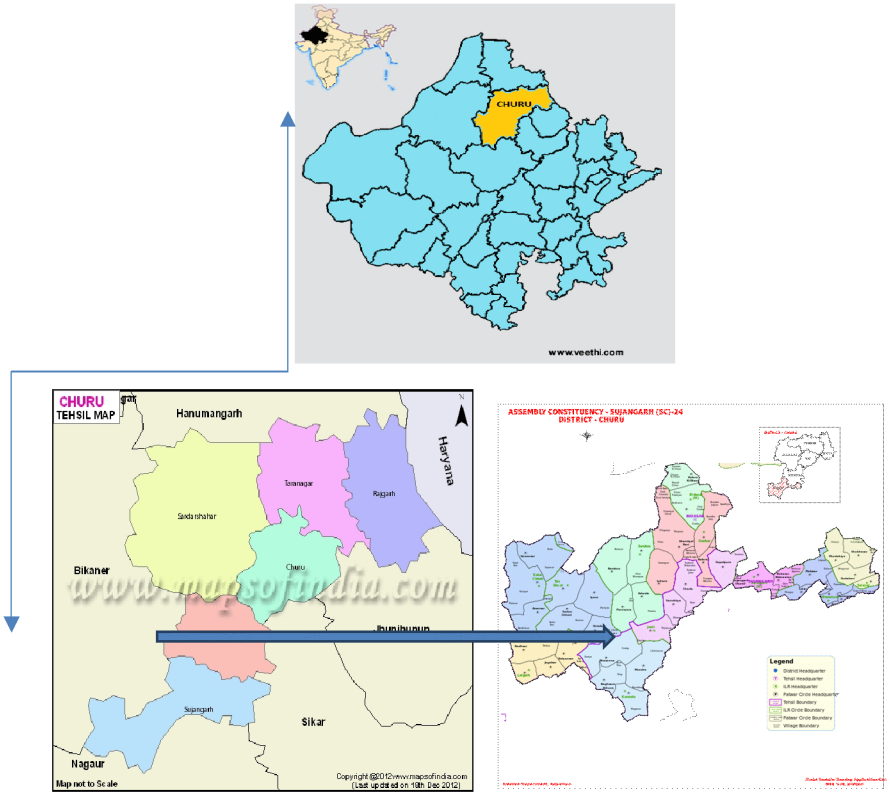

Fig.1 Map of study area in Churu District

The bulk of vegetation consists of stunted, thorny or prickly shrubs and perennial herbs capable of drought resistance. Xerophytes show characteristic features like deep root, dry hard and rod like thick or fleshy stems with spines and leaves either absent or much reduced. On the basis of climatic conditions and agricultural produce, Rajasthan has been divided into nine agro-climatic zones, each are having special characteristics of its own. Sujangarh tehsil of Churu district comes under arid Western plain.

This is the most arid part of the state where the annual rainfall varies from 10 to 40 cm, quite often erratic, so much. So that the entire rainfall of the year may fall on a single day the rest of the year may be dry.

This is an area of not so developed drainage system where there are no flowing streams. Owing to poor rainfall, surface water resources do not exist while ground water resources are often deep and blackish. Natural vegetation is therefore, only seasonal. With the first showers in late July, a few grass species grow and shrubs and dwarf trees become green. But soon after the retreat of the monsoon in mid-September the vegetation dries up, leaving only a few perennial shrubs and a thin pad of pale grass on the landscape.

3.2 Methodology

The present study was based onextensive field trips which were organized for collecting the plant species and data using as an integrated approach of botanical collections, interviews and questionnaires and taken to the fields for collecting information about ethnomedicinal plants, local name, parts used, method of drug preparation and approximate dosage administration. Collected plants were identified with the help of authentic herbarium specimens and floras and Herbarium specimens prepared following the standard method (Jain and Rao, 1978; Shetty and Singh, 1987, 91, 93) have been deposited in the herbarium of Botany UOR, Department of botany and KAZRI, Jodhpur.

For valuable information, collection and documentation, field trips have been done in the villages. I conducted metting about their utility and medicinal value with the experienced people of different communities, vendors, tribals, ayurvedic experts and original doctors like Ohja, Bhagat, Kalbelia and Vaidya, because they have a good knowledge of Ethno medicinal value plants. Collected samples will be taxonomically identified with the help of Indian vegetable

(Sharma and Balakrishnan, 1996; Sharma and Tigagi, 1979) and monograph (Bhandari, 1997) and standard key. The Ayurvedic Department of Rajasthan was formed to ascertain the authenticity of the group discussion information on the use of necessary inquiries and the use of some plants.

I visited interior rural area and discussed about the healing properties of a particular plants species. I collected several information given by the traditional healers, local people and vaidya on various properties. Literature reveals about the use of one plants part of a particular species while the traditional healers disclosed about the medicinal uses of other parts also which were not mentioned in the literature. Field trips were made twice a week in the beginning and once a week afterwards for the samples collection. Plant species were identified with the help of herbarium of department of Botany and prepared herbarium. Efferts were made to identify the unknown plants by choosing twig of available species sand those could not be identified, were preserved and authenticated at herbaria. Appropriate notes were prepared and the observation were discussed with the local people and traditional healers. With the help of these deliberations, useful plan of work was evolved and meaningful results were obtained.

Soil Samples

I collected soil samples of all season (winter, summer, Rainy). Like I have selected two sites for soil sampling, I have used some equipments like clay Augers, sand augers and mud augers (Screw or tube or post hole type), spade, core sampler, sampling bags, plastic tray or bucket.

Before taking soil sampling the surface area of soil has been removed by using spade. The soil sample has been collected from every compartment last corner soil samples has been taken at several location in a Zig – Zag pattern ensures homogeneity, Fields, which are similar in appearance, production and past management practices, can be ground into a single sampling unit. Soil sample should take left the 2-3 miter area of field's corner. For taking sample a cut of 'V' shaped were made by using spade up to 20 cm on selected spot from this selected spot. This soil surface up to 1 cm has been taken into the clear plastic bottle.

Likewise other soil samples has also been collected from remaining other spot also by using same producer and formula. Then whole the soil samples has been mixed soil has been again started the mixing procedure by the help of this formula only 500 gm soil was left for first sample. The same procedure was used for soil sampling of surface and depth. The total 24 soil samples have been collected from every reason (winter, summer and rainy).

Sampling date, location of the sample area and sampling number were marked on the bags and soil samples were brought to the soil testing Laboratory and soil sample were chemically analyzed like PH, electric conductivity, water holding capacity, Phosphorus, Nitrogen etc.

Soil samples were chemically analysed like; pH, electric conductivity, water holding capacity, phosphorus content, nitrogen content etc. Soil samples were determined as per standard methods (Walkley and Black, 1934; Piper, 1942; Richard, 1954; Olsen *et al.,* 1954; Jackson, 1967, Hesse, 1971; Muller Dombois and Ellenberg, 1974; Allen *et al.,* 1976,).

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CHAPTER-4

Floral Diversity

Table- 1 List of plant species observed at Sujangarh Tehsil.

S.No	Botanical Name	Local name	Family	Habitat
Dicot Trees				
1.	*Acacia catechu* (L.) Wild., Oliv	Khair	Fabaceae	Dry tropical Forest
2.	*Acacia leucophloea* (Roxb.) Willd.	Ronjh/safed babool	Fabaceae	Road sides and tropical Forest
3.	*Acacia nilotica* (L.) Willd. ex Delile	Babul	Fabaceae	Dry tropical Forest
4.	*Acacia senegal* (L.) Britton	Khumbhata/ gum babool	Fabaceae	Dry Tropical Forest
5.	*Acacia tortilis* (Forssk.) Hayne	Ishaeli-Babul\Umbrella Thorn	Fabaceae	Road sides and Tropical Forest

6.	*Aegle marmelos*	Bael	Rutaceae	Near by fields
7.	*Ailanthus excelsa* (Roxb.)	Ardu	Simaroubiaceae	Road sides
8.	*Albizia lebbeck* (L.) Benth.	Siris	Fabaceae	Road sides and open sides
9.	*Albizia procera* (Roxb.) Benth.	Safed Siris	Fabaceae	Panted in forest
10.	*Alstonia scholaris* (L.) R.Br	Chattin\Sapt parni	Apocynaceae	Near by fields
11.	*Azadirachta indica* A. Juss	Neem	Meliaceae	Road sides, open forest
12.	*Balanites roxburghii* (Planch.)	Hingota	Zygophyllaceae	Open sandy plains
13.	*Bauhinia racemosa* Lamk.	Jhinjha	Fabaceae	Open areas, forest edges
14.	*Bauhinia variegate* (L.) Benth	Kachnar	Fabaceae	Near by fields
15.	*Cassia auriculata* (L.) Roxb.	Avaram	Fabaceae	Along road side
16.	*Cassia fistula* L.	Amaltash	Fabaceae	Near by fields
17.	*Cassia siamia* Lam.	Siyama	Fabaceae	Along road sides
18.	*Cordia dichotoma* Forst.f.Prodr	Lasora/Lasua	Boraginaceae	Along road sides
19.	*Dalbergia sisso* Roxb.	Shisam	Fabaceae	Along road side
20.	*Delonix regia* (Bojer) Raf.	Gulmohar	Fabaceae	Near by fields
21.	*Emblica officinalis* Gaertn.	Anwla	Euphorbiaceae	Near by fields
22.	*Ehretia laevis Roxb.*	Bhairi, Chamror	Boraginaceae	Along roadside
23.	*Eucalyptus camaldulensis* Dehnb	Safeda	Myrtaceae	Along roadside

24.	*Eugenia jambolana* Lam	Jamun	Myrtaceae	Near by fields
25.	*Ficus benghalensis* (L.)	Bargad	Moraceae	Near Roadside,
26.	*Ficus religiosa* (L.)	Peepal	Moraceae	Roadside,
27.	*Grewia tenex* (Forssk.) Fiori	Gondni	Tiliaceae	Along roadsides
28.	*Holopteria integrifolia* (Roxb.) Planch	Papri	Ulmaceae	Along roadsides
29.	*Leucaena leucocephala* (Lam.) de Wit	Subabul	Fabaceae	Along road sides
30.	*Mangifera indica* L	Aam	Anacardiaceae	Near by fields
31.	*Melia azedarach* (L.)	Bakain	Meliaceae	Wastelands, Open forest
32.	*Moringa oleifera* (lam.)	Senjana	Moringaceae	Along roadside
33.	*Morus alba* L.	Sahtoot	Moraceae	Near by fields
34.	*Murraya koengii* L. Spreng	Curry patta/Mitha neem	Rutaceae	Near by fields
35.	*Parkinsonia aculeata* L.	Keshu	Fabaceae	Along with Road side
36.	*Polyalthia longifolia* (Sonnerat) Thw	Ashok	Magnoliaceae	Near by fields
37.	*Pongamia pinnata* (L.)	Karanj	Fabaceae	Along with road side
38.	*Punica granatum* (L.)	Anar	Lythraceae	Near by fields
39.	*Prosopis cineraria* (L.) Druce	Khejri/Janti	Fabaceae	Dry and open forest
40.	*Prosopis juliflora* (Sw.) DC	Bavalio	Fabaceae	Dry Wastelands
41.	*Salvadora oleoides* Decne.	Jhal/Peelu	Salvadoraceae	Throughout the forest
42.	*Salvadora persica* (L.)	Jhal/Peelu	Salvadoraceae	Rare in locality

43.	*Syzygium cumini* (L.) Skeels	Jamun	Myrtaceae	Planted in the Forest
44.	*Tamarindus indica* L.	Imali	Fabaceae	Near by fields
45.	*Tecomella undulata* (Sm.) Seem.	Rohira	Bignoniaceae	Rare in locality
46.	*Ziziphus mauritiana* (lam.)	Ber	Rhamnaceae	Dry wastelands
47.	*Ziziphus xylopyrus Willd*	Gat bor	Rhamnaceae	Open forest
II (Dicot shrub)				
48.	*Acacia jacquemontii* Benth.	Baonli kikar	Fabaceae	Dry Wasteland
49.	*Annona squamosal L.*	Sita phal	Annonaceae	Planted in the forest
50.	*Barleria acanthoides* Vahl	Vajardanti	Acanthaceae	Rare in locality
51.	*Barleria priontis* L.	Vajardanti	Acanthaceae	Rare in locality
52.	*Bougainvillea glabra Choisy*	Bogan bel	Nyctaginaceae	Near by fields
53.	*Calligonum polygonoides* L.	Phog	Polygonaceae	Rare in locality
54.	*Calotropis gigantea* (L.) R. Br	Shiv aak	Asclepiadaceae	Near by fields
55.	*Calotropis procera* (Aiton) W. T. Aiton	Aak	Asclepiadaceae	Wastelands, throughout the forest
56.	*Capparis decidua* (Forssk.) Edgew.	Kair	Capparidaceae	Throughout the forest
57.	*Carica papaya* L.	Papaya	Caricaceae	Near by fields
58.	*Carissa congesta* Wigh	Karunda	Apocynaceae	Along with roadsides
59.	*Cassia aungustifolia* Vahl	Sonamukhi	Fabaceae	Near by fields
60.	*Cassia occidentalis* (L.)	Kasondi	Fabaceae	Along roadsides
61.	*Cassia tora* (L.) Roxb.	Panawar\ Puadia	Fabaceae	Wastlands

62.	*Cordia gharaf* (Forsk.) Ehrenb. and Asch	Nani Gundi	Boraginaceae	Along with road sides
63.	*Clerodendrum inermi* (L.) Gaertn	Choti Arni	Verbenaceae	Near to Roadsides
64.	*Clerodendrum phlomoides* L. f	Arni	Verbenaceae	Near to Roadsides
65.	*Datura innoia* (Mill.)	Datura	Solanaceae	Wastelands
66.	*Datura metal* (L.)	Kala Datura	Solanaceae	Near to pump station
67.	*Datura stramonium* (L.)	Datura	Solanaceae	Roadsides, wastelands
68.	*Echinopus echinatus* Rob.	Unt katelo	Asteraceae	Dry open forest
69.	*Euphorbia cauducifolia* Haines	Thore	Euphorbiaceae	Near to water tank
70.	*Fagonia indica* Burm.f.	Dhamaso	Zygophyllaceae	Rare in locality
71.	*Farsetia hamiltonii* Royle	Fareed booti	Cruciferae	Plain sandy soil
72.	*Hibiscus ovalifolius* (Forsk.) Vahl	Dokala	Malvaceae	Forest and in thickets and grassland
73.	*Hibiscus rosa-sinesis* L	Gudhal	Malvaceae	Near by fields
74.	*Ipomoea fistulosa* Mart. ex choisy	Nagar pan/ Vilayati aak	Convolvulaceae	Along roadsides, Wastelands,
75.	*Lantana camera* (L.)	Besharam	Verbenaceae	Exotic weed, Road sides
76.	*Leptadenia pyrotechnica* (Forssk.) Decne.	Khimp	Asclepiadaceae	Open forest
77.	*Lowsonia inermis* (L.)	Hina	Lythraceae	Planted in forest
78.	*Lycium barbarum* (L.)	Murali	Solanaceae	Near by fields

79.	*Maytenus emarginatus* (Willd.) Ding Hou	Kankero	Celasteraceae	Mostly Near fields as fencing
80.	*Mimosa hamata* Willd.	Alai, Bander-ki-Rakhi	Fabaceae	Open forest
81.	*Nerium oleander* L.	Kaner	Apocynaceae	Near by fields
82.	*Opuntia elatior* (Mill)	Nag-phani	Cactaceae	open forest
83.	*Pithecellobium dulce* (Roxb.) Benth	Jangal Jalebi	Fabaceae	Along roadsides
84.	*Ricinus communis* L.	Arandi	Euphorbiaceae	Along roadsides, Wastelands
85.	*Psidium guajava* L.	Amrood	Myrtaceae	Near by fields
86.	*Sesbania bispinosa* (Jacq.) W. Wight	Dhaincha	Fabaceae	Marshy places, Near Pond
87.	*Sida cordata* (Burm. F.) Borss.	Aadio bal	Malvaceae	Wild along roadsides,
88.	*Sida cordifolia* (L.)	Ati bala	Malvaceae	Open forest
88.	*Sida ovata* forssk.	Dabi/Khariti	Malvaceae	Open dry places
89.	*Sida rhomboidea* Roxb.ex Fleming	Sahadeva	Malvaceae	Road sides, waste areas
90.	*Solanum elaegnifolium* Cav.	Silver leaf nightshade	Solanaceae	Rare present in forest
91.	*Solanum incanum* L	Dholi Ringni	Solanaceae	Along with road side, wastelands
92.	*Solanum indicum* (L.)	Barikateri	Solanaceae	Along with road side, wastelands
93.	*Tabernemontana divaricata*	Chandni	Apocyanaceae	Near by fields

	L.R.Br ex Roem. & Schult.			
94.	*Tamarix aphylla* (L.) Karst.	Farash	Tamaricaceae	Along road sides
95.	*Thevetia peruviana* (Pers.) Merr.	Pili-kaner	Apocynaceae	Near by fields
96.	*Tecoma stans* (L.) Juss.ex Kunth	Piliya	Bignoniaceae	Planted in forest
97.	*Volkameria inermis* L	Choti Arni	Verbenaceae	Near to Roadide
98.	*Withania somnifera* (L.) Dunal	Ashawagandha	Solanaceae	Wastelands, drylands
99.	*Xanthium strumarium* (L.)	Adhasisi	Asteraceae	Wastelands, Road sides
100.	*Ziziphus nummularia* (Burn. F.) Wight and Arn.	Jhadiber	Rhamnaceae	Open forest, dry aera
101.	*Zizyphus xylopyrus* Willd	Gat bor	Rhamnaceae	Open forest
III (Dicot herb)				
103.	*Abrus precatorius* L.	Chirmi, Ratti	Fabaceae	Climbing on hedges
104.	*Abutilon fruticosum* Guill. And Perr.	Imarti	Malvaceae	Rare in Area
105.	*Abutilon indicum* (L.) Sweet	Kanghi	Malvaceae	Along with roadsides
106.	*Acalypha indica* L.	Kuppi	Euphorbiaceae	Forest edges and near pond
107.	*Achyranthes aspera* (L.)	Chirchita	Amaranthaceae	Along road sides
108.	*Aerva lanata (L.)* Juss. Ex Schult	Kali bui	Amaranthaceae	Dry open areas
109.	*Aerva tomentosa* Forsk	Bui	Amaranthaceae	Dry open areas
110.	*Aerva persica* (Burm. F.) Merr.	Bui	Amaranthaceae	Dry open areas

111.	*Ageratum conyzoides* (L.)	Bhakumbar	Asteraceae	Found in moist areas
112.	*Alternanthera sessilis* (L.) R.Br.ex DC.	Bhaji	Amaranthaceae	Mostly occurrence near to wet areas
113.	*Alysicarpus monilifer* (L.) DC.	Gumal	Fabaceae	Mostly rainy season
114.	*Alysicarpus vaginalis* (L.) DC	Neel	Fabaceae	Mostly rainy season
115.	*Amaranthus hybridus* (L.)	Smooth pigweed	Amaranthaceae	Near to pond
116.	*Amaranthus spinosus* (L.)	Kantewali Chaulai	Amaranthaceae	Troublesome weed near to field
117.	*Amaranthus viridis* (L.)	Jangli chaulai	Amaranthaceae	Wasteland places
118.	*Anagalis arvensis* L	Neel	Primulaceae	Open forest, winter weed
119.	*Argemome mexicana* (L.)	Satyanasi	Papaveraceae	Open forest, wastelands
120	*Argemone ochroleuca* Sweet	Safed Satyanasi	Papaveraceae	Open forest, wastelands
121.	*Aristolochia bracteolate* Lam.	Hukka-bel	Aristolochiaceae	Waste places
122.	*Artemisia meritima* L.	Banna	Asteraceae	Open forest
123.	*Artemisia scoparia* Waldest. & Kit.	Banna	Asteraceae	Open forest
124.	*Boerhavia diffusa* (L.)	Sata	Nyctaginaceae	Sandy soil
125.	*Boerhavia erecta* (L.)	Punarnava	Nyctaginaceae	Along roadsides,
126.	*Borreria articularis* (L. F.) F. N. Williams	Agio	Rubiaceae	Open sandy areas
127.	*Brassica campestris L.*	Sarson	Brassicaceae	Near to field

128.	*Canna indica* L	Keli	Cannaceae	Near by fields
129.	*Cannabis sativa* L	Bhang	Cannabaceae	Planted in Ashram
130.	*Catharanthus roseus* (L.) G. Don.	Sadabahar	Apocynaceae	Near by fields
131.	*Celosia argentea* L.	Surli Garke\ Makhmal	Amaranthaceae	Troublesome weed
132.	*Celosia spicata* L.	Makhmal	Amaranthaceae	Near by fields
133.	*Chamaecrista mimosoides* L.	Sanjivani	Polygalaceae	Dry and moist areas
134.	*Chenopodium album* L.	Bathua	Chenopodi-aceae	Common winter weed near to fields and roadside
135.	*Chenopodium murale* L.	Chilwa\ Khartua	Chenopodia-ceae	Commen winter weed near to fields and roadsides
136.	*Chorchorus depressus* L.	Kagler	Tiliaceae	Dry and waste areas
137.	*Chorchorus tridense* L.	Kag nasha	Tiliaceae	Dry and waste areas
138.	*Chorchorus trilocularis* L.	Wild jute	Tiliaceae	Dry and waste areas
139.	*Cichorium intybus* (L.)	Kasni	Asteraceae	Commen weed along cultivated field, roadsides
140.	*Cleome gynandra* L.	Safed bagro	Capparidaceae	Waste lands
141.	*Cleome viscosa* L.	Hulhul	Capparidaceae	Waste lands
142.	*Conyza bonariensis* (L.) Cong.	Horse weed	Asteraceae	Commen weed along roadsides
143.	*Convolvulus arvensis* L.	Hiranpagi	Convolvulaceae	Near to ponds
144.	*Convolvulus microphyllus* Sieb.ex Spreng	Shankhpushp	Convolvulaceae	Naer to ponds

145.	*Convolvulus prostratus* Forsk.	Santari	Convolvulaceae	Near to ponds
146.	*Crotalaria buria* Benth.	Kharsana	Fabaceae	Dry sandy areas
147.	*Crotalaria medicaginea* Lam.	Gulali/ Gugario	Fabaceae	Open Forst
148.	*Croton bonplandianum* Baill	Kala-Bhangra	Euphorbiaceae	Along roadsides, Waste lands
149.	*Digera muricata* (L.) Mart	Lehsua/ khanjru	Amaranthaceae	Waste land
150.	*Eclipta alba* (L.) Hassk	Bhringraj	Asteraceae	Near to pond
151.	*Eruca sativa* (Mill.)	Taramira	Brassicaceae	Near to agricultural fields
152.	*Euphorbia cyathophora* Murra	Laal Patta	Euphorbiaceae	Near to agricultural fields
153.	*Euphorbia hirta* (L.)	Laldudhi	Euphorbiaceae	Wasteareas, road sides
154.	*Euphorbia prostrata* (Ait.)	Dudhi	Euphorbiaceae	Sandy and gravelly, waste areas
155.	*Evolvulus alsinoides* L.	Vishnukarnta	Convolvulaceae	Near to pond
156.	*Gisekia pharnaceoides* L.	Sureli	Molluginaceae	Mostly found in sandy soil
157.	*Gomphrena celosioides* Mart.	Lehsunia	Amaranthaceae	In dry arid regions
158.	*Heliotropium europaeum* L.	Caterpillar Weed	Boraginaceae	Dry areas, waste lands
159.	*Heliotropium marifolium* Retz. Obs. Bot.	Dungario agio	Boraginaceae	Sandy and muddy soils
160.	*Heliotropium strigosum* Willd.	Kundan, Kharchan	Boraginaceae	Open forest
161.	*Heliotropium supinum* L.	Ghedio	Boraginaceae	Open and dry places

		kharsan		
162.	*Heliotropium ovalifolium* L.	Hathi-sundha	Boraginaceae	Sandy and muddy soil
163.	*Heliotropium zeylanicum* (Burm.f) Lam.	Kali-bui	Boraginaceae	Waste lands
164.	*Indigofera cordifolia* Heyne ex Roth	Bakario	Fabaceae	Open forest
165.	*Indigofera hochstetteri* baker	Adio-bekario	Fabaceae	Open forest
166.	*Indigofera linifolia* (L.f.) Retz.	Pandar phalli	Fabaceae	Along roadside
167.	*Indigofera linnaei* Ali	Bakario	Fabaceae	Alone roadside
168.	*Indigofera tinctoria* L.	Neel	Fabaceae	Open forest
169.	*Ipomea pes-caprae* (L.) Sweet	Do patti lata	Convolvulaceae	Commonly found in sand dunes
170.	*Ipomoea cairica* (L.) Sweet	Panchpatti\Railway creeper	Convolvulaceae	Climbing on bushes and hedge
171.	*Ipomoea pestigridis* L.	Panchpatia	Convolvulaceae	Among Roadsides, waste places
172.	*Ipomoea carnea* Jacqu	Besharam	Convolvulaceae	Climbing on bushes and hedge
173.	*Ipomoea indica* (Burm. F.) Merrill	Morning glory	Convolvulaceae	Waste areas, among roadside
174.	*Ipomoea triloba* L.	Morning glory	Convolvulaceae	Sandy areas
175.	*Justicia procumbens* L	Kagner\ Makhania ghas	Acanthaceae	Open forest
176.	*Justicia simplex* D. Don	Kagner	Acanthaceae	Open forest

177.	*Launaea arborescens* (Batt.) Murb.	Cedada	Asteraceae	Winter weed, Sandy areas
178.	*Launaea nudicaulis* Hook. F.	Jangali gobi	Asteraceae	Winter weed, Along roadsides
179.	*Launaea procumbens* (Roxb.)	Ban murai, Jangali gobi	Asteraceae	Plain and dry areas
180.	*Launaea resedifolia* (L.) O. Kuntze	Phulwalo ount kantelo	Asteraceae	Sandy areas
181.	*Leucas aspera* (Willd.) Link	Gooma	Lamiaceae	Near to agricultural fields
182.	*Leucas cephalotes* (Roth) Spreng.	Dargal	Lamiaceae	Dry open Areas
183.	*Melilotus indicus* L. All.	Ban methi	Fabaceae	In winter near to fields
184.	*Mollugo cerviana* (L.) Seriage	Chirio ghas	Molluginaceae	Dry, Sand dune and gravel places
185.	*Mollugo nudicaulis* Lam.	Chirio ghas	Molluginaceae	Dry areas, gravel soil, roadsides
186.	*Parthenium hysterophorus* L.	Congress Grass	Asteraceae	Troublesome weed, along roadside
187.	*Pedalium murex* L.	Bara-gokhru	Pedaliaceae	Open forest
188.	*Peristrophe bicalyculata* (Retz.) Nees	Kagjangha	Acanthaceae	Among roadsides, moist places
189.	*Phyllanthus amarus* Schum. & Th.	Bhuiamla, Hajaar dana, Googa janti	Euphorbiaceae	Along roadsides, Waste lands
190.	*Phyllanthus fraternus* Webster	Bhui-anwla	Euphorbiaceae	Along roadsides, Waste lands
191.	*Physalis minima* L.	Charpaton	Solanaceae	Near to agricultural field

192.	*Physalis peruviana* L.	Rasberry	Solanaceae	Near to agricultural field
193.	*Polygala arvensis* (Willd.)	Golbel	Polygalaceae	Open dry places
194.	*Polygala erioptera* DC.	Gulpankhi	Polygalaceae	Open dry places
195.	*Portulaca aleracea* (L.)	Lunkha	Portulacaceae	Waste areas, salt marshes, near to crop fields
196.	*Portulaca pilosa* L	Lunkia	Portulacaceae	Waste areas, salt marshes, near to crop fields
197.	*Portulaca quadrifida* L	Lunkia	Portulacaceae	Waste areas, near to crop fields, common weed
198.	*Pulicariacrispa* (forssk.) oliv.	Haldwa\ Dhola lizru	Asteraceae	Near to moist places
199.	*Pulicaria augustifolia* DC	Soneli	Asteraceae	Near to moist places
200.	*Polycarpaea corymbosa* (L.) Lam.	Zutniokhad	Caryophyllaceae	Roadsides, Near to cultivated fields
201.	*Pupalia lappacea* (L.) Juss.	Gadar bharut	Amaranthaceae	Sandy soils
202	*Pupalia orbiculata* (Heyne) Wigh	Chiptio bharu	Amaranthaceae	Sandy soils
203.	*Rumex crispus* L.	Jangali palak	Polygonaceae	Near to pond
204.	*Rumex dentatus* L.	Jangali palak	Polygonaceae	Near to pond
205.	*Sesamum indicum* L.	Til	Pedaliaceae	Along roadside, near to agricultural fields
206.	*Sesamum mulayanum* N.C. Nair	Janli til	Pedaliaceae	Waste places, along roadside
207.	*Sisymbrium irio* L.	Jangli sarson/	Brassicaceae	Open forest, roadside, waste areas

		Khoob kalan		
208.	*Solanum nigrum* (L.)	Makoi	Solanaceae	Wastelands, winter weed
209.	*Solanum xanthocarpum* Schrad. & Wendl.	Nili katili/ pasarghatali	Solanaceae	Wastelands, along with roads
210.	*Solanum surattense* Burm. f.	Baigan-kanteli	Solanaceae	Wastelands, along with roads
211.	*Sonchus asper* (L.) Hill.	Kalijibi	Asteraceae	Near to agricultural field, Winter weed
212.	*Sonchus oleraceus* (L.)	Ankhali	Asteraceae	Near to agricultural field, Winter weed
213.	*Suaeda fruticosa forsk ex J.F. Gmel.*		Amaranthaceae	Sand dunes, along roadsides, troublesome weed
214.	*Tephrosia falciformis* Ramaswami	Rati biyani	Fabaceae	Rare in locality
215.	*Tephrosia purpurea* (L.) Pers.	Bansa	Fabaceae	Wasteland, along roadside
216.	*Tephrosia strigosa* (Dalz.) Sant. & Mahesh	Jhino biyono	Fabaceae	Near pond and wet area
217.	*Trianthema portulacastrum* Linn	Safed santo	Aizoaceae	Sandy soils of thickets, on dunes, waste grounds
218.	*Trianthema triquetra* Rottl. ex Willd	Lutanki	Aizoaceae	Wastelands and saline soil
219.	*Tribulus terrestris* (L.)	Chhota gokhuru	Zygophyllaceae	Waste areas
220.	*Tricholepis glaberrima* DC.	Brahmdandi	Asteraceae	Near to moist areas
221.	*Trichodesma indica* (L.) R. Br	Oundha huli\ Chota Kulpha	Boraginaceae	Found in wet areas

222.	*Tridex procumbens* (L.)	Patharchatti	Asteraceae	Open dry places
223.	*Triumfetta pilosa Roth*	Pahari kagler	Tiliaceae	Open wastelands
224.	*Triumfettarhomboidea* jacq.	Lapta	Tiliaceae	Open wastelands
225.	*Verbesina encelioides* (cav.) Benth. & Hook .f.	Jangli-genda	Verbenaceae	Wastelands
226.	*Vernonia cinerea* (L.) Less	Sahdevi	Asteraceae	Waste areas
227.	*Vernonia conyzoides* DC.	Sahdevi	Asteraceae	Waste areas
	Vicia faba L.	Bakla	Fabaceae	Near to agriculture field
228.	*Zaleya redimita* (Melville) Bhandari	Gudalio satto	Aizoaceae	Mostly found in waste land
IV (Climbers)				
229.	*Ceropegiabulbosa* Roxb	Khadulo	Asclepiadaceae	Rare in locality
230.	*Citrullus colocynthis* (L.) Schrad.	Tumba	Cucurbitaceae	Open forest in sandy soil
231.	*Clitoria ternatea* L.	Koyalri	Fabaceae	Near by fields
232.	*Coccinia grandis* L.	Tindru	Cucurbitaceae	Along roadside, wastelands
233.	*Cocculus hirsutus* (L.) Diels	Pilwani	Menispermaceae	Climbing on bushes and hedges
234.	*Cocculus pendulus* (J.R & G.Forst) Diels	Pilwani	Menispermaceae	Climbing on bushes and hedges
235.	*Cryptostegia grandiflora* (Roxb.) R. Br.	Vilayati akro	Apocynaceae	Along roadsides
236.	*Ctenolepis cerasiformis* (Stocks) Naud.	Ankhaphoto ni ki bel	Cucurbitaceae	Climbing on bushes and hedges
237.	*Ctenolepis garcinii* (Burm. f.)	Ankhaphoto	Cucurbitaceae	Climbing on bushes

	Naud	ni ki bel		and hedges
238.	*Cucumis callosus* (Rottler) Cogn.	Kachri	Cucurbitaceae	Climbing on boundaries hedges
239.	*Cucumis prophetarum* L.	Khat-kachario	Cucurbitaceae	Waste areas and climbing on hedges
240.	*Cucumis melo* (L.) var. momordica Duthie & Fuller	Baro Kachro	Cucurbitaceae	Sandy areas and climbing on hedges
241.	*Cuscuta reflexa Roxb.*	Amar-bel	Cuscutaceae	Parasite on shrubs and forming a dense mass of yellowish threads
242.	*Ipomea pestigridis* (L.)	Panchpatia	Convolvulaceae	Along roadsides, wastelands
243.	*Leptadenia reticulate* (Retz.) Wight & Wight & Arn.	Jivanti	Asclepiadaceae	Dry sany soil
244.	*Merremia aegyptia* (L.) Urban	Bilai bel/rota bel	Menispermaceae	Climbing on bushes and hedges
245.	*Momordica charantia* L	Karelo	Cucurbitaceae	Climbing bushes and shrubs
246.	*Momordica balsamina* L	Van Karela	Cucurbitaceae	Along roadsides, climbing bushes
247.	*Momordica dioica* Roxb. ex. Willd.	Kakoda	Cucurbitaceae	Along roadside, climbing bushes
248.	*Mukia maderaspatana* (L.) M. Roem.	Aankh phutani ki bel	Cucurbitaceae	Along roadside, climbing roadside
249.	*Pentatropis spiralis* Forssk. Decne.	Kakari bel	Asclepiadaceae	Climbing on bushes
250.	*Pergularia daemia* Forssk. Chiov	Gadaria ki bel	Asclepiadaceae	Climbing on bushes
251.	*Rhynchosia aurea* (Willd.)	Batti	Fabaceae	Among bushes and

	DC.			shrubs
252.	*Rhynchosia capitata* (Heyne ex Roth) D.C.	Batti	Fabaceae	Among bushes and shrubs
253.	*Rhynchosia minima* (L.) DC.	Ban arhar\ Chiri moth	Fabaceae	Among bushes and shrubs
254.	*Tinospora cordifolia* (Thumb.) Miers	Giloy	Menispermaceae	Climbing on tree
255.	*Quisqualis indica* L.	Jhumka Bel	Combretaceae	
256.	*Vigna trilobata* (L.) Verd	Arkmoth/Jangli moth	Fabaceae	Open wastelands
257.	*Vitis vinifera* Linn.	Angur	Vitaceae	Near by fields
III (Monocot herb)				
258.	*Agave americana* L.	Rambans	Agavaceae	Near by fields
259.	*Aloe vera* (L.)Burn. f.	Gwrarpatha	Liliaceae	Near by fields
260.	*Aristida funiculata* Trin. & Rupr.	Lampigrass	Poaceae	Open forest, Dry areas
261.	*Aristida adscensionsis* L.	Lamprogrars	Poaceae	Open forest, Dry areas
262.	*Asphodelus tenuifolius* cav.	Wildonion /Piazi	Liliaceae	Near to agriculture field
263.	*Asparagus racemosus* Willd	Satawari	Liliaceae	Near by fields
264.	*Brachiaria ramosa* (L.) Stapf	Kurighas	Poaceae	Wastelands
265.	*Brachiaria reptans* (L.) C.A Gardner & C. E. Hubb.	Para grass	Poaceae	Wastelands
266.	*Cenchrus biflorus* Roxb	Bhuront	Poaceae	Open forest, mostly present in rainy season

267.	*Cenchrus ciliaris* L.	Dhaman/Anjan ghas	Poaceae	Open forest, mostly present in rainy season
268.	*Cenchrus prieurii* (Kunth) Maire	Lambio Bhurant	Poaceae	Open forest, mostly present in rainy season
269.	*Cenchrus setigerus* vahl	Moda Daman grass	Poaceae	Open forest, mostly present in rainy season
270.	*Chloris barbata* Sw.	Rusad ghas	Poaceae	Sandy soil
271.	*Chloris virgata Sw*		Poaceae	Sany soil
272.	*Crinum defixum* Ker-Gawl	Sudershan	Amaryllidacae	Near by fields
273.	*Commelina forskalaei* Vah	Moriyabati	Commelinaceae	Mosty found in moist places
274.	*Commelina benghalensis* L.	Bukana	Commelinaceae	Mostly found in moist places
275.	*Cymbopogon jwarancusa* (Jones) Schult.	Lemon grass	Poaceae	Open forest
276.	*Cynodon dactylon* (L.) pers	Doob ghas	Poaceae	Open the forest
277.	*Cynodon barberi* Rang. & Tad	Doob	Poaceae	Open the forest
278.	*Cyperus bulbosus* Vahl	Moth	Cyperaceae	Near to wet areas
279.	*Cyperus capillaris* Nees	Moth	Cyperaceae	Open dry places
280.	*Cyperus compressus* (L.)	Mothio	Cyperaceae	Open dry areas
281.	*Cyperus difformis* L	Motha/Dila	Cyperaceae	Near to marshy areas
282.	*Cyperus rotundus* (L.)	Mothia Grass	Cyperaceae	Near to marshy and swamps
283.	*Cyperus triceps* (Rottb.) Endl.	Nirbasi	Cyperaceae	Near to gravy moist soil

284.	*Cyperus iria* L.	Moth	Cyperaceae	Near to marshy and swamps
285.	*Dactyloctenium aegybtium* (L.) willd	Makraghash	Poaceae	Waste places, open ground
286.	*Dactyloctenium sindicum* Boiss	Tantia	Poaceae	Sandy soil with low moisture
287.	*Desmostachya bipinnata* (L.) Stapf	Dab/Kush	Poaceae	Near to wet places
288.	*Dichanthium annulatum* (Forssk.) Stapt	Karad (Kail grass)	Poaceae	In humid areas
289.	*Digitaria adscendens* (H. B. & K.) Henr.	Jhernio	Poaceae	In humid areas
290.	*Digitaria biformis* Willd.	Jhernio	Poaceae	Open forest and forming thick mats
291.	*Digitaria ciliaris* (Retz.) Ko.eler	Jhernio	Poaceae	Open sandy areas
292.	*Echinochola colona* (L.) Link	Jungle rice	Poaceae	Along waterways
293.	*Eleusine flagellifera* Nees		Poaceae	Open forest, along roadsides
294.	*Eragrostis ciliaris* (L.) R. Br.	Under punchho	Poaceae	Along roadsides, near to fields
295.	*Eragrostis pilosa* (L.) P. Beauv.	Seta ghaas	Poaceae	Along roadsides and near to fields
296.	*Eragrostis tenuiflolia* Hochst. ex Steud	Seta ghash	Poaceae	Mostly found in moist areas, near to fields
297.	*Eragrostis tremula* (Lam.) Hochst. ex Steud.	Dholpalio	Poaceae	Near by fields

298.	*Lasiurus sindicus* Henr.	Sewan ghas	Poaceae	Sand dune and sandy plains, near to water tank
299.	*Melanocenchris jacquemontii* Jaub. & Spach	Vekar	Poaceae	Sandy soil, open forest
300.	*Perotis hordeiformis* Nees	Lonki-puncho	Poaceae	Open forst,
301.	*Pennisetum americanum* (L.) Leeke	Bajri	Poaceae	Near to Agricultural fields
302.	*Pennisetum typhoides* (Burm.f.) Stapf	Bajra	Poaceae	Near to Agricultural fields
303.	*Phoenix sylvestris* (L.) Roxb.	Khajur	Arecaceae	Wastelands
304.	*Polypogon monspeliensis* L. (Desf.)	Rabbits foot grass	Poaceae	Near to wet places
305.	*Saccharum munja* Roxb.	Kuncho	Poaceae	Sandy areas
306.	*Saccharum spontaneum* L.	Kans	Poaceae	Sandy areas
307.	*Sorghum halepense* (L.) pers.	Baru ghas	Poaceae	Wastelands
308.	*Sporobolus diander* (retz)	Khariya ghas	Poaceae	Near to moist areas
309.	*Tragus biflorus* (Roxb.) Schult.	Charchara	Poaceae	Near to moist places
310.	*Tragus racemosus* (L.) All.	Carrot grass	Poaceae	Wastelands
Non-Flowering Plants Gymnosperm				
311.	*Ephedra-foliata* boirs. Ex mey C.A. may	Shrubby horse tail	Ephedraceae	Climbing on tree and shrubs

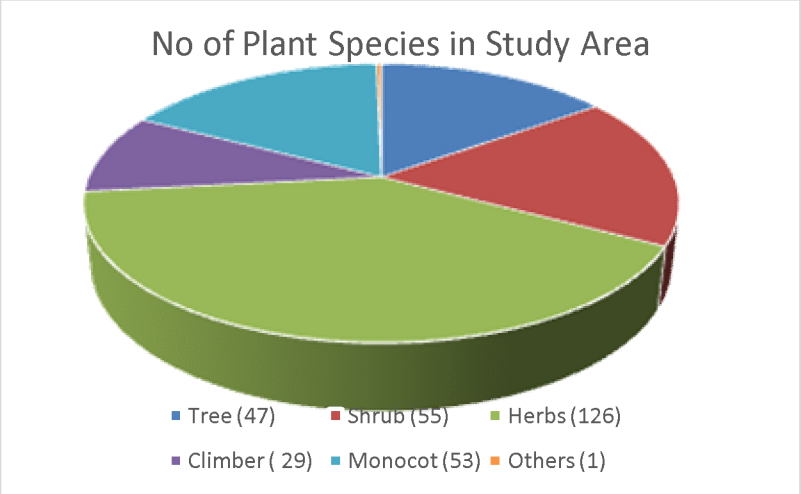

Plate-05

Distribution of Plant Habit in the Study Area (Fig-1)

In the present study, total 311 species of plants were recorder which are distributed among 195 genera and 61 families. Among these species 47 trees, 55 shrubs, 126 herbs, 29 climbers, 53 monocot and one gymnosperm species were recorded (Fig. 1). Herbs were the most dominant plant form in the study area represented by 126 species. Fabaceae and Poaceae are the largest and dominant families of study area amongst the dicotyledons and monocotyledons, respectively. Poaceae is the largest among families, represented by 41 species and fabaceae with 27 species occupies the second position. Other dominate families of study are Asteraceae (20), Amaranthaceae (15), Solanaceae (14), Convolvulaceae (12), Cucurbitaceae (11), Euphoribaceae (10), Boraginaceae (10), Malvaceae (09), Papilionaceae (09), Cyperaceae (07), Apocynaceae (07), Asclepiadaceae (07), Caesalpinioidaceae (07), Tiliaceae (06), Acanthaceae (05), Lamiaceae (05), Mulluginaceae (05) etc.

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CHAPTER-5

Study of Eco-Climate Condition

This area is not so developed drainage system where are no flowing streams, owing to poor rainfall, surface water resources do not exist while ground water resources are often deep and blackish. Natural vegetation is therefore, only seasonal. With the first showers in late July, a few grass species grow and shrubs and dwarf trees become green, but soon after the retreat of the monsoon in mid-September the vegetation dries up, leaving only a few perennial shrubs and a thin pad of pale grass on the landscape. There are no perennial streams and river around the area so the climate is dry and healthy. This Conservation Reserve is one of the unique habitat of its type is found this particular area. The variation in temperature in various seasons is quite high owing to arid semi desert and sandy soil. In summers the temperature soars to 47°C. In winters it drops to near about 0°C to -3°C. General climate of this area is dry and hot. Three seasons namely summer, monsoon and winter are observed over the region. Summer season generally starts from mid-March and continues up to the end of June. May and June are the peak summer months. During summers, days are very hot and longer. During summers, maximum day temperature, ranges between 45^0C and 47^0C. This is due to the extremely low relative humidity found during this period. At the end of summer season (June end), high temperature and unstable atmospheric condition prevail over the

region. Dust storm / Thunder storm activities associated with light to moderate rainfall are a common feature during afternoon hours. On some occasions, strong winds with gale force are also observed damaging the infrastructures at many places. These activities continue till the onset of monsoon. Summer prevails for a longer duration than the otherseasons.

Monsoon generally sets over the region in the beginning of July and lasts up to the end of August. Rains are observed only for three months (July to September). Monsoon sets over Kerala coast around 1stJune and gradually progress to reach this region (around1stJuly). On the other hand, the with drawal of monsoon commences first from this region (around 1st September). 90% of the annual rain fall is observed during monsoon season with highest variability in pattern and intensity in the country. Generally, monsoon with draws from the region during middle of September.

Weather during October and November are quite pleasant from tourist point of view. Winter conditions start developing over the region during the beginning of November month and as a result day and night temperature starts falling slowly over the region. Peak winter conditions are observed during December and January. Winter is also very chilly over most parts of the area. The minimum temperature even drops below freezing level on some occasions. The average minimum temperature during winter months is less than 10°C. This extreme condition generally continues up to the middle of February. After middle of February, the day and night temperatures again start rising slowly. In winters, Frost (Pala) is common in this area. Plants and wildlife live in harsh conditions and proper protective measures are required to protect flora & fauna from winds.

5.1 Location and Area

Sujangarh tehsil is one of the most important tehsil in Churu District. It is located in the extreme south of the district in its border with Nagaur at 74°28' East Longitudes and 27°42' North Latitudes at a height of about 518.6 meters above mean sea level

5.2 Climate

The Sujangarh is extremely hot and arid like other desert towns of the region. There is a great variation in day and night temperature. The mean daily maximum and minimum temperature vary from 41.3°C in summer to 4.8°C in winter. During summer hot winds blow throughout the day but the nights are generally pleasant and cool.

5.3 Temperature

Summer temperature is very high and the diurnal range exceeds even 20°C. During the day, the summer may as high as 46°C but drop in temperature after night fall in rather sudden. In winters, the day temperatures are higher but the night temperature may be near freezing point. January is the coldest month when the mean daily minimum temperature 0°C and the mean daily maximum temperature is 20°C. Frosts are fairly frequent.

5.4 Rainfall

The annual rainfall is about 450 mm. Due to monsoon characteristics the maximum annual precipitation is recorded between the months of June to September.

5.5 Humidity

Except during the brief rainy season, humidity in the air remains very low even during the rainy period. The summer months are the driest, especially in the afternoons of April and June when relative humidity is 20.5%, while maximum average humidity has been recorded 78.75%.

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CHAPTER-6

Analysis of Soil

The soil of the Sujangarh tehsil is more or less sandy except in a small portion where it is loam with shifting sand-dunes. Due to the scarcity of rains the vegetation cover on the surface and organic matter in the soil is wind erosion as moisture retaining capacity is nil.

Soil samples were collected from two different sites i.e. Chhapar and Tharda village areas of Sujangarh tehsil. Samples at 0-22 cm (superficial) and 22-45 cm (deep) were taken and packed in polythene bags and brought to the laboratory for analysis. All the soil samples collected for the purpose of study were analysed for various physio-chemical properties by following methods:

6.1 Methods for Soil Analysis

(A) Physical analysis:

1. Mechanical analysis was done by International pipette method as described Piper (1957) with modification inclusive Calcium Carbonate fraction by using as dispersing agent.
2. Maximum water holding capacity or saturation percentage was determined by preparing saturation paste of soil as suggested by Richards (1954).

(B) Chemical analysis :

1. **pH (Soil reaction)**: Soil pH was determined by preparing 1:2 soil water suspension by using glass electrode Toshniwal digital pH meter following the method outlind by Jackson (1973).
2. **Electrical Conductivity**: Electrical conductivity of 1:2 soil water ratio was measured by digital conductivity bridge of 25°C and results were reported mmhos/cm at 25°C.
3. **Available Nitrogen:** Available Nitrogen was estimated in the soil samples by using alkaline Potassium Permeganate as reported by Subbiah and Asija (1956). 20 gm. of soil was taken in a Kjeldal flask and 20 ml. of water was added followed by 100 ml. each of 0.32% Kmno and 2.5% NaoH solutions. The contents were distilled and liberated ammonia was collected in a flask containing 20 ml. of the standard Boric Acid solution (with mixed indicator). About 100 ml. of distillate was collected which was titrated with 0.02 NH_2SO_4 to the original shade (Pinkish).
   Available Nitrogen = Rx0.02x1/20x0.014x100
   Where R = Volume of 0.20 NH_2SO_4 used in titration
4. **Available Phosphorus:** Available Phosphorus content was determined by Olsen's *et al.*, (1954) method using 0.5 molar Sodium bicarbonate solution of pH 8.5 as extractant. Calorimetrically, soil extract was prepared by taking 2.5 gm. of soil in a 100 ml. plastic bottle, a little of Darco G 60 was added following by 50 ml. of Olsen's reagent. The Flasks were shaken for 30 minutes and the contents were filtered immediately through dry filter paper, 5 ml. of soil extract was taken into a flask and 5ml. of chloro molebedic acid added. The contents of the flask were diluted to about 22 ml. of this 1ml. of diluted stannous chloride solution was added, shaken and made up to the mark. The intensity of the colour was noted at 660 mu standard. Curve was calibrated with the help of standard phosphorous solution and readings of unknown solution was plotted.
5. **Available Potassium:** Available Potassium was determined by using normal neutral ammonium acetate as an extractant with the help of flame photometer (Jackson, 1973). 5 gm. Soil were shaken with 25 ml. of

neutral normal ammonium acetate for 5 minutes and the contents filtered immediately through a dry filter paper. First few ml. of the filtrate was rejected. Potassium was estimated in the extract with the help of AMIC digital flame photometer, calibrating it by standard solution.

6.2 Physical Characteristics

Physical characteristics like percentage of sand, silt, and clay particles have been analyzed. The maximum water holding capacity was also observed. Physical characteristics of soil samples taken from different sites are shown in the Table-6.2.1 given below:

Physical Characteristics of Soil of Different Sites

Name of Site	Depth (cm)	Sand %	Silt %	Clay %	Texture	Max. water Holding capacity (%)
Chhaper	0-22	91	3	5	Sandy	20.0
	22-45	88	4	6	Sandy	20.5
Tharda	0-22	87	5	7	Sandy	22.0
	22-45	82	9	9	Sandy	23.0

Table -6.2.1 indicates that the soil of both the sites is sandy in texture. It has low water holding capacity.

Chemical Characteristics

The chemical analysis of soil has been presented in the Table- 6.2.2 given below.

Chemical Characteristic of Soil of Different Sites

Name of site	Depth (cm)	PH	Electrical Conductivity Mmhos/Cm	Av. Nitrogen (Kg/ha)	Av. P_2O_5 (Kg/ha)	Av.K_20 (kg/ha)
Chhaper	0-22	8.90	0.52	16	37	202
	22-45	8.35	0.12	18	40	140
Tharda	0-22	8.30	0.17	19	45	140
	22-45	8.80	0.17	21	50	222

Table – 6.2.2 indicates that the soil is slightly alkaline and the amount of nitrogen, phosphorus and potassium contents did not show much variations in the soil of two different localities of Sujangarh Tehsil.

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CHAPTER-7

The Study of the Aspects of Phyto-Chemical and Ethno-Medicinal of Some Plants

Ten arid herbal plants species have been selected from phytochemical and ethnomedicinal point of view from study area. Information about their utility and medicinal value have been gathered from local people, tribal communities and experts Ayurvedic fields (Vaids and Hakeems). The arid herbal plants are being used by local people to cure many diseases.

The name of plants, its family, local name, habitat, morphological characteristics, flowering and fruiting period, phytochemical and ethnomedicinal aspects have been described.

In the present study the following ten medicinal plant species have been taken for research work:

(i) *Abutilon indicum* (Linn.) Sweet.
(ii) *Achyranthes aspera* Linn
(iii) *Argemone mexicana* Linn.
(iv) *Boerhavia diffusa* Linn.
(v) *Calotropis procera* (Ait) R.Br.
(vi) *Datura innoxia* Mill.
(vii) *Solanum surattense* Burm.f.
(viii) *Tecomella undulata* (Sm.) Seem.
(ix) *Tephrosia purpurea* (Linn.) Pers.
(x) *Tribulus terrestris* Linn.

1. *Abutilon indicum* (Linn.) Sweet.

Family : Malvaceae

Local napme : Tara-kanchi, Itawari

Habitat : Common in wastelands, neglected cornes of fields and gardens and fringes of forests.

Morphotaxonomic Characteristics

It is a perennial erect shrub, 1-1.5m high, goary, tomentose all over.Stem is woody when it is in old stage. Leaves are 5-6x3.6 cm, ovate, acuminate, chordate, 7-9 nerved from base, toothed, rarely 3 lobed, velvety on both sides, stipules depressed. Flowers solitary axile, jointed very near at the top, slightly curved at the joints. Pedicle is 2.5-5 cm long. Calyx 8-12 mm long, divided to the middle, lobes apicuate, corolla 2-3 cm in diam, yellow. Epicalyx is totally absent in this plant. Stamens numerous, anther kidney shaped. Staminal tube hairy at base, carples usually 15-20, 11-13 cm long, densely hairy at first, ultimately shining, glabrous, turning black, with a distinct mucro which is turned outwards.

Flowering and fruiting: October – April

Phytochemical Aspects: From the roots non-drying oil consisting of various fatty acids viz. linoleic, oleic, stearic, palmitic, lauric, myristic, caprylic, capric and unusual fatty acid having C_{17} carbon skeleton besides β-sitosterol, and β-amyrin from unsaponifiable matter is yielded. The oil showed significant analgesic activity. From the leaves amino acids, glucose, fructose and galactose have been isolated. Gossypetin-8 and 7 glucosides and cynidin-3-rutinoside is also isolated. Caryophyllene and its oxide, cineole, β-pinene, geraniol, geranyl acetate, eudesmol, farnesol and borneol are identified in oil.

Uses in Traditionally medicine:

- The leaves and seeds are crushed with water to from a paste which is applied for 20 to 30 days on penis to cure syphilis.

- Tribal also take orally the decoction of plant before dinner for about a month to cure gonorrhea. They grind the fresh leaves with turmeric, rice and coconut-milk to prepare a paste which is applied to cure boils and abscesses. They also use infusion of green leaves for gargling in stomatitis and psilosis.
- The paste of leaves is prepared with mustard oil and apply against rheumatism.
- The seeds, locally called as "Balbij", are rich in mucilage and used as laxative. The infuse the seeds in hot water and take it as a cooling drink.
- The leaves are rich in mucilage and are used as demulcent tonic.
- The bark is astringent and diuretic.

2. *Achyranthes aspera* Linn.

Family : Amaranthaceae

Local name : Apamarga

Habitat : The plant grows all over India in dry region.

Morphotaxonomic Characteristics: It is an erect, small herb, 0.5-1.5 meters in height with quadrangular branches, thickened towards the tips. The leaves 2.5-10 cm long and 5-7 cm broad, rounded at the apex, elliptic obovate and pale beneath. The flowers greenish white, in slender spikes of 30-40 cm length. The fruits small, oblong and grey. The seeds solitary and grey.

Flowering and fruiting: August-December.

Phytochemical Aspects: The whole plant contains the traces of basic substances e.g. betaine. Achyranthine has been isolated from the plant. The seeds have a saponin which contains olenolic acid, glucose, galactose, rhamnose and xylose. Two Achyranthes saponins A and B have isolated. Two new saponins C and D are also isolated from fruits. Ecdysterone (polypodine A) and ecdysone from roots are isolated. In the seed-oil linoleic (4.4), behenic (1.8), arachidic (1.6), myristic (1.2) and lauric (0.4%) acids present.

Uses in Traditionally medicine

1. It is reported to be pungent, astringent, pectoral and diuretic.
2. It is used as an emmenagogue, and in piles and skin eruptions.
3. A decoction the plant is useful in pneumonia and renal dropsy.
4. The juice of the plant is used in opthalmia and dysentery.
5. It dialates the blood vessels, lowers the blood pressure, depress the heart and also increase the rate and amplitude of respiration.
6. It is used in dropsy, asthma and as a remedy for cough.
7. Roots are astringent, their paste is applied to clear opacity of cornea, and to wounds as haemostatic.
8. It is reported to be useful in cancer.
9. Aqueous extract of root is used for stones in the bladder.
10. The fruit powder was brunt with Supari (*Areca catechu*) and their smoke is inhaled via mouth in teeth pain and in pyorrhoea. About one teaspoonful root-powder is taken with a cup of water in bleeding during delivery time. Whole plant is used as germicide.

1. ***Argemone mexicana*** Linn.

Family : Papaveraceae

Local name : Pili Kateli, Pila Dhatura, Satyanasi

Habitat : Common in wastelands, along roads, railway lines. Sandy soil and well drained sunny situation are ideal for these plants.

Morphotaxonomic Characteristics : Prickly herb with yellow sap and pinnatifed and spiny leaves, leaves alternate, sessile, sharply toothed, sepals 2-3; calyx prickly glabrous; petals 4-6; flowers solitary, terminal, yellow; capsules prickly; seeds blackish brown.

Flowering and fruiting: Throughout the year.

Phytochemical Aspects: From the plant, protopine nitrate, berberine nitrate, ceryl alcohol and succinic, tartaric and malic acids, glucose and fructose isolated. A flavonoid isorhamnetin-7-diglucoside, from Flowers and isorhamenetien-3, 7-

diglucoside, also from flowers. Detection of hydroxyl, epoxy and keto fatty acids in seed oil, myristic, palmitic, oleic and linoelic acids also found. Out of six alkaloids isolated, four identified as heletrine, sanguinarine, protopine and Allocryptopine, determined in leaves and roots respectively of Vietnames plant. New phenolicargemixitin-isolated from seeds and characterized. Presence of argemixtin in seeds not confirmed, luteolin and eriodictyol isolated.Protopine, allocrytopine, berberine, sanguinarine, reticuline, cheilanthifoline, scoulerine from flowering and fruiting plant.

Uses in Traditionally medicine

1. Dry and crushed flowers taken orally with water cures whooping cough.
2. Latex is applied for treatment of syphilis, rheumatic pains and cutaneous affections.
3. The paste of seeds taken with salt and Mustard oil is used as toothpaste by those suffering from pyorrhea.
4. Seed oil is used with root powder for massage in chronic skin diseases.
5. Tribals burn seed oil to collect carbon from the smoke which is applied against conjunctivitis.
6. Fresh leaves or juice is also applied in conjunctivitis; on ulcer for quick healing and against scorpion stings.
7. Leaves are rubbed on sites of irritation to cure scabies.
8. Yellow juice of stem is used twice a day for one week for healing of wounds.
9. Seeds possess an emetic quality.
10. In stomach complaints the usual dose of oil is thirty drop on a lump of sugar and its effect is perfectly magical, relieving the pain instantaneously, throwing the patient into refreshing sleep.

2. *Boerhavia diffusa* Linn.

Family : Nyctaginaceae

Local name : Satha, Sathi, Santhi, Gadhapurna, Punarnava

Habitat : Common in wastelands, very common in dry Lands.

Morphotaxonomic Characteristcs: Decumbent or diffuse, perennial, extensive herbs, about two feet long. Leaves appear two at one node, one smaller than the other, upper surface green and lower surface whitish, ovate oblong. Flowers rose or pink, arise in short clusters on long axillary stalk, very small in size. Fruits obovoid, rounded above, 5 ribbed, covered with glandular hairs and with fine ridges.

Flowering and fruiting: Throughout the year.

Phytochemical Aspects: From the plant, alkaloids, sterols and steroidal compounds have been isolated. The components like β-sitosterol, α-2-sitosterol, an unidentified alcohol, palmitic acid, ester of β-sitosterol, tetracosanoic, hexacosanoic, stearic, palmitic and arachidic acids have been isolated. Hentriacontane, β-sitosterol and ursolic acid isolated from roots. B-ecdysone, triacontanol and β-sitosterol isolated from roots. Two new retenoids-boeraviones A and B isolated from roots and their structure determined. A new antifibrinolytic agent- punarnavoside isolated from roots and characterized.

Uses in Traditionally medicine

1. The decoction of roots and leaves are used as perfect medicine for night blindness.
2. The decoction of roots is used as an expectorant to cure asthma, jaundice, anaemia and stomachache.
3. It also cures dropsy and gonorrhea.
4. It is diuretic and laxative.
5. The extract of roots is taken orally in diarrhea and vomiting.
6. The plant juice is antidote to rat poisoning
7. Tender shoots are eaten as potherb.
8. About 1-2 inches root is grinded and its decoction is given empty stomach which a cup of water to cure jaundice for 7 days.

3. *Calotropis procera* (Ait.) R. Br.

Family : Asclepiadaceae

Local name : Madar, Aak, Aakdo, Akra

Habitat : Common in wastelands, abundant on sand dunes.

Morphotaxonomic Characteristcs

Shrubs or small tress, 6-10 feet; leaves ovate or ovate oblong; cordate at the base; corolla buds, hemispherical, segments of the corolla spreading; revolute at the margin; corona lobes glabrous, equally or longer than staminal column; umbels peduncled; follicels obovoid; flowers pale purple.

Fnwering and fruiting: Throughout the year.

Phychemical aspect: From the leaves calotropin, calatoxin, uscharin and uscharidin have been isolated from latex. Calotropin shows digitalis like action on the heart, but its action is not cumulative and is less harmful. From the flowers, cyaniding-3 rhamncglucose and new triterpenecalotropeny1acetate is isolated Lupeol is isolated from latex. Quercetin-3-runtinoside is identified in the roots, stem, leaves, flowers and latex. Voruscharin is isolated from African plant. Cardenolides contents in leaf (2.04 mg/g) and in latex (162.0 mg/g), mostly calotropagenin derived carddenolides present. From Calotropis, gigantean, two triterpene esters-3-methy1-butanoates of α-amyrin and taraxasterol isolated from latex. Calotoxin uscharin and calactin have been also identified.

Uses in Traditionally medicine

1. The plant is purgative, anthelmintic, cures Aspects leprosy, leucoderma, ulcers, tumours, piles, diseases of spleen, the liver and the abdomen.
2. The paste of fresh root or dry root with water once a day for 3 days destroy cyclops and larvae of guinea worms in the intestine itself.
3. The tribal also tie leaves on the body where the worms emerge.
4. The powder of flowers with black pepper, when taken orally, is considered very effective medicine for treatment of cough, cold, asthma, piles and gastric problems in district.
5. Milky latex is also applied against thorn pricking, snake bite, piles and to relieve the pain of joints.
6. The dry root paste is applied against scorpion- sting.
7. Oil of *Sesamum indicum* (Til) is applied on the leaves and leaves are put on the abdomen to cure stomachache, chest-ache, headache, backache etc.

8. The local Vaids prescribe one teaspoon latex with balck pepper to take orally for nine days to the patients of hydrophobia.
9. The tribals boil the dry stem bark with mustard oil and 3-4 pieces of garlic and apply this paste against rheumatic pain.
10. The people drop the juice of mature yellow leaves with a pinch of salt in the ears for few days to cure deafness.
11. The root extract is given to drink to cure diabetes and fever.
12. The twigs are sometimes used as toothbrush
13. The leaves are applied to paralysed parts, painful joints, swelling; heal wounds.
14. The dried and powdered flowers in small doses are useful in cough, cold, asthma and indigestion.
15. The fibers are extracted from its fruit and used to stuff pillow to give relief in headache. The leaves are spread on jute bed and passed by the fumes of burning coal to give instant relief in the sprain of various body parts.
16. About 2-3 buds with same amount of black pepper are given with a cup of water to cure vomiting and dysentery. When latex is applied externally over wound, it heals quickly.

4. *Datura innoxia* Mill

Family : Solanaceae

Local name : Dhatura, Dhaturo

Habitat : Common in wastelands.

Morphotaxonomic Characteristics: Shrubs clothed with erect glandular hairs. Leaves ovate, sinuate toothed. Flowers white solitary, axillary. Capsules armed with weak spines.

Flowering and fruiting: Throughout the year.

Phytochemical Aspects: The seeds oil contains oleic (64.51), linoleic (18.87) and saturated (16.60%) acids. A new tropane alkaloid-datumetine isolated from the leaves. Atropine and scompolamide are also isolated. Isolation of new with an oliodedaturilin from fresh leaves. From the whole plant, daturamelins A and

B have been also isolated. Isolation of withametelin and isowithametelin is isolated from the leaves

Uses in Traditionally medicine

1. Seeds and leaves are smoked to cure asthma.
2. Juice of seeds is also taken to cure asthma.
3. Juice of fresh plant is used for the treatment of hydrophobia and malarial fever.
4. A poultice made from flowers is applied to wounds to reduce pain.
5. Leaves are also applied on boils and ulcers.
6. Leaves boiled in cow milk are applied to boils, abscesses and guinea worm wound.
7. The paste of mature fruit in mustard oil is applied to cure swellings.
8. The whole plant is antiseptic, narcotic and sedative.
9. The poultice of leaves check inflammation of breast caused by excessive formation of milk.
10. Roots are used as tooth-brush to cure toothache.
11. Tribals apply leaf-juice to hairs as a preventive for early greying.
12. Some tribals remove all the seeds from the fruit and a live sparrow is kept in fruit cavity for 24 hours. Now the fruit is roasted along with bird and both are given to eat to the asthma patients.

7. ***Solanum surattense*** Burm. f.

Family : Solanaceae

Local name : Bhurhingari, Ringani, Kantkari

Habitat : Common in wastelands.

Morphotaxon Morphotaxonomic Characteristcs:

Prostrate, prickly herb, diffuse, Bright green, perennial, woody at the base. Leaves ovate or elliptic in outline, Sinuate or sub pinnatified, obtuse or subacute, stellately hairy on both surfaces (especially beneath). Flowers in few flowered, extra axillary cymes or inflorescence sometimes reduced to a single flower, axis of cyme 6-15 cm long. Calyx 7-8 mm long, densely having, Prickly, tube 2-3

mm long. Corolla bluish purple 2.5-3.2 cm in diam, lobes 6-12 mm long, deltoid acute green and stellate hairy outside. Stamens 2 mm long, glabrous, anthers 8-19 mm long, yellow, oblong, lanceolate, slightly curved. Fruit a berry, globose, yellow when ripe.

Flowering and fruiting: Throughout the year.

Phytochemical Aspect

A glucoalkaloid termed solanocarpine is found in the fruits. Asterol known as carpesterol and solanocarpidine are also present. Potassium nitrate, a fatty acid, a resinous and phenolic substance, diosgenin and sitosterol are present. Dry fruits contain traces of isochlorogenic, neochronogerlic chronogenic and caffcic acids. Solasodine, solasonine, solamargine and β-solamargine are present in fruits of Nepalese plant. Quercetin isolated together with apigenin and sitosterol.

Uses in Traditionally medicine

1. The roots, seeds and flowers are all used in indigenous medicines.
2. Leaves are applied as such to relieve muscular pain.
3. The juice of leaves with black pepper is given to cure rheumatism and locally called "Mahuri" which is given to cure vomiting.
4. Dry fruits are smoked to cure cough, jawache and toothache or chew the seeds for this purpose.
5. Extracts of roots are taken to cure cough, asthma and pain in the chest.
6. Dry fruits are collected and soaked in mustard oil and then burned in clay pot.
7. The fumes are inhaled to cure toothache and pyorrhea.
8. The decoction of plant are taken with Tulsi to cure bronchitis.
9. The roots are collected to cure hernia. Roots are thoroughly washed in water and a paste of root-bark is prepared and applied on of swollen part of abdomen and testicles.
10. The affected organs are gently warmed for 5 minutes. This produces an immediate effect and when the swollen organs regain normal size and shape, the paste is removed, otherwise it may prove harmful to the patient.

11. Local vaids prescribe the root powder of white flowered from with honey to eat for about a month after meal to the women to increase fertility and chances for early pregnancy.
12. The plant if dipped in water overnight and decoction is given to the patient's cures syphilis.
13. The flowers are crushed and given orally with water to cure diarrhea in children. It is reported that root-paste if taken orally causes abortion of up to 3 months old foetus.
14. Stem, flowers and fruits are bitter, carminative and useful in burning feet and in cases attended with vesicular watery eruptions.
15. The buds and flowers with salt solution are good for watering eyes.

5. ***Tecomella undulata* (Sm.) Seem.**

Family : Bignoniaceae

Local name : Rohida, Rohira, Rohiro

Habitat : Common in sandy habitats.

Morphotaxonomic Characteristics: A medium sized tree with drooping branches and simple leaves. Branches Glabrous, minutely hairy when young. Leaves simple, usually subopposite, oblong, apex obtuse, emarginated, Margins entire. Inflorescence usually in few flowered cymes, arranged in racemose manner, terminating branches. Flowers yellow-orange.

Fruit: a capsule linear, curved; seeds wrinkled at the apex

Flowering and fruiting: January – April

Phytochemical Aspects: A new glucosidetecomin-isolated from bark and its structure determined. Lapachol, veratric acid, sitosterol, dehydrotectol, a wax alcohol ferulate, n-triacontanol and tecomelloside isolated from heart-wood and bark. Rutin, quercetin, luteolin-7-glucoside and β-sitosterol isolated from flowers. A new iridoid glucoside 6-0-veratryl cataposide isolated. Tectol and dehydro-αlapachone isolated from roots. From the leaves, n-alkanes, n-Octacosanol, stigmasterol, cam-pesterol, α-amyrin and oleanolic acid isolated. A new chromone glucoside-undulatoside isolated and characterized. Another new chromone glucoside undulatoside B isolated from bark along with β-sitosterol

glucoside. Isolation of a new irridoid glucoside-undulatin and its structure determined.

Uses in Traditionally medicine

1. The people of desert chew the bark of tender branches to cure syphilis in males; the ladies, however, are not given this treatment since it may result in abortion.
2. They also take powder of root bark with honey or sugar and milk before sleeping at night to the women to cure leucorrhoea.
3. The paste of stem bark with vegetable oil is applied over eczema.
4. In case of old eczema, the inner bark of stem is placed in an earthern pot, The mouth of pot is sealed keeping a hole in the centre, the pot is placed upside down over the fire, the fluid that comes out through the fire, the fluid that comes out through the hole of lid is collected and applied on the eczema.
5. The local Vaids prescribe seed-powder with pure "Ghee" to apply on abscesses.
6. The vapours of crushed leaves are inhaled to cure cough by the tribals.
7. They also prepare a remedy for inducing abortion by powdering its roots with the roots of Sapindus emarginatus (Ritha) and take it orally for 2-3 days.
8. The twigs are used as tooth brush.

9. ***Tephrosia purpurea*** (Linn.) Pers.

Family : Fabaceae

Local Name : Biyani or Sarphanko

Habitat : It is found on sand dunes throughout. The area, rarely dense, also occurs on open wastelands and fields.

Morphotaxonomic Characteristics: A much branched, erect perennial herb, 6-8 dm high. Stem more or less hairy with adpressed hairs. Leaves upto 13 cm long, stipules 7-9 mm long, lanceolate, linear-subulate, etect or reflexed, hairy, triangular, leaflets 7-13, 1.8-2.5□ 0-5.2cm, oblanceolate, apex mucronate, sub-coriaceous, both sides grey-green, glabrous above, adpressedly pubescent

beneath. Flowers reddish-purple, on terminal or leaf opposed peduncles, latter 7.5-15 cm long, laxly 6-25 flowered, pedicels 8 mm long, bracts linear, 2-4 mm long. Calyx 4 mm long, teeth lanceolate-acuminate, exceeding the tube in length. Corolla 8 mm long, deep purple. Style glabrous, stigma penicillate. Pods 3-4° 0.4-0.5 cm, slightly recurved, Glabrous or softly pubescent, 5-6 seeded.

Flowering and fruiting: July to December.

Phytochemical Aspects: The roots, leaves a seeds contain tephrosin, deguelin and quercetin. The roots contain isotephrosin and rotenone. In the roots and leaves, 2.5% rutin is found. Purpurin, a flavonone has been isolated from the seeds, as also 8-substituted flavonoid and 3-substitued oxygenatec chalcones. Octacosanol, sitosterol β-D-gluco-pyranoside and a flavones glycoside have been isolated from the whole plant. Caffeic acid isolated from dormant seeds; rutin, β-sitosterol and lupeol isolated from leaves; delphinidin chloride and cyaniding choloride isolated from flowers. Purpuritenin A and B and purpureamethide isolated from seeds. A new β-hydroxychalcone- purpurenone isolated from roots and its structure established.

Uses in Traditionally medicine

1. The infusion of leaves and seeds is applied to the eyes in ophthalmia and leucoma by tribes.
2. The seeds are taken orally to extricate corns from intestine by the nomadic tribes.
3. The seeds are considered to be anthelmintic; a blood purifier and to cure "Dhamasia" (cough with black Phlegm) - a common disease in rural areas.
4. The paste of leaves is made with the Leaves of *Cannabis sativa* (Bhang) on bleeding and painful piles.
5. The tribes consider leaf-juice effective in leprosy and decoction of roots to hydrocele.
6. Pills of powdered root-bark is made with black pepper to cure obstinate colic.
7. The tribals chew the roots to cure toothache and drop the sap of roots in the earache
8. Twigs are used as toothbrush.

10. ***Tribulus terrestris*** Linn.

Family : Zygophyllaceae

Local name : Goksura, Gokhru

Habitat : The plant occurs throughout India.

Morphotaxonomic Characteristics: It is prostrate spreading herb, densely covered with minute hair. The shrub is annual or perennial and thrives in moist soil. The leaves in opposite and pairs, 5- 8 cm long, compound and the leaflets 4-7 pairs are 8-12 mm long. The flowers are bright yellow, leaf-opposed, solitary, 1-15 cm in diameter, the fruits very Characteristic, are globose, consisting five woodycocci, each with two, paired sharp spines seeds, numerous, within each coccus.

Flowering and fruiting: August-December.

Phytochemical Analysis:

From the fruits and leaves, flavonoid components like kaempferol, kaempferol-3-glucoside, and a new acylated kaempferol-3-glucoside is isolated. Other components like hecogenin, steroid sapogenins and neotigogenin are also reported. The bigger variety of Goksura is botanically components known as *Pedalium murex*. Disogenin, gitogenin and chlorogenin isolated; kaempferol, is 3-glucoside, its 3- rutinoside and tribuloside from fruits and leaves.

Uses in Traditionally medicine

1. The leaves are used in stomachic problems.
2. The root is credited with aperiant and tonic properties.
3. The fruits are used for treatment of calculous, affections and painful micturition.
4. It is useful in urinary calculi (stones).
5. It is useful in diabetes.
6. It is used diuretic and aphrodisiac.

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CHAPTER-8

The Study of the Aspects of Ethno Medicinal of Some Plants

Many medicinal plants have anti-viral, anti-allergenic, anti-microbial, anti-inflammatory properties that fights against various type disease. The plants have been arranged alphabetically according to there botanical names. Followed by their family, vernacular names, Medicinal of the species. Some plants are describe below;

1. ***Acacia lecuphloea*** (Roxb) Willd.

Family : Mimosaceae

Common Name : Reonja/Safed babool

Flowering and Fruiting : June-January

Habit and Habitat : Road sides and tropical forest

Parts Used : Root

Uses in Traditionally medicine

- About on teaspoonful root powder is taken with a cup of water once a time daily for the treatment of jaundice.

2. ***Acacia senegal*** **(Linn) Willd.**

Family : Mimosaceae

Common Name : Kumbat

Flowering and Fruiting : July – Feb.

Habit and Habitat : It is tree and it is found in alongwith roadsides.

Parts Used : Flower, Root, Stem, and Gum

Uses in Traditionally medicine:

- The decoction of flowers is used to wash the eyes in conjunctivitis.
- Decoction of root bark is taken in diabetes by the rural people.
- Decoction of stem bark is taken in diabetes by the rural people.
- Gum dissolved in leukewarm water is taken orally by the rural people to cure inflammation of intestine and also it is applied on sores and burns.

3. *Ageratum conyzoides* Linn.

Family : Asteraceae

Common Name : Bhakumbar / Goat weed

Flowering and Fruiting : All round the year

Parts Used : Whole plant

Habit and Habitat : It is annual herb and it is grow in dry areas.

Uses in Traditionally medicine

- Leaves extract is applied on teeth and gums in toothache.
- The poultice of leaves is tied over boils and wound as an antiseptic.
- The decoction of fresh plant is used to cure of allergic rhinitis and sinusitis in aqueous solution for nasal instillation.
- The decoction of fresh plant is also used in post-partum uterine haemorrhage.
- A decoction of fresh plant is used in hair wash for gragrant soft and dandruff free hair.

- To control epilepsy, 70-80 gm of root-paste and 20 gm of leaf-paste is mixed, then applied on the forehead at the time of *sizures.* The root of Bhatkataiya (*Argemone mexicana L.)* is also tied on the neck with this treatment.

4. *Cenchrus ciliaris* Linn.

Family	:	Poaceae
Common Name	:	Anjan ghas
Flowering and Fruiting	:	August – March
Parts Used	:	Whole plant
Habit and Habitat	:	It is an erect or ascending perennials herb. The plant is growing commonly throughout the sandy habitats.

Use in Traditionally medicine:

- Decoction of roots is given to children suffering from intestinal worms.
- *Cenchrus ciliaris* is used to be lactagogue, kidney pains, tumours, sores and wounds.
- Seed powder is used as diuretic.

5. *Cichorium intybus* Linn.

Family	:	Asteraceae
Common Name	:	Kasni
Flowering and Fruiting	:	September-March
Parts Used	:	Leaves, Root, Seed
Habit and Habitat	:	It is a perennial herb and it is found growing as weed in and around cultivated fields and waste lands.

Use in Traditionally medicine:

- It root is taken to cure cough.
- Boiled root is taken to cure diabetes.
- Decoction of whole plant is useful in curing constipation.
- Syrup is prepared from roots which are used as laxative for children

6. Dactyloctenium sindicum Boiss.

Family	:	Poaceae
Common Name	:	Makro
Flowering and Fruiting	:	September - January
Parts Used	:	Whole plant
Habit and Habitat	:	The plant is prostrate perennial grass. It is found in rainy season and grown in cultivated field.

Use in Traditionally medicine:

- Whole plant extracts is taken orally in rheumatism.

7. Datura stramonium Linn.

Family	:	Solanaceae
Common Name	:	Kantawala-datura / Thorn apple
Flowering and Fruiting	:	August - January
Parts Used	:	leaves, flower, Seed
Habit and Habitat	:	The plant is annual – perennial herb, it is found rarely, in the waste lands and road side.

Use in Traditionally medicine:

- Extract of root mixed with latex of *Calotropis procera* is applied locally in scorpion sting and snake bite as antivenom.
- 125 ml juice of the leaves mixed with sugar is taken to cure fever.
- Juice of leaves is taken orally to destroy worms.
- Seeds of *Datura stramonium* are taken to with cold water to get relief against filariasis.
- *Datura stramonium* and *Trianthema portulcatrum* is taken to cure rabies.
- Paste of Haridra and Datura fruit is applied externally to cure pain in breast.
- Powder of seeds is taken with water to cure asthma.
- Leaf burned and smoked in asthma and difficulty breathing or shortness of breath

8. Fumaria indica (Hausskn.) Pugsley

Family	:	Fumariaceae
Common Name	:	Pithpapro
Flowering and Fruiting	:	January-April
Parts Used	:	Whole Plant
Habit and Habitat	:	The plant is an annual herb, it is found in waste places, cultivated fields and

Use in Traditionally medicine:

- (50-100ml) decoction of whole plant is used as blood purifier and diuretic.
- Poultice is tied locally on abscesses for early cure.
- Cooled decoction of *F. indica* is taken with honey to cure vomiting.
- The plant with (dry *Zingiber officinale*) is taken to cure fever.
- The whole plant has cooling effect.

9. Glycyrrhiza glabra (Mulethi)

Family-	:	Fabaceae
Common Name	:	Mulethi
Flowering and Fruiting	:	June- July
Parts Used	:	Roots and Stolon
Habit and Habitat	:	It is a perennial under shrub. It grows in dry open fields, especially in sandy places, roadsides and disturbed areas.

Use in Traditionally medicine

It has chief constituent –Glycyrrhizin.

- **Anti-microbial activity-** It has anti-microbial activity.Roots are taken as a protection against virus, bacteria and fungi due to the presence of Glycyrrhizin that blocks the microbial growth.
- **Improves immunity-** Root extracts taken to increasing the production of lymphocytes and macrophage thereby improving defense mechanism & preventing microbial attack. It also helps in minimizing immune related problems as like- allergy and autoimmune complications.
- **Anti-inflammatory activity**–Liquorice are powerful anti-allergic, anti-inflammatory activity and used to cure chronic inflammation as arthritis, rheumatic problems and skin diseases and autoimmune diseases and also used to preventing any inflammatory problems as like conjunctivitis with the help of glycyrrhizin activity that counteracts negative effects caused by cortisol.

10. Leaucas aspera (willd.) Link.

Family	:	Lamiaceae
Common Name	:	Kaddiyo / Piyari / Gooma
Flowering and Fruiting	:	Almost throughout the year

Parts Used : leaves, whole plant

Habit and Habitat : The plant is densey hairy herb. It is common from plains to hills throughout the state.

Use in Traditionally medicine:

- Warmed leaves are applied locally on painful swelling.
- Leaves paste is applied locally on various skin diseases like eczema and warts etc.
- The inflorescence is massaged on forehead to cure headache and migraine.
- Poultice of warmed leaves are applied locally in abdominal pain and gastric complaints.
- Leaves paste is applied locally in leprosy.
- The smoke of whole plant is inhaled by the local people to cure chicken pox.
- Flowers along used for cough and colds with honey.
- The plant is used as an antipyretic.
- Juice of fresh leaves or cooked leaves is given in anorexia
- About 50 ml plant decoction is given orally with a cup of water for one week to cure nervous disorder and chronic fever.

11. Leucas cephalotes (Koen ex. Roth) Spr.

Family : Lamiaceae

Common Name : Kubi

Flowering and Fruiting : August - February

Parts Used : Leaves, whole plant

Habit and Habitat : The plant is erect, annual herb. It is common weed in waste lands and cultivated fields.

Use in Traditionally medicine:

- Whole plant is used as a stimulant.
- Leaves powder is sniffed for treating headache.
- Juice of the plant is taken to cure jaundice.
- Juice of the plant is taken to cure malarial fever.

Juice of the plant is taken with mixed rice water to cure eye disease

12. Madhuca longifolia (Roxb.) A. Chev.

Family	:	Sapotaceae
Common Name	:	Mahua
Flowering and Fruiting	:	Feb.-April
Parts Used	:	Bark
Habit and Habitat	:	It is tree. It grows in deep loamy or sandy-loam soil with good drainage and also accurs on shallow stony, clayey and calcareous soils.

Use in Traditionally medicine:

- Bark is boiled in water in water and the extract is used as mouth-wash in tooth pain.

13. Nyctanthes arbor-tristis.

Family	:	Oleaceae
Common Name	:	Harsingar
Flowering and Fruiting	:	August-october
Parts Used	:	Leaf, Bark, Flower, Seed
Habit and Habitat	:	It is shrub and cultivated.

Use in Traditionally medicine:

- The soft leaves are crushed and about 2 gm slurry is given with milk in empty stomach in the treatment of malaria for one week.

13. Ocimum sanctum (Tulsi)

Family-	:	Lamiaceae
Common Name	:	Tulsi
Flowering and Fruiting	:	September -March
Parts part Used	:	Whole Plant
Habit and Habitat	:	An erect, branched, perennial herb. It grown as a pot plant and found in almost every traditional hindu's house.

Use in Traditionally medicine:

- Tulsi is known as the "mother medicine of nature" and "Queen of plants" and due to its multi medicinal qualities.
- It has antimicrobial activity as it present inTulsi Essential Oil.
- Recent investigation has scientifically confirmed that a decoction from the leaves can cure infections of the upper respiratory tracts.
- It is used to enhance bodily resistance against stressful condition.
- Leaves along with black pepper is prepared for tea and ginger is taken to cure cold, cough and fever.
- Half tea spoon dried powder of seed is taken orally with milk to cure fever.

14. Pithecellobium dulce (Roxb.) Benth.

Family	:	Mimoaceae
Common Name	:	Jangal - Jalebi
Flowering and Fruiting	:	March - August
Parts Used	:	Leaves, inflorescence

Habit and Habitat : The plant is medium size tree common in open forest and also plant on the edges of gardens.

Use in Traditionally medicine:

- Infusion of leaves or inflorescence is used to get rid of lice from hair and also to promote the hair growth.

15. Phyllanthus emblica/Emblica officinalis

Family : Phyllanthaceae

Common Name : Amla

Flowering and Fruiting : October-February

Habit and Habitat : It is a tree and found dry open forest.

Part Use : Fruit

Use in Traditionally medicine

- Fruit is a natural immune boosting plant as it containing a powerful cocktail of vitamins C (ascorbic acid) and A, alkaloids, polyphenols and flavonoids such as quercetin and kaempferol.
- Fruit of Amla has strong antioxidant and anti-aging agent due to proliferation inhibition, apoptosis induction, invasion suppression, and angiogenesis inhibition.
- Juice of Amla is used to increase white blood cells, that's are main line of defense for the immune system. White blood cells (WBC) are attack and eliminate on foreign toxins and substances into the bloodstream throughout the body.
- Studies revealed that *E.officinalis* have anti-inflammtory, hypolipidemic, antiviral, antimicrobial, antifungal, antimutagenic and immunomodulatory activities.

16. Piper nigrum

Family	:	Piperaceae
Common Name	:	Kali mirch
Flowering and Fruiting	:	March -April
Parts Used	:	Dried fruit
Habit and Habitat	:	It is a perennial climber and mostly grown on shade trees.

Use in Traditionally medicine

- Black paper ***(Piper nigrum)*** is also known as 'King of Spices'.
- It is a pungent, aromatic, digestive stimulant and nerve tonic as it contains a chemical piperine.
- *Piper nigrum* has good source of many anti-oxidant vitamins like vitamin-C and vitamin-A. These compounds help to remove harmful free radicals and help to protect from cancers.
- It is beneficial to cure cough and cold.
- The tea prepared from leaves along with *Ocimum sanctum*, black pepper and (ginger) *Zingiber officinale* is widely taken to cure cough, cold and fever.

17. Senna occidentails (L.) Link

Family	:	Caesalpiniaceae
Common Name	:	Chakwar
Flowering and Fruiting	:	March - June
Parts Used	:	Root
Habit and Habitat	:	It is an annual to perennial herb to shrub. It grows in waste areas, grasslands and open areas.

Use in Traditionally medicine

- About 10 ml. root extract is given with a cup of water with empty stomach in the treatment of body ache and in urinary problem.

18. *Sonchus asper* (Linn.) Hill

Family	:	Arteraceae
Common Name	:	Kalijibi
Flowering and Fruiting	:	February- May
Parts Used	:	Whole plant
Habit and Habitat	:	The plant is a glabrous herb. It is common in wastelands and fields in wet and sandy habitats.

Use in Traditionally medicine:

- The plant juice is applied locally on wounds and boils.
- Paste of whole plant is taken orally by the rural female to increase lactation.
- Fruits and roots are useful in bronchitis, asthma, and fever, pains, piles, and thirst and heart disease improves appetite.
- The plant is applied as a poultice on wounds and boils.

19. *Sonchus oleraceus* Linn.

Family	:	Asteraceae
Common Name	:	Ankhali
Flowering and Fruiting	:	September-October
Parts Used	:	Whole plant
Habit and Habitat	:	The plant is anerect herb. It is frequently found in wastelands.

Use in Traditionally medicine:

- The juice of plant is taken orally with sugar to cure liver diseases mainly enlarged liver and cirrhosis.

20. Tinospora cordifolia

Family	:	Menispermaceae
Common Name	:	Giloy
Flowering and Fruiting	:	May-October
Parts Used	:	Leaf, Bark, Stem, Root
Habit and Habitat	:	It is a climbing shrub. It is grows over hedges and other trees

Use in Traditionally medicine

- (Giloy) *Tinospora Cordifolia*is a universal medicinal plant that helps boost immunity.
- It is known as powerhouse of antioxidants which can figh free-radicals, keep cells healthy to get rid of diseases.
- Giloy is used in all types of fever and infections including Bacterial and viral infections.
- The plant is used for its immune-modulatory action.
- It is taken to reduce of several type disease like Swine Flu, dengue and Malaria as well.
- It used to help reduce to mental stress as well as anxiety.
- It used to helps get rid of toxins, boosts the memory, calms you down and makes for an excellent health tonic.
- It is also used into curing diabetes.

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CHAPTER-9

The Study on Some Medicinal Plants Along with Household Remedies used in Respiratory Disease during Lockdown

1. ***Achyranthes aspera*** **Linn.**

Local name : Latjiro

Family : Amranthaceae

Parts Used : Leaf, Seed,

Uses-

1. Powder of roasted seeds is taken with honey to relief in respiratory disease like asthma.
2. Juice of leaf and root are mixed with honey and taken once time in a day for a month to cure respiratory disease like asthma, difficulty breathing or shortness of breath.

2. ***Adhatoda zeylanica*** **Medic.**

Local Name : Adusa

Family : Acanthaceae

Parts Used : Leaves, Roots

Uses-

1. Leaves of (Adusa) *Adhatoda zeylanica* and (Tulsi) *Ocimum sanctum* are crushed and taken along with honey to cure cold and cough.

2. Leaves and roots are useful in cough, asthma, bronchitis.
3. Dried leaves are made into cigarettes and cheroots and are smoked in asthma.

***3. Calotropis gigantea* (L.) Ait f.**

Local name : Aak

Family : Asclepiadaceae

Parts Used : Flower

Uses-

1. 5 flowers of *Calotropis gigantea* and 5 -10 cloves of *Syzygium aromaticum* are burnt with cottons fire bars *(Gossypium herbacum)* to prepare ash. About 10 g. of ash is taken daily early in the morning with glassful of water of cure asthma and other respiratory disease.
2. A flower of *Calotropis gigantea* is chewed daily early in the morning with glassful of water of cure asthma.
3. Paste of 3 flowers is fried in pure ghee and it is taken with "Roti" (making with flour of wheat) to cure asthma and difficulty breathing or shortness of breath.

4. Connabis sativa

Local name : Ganja

Family : Cannabinaceae

Parts Used : Leaves

Uses-

1. Once gram ash of 'Ganja' is mixed with 5 grams honey and this mixture is taken orally to cure asthma and bronchitis.

***5. Celosia argentea* L.**

Local name : Lambadi

Family : Amranthaceae

Parts Used : Seeds

Uses-

1. Powder of seeds is mixed with jaggery and some pills are prepared. One pill is taken twice a day with water to cure asthma and difficulty breathing or shortness of breath.

***6. Cocos nucifera* L.**

Local name : Nariyal

Family : Arecaceae

Parts Used : Fruit

Uses-

1. Latex obtained from the leaves of *Calotropis gigantea* is filled in the endosperm of ripe, dried fruit of *Cocos nucifera* through hole. The hole is plugged with the removed piece of the fruit and the fruit is roasted in the burning cow dung. After the fruit is roasted, it is made in to a powder with cow milk is taken in early morning to cure asthma and respiratory disease.

7. ***Datura metel* L.**

Local name : Dhaturo

Family : Solanaceae

Parts Used : Fruit

Uses-

1. The ash (1-gm) of dried fruit wall (in sunlight) is taken with honey to cure asthma and difficulty breathing or shortness of breath

8. ***Gossypium herbaceum* L.**

Local name : Kapas

Family : Malvaceae

Parts Used : Cotton fibers

Uses

1. 5 flowers of *Calotropis gigantea* and 5-10 cloves of *Syzygium aromaticum* are brunt with cotton fibers (*Gossypium herbaceum*) to prepare ash. About

10 gm of ash is taken daily early in the morning with glassful of water to cure asthma, bronchitis, difficulty breathing or shortness of breath.

9. ***Opuntia elatior* (Willd.) Mill**

Local name	:	Hasla -Thuar
Family	:	Cactaceae
Parts Used	:	Flower

Uses-

1. Flower *Opuntia elatior* is roasted in the burning dried cow dung. After the flower is roasted, it is eaten for 7 days to cure asthma and difficulty breathing or shortness of breath.

10. ***Ocimum tenuilorum* L.**

Family	:	**Lamiaceae**
Common Name	:	Tulsi
Parts Used	:	Leaves

Uses-

1. Powder of leaf is mixed with honey and taken once daily for a week to cure cough, bronchitis.

11. ***Zingiber officinale* Rosc.**

Local name	:	**Adrakh**
Family	:	**Zingiberaceae**
Parts Used	:	**Rhizome**

Uses

Hing (Gum resin obtained from roots of *Ferula asafoetida* L.) is filled in the dried rhizome of (adrakh) *Zingiber officinale* through hole. This is rhizome is roasted in the burning cow dung. After it is roasted, it is made into a powder 1 gm of powder with honey is taken in early morning daily to cure asthma.

1. Rhizome of Ginger is crushed along with raw turmeric and boil in water for half an hour and the thickened decoction is taken to cure cold and cough.
2. *Zingiber officinale* is a tuberous rhizome.
3. Ginger has an effective antimicrobial, antifungal, and antiviral agent.
4. Ginger have an aromatic essential oil and non-volatile pungent substances (gingerols and shogaol).
5. The rhizome of plant is normally used in the treatment of cold, asthma and bronchitis.
6. It's powdered are used in drug form capsules.
7. It's alcoholic extracts (including tincture) used in combination with other drugs in extracts of tonic.
8. The tea prepared from leaves along with *Ocimum sanctum*, black pepper and (ginger) *Zingiber officinale* is widely taken to cure cough, cold and fever.
9. It exerts have antilipidemic, anti- oxidative, cardio tonic, antitumor genic, anti- carcinogenic, cytotoxic and apoptotic activities, as well as immunology dilatory effects.

Result and Discussion-

Provided 11 interesting medicinal plants used in the treatment of Respiratory disease like Asthma, bronchitis, cough etc. These medicinal data have founded a base to start the search of new compounds related to Photochemistry, Pharmacology & Pharmacognosy. These research have led to the development of many commercial plants-derived drugs, with the help of this paper we seek to record and presence orally transmitted knowledge in danger of being forgotten. These studies of traditional plants indicate the need of discovery of new drugs of the welfare of mankind.

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CHAPTER-10

Various Disease and Uses of Some Medicinal Plants in Treatment

The usage of plants for various aliments are listed below.

Cold and Cough

- Leaves of Adusa (*Adhatoda zeylanica* Medic.) and Tulsi (*Ocimum tenuifolium* Linn.) are crushed and taken along with honey.
- Ginger rhizome (*Zizgiber offcinal* Rosc.) is crushed along with raw turmeric and boiled in water for half an hour and the thickened decoction is taken.

Fever

- Leaves of Brahmi (*Centella asiatica* (Linn.) Urban.) are crushed and placed on the head at regular interval to reduce the body temperature.

Headache

- Intake for coconut water in mild cases.
- The wet leaf Arrand (*Ricinus communis* Linn.) or Kela (*Musa paradisioca* Linn.) are placed on the head for cooling purposes.

Cuts and wounds

- Crushed leaves of Morning glory (*Ipomoea aquatica Forsk.*) and Pangara (*Erythrina varigata* L. Var. orientalis (L.) merr.) are used to heal pus filled boils. While leaf of Gurhal (*Hibiscus rosa-sinesis* L.) is used for effective healing of wounds.
- Leaf of pattharachatta (*Kalanchoe pinnata* (Lam.) Pers.) is known for its amazing property of binding the skin.
- The mucilage obtained from the leaves of danda thor (*Euphorbia neriifolia* Linn.) and Gular (*Ficus racemosa*L.) are used for healing the bruises.
- The leafless stem of thor (*Euophorbia tirucalli* Linn.) is slit and applied with salt and turmeric on the wound.
- The dried bark of Kaniar (*Bouhinia purpurea* Linn.) is rubbed against a stone the paste is applied on the wound.

Skin Infection

- Crushed leaves of Gurhal (*Hibiscus rosa-sinensis* L.) are used to cure pimples.
- Leaves of Neem (*Azadirachta indica A juss.)* are used, crushed and can be applied on skin infection or used in warm water bathing also.
- The dried seeds of Karanj (*Pongamia pinnata* (L.) pierre) are burnt and blackened. This black soot is mixed with oil and is applied over infected region.

Jaundice

Juice extracted from sugarcane (*Saccharum officinarum* Linn.) and chana (*Cicer arietinum* Linn.) is taken to cure jaundice for relief.

Stomach aliments

- Leaves of Gram are crushed and the juice is taken while the leaves are applied on the stomach.

- Fruits of Bel (*Aegle marmelos* (L.) Corr.) and Kala jamun (*Syzygium cumini* (L.) Skeels) are eaten to cure dysentery.
- Leaves of Bel (*Aegle marmelos* (L.) Corr.) as well as juice given to children with this problem.
- Raw fruit of Karela (*Momordica charantia* Linn.) is crushed and the juice is taken. Also a vegetable made from khet papar (*Mollugo pentaphylla* Linn.) is eaten for relief from biles and acidity.

Urinary problems

- Vegetable made from sata (*Boerhavia diffusa* Linn.) is eaten to cure urinary problems
- Decoction made from the roots of (*Mucuna pruriens* (L.) DC.) is taken as a diuretic.

Piles

- The bark of gular tree (*Ficus racemose* L.) is dried, grind and mixed with water and orally administered. .

Menstrual problems

- Haldi (*Curcuma aromatica* Salisb.) roots are crushed and juice is taken as an effective remedy against menstrual disorders.

Earache

- Juice obtained from the leaves of Tulsi (*Ocimum tenuifolium (L.)* Tindru (*Coccina grandis* (L.) Voiget) and chirmi (*Abrus precatorius* Linn.) are used as ear drops to cure the ear pain also the juice of white onions is used for the same.

Eye aliments

- Leaves of Pilwani (*Cocculus hirsutus* (L.) Diels) are crushed, dried in sun light and the take is placed on the eyes for its soothing effect.

- Flowers, Leaves and pods of Sehnjana (*Moringa oleifera* Lam.) are eaten as vegetable to improve the eyesight.

Muscular and bodyache

- Leaves of mehndi (*Lawsonia inermis L.)* are roasted and tied in cloth and placed on effected region.
- Leaves of Nirgundi (*Vitex negundo* Linn.) are crushed with tamarind leaves and brick pieces. This mixture is heated and used on sprains.

Snake/Scorpion bite

- Exudation of mango tree is applied on scorpion bite affected area.
- Leaves and flowers of Tulsi (*Ocimum tenuifolium* L.) are known for its use in case of snake bite.

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CHAPTER-11

Study of Some Medicinal Plants form in Table Along with Household Remedies

Information about their utility and medicinal value have been gathered from local people, tribal communities and experts Ayurvedic fields (Vaids and Hakeems).

The name of plants, its family local name habitat morphological characteristics, flowering and fruiting period, phytochemical and ethnomedicinal aspects have described.

11.1 Table 1.Some Medicinal Plants along with Household Remedies commonly used in Skin Disease

Many medicinal plants have properties that fights against various type of skin disease. Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-1.

Table 1 Some Ethno-medicinal Plants Used in Treatment in Skin Disease

Sr. No	Botanical Name with Local Name	Family	Parts Used	Name of Diseases	Use of Method
1.	*Abrus precatorius* linn (Chirmi)	Papilionaceae	Seed	Eczema	Prepare a paste from crushed seed and can be applied on affected part daily once time for a week
2.	*Adhatoda vasica* nees. (Adusa)	Acanthaceae	Leaf	Abscess	4-5 leaves are crushed and mixed along ½ teaspoonful of sugar and applied on the infected area for whole night until cure disease.
3.	*Allium sativum* linn. (Lahsun)	Liliaceae	Stem & abscess	Ringworm and Scabies	Stem is crushed and applied over the affected area in three times a day until cure disease.
4.	*Alstonia scholaris R. Br* (Saptparni)	Apocynaceae	Latex	Toe crack	Latex is applied on affected area at bedtime for several days.
5.	*Amaranthus spinous* linn. (Katili Chouli)	Amarantaceae	Entire Part	Eczema	Entire part of the plants crushed and applied over affected area once daily for three days.
6.	*Boerhaavia diffusa* Linn. (Punarnava)	Nyctaginaceae	Leaf	Carbuncle	8-10 leaves are crushed and made a paste and applied over affected area for about 3-4 hours and is repeated for one week.
7.	*Brassica nigra* Koch (Kali Rai)	Brassicaceae	Seed	Pimple	Seeds are crushed and prepare the paste with water and applied over affected area once daily for five days.

8.	*Bryophyllum pinnatum* Kurz. (Pattarchatta)	Crassulaceae	Leaf	Pediculosis	Prepare a paste of the crushed leaves and applied on the affected area for a week.
9.	*Calotropis procera* R.Br. (Aak)	Asclepiadaceae	Latex	Carbuncle	Latex is applied over carbuncle twice a day until cure.
10.	*Carica papaya* Linn. (Papita)	Caricacae	Latex	Ringworm & Pimple	Latex is applied on the infected area twice in a day for 5 days and same is repeated after week until cure.
11.	*Senna alata* Linn. (Ringworm plant)	Caesalpiniaceae	Leaf	Ringworm	3-4 Leaves are crushed and applied on affected area daily two times for 3 days.
12.	*Cinnamomum tamala* nees. (Tejpata)	Lauraceae	Leaf	Prickly heat	Leaves are crushed and prepare a paste and can be applied on affected area for 3 days.
13.	*Curcuma longa* L. (Haldhi)	Zingiberaceae	Rhizome	Allergy and Skin dryness, Prickly heat and Paronychia.	(50 gm.) fresh stem is taken orally for 15 days to cure allergy and skin dryness. (100gm) extract of stem is applied over affected area to cure prickly heat and paronychia.
14.	*Cymbopogon nardus* Rendle (Lamon Ghas)	Poaceae	Oil	Pediculosis	It's Equal amount of oil *Cymbopogon nardus* and oil of (coconut) *Coscos nucifera* L. are mixed properly and applied over the scalp for a fortnight until to cure pediculosis.
15	*Cynodon dactylon* pers.	Poaceae	Entire Plant	Allergy and Prickly heat	Equal part of the extract of entire plant of the *Cynodon dactylon* and extract of

	(Doob gash)				rhizome of *Curcuma longa* and applied on affected area to cure Allergy and prickly heat.
16.	*Datura stramonium* Linn. (Dhatura)	Salanaceae	Leaf	Eczema	Extract of the leaves is applied over the affected area once a day until to cure eczema.
17.	*Eclipta prostrata* Linn. (Bhringraj)	Asteraceae	Leaf	Alopecia	Crushed of leaves and prepared a juice and washing the scalp with juice for a month.
18.	*Emblica officinalis* Gaertn (Amla)	Euphorbiaceae	Fruit	Pediculosis	Equal amount of juice of fresh fruit of *Emblica offcinalis* and (Nimbu) *Citrus aurantifolia* are applied on scalp to cure pediculosis.
19.	*Hibiscus rosa - sinensis* Linn. (Gurhal)	Malvaceae	Leaf	Dandruff	Paste is prepared by leaf and applied over scalp for an hour and repeated it for 5 days.
20.	*Lawsonia inermis* Linn. (Mehandi)	Lythraceae	Leaf	Skin dryness	Prepare a paste of leaf and is applied on affected area until to cure skin dryness.
21.	*Melia azedarach* Linn. (Curry patta)	Meliaceae	Leaf	Carbuncle and prickly heat	Boiled the leaves and prepare an extract and washed the affected area with extract twice daily until to cure.
22.	*Moringa oleifera* Lam. (Sahjana)	Moringaceae	Brak	Stay of eye lid	Prepare an extract from bark and is applied over the infected area once daily for a week to cure stay of eye lid.
23.	*Nyctanthes arbortristis* Linn.	Oleacaeae	Seed	Peduclosis	A paste prepared from crushed seeds can be applied to the affected area once daily for three days to cure peduclosis.

24.	*Ocimum basilium* Linn (Tulsi)	Lamiaceae	Leaf	Allergy	Equal amount of 25 ml of extract of leaf of *Ocimum basilium* Linn. And extract of rhizome of *curcuma longa* are taken to cure allergy.
25.	*Ocimum sanctum* Linn. (Kalitulsi)	Lamiaceae	Leaf	Ringworm	6 leaves are crushed and 1/5 teaspoon of common salt is added and applied twice daily for 5 days to cure ringworm.
26.	*Piper betle* Linn. (Pan)	Piperaceae	Leaf	Pediculosis	Crushed of young leaves and washed to scalp for several days to pediculosis.
27.	*Punica granatum* Linn. (Anar)	Punicaceae	Seed	Vaginal infection	Crushed of one leaf and prepare a paste can be applied in the infected area twice a day for three days. Extract the seeds and washing the infected area with extracted seeds once a day for six days.
28.	*Ricinus communis* Linn. (Arandi)	Euphoriaceae	Leaf	Eczema	One leaf to be crushed and prepare a paste and can be applied on the infected area twice a daily for 3 days.
29.	*Solanum indicum* Linn (Bhekuri)	Solanaceae	Fruit	Pediculosis	Pastes are prepared from crushed of 10 fruit with honey and applied over the scalp for 4-5 hour to cure pediculosis.
30.	*Zingiber officinale* Rocs. (Adarak)	Zingiberaceae	Rhizome	Allergy	(20gm) extract of rhizome with equal amount of molasses are taken orally three times in a day for a week.

The result revealed that 30 Ethno medicinal plants have used in various type of skin disease like-Allergy, Pediculosis, Eczema, Vaginal infection, Ringworm, Stay of eye lid, Abscess, Scabies, Toe crack, Carbuncle, pimple, prickly heat, skin dryness, paronychia, alopecia, dandruff etc.

11.2 Some Medicinal Plants along with Household Remedies commonly used in Cancer Disease

Many medicinal plants have properties that fights against cancer disease. Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-2.

Cancer is considered a fatal and complex disease. It is a disease that affects the body parts of many. When the toxic substances in the body are collected near a particular organ, it results in poisoning in all the organs of the body. The cells of the cells are united, Generate swelling in the body. The attachment of cells and tissues is expected to be affected. If the toxic substances are not removed from the body, then cancer is affected by blood and other parts of the body from diseased cells.

Natural remedies, like as the use of plants ailment products in treatment of cancer. It can be reduce side effects. Recently, some plants products are being used in the treatment of cancer. Now days, many of the plants ailment products which have very effective anti-cancer properties, but people have not yet been evaluated. In the treatment of cancer in humans, further study is needed to determine the efficacy of these plants' products. These surveys will knowledge on the different plants, which have naturally derived of anticancer properties in recent years and they have less toxic side effect comparatively chemotherapy.

Table 2. Some Ethno-medicinal Plants Used in Anti-Cancer

S. No	Botanical Name	Common Name	Family	Part Used	Disease
2.	*Berberis vulgaris* (L.)	Barberry	Berberidaceae	Fruit, bark, Root	Anticancer
3.	*Eugenia aromaticum* (L.) *Baill*	Clove	Myrtaceae	Dried flower bud	Anticancer
4.	*Digitalis purpuria* (L.)	Foxglove	Plantaginaceae	Leaves	Anticancer
5.	*Zingiber Officinalis* (R.)	Ginger	Zingibaracae	Rhizome	Anticancer
6.	*Vitis vinifera* (L.)	Grape seed	Vitaceae	Seed	Anticancer
7.	*Annona muricata* (L.)	Graviola	Annonaceae	Fruit	Anticancer
8.	*Aloe Barbadensis* (Mill.)	Gwarpatha	Liliaceae	Leaves	Anticancer
9.	*Xanthium strumarium Linn.*	Jhadugar	Asteraceae	Root	Anticancer
10.	*Bauhinia variegata* (L.) Benth	Kachnar	Fabaceae	Root	Anticancer
11.	*Crocus sativus* (L.)	Kesar	Iridaceae	Stigma and Style	Anticancer
12.	*Citrus medica* (L.)	Lemon	Rutaceae	Root	Anticancer
13.	*Viscum album* (L.)	Mistletoe	Santalaceae	Leaves and	Anticancer

				berries	
14.	*Nicotiana tabacum* (L.)	Tobacco	Solanaceae	Leaves	Anticancer
15.	*Ocimum sanctum* (L.)	Tulsi	Lamiaceae	Whole Plant	Anticancer
16.	*Catharanthus Roseus* (L.)	Sadabahar	Apocynacae	Whole plant	Anticancer

Medicinal plants play an important role against cancerous diseases. The conclusions of various herbal plants and plants play an important role in anti-cancer activity in humans. The results of my study show that 16 medicinal plants are used in treatment as anti-cancer and the above mentioned medicinal plants prevent cancer from dose-dependent theory. Reported to have anti-oxidant activity on top of plant variety. These medicinal plants are also used in food, fodders, gums, resins, colours, spices etc. These medicinal plants have great tolerance for use in medicines and pharmaceutical industries.

11.3 Some Medicinal Plants commonly used in rituals

Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-3.

Since the Vedic times, the human race has used various plants for ritual purpose. As such, the good omen plants are sacred, used in worship and offered to God. They also use them in their social ceremonies to keep themselves fit and prosperous.

Table 3. Some Ethno-medicinal Plants Used in rituals.

Sr. No.	Botanical Name	Local Name	Use of Part	Purpose
1.	*Aegle marmelos* (L.) corr.	Bil	Leaves	Offered to lord Shiva
2.	*Azadirachta indica* A Joss	Nimbo	Leaves	Reception
3.	*Butea monosperma* (Lam) Taub.	Khakhro	Flowers	On Dhuleti Festival
4.	*Calotropis gigantea* (L.) R.Br.	Safed Aakdo	Flowers	Offered to lord Shiva and Hanuman
5.	*Calotropis procera* (Ait.) Ait. F.	Aakdo	Flowers	Offered to lord Shiva and Hanuman
S6.	*Catharanthus roseus* (L.) G. Don	Barmasi	Flowers	Offered to God
7.	*Catunaregam spinosa* (Thumb) Tirveng.	Mindhal	Dried Fruit	Bandaged on hand during marriage
8.	*Celastrus poniculata* Wild	Malkanki	Fruit branch	Offred to Lord Ganpati
9.	*Cocos nucifera* L.	Nariel	Fruit	Any religious & Social ceremony
10.	*Cucurbita maxima* Duch ex. Lam	Kolu	Fruit	Sacrifice

11.	*Curcuma longa* L.	Haldar	Rhizome	Marriage ceremony
12.	*Cynodon doctylon* (L.) Pres	Doob	Leaves	Ritual
13.	*Datura innoxia* Mill.	Dhaturo	Flowers	Offered to Lord Shiva
14.	*Desmostachya bipinnata* (L.) Stapf	Dabh	Leaves	Held in food grains during eclipse
15.	*Ficus Benghalensis* L.	Bad	Whole Plant	Holly tree
16.	*Ficus racemosa* L.	Umro	Whole Plant	Holly tree
17.	*Ficus religiosa* L.	Pipal	Whole Plant	Holly tree and ladies' worship on "Kevdatrij"
18.	*Helicters isora* L.	Mardasingi	Dried Fruit	Marriage ceremony
19.	*Lawsonia inermis* L.	Hina, mehndi	Whole Plant	Marriage Ceremony
20.	*Madhuca longifolia* (Koen.) Mac Bride	Mahudo	Whole Plant	Religious Belief
21.	*Mangifera indica* L.	Ambo	Leaves	Marriage ceremony and festival Auspicious, garland hung around gate
22.	*Musa paradisiaca* L.	Kela	Leaves	Ritual
23.	*Nelumbo nucifera* Gaertn	Kamal	Flowers	Offred to Lord Shiva
24.	*Ocimum basilicum* L.	Marvo	Whole Plant	Holly plant
25.	*Ocimum tenuiflorum* L.	Tulsi	Whole plant	Holly Plant
26.	*Pandanus fascicularis* Lam	Kevdo	Leaves	Ladies worship on "Kevdatrij", Holly Plant
27.	*Polyalthla longifolia* (sonn.) Thw	Asopalav	Leaves	Auspicious garland hung around gate
28.	*Prosopis cineraria* (L.)	Khijdo	Stem	Used in "Havan" sacrifice

	Druce			
29.	*Santalum album* L	Chandan	Wood	Worship
30.	*Sesbania grandiflora* (L.) Poir	Agathio	Flowers, Leaves	Offered to God
31.	*Tabernaemontana divaricata* (L.)	Tagar	Flowers	Offered to God

The tribals not only use plants for food, medicine and house construction but also in religious rituals and social customs, The tribals associate plants like Tulsi (*Ocimum tenuifolium linn.),* Dhatura *(Datura metel Linn.),* Bel *(Agle mermelos (L.) Corr.),* Kamal (*Nelumbo nucifera* Gaerten) With Lord Shiva and Sun also the flowers of Gudhal (*Hibisucs rosa -sinensis* Linn.) and Durva (*Cynodon Dactylon* (L.) Pers.) are used for adorning the idols of God. The "Holi" festival is celebrated by relishing a drink "Bhang" made from Ganja (*Cannabis sativa Linn.)* and burning the nut of Supari (*Areca catechu* Linn.) the bidis (Type of cigarette) used by tribals for smoking purpose are made from crushed tobacco leaves wrapped in leaves of Apta (*Bauhinia racemose* lam.).

The tribal art traditional done to celebrate weddings is a depiction of the life and activites of the tribe. It is painted directly on the walls as murals with mud. Charcoal and cow dung as base, with rice paste of fine white powder mixed with water and tree-gum and a twig as a brush.

11.4 Some Medicinal Plants along with Household Remedies commonly used in digestive disorders

Many medicinal plants have properties that fights against digestive disorders. Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-4.

During ethno botanical survey in different villages. The information about utilization of natural plant resource for digestive disorders was gathered from tribal informants and elder woman. Information gathered on various digestive disorder, such as dysentery, diarrhoea, piles, indigestion, constipation, dysepepsia, jaundice, stomachache, gripping intestinal warm etc.

Table-4 Some Ethno-Medicinal Plants Used in Treatment for Digestive Disorders

S. N.	Scientific name	Family	Local Name	Part (s) used	Mode of administration
1.	*Acacia catechu (l.F.) Willd*	Mimosaceae	Kheir	Stembark	Decoction of stem-bark is taken orally to cure stomachache.
2.	*Adhatoda zeylanica medic*	Acanthaceae	Ardushi	Leaves	Extract of leaves is taken orally in diarrhoea and dysentery
3.	*Aegle marmelos (L.) Corr.*	Rutaceae	Bael	Fruitpulp	Fruit pulp is taken orally in chronic diarhoea, dysentery & flatulence
4..	*Ailanthus excelsa Roxb.*	Simaroubaceae	Arduso	Stembark	Powder of stem-bark mixed with curd is taken orally to cure dysentery.
5..	*Allium cepa L.*	Liliaceae	Dingali	Bulb	Two table spoon juice of bulb is taken orally to cure constipation
6.	*Allium sativum L.*	Liliaceae	Lahsan	Clove	4-5 Cloves juice is mixed with seed powder of

					Papaver somniferum L. and taken orally twice a day which cure diarrhoea.
7.	*Aloe vera (L.) Burm f.*	Liliaceae	Gunvar – patha	Leaves	Extract of leaves is taken orally in cure indigestion and constipation
8.	*Azadirachta indica A. juss*	Meliaceae	Nimb	Leaves	20 ml extract of leaves, 20 ml honey are mixed with seeds powder of *Piper nigrum* L. such mixture is taken orally twice a day for cirrhosis of liver and dyspepsia
9.	*Balanitis aegyptiaca (L.) Del.*	Balanitaceae	Hingota	Fruit-pulp	Fruit pulp mixed with curd is taken orally in dysentery
10.	*Bauhinia racemosa Lam.*	Caesalpiniaceae	Kachnar	Flower	Powder of flower is taken orally in diarrhea
11.	*Bauhinia tomentosa t.*	Caesalpiniaceae	Champo	Root	Decoction of root is taken orally in dysentery
12.	*Boerhavia diffusa L.*	Nyctaginaceae	Satodi	Seed	Powder of seeds is taken orally in jaundice
13.	*Butea monosperma* (Lam.) Taub	Fabaceae	Khakhro	Leaves	Decotion of leaves is taken orally to cure intestinal warm & griping
14.	*Capparis grandis* L. f.	Caesalpiniaceae	Ghuti	Root	Root ash mixed with milk taken orally in dyspepsia
15.	*Cinnamomum varum* J.S. Presl	Lauraceae	Taj	Stem Bark	Pwder of Stem bark is taken orally to cure dysentery, flatulence.
16.	*Citrullus colocynthis* (L.)	Cucubitaceae	Indravarna	Root	Decoction of root is taken

	Schrad.				orally in jaundice
17.	*Cleomoe viscosa L.*	Cleomaceae	Pilitalavani	Seed	Powder of seeds mixed with eugage cube is taken orally in flatulence and intestinal warm.
18.	*Commiphora wightii (Arn.) Bhandri*	Burseraceae	Gugal	Stem-gum	Stem gum mixed with water is taken orally to cure dysentery
19.	*Corchorus capsularis L.*	Tiliaceae	Bor-chhuchh	Seed	Decoction of seeds is taken orally in stomachache
20.	*Corchorus oiltorius L.*	Tiliaceae	Motichhuchh	Whole plant	Ash of whole plant is taken orally with honey and sugar cube in stomachache
21.	*Coriandrum sativum L.*	Apiaceae	Dhania	Fruit	Powder of dried ripe fruits is taken orally in flatulence.
22.	*Crocus sativus L.*	Iridaceae	Kesar	Style	Powder of style is taken orally in flatulence, piles.
23.	*Cuminum cyminum L.*	Apiaceae	Jeeru	Fruit	Powder of fruit is taken orally with water to cure flatulence
24.	*Curcuma longa L.*	Zingiberaceae	Haldi	Rhizome	Decoction of rhizome is taken orally to cure diarrhoea and jaundice
25.	*Daucus carota L.*	Apiaceae	Gajar	Seed	Powder of seeds is taken orally to cure flatulence and dysentery.
26.	*Elettaria cordamomum*(L) *Maton*	Zingiberaceae	Elaichi	Fruit	Powder of fruit of *Elettaria cordamomum* and fruit powder of *Foeniculum vulgure* Mills. mixed with sugar cube are taken orally to cure bacillary diorrhoea.
27.	*Ferula asafoetida L.*	Apiaceae	Hing	Resinousgum	Resinous gum mixed with honey is taken orally for

					treatment of flatulence, Stomachache, dysentery
28.	*Feronia limonia (L.) Swingle*	Apiaceae	Wood apple	Fruit	Decoction of fruit is taken orally for treatment of flatulence, stomachache, dysentery.
29.	*Fumaria indica (Haussk.) Pugsley*	Fumariaceae	Pitpapdo	Whole plant	Decoction of whole plant is taken orally in dysentery.
30.	*Melia azedarach L.*	Meliaceae	Bakan	Root-bark	Decoction of root bark is taken orally to cure intestinal warm and constipation.
31.	*Mentha spicata L.*	Lamiaceae	Pudino	Leaves	Extract of leaves with water is taken orally to cure diarrhoea.
32.	*Moringa oleifera Lam.*	Moringaceae	Sahjana	Seed	Powder of seeds is taken orally in flatulence, indigestion
33.	*Murraya koeniggi* (L.) Spreng.	Rutaceae	Mitho-limbo	Leaves	Decoction of leaves is taken orally to cure indigestion.
34.	*Ocimum tenuifolium L.*	Lamiaceae	Tulsi	Leaves	Decoction of leaves is taken orally to cure constipation, jaundice.
35.	*Papaver somniferum L.*	Rutaceae	Afim	Seed	Seeds are taken orally in gripping
36.	*Phyllanthus emblica L.*	Euphorbiaceae	Amla	Fruit	Extract of fruit is taken orally in flatulence.
37.	*Piper nigrum L.*	Piperaceae	Black Pepper	Seed	Powder of seeds is taken orally in constipation a flatulence.
38.	*Plantago ovata forsk.*	Plantaginaceae	Isabgul	Seed	Seeds are soaked in water for several hours and taken orally in constipation

39.	*Plumbago indica L.*	Plumbaginacea e	Lal-chirak	Root	Decoction of root is taken orally in piles and dysentery.
40.	*Portulaca oleracea L.*	Portulacaceae	Motiluni	Seed	Seeds are taken orally in piles and dysentery
41.	*Prosopis cineraria (L.) Druce*	Mimosaceae	Khijado	Root bark	Decoction of root bark is taken orally in dysentery
42.	*Punica granatum L.*	Punicaceae	Anar	Fruit-pericarp	Powder of fruit pericarp is taken orally in dysentery and diarrhoea.
43.	*Ricinus communis L.*	Euphorbiaceae	Arandi	Seed	Seeds oil taken is orally for intestinal warms.
44.	*Ruellia tuberosa L.*	Acanthaceae	Cracker plant	Root	Decoction of rootis taken orally to cure stomachache.
45.	*Santalum album L.*	Santalaceae	Chandan	Stem-bark	Decoction of stem bark is taken orally twice a day for relief from acidity
46.	*Sapindus laurifolius vahl*	Sapindaceae	Ritha	Fruit	Extract of fruit is taken orally in dysentery.
47.	*Saraca asoca (Roxb.) de Wilde*	Caesalpiniaceae	Sonamukhi	Leaves	Extract of leaves is taken orally to cure indigestion
48.	*Senna auriculata (L.) Roxb.*	Caesalpiniaceae	Aval	Root bark	Root bark is crushed with table salt and taken is orally in constipation dysentery
49.	*Smilax ovalifolia Roxb.*	Smilacaceae	Sarsaparill a	Root	Decoction of root is taken orally to break up gas.
50.	*Salanum anguvivi Lam.*	Solanaceae	Moti-ringi	Root	Decoction of root is taken orally in intestinal worm.
51.	*Syzygium aromaticum (L.) merr. Perry*	Myrtaceae	Laving	Fruit	Powder of fruit is taken orally to cure flatulence, indigestion.

52.	*Syzygium cumini (L.) Skeels*	Myrtaceae	Jamun	Root	Decoction of root bark is taken orally in dysentery
53.	*Tephrosia purpurea (L.) Pers*	Fabaceae	Sarpankho	Root	Extract of root mixed with honey is taken orally with water for cure or stomachache
54.	*Terminalia chebula (Garten.) Retz.*	Combretaceae	Harde	Fruit-pulp	Fruit pulp is taken orally to cure chronic diarrhoea, dysentery
55.	*Tinospora cordifolia (Willd) miers*	Menispermacae	Galo	Whole plant	Decoction of whole plant is taken orally for treatment of jaundice.
56.	*Trachyspermum ammi (L.) Sprague.*	Apiaceae	Ajwain	Seed	Seed powder is used in acidity.
57.	*Trianthema portulacastrum L.*	Aizozceae	Sata	Root	Decoction of root is taken orally to cure constipation
58.	*Trichosanthes cucumerina L.*	Cucurbitaceae	Kadvipadar	Seed	Powder of seeds is taken orally in stomachache and worm.
59.	*Trigonella foenum-graecum L.*	Apiaceae	Methi	Seed	Powder of seeds is taken orally in dyspepsia and dysentery
60.	*Vernonia cinerea (L.)*	Asteraceae	Sahdevi	Whole plant	Decoction of whole plant is taken orally in dyspepsia
61.	*Vigna trilobata (L.) verd.*	Fabaceae	Banmoong	Whole plant	Decoction of whole plant is taken orally in dysentery
62.	*Vitex negundo L.*	Verbenaceae	Nagod	Leaves	Decoction of leaves is taken orally in jaundice and worm
63	*Zingiber officinale rosc.*	Zingiberaceae	Adarak	Rhizome	Powder of rhizome is taken orally to cure dyspepsia and constipation

5. Some Medicinal Plants along with Household Remedies commonly used in Cosmetics

Many medicinal plants uses as cosmetic products. Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-5

Beauty has always been an object of aesthetic appraisal appreciation and inspiration it has ever delighted artists, philosophers, poets, musicians and even common man but has never been a subject of scientific analysis it is an abstract perception truly saying; 'beauty lies in the eyes of beholders. The very existence of beauty might have been realized by the first man having his hunger satisfied. The inner instinct of man to appreciate beauty took wide range and tried to create it in this attempt he screamed different object as beauty enhancer, which founded the stone of modern cosmetics. Cosmetics are the prosthetic makeup devices or substance intended to improve appearance which can delight the sight. Now a day-thousands of synthetic and some natural cosmetic products are adding to the beauty of humanity, many of them are not only producing hypersensitivity but also destroying the natural charm and grace of the skin and causing different superficial and physiology disorders. The people residing in remote areas, away from the modern cosmetic age are also very good looking by practicing wild and time-tested beauty tips

Table 5. Some Ethno-medicinal Plants and their ethnocosmetic uses.

S. No	Botanical Name	Family	Part used	Problems	Mode of application
1.	*Albizia lebbeck* (L.) *Benth.*	*Mimosaceae*	) Leaf i) Seed	i) Whitish spots ii) Eye	Juice appilied twice a day. Grounded seeds, used as 'anjan' to improve sight
2.	*Allium cepa* L.	Liliaceae	Bulb	Loss of hair in patches	Juice applied over affected areas twice a day

3.	*Argemone maxicana L.*	Papaveraceae	Seeds	Scables, itching	Paste massaged over affected parts half an hour before bath
4.	*Bombax ceiba* L.	Bombaceae	Bulbous prickles	Dark complexion	Powdered bulbous prickles are mixed with milk and used as face pack, once day
5.	*Brassica campestris L.*	Brassicaceae	Seeds	Lip Crack	Oil applied in navel, twice a day
6.	*Butea monosperma (Lamk.) Taub.*	Fabaceae	Seeds	Leucoderma	Oil applied over affected part twice a day
7.	*Cirtus aurantifolia* (Chr.) Wingle	Rutaceae	Rind	Acnem, pimples	Oil applied over affected part twice a day
8.	*Croton bonplandianum Baill.*	Euphorbiaceae	Leaves	Dandruff	Decoction used as a hair wash.
9.	*Curcuma zedoaria (Christ.) Rosc.*	Zingiberaceae	Rhizome	Complexion wrinkle	Paste massaged over body two hour before bath
10.	*Cyperus iria L.*	Cyperaceae	Root tuber	Black spot, wrinkle	Powder/paste mixed with lemon juice, applied over face once a day.
11.	*Datura innoxia Mill.*	Solanaceae	Fruits	Whitish spots	Pulp of roasted fruits massaged over affected parts of the body everyday
12.	*Eclipta prostrata (L.)*	Asteraceae	Whole plant	Greying, loss of hair	Extract applied over scalp half an hour before bath
13.	*Indigofera*	Fabaceae	Leaves	Hair loss	Juice applied over scalp once a day

	tinctoria L.				half an hour before bath
14.	*Lawsonia inermis L.*	Lythroideae	Leaves	Bad odour of body	Paste applied over palm and feet, fortnightly
15.	*Mirabilis jalapa L.*	Nyctaginaceae	Petals	Black spot, wrinkles	Paste massaged over face twice a day after washing with luke warm water.
16.	*Nyctanthes arbor-tritis L.*	Oleaceae	Flowers, Seeds	Dark complexion & Black spots Dandruff	Paste massaged over face, half an hour before bath. Paste applied over scalp
17.	*Piper betel L.*	Piperaceae	Petiole	Worts	Worts are brushed with lime dipped petiole for their instant removal.
18.	*Piper nigrum L.*	Piperaceae	Fruits	Painful pimples	Paste applied twice a day
19.	*Pithecellaobium dulce (Roxb.) Benth.*	Mimosaceae	Leaves	Loss of hair	Paste applied over scalp to promote hair growth.
20	*Portulaca oleracea L.*	Portulacaceae	Tender Shoot	Prickly heat	Paste massaged over affected parts of the body once daily.
21.	*Terminalia bellirica (Gaertn.) Roxb.*	Combretaceae	Fruits	Greying loss of hair	Paste applied over scalp twice a week, half an hour before bath.
22.	*Trichosanthes dioica Roxb.*	Cucurbitaceae	Leaves	Loss of hair	About 50 ml. juice mixed with a few drops of lemon juice, applied over

					scalp one hour before bath
23.	*Xanthium stumarium L.*	Asteraceae	Leaves	Dandruff	Juice applied over scalp before bath.
24.	*Zingiber officinale Roscoe*	Zingiberaceae	Rhizome	Dandruff, loss of hair	Juice applied over scalp before bath.

11.6 Some Medicinal Plants along with Household Remedies commonly used in Dantal Disease

Many medicinal plants uses as in Dantal Disease. Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-6

Ethno-medicinal survey and collection of indigenous ideas concerning oral and dental hygiene, especially the use of plant parts as tooth-brush (datoon). About 24 Ethnomedicinal plant species are used for treatment in Disease of Dental.

Survey of Ethnobotanical and indigenous ideas was conducted in some rural area of Study area. The indigenous ideas collected are chiefly popular among the nonspecific farming communities, fisherman and weaver communities of the district voucher specimens of the plant species were collected and preserved in the University herbarium for future reference.

Table 6. Some Ethnomedicinal Plants used for Dental Disease.

S. N	Botanical Name	Local Name	Family	Parts used	Purpose (Diseases)	Mode of Administration
1.	*Abutilon indicum* (L.) Sweet	Kanghi	Malvaceae	Leaf	Toothache	Decoction of plants is used as dental rinse.

2.	*Acacia nilotica* (L.) Willd	Babool	Mimosaceae	Stem	Loose teeth	Stem are used as tooth stick
3.	*Acaica catechu* (L.F.) Wild	Khair	Mimosaceae	Stem & Leaf	Pyorrhoea	Stem are used as tooth stick. Decoction of leaf is used as dental rinse.
4.	*Achyranthes aspera* L.	Chirchita	Amaranthaceae	Stem	All type of diseases of Teeth	Stem is used as tooth stick.
5.	*Albizia lebbeck* (L.) Benth	Siris	Mimosaceae	Stem	Yellow Teeth	Stem is used as tooth stick.
6.	*Alstonia Scholaris* (L.) R Br.	Saptaparna, Chatiyan	Apocynaceae	Bark	Toothache	Powder of Bark is applied along with honey to cure Toothache.
7.	*Azadirachta indica* A. Juss.	Neem	Meliaceae	Stem	Cavity and Decaying	Stem is used as tooth stick.
8.	*Barleria prionitis* L.	Vajradanti,	Acanthaceae	Flower	Toothache	Powder of flower is used with honey to cure toothache.
9.	*Cordia dichotoma* Forst. F.	Lasora	Ehretiaceae	Bark	Toothache	Decoction of bark is used as dental rinse.
10.	*Dalbergia sisso* (Roxd.)	Sisam	Papilionaceae	Stem	Dirty teeth	Stem is used as tooth stick
11.	*Euphorbia antiquorum* L.	Tridhar	Euphorbiaceae	Root	Toothache	Root is pressed into the teeth to cure painful toothache.

12.	*Ficus benghalensis* L.	Bar	Moraceae	Latex	Toothache & Loose teeth	Latex is applied on teeth to cure toothache and loose teeth.
13.	*Jatropha Gossypifolia* L.	Ratanjot	Euphorbiaceae	Stem	Pyorrhoea	Stem is used as tooth stick
14.	*Lantana camara* L.	Putus	Verbenaceae	Stem	Dirty breath	Stem is used as tooth stick
15.	*Madhuca indica* J.F. Gmelin	Mahua	Sapotaceae	Stem	Loose teeth	Stem is used as tooth stick
16.	*Mangifera indica* L.	Aam	Anacardiaceae	Stem	Loose teeth	Stem is used as tooth stick.
17.	*Psidium guajava* L.	Amrood	Myrtaceae	Stem and Leaf	Toothache	Stem is used as tooth stick. Decoction of leaf is used as dental rinse.
18.	*Shorea robusta* Gaertn. F.	Sal	Dipterocar-paceae	Stem & Resin	Toothache	Stem is used as tooth stick. Powder of Resin is used as tooth powder.
19.	*Tabernaemontana divaricata* (L.) R Br. Ex. Roeam & Schult.	Chandani	Apocynaceae	Root	Toothache	Root is chewed to cure toothache.
20.	*Syzygium heyneanum* (Duthie) Wall. Ex. Gamble	Kath-Jamun	Myrtaceae	Stem	Gum problem	Stem is used as tooth stick.
21.	*Tamarindus indica* L.	Imli	Caesalpiniaceae	Leaf	Gum problem	Decoction of leaf is used as dental

						rinse.
22.	*Tephrosia purpurea* (L.) Pers	Sarphonka	Papilionaceae	Stem	Toothache and Pyorrhoea	Stem is used as tooth stick.
23.	*Ziziphus nummularia* (Burm. F.) Wt. & Arn.	Jharberi	Rahmnaceae	Stem	Pyorrhoea	Stem is used as tooth stick to cure pyorrhea.
24.	*Rumex vasicarius* L.	Khatti palak	Polygonaceae	Leaf	Toothache	Juice of leaf is applied on teeth to cure toothache.

The aboriginals of the rural pockets have pharmacopoeia of their own and traditionally treat the oral aliments with indigenous medicinal plants, unfortunately, their knowledge could not be documented, and however, there is an urgency for documentation of their knowledge on priority basis. It is noted that they are not interested to share their knowledge with others. It has also been established during the survey that several old, experienced medicine men never disclosed their knowledge of medicinal uses to others. However, after developing intimacy with some of the experienced medicine men and other traditional healers, some information on medicinal uses has been collected and is presented in this paper. It was also observed during this study that over exploitation of these plants for dental care cause threat to these species locally and requires conservation. At the same time documentation of indigenous knowledge is also suggested.

11.7 Some Medicinal Plants along with Household Remedies commonly used in traditionally

Ethno-medicinal plants are given alphabetically, botanical name, local name, parts used, method of drug preparation and approximate dosage administration has been described below in Table-7

Table 7*:* Some Ethno-medicinal used traditionally

S. N.	Plant Species	Family	Local Nane	Traditionally use
1.	*Justicia adhatoda L.*	Acanthaceae	Adhatoda	Extract of leaf is taken internally to cure cough and cure asthma.
2.	*Achyranthes aspera L.*	Amaranthaceae	Chirchita	Juice of the leaves is mixed with powder of gingar and applied externally to cure eye injuries of cattle.
3.	*Anacardium occidentalis L.*	Anacardiaceae	Cashew	Oil extracted of seeds is used as an anesthetic in leprosy psoriasis.
4.	*Mangifera indica L.*		Aam	Paste of the seed is taken to cure ringworm infection.
5.	*Centella asiatica (L.) Urban*	Apiaceae	Brahmi	Extract of leaf is taken internally to cure dysentery and to improve the memory power.
6.	*Catharanthus roseus (L.) G. Don*	Apocynaceae	Sadabahar	Bark is taken for cancer therapy
7.	*Wrightia tinctoria (Roxb.) R. Br.*		Dudhi	Juice of leaves is mixed with lime and turmeric powder and externally applied to the swelling
8.	*Cocos nucifera L.*	Arecaceae	Nariyal	Toddy is taken internally as cooling beverage.
9.	*Aritstolochia*	Aristolochiaceae	Hukka-bel	Warmed leaves covered with

	bracteolata Lam.			cotton cloth are tied on the painful parts of the body to cure rheumatic joint pain and swellings.
10.	*Calotropis gigantea (L.) R.Br.*	Asclepiadaceae	Safed-aakda	Latex is applied around the thumbs-nails of leg for getting immediate relief from burning sensation while passing urine.
11.	*Pergularia daemia (Frosk) Chivo.*		Gadaria ki bel	Leaves are boiled and take bath with cooled water cure body pain
12.	*Tridax procumbens L.*	Asteraceae	Patharchatti	Juice of leaves is applied externally for healing the wounds.
13.	*Cassia fistula L.*	Cannabinaceae	Amaltash	Decoction of bark is mixed with garlic and powder of pepper and given to cattle as purgative
14.	*Delonix alata (L.) Gamble*		White gulmohar	Paste of leaf is mixed with lime juice is applied for paralysis and joint pain.
15.	*Senna auriculata (L.) Roxb.*		Tarwar	Decoction of bark is mixed with garlic and powdered pepper and given to cattle as purgative.
16.	*Tamarindus indica L.*		Imali	Paste is made pulp of the fruit and mixed with lime and applied on the painful muscle swellings.
17.	*Cannabis sativa L.*		Bhang	Dried leaves are smoked as temporary pain relief.

18.	*Cleome viscosa L*	Cleomaceae	Hulhul	Paste of leaves is applied externally to cure wounds in cattle. The grinded seed-paste is applied externally over head for the relief headache.
19.	*Evolvulus alsinoides (L.) L.*	Convolvulaceae	Vishnukarnta	Decoction of leaves is taken orally to improve memory.
20.	*Coccinia grandis (L.) J.O. Voigt*	Cucurbitaceae	Tindru	Juice of leaves is mixed with salt and taken to cure the eye disease.
21.	*Acalypha indica L.*	Euphorbiaceae	Kuppi	Juice of leaves is applied externally for body itching.
22.	*Croton bonplandianum Baill.*		Kala-Bhangra	Latex is applied on externally to cure wounds
23.	*Euphorbia hirta L.*		Laldudhi	Entire paste of plant is mixed with goat milk and taken internally for digestive problem in children.
24.	*Jatropha curcas L.*		Ratanjot	Juice of stem is gargled to relief toothache and to cure angular stomatitis.
25.	*Phyllanthus amarus schum. & Thonn.*		Bhuiamla	Juice of entire plant and root extract are used to jaundice.
26.	*Phyllanthus emblica L.*		Amla	Fruit-jellies are taken in the case dysentery.
27.	*Ricinus communis L.*		Arandi	Oil extracted of seeds is used for cooling the body.
28.	*Abrus precatorius L.*		Chirmi	Seeds are taken to affect the nervous system and their paste is applied locally in sciatica, paralysis and stiffness of shoulder joints.

29.	*Clitoria ternatea L.*	Fabaceae	Koyalri	Root-paste is taken internally as cathartic and diuretic.
30.	*Eryhrina uariegata L.*		Dadap	Paste of leaves is applied on the wounds of the cattle for healing.
31.	*Pongamia pinnata (L.) pierre*		Karanj	Bark and leaves are given internally to cattle for better digestion.
32.	*Sesbania grandiflora (L.) poir*		Gaach-munga	Leaves are cooked and eaten to cooling effect for eyes.
33.	*Tephrosia purpurea (L.) pers.*		Bansa	Root is chewed to cure stomach pain and poisonous bites.
34.	*Leucas aspera (Wild) link*	Lamiaceae	Paniharin	Juice of leaves is mixed with turmeric powder and applied externally around throat tonsilitis.
35.	*Ocimum basilicum L.*		Tulsi	Juice of leaves is poured in drops in the case of ear pain.
36.	*Ocimum tenuiflorum L.*		Tulsi	Juice of leaves is mixed with cumin seeds and taken to cure dry cough.
37.	*Allium cepa L.*	Liliaceae	Onion/Pyaz	Prepared a pulp and mixed with common salt and taken internally as diuretic.
38.	*Aloe vera (L.) Burm F.*		Gwarpatha	Prepared a paste of fleshy leaves with garlic and given to cattle to increase digestion.
39.	*Asparagus racemosus Willd.*		Satawari	Tuberous roots are used as an appetizer diuretic, laxative, astringent and also useful in dysentery.
40.	*Gloriosa superba L.*		Kari-hari	Paste of tuber is used as

				abortifacient.
41.	*Lawsonia inermis (L.) Sweet*	Lythraceae	Mehndi	Powder of leaf is taken internally for hair growth and cooling effect.
42.	*Abutilon indicum A. juss.*	Malvaceae	Kanghi	Extract of leaf and neem oil are mixed and used to cure small-pox and skin diseases.
43.	*Tinospora cordifolia (Willd) Miers chintill ex Hook F. & Thoms.*	Menispermaceae	Giloy	Decoction of leaf is used to relief gastric problem
44.	*Albizia amara (Roxb.) Boivin*	Mimosaceae	Siris	Prepared a paste of powdered bark and applied externally for healing the wounds.
45.	*Albizia lebbeck (L.) Bent*		Siris	Powder of bark is mixed with un boiled milk of goat, turmeric, garlic, paper and then filtered. Juice is given orally to cure rheumatic joint pains.
46.	*Moringa oleifera Lam.*	Moringaceae	Sehjana	Prepared a Powder of bark and taken orally as an antidote to poisonous bites.
47.	*Musa paradisiaca L.*	Musaceae	Kela	Juice are obtained from central trunk is taken internally to dissolve kidney stone.
48.	*Eucalyptus tereticornis Smith*	Myrtaceae	Red gum/Yakuli	Inhalation of leaves vapor with hot water to relief body pain.
49.	*Syzygyum cumini (L.) Skeels*		Jamun	Power of seed is taken internally to control diabetes
50.	*Sesamum indicum L.*	Pedaliaceae	Til	Paste of leaves is mixed with water and then given is post-delivery pain in cattle.
51.	*Aegle marmelos (L.)*		Bel	A paste prepared from the

	Corr.	Rutaceae		ripen fruit pulp is applied on head to give cooling effect to eyes.
52.	*Murraya koenigii (L.) Spreng*		Curry-patta	Infusion and leaves are taken in vomiting. Leaf decoction is used as febrifuge.
53.	*Datura metel L.*	Solanaceae	Datura	Leaves are warmed with castor oil and applied externally for pus release and heal the wounds. Smoke of leaves are used to cures asthma.
54.	*Salanum americanum L.*		Makoy	Leaf is cooked and eaten to cure ulcer in the mouth and stomach.
55.	*Salanum torvum Sw.*		Bhurat	Unripen fruit is cooked and taken internally to eradicate intestinal worms.
56.	*Withania sominifera (L.) Dunai*		Aswagandha	Paste of root is applied internally for inflammatory conditions, ulcers, and scabies.
57.	*Ficus benghalensis L.*	Moraceae	Bargad	Latex is given to children to cure fever and dullness.
58.	*Vitex negundo L.*		Nirgundi	Leaves is tried into a cloth and made as a pillow to get immediate relief from headache. Inhalation of leaves vapors with hot water to cure sinus problem.
59.	*Curcuma longa L.*	Zingiberaceae	Haldi	Paste of rhizome is applied externally to reduce body swellings.
60.	*Zingiber officinale Rosc.*		Adarak	Juice of rhizome is taken internally to improve digestion.

In the present study, 60 plant species belonging to 25 families have been identified which have medicinal potential. In view of greater importance of medicinal and herbal plants. Many of the progressive farmer are switching over to cultivation of some of these plants as they found it to be more profitable than traditional crops. Farmers are practicing mass cultivation of *Aloe vera, Azadirachta indica, Phyllanthus emblica, Gloriosa superba, Moringa olifera, Ricinus cummunis, Tamarindus indica* and *Zingiber officinale.* Apart from these species, there is much scope to cultivate many, Other Medicinal plant species under cultivation and for their increase productivity, further research is needed as regard systematic and scientific cultivation methods which include organic farming irrigation, harvesting and preservation and marketing. To enhance the economic condition of rural people as well as poor villagers, it is essential to impart necessary training to farmers in mass cultivation practices.

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CHAPTER-12

Summary

Arid region of Rajasthan is characterized by its xeric flora and fauna due to extreme conditions. Xeric flora includes diversity of herbal plants. This region of desert suffers periodic droughts and comprised of isolate and dreary regions which are occupied by fixed or mobile dunes.

Plants of this zones are good and potential source of nutritional and medicinal compounds. In the present study of Sujangarh Tehsil, Churu district is selected for ecological survey from medicinal plants point of view.

12.1 Eco Climate Data

Temperature

The suajngarh is extremely hot arid like other desert towns of the region. There is a great variation in day and night temperature. The mean daily maximum and minimum temperature vary from 41.3°C in summer to 4.8°C in winter. During summer hot winds blow throughout the day but the nights are generally pleasant and cool. In winters, the day temperature is higher, but the night temperature may be near freezing point.

Rainfall

The annual rainfall is about 450 mm. Due to monsoon characteristics the maximum annual precipitation is recorded between the months of June to September.

Humidity

Expect during the brief rainy season, humidity in the air remains very low even during the rainy period. The summer month are the driest, especially in the afternoon of April and June when relative humidity is 20.5% while maximum average humidity has been recorded 78.75%

12.2 Soil Analysis

The physical analysis indicates that the soil of both the sites is sandy in texture. It has low water holding capacity. The chemical analysis indicates that the soil is slightly alkaline and the amount of nitrogen, phosphors and potassium contents did not show many variations in the soil of two different localities of Sujangarh tehsil.

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CHAPTER-13

Result and Discussion

In desertic and sandy habitats, floral diversity is comparatively higher which includes climbers, undershurbs and herbs. The plant's communities growing at the area are grouped under mixed xeromorphic thorn forest because of largely dominated by thorny and spiny species, which includes some evergreen non-thorny species. Major plant's species in this region are: *Euphorbia caducifolia, Salvadora persica, Lycium barbarum, Barleria prionitis, Abutilon indicum, Aerva tomentosa, Indigofera cordifolia, Phyllanthus amarus, Corotalaria medicaginea, Convolvulus microphyllus,* etc. In this area, the dominant plant's species are; gravel and compact habitats *Capparis decidua, Prosopis cineria, Salvedora persica, Lycium bararum, Zizphus numularia etc. Besides these, indigofera linifolia, Polygala erioptara, Celosia argentea, Peristrophe bicalyculata, Withania somnifera, Euphoribia hirta, etc.* are co-dominant plant's species.

Ethno botanic investigations plants and their uses in traditional medicine are graining great importance these days because a number of those plants from the traditional medicine have provided valuable drugs to the modern medicines. Prime examples are *Abutiton indicum* (linn.) sweet, *Achyranthes asper* linn. *Aloe barbadenisis* mill. *Argemone mexicana, Catharanthus roseus, Evolvulus alsinoides, Calotropis procera, Citrullus colocynthis, Cleome gynandra* linn., *Ricinus Cummunis* linn. Etc.

Every human civilization on the earth has been rooted in the biodiversity of nature. The domestication of wild crops made the first farming possible. Genetic resource taken from the wild, still sustain modern societies, providing food, fodder, medicines and industrial raw material.A discussion of human life on this planet would not be complete without a look at the role of plants, because plants have been an integral part of human society since the start of civilization. The main uses of plants include sources of food (cereals, vegetables, fruits, beverages, drinks, spices, condiments, seasoning, etc.); edibles (for colouring) or as dye-colours; ethno-medicine and ethno-veterinary medicine; pesticides and insecticides to protect the crops; wood for making equipments, utensils, tools, musical instruments, boats, oars and other household goods; cordage; commercial plants; crude drugs, packaging material, wild fruits and vegetables and fuel.There was a time, when only early men discovered the healing propeties of some of these plants of food products and several roots of plant such as those of snake-root plant (*Rauwolfia serpentina*), asparagus roots (*Asparagus racemosus and A. officinalis*) and stems, leaves, fruits and flowers and revealed to the modern men about their utility as a medicine for combating one or other diseases and aliments.

Although several of those wild medicinal plants used by early men have been domesticated today by the modern civilization and has become parts of our life and culture of agriculture also. Now days, such plants still grow and are conserved as well as protected by the indigenous and ethnic societies through folkore and through faith and folk traditions.

Diabetes mellitus is a common disease to all parts of world. This is a prevalent disease affecting the citizen of both developed and developing country (Khan *et al.,* 2010). In view of the increasing prevalence, there is growing need to develop integrated approaches towards the management and prevention of Diabetes mellitus by exploring potential offered by the traditional phytotherepies. It was very surprising that fruits crushing was treating for diabetes and patients were feel better (low sugar level) after regular crushing.

People have been using various folk remedies for treating fever due to cold and cough. These people have been preserving this folk knowledge in their scripts. Plant preparations, which they are used for treatment of cold and cough in most case are regarded as miracle remedies and sometimes only one does is sufficient for treatment. Plant parts were generally prepared as medicine using hot and cold water as the solvent but occasionally remedies were also prepared with milk and honey (Khan and Singh, 2010). Leaves of *Moringa oleifera* squeezed with salt on palm and added with some lime juice are applied around the neck for chocked voice. *Abrus precatorious, Adhatoda vasica, Asparagus racemosus, Ocimum canum, Solanum surrattense, Withania somnifera* etc. are commonly used for treatment of cold and cough. The study analyzed that most of people use modern allopathic medicines for fighting various diseases but some were totally depended on herbal medicines and some were observed to use different type of herbal drugs along with modern medicines. Various workers have been also recorded similar observations from different parts of India to cure disease (Borthakur, 1991; Sahu *et al.,* 2002; Sharma *et al.,* 2008; Kapoor *etal.,* 2008; Singh *et al.,* 2009).

The soil show wide variations in their morphological, physical and chemical characteristics and accordingly large variations occur in their resources potential. Major factor responsible for soil formation in this region are climate, parent material and history of landscape evolution. Physical properties of soil are the function of level of organic matter, its texture and structure, which are most significant aspect in plant production. Chemical properties of soil determine the availability of nutrients of plants.

The soil reactionis due to the soild solutions. This reacton is acidic or alkaline according as the hydrogen or hydroxyl ions are in greater concentration. In general high soil pH is associated with sodium and boron concentrations reach high levels in alkaline soils. Most of the plant grow best in soils that are neutral or only slightly acidic. Most of the plants are injured when grown in acid soils because acidity checks the activities of nitrogen fixing microbes and prevents the decaying process of humus, carbon dioxides and other toxic substance. Further,

at all these study area, *Parthenium hysterophours*, etc. These exotic species adversely affected the native flora. *P. juliflora* is growing in almost every patch of study area and cover the native plants area and shifted them.

Plant growth is mainly determined by nitrogen availability. Biological nitrogen fixation plays an important role in meeting the nitrogen requirement of legumes and also in enrichment of soil nitrogen status for use by the succeeding cereal crops (Lahiri and Rao, 1989).

Majority of medicinal plants are used in the form of juice, powder, decoction or paste and herbal products as well. The mixture of different plant's parts is also used for preparing herbal medicines. Decoctions were common method for preparation of drug remedies are used in the form of juice, powder, decoction or paste. People in the vicinity of the Sujangarh always use these medicinal plants to cure the disease like fever, cold and cough, skin disease, dysentery, pain, diarrhea, wounds, snake bite, insect bite, asthma, burn and other disorders. *Sida cordifolia, Physalis minima, Boerhavia diffusa, Citrullus colocynthis, Aloe vera, Cocculus hirsutus, Tinospora cordifolia, Vernonia cinerea, Cassia occidentalis, Aspargaus racemous,* etc. are important ethno-medicinal plants

In the present investigation that some species have the property of curing kidney disorder and urinary disorder by using plant species like, *Emblica officinals* Gaertn, *Boerhavia diffusa* L., *Acacia nilotica* L., *Achyranthus asper* L., *Cassia occidentalis* L., *Chenopodium album* L., *Citrullus colocynthis* (L.) Schard, *Pedalium murex* L. *Tribulus terrestris* L., *Tinosporacordifolia* (Willd.) Miers and some plants are used in curing diabetes like- *Azadirachta indica* A. Juss., *Cassia occidentalis* L., *Calotropis procera* (Ait) Ait. F., *Ficus benghalensis* L., *Acacia senegal* willd, *Leptadenia pyrotechnica* (Farssk.) Decne. *Momordica balsamina* L., *Solanum nigrum* L., *Tecomella undulata* (Sm.) *Seem.* Some plants's species have the property of curing jaundice like-*Abrus precatorius* L., *Calotropis procera* (Ait) Ait. F., *Leucas aspera* (Willd.) Link, *Fagonia indica* L. are used in leprosy. *Abrus precatorius* L., *Barleria prionitis* L., *Cassia occidentalis* L., *Chenopodium album* L., *Citrullus colocynthis* (L.)

Schard., *Cynodon dactylon* (L.) Pers, *Tecomella undulata* (Sm.) Seem, While some plant's species are used in curing arthritic diseases, skin diseases, old fever like- *Aloe vera* L., *Abrus precatorius* L., *Azadirachta indica* A. Juss., *Achyranthus asper* L., *Cassia occidentalis* L., *Cynodon dactylon* (L.) Pers., *Fagonia indica* L., *Ocimum sanctum* L., *Tecomella undulata* (Sm.) Seem, *Withania somnifera* Dunal. Other plants of ethanol importance, have the property for curing a wide range of diseases and disorders related to anemia, respiratory system, constipation, liver ailments, leprosy, animal bites, parasite related problems, rheumatism, dysentery, diseases of eye, ear and teeth etc. Some plants are used as common for different kind of ailments.

Results revealed that pH value were slightly differed at various sites of Sujangarh tehsil and seasonal variations were also not found at visited sites. The result indicate that the pH of soil of Sujangarh tehsil is alkaline in nature and ranged from 8.30 to 8.90. Electrical conductivity (mmhos cm-1) in the soil collected from different site of Sujangarh Tehsil ranged from 0.12 to 0.52 so the most soil sample were saline in nature. Therefor it is recommended to incorporate organic and use of salt tolerant variety of plants to achieve maximum growth and to reduce to adverse effect on flora. The available phosphorus in these soils were found from 37-50 kg/ha; where available nitrogen ranged from 16-21 kg ha-1. The most of soils samples were medium to normal in available phosphorus and the most of soils samples were low range in available nitrogen. Therefor it is recommended to increase additional dose of nitrogen and phosphorus fertilizers in area of low category. Water holding capacity (%) in the soil collected from different sites of Sujangarh Tehsil is ranged from 20 to 23. The most soils samples were low range in Water holding capacity. The most of soil sample were sandy loamy.

The many sample of soils were taken and it was investigated that the nitrogen contents ranged low and low status of water holding capacity. The soil is alkaline in reaction. The low content of available nitrogen and phosphorus in this region is associated with hot and dry climate complex due to low content of organic matter and reported nitrogen deficiency in soils. The climate is going to

change negatively in the reference of plants natural growth due to the low content of available nitrogen, phosphorus in the concerned area. The less content of N and low range of water holding capacity are not suitable for growing flora.

Summer temperature is very high and the diurnal range. During the day the summer June as high as 46.30C but drop in temperature after night full in rather sudden. In winter the day temperature are higher but the night temperature may be near freezing point.

Except during the brief rainy season, humidity in the air remains very low. The summer months are the dried.

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CHAPTER-14

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Abutilon indicm

Achyranthes aspera

Argemone mexicana

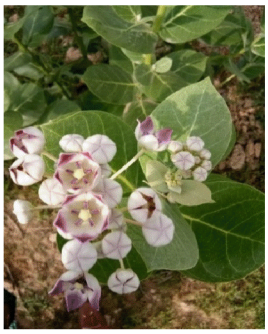
Asparagus racemosus

Ageratum conyzoides

Boerhavia diffusa

Capparis decidua

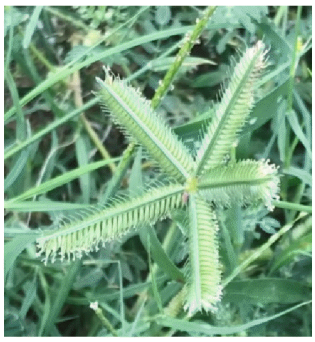
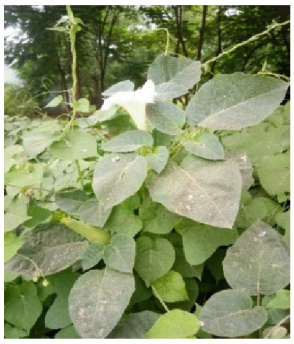
Cenchrus ciliaris



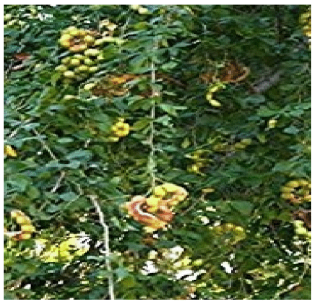
Calotropis procera

Some Medicinal Plant Growing at Study Area

Plate-1

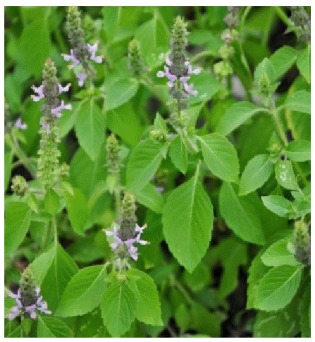




Cichorium intybus *Dactyloctenium sindicm* *Datura stramonium*


Fumaria indica *Pithecellobium dulce* *Leucas cephalotes*

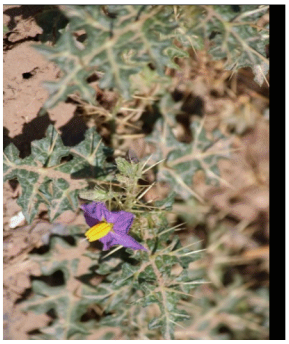


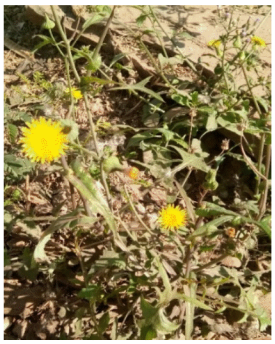


Launea procumbens *Phyllanthus emblica* *Ocimum sanctum*

Plate-2

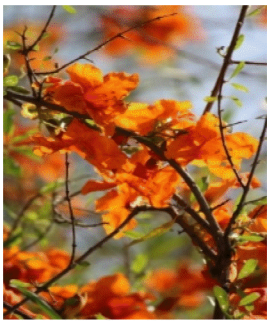
Some Medicinal Plant Growing at Study Area





Solanum surattense *Sonchus asper* *Sonchus arvensis*





Tamarix aphylla ***Tephrosia purpurea*** ***Tecomella undulata***



Tribulus terrestris ***Tinospora cordifolia*** ***Zizyphus nummularia***

Some Medicinal Plant Growing at Study Area

Plate-3

❑❑❑

About the Author

Anita Jeph, Assistant Professor, Department of Botany, Government Girls College, Jhunjhunu. She has qualified M.Sc., M. Phil. from MGS University Bikaner. She has 13 years teaching experience. She has attended and presented papers in many conferences, seminars and workshops. She has published 15 papers in referred/UGC approved National and International journals. She has authored one book "A Textbook on Algae and Bryophyta" and she has edited 3 books. She is preparing a botanical garden based on Ethno-botanical plants at SNMT Govt. Girls College, Jhunjhunu. She is also pursuing Ph.D. on "Biodiversity & Ethno-botanical study of Plants Traditionally used in Jhunjhunu district: A Part of Indian Thar Desert".

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