



AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS IN CHURU DISTRICT, RAJASTHAN

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Abstract—

Ethnobotany is a scientific discipline that examines how people in a particular community interact with the plants in their environment. This study focuses on the ethnomedicinal plants of Churu district of Rajasthan. I found 56 Ethnomedicinal plants from 26 different families which are used to cure many different diseases. The information or data was collected with the help of local tribal peoples, traditional medicinal practitioner, traditional healers, vaidas, Hakims and elderly peoples. Various data collection methods were applied to acquire information from the people using a standard questionnaire. Department of Botany, university of Rajasthan Jaipur, India. Largest family found during the study is Fabaceae. The vegetation in Churu district is of xerophytic type and grows in adverse conditions of temperature, scanty rainfall, high wind velocity. This area has vast diversity of medicinal plants which need to be conserved by in-situ conservation by establishing botanical gardens, germplasm banks in this area. Degradation of forest should be immediately stopped to preserve this vast knowledge of ethnobotany. Indian government should enact strict rules and make stringent laws to preserve these Ethnomedicinal plants wealth.

Keywords— *Ethnobotanical Study, Medicinal Plants, Medicinal Plants in Churu District*

1. Introduction

Ethnobotanical studies are an essential part of the field of botany that aims to document and understand the traditional knowledge of indigenous communities regarding the use of plants for medicinal purposes. These studies not only contribute to the conservation of traditional plant knowledge but also provide a scientific basis for the development of new medicines.

The Churu district, located in the Indian state of Rajasthan, is known for its diverse flora and rich traditional knowledge of medicinal plants. The region has a long

history of using plants for medicinal purposes, and the traditional knowledge has been passed down through generations. The ethnobotanical study of medicinal plants in Churu district aims to document and analyze this traditional knowledge and understand the medicinal properties of the plants used by the local communities.

This study is of great significance as it will provide valuable information on the traditional use of medicinal plants in the Churu district. It will also help in the identification of new plant species with potential medicinal properties, which can

be further studied for the development of new drugs. Additionally, the study can also aid in the conservation of the local biodiversity by identifying threatened plant species.

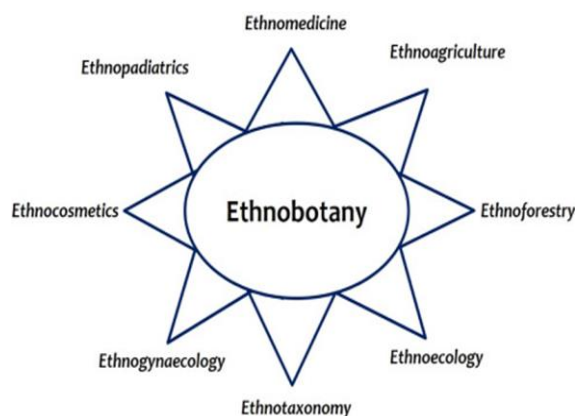
Overall, the ethnobotanical study of medicinal plants in Churu district holds great potential for contributing to the development of new medicines and the conservation of traditional plant knowledge.

1.1 Ethnomedicine and the Discovery of New Drugs:

Ethnobotany has a rich history that may be traced back to the Old Testament of the Bible.

1 “As a result of developments in modern science, various medicines trace their origins in discovery and development to the discipline of ethnobotany”. Quinine was extracted from the *Cinchona* spp. (Rubiaceae) plant, which was native to South America. Es Recent research has shown that the traditional Chinese medicine Quinghaosu contains artemisinin, which acts as an antimalarial.

2. It has been shown that up to 25 per cent of the traditionally given pharmaceuticals are directly or indirectly related to naturally occurring substances, which are often derived from plants. The discipline of ethnobotany deserves credit for its contribution to the pharmaceutical industry. More than half of the pharmaceuticals that are now prescribed are made from natural substances that originate from plants, microbes, and animals. 3, 4, and Farnsworth⁵ demonstrated that fewer than 90 plant species were responsible for producing 119 medicinally important chemicals.



Ethnobotany is beneficial to the process of developing new drugs since it provides leads to :

1. Direct drug molecules are isolated from their natural environments, such as reserpine⁶ and eserine.
2. Pharmacological compounds have undesirable biological activity or positive drug activities but adverse side effects.
3. Excipients used in manufacturing medicines, such as gum arabic extracted from the *Acacia Derek* plant (Guill. & Pier) (Mimosaceae).
4. Raw materials for manufacturing drugs: Diosgenin is derived from the plants *Dioscorea composita* Hemsl. Moreover, *Dioscorea terpinapensis* Uline (Dioscoreaceae) is used to produce steroidal medications.

These discoveries have surfaced even though ethnobotany and the typically associated practice of ethnomedicine are subject to several recognized constraints.

Alterations to Bioactivity and Their Development

1. The Leeds University Plants for a Future Database offers information on more than 7,000 plant species (Ethnobotany covers medicinal and edible plant species; visit <http://www.pfaf.org/database/index.php>). Common names, families, applications, geographical regions, habitat types, and keywords can all be

- used to narrow down a search for a certain plant.
2. "U.S. Department of Agriculture's Agricultural Research Service maintains Jim (<http://www.ars-grin.gov/duke/>) Duke's phytochemical and ethnobotanical databases". Plants, chemicals, biological activities, and even traditional medicinal applications can all be searched for by users.
 3. The website TCM Basics (<http://www.tcmbasics.com>), for example, introduces visitors to the core concepts of TCM while also featuring monographs on a small number of species. There are introductions to various topics related to the theory and practise of Traditional Chinese Medicine, as well as monographs on 116 different plants (TCM).
 4. The traditional Indian medicine databases (<http://indianmedicine.nic.in/welcome.html>) provide an online pharmacopoeia of Ayurveda, Unani, and Siddha drugs. The Department of Ayurveda, Yoga, Unani, Siddha, and Homeopathic Medicine of the Ministry of Health and Family Welfare is responsible for the site's upkeep. Includes an introduction to the fundamental concepts and principles shared by the many schools of Indian traditional medicine, as well as their respective formularies and pharmacopoeias.

Human civilization relies heavily on the resources that plants provide. After meeting his most fundamental needs, like those for food and shelter, the man looked to the plant world for answers to his other medical problems.

Native American medicine is another name for traditional or herbal medicine. It differs from allopathic medicine in that it does not rely on scientific studies to guide its practises of health upkeep, disease prevention, and patient care. There is evidence that traditional medicine practises

date back thousands of years. Practitioners in this field have made notable advancements in human health over the course of that time, especially as community-based primary care physicians. Traditional medicine is still very popular all over the world despite these advances. According to Sofowora, anywhere from 60% to 85% of people in every third-world nation practise traditional medicine. Several nations in Asia, such as China, India, Japan, Pakistan, Sri Lanka, Thailand, and Korea, rely heavily on traditional medicine. Over 40% of all medical treatment in China is supplied through traditional medicine, which is used on more than 200 million people annually.

Ethiopians have used herbal remedies for all sorts of ailments since the dawn of written history. Modern life in this nation cannot be imagined without the widespread use of traditional medicine. Oral tradition, early medico-religious literature, and traditional pharmacopoeias are all sources of documentation for these ancient medicinal treatments and cures. Several historians believe that the 15th century is when these records were first written.

The country's varied topography and climate conditions likely account for the estimated 6,000 vascular plant species found in Ethiopia. About 80% of the people and 90% of the livestock in this country regularly use some form of traditional medicine. Many illnesses, both human and animal, are treated with traditional medicine in Ethiopia. The most crucial figures in the practise of traditional medicine are traditional healers, who go by a variety of names depending on where in the country one resides. In order to preserve the wisdom of indigenous communities in the Berbere region regarding the medicinal properties of plants, this research project was initiated.

2. Literature Review

Osman Tugay, "Ismail Senkardes", Gizem Emre, Aysen Satiroglu; "Mehmet Zeki Haznedaroglu", and Mahmut Ulger; "Berivan Can Emmez"; "Ahmet Dogan"; Gizem Emre; Mehmet Zeki Haznedaroglu; (2021) This article reports on the findings of an ethnobotanical study of traditional knowledge about the therapeutic plants of Turkey's Mersin area (Turkey). Located in southern Anatolia, east of the Mediterranean Sea, is the province of Mersin, where this in-depth ethnobotanical study was undertaken. The primary objective of this study was to conduct in-depth interviews with experts in the field to gather ethnopharmacological data and knowledge on therapeutic plants. The objective was to learn about and collect indigenous peoples' preferred medicinal plants for use in traditional herbal medicine. We collected specimens of many plants on our frequent treks into the countryside.

The "Loes" research was done by Divya Jain and Pracheta Janmeda in 1996. *Gymnosporia senegalensis* leaves, stems, and bark were dissected and investigated for morphology, anatomy, and histochemistry (Lam.). Light and field emission scanning electron microscopy were used to analyse the anatomical and histochemical features of *G. senegalensis* (FESEM). The plant had several different types of trichomes, fibres, stone cells, starch, powdered calcium oxalate crystals, and stone particles when examined under a microscope. There were actinocytic stomata and a lactiferous channel in the stem, in addition to the epidermis, collenchyma, parenchyma, phloem partner cells, and lignified pericyclic fibre.

An ethnobotanical study of the medicinal plants indigenous to the high alpine area of the Chail Valley was undertaken by Shazia Sultana, "Muhammad Zafar", "Mir Ajab Khan", "Muhammad Pukhtoon", Taibi ben Hadda, Syed Fazl-i-Hadi Zada Khan, and Ghulam Yaseen in 2014. (District Swat-

Pakistan) The first comprehensive ethnobotanical study of the Chail valley in Pakistan's Swat region, this book presents the findings of that research. It's useful for learning about how native people in the area treat illness using herbs. The purpose of this study was to create an ethnobotanical inventory of the indigenous flora and document the many medical applications to which they have been put.

Tjahjaningrum Blessed Be the Muslims Trisnawati Dewi Hidayati Said Nurul Jadid E. Kurniawan Erwin Chusnul Safitri, Eka Andriyani Himayani Prasetyowati Indah Purwani, Kristanti Indah Tjahjaningrum Prasetyowati Indah Indah Kristanti Purwani Dwi (2020) studied the Tengger of the Indonesian city of Ngadisari to learn more about their traditional medicine. The indigenous Tengger people of Indonesia have made considerable use of plants in their traditional treatment. In contrast, this indigenous knowledge was completely unknown until quite recently. To learn how the Tengger people of Ngadisari hamlet, Sukapura District, Probolinggo Regency, Indonesia, use plants in their traditional medicine. A total of 52 people were questioned, both informally and formally, representing 10% of the households in the hamlet. Sachin D. Kuvar and R. D. Shinde (2019) brought their ethnobotanical study on the Kokni tribe in the Indian state of Maharashtra to a successful conclusion. In the districts of Nasik, Dhule, Thane, and Nandurbar in the Indian state of Maharashtra, the Kokni people make they're living off of the abundant plant life. According to the findings of the ethnobotanical study, the region's indigenous inhabitants used medicinal plant species from many plant families to cure a wide range of ailments. The history of tribal medicine is comparable to that of other mainstream medical practices. It is only possible to convey the information vocally. there is very little amount of information about the origin of the vast majority of medications. It's quite amazing the medicines that are available for so

many different diseases. The indigenous inhabitants of the area identified the benefits of plants by making use of the empirical knowledge they had.

Indigenous remedies from Southern Rajasthan are researched by K.L. Meena and B.L. Yadav (2008). To record the indigenous peoples' long-held knowledge of medicinal plants and the methods in which they make use of them, researchers combed the southern region of Rajasthan, including the districts of Chittorgarh, Udaipur, Banswara, and Dungarpur. The Bhils, Damors, Garasias, Kalbeliaans, Kathodiaans, and Meenas are some of the local tribes. These people, in addition to the medicine men and women who serve them, have significant knowledge of the properties of plants and their uses in medicine. This paper aims to record 31 different plant species, spanning 22 families and 31 genera that the indigenous people have traditionally used.

B.B.S. Kapoor and Swati Lakhera (2013) conducted on ethnomedicinal plants used in herbal and traditional forms of medicine. The Jodhpur area, which includes the Thar Desert, is home to many plants with potential medicinal uses. There is great potential for the medical and pharmaceutical industries to benefit from the area's natural resources, particularly the medicinal plants. For centuries, locals, tribal populations, sellers, and native doctors like Ojhas, Bhagats Bhopal, and Ayurveda professionals have relied on these therapeutic plants in herbal and traditional medicines. Traditional plant-based medicines are well understood by the "Kalbelia", "Nats", "Bhils", "Raika", Bhopal, Banjara, Gadolia-Lohar, Saharia, and Meena people that reside in this district.

J. E. Morvin Yabesh, S. Prabhu, and S. Vijayakumar (2014) investigated the use of medicinal plants by indigenous healers via ethnobotanical research. Medicinal plants have the potential to treat and prevent a wide range of conditions. As soon as

humanly possible, these specifics must be recorded. To our knowledge, this is the first research in ethnobotany to employ the ICF approach in order to do statistical analyses on plants. The researchers set out to learn what kinds of plants local healers in Silent Valley, Kerala's Palakkad district, utilised for medicine and treatment, as well as the plants' traditional names, preparation methods, and clinical uses. The gender of Purushottam is male. In the year 2020, researchers Thirumurthy and Irfana Mol studied the traditional Kani and Kurichiyar remedies of Kerala. The natural world is home to a wide variety of flora and wildlife that have yet to be fully explored. Ethnobotanical knowledge among indigenous peoples is crucial for the survival of traditional medicine and the advancement of scientific inquiry. One method of exploiting and maintaining biodiversity is the documenting of traditional medical practises through botanical study. Some of Kerala's ethnically and tribally distinct populations continue to practise traditional healing methods that make use of a wide range of natural resources. Kerala is home to a wide variety of indigenous communities, each with its own culture and customs.

Many plants are used in Southern Rajasthan's traditional medicine, and KL Meena and BL Yadav (2010) looked into them. Expertise with medicinal plants was documented by researchers in the southern region of Rajasthan. The areas of Chittorgarh, Udaipur, Banswara, and Dungarpur were covered by this analysis. Several different ethnic groups live there, such as the Bhil, Damor, Garasia, Kalbelia, Kathodia, and Meena. Their medicine men and women have an in-depth understanding of the plants' curative properties. A historical overview of plants utilised for traditional medicine by indigenous peoples is provided. For the first time in human history, the names of Native American plants and their traditional methods of preparation and gathering will be recorded. Specifically, we have information on 31

species, 31 genera, and 22 families.

Sariska and Siliserh, in the Alwar district of Rajasthan, “S.C. Jain”, “R. Jain”, and “R. Singh” (2009). The purpose of this study is to list the plants used by locals in the Sariska and Siliserh districts of Rajasthan, India. The study found 110 plant species over 88 taxonomic categories and 43 family groupings that were employed in traditional medical practises. Fever, diarrhoea, skin problems, jaundice, and rheumatism are just some of the illnesses that may be treated using medicinal plants. There has been a decrease in plant populations due to overgrazing, encroachment, and unsustainable usage. Long-lived medicinal plant species are under danger of extinction owing to human activity in the region. Locals have no idea about these plant communities since they haven't taken the time to learn about their history or do the necessary study. Traditional medicine relies heavily on the results of this survey. Researchers and medical professionals who focus on medicinal plants may provide important insights to contribute to the development of future conservation programmes.

Subhan C. Nath and Dilara Begum (1988). Studying the ethnobotany of Indian herbal remedies for skin and other ailments In order to better understand the plants used to treat skin disorders and other ailments in northern India, ethnobotanical records were analysed. Out of the 275 plant species studied, 224 were reported to have been used to treat human ailments such as asthma, allergies, burns, cuts, inflammation, leprosy, leucoderma, scabies, and STDs. *Artemisia* (CI), *Centella asiatica* (L.), *Cyclea pellata* (Hk.), *Datura metal* (L.), and *Drymaria cordata* (L.) (L.) (Ex-Roam & Schult, Willd.) are all nilagiric plants.

Derek J. Chadwick, Maurice M. Iwu, and Joan Marsh are the authors of this piece (2007) Lead in the Search for New Drugs Derived from Ethnobotanical Studies of African Medicinal Plants. From an African perspective, nature is a sentient being, its

many parts interdependent on one another and on human beings. The materia medica consists mainly of edible plants, spices, and common herbs, as opposed to the numerous, strictly controlled poisons used in conventional Western medicine. There are currently two main tracks for drug development based on ethnobotanical leads: the first is the traditional approach of identifying single plant species with physiologically active chemicals, and the second is the characterization and standardisation of traditional recipes for reformulation as medicines. Ethnobotanical lead identification is one approach, and ethnobotanical lead standardisation is another. By using the first technique, many African plants with medicinal properties have been discovered, and several biologically active molecules have been isolated. Physostigmine, used to treat glaucoma, is extracted from the *Physostigma* venomous plant; antiviral agents were recently discovered in *Ancistrocladus abbreviatus*. Although it has received less attention, the second method—which aims to optimise blended medications as formulated dosage forms—may be more relevant to the needs of underserved rural populations. The goal of this approach is to improve the efficacy of the formulations. Ethnobotanical leads in drug development projects require that local communities and individual informants be compensated fairly and reasonably.

Joaquim Matavele and Mohamed Habib (2000) conducted an ethnobotany study titled "Medicinal Plant Use" in Cabo Delgado, located in Mozambique. The people living in Mozambique's rural areas are very dependent on the country's natural resources. Residents in Cabo Delgado, for instance, make use of the natural environment that surrounds them. Plants have a wide range of applications, including in cuisine and handicrafts, as a primary energy source, construction, and even medicine. For this research, 146 residents of the Cabo Delgado area,

including adults and children, were asked about the various ways they used plants for therapeutic purposes. This community listed 13 plant families and 16 different plant species. The usage of numerous categories of people depending on their gender and age was compared, and inequalities in specific groups were observed. It is common knowledge that older people have a deeper comprehension of medicinal plants than their younger counterparts. Both men and women possess an equal level of knowledge about medicinal plants.

Alpina Begosi (1996) Among the ecological methods used in ethnobotany is diversity indices. Ecological concepts in ethnobotanical research are investigated, specifically in studying diversity. Diversity indices are very helpful tools when it comes to examining the relationships between humans and their environments. These indices make it possible to compare how distinct populations use plants in various settings. An analysis of recent significant publications in ethnobotany was carried out, and ten pieces of research—seven from Latin America, two from Asia, and one from Europe—were selected to develop diversity indexes based on the data that was readily accessible. Both the Shannon-Wiener curve as well as the rarefaction curve were computed. It was discovered that Peru, Mexico, Brazil, and Thailand each have their unique plant-based industries and uses. The island biogeography hypothesis is used to explain the low variety that can be found in Tonga. The amount of effort put into sampling may be evaluated using rarefaction curves. Regarding the design and management of conservation areas, having an accurate estimate of the range of resources used by native populations may be helpful.

Buzios Island, A Begossi, and HF Leito-Filho (1993) were plants used in a coastal fishing community in Brazil. In the past, agriculture was the primary economic activity in the Pesqueira village located in

the Bios region of the Ilha dos Blios (southeast Brazil). Even if there has been an increase in fishing-related activities, a decrease in agricultural production, and certain shifts from traditional medicine to modern medicine, harvested and grown plants continue to play an important part in the economics of the community. This research presents a description. Io Geral da vegetal. io da área, das plantas cultivadas ou coletadas para alimenta,. Io construes.

Gisela M. Figueiredo, Hermógenes F. Leito-Filho, and Alpina Begossi(1993). Their findings were published in *Plant Use Diversity in Gamboa (Itacurucá Island, Brazil)*. The inhabitants of Gamboa, a small village on Itacurucá Island in Rio de Janeiro, Brazil's Sepetiba Bay, rely heavily on the vegetation of the area. The forty plant families that contain the ninety plant species used for things like food, building materials, crafts, and medicine are all interconnected. The majority of respondents to a recent survey admitted to having used plants for medicinal purposes. Gamboa and other coastal communities conduct research into the therapeutic use of plants using diversity indexes. It was determined how different demographics, such as age, gender, and occupation, use a variety of services. "The concept of island biogeography has been shown to be useful for analysing the varying degrees of resource consumption that may be found on different islands".

Begossi (1992) in the journal *Human Ecology*. An illustration from the Sepetiba Bay (Rio de Janeiro State, Brazil) Gamboa is a small community in Sepetiba Bay with 26 homes. It is located on Itacurucá Island (State of Rio de Janeiro, Brazil). Most locals are self-sufficient fishermen who fish in a traditional fashion utilizing canoes, rowboats, or motorboats with surrounding nets. The predictions made by the optimal foraging theory, often known as the patch model, are compared to the actual behavior of fishermen when they are on fishing trips. Specifically, the patch residence time

comes under scrutiny. The different types of animals that fishermen target need different fishing strategies. They spend more time in patches, although they have fewer shrimp patches.

Maria Adele Signorini, Matteo Tonini, Piero Bruschi, and Valeria Urso (2016). The people of southern Angola, who call the Mopane woods home, employ many different kinds of wild plants for both medical and culinary purposes, according to the findings of an ethnobotanical field research. Importance from an ethnopharmacological viewpoint in clinical practise: There is a lack of information on the plants historically utilised by local communities, notably medicinal plants, because of the lack of interest shown by ethnobiologists in the Mopane woods. The mopane woods provide essential resources for the local economy. Our study's overarching goal is to document seven underprivileged communities' ethnobotanical expertise in southern Angola's Mopane area (Namibe province). We zeroed particularly on medicinal and edible plants to highlight the value of wild plants to local economies and, potentially, find species with potential in the pharmaceutical business. The required ethnobotanical data was gathered through semi-structured interviews. When data collecting was finished, the collected information was put into a database. For the sake of this study, the terms "Level of Fidelity," "Informant Consensus Factor," and "Cultural Importance Index" (CI) were made up (FL). Twenty-six males and forty women (66 total) were interviewed. There were a total of 1247 references found, with 104 ichnospecies recognised at several taxonomic levels and another 132 recognised at only one or two. In the case of medicine, 116 species were reported together with 20 uses (cited 650 times); in the case of food, 33 species were recorded along with 8 uses (597 citations). Most often ingested was the fruit (471 citations; 21 ichnospecies), next the subterranean organs (288 citations; 82 ichnospecies), and

finally the leaves (82 citations; 4 ichnospecies) (175, 41). In terms of CI, the plants with the most cultural value to the groups we looked at were berchemia discolour, "ximenia americana var". "Americana", and "adansonia digitata". All of them are considered woody plants, with trees making up 34.6%, "shrubs" 32.7%, "perennials" 21.2%, "annuals" 8.7%, and other plants 2.8% of the total. Most commonly, medicinal plants are used to treat digestive problems (52 ichnospecies, 205 citations), obstetric and gynaecological problems (27, 40), and respiratory problems (27, 40). (25, 54). The categories with the highest FIC scores were those dealing with the body (FIC141.0), the circulatory system (FIC140.91), malaria (FIC140.81), and the digestive system (FIC140.81) (FIC140.55). The highest approval rate (FL14100%) went to the plant species *Myrothamnus flabellifolia*, which is used to treat respiratory illnesses and colds. This was followed by *Terminalia prunioides*, which is used to treat digestive problems (93% approval rate), and *Euphorbia sub salsa*, which is used to treat backaches (86% approval rate). Five plants were identified as medicinal by the informants, but neither the ethnobotanical nor the ethnopharmacological literature revealed any information on their usage. Fresh fruit (20 ichnospecies, 287 citations), alcoholic (11) and non-alcoholic (10) beverages, massage, a kind of mash (4, 65), vegetables (10), and many more commercial commodities are made from wild plants. According to the results, residents of Mopane settlements in southern Angola have an in-depth understanding of the local flora. Some of the plants discussed in the interviews were singled out as being particularly important to the residents' way of life. These communities are located in Mopane Province. We also found a few plants that may be useful in the pharmaceutical industry.

3. Methodology

3.1 INTRODUCTION CHURU DISTRICT:

More than 50,000 of the 4,20,000 blooming plants discovered worldwide (Govaerts, 2001) are applied for healing purposes (Schippmann et al., 2002). It is estimated that around 43 per cent of all flowering plants found in India have some medicinal use (Pushpangadan, 1995). Ancient scriptures reveal that people in India have been extracting medicinal properties from plants for a long time (Tulsidas, 1631: Samvat; Charak, Drdhabala, 1996). However, the first systematic examinations of this kind were conducted in 1956 (Rao, 1996), and these kinds of studies are acquiring growing relevance and appeal as traditional knowledge becomes less prevalent and plant populations continue to decrease. This industry today possesses a considerable amount of previously undiscovered treasures (Farnsworth et al., 1985). Most of Churu's rural regions rely on plants as their primary source of traditional medicine. In India, where a wide variety of powerful medicinal herbs grow wild, there is a wealth of knowledge about medicinal plants that have been orally passed down via folklore and primitive societies. This information has been passed down down the generations. Even though various Research on ethnobotany has been done in a number of the country's remote rural and tribal groups, a significant quantity of information has not yet been uncovered. Research in the field of ethnobotany is very important because it helps bring to light on the various plant species in our diverse flora that have the potential to be employed in the production of pharmaceuticals that are both safer and more effective for the benefit of humankind. Conservative estimates suggest that around 70 per cent of Indians still use various plants (Singh & Gautam, 1997). Around 2500 plant species hailing from around 1000 different genera are used in many places by the traditional healers

(Chandel et al., 1996). Ethnobotanical research has been carried out by a significant number of experts working on this subject in a wide range of locations throughout the state of Rajasthan. On the other hand, there is no indication that the district's numerous subsectors used plants as traditional medicine. These applications of the plant lack any supporting documentation. This prompted the current study, which aims to record the medical plant knowledge and folklore of rural residents of the Churu district. Particular attention was given to documenting information on therapeutic plants. The Indian state of Rajasthan is located in the country's north, and one of its numerous districts is called Churu. The Bancroft Rajputs founded it first. A few people think it was the Jat village of Kalera ka Bas. During a battle in 1871, the Churu fort, built in 1649 by Thakur Kushal Singh, fell into the hands of the Bikaner army. Churu, which is also the name of a town in the district, is where the district government is headquartered. One possible location is Bikaner, in northern Rajasthan. The districts of Nagaur and Jhunjhunun lie to its south, Sikar and Bikaner to its southeast, and Hanumangarh and Hanumangarh to its west and north, respectively. The state of Rajasthan is broken up into the following districts. The state of Haryana is located to the east of here. About 2,039,547 individuals called this region home as of the 2011 census. The literacy rate is 67.46%, and there are 938 more women than men for every 1,000 people. There are eight tehsils in the district; they are named Churu, Sidhmukh, Ratangarh, Taranagar, Rajgarh, Sardarshahar, Sujangarh, and Bidasar. The Churu District's most populous tehsil is Sardarshahar, while Sidhmukh is its most recent addition. Bajra and guar are the two most important crops.

Attractions:

Other important towns in the district include Ratannagar, Chapper, Bidasar, and Rajaldesar. Sujangarh, which is located to

the south of the district; Ratangarh, which is located to the southwest of the district, Sardarshahar, which is located to the north of the district, Tarangire, which is located to the northeast of the district; and Rajgarh, which is located to the east of the district, are its administrative centres. It is estimated that the Tal Chhappar Sanctuary, dedicated to protecting blackbucks, is home to at than 1,680 blackbucks and migratory species. People interested in the natural world often choose to spend their holidays there. The following are examples of well-known places to visit by tourists:

1. The Havelies are the enormous palaces located at Ratannagar, Ratangarh, and Sardarshahar.
2. Salasar's Hanuman temple.
3. Sujangarh's Venkateshwar temple.
4. The local deity known as Goga Pir had his beginnings in the town of Andrews.

In order to worship at the Bhadrakali Temple, adherents of the Shakta Tantra religion go from all across India to Rajaldesar. Anant Shri Vibhushit Dandi Swami Jogendrashram Ji Maharaj, who is widely regarded as the founder of the Shakta Tantra school of thought, established this temple. The Baba Phool Nath Temple may be found in the state of Rajgarh in India, near Nawa. The inhabitants of Nath are quite knowledgeable when it comes to this temple.

Demographics:

According to the most recent census (2011), there were about 2,039,547 people living in the Churu district. Population-wise, the region is on par with New Mexico and Botswana in the United States. In a country of 640 districts, this one is ranked a dismal 224. There are a lot of people living in this area, as there are 148 per square kilometre (380 people per square mile). Between 2001 and 2011, its population grew at a pace of 6.1% per year. There are about 938 more women than men for every 1000 inhabitants in Churu, and the literacy

rate is close to 67.46%.

Languages:

Bagad is spoken predominantly in Sardarshahar, Taranagar, Ratangarh, and Sadulpur. Communication is often done in Rajsthani and Marwadi among the people who live in Churu, Sujangarh, Chapar, and Bidasar.



Fig. 1: A map of Rajasthan depicting the Churu study area

3.2 Surveys:

In the uninhabited areas of the Churu district in the Thar Desert in India in 2005, a study was conducted. The purpose of the research was to compile a list of natural medicinal plants and their uses. The investigation was carried out during each of the four seasons to collect the maximum amount of feasible data. In addition to researching the literature, information about the medicinal uses of native plants was collected from general locals, old age rural people, Ayurvedic doctors and local herbal medicine vendor. Interviews were conducted with a total of three hundred individuals. The local language, Shekhawati, was used for the interviews. A total of 186 males and 114 females were picked randomly, and their ages ranged from 25 to 57.92. In addition, men and women who practiced traditional medicine known as "guns" were consulted for direct plant observation and identification. In

order to collect data from the resource people, conventional research methods and a standardized questionnaire were used (Martin, 1995).

Using published regional flora, the plants that were gathered during the surveys could be recognized (Bhandari, 1990; 1993, Shetty and Singh; Sharma, 2002a,b) and by comparing voucher specimens to known herbaria collections in the Jaipur Herbarium, which is located in the Botany Department at the Rajasthan university in Jaipur, India. The Jaipur Herbarium is widely regarded as one of the best herbariums in the world. In order to gather as much information as possible from respondents, the survey was carried out continuously throughout the year. Using the information gathered, a list of plants belonging to a variety of families, together with the traditional applications for those plants, the plant parts that have been used, recipes, and modes of administration, is compiled. This list is laid up in alphabetical order according to the names of the plant families and the plants included in each family. Interviews were conducted with members of the general public, knowledgeable older adults who reside in rural areas, traditional herbal medicine practitioners, and local herbal medicine traders as to gather data on the curing benefits of native plants. Additionally, a review of the relevant literature was conducted. During this research, there were three hundred different interviews with local inhabitants. In order to get responses to the questions, we randomly recruited 186 male and 114 female participants, whose ages ranged from 25 and above ($x = 57.92$). The same questions were asked to both sets of participants.

In addition, with the aid of local healers known as "guns," direct plant observation and identification were carried out. In addition, established data collection methods were used to get information from resource persons via a standard questionnaire (Martin, 1995).

Documentation was compiled on the following aspects of the plant: its indigenous name, the qualities that provide the medicinal plant value, recipes that include the herb, and the procedure for administering the herb. Plants that were gathered during the field trips were recognised by consulting published regional flora (Bhandari, 1990; Shetty & Singh, 1993; Sharma, 2002a,b) and by observing voucher specimens to known herbaria assemblage at the Botany Department in the Rajasthan University, abbreviated as RUB, in Jaipur, India. The information acquired was put to use in the process of compiling a list of plants hailing from various plant families. This list was then ordered alphabetically by family name and plant name.

Plants play an important part in the natural world and serve as a model for the creative work that God has done in general. There is often an end goal in mind while cultivating plants. They are the engine that keeps the cycle of life on our planet turning over and over again. A portion of the people living in the Churu District thinks that, in addition to modern medicines, they should also use traditional medicinal practices. The region's population is mostly comprised of individuals who live in rural areas and indigenous people. People living in rural areas and indigenous communities often turn to medicinal plants to treat various illnesses and injuries, including infections, wounds, fractures, and others. In tribal communities, there is a wealth of information about ethnobotany. The most recent findings indicate that individuals living in rural areas use a total of 56 different plant species to cure various illnesses. To a large extent, the extent to which these plants have therapeutic characteristics is decided by traditional medicine practitioners. The investigation uses a great deal of the plant, including its leaves, stems, bark, roots, and so on, amongst other components. It is possible to utilize the plant itself.

Table List of villages selected for the study.

Sr. No.	Name of village/city	Number of informants
1	Beenasar	04
2	Asloo Station	03
3	Badhki	03
4	Balrasar Athoona	03
5	Balrasar Tanwaran	04
6	Dhani Ranwan	06
7	Dhameri	07
8	Dhadhar	03
9	Dhani Lalsinghpura	02
10	Beekasi	02
11	Taranagar	03
12	Sardharshar	02
13	Sujangarh	04
14	Salasar	05
15	Ratangarh	03
16	Dabla	03
17	Rajgarh	02
18	Bidasar	05
19	Sidhmukh	03
20	Dhadhariya Charnan	04
21	Dhani Doongarsinghpura	04
22	Dhani Lachhmansingh	01
23	Dhani Muneemji	02
24	Dhani Pannesingh	04
25	Chalkoi Beekan	05
26	Chandelnagar	05
27	Charanwasi	02
28	Churu (M CI)	05
29	Churu (Rural)	10
30	Chhajusar	2
	Total	111

3.4 materials and methods

3.4.1. Study Area

One of the districts that make up the Shekhawati region of Rajasthan is called Churu. The Churu district may be found in the far northeastern part of the state of

Rajasthan. The following is a list of its coordinates: Longitude 73° 51' to 75° 41' to the east and latitude 27° 24' to 29° 00' to the north. Even though it is just roughly 13,858 km², it has a very diversified population dispersed across the territory (Fig.1). In addition to being placed at an elevation of 400 mts above sea level, the site may be in the Thar Desert in India. The region is famous for its extreme daily and recurring temperature swings, which range from 2 degrees Celsius in the winter to 49.8 degrees Celsius in the summer, shifting dunes, irregular and little rainfall, strong wind speeds, and sparse, prickly flora. The temperatures in the area range from -2 degrees Celsius in the winter to 49.8 degrees Celsius in the summer. The location has received much praise as a result of these characteristics. Temperatures in this part of the world range from a low of -2 degrees Celsius in the winter to a high of 49.8 degrees Celsius in the summer. The growth of desert flora that offers a range of medicinal advantages may be connected to the region's rich sandy soil and high sunlight levels, both of which are significant natural resources. The arid environment provides the perfect conditions for the growth of plants of this sort. Most individuals know the chemicals provided and their potential therapeutic usefulness .



Fig 2: A Outline Rajasthan Map depicting the District Churu

3.4.2. The categorization of plants

Plants were categorized as either wild or cultivated, and they were also categorized in terms of the growth types they displayed (herbs, shrubs, and trees).

1. Herbs are planted with thin, green stems and a quick decomposition rate. Herbs, on the other hand, are separated from shrubs by several distinguishing characteristics that establish them as a separate group of plants:

Herbs are delicate plants with fewer leaf and stem structures than other plants.

b) The stems of these plants have a fine and silky texture and a greenish tint.

c) They are on the small side.

Compared to other types of plants, the lifespan of a herb is not very long. They are appropriate for no more than one or two seasons at the very most. Herbs include grass, maize, rice, mint, coriander, and other plant species.

2. Shrubs are plants with woody stems and branches that emerge from the stem above ground and are about the same size. Shrubs may be differentiated from trees by their woody stems and branches. The characteristics that are described in the following list serve to differentiate shrubs and herbs as two distinct kinds of plants:

a) Shrubs are more adaptable than trees to growing in confined spaces.

b) One of them is an average of three meters in height.

When the branches of a shrub grow closer and closer to the ground, the plant develops a bushy appearance.

d) They are indifferent to the soil they grow as a part of their environment.

f) Shrubs have a life cycle that follows the seasons and thrive in full light.

A few examples of shrubs include Tulsi, Lemon, Jasmine, Nerium, China Rose, and Pomegranate. Pomegranate is also a shrub.

3. Trees are enormous, towering plants with

a single, sturdy, woody stem called a trunk. Trees may grow to great heights. Trees can survive for thousands of years if they are well cared for. Above the earth, trees produce branches made of wood, leaves, and twigs. Leaves are another product that trees produce. Coconuts and palms are considered trees even though they do not have branches. The following is a list of some of the qualities that trees have:

a) A tree will have a single, sturdy, and woody stem capable of standing independently.

b) The numerous branches of the tree are each developed at a certain height above the ground.

d) On average, they live far longer than other animals.

d) Trees have the potential to develop into large organisms that can fill all three dimensions of space.

There are many different kinds of trees, including mango, neem, palm, and banyan, among others.

3.4.3 The existence of a diverse selection of different species in the environment.

The number of individuals discovered inside a particular sample unit is referred to as the "abundance" of that species. The quantity of plants is utilized to create four arbitrary subgroups based on the abundance of plants. The categories are as follows: very unusual, uncommon, common, and moderately common. Many fall into the latter category. The first category has a variety of unusual items.

3.4.4 The study of plants and how they are used.

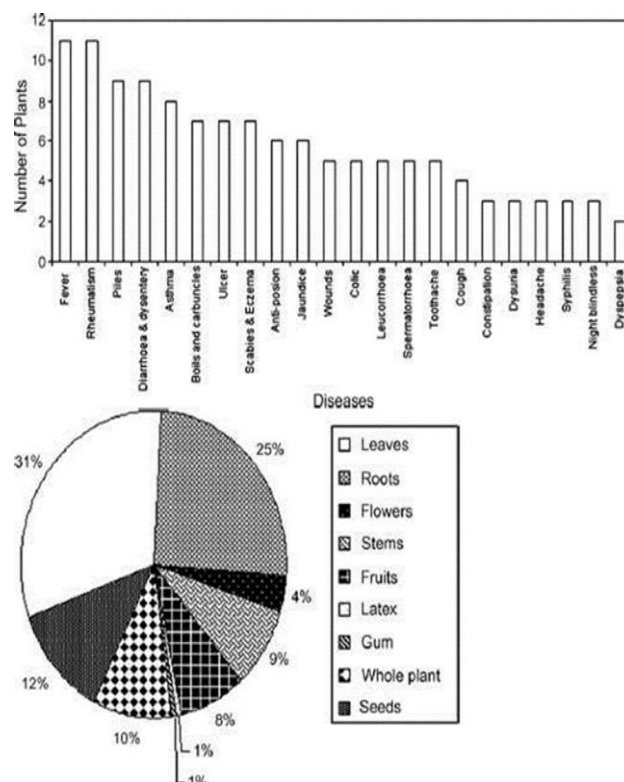
To establish whether or whether there is a connection between respondents' ages and their levels of knowledge about medicinal plants, the Spearman rank correlation test was carried out. The age was directly proportional with their knowledge of the sum of ethnobotanical plants native to that location and exploited (Spearman rank correlation test, $r = 0.57$ and 0.51 ,

respectively, $P < 0.05$); this was shown by contrasting the two values. The previous generation was more knowledgeable about and experienced using a wider variety of medicinal plants than the current one. On the other hand, women were known to have a deeper understanding of medicinal plants and to use them better than men.

(3.5) Techniques

Two distinct approaches of inquiry were used to compile a history of the large body of information that constitutes ethnomedical knowledge. Interviews with local peasants, folk healers, ghosts, vaid, saints, homoeopaths, and other people in the NWS region were the first stage in this process. These events also included interviews, roundtable discussions, and chats with the celebrities above and public figures. In the second step of the process, the traditional medical literature was combed through. This step was part of the protocol. People who live in the rural Churu district of Rajasthan's Shekhawati area were the subjects of research conducted not too long ago to investigate the traditional techniques of therapy that they use. In order to get as much information as possible from the survey, it was administered many times during the year. The daily routines were strictly controlled and enforced, and participation in various social and religious rituals was actively promoted. Because of this, meaningful connections between individuals were encouraged to emerge. Having respondents fill out questionnaires written specifically for them and in their local language was another method of data collection. Himalayan flora (Sharma & Balakrishnan, 1996), Indian flora (Sharma & Balakrishnan, 1996), southeastern Rajasthan (Sharma & Tiagi, 1979), the Upper Gangetic Plain, and the neighbouring Siwalic and Sub Himalaya Tract have all been researched for their flora (Duthie, 1903–1929). Sharma and Bal both made contributions to the book "Flowers of Himalaya" (Polunin &

Stainton, 1984). In the preceding investigation, we rated the reliability of the information.



Evaluation:

The original form of traditional medicine that gave rise to other forms of traditional medicine, was largely disregarded in India and allowed to expire of natural causes. Various forms of traditional medicine, on the other hand, thrived there and received public and government support. The Indian government has not taken much action to invest in any financing mode to ensure the maintenance of various medicinal plants that numerous traditional folk healers have historically utilized. This is a problem (Sinha, 1999).

In the study I identified and documented 56 ethnomedicinal plants that belong to 26 families. The identified plants species along with Habit and significance are summarized in table. Largest family is Fabaceae. With other families like Acanthaceae, Amaranthaceae, Apiaceae, Apocyanaceae, Aristolochiaceae, Asteraceae, Bignoniaceae, Cactaceae, Casesalpiniaceae, Cappariaceae, Caricaceae, Chenopodiaceae,

Convolvulaceae, Crassulaceae, Cucurbitaceae, Cuscutaceae, Cyperaceae, Euphorbiaceae, Lamiaceae, Liliaceae, Lythraceae, Malvaceae, Meliaceae, Menispermaceae, Mimosaceae, Moraceae, Papaveraceae, Poaceae, Ranunculaceae, Solanaceae, Zingiberaceae, Zygophyllaceae etc.

4. Results

In the study I identified and documented 56 ethnomedicinal plants that belong to 26 families. The identified plants species along with Habit and significance are

summarized in table. Largest family is Fabaceae. With other families like Acanthaceae, Amaranthaceae, Apiaceae, Apocyanaceae, Aristolochiaceae, Asteraceae, Bignoniaceae, Cactaceae, Casesalpiniaceae, Capparidaceae, Caricaceae, Chenopodiaceae, Convolvulaceae, Crassulaceae, Cucurbitaceae, Cuscutaceae, Cyperaceae, Euphorbiaceae, Lamiaceae, Liliaceae, Lythraceae, Malvaceae, Meliaceae, Menispermaceae, Mimosaceae, Moraceae, Papaveraceae, Poaceae, Ranunculaceae, Solanaceae, Zingiberaceae, Zygophyllaceae etc.

Name of Plant	Type of Plant	Significance
Aristolochia Bracteolata (Kiramar)	Creeper Perennial plant	Treats intestinal worms, skin irritation and insect bites
Artemisia scoparia (Bana)	Hardy Herbaceous plant	Treat jaundice, reduce fever, restore gallbladder function, increase diuresis. Potential use of anticancer drugs. "After wash-dry-crush, the leaves are combined with high quality green tea, sterilized by baking", screened and packed in bags. blossoms, young stalks and plant seeds used for extraction of essential oils which contain antibacterial, antiseptic, antipyretic, vasodilator and diuretic properties. Essential oils, flavonoids and cumenes extracted from roots, flower and aerial sections. Flower heads- dental rinses
"Azadirachta indica (Neem)"	"A medicinal Tree"	Native to India. Long usage may damage Kidneys and Liver. Oil is poisonous and fatal to young children. Adverse effects include miscarriage, infertility, low blood sugar levels. Component of Non-pesticidal management (NPM) (1960). Once in 10 days. Prevents crop from being damaged by acting as egg laying inhibitor, repellent and antifeedant. Neem based fertilizers shown to be effective in preventing the spread of Southern Armyworm, warding off Termites. Neem oil is reducing polymeric resins. Preparation of polyurethane coatings using "alkyd resins synthesized from neem oil using a monoglyceride (MG) approach".
Calotropis procera (Aak)	A common weed of desert	We treat a wide range of medical issues, including broken bones, bacterial infections, rheumatoid arthritis, leprosy, tooth pain, eczema, and paralysis. Asthma, bronchitis, coughing, diarrhoea, malaria, cancer, dysentery, and jaundice are only few of the diseases included. Diabetes, cancer, inflammation, and infection are just some of the medical conditions that can be

		fought using these extracts. Cardenolides were discovered in the root bark of <i>C. procera</i> and were used to create chemicals with strong anti-cancer cell action.
<i>Capparis deciduas</i> (Kair)	A shrub, often the species are called as caper shrubs	Edible plant. Feeds many birds and cattle. Leaves rich in Proteins as compared to other desert plants.
<i>Carissa congesta</i>	Shrub	Promising solutions for different ailments. Potential to provide innovative products and bioactive components for use in development of therapeutics.
<i>Chenopodium album</i> (Bathua)	Edible Herb	Nutrient rich with minerals like Calcium, Iron and rich immunity booster. Weed. Helps in stomach ailments and gives warmth to the body.

Table: 1 Plants Table

<i>Citrullus colocynthis</i>	Desert Viny Plant. A small watermelon plant with a fruit resembling watermelon.	Remedy for conditions like boils, acne, constipation and inflammation of the joints. Joint deterioration, rheumatism and abdominal enlargement to reduce glucose. Also treats urticaria and constipation, snake venom, stomach pain, hepatitis, malaria. Epilepsy and intestinal issues
<i>Cleome gynandra</i> (Hulu)	Annual wild flower.	Used as an antihelmintic in Ayurveda for ear problems, pruritus, GI issues, and GI infections. Many illnesses, including epilepsy, IBS, protozoal, and worm infections, are treated with it by traditional healers in India. High concentrations of protein, amino acids, and minerals make this a crucial crop.
<i>Cucumis melo</i> (Kachri)	A edible fruit though a wild plant	Enhances the taste of food – salty and tangy. Used as a taste enhancer in local food items. Generally added to vegetables.
<i>Cynodon dactylon</i> (Dub Ghas)	A grass much used for decorative purposes. Perineal in nature	“Epilepsy, bronchitis, asthma, tumours, measles, rubella, snakebite, cystitis, cough, camps, cystitis, diarrhoea, dropsy, dysentery, and a host of other ailments..”.
<i>Cyperus triceps</i> (Nirbasi)	A shrub of medicinal uses.	“The medicinal properties of <i>Kyllinga triceps</i> rotth rhizomes include aromatherapy, cooling, sweetness, astringency, bitterness, antidiarrheal, stomachic, anthelmintic, expectorant, demulcent, and tonic.”
<i>Dalbergia sissoo</i> (Shisham)	A tree known for strong wood.	Most important leprosy and gonorrhoea treatment. Leaf extract has cured various conditions including gonorrhoea, syphilis, diarrhea and sore throats.
<i>Datura stramonium</i> (Datura)	A weed and fruit used for drugs.	Notorious for Drug abuse. Causes drowsiness and unconsciousness upto being fata in consequences. The plant is not thought as auspicious
<i>Emblica officinalis</i>	Tree with many	Fruit with many nutrients. Usage varied with varied rare combinations of Iron and Vitamin C, minerals and

(Amla)	medicinal value	nutrients are not disturbed even when dried.
Enicostemma hyssopifolium (Chota Chirayata)	Perineal herb	Treats Malaria, skin diseases, leprosy, diabetes. Leaf has properties that help reduce fat, including hypoglycemic, antioxidant, hepatoprotective and hepatic modulator
Euphorbia hirta (Waldhuni)	Pan tropical weed.	Another local plant of Churu is known for treating asthma, skin disease and hypertension. As a brain tonic, fresh flowers mixed with sugar are more often consumed.
Evolvulus alsinoides (Shankpushpi)	A weed, a small plant as a creeper with less than 1 feet of height	The leaves are rolled into cigarettes and smoked by patients who suffer from chronic bronchitis and asthma. It also helps in reproductive health.
Ficus religiosa	A big tree	Species of family Moraceae (fig or mulberry) known to treat almost fifty different ailments like asthma, diabetes, epilepsy, gastrointestinal issues, inflammatory disorders, infectious diseases and sexual disorders among many others
Jatropha curcas (Ratanjot)	A biofuel plant of shrub height	The most fascinating thing is the oil content in it. It is also known as biofuel of Rajasthan. Great possibilities in developing fuel instead of petrol and diesel
Lagenaria siceraria (Kashiphal)	Creeper with vegetable values and medicinal value.	Fruits have low calorie when consumed hence are used for stomach ailments and reducing weight. The shell of fruits gets very hard and is used to make vessels and musical instruments. Fruit pulp has a cooling and diuretic effect on the body.
Leptadenia pyrotechnica (Khimpi)	Desert herb	This plant has many good qualities for animals such as camels, goats etc. animals seek these plants especially immature pods as food.
Momordica balsamina (Karela)	A creeper and its fruit has many medicinal uses	Wide spread cultivated plants as vegetables with many therapeutic activities. Traditional medicine for various ailments, most often gastrointestinal disorders.
Nerium indicum (Kaner)	A shrub like plant with flowers. Also used for fencing and decorative purposes	Treats epilepsy, asthma, corn, cancer, and heart diseases.
Tinospora cordifolia (Neem giloy)	A creeper, herbaceous vine. Has many medicinal value	It has been recognized by Ayush India. In India, the ministry of AYUSH recommended using “glory” as a home treatment for immune support during the 2020-22 COVID-19 epidemics.
Tribulus terrestris (Chota gokhru/	A annual noxious weed	The root belongs to the Dashmool drug family. Traditional medicine uses both the fruit and root of this plant. “The fruits have a variety of medicinal properties,

Bhankari)		including diuretic, aphrodisiac, emollient, expectorant, anodyne, cardiotoxic, styptic and lithotriptic”.
Withania somnifera (Ashwagandha)	A medicinal Shrub	Traditional Indian medicine used for a long time, especially the powder made from its roots. used not only as medicine but also as protection from heavy metal exposure, cancer and major diseases.
Ziziphus mauritiana (Ber/ Bordi)	A desert evergreen shrub with many thorns and sweet fruit	Fruit of plants is a good diet food. It has a good content of proteins and carbohydrates. The fruit cures indigestion and biliousness, as well as wounds and ulcers, pulmonary problems and fevers.

Table 2: Showing medicinal plants of Churu with their type and medicinal value

This piece of work will add to value to the plants of Churu district by explaining the details of cultivation of many ornamental, edible and medicinal plants. “Maru Pradesh”, the other name of desert, is well known for medicinal plants. The plants of Churu also fall under the same category of plants of high medicinal value.

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Some of the important ethnomedicinal plants of Churu District which are used in various diseases and are very common to the studied area :-

AERVA TOMENTOSA (Gorkha bundi)

This plant has an exceptional pain healing quality. It helps in relieving pains of head and teeth.

ALOE BARBADENESIS (Ghikumari/Ghikanwar)

Skin treatment on topical application. It's a boon for skin problems. However direct consumption may lead to stomachache and cramps resulting in diarrhea too.

ARISTOLOCHIABRACTEOLATA(Kiram ar)

This plant is used to treat intestinal worms, skin irritation, and insect bites. An excellent deworming plants. This is a herb of approximately a few centimeters in height with green white or purple flowers. A plant with woody roots and a creeper. Only a person who has practiced can identify and take advantage of this native plant.

ARTEMISIA SCOPARIA (Bana)

This medicine may treat jaundice, reduce fever, restore gallbladder function, and increase diuresis. Several different conventional prescriptions have included the usage of this medication. It has also been investigated for potential use as an anticancer drug in the treatment of several forms of cancer.

CALOTROPIS PROCERA (Aak)

Cuts, scabies, sores, external infections, swelling, rheumatic pains, leprosy, toothaches, rashes, and even the therapy of paralysed limbs can all be treated with the plant. Asthma, cough, diarrhoea, malaria, cancer, and jaundice are some of the other illnesses that may be treated using traditional medicine.

CAPPARIS DECIDUA (air)

Kair is a simple edible plant. Feeds many birds and cattle. The leaves are rich in proteins when compared to many other plants present in deserts.

CARISSA CONGESTA

The plant has many promising solutions for different ailments. Plants has potential to provide innovative products and bioactive components for use in the development of therapeutics.

CHENOPODIUM ALBUM(Bathua)

A nutrient rich herb with minerals like calcium, iron and rich immunity booster. It's a weed still is grown for it's food quality. This plant helps in stomach ailments and gives warmth to the body.

CUCUMIS MELO (Kachri)

A plant used for enhancing taste of food the salty tangy taste is liked by most. A taste enhancer in many local food items, which can be had in many forms. This is generally added in as vegetable.

CYPERUS TRICEPS (Nirbasi)

The rhizomes of the *Kyllinga triceps* rottb plant have a variety of medicinal uses thanks to their aromatic and flavorful compounds. Antidiarrheal, stomachic, anthelmintic, expectorant, demulcent, and tonic are only some of the other medical uses for them. (Rafat, 2019) In several parts of India, people turn to this plant for antidotes. The root has cooling properties and can be used to treat skin issues (Padmavathy & Anbarashan, 2011; Singh, 2016). Eye and skin conditions can also be treated with this medication. "Shui wu gong" translates to "murder" in Chinese. It is used to treat a wide variety of conditions, including the common cold, bronchitis, malaria, arthritis, and injuries.

DALBERGIA SISOO(Shisham)

The most important leprosy and gonorrhoea are the best treated with this plants.

DATURA STRAMONIUM (Dhatura)

This beautiful flowered plant has more of notorious for drug abuse rather than uses. It causes drowsiness and unconsciousness upto being fatal in consequences. The plant is also not thought auspicious throughout and

cultivated in gardens. This way it confirms the name of it's family Solanaceae.

EMBLICA OFFICINALIS (Amla)

A fruit with many nutrients is Amla. It's usage is also very varied a rare combination of iron and vitamin C. minerals and nutrients are not disturbed even when dried.

ENICOSTEMA HYSSOPITOLIUM (Chota Chirayata)

The plant is also used for stomachic, bitter tonic, carminative for treating fever, and tonic for lack of appetite. *E. littorale* has both an anti-inflammatory effect and the ability to inhibit tumor growth as observed in rats.

EUPHORBIA HIRTA (Laldhuni)

Another local plant of Churu is known for treating asthma, skin diseases, and hypertension. As a brain tonic, fresh flowers mixed with sugar are often consumed.

EVOLVULUS ALSINOIDES (Shankhpuspi)

The leaves are rolled into cigarettes and smoked by patients who suffer from chronic bronchitis and asthma. It also helps in reproductive health.

FICUS RELIGIOSA

The usage of a single plant of the family Moraceae has been connected to the treatment of around fifty medical illnesses, including asthma, diabetes, diarrhoea, epilepsy, gastrointestinal troubles, inflammatory disorders, infectious diseases, and sexual dysfunction (fig or mulberry).

JATROPHA CURCAS (Ratanjot)

The plant has many qualities but the most fascinating is oil content in it. It is also known as Biofuel of Rajasthan. It has great possibilities in developing fuel instead petrol and diesel.

LAGENARIA SICERARIA (Kashiphal)

Several parts of the plant are used to cure various diseases. Fruits may assist with both weight reduction and gastrointestinal

problems since they are low in calories. The fruit's tough rind may be used as anything from a tool to a percussion instrument. The diuretic and cooling qualities of the fruit pulp (Duke, 1992; Warriar et al., 1995). The leaves, either fresh or as a decoction, may be used to make a remedy that induces vomiting and nausea. Jaundice may also be treated with sugar, which has anti-inflammatory and antioxidant properties.

LEPTADENIA PYROTECHNICA (Khimp)

Every plant is made for human only is not the law of nature. This plant has many goodness for animals such as camel, goat etc. Animal seek these plants especially immature pods as food. The plant was recently tested for many disease treatment and have given promising results for it possesses various antibacterial, antifungal, "anticancer, antioxidant, wound healing, anthelmintic, anti-atherosclerotic, hypolipidemic, antidiabetic, and hepatoprotective".

NERIUM INDICUM (Kaner)

A plant known for its value in treating epilepsy, asthma, corn, cancer, and heart disease, are some. The green hue of the flower is applied to the skin to cure a variety of skin conditions, and it also promotes wound healing and reduces inflammation. This plant is used to treat reproductive disorders and to cure conditions that affect the upper respiratory tract and the digestive system.

PEDALIUM MUREX (Bada gokhru)

The fruits contain useful compounds including 2',4',5'-trihydroxy-5,7-dimethoxy flavones and triacontanol dotriacontanoate. Urinary tract infections are its most prevalent usage, although it has a broad variety of other medicinal uses, such as treating puerperal illnesses, digestive tonics, ulcers, fevers, wounds, and general debility.

PHYLLANTHUS NIRURI (Bhui-anwla)

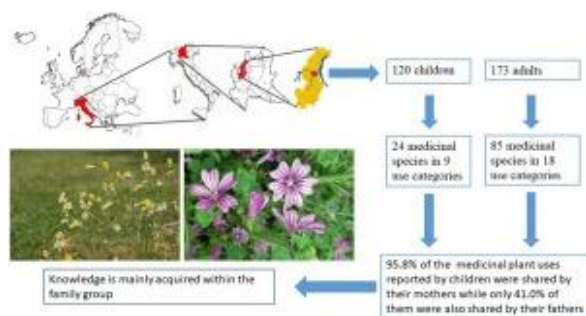
This small plant is more often used in cosmetics. For example in toothpowder, for colour in cosmetics. Also in face lotion, hair oil color, and teeth powder, all of which are products that fall under the category of health and cosmetics. The medicinal uses are as plant extract promise as a treatment for various conditions, including bronchitis, urinary problems, anemia, leprosy, and asthma.

TEPHROSIA HAMILTON (Sarphonka)

A plant grows naturally with many medicinal properties. The properties that make it effective as an antipyretic, an anthelmintic, an alexiteric, and a treatment. It is used in treating leprosy, ulcers, asthma, and tumors, in addition to disorders affecting the liver, spleen, heart, and blood. The roots decoction is often administered to patients suffering from urinary difficulties, asthma, rheumatism, and dyspepsia. Its root powder is said to alleviate pain associated with any bleeding. African shepherds make a beverage made from crushed leaves that acts as an antidote for snake bites suffered by their animals. It serves as a source of nutrition for animals like goats.

TINOSPORA CARDIFOLIA (Neem giloy)

This plant can be considered as all medicine put together. Its functionality in almost all types of ailments are proven. This plant is been recognized by Ayush India and is glorified also. In India, the Ministry of AYUSH recommended using *T. cordifolia* (also known as "glory") as a home treatment for immune support during the 2020-22 COVID-19 epidemic. [6] However, this practice was linked to hepatitis infections among six patients in Mumbai who used boiling or capsule preparations of the plant.



WITHANIA
(Ashwagandha)

SOMNIFERA

Traditional Indian medicine has used the plant for a long time, particularly the powder made from the plant's roots. A rather exploited plant for its use as not only medicine but for protection from heavy metal exposure, cancer and many major diseases.

5. AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS IN CHURU DISTRICT RAJASTHAN

Humans and their relationships with plants is the focus of ethnobotany. The individuals who have lived in a region for generations are consulted for their knowledge of the plants that thrive there. It has been around for a long time as a subfield of botany. John William Harshberger first used the term "ethnobotany" in 1895 to denote the study of plants utilised by indigenous peoples. The scientific investigation of human interactions with flora is known as "ethnobotany."

Ethnobotany is a scientific discipline that examines how people in a particular community interact with the plants in their environment. Alternately, we may define ethnobotany as the study of how different people utilize plants in different settings.

6. The Significance of Ethnobotany Within the Framework of Indian Culture

Since the dawn of time, the bulk of human necessities, especially those about health, have been satisfied by resources derived

from plants. Indigenous knowledge of plants is valued worldwide because of the intrinsic value of plants and their usage in the development of modern pharmaceuticals. It is because plants are used in the manufacturing of these drugs. Indigenous ethnic populations in several different areas of India, notably in the Himalayan region, use plants as part of their traditional medical practices. Ethnomedicines serve as the basis and progenitor of all traditional medicinal systems used in India and other countries and regions worldwide. India is still unable to appropriately appreciate the value of ethnobotany due to a lack of funds for research, educational opportunities, and awareness of the languages spoken by indigenous peoples. The field of study known as ethnobotany provides knowledge that may be usefully conveyed to policymakers and researchers, facilitating the formulation of plans for the growth and diversification of the economies of indigenous populations.

Between 15 and 17 million unique species have been identified on this planet. So yet, we have only a description for five billion billion of them. Seventy percent only happen in the tropics and subtropics (Krishnankutty and Chandrasekaran, 2007). About 43% of India's flowering plants are considered useful for medical purposes (Pushpangadan, 1995). For centuries, ancient Indian literature has detailed the treatment's use of medicinal plants. Researchers didn't start looking into this method seriously until 1956. The development of many modern essential pharmaceuticals would not have been possible without the careful recording of traditional knowledge, particularly that which refers to the therapeutic characteristics of plants (Anon, 1994).

The indigenous people's knowledge of how to use different plant species is influenced by the plants that grow nearby (Reddy et al., 2010). Using plants and other forms of life into healthcare already holds

considerable promise (Subbu and Prabha, 2009). The study of ethnobotany can be traced back to the first man, who, after observing animals, mostly apes and monkeys, consuming various plants, learnt how to repair his wounds and alleviate his pain and suffering. These discoveries inspired them to employ plants in health maintenance and disease prevention (Sinha, 1999). Traditional medicinal plant use has persisted in a variety of cultural contexts across the world, even as modern medicine has advanced. An estimated 80% of the global population uses traditional medicines as their primary form of healthcare, according to the World Health Organization (Fransworth, 1990). However, until now, only 5% of the herbal treasure has been researched, leaving 95% of it undiscovered (Arya et al., 2008). Many people feel that medicinal plants offer benefits including fewer side effects and better adherence from patients. This has led to an increase in their popularity (Brown et al., 2008). The medical industry of today is experiencing a number of complex challenges. Thus, the healthcare system needs to employ an integrated and pluralistic approach to treat his condition adequately (Sen and Batra, 2008). Scientific monitoring will be exercised through the production of herbal forms in carefully chosen locations (Kritikar and Basu, 1987), allowing for widespread usage of these plants in traditional medicine practises (Rai, 2007). Our number one concern is ensuring that medicinal plants are safeguarded from being exploited to no good effect by either domestic or international commercial interests (Natesh and Mohan Ram, 1999).

In the Shekhawati region of Rajasthan, traditional doctors have a deep familiarity with the healing properties of the local flora (Katewa and Galav, 2005). In the Churu areas, residents turn to traditional local medicine, which is derived primarily from a number of plant species, to cure a wide range of diseases. There has been an uptick in the interest in studying herbal remedies

in the quest for new therapeutic compounds. Several potent medicinal herbs are found growing wild in India, and the country's indigenous civilizations have a wealth of oral knowledge about these plants. The history and culture of India are deep and varied. There has been a lot of ethnobotanical study conducted in a variety of rural and tribal communities around the country, but there is still room for expansion. For the sake of humanity as a whole, increasing investment in ethnobotany research is essential if we are to discover which plant species from our rich flora may be used as a source of safer, more cost-effective medicines. Almost 70% of the population in countries like India is still predicted to use herbs as their primary source of healthcare in the near future (Singh, 1997).

7. Conclusion

In conclusion, the ethnobotanical study of medicinal plants in Churu district is of great importance in preserving traditional plant knowledge, identifying new sources of medicine, and promoting biodiversity conservation. The study reveals the diversity of plant species used for medicinal purposes in the region and highlights their significance to the local communities. The information gathered through this study can serve as a valuable resource for researchers, policymakers, and healthcare professionals who seek to develop new drugs or integrate traditional medicine into modern healthcare systems. Additionally, this study emphasizes the need for sustainable management and conservation of the region's biodiversity to ensure the availability of medicinal plants for future generations. Overall, the ethnobotanical study of medicinal plants in Churu district provides a wealth of information that can contribute to improving the health and well-being of people while promoting the conservation of the natural environment. According to the study's findings, several of the Churu area's

native medicinal plants can be used to cure a variety of human illnesses. Herbal remedies have demonstrated a lot of potential for many different health issues. The state of Rajasthan is home to several different types of medicinal plants. In addition to their medicinal value, these plants have numerous other applications, such as in the production of food, fodder, gums and resins, essential oils, colour, fatty oils, sauces, and spices. The economic and social benefits that these plants provide make their preservation an urgent matter. For medicinal purposes, we found that people most frequently used leaves, then roots, then seeds, then the entire plant, then fruit, and finally bark.

The Canopy Status

The plants of district Churu are varied. Churu has a wide diversity in plants. Although the plants are of xerophytic habitat the canopy is complete with many types of plants. The canopy is made of trees of at least five to seven plants. Shrubs are more than trees. These plants cover the major floral community of Churu. The sand of Churu is covered with many creepers and plants of less than one feet reaching to some centimeters in height and not gaining a foot of height. The described fifty-six plants are of all categories i.e. trees, shrubs, herbs and grass. Here in this piece of work we have tried to list only the endemic plants of Churu. We have tried to pick as small a few centimeters of height and as big as Ficus. We have also discussed the pattern of cultivation of plants which are the basic earning for farmers and used to develop a livelihood. The cultivation techniques are explained in details to assist farmers in their work. The plants are some creepers and runners also. We have even included druva grass as one of the endemic species as we have observed it as local growing plant in wild. Most of the plants are of less than one feet in height. A few reach the height of three – four feet in height. The medicinal value is also been discussed separately as it is most important

reason to cultivate plants. Churu has a temperature of extreme hot in summers and extreme cold in winters. In winter the mercury drops to zero and sometimes even in minus degrees the temperature is recorded. The survival of plants is really tough. One of the plants is a promising biofuel i.e Jatropha. It's oil is been already tested to drive a car for almost ten days. The railway of India is taken a step forward to work on this project. The cultivation of this plant is been encouraged in the region. The purpose of this thesis is also to bring forth the prospectus of the plant to increase the income of farmers for proper growth of endemic species.

The plants which reach the maximum height are the Ficus species (Bargad), Pipal, Dalbergia sissoo and Neem. Prosopis cineraria (Khejri/janti), Emblica officinalis (Amla) are some more trees. Eucalyptus plants are found in Churu but are not of endemic status hence are not included in this study.

The second line of canopy is made by Shrubs reaching a height to six to eight feet. Most common are the flowering plants listed as

Kaner, Tecomella undulata (Rohida), Solanum indicum (Baigan Kateli), Prosopis cineraria (Khejri/janti), Leptadenia pyrotechnica (Khimpi), Lantana camara (Gendi) and Acalypha Indica. Withania somnifera (Aswagandha), Ziziphus, Salvadora persica (Jhal/ Chotapilu)Jhal, Tribulus terrestris (Chota Gokhuru), Pedalium murex (Bada Gokhur), Leucas Aspera (Paniharin), Lantana Camara (Mehndi), Eclipta alba (Bringraz), Datura stramonium (Datura), Capparis decidua (Kair), Aerva tomentosa (Gorkha bundi), Acacia nilotica (Babul), Aristolochia bracteolata

The third line of canopy is made by herbs of somewhat lesser heights. The herbs are of medicinal values also. Some of them are herbs. The plants that fall under this category are listed as:

Jatropha curcas (Ratanjot), *Embolia officinalis* (Anwla), *Carissa congesta* (Karaunda), *Ricinus communis* (Erand), *Calotropis procera* (Aak), *Amaranthus spinosus*, *Acacia Senegal* and *Acacia nilotica* are amongst the common list.

The plants with less than one feet is listed as *Tephrosia purpurea* (Sarpunkha), *Solanum*, *Tephrosia purpurea*, *Tephrosia purpurea* (Sarpunkha), *Leucas Aspera*, *Aristolochia bracteolata* (Kiramar)

(*Chota Chiratia*), *Euphorbia hirta* (Laldhuni (Shankpushpi)), *Bhuj amla*, *latjeera eklafia aloe chaulai* *Aristolochia bracteolata* (bana) *Chenopodium album* (bahtua), grass kush *Desmostachya bipinnate*.

Creeper

The list of creepers starts with *Tinospora cordifolia* (Giloy) which has a special mention by Ayush Ministry of India. Other than Giloy the most studied creeper is of Karela and torai of many medicinal uses. *Tribulus terrestris*, *Lagenaria siceraria* (Kashiphal). Parasite plant *Cuscuta* (Amarbel) parasite is also found in Churu

Apart from this the typical xerophytic plant Cactus is also found in the district. This grows to a height of many feet and is edible by locals. Churu a name in Rajasthan has a typical desert condition for plants with extreme temperature in winters and summers. This develops plants into high resistant and adapted for difficult

The Plants of Medicinal Value

Many have medicinal value for major problems of ailments such as stomachaches, headaches, indigestion, liver malfunctioning etc.

A few of them are used for diuretic treatment, whereas many others are used as anti-bacterial and antibiotic also. The plants are used and tested for cancer and many reproductive problems. One of the plants stands apart as it is been used for POP also. Other-wise the allopathy has a treatment as

surgery only. Many of them are used for venereal infections medication.

Acica notila is known for general pain and stomach problem. Majorly for venereal infections and POP. Cancer hepatitis and HIV are other major issues dealt with this plant.

ACALYPHA INDICA (khokali) In Churu (Rajasthan), eye infections may be treated using the sap extracted from the leaves. Leaf powder is used to heal wounds that maggots have infected. Pharmacopoeia for treating respiratory conditions, including pneumonia and asthma. Consumption of *Acalypha India* has the potential to induce hemolysis in those who are deficient in glucose-6-phosphate dehydrogenase.

8. Recommendations

The present study of ethnobotanically important medicinal plants of Churu district Rajasthan. I documented 56 ethnobotanically important medicinal plants from 26 different families. The result obtained from this study are going to be very important and valuable for churu district and state of Rajasthan Due to adverse weather conditions like, extreme high & low temperature, high wind velocity, humidity, famines the flora of churu district is adversely affected. I have to follow the recommendations as listed below.

1. The create awareness among the people of churu district about the uses of economically ethnomedicinal plants.
2. This study will prove very beneficial for research in various fields like botany, phytochemistry pharmaceuticals, pharmacology etc.
3. If proper emphasis with the help of govt is given than this traditional knowledge can provide source of income to the local villagers and tribal people.

4. Conservation of vast heritage of medicinal plants of churu district is important.
5. This study outcomes reveals that there is utmost requirement that immediate attention from government and NGO'S is required for sustainable utilization, protection and conservation fo these plants.

9. Future scope of the study

1. Conservation and to flourish the biodiversity of churu district.
2. To create a novel database of medicinal plants that can be used for future research in the field of ethnobotany.
3. The information and data collected in this study can be very useful for conserving the vegetation and vast biodiversity this area.
4. This study focuses on ethnobotanically important medicinal plants traditional knowledge that can be used for making herbal drugs for the welfare of the mankind.
5. This study will be very useful to conserve the traditional knowledge of churu district.
6. The outcomes of the study will be very useful for formulation of policy and other programes related to research.
7. "This study will lay good impact for the future use of medicinal plants for the treatment of various diseases because this method is very economical an effective".

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