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Vegetation of Churu District

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ABSTRACT: Churu is encircled by large shifting sand dunes. The area is scanty in vegetation. Phoge and Kair bushes and Khejri/Khejra (*Prosopis cineraria*), Royara and Babul trees are mainly found on the sand dunes. One can find sand dunes all over the area with a couple of small limestone hills.

KEYWORDS-Churu, vegetation, trees, Rajasthan, sand, scanty

I.INTRODUCTION

Churu is a city in the desert region of Rajasthan state of India. It is known as the gateway to the Thar Desert of Rajasthan. It is the administrative headquarter of Churu District. It lies in the Thar Desert on the National Highway 52 connecting Sangrur to Ankola and is a junction station on the railway line to Bikaner. It is near the shifting sand dunes of the Thar Desert and has grand havelis with marvelous fresco paintings, namely Kanhaiya Lal Bagla Ki Haweli and Surana Haweli, with hundreds of small windows. It also has some fine Chhatris. Near the town is a religious seat of the Nath sect of Sadhus where there are life-size marble statues of their deities and a place for prayers. At the center of the town is a fort built about 500 years ago.[1,2,3]

Temperatures in Churu usually range from 0 to 47 °C (32 to 117 °F). The region boasts record temperatures ranging from below freezing point in the winters to over 50 degrees in the summer afternoons. Before dawn in the months of December and January one may not be surprised to notice ice in small waterpots or frozen water dews on the little vegetation. Yet one may find that summer nights are cooler and winter days are warmer. There is a great variation in the minimum and the maximum temperature of Churu. Churu's lowest recorded temperature is -4.6 °C (23.7 °F) and highest temperature ever recorded is 50.8 °C (123.4 °F) on 1 and 2 June 2019.^[5] Even in 2020, Churu recorded a maximum of 50 °C (122 °F).^[6] On 30 December 2020, Churu recorded -1.5 °C (29.3 °F), the coldest December night in 46 years.^[7]

Climate data for Churu (1981–2010, extremes 1956–2020)													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	33.4 (92.1)	37.4 (99.3)	42.5 (108.5)	46.4 (115.5)	50.0 (122.0)	50.8 (123.4)	46.6 (115.9)	43.1 (109.6)	44.1 (111.4)	42.6 (108.7)	38.4 (101.1)	33.5 (92.3)	50.8 (123.4)
Mean maximum °C (°F)	28.7 (83.7)	32.7 (90.9)	39.0 (102.2)	44.1 (111.4)	46.6 (115.9)	46.1 (115.0)	42.9 (109.2)	40.5 (104.9)	40.7 (105.3)	39.6 (103.3)	35.6 (96.1)	30.4 (86.7)	47.2 (117.0)
Mean daily maximum °C (°F)	23.0 (73.4)	26.4 (79.5)	32.7 (90.9)	39.0 (102.2)	42.2 (108.0)	41.6 (106.9)	37.9 (100.2)	36.8 (98.2)	37.2 (99.0)	35.8 (96.4)	30.9 (87.6)	25.2 (77.4)	34.1 (93.4)
Mean daily minimum °C (°F)	5.5 (41.9)	9.0 (48.2)	14.9 (58.8)	20.7 (69.3)	26.1 (79.0)	28.3 (82.9)	27.7 (81.9)	26.4 (79.5)	24.3 (75.7)	18.0 (64.4)	11.1 (52.0)	6.0 (42.8)	18.2 (64.8)
Mean minimum °C (°F)	0.5 (32.9)	2.9 (37.2)	8.8 (47.8)	14.5 (58.1)	19.4 (66.9)	22.6 (72.7)	23.6 (74.5)	24.0 (75.2)	20.8 (69.4)	12.9 (55.2)	5.4 (41.7)	0.9 (33.6)	-0.1 (31.8)
Record low °C (°F)	-4.6 (23.7)	-4.6 (23.7)	1.8 (35.2)	8.8 (47.8)	11.8 (53.2)	17.7 (63.9)	19.1 (66.4)	19.6 (67.3)	14.0 (57.2)	8.1 (46.6)	-1.0 (30.2)	-4.6 (23.7)	-4.6 (23.7)
Average rainfall mm (inches)	7.4 (0.29)	12.5 (0.49)	11.2 (0.44)	6.9 (0.27)	25.3 (1.00)	53.8 (2.12)	115.3 (4.54)	99.5 (3.92)	46.1 (1.81)	7.1 (0.28)	2.4 (0.09)	2.9 (0.11)	390.4 (15.36)
Average rainy days	0.8	1.2	1.0	0.9	1.9	3.2	6.4	5.7	2.7	0.7	0.2	0.3	25
Average relative humidity (%) (at 17:30 IST)	37	29	22	16	19	30	51	55	43	29	34	38	34

II.DISCUSSION

Out of the total 13,835sq km of area in Churu district, only 82.00 is under forest cover. As per the classification by Forest Survey of India, there is no area under very dense forest category, 3.00 under moderately dense forest category and the remaining 79.00 under open forest category. As mentioned above the district is a part of the Indian Great Thar desert. The vegetation cover in the district is almost negligible due to extremes of temperature. during winter and summer and scanty rainfall. Established sand dunes inside Grass Reserves of inside areas, free from biotic interference, contain very poor and open forest. Important trees found in the district are Khejara, Kikar, Neem, Hingotaker, Shisham, Rohira, Bhui, Phog, Ask, Senia, Thor, Morali, Bura, Lampre, Kucha, Mural etc. Fox, Blue, Bull, common hare, Jackal porcupine, Bats and Bush rats etc. are found here. The common birds found here are Bulbul, kite, Owl, Pigeon, Sand Grouse, Grey partridge, Godavan of Guraha. Spread across 719 hectares, Talchappar was declared a reserved land in 1962. Talchappar has a unique ecosystem, with mostly grass covering the land, it falls on the way of many migratory birds who while flying back to their home, stay on for a while or for an entire season. This place is popular amongst bird lovers. It also homes the rare and endangered black buck, jungle cat, rojra, foxes etc.

In India, whereas all other systems of traditional medicine flourished well and received encouragement from both people and government, their very originator 'folklore medicine' which gave birth to traditional medicine remained largely neglected and was left to die a natural death. There has been no movement on the part of Government of India for investing public or private funds for ensuring long term availability of large number of medicinal plants that have been traditionally used by the numerous traditional folk healers (Sinha, 1999). In the present study, 56 species of ethnomedicinal plants were recorded belonging to 28 families used by the rural people of Churu district of Shekhawati for various ailments. These medicinal plants were used as simple drugs and the drug remedies are used in the form of juice, powder, decoction or paste. The mixture of different plant parts were also used for preparing medicines. Rural people were using these to cure diseases like fever, cold & cough, skin diseases, dysentery, pain, diarrhoea, wounds, snake bite, insect bite, asthma, burn and other various disorders. The issue of medicinal plants conservation has been focused in the last 15 years and various conservation methods (in situ, botanical gardens, germplasm banks, etc.) were mentioned by many researchers (Jain and Defillips, 1991). The rapid degradation of forest has resulted in depletion of natural resources on which these people depend and it has become difficult for them to lead their traditional way of life. This situation has been forcing them to discard their traditional way of life and adopt the urbanized practices. To avoid this, the government should take severe action to protect the forest and its wealth and need for developing a code of practices for growing, harvesting, collecting, handling, packaging, storing and exporting these plant materials. Many ethno-medicinal plants are at the verge of extinction due to over-exploitation. Therefore, conservation of these plants should be viewed seriously and there is urgent need to embark on large scale cultivation of these ethnomedicinal plants of high socio-economic value through creation of herbal gardens in Rajasthan and also in other part of India. The survey indicates that Churu region is rich in medicinal plants and covers a wide spectrum of human ailments. Some plants are of common use for different kind of ailments. This region has important areas of plant wealth for healthcare in Rajasthan. The plants are not only valued as herbal drugs but also utilised for food, fodder, gums and resins, essential oil, dye, fatty oil, condiments, spices, etc. there are urgent need conserve these medicinal and economical important plants[4,5,6]

III.RESULTS

Medicinal plants are considered as rich sources of ingredients which can be used in drug development. Medicinal plants such as Aloe, Tulsi, neem, giloy, datura, aak, gokhru, cure several common diseases. These are considered as home remedies in sujangarh. In India of the 17000 species of higher plants, 7500 are known for medicinal uses. 68 plant species are commonly used by the local people for curing various diseases in Churu district. A total 18 type of medicinal plants are explained by researcher such as tumba, neem, tulsi, khimp, gokhru, aak etc. There are many medicinal plants in this area, which are used by people according to the need in many diseases. 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. 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.

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. [7,8,9] 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 gonorrhea 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 fata 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 (Khim) 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 SOMNIFERA (Ashwagandha) 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.[10,11,12]

IV.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 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 [13,14,15]

Jatropha curcas (Ratanjot), Emblica 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. Acacia nilotica 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 Indica has the potential to induce hemolysis in those who are deficient in glucose-6-phosphate dehydrogenase. [16,17,18,19]

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