International Journal Of Multidisciplinary Research In Science, Engineering and Technology (IJMRSET)

| ISSN: 2582-7219 | www.ijmrset.com |

| Volume 1, Issue 2, December 2018 |

ETHNOMEDICINAL PLANTS OF RAJASTHAN

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ABSTRACT: An extensive survey of Rajasthan including Chittorgarh, Udaipur, Banswara and Dungarpur districts was made to document the traditional knowledge of medicinal plants used by tribal communities. Tribals like Bhil, Damor, Garasia, Kalbelia, Kathodia and Meena are residing in this area. These people and their medicine men and women have valuable information about properties and medicinal uses of plants. An attempt has been made to document the ethnomedicinal plants was being used traditionally by the tribals with their local name, methods of administration and precautions. The Jodhpur district a part of Thar Desert is very rich in medicinal plant wealth. The medicinal plants of this region have great potential to be used in drug and pharmaceutical industries. These herbal plants have been used by local people, tribal communities, vendors, native doctors such as Ojhas, Bhagats Bhopas and experts of Ayurvedic fields since long time in herbal and folk remedies. Kalbelia, Nats, Bhils, Raika, Bhopas, Banjara, Gadolia-Lohar, Saharia and Meena communities of this district have a rich knowledge of plants based traditional medicines. Ten ethnomedicinal plants like *Cleome gynandra* Linn., *Clerodendrum phlomidis* Linn., *Cassia angustifolia* Vahl., *Echinops echinatus* Roxb., *Leucas aspera* (Willd.) Spreng., *Mimosa hamata* Willd., *Moringa oleifera* Lamk., *Pedalium murex* Linn., *Peganum harmala* Linn., *Sida cordifolia* Linn. have been selected for research work. The present investigation is aimed to create awareness about the ethnomedicinal value of the plants and their uses to draw the attention of pharmacologists, phytochemists and pharmaceuticals in Rajasthan.

KEYWORDS: Rajasthan, tribals, ethnomedicinal, plants, desert, ayurvedic, ethnobotanical, folk, communities

INTRODUCTION

The history of medicine is linked with evolution of mankind. Since disease, decay and death have always co-existed with life, the study of disease and their treatment must also have been contemporaneous with the down of human intellectuality. The primitive man must have used those therapeutic agents and remedial measures. Vedas are written documents of this knowledge up to the time of curative herbs. Among traditional medicines, Ayurveda has a major role designated as the science of life. Ayurveda is the Indian system of medicine whose foundation was laid down by Charak, Sushruta and others like Bag Bhatta, Chakradatta, Bhav Prakash, and Bag Sen etc.[1,2] The practice of medicine among tribal people and villagers follows the same pattern of two thousand years ago, there is hardly any change. Rajasthan has 70.97 lacs tribal population (fifth rank in India) forming 12.5% of state's total population which is concentrated mainly in ten districts viz. Baran, Banswara, Chittorgarh, Dausa, Dungarpur, Karauli, Pratapgargh, Rajsamand, Sawaimadhopur, and Udaipur. In the eastern Rajasthan, main tribal community is Meena and traditional communities are Gurjar, Jogi, Kanjar, Sansi, Mali, Mongia etc. Above mentioned groups still live in remote areas[3,4] and used local flora for their daily needs. In Rajasthan a lot of work on medicinal plants has been carried out. Scientists gave an overview of the ethnomedicine of tribals of Rajasthan. It has been reported total 384 medicinal plant species used by the tribals of Rajasthan. These works were mainly carried out in southern Rajasthan. It was studied home remedies of different communities of Jaipur district whereas reporters of Bundi district. Authors published work on ethnobotany of Siliserh, Alwar. Scholars collected data on ethnomecdicinal plants of Jaisalmer district. Many workers documented ethnomedicinal plants of Karauli district. It is evident that very little work has been carried out on ethnomedicinal plants of eastern Rajasthan and therefore there is a great scope to study traditional medicines used by the natives of the area.[5,6]

Rajasthan is the largest state in India, geographically lies between 23º3' to 30º12'N longitude and 69º30' to 78º17'S latitude and is rich in diversity of medicinal plants1. Numerous literatures show the medicinal values of different plants standing from the age of Vedas. A lot of work has been also been done on ethnomedicinal plants used for various ailments by different tribal communities and researchers in Rajasthan. This article highlights some important medicinal plants of Rajasthan and their therapeutic use in daily life.

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Balanites aegyptiaca

Balanites aegyptiaca belongs to Zygophyllaceae family. In India, it is widely distributed in Rajasthan, Gujarat, Madhya Pradesh, and Deccan. It has been reported that the plant has anthelminthic, insecticidal, antidiabetic, antimicrobial, antibacterial, antifungal, hepatoprotective, anticancerous, antiparasitic, anti-inflammatory, molluscicidal and antioxidant properties.

It is traditionally used in treatment of various diseases i.e. jaundice, intestinal worm infection, wounds, malaria, syphilis, epilepsy, dysentery, constipation, diarrhea, hemorrhoid, stomach aches, skin boils, leucoderma, malaria, wounds, colds, syphilis, liver and spleen disorders, asthma, snake bite6 and fever. The bark of the plant is useful in curing mental diseases, yellow fever, jaundice and syphilis and can also act as a fumigant to heal circumcision wounds. Fruit kernel has been found as a mild laxative, an antidote to arrow poison, and also acts as a vermifuge. Kernel oil helps in curing skin disease. The seeds are useful as ointments, to cure cough, colic pain and also have magicoreligious properties.[7,8]

Calligonum polygonoides

Calligonum polygonoides is a member of family Polygonaceae. It is a small leafless shrub, which has a reputation in folklore medicine as a stimulant and astringent. It grows on sand dunes of Barmer, Bikaner, Churu, Jaisalmer, Jhunjhunu, Nagaur, Sikar and Shri Ganganagar.

Leaves and stems are chewed to wash teeth and to treat gummosis while young shoots infusion is used as tonic10. Root's paste is applied on the affected areas for the treatment of prickly heat and scabies. Decoction is used for the treatment of sore gums, typhoid. Flowers buds are effective in sun stroke. Flowers paste are also used for the treatment of asthma, eczema, cough and cold. It is reported that juice of the plant is applied in eyes to remove poisonous effect of Calotropis procera.

Calligonum polygonoides possesses hypoglycemic, cytotoxic, antioxidant, antimicrobial, anti-cancer, antiulcer, anti-inflammatory, antifungal, and mosquitocidal activities.[9,10]

Citrullus colocynthes

This plant belongs to family Cucurbitaceae, commonly known as Chitrapala or Bitter apple. It is found widely in the sandy lands of North West, the Punjab, Sindh, and Central and Southern India, and Coromandal coast.
Citrullus colocynthis shows mild stomachic, bitter tonic, anthelmintic, anti-cancer, antioxidant, antimicrobial, antidiabetic, analgesic, antipyretic, anti-inflammatory, carminative, diuretic and anthelminthic property.

Citrullus colocynthis is used generally in the cure of various diseases such as leprosy, gut disorders, diabetes, constipation, asthma, indigestion, colic, rheumatism, hypertension, gastroenteritis, dysentery, bronchitis, jaundice, joint pain, cancer and mastitis.

Commiphora wightii

Guggulu consists of oleo-gum resin obtained as an exudate from the tapping of stem and branches of *Commiphora wightii* (Arnott) Bhandari; Family, Burseraceae. The plant is commonly known as guggal, gugar, and Indian bdellium tree and is found in arid areas of India, Bangladesh, and Pakistan. In India, it is found in Rajasthan, Gujarat, Assam, Madhya Pradesh, and Karnataka. It is a small, bushy tree with thorny branches and produces a yellowish gum resin (guggulu) in small ducts located throughout its bark. Guggulu possesses hypolipidemic, anti-inflammatory, anti-arthritic, antifertility, Anti-atherosclerotic, astringent, anti-septic, anti-inflammatory, analgesic, wound healing, anti-obesity, anti-spasmodic activity.[11,12]

In Indian traditional system of medicine, guggulu has been used for thousands of years in the treatment of arthritis, inflammation, stimulates libido, nervous diseases, bronchial congestion, cardiac and circulatory problems, weak digestion, wounds, abscess, foetid ear, fractures, gout, skin rashes, irregular menstruation, diarrhea, headache, mild nausea, liver toxicity, rheumatism, obesity, and disorders of lipids metabolism.

Cordia myxa

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Cordia myxa belongs to family Boraginaceae, is also known as clammy-cherry, glueberry, Indian-cherry in English and Gondi in Hindi. Pharmacological studies revealed that Cordia myxa possessed analgesic, anti-inflammatory, immunomodulatory, antimicrobial, antiparasitic, insecticidal, cardiovascular, respiratory, gastrointestinal and protective effects.

Cordia myxa was eaten to suppress cough and for the treatment of respiratory infections and a sore throat, as it has demulcent properties. The pulp was also applied as an emollient to mature abscesses, to calm rheumatic pain and as an anthelminthic. Fruit pulp is applied on ringworm. Leavs' paste was applied to wounds and ulcers.

Gymnema sylvestre

Gymnema sylvestre belongs to family Asclepiadaceae, is also known as 'gurmar' or 'sugar destroyer' (If the leaves of the plant are chewed, the sense of taste for sweet and bitter substances is suppressed). *Gymnema sylvestre* is a slow growing, perennial, medicinal woody climber found in southern part of China, Tropical Africa, Vietnam, Malaysia, and Srilanka and is widely available in Japan, Germany, USA, central and peninsular India (mostly in Rajasthan, Bihar, West Bengal). The bioactive compounds of plant have antidiabetic, atherosclerotic, antimicrobial, antiarthritic, antibiotic, hypolipidaemic,[13,14] immunostimulatory, hepatoprotective, anti-hyperglycemic, antipyretic, diuretic, anti-inflammatory, wound healing and anticancer properties.

Gymnema sylvestre is a traditional medicinal plant, with reported use as a remedy for diabetes mellitus, stomachic and diuretic problems. Its use has been indicated in adenopathy, cough, asthma, alexipharmic, anthelmintic, astringent, biliousness, bronchosis, cardiopathy, conjunctivosis, cornea, dysuria, digestive, emetic, expectorant, fever, furunculosis, glycosuria, hemorrhoid, hepatosplenomegaly, inflammation, jaundice, leukoderma, rheumatismopacities, ophthalmia, and worm. The roots of *Gymnema sylvestre* has also been used in snake bite, boil, constipation, and water retention, epilepsy, pain, high cholesterol, IDDM, NIDDM and obesity.

II.DISCUSSION

The term "Ethnobotany" is not new even to India,", the ancient Hindus should be given the credit for cultivating what is now called ethnobotany". According to scientists ethnobotany is "the study of the relationship which exists between people of primitive societies and their plant environment". There are several methods of ethnobotanical research and those relevant to medicinal plants are archaeological search in literature, herbaria and the field studies. "Man, ever desirous of knowledge, has already explored many things, but more and greater stillremains concealed; perhaps reserved for far distant generations, who shall prosecute the examination of their creator's work in remote countries and make many discoveries for the pleasure and convenience of life…" The above quotation of Linneaus is the most appropriate to this review which deals with the relationship between medicinal plants and the total filed of ethnobotany. Ethnobotany, is totality, is virtually a new field of research, and if this field is investigated thoroughly and systematically, it will yield results of great value to the ethnologists, archaeologists, anthropologists, plant-geographers and pharmacologists etc. Basic quantitative and experimental ethnobotany includes basic documentation, quantitative evaluation of use and management and experimental assessment .[15,16] It has been realized all over the world that much valuable knowledge about uses of plants including medicinal uses is still endemic among many tribal or rural human societies. The ayurvedic system of medicine not only provides cure for a large number of general and chronic diseases but it also strengthens the inner body strength. Generally, wasteland plants are called as weeds and said to be unwanted and undesirable plant species. On the contrary as suggested by 'Ayurveda' has said, "No plant of this world is useless". In ayurvedic system of medicines a large number of plants are employed for the treatment of several diseases like Alzheimer's disease, AIDS, cancer, depression, nervous disorders, diabetes, rheumatism, leprosy, skin disease, urinary stone track diseases, hepatic diseases, diseases of digestive system, malaria and paralysis. The World Health Organization estimates that about 80% of the population of most developing countries relies on herbal medicines for their primary health care needs . About 610 species of medicinal plants have been used by 42 lakhs population of tribals of Rajasthan . Rajasthan, where 80% of its people live in the rural areas and cannot afford costly medicine. They depend on vegetation surrounding them and make perfect uses of them for their medicinal needs.[17,18] A floristic survey of ethnomedicinal plants occurring in the tribal area of Rajasthan was conducted to assess the potentiality of plant resources for modern treatments. A large number of medicinally important tree species are present on Aravalli hill range and other areas including less hospitable North–West Rajasthan. An attempt was made to characterize tree species of the region and detailed ethnobotanical studies on them are in progress. In a floristic survey, 61 ethnomedicianl plant species belonging to 38 families were recorded from Aravalli hills of Mewar region of Rajasthan .

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Ethnomeicinal uses of biodiversity from Tadgarh-Raoli wildlife sanctuary of Rajasthan . Ethnobotanical survey of Sariska and Siliserh regions from Alwar district . A categorical list of plant species along with their plant part/s used and the mode of administration reported to be for effective control in different ailments is prepared .The tribals who depend on forest (mostly their surrounding vegetation) wealth are the real custodians that safeguard the medicinal plants till now. Rapid deforestation caused by over– harvesting and exploitative trade of medicinal plants has significantly reduced the availability of the medicinal plants in arid and semi–arid region of Rajasthan . Generally the folk people are well acquainted with the medicinal properties of their surrounding vegetation particularly for their well being Kheep (*Leptadenia pyrotechnica*) is a widely distributed shrub in western Rajasthan. It is traditionally used as food and medicine. Nowadays, natural products and herbal medicines have been recommended for the treatment of diabetes .Over 50 plants are present in arid zone of Rajasthan having anti diabetic potentials . In Dang region of Rajasthan, 36 plants species are used as cooling agents during summers . An extensive survey of southern part of Rajasthan including Chittorgarh, Udaipur, Banswara and Dungarpur districts was made to document the traditional knowledge of medicinal plants used by tribal communities .The tribals who depend on forest (mostly their surrounding vegetation) wealth are the real custodians that safeguard the medicinal plants till now. Rapid deforestation caused by over– harvesting and exploitative trade of medicinal plants has significantly reduced the availability of the medicinal plants in arid and semi–arid region of Rajasthan. For sustainable development, in-situ strategy of conservation is needed.[19,20]

III.RESULTS

Rajasthan has a large population of about 5, 64, 73, 122 crore. Around 80 percent live in villages which utilizes local medicine.
The people of Rajasthan can be broadly divided into ; those living into extreme wheather condition as in Western Rajasthan and others in milder climate.
Rajasthan has rich biodiversity consisting of a large number of plants, some of which are used for their medicinal value. Although flora of Rajasthan has been compiled but detailed information about their medicinal properties are lacking.

A large number of medicinally important tree species are present on Aravalli hill range and other areas including less hopitable North–West Rajasthan. An attempt was made to characterize tree species of the region and detailed pharmacognostical studies on them are in progress.

Several tribes of Rajasthan used the traditional system of medicine.

The tribals who depend on forest (mostly their surrounding vegetation) wealth are the real custodians that safeguard the medicinal plants till now. Rapid deforestation caused by over–harvesting and exploitative trade of medicinal plants has significantly reduced the availability of the medicinal plants in arid and semi–arid region of Rajasthan .[21,22]

Generally, wasteland plants are called as weeds and said to be unwanted and undesirable plant species. On the contrary as suggested by ‘Ayurveda’ has said, “No plant of this world is useless”.

Knowledge about the medicinal properties of these plants is confined to tribals only. Generally the folk people are well acquainted with the medicinal properties of their surrounding vegetation particularly for their well being .
Rajasthan where 80 percent of its people live in the rural areas and cannot afford to the luxury of costly modern medicine. They depend on vegetation surrounding them and make perfect uses of them for their medicinal needs. The present investigations were undertaken for collection of important medicinal plants from different regions of Rajasthan.

Detailed survey has made in all districts in Rajasthan and the information regarding use of medicine has been documented. The plants were identified by using standard monographs and flora (Sharma, 1976 and Bhandari, 1990). Ethnomedicinal information about the plants was collected on the basis of frequent interviews with graziers, shepherds and experienced old village folk.

All the plant species are deposited in Herbarium, Department of Botany, University of Rajasthan, Jaipur.[23,24]

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Ethnomedicinal Observations –

The present investigation provides first hand information and enumeration of some species, described along with name of their families, local names and plant parts used. Family and local names of plant species are given in parenthesis.

1. *Abrus precatorius* Linn : (Local name–Chirmi, Family–Fabaceae). Decoction of root is given with almonds to increase vigour and vitality. Leaves are used for various skin diseases.

2. *Acacia nilotica* (L.) Delile : (Local name–Babul, Family–Fabaceae). Gum of the tree is highly nutritive and is useful for pregnant mothers. Raw fruits have medicinal values in women diseases, also used in tooth paste.

3. *Argemone mexicana* Linn : (Local name– Pili kateli / Satayanasi, Family–Papaveraceae) : Root is used for chronic skin diseases, eye and mouth wash. Leaves for gonorrhoea, dropsy, jaundice, scabies, other skin diseases. The yellow juice is used in eye infection. The juice rubbed on the body relieves rheumatic pain. The oil from the seed is used externally for skin diseases, joint pains.

4. *Azadirachta indica* A. Juss : (Local name–Neem, Family–Meliaceae). The stem bark is bitter tonic, used to cure chronic fever. Bark is also used for wound.

5. *Calotropis procera* (Ait.) R. Br. :(Local name–Akara. Family–Asclepiadaceae). Flowers of this plant are used in piles and asthmatic problems. Latex used in tooth–ache and ringworm, and also for removing face darkness. Roots is used for spleen complaints, elephantiasis, rheumatism, protracted labour (given with black pepper). Bark is used for diaphoretic, expectorant, emetic in dysentery hempologia. Leaves are used on sores, skin disease , inflammation and rheumatic joints.

6. *Datura innoxia* Mill. : (Local name–Dhatura, Family–Solanaceae). The dried leaves and twigs of the plant are smoked as an antispasmodic in asthma, whooping cough, bronchitis etc.

7. *Tephrosia hamiltonii* Drumm. : (Local name–Sarphanko, Family–Fabaceae) Plant is used as tonic, laxatic, diuretic and deobstruent. Root and seeds are insecticidal and pesticidal. Decoction of pods used as vermifuge and to stop vomiting.

8. *Tridax procumbens* Linn. : (Local name–Rukhari, Family–Asteraceae). Whole plant checks bleeding when applied on cut wounds. Leaf juice is insecticidal, pesticidal, checks heamorrhage, removes stones from urinary bladder, diarrhoea, dysentery.

9. *Xanthium strumarium* Linn : (Local name–Aadha–Shishi, Family–Asteraceae). Seeds are used for the disease Aadha–shishi, generally known as migrene pain.

10. *Zizyphus nummularia* (Brum.) Wt. : (Local name–Jhari–Bor, Family–Rhamnaceae). Leaves placed on to boils and scabies fruit are used for biliousness, astringent and cooling.

The following medicinal plants are distributed in various districts of Rajasthan:–

1. *Calotropis procera* : This plant mainly found in Kota, Baran and Udaipur district of Rajasthan

2. *Azadirachta indica* : Cosmopolitan

3. *Chlorophytum tuberosum* : This plant mainly found in Udaipur, Chittaurgarh, Banswara, Dungarpur, Baran district of Rajasthan

4. *Asparagus racemosus* : Cosmopolitan

The distribution of medicinal plants in various districts of Rajasthan.

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1. *Aloe vera* ---Jaisalmer, Barmer, Jodhpur, Nagaur, Jhunjhunu, Churu.

2. *Chlorophytum*--- Udaipur, Chittaurgarh, Banswara, Dungarpur, Baran.

3. *Ocimum sanctum*--- Cosmopolitan.

4. *Madhuca longifolia* ----Kota, Bundi, Jhalawar.

5. *Azadirachta indica*---- Cosmopolitan.

6. *Tecomella undulate*--- Udaipur, Sirohi, Pali

7. *Calotropis procera*---- Kota, Baran, Udaipur

8. *Citrus maxima* ---Jaipur, Sikar, Alwar, Ajmer, Bharatpur, Sawaimadhopur, Karauli, Dhaulpur, Tonk

9. *Acacia catechu* ----Cosmopolitan

10. *Ricinus communis*---- Udaipur, Bhilwara, Chittaurgarh, Jaipur, Kota, Baran,

Dungarpur

11. *Asparagus racemosus*----- Cosmopolitan.[25,26]

IV.CONCLUSIONS

Understandably, ancient cultures imposed restrictions, slapped sanctions and handed down hard prescriptions mainly to arrest the attitudinal change eating into the vitals of conservation. To supplement the human authority, they invoked godly interventions in the form of rites, rituals and folk tales and lore to create a fear psychosis. The tribal have identified certain plants favorable to them leading to prosperity on the basis of their utility which mark them out different from hundred of other species present around. They worship them and feel cutting of them is a sin and anyone if caught red hundred is punished by them. A detailed account in respect of different aspects of human-plant relations in the area has been mentioned after conducting a wide survey during the present investigation. It is based on surveys of different tribal villages and remote areas and interviews with people of different age groups. Studies have been undertaken medicinal plants used against diseases. Moreover, conservation of biodiversity and the sustainable use of plant resources is another area for paying due attention. The observations and findings made under present investigation reveals that the ethnic groups and local people of the area are highly dependent on the natural plant resources surrounding their vicinity and these resources play an important role in their routine life. It is the need of the hour to focus immediate attention for the plant conservation from the government and NGOs with the help of local people by creating rapid awareness in them. There is need of cooperation and coordination among various agencies such as forest and the pharmaceutical firm interested in the utilization of these medicinal plants and to initiate restoration work in affected areas. By doing so we can change the economic and social conditions of the local inhabitants positively[27].

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