

Full Length Research Paper

## Ethnobotanical exploration in Mahendergarh district of Haryana (India)

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This study aimed at identifying plant species used and manipulated by the community for routine maladies in Mahendergarh district of Haryana, India. The data were collected through a series of fieldworks conducted from May, 2010 to January, 2012. Random and systematic sampling methods were employed to select the study sites as well as the informants. Ethnobotanical methods using semi-structured interviews were employed and a total of 56 species of medicinal plants belonging to 33 families were recorded. Local people use these plants in treating more than 60 diseases. The wild/natural environment yielded larger proportion of the total records followed by home gardens of the area. These species were found to have the highest diversity of medicinal applications. However, only very few individuals of each species were found in the area and this might be attributed to the ongoing habitat modification and loss of natural vegetation. Measures are needed to conserve plants that are reported to be scarce in the study area, but still, they are only harvested from the wild. Therefore, it is important to create awareness on sustainable use of the natural vegetation. Paying special attention to the medicinal plants found in the area may help to amplify the role that these plants play in healthcare, poverty alleviation as well as biodiversity conservation.

**Key words:** Ethnobotany, medicinal plant, healthcare, biodiversity conservation.

### INTRODUCTION

Nature has provided for its living components all they need, namely, food, fodder, fuel, medicines, etc. For all human ailments, medicines are available in this environment itself. The use of plants to alleviate human sufferings is perhaps as old as the origin of man itself on this planet. Plants with medicinal properties enjoyed the highest reputation in the indigenous system of medicines all over the world. In India, the sacred Vedas dating back between 3500 and 800 B.C give many references of medicinal plants. One of the remotest works in traditional herbal medicine is "Virikshayurveda", compiled even before the beginning of Christian era and formed the basis of medicinal studies in ancient India. The Rig Veda, dating between 3500 and 1800 B.C., seems to be the

earliest record available on medicinal plants (Ahmad et al., 2003). Nearly 80% of the world population depends upon traditional system of health care. Allopathic drugs have brought a revolution throughout the world, but the plant base medicines have its own status. Surveys had revealed that 50% of the top prescription drugs in the USA are based on natural products and the raw materials are locked up in the tropical world, interiors of Africa, Asia, and Latin America. The local uses of plants as a cure are common, particularly, in those areas, which have little or no access to modern health services, such as the innumerable villages and hamlets in India (Sandhya et al., 2006). The knowledge of use of medicinally important plants has been passed verbally from

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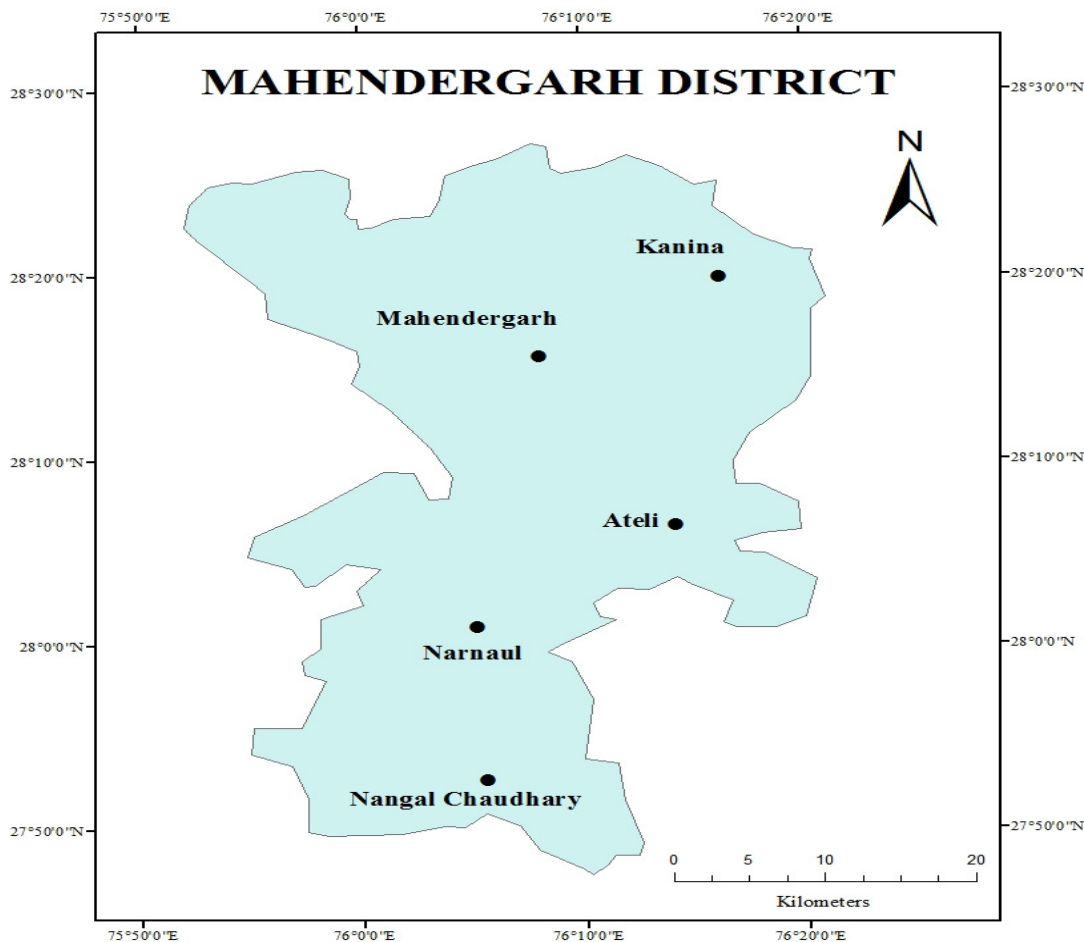


Figure 1. Map of the study site.

from generation to generation over times, and it led to the discovery of a wide range of plant derived drugs.

India is a vast country of rich plant resources, including considerable number of medicinal plants. Local communities in different parts of the country have developed a deep knowledge of various uses of plants during their old history. Traditional medicine and medicinal plants usage have been investigated in some parts of the country (Jain and Borthakar, 1980; Jain et al., 2011; Khongsai et al., 2011; Singh and Singh, 2011). Some pharmaceutical investigations have been conducted on special disease or cytotoxic properties of different plant species based mainly on local ethnobotanical data in recent years (Ogunkunle and Ladejobi, 2006; Lukhoba and Siboe, 2008). In Haryana, a little work is done in this field (Jain and Verma, 1981, 1987; Jain et al., 1982; Lal and Yadav, 1983; Jain, 1987; Sharma and Ahmad, 1995; Yadav et al., 2006; Yadav et al., 2004; 2006; 2010). However, regarding the vast surface, richness of biodiversity of the country and remarkable divergence of culture and traditional customs distributed throughout this area, it is clear that a high number of ethnobotanical investigations should be conducted to help in efficiently documenting

and conserving this knowledge. Therefore, documentation of medicinal plants and their usage by indigenous inhabitants of the district is an important matter. The objectives of this study were to collect and document information about the medicinal plants used by local people and traditional healers of Mahendergarh district of Haryana (India).

#### MATERIALS AND METHODS

Mahendergarh is one of the southern arid district of Haryana State in India. The district is located on the northern side of Thar desert of India. It lies between 27° 47' to 28° 26' latitude and 75° 56' to 76° 51' longitude and is spread over an area of 1899 km<sup>2</sup> (Figure 1).

Administratively, the district has five community block, namely, Ateli, Kanina, Mahendergarh, Nangal Chaudhary, and Narnaul. The topography of the district includes the offshoots of Aravalli slope and sand dunes of different sizes. The climate of the district, except during the monsoon, is characterized by low humidity, an extreme hot summer and a cold winter. The economy of the region is based on agriculture and livestock activities. In recent decades, the region has suffered population migration in search of employment which has led to an aging population, a decrease in demographic density, and the preservation of much of its rural character. The absence of any ethnobotanical study in this region led us to conduct an

ethnobotanical survey to explore and document the ethnobotanical potential of this district.

#### Field work

The method used to gather information was the ethnobotanical interview. The interviews were with people indicated by other local people as owning huge knowledge of plants and their uses (mainly elderly people). Seventy-seven interviews were conducted, each one involving more than one visit and sometimes with the participation of more than one informant; in total, 245 people were interviewed. The interviews were developed as informal conversations without a strict questionnaire, though with guidelines of the items to talk about held in mind, in order to let people speak spontaneously and not feel pressured. Our final purpose was to obtain the complete list of medicinal and aromatic plants used and/or known by each informant. The hakims (Ayurvedic medical practitioners), priests and aged people were given special attention during data collection as they had a lot of knowledge about the plant uses. Information was recorded from native people, especially who were familiar with herbal medicines.

Discussion was also carried out with villagers by giving them a topic and informal discussion was organized with the rural people. The topics given were, "how they used plants in their day to day life, medicinal uses, folklore, superstitions, songs, etc". These discussions gave vast data as each group was large and miscellaneous. As the discussions proceeded, more and more people joined, who had something more to add.

The data acquired for each plant comprise the common local name, its uses or effects, the part of the plant used, and its preparation and administration process. Most of the mentioned plants were observed *in situ* during short field walks with the informants and were collected for scientific identification. Plants were identified with the help of the literature (Jain et al., 2000). Voucher specimens of wild plants in the study area reported by informants were prepared and deposited in the herbarium of Botany Department of Maharshi Dayanand University, Rohtak (Haryana) India.

## RESULTS

### ***Abutilon indicum* (Linn) Sweet (Malvaceae), Pilibooti**

The leaves and seeds of this plant are crushed with water to form a paste which is applied by rural people to cure syphilis. They also take orally 10 ml decoction of the plant before dinner for about a month to cure gonorrhoea. The fresh leaves are grinded with turmeric, rice, and coconut milk to prepare a paste which is applied on boils.

### ***Acacia nilotica* (Linn) Delile. (Fabaceae), Kikar**

The green pods and young leaves of this plant make excellent fodder for goats. The wood is hard and durable, and chiefly used for making carts, pillar, beam, plank, door-frame, agriculture implements, house-hold articles like pestle and mortar, for making pestle of oil expeller, boats, etc.

### ***Achyranthes aspera* Linn (Amaranthaceae), Puthkanda, Ulta-kanta**

Ripen seeds of this plant after rains are collected and

mixed with the latex of *Calotropis procera*. The mixture is put in an earthen pot to dry up. After 2 to 3 days, the seeds are removed and powdered. About 500 mg powder is taken orally with betel leaves to cure cough. The whole plant ash is dissolved in water, stirred, decanted, and boiled to concentrate. A dose of 10 ml of this should be taken in cases of whooping cough thrice daily till cure. The decoction of the whole plant is taken to cure asthma.

### ***Aegle marmelos* (L.) Corrêa ex Roxb. (Rutaceae), Bel-Patra**

The paste of the leaves of this plant is applied on forehead to relieve headache. The unripe fruit is powdered and taken with water in dysentery. The pulp of the fruit is useful in treating stomach disorders. Juice is good heart tonic, and ripe fruit is eaten. The pulp of fruit is also preserved in the form of 'Morabba' since it has a cooling effect.

### ***Aerva javanica* (Burm.f.) Juss ex. Schult (Amaranthaceae), Bui**

The rural people boil the flowers of this plant in water and apply the decoction over the swellings.

### ***Ailanthus excelsa* Roxb. (Simaroubaceae), Bilayati neem or Uloo neem**

The powder of this plant stem-bark (5 mg) when mixed with curd is taken orally to cure dysentery. The stem-bark is also useful against scorpion sting and snake bite. The juice of the leaves and stem bark is also applied against skin eruption. The seed-oil is considered to have insecticidal properties.

### ***Albizia lebbek* (L.) Benth. (Fabaceae), Siris**

The paste of leaves and bark of this plant is used to cure insect-bite and scorpion-sting. The plant is also useful in the treatment of asthma, cold, and cough.

### ***Amaranthus viridis* Linn. (Amaranthaceae), Jangli Chauli**

The tender branches and leaves of this plant are cooked as vegetables and eaten to cure digestive problems.

### ***Amaranthus spinosus* Linn. (Amaranthaceae), Kante-Wali-Chaulai**

The pills prepared from root paste of this plant are useful to cure congestion of liver and irritation in urinary duct. The decoction of root is also taken orally to cure stomachache and applied externally on wound and boil.

***Argemone mexicana* Linn. (Papaveraceae), Pili Kateli or Satyanasi or kandiali**

The 5 ml decoction of dried and crushed flowers of this plant with water is taken orally to cure whooping cough. The latex of the plant is useful in the treatment of rheumatic pain and cutaneous infection. The fresh leaves or their juice is applied on wounds and against scorpion sting. Local people also rub the leaves on the sites of irritation to cure scabies.

***Blumea balsamifera* DC. (Asteraceae), Kakronda**

The warm juice of the leaves of this plant is applied on the chest of children suffering from pneumonia. Juice (2 ml) of the leaves mixed with honey (same quantity) is taken orally once a day for three days to destroy intestinal worms.

***Boerhavia diffusa* L. (Nyctaginaceae), Punarnava**

Decoction (5 ml) of the whole plant with 6 black peppers and a piece of garlic are given once a day for to cure jaundice. The fresh juice of the aerial parts, if taken on empty stomach regularly, helps in making new body cells. The extract of the roots is taken orally to cure diarrhea and vomiting.

***Bryophyllum calycinum* Salisb. (Crassulaceae), Patharchat**

Decoction of leaves of this plant is given to the stone patients. Leaves are warmed with edible oil and tied on boils.

***Calotropis gigantea* (Linn). R. Br. (Asclepiadaceae), Safed-aak, Shiv-aak**

Decoction of the bark of this plant is used to cure dysentery and diarrhea. Powder of white flowers are made and mixed with honey and taken orally to cure mental disorders. The ash of the leaves is used to cure cough and cold. The root paste is applied against scorpion-sting. The local people put the leaves in boiling water for some time and then rub the leaves on the body to cure fever and jaundice.

***Calotropis procera* (Ait) R. Br. (Asclepiadaceae), Aak**

The paste of roots of this plant is applied on pimple and boil. Latex of the plant is locally applied on scorpion, snake

and insect bite to relieve pain and burning sensation. It is applied locally on painful joints and swellings. Fresh buds of this plant are taken to relieve asthma and cough. Root-bark powder of the plant cures the re-occurrence of malaria. The leaves warmed with brassica oil are tied over the cut or bruises to relieve pain.

***Cannabis sativa* Linn. (Cannabinaceae), Bhang**

Dried leaves and inflorescence of the plant are orally administered to cure dysentery and diarrhea. Crushed seeds are used to make some tablets and put in vagina every night and removed in morning to cure leucorrhoea after marriage.

***Capparis decidua* (Forsk) Edgew (Capparidaceae), Kair**

The fruits of the plant are useful for diabetic patients. The powder made from the fruits of this plant when taken on empty stomach cures constipation and stimulates digestion. The fruits are used in curing scurvy. Unripe fruits are pickled locally, as well as commercially, and it is also cooked as a vegetable.

***Capparis sepiaria* Linn. (Capparidaceae), Heens**

The paste of fresh roots of this plant and ginger is applied externally to cure mumps in children. The juice of the roots is dropped in the ear to relieve earache. The root powder is applied on forehead to cure headache. Bath with decoction of the leaves helps to cure skin diseases.

***Cassia occidentalis* Linn. (Caesalpiniaceae), Kasumba**

Paste of fresh leaves of this plant is applied externally to cure skin diseases. Local people tie warmed leaves over the eyes to cure conjunctivitis. The paste of fruit is applied against scorpion-sting. A warm bath with the decoction of the leaves of this plant is said to be a reliable remedy to cure rheumatism.

***Cassia tora* L. (Caesalpiniaceae), Panwar**

The root-paste of this plant is applied as an antidote to snake-bite and scorpion sting. The root paste with lime juice is used for ringworm. The decoction of leaves and seeds are used to cure several skin diseases.

***Chenopodium album* Linn. (Chenopodiaceae), Bathua**

The fresh leaves of this plant are mixed with wheat flour

to prepare *chapatti*. The tender-branches with leaves are boiled and are used as vegetable in rural households. This pot vegetable improves digestion and cures constipation. The juice of this plant mixed with sugar is used to cure kidney stones.

***Commelina benghalensis* Linn. (Commelinaceae), Kankaoa**

The leaves of this plant mixed with gram flour are used to prepare snacks. The decoction of the whole plant is useful for constipation and leprosy.

***Cordia dichotoma* Frost F (Boraginaceae), Lasura**

Paste of the stem bark of this plant and green leaves is applied in skin diseases. Decoction of the bark is used as gargle for mouth ulcer. The fruits of this plant are used in making pickles and jams.

***Crinum asiaticum* Linn. (Amaryllidaceae), Sukh darshan**

The bulb of this plant is used as laxative and also used for urinary troubles. The bulbs are crushed and roasted, then their extract is used for ear-ache.

***Croton bonplandianum* Baill. (Euphorbiaceae), Jangli jamalgota**

Oil of the seeds of this plant is used as purgative of extraordinary efficiency.

***Cuscuta reflexa* Rouxb. (Convolvulaceae), Amar- bel, aakash-bel**

The decoction of the stem of this plant is used to cure dysentery, diarrhea, jaundice, cholera, and asthma. The plant is a common blood purifier. The plant is useful to cure small and large pimples.

***Cynodon dactylon* (Linn.) Pers. (Poaceae), Dub**

The paste of the leaves of this plant with curd is useful in the treatment of piles. The fresh juice of plant is effective in controlling nasal bleeding, when used as nasal drop. The plant is beneficial in the treatment of dysentery, diarrhea, vomiting, and frequent thirst. It is also used as a common fodder for livestock.

***Dalbergia sissoo* Roxb. (Fabaceae), Sisham**

One tea spoon leaf decoction of this plant is used twice a

day to cure dysentery and diarrhea. Infusion of the leaves is used for gargling against throat infection. The paste of the leaves is used to cure diabetes. The oil of the wood is use for massage to cure paralysis. The powder of the stem bark is taken orally twice a day for 2 to 3 days to cure pneumonia in children.

***Datura stramonium* Linn. (Solanaceae), Dhatura**

The leaves of this plant are warmed and applied on boils, pustules, and swellings. The seed powder of this plant mixed with cloves is taken with honey twice daily for five days in case of malaria. To take the thorn out from any part of the body, one forth piece of the leaf along with jaggery is chewed once only. This dissolves the thorn within 24 h, as claimed by local people.

***Eucalyptus lanceolatus* Dum. (Myrtaceae), Safeda**

Dilute infusion of leaf of this plant is used as an astringent. The oil of the leaf is an antiseptic and is used for disinfecting and dressing of wounds. The oil is mixed with an equal quantity of olive oil. It is considered a useful rubefacient for rheumatism.

***Eugenia jambolana* Linn. (Myrtaceae), Jamun**

The use of this plant controls blood sugar as claimed by local people. The pulp of fruit is used in manufacturing jams and jellies.

***Euphorbia hirta* Linn. (Euphorbiaceae), Dudhi**

Decoction of whole plant is used to cure asthma, bronchial infection, cough, dysentery, and colic pain. The paste of the leaves is used to cure ringworms. The extract of the leaves is taken to cure pneumonia and typhoid.

***Euphorbia royleana* Boiss (Euphorbiaceae), Danda thor**

The latex of the plant is usually applied for curing skin diseases.

***Ficus benghalensis* Linn. (Moraceae), Bargad**

Tender twigs of this plant are used to clean teeth. Extract of young leaves is used to cure diarrhea and dysentery. The latex is applied externally to cure pain of rheumatism. Male takes two drops of it orally daily with sugar

sugar (patasa) for one or two months to make the semen thick and to regain sexual potency. The latex is also useful against bleeding, boils, earache, and to fill cracks of feet. Powder of the bark of this plant is given with cow milk and sugar cube to decrease vagina pains and prevent sterility.

***Ficus religiosa* Linn. (Moraceae), Pipal**

Decoction of bark powder of this plant is taken orally 2 to 3 times for 2 or 3 days to cure typhoid, and decoction of the leaves is taken to cure pneumonia. The bark is rubbed on the stone and the sap is applied on honey bee-sting. The bark of stem is also applied on skin diseases. Decoction of the bark is taken to relieve vomiting and fever. It is also used as mouth wash for toothache, gum problems and bad odour. The bark is crushed in water and mixed with honey and cow milk and applied on breast for mastitis. The decoction of the plant mixed with honey is used to cure common-cold. The plant is also useful in treatment of jaundice, headache, earache, toothache, etc.

***Fumaria parviflora* Lam. (Fumariaceae), Pitpapra**

Decoction (8 to 10 ml) of whole plant is taken orally to cure dysentery twice a day for 2 to 3 days.

***Launaea nudicaulis* Hook. f. (Asteraceae), Tikchana, Jangli gobhi**

The juice of the leaves of this plant is taken orally to cure constipation.

***Melia azadirach* L. (Meliaceae), Bakain**

Decoction of the stem bark is taken to cure malaria, while that of the root bark for intestinal worms and constipation. The paste of the leaves of this plant along with leaves of custard apple (*Annona squamosa*) is applied over the head for 24 h to remove lice and louse of the hairs. The paste of the leaves and bark is applied on the skin diseases.

***Melia azadirachta* Linn. (Meliaceae), Neem**

Young shoots and green twigs are used as toothbrush. It cures toothache, bad breath and gum problems and protect the mouth from many infections. Chewing young leaves is a good remedy against snake-bite. The decoction made from the bark of the tree is useful in fever, arthritis, stomach disorders, etc. Water boiled with the the leaves of this plant is used by small pox patients for bath, and its twig is kept alongside the patient to keep away evil spirit. Fumigation of dried leaves acts as good

insecticide.

***Melilotus indica* Linn. (Fabaceae), Senji**

Whole plant is used to cure dysentery and diarrhea.

***Moringa oleifera* Lam. ( Moringaceae ), Sohanjana or Saijna**

The young fruits and flowers of this plant are cooked as vegetables and are used in curries. The fresh roots and stem-bark are crushed with little water and the paste is applied to the joints for relief in swelling, tumor, and in rheumatic pain. The fresh leaves mixed with lime are applied on wounds caused by snake bite and dog bite. The fresh leaves with sugar are given in acute diarrhea. Powder of the seeds is taken orally in flatulence and indigestion.

***Morus alba* Linn. (Moraceae), Tut or shahtoot**

Young tender leaves are eaten for curing dysentery. Young solid branches are used in making baskets.

***Ocimum sanctum* Linn. (Lamiaceae), Tulsi**

The tea prepared with the leaves of this plant, black pepper and ginger is widely used to cure cough, cold, and fever. Juice of the leaves mixed with lime juice is an excellent remedy in skin infections and ringworms. It is conserved as sacred plant and worshiped by local women for health and vitality of their husbands.

***Oxalis majus* Linn. (Oxalidaceae), Khati-buti**

The plant sap is used to cure scurvy and other skin diseases. The leaves are used as a cooling refrigerant in stomach disorders, fever, and acute headache. Extract of the leaves with honey or sugar is used to cure dysentery and diarrhea.

***Physalis minima* Linn. (Solanaceae), Palpotan**

The whole plant is crushed and the juice is taken by diabetic patients to control blood sugar level.

***Prosopis cineraria* Linn. (Fabaceae), Janti, Jand, Sangar**

The stem bark of this plant is useful in the treatment of asthma, arthritis, and scorpion-bite. The paste of the flowers is used as blood purifier and remedy for skin

diseases. The leaves are used commonly as fodder by local farmers which increase milk production. The unripe fruits are commonly used to make delicious vegetable.

***Ricinus communis* Linn. (Euphorbiaceae), Arand or arandi**

The juice of the leaves of this plant mixed with mustard oil is applied on burns for instant relief. The warm leaf is tied locally on the points of swellings, guinea-worms, sprains and fractures, injury, headache, abdominal pain, and rheumatism. It is very common to apply the warm leaf over the swellings on teats in nourishing mothers. The massage of the oil relieves pain in any part of the body.

***Salvadora oleoides* Linn. (Salvadoraceae), Jaal, Meswak**

The ripened fruits of this plant are very delicious in taste and give cooling effect. The tender branches are used as tooth brushes. The decoction of the root bark is used to make menstruation regular. The paste of the root bark is applied on injury and wounds. The paste of the leaves is applied effectively to cure rheumatism and scurvy. The decoction of the root-bark is taken to cure fever.

***Solanum nigrum* Linn. (Solanaceae), Makoi**

Juice (5 ml) of the fresh plant is taken orally daily early in the morning to cure liver diseases. The leaf juice is applied on wounds caused by dog-bite.

***Tamarix aphylla* (Linn) Karst. (Tamaricaceae), Faransh**

The powder of the stem bark of this plant is used as tooth powder to relieve toothache and gum problems. The old bark of the plant is powdered and mixed with coconut oil (*Cocos nucifera*) to make a paste. The paste is applied on boils.

***Tephrosia purpurea* (L.) Pers. (Fabaceae), Jhojharu**

Extract of root of this plant mixed with honey is taken orally with water to cure stomachache. The decoction of the whole plant is used as antihelminthic for children and as a blood purifier.

***Trianthema portulacastrum* Linn. (Aizoaceae), Satta**

The whole plant filtrate is given in the dose of 3 ml twice a day for about 5 days to cure typhoid. One teaspoon full

of fresh juice of the plant with two teaspoonful honey is taken orally twice a day for about one week to cure pain and swellings of joints. It is also used as pot vegetable and very helpful in curing constipation and other digestive problems.

***Tribulus terrestris* Linn. (Zygophyllaceae), Bhankhari**

The fruits of this plant are powdered with the seeds of *Sesamun* species (Til) and taken orally with milk to cure impotence. Fruit powder is also taken orally to cure urinary disorders.

***Withania somnifera* (Linn.) Dunal (Solanaceae), Ashgandh**

Powder of root of this plant is given with cow milk and sugar cube to decrease vagina related pain and prevent sterility. The plant is very useful for man to increase sperm count, concentrate semen and increase semen. The warm leaf of the plant with latex of *C. procera* is applied and tied over boils, swellings and rheumatic pains.

***Xanthium strumarium* Linn. (Asteraceae), Mashkhara**

The decoction of the root bark of this plant is used to cure cough and asthma. The stem bark is useful to cure vomiting and diarrhea. Decoction of the leaves is useful to cure mouth sores, pyorrhea, and asthma.

***Ziziphus jujuba* Lam. (Rhamnaceae), Ber or Beri**

The leaf paste of this plant is applied topically to cure boils, bruises, and pimples. It is also used to fill cracked feet.

## DISCUSSION

This present ethnobotanical study provides information on the ethnobotanical uses of the 56 plants belonging to 33 families. Most dominating family of the area is Fabaceae with 6 species followed by Amaranthaceae, Euphorbiaceae, and Solanaceae each with 4 species, then Asteraceae and Moraceae with 3 species each, Cappariaceae, Myrtaceae, Asclepiadaceae, Ceaselpiniaceae, and Meliaceae each with 2 species, the remaining 22 families, namely, Aizoaceae, Amaryllidaceae, Boraginaceae, Cannabinaceae, Chenopodiaceae, Commelinaceae, Convolvulaceae, Crassulaceae, Fumariaceae, Lamiaceae, Malvaceae, Moringaceae, Nyctaginaceae, Oxalidaceae, Papaveraceae, Poaceae, Rhamnaceae, Rutaceae, Salvadoraceae, Simarubaceae, Tamaricaceae, and

Zygophyllaceae are represented by one species.

Most of the plant species are reported to be quite effective remedies for different diseases, such as fever, diarrhea, dysentery, diabetes, jaundice, backache, stomachache, ulcers, cold, cough, etc. These plants are also used by the local herbal healers as traditional medicines. The local people use these plants to cure 66 types of various minor to major diseases. The analysis of data revealed that 12 species are used in curing dysentery and diarrhea, 9 species in fever and malaria, 11 species in skin disorders, 8 species in cough, 7 species in rheumatic pain, 8 species in curing boils, 8 species in asthma, 4 species in purifying blood, 8 in scorpion bite, 8 in constipation, 5 species in treating arthritis, 6 in snake bite, 4 in pneumonia, 4 in jaundice, 5 in influenza, 2 in piles, 3 in urinary disorders, 4 in teeth problems, 5 species act as insecticide, 5 as antiseptic, 4 species in stomachache, 4 in regulation of menstruation, 5 in swelling, 3 act as anthelmintic, 5 in diabetes, 3 in earache and headache. Other disorders like leucorrhea, night blindness, leprosy, paralysis, conjunctivitis, cardiac pain, pimples, body pain, rabies, bee sting, stomach trouble, sterility, contraceptive, ulcer, mouth problems, gonorrhoea, pyorrhoea, mumps, insomnia, throat infection, high blood pressure, nasal bleeding, migraine, stone, typhoid, liver problems, heat, scurvy, and syphilis are treated with 1 to 3 species. Few species act as aphrodisiac, astringent, purgative, and laxative. In the other uses, 8 species are used as fodder, 4 species in making jams and jellies, 3 species are used in cosmetics and as vegetables. Medicine form these plants is prepared in many ways and different parts of plants are used in different maladies. Extract of the whole plant followed by root, stem bark, fruit, latex, and fruits are used frequently for drug preparation. Panghal et al. (2010) has reported similar results from the Sapera community of the Jhajjar District of the State.

## Conclusion

The local people of the study area are knowledgeable about the plants that provide remedies to humans and livestock health problems. However, the area is losing its natural vegetation cover together with the medicinally valuable species rapidly. Most of the medicinal plants are getting very rare as confirmed by elders and as observed during the field work too. If the present trend continues unchecked, it will not be too long before some of them will head to local extermination. It is therefore, very crucial that awareness creation be undertaken so that the community is actively involved in conservation and sustainable utilization of the traditional medicinal plants; as part of the entire plant biodiversity of the area. *In situ* and *ex situ* conservation measures are required to be taken on medicinal plants which are found to be scarce in the study area, but still they are harvested from the wild only. Conservation priority should also be given to

multipurpose plants (plants with more diversified medicinal uses) as this could indicate high intensity of harvest, which could lead to overexploitation. Special attention needs to be accorded to the medicinal plants in order to amplify the role that they play in health care delivery, poverty alleviation, and environmental protection. Further, in depth studies to document and substantiate the indigenous knowledge on medicinal and other useful plants would help to draw serious attention to the valuation of the biological diversity of the study area. More studies like this one and those quoted in the introduction are necessary to gather ethnobotanical knowledge, including all kinds of useful plants, in the various parts of Haryana state.

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