

## Ethnomedicinal survey of Bahadurgarh sub-division, District Jhajjar, Haryana, India

Priya<sup>1</sup>, Priya Kadiyan<sup>2</sup>, Navneet Kumari<sup>3</sup>, Surender Kumar<sup>4</sup>  
and Surender Singh Gulia<sup>5\*</sup>

<sup>1,2</sup>Department of Botany, All India Jat Heroes Memorial College, Rohtak-124001 (India)

<sup>3</sup>Department of Botany, Baba Mast Nath University Rohtak-124001 (India)

<sup>4,5</sup>Department of Botany, Pt. Nekiram Sharma Government  
College Rohtak, Haryana (India)

**Corresponding Author:** Dr Surender Singh Gulia

Assistant Professor, Deptt. of Botany

Pt. NRS Govt. College, Rohtak,

Haryana, Pin-124001

Email: [guliasurender200@gmail.com](mailto:guliasurender200@gmail.com)

Cell: 9050225352

### Abstract

The present study was conducted for documenting the detailed ethnomedicinal plants information of an unexplored area of Haryana. A floristic and ethnomedicinal survey was carried out from 2018 to 2019 in Bahadurgarh block of district Jhajjar, Haryana, India. In present study, we have discussed ethnomedicinal uses, mode of administration, doses and duration of 64 medicinal plant species belonging to 60 genera of 40 families for treating human ailments. The dominating families were Fabaceae, Asteraceae followed by Solanaceae and Amaranthaceae. The most commonly used plant parts in herbal preparations were leaves (33.13%), and fruit (14.20%) followed by other parts of the plants. The documented plants were useful in treatment of various diseases *viz.* pain relief, cough, jaundice, diarrhea, diabetes, menstrual disorders, skin infections, respiratory disorders, digestive disorders, urinary disorders, fever, toothache, rheumatism, headache, pile, arthritis, kidney disorder and some other simple ailments. Further, the findings presented in this article are preliminary and needs further authentication, but these findings can form important criteria for identification of new and effective drugs through further scientific studies.

**P**lant wealth has remained an integral part of human society since the beginning of civilization. Plants have long been used to treat human ailments all over the world and throughout history<sup>19</sup>. Many of the currently available drugs have been obtained directly or

indirectly from plant source<sup>1</sup>. Herbal plants are a very rich source of biologically active compounds and are of great importance for developing new therapeutic agents<sup>11</sup>. The World Health Organization (WHO) has a keen interest in documentation of traditional knowledge of plants by native people from different parts of the world<sup>6</sup>. India is one of the countries with rich floral and faunal diversity, due to its different topography and climatic conditions<sup>18</sup>. India possesses about 47,500 species of plants belonging to various groups<sup>16</sup>. In India, plants have been used as a source of medicine since Vedic era. Medicinal plants offer a real substitute for the treatment of various human ailments<sup>12</sup>. In the developing countries, like India, the use of herbal medicines are widely known among the local people in rural areas whereas in developed countries plants and their derivatives contribute only 25% of the medical drugs. There is about 60-85% of the population in developing countries use a traditional remedy at some stage during their lifespan<sup>17,22</sup>. India possess 70% of the population rely on traditional medicine to meet their health care requirements<sup>21</sup>.

Ethnomedicine mainly deals with indigenous medicine that is used to maintain health and treat physical and mental illnesses differently from allopathic medicine based on old theories, beliefs, and different experiences<sup>12</sup>. In recent decade, ethnomedicine has gained much importance all over the world<sup>15</sup>. For several thousand years, herbal medicine prepared from different plants are being used by the local people such as *Aloe*, Tulsi, Neem, Turmeric, Ginger etc. to cure several common ailments. They are called as home remedies in many parts of the country. It is believed that

drugs obtained from the plants are safer. Plants have medicinal quality for the therapy of many internal diseases, which are otherwise considered very difficult to heal.

Interestingly, Jhajjar district of Haryana has floristic biodiversity and secular knowledge about healing properties of plants. However, biochemical composition has been systematically studied for a very few plants. Therefore, need of the hour is to explore this district for documentation of ethnomedicinal flora and medicines obtained from them, including their preparation methods, dose and mode of ingestion used for the treatment and prevention of various human and animal diseases. Further, there is very few information available on ethnomedicinal uses of plants of the studied area. Present survey is a small scale attempt to gather information about use of local plants by rural society of Bahadurgarh sub-division of district Jhajjar (Haryana), India to cure various human ailments.

#### *Study site :*

Bahadurgarh is a sub-division in the Jhajjar District of Haryana (Figure-1). Total area of Bahadurgarh is 517 km<sup>2</sup> including 478.67 km<sup>2</sup> rural area and 38.23 km<sup>2</sup> urban area. Bahadurgarh sub-division has a population of 4,03,746 peoples. This sub-division is an administrative unit consisted of 65 villages. The climate of the district is semi-arid and hot which is mainly characterized by the dryness of the air except during months of monsoon, summers are intensely hot and winters are cold. The normal annual rainfall in the area is 532 mm. The average temperature ranges from 3° to 45°C. Agriculture is the main occupation of residents for livelihood.



Figure 1: Map of study site

#### Data Collection :

Field work was carried out from 2018 to 2019 in different villages of Bahadurgarh sub-division to explore the ethnomedicinal potential of plants available in the region. The survey was done in most of the villages of the studied area. The information was collected through semi-structured interviews and questionnaire based household surveys (Figure 2). The interviews with local dwellers began only after explaining the purpose of this survey and taking prior consent to the subjects. The information was cross checked with other information from neighboring villages. The questions were asked to the people in local language. The questionnaire contained no strict questions and informants were allowed to speak spontaneously and without pressure. Plant specimens collected from the study sites

were identified with the help of taxonomic experts while unidentified plants were identified with the help of available literature<sup>4,7-10</sup>.

In the present study, ethnomedicinal uses of 64 medicinal plant species belongs to 40 families were documented. The human ailments *viz.* pain relief, cough, jaundice, diarrhea, diabetes, menstrual disorders, skin infections, respiratory disorders, digestive disorders, urinary disorders, fever, toothaches, rheumatism, headache, pile, arthritis, kidney disorder etc. were treated with these medicinal plants. Detailed information pertaining to these medicinal plants used in ethnomedicine *viz.* their botanical name, vernacular names, name of the family, part used, mode of preparation, administration, doses and duration for each plant is given in the Table-1.

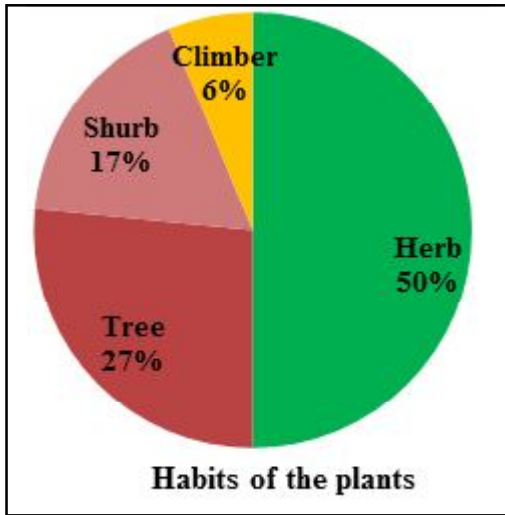


Figure 2: Habits of the plants used to cure different ailments

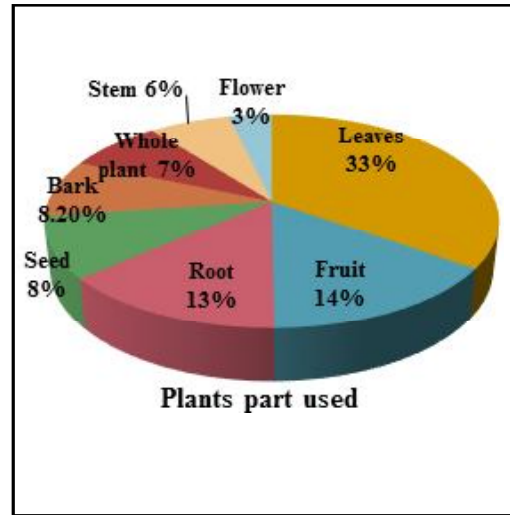


Figure 3: Frequency of plant part used during preparation of herbal medicine

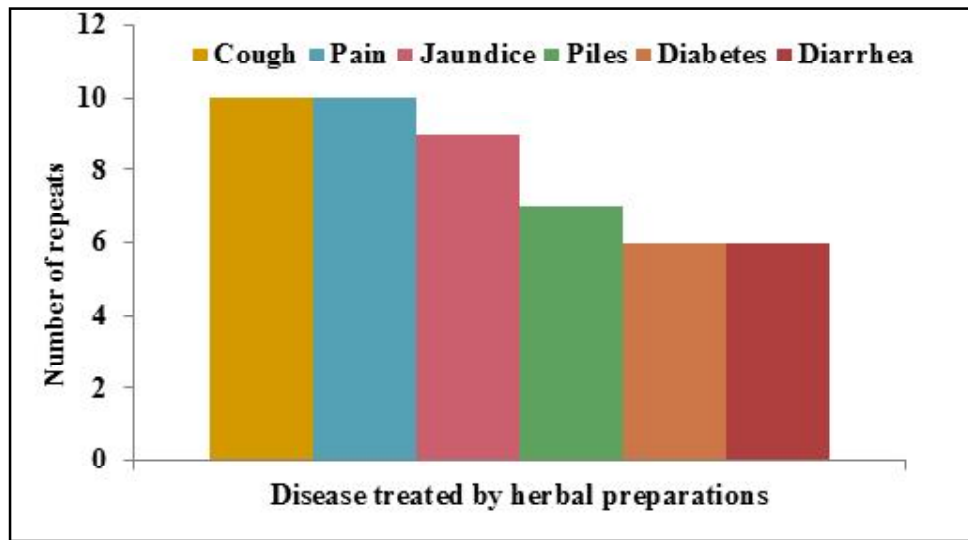


Figure 4: Frequency of disease treated by herbal preparations

Table-1. Traditional uses of some ethnomedicinal plants of Bahadurgarh sub-division, District Jhajjar, Haryana

S. No.	Botanical name	Local name	Family	Habit	Status	Plant part used	Disease treated	Method of drug preparation	Dosage
1	<i>Eugenia jambolana</i> Lam	Jamun	Myrtaceae	Tree	Cultivated	Seed Pulp	Fair skin & acne problems	Seeds are crushed and mixed with cow milk and a paste is prepared. Apply the paste on face before going to bed and wash it in the morning	Daily for 2-3 months
						Leaves	Diarrhea	Chewing and eating of leaves directly	5-10 leaves a day for few days
						Seed	Nocturnal emission	Seed powder (4 gm) taken orally with water	Twice a day
2	<i>Calotropis procera</i> (Aiton) Dryand.	Aak	Asclepiadaceae	Shrub	Wild	Leaves	Diabetes	Take 2 leaves and use them from their lower surface, place it on your heel sole and wear socks. Before going to sleep remove it and wash your legs	Daily for few days
						Leaves	Pain	Leaves warmed with Sarso oil and tie them over the affected area	2 times a day
						Bud	Asthma	Fresh buds are taken orally	Once a day for a week
3	<i>Trigonella foenum-graecum</i> L.	Methi	Fabaceae	Herb	Cultivated	Seed	Diabetes	5-100 g of powdered seeds added to one or two meals	2-3 times a day with meals
						Seed	Male infertility	Seeds oil drops taken by mouth to improve sperm count	3 times a day, for 4 months
4	<i>Abutilon indicum</i> (L.) Sweet	Kanghi	Malvaceae	Shrub	Wild	Leaves	Piles	<i>Abutilon indicum</i> leaves, Makoi leaves, Kali mirch are grounded and paste is prepared	Take it orally, 5 g a day for 2 weeks
						Leaves	Indigestion	Leaves made into a chutney and consumed	1-2 times a day
						Root	Urinary problems	Root powder of the plants is used along with water	3-6 g in a day

5	<i>Piper longum</i> L.	Pippali	Piperaceae	Climber	Wild	Fruit	Cough	1 to 2 g of the fruit, fry it in a little bit of ghee	Consume 1 tsp twice a day
						Fruit	Uterus problems	Fruit taken orally after delivery along with water, so that the uterus retain its normal size	2 times a day for few days
6	<i>Achyranthes aspera</i> L.	Ola kanta	Amaranthaceae	Herb	Wild	Leaves	Toothache Swelling	Prepared a decoction of the root, filter it	Take it twice a day
						Leaves	Kidney	Crush leaves of the plant to extract its juice	Take half tsp twice a day
7	<i>Punica granatum</i> L.	Anar	Punicaceae	Tree	Cultivated	Fruit	High blood pressure	45-300 ml of pomegranate juice has been taken orally	Daily for 20 months
						Fruits	Piles	Take 1 tsp of dried pomegranate powder and mix it with buttermilk	Taken thrice a day
8	<i>Carthamus tinctorius</i> L.	Kusumbha	Asteraceae	Herb	Cultivated	Leaves	Micturition	Prepared a decoction of the dried leaves	40-50 ml for few days
						Seed	Intestinal worms	Safflower oil is given to a patient orally	20-30 ml for one week
						Flower	Jaundice	Flower powder in 4 g with water and drink it	3 times a day
9	<i>Ferula assa-foetida</i> L.	Hing	Apiaceae	Herb	Cultivated	Stem	Cough	Paste prepared by grinding Hing with water. Apply it on chest	3-4 times a day
						Stem	Asthma	Mix Hing powder, dry Ginger powder and 2 tsp of honey	Taken orally 3 times a day
						Stem	Menstrual disorders	Mix a pinch of Hing, one half tsp of Fenu greek powder and salt for taste in a cup of buttermilk	Drink 2-3 times a day for few months
10	<i>Chenopodium album</i> L.	Bathua	Chenopodiaceae	Herb	Wild	Leaves	Constipation	Make juice from plant leaves	Drink it, every morning with empty stomach

								Leaves	Menstrual disorders	Decoction of 30 g leaves with some dried	Consume twice a day
								Leaves	Urinary infections	Boil half Kg leaves in 3 glasses of water. Cool the liquid add Lemon, black salt	Drink 1 cup, twice a day for few days
11	<i>Spinacia oleracea</i> L.	Palak	Amarantaceae	Climber		Cultivated		Leaves	Kidney disease	Crush the fresh leaves of Spinach. Make its decoction twice a day	Take 50 ml
								Leaves	Baldness	Mix equal quantity leaf juice of Lettuce and Spinach	Drink 3 cups a day
								Leaves	Low platelet count	5-6 leaves. Boil in a glass water until it reduces to half. Add half glass of tomato juice	Drink twice a day
12	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Arjun	Combretaceae	Tree		Cultivated		Bark	Fractured bone	Arjun bark is boiled with milk	Take orally as per needed
								Bark	Heart disease	Grind the bark. Take 2 pinches powder and mix in one tsp honey	Have it with milk for 15 days
								Bark	Heavy menstrual bleeding	Boil half tsp bark powder in one litre water. Cool and drink	Drink it after every 2 hours
13	<i>Cannabis sativa</i> L.	Bhang	Cannabaceae	Herb		Wild/cultivated		Leaves	Diarrhea	Chew 3-4 leaves with black pepper powder and sugar	As per needed
								Leaves	Dysentery	Paste is prepared by taking leaves with black pepper and sugar	Take 1 tsp orally twice a day
								Leaves	Colon cancer	Burn the dried leaves	Inhale the smoke
14	<i>Saccharum officinarum</i> L.	Sugarcane	Poaceae	Herb		Cultivated		Stem	Wrinkles	Mix a pinch of turmeric in sugarcane juice	Apply for 10 min

						Stem	Jaundice	Mix sugarcane juice with yoghurt	Drink a glass twice daily
15	<i>Albizia lebeck</i> (L.) Benth.	Siris	Mimosaceae	Tree	Wild/cultivated	Leaves	Urine disorder	Make a paste of 10 g of Siris leaves and strain. Add mishri and drink it	Drink this in the morning and evening
						Bark	Boils	Grind the bark of Siris, Nagar, Jatamashi, Turmeric and Lotus in equal quantities with cold water	Apply as a paste on affected area
						Leaves	Ear ache	Heat the juice of Siris leaves and Mango leaves	2-3 drops pour into ear
16	<i>Argemone mexicana</i> L.	Satyanashi	Papaveraceae	Herb	Wild	Root	Jaundice	Fine paste of the roots is mixed with jaggery and given to the patients	3-4 grams once or twice a day
						Root	Fever	Fresh juice of the plant is given to patients	3-5 ml in a day
						Seed	Joint pain	Seasame oil with seeds of Satyanashi are applied externally	As per needed
17	<i>Catharanthus roseus</i> (L.) G. Don	Sadabhar	Apocynaceae	Sub-shrub	Cultivated	Leaves	Heavy menstrual flow	6 to 8 fresh leaves of the plant are boiled with 2 cup of water and reduced to half a cup	Taken regularly for 3 consecutive menstrual cycles
						Flower	Nasal bleeding	Sadabhar flower and pom-egranate tender buds are taken and fresh juice is obtained	Drink 1 cup every day
18	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Sarpagan-dha	Apocynaceae	Herb	Wild	Root	Stomach disorder	Root juice extracted by rubbing on stone	Take twice a day for 3 days
						Leaves	Constipation	Leaf juice is taken directly	3 times a day for 2 weeks
						Roots	Arthritis	Roots of Sarpagandha and Chitrak are boiled in Mustard oil. Oil used for massaging the aching parts	As per needed



19	<i>Cuscuta reflexa</i> Roxb	Amar bel	Cuscutaceae	Climber	Wild	Whole Plant	Cataract	Mix little sugar in one tsp juice	Apply on the affected eye twice a day
						Whole Plant	Blood impurity	Grind and dried Amar bel. Boil 1/4 tsp in one glass of water	Drink once a day for a months
						Whole Plant	Piles	Mix half tsp Black pepper in 10 ml of Amar bel	Take it once a day
20	<i>Bauhinia variegata</i> L.	Kachnar	Fabaceae	Tree	Wild	Bark	Mouth ulcer	In 10 g of dried bark add 400 ml water. Boil and after that simmer till about 100 ml of water remain	Do this 2-3 times a day
						Leaves	Jaundice	Extract the juice from leaves	Consume 2 times a day. Dose for adults 50 ml and kids 15 ml
						Bark	Intestinal mucus	Take 3 g of bark powder along with water	Twice, daily at morning and evening
21	<i>Piper nigrum</i> L.	Kaali mirch	Piperaceae	Herb	Cultivated	Fruit	Toothache	Make a decoction of Pepper by adding 1/8 th tsp of Black pepper to 1/2 cups of boiling water. Stir, cover and simmer on low heat for 10 minutes	Rinse the mouth with small sips with decoction
						Fruit	Cough	Add jaggery to a cup of water and boil. Then add pepper powder and honey and take it	2-3 spoons per day
						Fruit	Indigestion	Intake of Ginger juice mixed with a fine powder of pepper	2 tsp in late night after meal
22	<i>Carica papaya</i> L.	Papaya	Caricaceae	Tree	Cultivated	Fruit	Intestinal worms	The raw Papaya is consumed as vegetable	Once a day
						Leaves	Micturition	Leaves of plant along with water to form decoction	20-30 ml dose per day

								Leaves	Pain and swelling	Leaves of plant are slightly heated and applied over the affected part	2-3 times in a day
								Leaves	Dengue fever	Leaves extract was prepared in water	25 ml was given orally to patient twice a day
23	<i>Lawsonia inermis</i> L.	Mehandi	Lythraceae	Shrub	Cultivated			Bark	Jaundice	Decoction from the bark of the plant with water	50-60 ml daily
								Leaves	Micturition	Leaves juice is mixed with sugar and given to the patient orally	In a dose of 10-15 ml for some days
								Flower	Headache	A paste made of flowers soaked in vinegar and applied over forehead	As per needed
24	<i>Pongamia pinnata</i> (L.) Pierre	Papdi	Fabaceae	Tree	Cultivated			Seed	Eczema	Papdi seeds and wet rhizome of turmeric paste is made separately. Mixed together and applied over the skin	3-4 times a day
								Leaves	Diarrhea	5-6 dry leaves are added with 200 ml of water and boiled it. On reducing it to 50-60 ml then filter it	Given orally 2-3 times a day
25	<i>Physalis minima</i> L.	Palpotan	Solanaceae	Herb	Wild			Fruit	Diabetes	Fruits are boiled along with 2 cups of water, till leftover 1 glass	Drink once each morning
								Whole Plant	Influenza and laryngitis	The whole plant cut into pieces, dried after that wrapped to help keep damp longer. Then take about 10-15 gm of it with boiling water to prepare decoction	Drink 3 times every day
26	<i>Raphanus sativus</i> L.	Muli, Radish	Brassicaceae	Herb	Cultivated			Root	Bloating and fullness of abdomen	Intake of boiled barley along with radish juice and a tsp of ghee	Drink 1 times a day

							Root	Constipation	Add a tsp of honey to 100 mg of grated radish mix well	Eat mixture twice a day
			Leaves				Leaves	Earpain	Extract leaves juice. Mix with Sesame oil in equal amount. Cook this mixture till all water gets evaporated	Pour 2-3 drops in the ear
27	<i>Morus alba</i> L.	Shahtoot, Mulberry	Moraceae	Tree		wild/cultivated	Fruit	Constipation	Eat Mulberries with a glass of water	Consume empty stomach daily
							Leaves	Diabetes	Leaf powdered taken orally along with a glass of water	1 gram powder 3 times a day for 4 weeks
							Bark	Athlete's foot	Boil bark powder with water and soak feet	Do twice a day
							Seed	Intestinal worms	Seeds of the plant with hot water are given orally to patient	In a dose of 20 mg per day
28	<i>Aloe barbadensis</i> Mill.	Aloe vera	Asphodelaceae	Herb		Wild/cultivated	Leaves	Lower blood sugar	Prepare juice of plant along with water	2 tsp every day for 2 weeks
						Leaves	Burns	Gelis directly applied on the affected area		3-4 times a day
29	<i>Tribulus terrestris</i> L.	Gokhru	Zygophyllaceae	Herb		Wild	Fruit	Sexual weakness	Boil Gokhru powder, Ashwagandha powder in one cup milk to prepare a decoction	Drink twice a day for ten days
							Fruit	Urinary blockage	Take fruit 1 tsp, Coriander seeds 1/2 tsp in water 450 ml cook till volume reduces to half	Drink this decoction 2 tsp twice a day for few days
							Whole Plant	Jaundice	Mix powder of plant with cinnamon 1 tsp, misri 1/4 cup	Take this powder 1/2 tsp 3 times a day with water
							Fruit	Uterus infection	Prepare decoction of fruit 10 g and Ajwain 2 g in water	Drink for few days

30	<i>Withania somnifera</i> (L.) Dunal	Ashwag- andha	Solanaceae	Herb	Wild	Root	Wound healing	Root powder mixed with water to make a smooth paste and apply to the wound	2-3 times a day for 1 week
						Root	Obesity	Boil 1 tsp of Ashwagandha powder in 2 glasses of water. Grind the Cadamom and add to the mixture. Keep boiling until the quantity becomes half	Drink 1 small cup twice a day
						Root	Male and female infertility	2 g of root powder with misri and warm milk to prepare a decoction	Take twice a day
						Root	Physical weakness	Make a powder with 2 g of root and mixed with 125 mg (dried ginger, black pepper, and long pepper)	Take this powder 1/2 tsp 3 times a day with milk
31	<i>Cissus quadrangularis</i> L.	Hadjod	Vitaceae	Climber	Wild	Whole plant	Weak digestion	Young shoot of this plant are dried. Put on fire. The ash is collected and given orally	12.5-22.5 mg daily
						Stem	Heavy bleeding during menstruation	Skin removed stem juice mixed with Sandal wood, honey and glue is given orally	3-6 days in the morning with empty stomach
						Stem	Bone fracture	Stem juice 10 ml in one cup of water and drink it	Drink once or twice a day
						Stem	Improving semen quality and quantity	Small stem pieces ground with an equal quantity of Ashwagandha root and consumed with sugar and honey	Once a day at night with milk
32	<i>Ricinus communis</i> L.	Arand	Euphorbiaceae	Shrub	Wild	Leaves	Ringworm	Fresh or dried 10 to 15 leaves. Heat with 50 ml Coconut oil. Apply lukewarm over affected area	Apply at night daily

							Leaves	Lower back pain	Prepare decoction of Castor plant with water	Drink 10 ml once in a day for 15 days
			Root				Root	Jaundice	Prepare a decoction of root with 2 tsp of honey	Drink 80-100 ml per day
33	<i>Barleria prionitis</i> L.		Acanthaceae	Tree	Wild		Leaves	Cough	A decoction prepared by juice of the leaf with honey	Taken orally 20-25 ml twice a day
							Leaves	Ringworm	Leaf paste is applied over affected area	2-3 times a day for 1 week
34	<i>Mangifera indica</i> L.		Anacardiaceae	Tree	Cultivated		Gum	Ringworm	Make an ointment by grinding mango tree gum with lemon juice. Apply it on affected area	3-4 times a day
							Pulp	Cracked soles	Crush equal quantities of Mango pulp and Turmeric powder. Apply it externally	2 times a day
35	<i>Capparis decidua</i> (Forsk.) Edgew.		Capparidaceae	Shrub	Wild		Bark	Asthma	Boil small quantity of stem bark in 200 ml of water until it reduces to half. Strain it off	Drink twice a day
36	<i>Asphodelus tenuifolius</i> Cav.		Asphodelaceae	Herb	Wild		Stem	Wasps bite	Stem rubbing on the affected part	2-3 a day
37	<i>Ziziphus jujuba</i> Mill		Rhamnaceae	Shrub	Wild/ Cultivated		Fruit	Constipation	A handful of Jujubes fruit have to eat	Eat regular for one week
							Leaves & Root	Rheumatism	Paste of leaves and root of Jujubes and <i>Cassia auriculata</i> plant are prepared	Apply 2-3 times in a day on affected area
							Bark	Chronic cough	Paste of bark is fried in ghee and taken with rock salt	1-2 tsp thrice a day
38	<i>Salvadora oleoides</i> Decne.		Salvadoraceae	Tree	Wild		Stem (Twig)	Gum inflammation	Fresh twig of the plants are used as toothbrush stick	Daily in the morning
							Fruit	Fever	Cold fusion prepared from the fruit	40-50 ml twice a day

						Root	Snake bite	Paste of root and root bark are prepared with water	Apply 3-4 times on affected area
39	<i>Citrullus colocynthis</i> (L.) Schrad.	Gadumba	Cucurbiaceae	Herb	Wild	Root	Stomach diseases	Take the dried roots make powder of it. Use 1/4 tsp of this with lukewarm water	Have this early in morning daily
						Root	Piles	Take equal quantity of Gadumba and Long pepper root. Grind them together. Make the small pills of it. Dry under the sun	Have 1-2 pills with a glass of water every morning for 7 days
						Fruit	Boils	Take out the fruit and extract the pulp of it. Use this on affected area	Twice a day
40	<i>Amaranthus spinosus</i> L.	Kanta chauli	Amaranthaceae	Herb	Wild	Fruit	Jaundice	Decoction is prepared from ash of fruits with water	2-3 times a day for 1 week
						Root	Headache	Juice of the roots are extracted and add honey to it	2 tsp 2-3 times a day
						Root	Boils	Root paste are prepared	Apply on the affected area 3-4 times a day
41	<i>Cichorium intybus</i> L.	Kasni	Asteraceae	Herb	Wild	Whole Plant	Jaundice	Crush the fresh plant of Makoi and Kasni to extract the juice	60-70 ml of before the meal daily
						Root	Tooth sensitivity	Roots are boiled and mixed with sirka in small amount	It is used as gargle for 2-3 times a day
						Leaves & Flower	Joint pain	1/4 cup of leaves and flower of chicory are soaked in one cup of boiling water and brewed for 5-10 min	2 times a day
42	<i>Glycyrrhiza glabra</i> Linn.	Mulethi	Fabaceae	Herb	Wild/ Cultivated	Root	Cold & Cough	Take pieces of mulethi root, Tulsi 5-6 leaves Pudina 5-6 leaves and cook at low flame for 15 min. Filter it	Drink twice a day

								Root	Digestion problem	Take Mulethi powder, Fennel powder and Amla powder. Mix all powder to make a churma	Twice a day for 2 week with water
								Root	Mouth sores	Mix Mulethi powder in lukewarm water	Gargle 4-5 times a day
43	<i>Ficus religiosa</i> L.	Peepal	Moraceae	Tree	Wild			Bark	Tooth decay	Take barks of Pipal and Banyan trees in equal quantity and mix them well. Boil the mixture in hot water and use it for rinsing the mouth	2-3 times a day
								Fruit	Constipation	5-10 fruits of the plant eaten raw	Once in a day
44	<i>Cynodon dactylon</i> (L.) Pers.	Dub	Poaceae	Grass	Wild, Cultivated			Whole Plant	Menstrual problems	Take the juice of dub grass and honey	3-4 times a days
								Whole Plant	Acidity	Juice of dub (3-4 table spoon) and water (1 glass)	1 glass with empty stomach for few days
								Leaves	Piles	Paste of leaves taken with curd orally	Once a day for few days
45	<i>Datura stramonium</i> L.	Datura	Solanaceae	Herb	Wild			Leaves	Boils and swelling	Leaves of this plant are warmed with Sarso oil and applied on boils	For few days
								Leaves	Hair dandruff	Leaves are boils in the water and filter out the leaves and wash the hairs with this water	2 times in a week
								Seed	Baldness	Oil extract from seed is used on scalp	2-3 times in a week
46	<i>Saraca asoca</i> (Roxb.) Willd.	Ashoka	Caesalpiniaceae	Tree	Cultivated			Bark	Piles	Prepare a decoction of 90-100 g of bark, 360 ml of water and 30 ml of milk. Boil it till it reduces to 3/4 cup	Drink it daily

						Flower	Diabetes	Extract the juice of dried flower by grinding them in little water	Consume 15 drops of the juice, 2 times a day
						Seed	Urine retention	Make a paste of seeds with water	Take 2 tsp daily
47	<i>Eucalyptus lanceolatus</i>	Safeda	Myrtaceae	Tree	Cultivated	Leaves	Cold, cough	Pour the boiling water over the leaves and leave it to steep for 10-15 min before straining and drinking	Drink a cup 3 times a day
						Leaves	Relieve pus and pain	The powder of the dried leaves of is burnt and the smoke coming from the burnt leaves is exposed to wounds	2-3 times in a day
48	<i>Euphorbia hirta</i> L.	Dudhi	Euphorbiaceae	Herb	Wild	Leaves	Gonorrhoea	Take 1 gram leaf paste with a glass of milk	2-3 times in a day
						Leaves	Dysentery	1 gram leaves and grind to make fine paste. Add pinch of black pepper. Mix in a glass of milk and drink	As per needed
49	<i>Bryophyllum calycinum</i> Salisb.	Patter chat	Crassulaceae	Herb	Wild	Leaves	Blood mixed diarrhoea	Mix leaf juice 3 ml, Jeera 3 g and ghee 6 g	Take regularly for few days
						Leaves	Boils	Leaves are warmed with Sarso oil on slow heat and tied on the boils	2 times a days
						Leaves	Stone	Decoction of leaves is given	5-10 ml per day
50	<i>Tinospora cordifolia</i> (Willd.) Miers	Giloy	Menispermaceae	Climbing shrub	Wild/ cultivated	Stem	Skin problems	Giloy juice is taken with Neem and Amla	For 15 days
						Leaves	After abortion or delivery	5 g of its leaves are crushed together and its juice is extracted	2 to 3 ml in half cup of water till condition improve
						Leaves	Diabetes	Decoction are prepared from dry leaf powder of Giloy along with water	Take regularly for few days



51	<i>Tagetes erecta</i> L.	Genda, Marigold	Asteraceae	Herb	Cultivated	Leaves	Stone	Make a decoct of 20-30 ml of Marigold leaves	Twice a day for a week
						Seed	Cough	Take 3-4 g of seed powder with equal amount of mishri	Orally, Twice daily
						Seed	Erectile dysfunction	Take 3 g of seeds powder mix it with misri. Drink with a glass of milk	Once or twice a day
52	<i>Trianthema portulacastrum</i> L.	Sathi	Aizoaceae	Herb	Wild	Whole Plant	Typhoid	Plant juice taken orally	3 ml juice twice a day for about 5 days
						Whole Plants	Pain and swellings of joint	1 tsp fresh juice mixed with 2 tsp honey properly	Taken orally twice a day for a week
53	<i>Ageratum conyzoides</i> (L.) L.	Gandhili, Ajgandha	Asteraceae	Herb		Leaves & Flower	Anal worm in children	Leaves and flowers are crushed, the extract or juice is applied around the anal region of children	As per needed
54	<i>Opuntia aciculata</i> Griffiths	Nagphani	Cactaceae	Shrub	Wild	Whole Plant	Asthma	Root bark powder mixed with honey	Taken orally 2 times a day for few months
55	<i>Eclipta alba</i> (L.) Hassk.	Bhringraj	Asteraceae	Herb	Wild/ Cultivated	Leaves	Hair shining and black	Leaf juice boiled with Sesame oil, Coconut oil and Amla oil to make a mixture	3 times in a week
						Leaves	Memory of kids	When mixed with Brahmi and massaged on scalp of children	2-3 times in a week
						Leaves	Dandruff	Rub it on your scalp, wrap a steamed towel for five minutes and then massage some more oil again	1-2 times in a week
56	<i>Solanum nigrum</i> L.	Makoi	Solanaceae	Herb	Wild	Whole Plant	Liver disease	Juice of the fresh plant	Taken orally daily at morning
						Leaves	Dog-bite	Juice of leaves is applied on wounds	3-4 times a day for one or two week

57	<i>Aegle marmelos</i> (L.) Corrêa	Belpatra	Rutaceae	Tree	Wild/ Cultivated	Fruit	Epilepsy in children	A homogenous mixture of fruit pulp and cow milk in equal proportion	Regular use for 1 month
						Fruit	Dysentery	Unripe fruit is powdered and mixed with water	Taken orally, 1-2 times a day for 2-3 days
						Fruit	Stomach disorder	Pulp of the fruit is used to prepare morabba	1 tsp daily
58	<i>Sesamum indicum</i> L.	Tilcut	Pedaliaceae	Grasses/ Herb	Cultivated	Seed	Micturition	Grind 250 g Black til and add 250 g of jaggery syrup in it and make a mixture. Prepare 20-20 g ladoos	Eat 2 ladoo per days
59	<i>Calotropis gigantea</i> (L.) Dryand.	Safed aak	Asclepiadaceae	Shrub	Cultivated/ Wild	Bark	Diarrhea	Decoction of bark of Safed aak are prepared	Taken orally as per needed
					Leaves	Cough and cold		The ash of the leaves taken with water	As per needed
60	<i>Acacia nilotica</i> (L.) Delile	Babul, Desi Kikar	Fabaceae	Tree	Wild	Gum	Arthritis	Babul gum powder 3 grams is added to a cup of water, heated for 2-3 minutes and consumed	Continue for 1 month
						Bark	Burn area	1 kg bark and mixed with 250 g of mustard oil 250 g boiled in water till it remains 1/5 <sup>th</sup>	Applied 2-3 times on burnt area
						Leaves	Diarrhea	Juice of leaves is extracted and taken orally	Once in a day
61	<i>Terminalia chebula</i> Retz.	Harad	Combretaceae	Tree	Cultivated	Fruit	Loose motion/ dysentery	Fry 4-5 Harad with pure ghee. Take it with sugar	Twice a day
						Fruit	Piles	Take 2-4 g powder of Harad with jaggery	Taken orally, twice a day for few days
						Fruit	Pyorrhoea	Make the fine powder by grinding Harad and store it and rubbing this powder on the teeth and gums	2 times a day for few days

62	<i>Allium sativum</i> L.	Lahsun	Amaryllidaceae	Herb	Cultivated	Bulb	Ear pain	4-5 bulbils or Cloves are fried in Mustard oil, grinded and filtered	1-2 drops of the filtrate are poured in ear
						Bulb	Common cold in infants	The ash obtained from burning bulbils of Garlic in an ironpan,	Given with breast milk 2-3 times in a day
63	<i>Brassica campestris</i> L.	Sarso	Brassicaceae	Shrub	Cultivated	Seed	Elephantiasis	Grind the Mustard seed with cow urine. Paste is prepared	Apply on the affected part for 24 hours
						Seeds	Ear pain	3 Garlic cloves in 30 g mustard oil and cook them in slow gas. If the Garlic becomes black, then let it cool down	Morning and evening 2-2 drops pour in both ears
						Seed	Phlegmatic cough	Mix 1 tsp of honey in the quantity of 1 gram seed powder	Taken orally twice per day
64	<i>Allium cepa</i> L.	Paladu/ onion	Liliaceae	Herb	Cultivated	Bulb	Night blindness	Peel the onion and extract the juice of it and add small amount of sangha salts in it and then pour into the eyes	2-3 drops two times a day

A total of 68 men (48%), 55 women (39%) and 19 traditional mender (13%) were interviewed. The informants were divided into three age groups (1) 31-45, (2) 46-60 and (3) 61-75 years old. Majority of the informants belonged to age between 61-75 years. The Eighty two were aged between 61-75 years, 42 between 46 - 60 years and 18 between 31-45 year. It has been reported that most of the knowledge about herbal plants has been passed to them by their parents and grandparents or some relatives who have vast knowledge of human ailments and their cures. It was eminent during the survey that, the female informants, in comparison to male members have a remarkable knowledge about the preparation and management of herbal drugs which reflect their role in house hold management and disease treatment in order to keep the family healthy. The names of the plants species, its local name, mode of administration as well as formulation methods of herbal preparations have been shown in Table -1. From the survey, it was also reported that most of the plants cited by local healers are wildly available.

The most cited plants families were Fabaceae and Asteraceae with 5 species each followed by Solanaceae (4 sp.); Amaranthaceae (3 sp.); Euphorbiaceae (2sp.); Moraceae (2sp.); Piperaceae (2sp.), Combentaceae (2sp.), Poaceae (2sp.), Apocynaceae (2sp.); Brassicaceae (2sp.) and Asclepiadaceae (2sp.). There were twenty eight families with 1 species each. Parul *et al.*, 2017 also reported Fabaceae as dominating family in an ethnobotanical survey of Gurugram district, Haryana.

During the investigation, it was

reported that almost all parts of the different plant species were utilized against some common diseases. The most commonly used plant parts in herbal preparations were leaves followed by fruit, root seed, bark, whole plant, stem, flower and bud (Figure-3). Similar to our studies Ashfaq *et al.*,<sup>2</sup>; Bouasla and Bouasla<sup>5</sup> and Muthu *et al.*,<sup>13</sup> also recorded that the majority of drugs were prepared in the form of decoction from the leaves. Some times more than one part of the same species mainly leaves and aerial parts (comprising stems, branches and flowers) were used in different herbal drug preparations. During survey, the plants documented for treatment of different diseases were mostly herbs followed by trees, shrubs and climbers (Figure-2).

The plant species were most frequently used for treatment of cough and pain followed by Piles, Diabetes, Diarrhea, Constipation, Boils, Micturition, Dysentery, urinary problems, intestinal worms etc. (Figure-4).

The most common method for herbal drugs preparation was decoction, followed by powder, paste, extract (with oil/milk), and juice. Similar to our study, many ethnomedicinal survey reports showed decoction being the most frequent method for herbal drug preparations<sup>20</sup>. In majority of the cases, decoction was given as a drink and in some other cases, rubbed on the body to cure skin related ailments. Paste and oil were mainly used externally to treat skin ailments. Paste was also plastered to set fractured bones or for muscular pain. Powder was taken orally in majority of the cases. The powder prepared was given orally either with honey, crystalline

sugar, gur, cow milk and water. The dosages of the medicinal preparation (quantity, doses, frequency, period of use, *etc.*) were not very precise, as it mainly varied based on application, disease, age, patients physical health, illness severity, diagnosis and experience of traditional healer. It was also observed in few cases that preparations consist of more than one plant species in different combinations were used to treat same disease.

From the present investigation, it was concluded that the indigenous methods of disease treatment were still an important part of culture and life in the studied area. The significant use of herbal remedies by the local people of the studied region indicates their interest in traditional medicines. However, lack of proper documentation, the traditional knowledge of local people is declining gradually. Hence, there is a need of documentation of information about herbal plants. It will be essential to adopt a sustainable management strategy to avoid the rapid degradation of biodiversity of the region. The present study will be very helpful in protecting the folklore and traditional knowledge of rural people and also to transfer the knowledge to next generation. Further, the scientific validation of the plant based remedies will build a roadmap or may be helpful in discovery of new drugs.

The authors acknowledge the contribution of villagers of Bahadurgarh sub-division for sharing their valuable knowledge, without their support this study would not have been possible. Authors also acknowledge the logistic support facilitated by AIJHM College, Rohtak, Haryana to carry out this study.

#### *Financial Support :*

There is no any financial grant received from any funding agency for this work.

#### *Conflict of Interest :*

The authors declare that there is no conflict of interest.

#### *References :*

1. Arumugam, G., P. Manjula, and N. Paari, (2013). *J. Acute Dis.*, 2(3): 196-200.
2. Ashfaq, S., M. Ahmad, M. Zafar, S. Sultana and S. Bahadur, *et al.* (2019). *Indian J. Tradit. Know.*, 18(2): 226-241.
3. Ayyanar, M. and S. Ignacimuthu, (2011). *J. Ethnopharmacol.*, 134(3): 851-64.
4. Bhandari, M.M. (1990). *Flora of Indian desert*, Scientific Publisher Jodhpur, India, pp 1-471.
5. Bouasla, A. and I. Bouasla, (2017). *Phytomedicine*, 36(1): 68-81.
6. Buragohain, J. (2011). *Recent Res. Sci. Tech.*, 3(9): 31-42.
7. Jain, S.K (1975). *Medicinal plants*. NBT, New Delhi, India, pp 1-162.
8. Jain, S.P., D.M. Verma, S.C. Singh, J. S. Singh, and S. Kumar, (2000). *Flora of Haryana*. Central Institute of medicinal and aromatic plants, Lucknow, India.
9. Kumar, S. (2001). *Flora of Haryana*, Bishen Pal & Mahender Co. Dehradun, India, pp 1-507.
10. Maheshwari, J.K. (1963). *Flora of Delhi*. Council of Scientific and Industrial Research (CSIR), Delhi, pp1-447.
11. Mahmud, S., H. Shareef, M. Ahemad, S. Gouhar, and G.H. Rizwani, (2010). *Pak.*

- J. Bot.*, 42(6): 3705-3708.
12. Mahwasane, S. T., L. Middleton, and N. Boaduo, (2013). *S. Afr. J. Bot.*, 88: 69-75.
  13. Muthu, C., M. Ayyanar, N. Raja, and Ignacimuthu (2006). *J Ethnobiol Ethnomed.*, 2(43): 1-10.
  14. Parul, Groach, R., M. Lal and B.D. Vashistha (2017). *Int. J. dev. Res.*, 7(11): 16623-16626.
  15. Singh, B. and J. Singh (2014). *Phytodiversity*, 1 (1&2): 7-24.
  16. Singh, P. and S.S. Dash, (2014). Plant discoveries, new genera, species and new records. Botanical Survey of India, Kolkata.
  17. Sofowora, A. (1982). Medicinal plants and traditional medicine in Africa. John Wiley & Sons Limited, New York, pp 1-256.
  18. Stephen, A., R. Suresh, and C. Livingstone (2015). *Int. J. environ. Nat. sci.*, 7: 13-28.
  19. Thirumalai, T., E. Kelumalai, B. Senthilkumar, and E. David, (2009). *Ethnobotanical leaflets*, 13: 1302-1311.
  20. Tshikalange, T.E., B.C. Mophuting, J. Mahore, S. Winterboer and N. Lall (2016). *Afr. J. tradit. Complement. Altern. Med.*, 13(3): 83-89.
  21. Wachtel-Galor, S. and I.F.F. Benzie, (2011). Herbal Medicine: An introduction to its history, usage, regulation, current trends, and research needs. In: Benzie IFF, Wachtel-Galor S, editors. Herbal medicine: biomolecular and clinical aspects. 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis.
  22. Yadav, S.S. and M.S. Bhandoria, (2013). *Journal of medicinal plant research*. 7(18): 1263-1271.