

An Ethnobotanical Study of Plains of Yamuna Nagar District, Haryana, India

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ABSTRACT: Yamuna Nagar district of Haryana is very less explored for ethnobotanical studies. Therefore many survey of Yamuna Nagar district have been conducted for the documentation of ethnobotanical data and exploration of floristic diversity during the year 2011-2012. Field surveys were carried out throughout the district to collect ethnobotanical data (traditional use of plants, local name, plant parts used, medicinal value). Over all 73 species of flowering plants were collected during the field survey, out of which 46 species of ethnobotanical value belonging to 42 genera and 26 families have been recorded. Among all families, Leguminosae and Solanaceae are the more dominant. Most commonly used plant parts are leaves 30.43%, whole plants 26.08%, fruits 13.04%, bark 17.39%, seed 21.73%, roots 10.86%, flowers 8.70% and others 10.86%. They are used by the rural peoples for the treatment of various disease like diarrhoea, dysentery, male and female sexual diseases, cardiovascular diseases, headache, asthma, toothache, acne, diabetes, gonorrhoea, skin disease, kidney stone, hyperthyroidism, piles, cancer.

KEYWORDS: Ethnobotany, Yamuna nagar, Field survey, Plant parts, Medicinal plants, Haryana, India

I. INTRODUCTION

Ethnobotany word is made from two words ethno and botany and the term was coined by John William Harshberger in the 1890. Ethnobotany is the study of people and study of plants; this is represented good relationship between wild plants (Herbs, Shrubs and Trees) and tribal's. Ethnobotany is the branch of Ethnobiology and complete information about plants and their medicinal uses is given by ethnobotanical studies [1]. Plants represent an enormous pool of natural resources that can produce various products and chemicals for the advantage of all other life forms and ethnobotany reveals historical and present plant use to fulfil a wide variety of human needs, so the documentation of ethnobotanical knowledge is important for species conservation and sustainable use of resources. Furthermore, such studies are often significant in revealing locally important plant species, sometimes leading to the discovery of crude drugs [2], [3].

The World Health Organization (W.H.O.) reported that 80 % of the world population rely chiefly on indigenous medicine and that the majority of traditional therapies involve the use of plant extracts or of their active constituents [4]. There are over 20,000 species of wild edible plants in the world, yet fewer than 20 species now provide 90% of our food [5]. Utilization of plants for medicinal purposes in India has been documented long back in ancient literature because they are essential for human survival [6]. First record of medicinal plants were recorded in Rig Veda between 4500–1600 BC and Ayurveda between 2500–600BC [7]. According to the National Medicinal Plants Board, Govt. of India, a number of 17,000 to 18,000 species of flowering plants are estimated of which 6,000 to 7,000 species are found to have medicinal usage in folk and documented systems of medicine like Ayurveda, Unani, Siddha and Homoeopathy [8]. Because of the fast acceleration of market demand for herbal medicines, and recent controversies related to access, benefit sharing and biopiracy, the documentation of indigenous knowledge is of urgent priority [9]. Many ethnobotanical studies have been conducted by various researchers in different parts of India [9], [10], [11], [12], [13]. However, Yamuna Nagar district of Haryana is very less explored for ethnobotanical studies. Therefore many survey of Yamuna Nagar district have been conducted for the documentation of ethnobotanical data and exploration of floristic diversity during the year 2011-2012.

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II. MATERIALS AND METHODS

STUDY SITE: Yamuna Nagar district was selected for ethnobotanical studies and exploration of floristic diversity. Yamuna Nagar is one of 21 districts of Haryana state (India) and lies on the north-eastern edge of Haryana, located between $30^{\circ} 7' 58.8''$ N and $77^{\circ} 17' 16.8''$ E. It is bordered by the Saharanpur district of Uttar Pradesh in east, in west by Ambala, in north Sirmour district of Himachal Pradesh, in south by Karnal district and in south west by Kurukshetra (Fig.1). Yamuna Nagar has an area of 1,756 square kilometres. Average annual rainfall is 1400mm and the temperature ranges between -1°C to 45°C , out of which 70% rainfall is received during the month of July to September and the remaining during December to February. Yamuna Nagar has the river Yamuna running through the district. The Yamuna river system separates from the Satluj river system by district Yamuna Nagar. Towards its northern edge is a sub-mountainous region (ShivalikHills), which has more forest cover and lots of streams. Geologically speaking, the Shiwalik belong to the tertiary deposits of the outer Himalayas, and are chiefly composed of low sandstone and conglomerate hills, the solidified and upheaved detritus of the great range. Shiwalik system takes its name from shiwalik hills of Haridwar region between the Ganga and the Yamuna rivers.

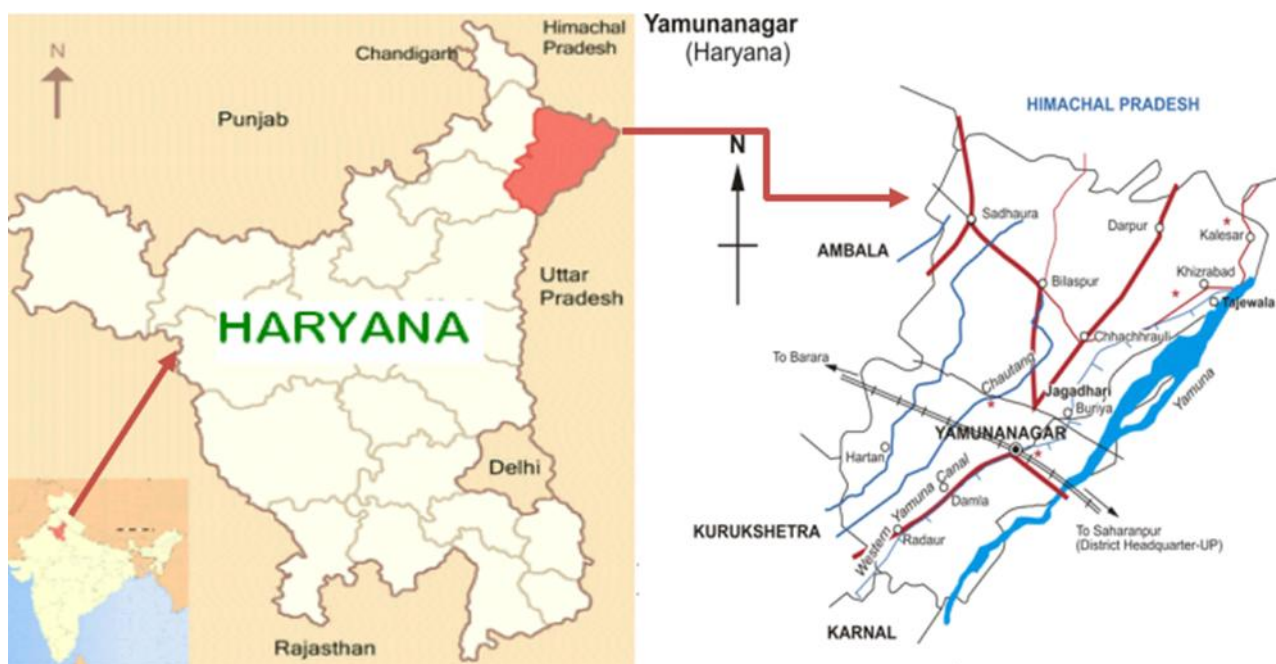


FIGURE-1: MAP SHOWING LOCATION OF THE STUDY AREA

METHODOLOGY: Many field surveys were conducted in Yamuna Nagar district in different seasons during 2011-12. Standard methods were adopted for collection of voucher specimens, preservation, and for the collection of ethnobotanical information [14]. Photographs of plants were taken in natural habitat. The ethnobotanical data (use of plant, plant parts used, local name) (table-2) was collected through interviews and discussions with herbalists, farmers, spiritualist, in study area. Majority of informant's were belonged to old age group, who have a very long association with usage of plants. Specimens of all species were identified with the help of available literature [9], [10], [12], [13]. Voucher specimens were prepared and deposited in the herbarium of Botany Department, Kurukshetra University, Kurukshetra (Haryana) India.

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III.RESULTS AND DISCUSSIONS

Over all 73 species of flowering plants were collected during the field survey, out of which 46 species were of ethnobotanical value. These species belonged to 42 genera and 26 families. Among all families ,Leguminosae and Solanaceae (4 genera and 5 species each) are the more dominant families followed by Malvaceae, Brassicaceae, Euphorbiaceae (3 genera and 3 species each), Amaranthaceae(2 genera and 3 specie), Asteraceae, Convolvulaceae, Menispermaceae(2 genera and 2 species each), Moraceae(1genera and 2 species) and 16 families were represented by single genera and single species (Table-1).

TABLE -1: FAMILY WISE REPRESENTATION OF NUMBER OF GENERA AND NO SPECIES IN THE STUDY AREA

S.No.	Family name	No. of Genera	No. of Species	S.No.	Family name	No. of Genera	No. of Species
1	Malvaceae	3	3	14	Moraceae	1	2
2	Leguminosae	4	5	15	Lythraceae	1	1
3	Asteraceae	2	2	16	Sapotaceae	1	1
4	Amaranthaceae	2	3	17	Meliaceae	1	1
5	Papaveraceae	1	1	18	Oxalidaceae	1	1
6	Nyctaginaceae	1	1	19	Palmaceae	1	1
7	Brassicaceae	3	3	20	Ranunculaceae	1	1
8	Asclepiadaceae	1	1	21	Polygonaceae	1	1
9	Convolvulaceae	2	2	22	Apocynaceae,	1	1
10	Menispermaceae	2	2	23	Dipterocarpaceae	1	1
11	Cyperaceae	1	1	24	Myrtaceae	1	1
12	Solanaceae	4	5	25	Aizoaceae	1	1
13	Euphorbiaceae	3	3	26	Vitaceae	1	1

Most commonly used plant parts are leaves 30.43%, whole plants 26.08%, fruits 13.04%, bark 17.39%, seed 21.73%, roots 10.86%, flowers 8.70% and others(latex, gum, stem)10.86%, out of them leaves were the leading part used in majority of medicinal plants(Fig. 2). Plants of different habits i.e. herbs 43.48%, shrub 15.21%, under shrub 8.70%, trees 23.91%, and climber 8.70% were recorded for different ethnomedicinal value, out of them herbs are more prominent shown in Fig.3.

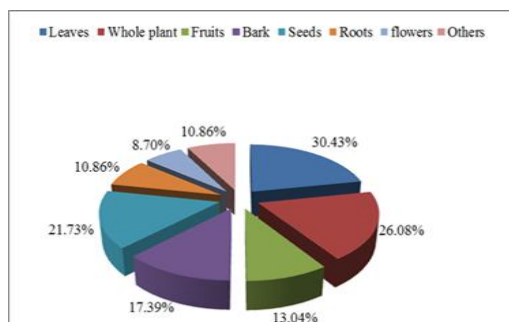


FIGURE-2: PERCENTAGE OF DIFFERENT PLANT PARTS USED

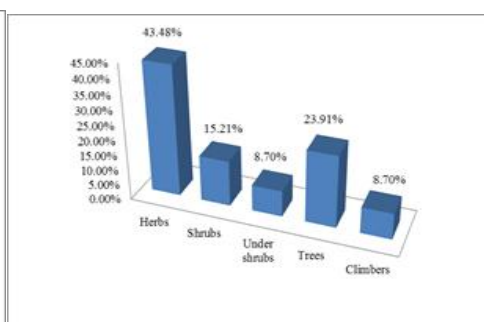


FIGURE-3: PROPORTION OF PLANTS BY HABIT

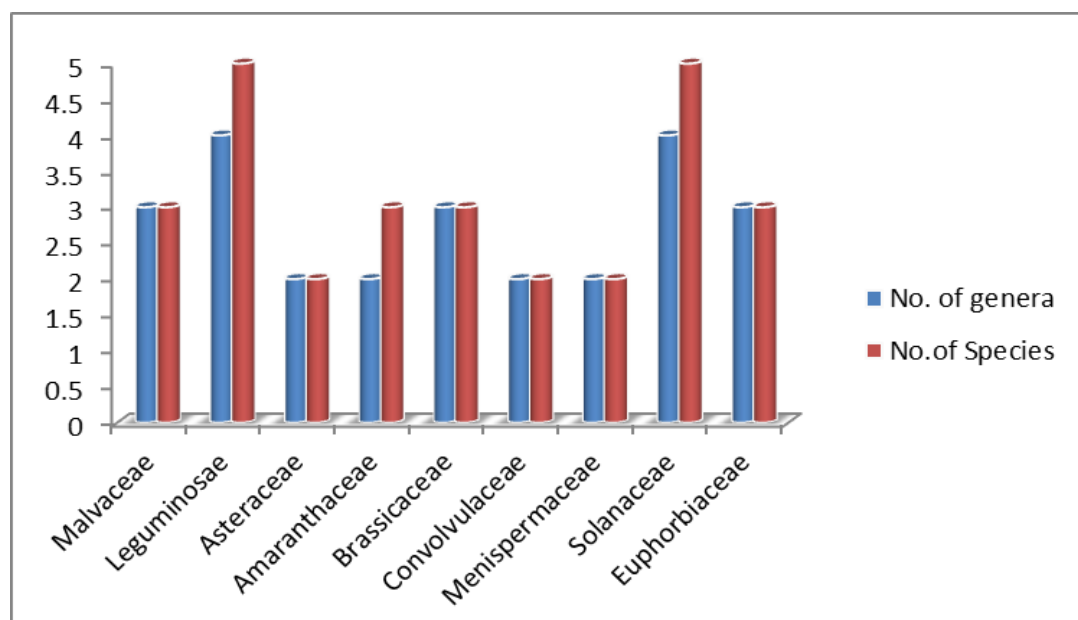


FIGURE-4: SHOWING NUMBER OF GENERA AND NUMBER OF SPECIES IN LEADING FAMILIES OF COLLECTED PLANTS

All 26 families were found to contribute for various ethnobotanical values, out of them Leguminosae and Solanaceae (4 genera and 5 species each) are the more prominent families followed by Malvaceae, Brassicaceae, Euphorbiaceae (3 genera and 3 species each), Amaranthaceae (2 genera and 3 species), Asteraceae, Convolvulaceae, Menispermaceae (2 genera and 2 species each) shown in Fig.4. They are used by the Rural peoples and traditional healers for the treatment of various diseases like diarrhoea, dysentery, male and female sexual disease, cardiovascular disease, headache, asthma, toothache, acne, diuretic, diabetes, gonorrhoea, skin disease, kidney stone, hyperthyroidism, piles and cancer (Table-2).

TABLE-2: DOCUMENTATION OF ETHNOBOTANICAL USES OF COLLECTED PLANT SPECIES

Plant Names	Family	Vernacular name	Habit	Plant parts used	Ethnobotanical uses
<i>Abutilon Indicum</i> (L.) Sweet	Malvaceae	Kanghi	Shrub	Leaf, Roots	Dry leaf powder is used to treat cattle diarrhoea and Roots decoction is used to treat fever & chest infection.
<i>Acacia leucophloea</i> (Roxb.) Willd	Leguminosae	Ronjh, safedki kar	Tree	Bark	Bark decoction is given to treat diarrhoea, dysentery, wounds, bronchitis, and gastric troubles and also used to improve immune system.
<i>Abrus Precatorius</i> L.	Leguminosae	Ratti	Climber	Seed	Seeds paste mixed with mustard oil is applied on affected skin to cure eczema, psoriasis, rosacea skin diseases and also massaged over paralytic body.
<i>Ageratum conyzoides</i> (L.) L.	Asteraceae	Janglipudina	Herb	Whole plant	Whole plant paste is used for healing wound, eczema, chest pain, muscular pain, swelling of joints, plant juice is used as health tonic, mood refresher and also used to treat urinary disorders, Leprosy,

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					skin disease.
<i>Amaranthusviridis</i> L.	Amaranthaceae	Chaulai	Herb	Whole plant	Whole plant boiled for making Sag (local food item), is used in constipation, urinary troubles, blood purifier, nutritive, skin diseases, for sharpness of eye sight.
<i>Amaranthus spinosus</i> L.	Amaranthaceae	KateliChaulai	Herb	Leaf	Leaves boiled for making Sag (local food item), used to treat leucorrhoea, gonorrhoea, ulcer, constipation, fever, stomach pain & diarrhoea.
<i>Argemonemexicana</i> L.	Papaveraceae	Pilikatili	Herb	Latex	Plant latex is directly applied on skin affected by ring worm and latex also used for healing wound.
<i>Boerhaviadiffusa</i> L.	Nyctaginaceae	Punarnava	Herb	Whole plant	Whole plant decoction is used to treat eye disease, urinary disorders, anaemia, blood purifier, fever, jaundice, liver problems & vitiligo.
<i>Capsella bursa-pastoris</i> (L.) Medik.	Brassicaceae	Kaanu, Mumiri	Herb	Whole plant	Whole plant juice is taken to treat asthma, diarrhoea, ear infection, bleeding nose, menstrual disorders, leucorrhoea and hormonal disorders.
<i>Calotropisprocera</i> (Aiton) Dryand.	Asclepiadaceae	Madar, Aakhi	Shrub	Root, latex	Root paste is used to stop bleeding of wounds and also applied as antiseptic on burns & latex is used to treat skin disease, ear pain, toothache, scorpion sting.
<i>Cassia fistula</i> L.	Leguminosae	Amaltas	Tree	Fruit,	Ripe fruit decoction is taken orally to treat asthma, bronchitis, cough, cold, blood purifier, constipation and ripe fruits also used as purgative.
<i>Cassia tora</i> L.	Leguminosae	Panwad	Under shrub	Whole plant, & seed	Whole plant paste is applied directly on skin disease, skin itching, inflammation and redness of skin and seed paste applied on ring worm & other fungal infection.
<i>Cuscutareflexa</i> Roxb.	Convolvulaceae	Aakabel	Climber	Whole plant	Whole plant juice is used to treat body pain, joint swelling, general debility, fever, rheumatism, headache & food poisoning
<i>Cissampelospareira</i> L.	Menispermaceae	Chhotitan	Climber	Root	Root is used for abortion and also used to treat anaemia, haemorrhages, diuretic, intestinal ulcer, fever, menstrual disorders, unbalanced hormones & snakebite.
<i>Cocculushirsutus</i> (L.) W.Theob.	Menispermaceae	Jalajamani	Climber	Leaf roots	Leaf juice is used to treat skin itching, scorpion sting and root is used to treat body ache, muscular pain & fistula.
<i>Cyperusrotundus</i> L.	Cyperaceae	Mottha	Herb	Root	Root is used to treat kidney stones, joint inflammation, vomiting, digestive disorders, hyperacidity & summer stroke.
<i>Dalbergiasissoo</i> DC.	Leguminosae	Sheesham	Tree	Bark	Leaf juice mix with honey is used to treat diarrhoea, dysentery and bark decoction is used to treat gonorrhoea & epilepsy.
<i>Daturametel</i> L.	Solanaceae	Kaladatura	Herb	Leaf, seed	Leaf juice is used as analgesic; seeds are used to increase sperm counting and also used to treat bronchitis, fistula & neurological disorders.
<i>Daturastramonium</i> L.	Solanaceae	Datura	Herb	Leaf, seed	Leaf juice is used to treat urogenital disorders, anaemia, asthma, boils and seed used to treat uterine node, dog bite, glaucoma & sprains.

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<i>Digeramuricata</i> (L.) Mart.	Amarantaceae	Lesua	Herb	Leaf	Fresh leaf juice is used to stop bleeding and also used to treat burning sensation, skin itching & healing wound.
<i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Bhangra	Herb	Whole plant	Whole plant boiled with mustard oil is used for hair growth and plant juice used to treat rheumatism, pimple, & skin eruption.
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Dudhi	Herb	Leaf, latex	Latex is used to treat skin disease and leaf juice is used to treat jaundice, fever, fungal infection, and syphilis & body nodes.
<i>Erucasativa</i> Mill.	Brassicaceae	Tara Mira	Herb	Seed, flowers	Seeds used in pickles for specific flavour, flowers used with bhang in refreshing drink.
<i>Ficus religiosa</i> L.	Moraceae	Pipal	Tree	Leaf, bark	Young leaves chewed to treat scabies, heart disease, gonorrhoea and bark is used to treat asthma, epilepsy & diabetes.
<i>Ficus racemosa</i> L.	Moraceae	Gular Trees	Tree	Bark, fruit	Bark powder is taken with milk to treat diabetes, leprosy, small pox, leucorrhoea and fruits are eaten for balancing hormones.
<i>Ipomoea carnea</i> Jacq.	Convolvulaceae	Behaya	Shrub	Leaf, stem	Leaf paste applied over ring worm, skin itching and dried stem use as fuel.
<i>Lawsonia inermis</i> L.	Lythraceae	Mahendi	Shrub	Leaf	Fresh leave paste used for head cooling hair dye and also used to treat leprosy & sprain.
<i>Madhucal longifolia</i> (J.Koenig ex L.) J.F.Macbr.	Sapotaceae	Mahua	Tree	Seed, flower, bark	Seed oil is used for removing foam of milk by local milkmen's, and also massaged over rheumatic body & joint pain.
<i>Melia azedarach</i> L.	Meliaceae	Bakain	Tree	Bark, seed	Bark decoction & seed powder is used to treat vitiligo, viral fever, urogenital infections, antiseptic, skin rashes.
<i>Oxalis corniculata</i> L.	Oxalidaceae	Biliki roti	Herb	Whole plant	Whole plant juice is used to treat dysentery, micturition, diarrhoea, scorpion sting, pushy wounds, sprain and Leaf decoction is given in fever and dysentery.
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Amla	Tree	Fruit	Dry fruits powder is taken with milk to improve immunity and also to treat asthma, cough, constipation and ripe fruits also used in pickles, juice for sharpness of eye sight, jaundice, hair growth, & hair washing.
<i>Phoenix sylvestris</i> (L.) Roxb.	Palmaceae	Khajur	Tree	Fruit	Ripe fruits boiled with milk are used to treat asthma, menstrual disorders, constipation, whooping cough, chest infection, cardiovascular disease.
<i>Physalis minima</i> L.	Solanaceae	Rasbhari	Herb	Fruit	Ripe fruits are eaten by villagers to treat burning sensation of urinary track, diuretic, joint inflammation, blood purifier, skin disease, pimples, and liver tonic.
<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Jaldhanya	Herb	Whole plant	Whole plant decoction used to treat eye redness, chest infection, bronchitis, analgesic, kidney stones, diuretic, premature ejaculation.
<i>Ricinus communis</i> L.	Euphorbiaceae	Arendi	Shrub	Seed	Seed oil is used to treat ring worm, skin itching, rheumatism, cardiovascular disease, sciatica, cancer and also used for abortion & hair growth.
<i>Rumex dentatus</i> L.	Polygonaceae	Junglipalak	Herb	Leaf, seed	Leaf extract is used to treat mouth ulcer, insect bite, healing wound and seed used for post-delivery recovery & whole plant is used as fodder for cattle's.

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<i>Rauwolfiaserpentina</i> Benth. ex Kurz.	Apocynaceae,	Sarpagandha	Shrub	Root, flower	Root is used for abortion, healing of pushy wounds and also used as antidote of snake bite, flowers juice is used to treat scabies, ring worm, cardiovascular disease, and vitiligo.
<i>Shorea robusta</i> Gaertn.	Dipterocarpaceae	Sal	Tree	Bark, gum	Bark powder is taken with milk to treat tonsils, general weakness, ear push, throat pain and gum is given to treat calf dysentery.
<i>Sida acuta</i> Burm.f.	Malvaceae	Mahabal	Undershrub	Whole plant	Whole plant juice is used to treat dysentery, diarrhoea, leucorrhoea, heel cracks, boils, sores.
<i>Solanum nigrum</i> L.	Solanaceae	Pat Peroon	Herb	Fruit	Ripe fruits are eaten as liver tonic, aphrodisiac and also used to treat cardiovascular disease, urogenital disorders, and leucorrhoea.
<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Jamun	Tree	Bark, seed	Seed powder is taken with curd to treat diabetes and ripe fruits are eaten to treat indigestion due to mango, bark decoction is taken in diarrhoea, stomach pain, boils, acne, and roughness of skin, headache, and vitiligo.
<i>Sisymbrium irio</i> L.	Brassicaceae	Khubkalan	Herb	Whole plant	Whole plant juice is used to treat skin disease, fungal infection and massaged over scalp for removing dandruff.
<i>Trianthema portulacastrum</i> L.	Aizoaceae	Santhi	Herb	Whole plant	Whole plant is used as vegetable and plant juice is applied on insect bite and also taken orally to treat hyperacidity, dysentery, diarrhoea.
<i>Urena lobata</i> L.	Malvaceae	Lapetua	Undershrub	Leaf	Leaf juice is used to treat heart burn, diarrhoea, cholera, cardiovascular disease and root powder is used for removing kidney stone, diuretic.
<i>Vitex negundo</i> L.	Vitaceae	Nirgundi	Shrub	Leaf, flower	Young shoot (with flowers) decoction is taken to treat, pneumonia, cold, asthma, bronchitis, headache, body ache.
<i>Withania somnifera</i> (L.) Dunal.	Solanaceae	Aswagandha	Undershrub	Leaf	Dried leaf powder is taken with milk for gaining weight, post-delivery recovery and leaf is chewed to treat dyspepsia, irregular mensuration, hormonal disorders & asthma.

IV. CONCLUSION

The Floristic and Ethnobotanical survey of Yamuna Nagar district concludes that rural people of district possess rich ethnobotanical knowledge about treatment of various diseases (diarrhoea, dysentery, male and female sexual disease, cardiovascular disease, headache, asthma, toothache, acne, diuretic, diabetes, gonorrhoea, skin disease, kidney stone, hyperthyroidism, piles, and cancer), but this traditional medicinal knowledge is declining with time due to rapid urbanisation and migration of rural people. It thus becomes necessary the documentation of ethnobotanical knowledge. This study also suggested that documentation of traditional knowledge about plant medicinal uses provides raw material for pharmacological investigation and leading to discovery of various drugs.

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