



Floristic Diversity and Ethnobotanical Studies On Some Parts Of Southern Haryana –I: Bhiwani District

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ABSTRACT

Surveys were conducted to assess the floristic diversity and ethnobotany of some parts of southern Haryana. During the first phase, district Bhiwani was explored and 76 species were collected which belong to 27 families. Of these 37 species are of ethnobotanical importance and are utilised for treating various ailments by local population. Aerial parts especially leaves are most commonly exploited for medicinal uses.

Key Words – Ethnobotany, Bhiwani, Floristic diversity

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INTRODUCTION

The existence of human beings is dependent on plants as they provide food, clothes fuel, timber for shelter in addition to important life supporting ecological services [1]. Further, there is common practice to use wild plant as medicine by local people in their tradition. According to WHO about 80% of world developing countries including India still relies on traditional medical practice for their primary health care needs [2]. This is all due fast growing population and unsustainable use of plant resources and an unorganised system of cultivation practice of medicinal important plant aggravated the situation. Anthropogenic impact have caused the great loss of plant resources due to continuous exploitation. Many of species have been become extinct and some others are facing threat of extinction [3]. So it becomes very important to survey and document the floristic diversity and ethnobotany of important medicinal plant on earth. Keeping in the view the above aspects the survey of flowering plant diversity as well as ethnobotany of Bhiwani district has been conducted to assess and documentation of natural wealth of district Bhiwani, Haryana, India.

MATERIAL AND METHODS

Study area

For the present study district Bhiwani of Haryana state was selected. It is located at latitude of 28.190 to 29.050 North and Longitude of 75.260 to 76.280 East. Bhiwani is surrounded by Hisar on its North, Churu districts of Rajasthan on its west, Dadri, Mahendergarh of Haryana and some part of Jhunjhunu district of Rajasthan on its south, and district Rohtak on the East. Bhiwani is an area with alluvial plain in its northern side and semi desert on its southern side. Southern region have Aravalli mountain range making its soil sandy while the northern parts have loamy soil. Temperature varies from 1 to 48 °C. Rain fall is scanty mainly in month of July and August.

METHODOLOGY

To assess and documentation of the floral diversity and ethnobotany of angiospermic plant extensive, careful and regular surveys were carried out in different seasons of district Bhiwani, Haryana, India during the years 2014 -15.

Plant specimens were photographed at site, describing all possible details of leaf, stem, flower, fruit and association, with habitat and habit in field note book. Specimens were collected comprising all available part and preserved. Finally herbarium was prepared by standard method [4]. Side by side the important traditional and folk medicinal uses of plant were also documented from local people. The preserved herbarium specimen were studied in detail and with the help of available literature collected species were identified [5-7].

RESULT

During the survey about 76 plant species were collected, preserved and documented. Of these 38 species were of major ethnobotanically importance. The information regarding scientific nomenclature of plant species, their families, habit, flowering and fruiting period, and distribution is provided in Table - I while the Table -II represents the data regarding vernacular name, part used and traditional uses.

Table -I

	Name of the species	Family	Habit	Flowering, Fruiting Period	Distribution in study site
1	<i>Abutilon indicum(L.)Sweet</i>	Malvaceae	Herb	Throughout the year	Common in Moist places
2	<i>Abrus precatorius L.</i>	Fabaceae	Climber	August to February	Common along Roadside
3	<i>Achyranthes aspera L.</i>	Amaranthaceae	Herb	Throughout the Year	Common in Dry wasteland
4	<i>Aegle marmelos Correa ex Roxb.</i>	Rutaceae	Tree	April to August	Mainly in Temples and Houses
5	<i>Amaranthus viridis L.</i>	Amaranthaceae	Herb	August to march	As weed in fields
6	<i>Anagalis arvensis L.</i>	Primulaceae	Herb	January to April	Moist and Shady places
7	<i>Argemone maxicana L.</i>	Papaveraceae	Herb	January to may	Dry wasteland
8	<i>Barleria prionites L.</i>	Acanthaceae	Herb	September tp December	On rocky substrates
9	<i>Bauhinia purpurea L.</i>	Caesalpiniaceae	Tree	September to March	Canal side and roadside
10	<i>Boerhaavia diffusa L.</i>	Nyctiginaceae	Herb	Throughout the Year	Dry wasteland
11	<i>Calotropis procera (Aiton) Dryand</i>	Asclepiadaceae	Shrub	February to July	Abundant in area in study
12	<i>Cannabis sativa L.</i>	Cannabinaceae	Herb	September to March	Moist and shady places and female plant chiefly present in Temples
13	<i>Cassia tora L.</i>	Fabaceae	Herb	August to September	Dry wasteland and along canalside
14	<i>Cassia fistula L.</i>	Fabaceae	Tree	April to May	Chiefly roadside and abundant in Tehsil Bhiwani
15	<i>Chenopodium album L.</i>	Chenopodiaceae	Herb	December to March	Mainly As weed in crop field but also present at other moist and shady places
16	<i>Chenopodium murale L.</i>	Chenopodiaceae	Herb	January to march	Common weed in crop field but also present at shady and moist places
17	<i>Coccinia grandis(L.) J.Voigt</i>	Cucurbitaceae	Climber	July to December	Abundant in Bhiwani
18	<i>Cocculus hirsutus(L.) Diels</i>	Menispermaceae	Climber	February to April	Common in study area
19	<i>Commelina benghalensis L.</i>	Commelinaceae	Herb	August to November	Throughout District Bhiwani
20	<i>Croton bonplandianum Baill.</i>	Euphorbiaceae	Herb	Major part of the Year	Dry wasteland
21	<i>Datura stramonium L.</i>	Solanaceae	Herb	December to May	Wasteland
22	<i>Dalbergia sissoo DC</i>	Fabaceae	Tree	March to August	Along roadside and on border of field
23	<i>Digera muricata (L.) Mart.</i>	Amaranthaceae	Herb	July to December	As common weed in crop field
24	<i>Eclipta alba (L.) Hassk.</i>	Asteraceae	Herb	Throughout the Year	Moist and shady places chiefly along dry ponds
25	<i>Eicchornia crassipes Kunth.</i>	Pontederiaceae	Herb	April to august	Abundant in waste water canal

26	<i>Euphorbia hirta L.</i>	Euphorbiaceae	Herb	Throughout the Year	Throughout District Bhiwani
27	<i>Ficus benghalensis L.</i>	Moraceae	Tree	March to September	Throughout District Bhiwani
28	<i>Ficus racemosa L.</i>	Moraceae	Tree	April to August	Rare
29	<i>Fumaria indica (Hauskn.) Pugsley</i>	Fumariaceae	Herb	March to November	As weed in crop field
30	<i>Gnaphalium indicum L.</i>	Asteraceae	Herb	December to April	Moist and shady places chiefly along canalside ponds
31	<i>Lawsonia inermis L.</i>	Lythraceae	Shrub	July to November	Present abundantly in Herbal park of 'Kairu'
32	<i>Morus alba L.</i>	Moraceae	Tree	January to April	Along roadside and canal side
33	<i>Nicotiana plumbaginifolia Viv.</i>	Solanaceae	Herb	February to May	Moist and shady places chiefly along canal side and ponds
34	<i>Pedaliium murex L.</i>	Pedaliaceae	Herb	August to November	Throughout District Bhiwani
35	<i>Rumex dentatus L.</i>	Polygonaceae	Herb	January to may	Common in waste water canal, near water bodies and marshy places
36	<i>Salvadora oleoides L.</i>	Salvadoraceae	Tree	March to July	Abundant
37	<i>Tribulus terrestris L.</i>	Zygophyllaceae	Herb	July to November	Abundant
38	<i>Ziziphus jujuba Lam.</i>	Rhamnaceae	Shrub	September to February	Abundant

Table -II

	Scientific name of the species	Part used	Traditional importance	Vernacular name
1	<i>Abutilon indicum(L.)Sweet</i>	Root and leaves	Decoction of root as well as powder is used to cure chest infection and fever and Leaf juice in early morning used to cure kidney stone and dry leaf powder used to treat cattle diarrhoea	Kanghi
2	<i>Abrus precatorius L.</i>	Seed and root	Seed helpful to boost nervous system and many nervous disorder also paste of seed applied to cure joints pain, while root decoction used to treat cough,cold and also to remove the intestinal worm.	Ratti/ Chirmati
3	<i>Achyranthes aspera L.</i>	Root, tender stem ,and fresh leaf, flowers	Decoction of whole plant in utilised in pneumonia,cold cough also it is diuretic so help to cure renal dropsies.Flowers and seed have antivenom properties so help in snakebite if applied in paste form externally.Tender leaf substitute spinach .	Ultakanta/ kutri
4	<i>Aegle marmelos (L.) Corre'a.</i>	Chiefly fruit and leaf also	Ripe fruit juice have cooling effect so used coolant also have properties to cure chronic dysentery and other stomach disorder. Leaf juice also cure diarrhoea and gastric problems.	Bel patra
5	<i>Amaranthus viridis L.</i>	Fresh leaves	Leaf are good sources of iron, so used as vegetable, also have some ant venom properties to treat scorpion and snake bite.	Chulai
6	<i>Anagalis arvensis L.</i>	Whole plant	Plant have properties to treat Leprosy, hydrophobia, dropsy, nervous disorders, gout and used as cattle feed to expel out leeches from nostrills.	Jonkmari
7	<i>Argemone maxicana L.</i>	Whole plant chiefly flowers and Latex	Decoction of whole pant can treat jaundice and other liver disorders, flowers used to cure cough and latex is directly applied to skin for skin problems and healing wound.	Satynasi/ Pilibutti
8	<i>Barleria prionites L.</i>	Leaves, roots	Leaf and root ash mixed with honey useful in treatment of cough. Also leaf prevent skin	Pila bansa

			eczema, tooth problems and cracking and maceration of feet.	
9	<i>Bauhinia purpurea L.</i>	Pods, root ,Flower bud ,and bark	Bark have fibre content and also used in diarrhoea, root have carminative effect, flower bud have laxative and antihelmenthic properties.	Khairwal
10	<i>Boerhaavia diffusa L.</i>	Whole plant	Plant have vitalising effect so known as punarnava for energetic effect to body. Decoction have diuretic, laxative and expectorant properties and known to cure eye disease, kidney stone, blood purifier, anaemia and liver disorders.	Santi/ Punarnava
11	<i>Calotropis procera (Aiton) Dryand.</i>	Root, flower, leaf and latex	Dry leaf and flower powder is used to treat rhuematism, and paste applied to cure leucoderma, Ash of root used to remove pus and ash of leaf helpfull to cure cough and cold , latex applied for skin problem, toothache,ear pain etc.	Aak
12	<i>Cannabis sativa L.</i>	Leaf and seed and female inflorescence	Decoction of plant used to cure asthma, dysentery. it has sedative, narcotic, hypnotic and hypotensive effect.	Baang
13	<i>Cassia tora L.</i>	Leaves and seed	Leaf paste have soothing effect so applied on skin, also they have purgative effect. seed used to treat inflammation and other fungal infection.	Panwad
14	<i>Cassia fistula L.</i>	Fruit and seed	Decoction of ripe fruit used to treat asthma, cough, cold and bronchitis. Seed known to cure constipation and good for blood purification.	Amaltas
15	<i>Chenopodium album L.</i>	Whole plant	A good source of iron and vitamin a. Laxative and antihelmenthic. Root used for liver infection and jaundice.	Bathua
16	<i>Chenopodium murale L.</i>	Whole Plant	Pain reliever if paste of leaf and stem is applied on joint and back. Used as vegetable. Used to prevent cold and cough during winter if leaf taken with gur.	Kharthua
17	<i>Coccinia grandis(L.) J.Voigt</i>	leaf, fruit and Root	Leaf juice used to cure ulcer. Raw fruit consumed as vegetable and root decoction known to cure sore throat and useful in Diabetes.	Ram kachri / Chibaad
18	<i>Cocculus hirsutus(L.)W. Theob.</i>	Root and leaf	Root known as good pain killer for body. leaf paste used for skin problem and scorpion sting. Decoction of leaf used to cure leukaemia and Eczema.	Jaljamanti
19	<i>Commelina benghalensis L.</i>	Whole plant	Decoction of whole plant known to cure dysentery. Having laxative, emollient and demulcent effect. Paste is applied for aches and swelling.	Kana
20	<i>Croton bonplandianum Baill.</i>	Leaf and Stem	Dry Leaf powder with reetha and Amla is used to wash hair for healthy and dandruff free hair. Leaf Juice directly can also utilised for the same. Tender stem juice is known to cure cataract if daily 2-3 drop is put in eye.	Ban Tulsi
21	<i>Datura stramonium L.</i>	Leaf, Fruit and seed	Have narcotic effect so used as drug. Hallucinogenic so used for nervous disorders. Leaf juice known to cure urinogenital problem. Seed are used for Abortion if consumed in limited amount. seed paste in musturd oil treat skin itching and wound.	Dhatura
22	<i>Dalbergia sissoo DC</i>	Heart wood, flowers and Leaf	Heart wood is good for making door, household and furniture. Leaf paste have cooling effect if applied on sunburn. Also "Thandai" of leaf and flower is used in summer. Leaf known to traet urinogenital problem specially gonorrhoea.	Shisham
23	<i>Digera muricata (L.) Mart.</i>	Whole plant	Fresh leaf is consumed as vegetale being a good source of iron and Vitamins. Flower and seed	Kundra / Tartara

			used in urinary discharge and removes blockages due to calculi. of leaf used to stop bleeding, burning sensation and itching.	
24	<i>Eclipta alba (L.) Hassk.</i>	Whole plant	Leaf powder used for blackening of hair. Important constituent of many hair oil. Plant juice for skin problems and plant boiled in mustard oil applied on joint. Leaf decoction relieve headache. A good health tonic and antiseptic.	Bhringraj
25	<i>Eichhornia crassipes (Mart.) Solms</i>	Inflorescence and plant	Plant is grown in waste water drainage to dry it. Inflorescence is beautiful so used as pot herb.	Jal kumni /
26	<i>Euphorbia hirta L.</i>	Whole plant	Latex of plant is directly applied on skin for skin problems. Decoction of foliage help in treatment of bronchitis while juice known to cure jaundice, fungal infection, syphilis and body nodes. Dried leaf powder cure dysentery and piles. Plant with <i>Phyllanthus</i> crushed and juice is taken to treat spermatorrhoea.	Dudhi
27	<i>Ficus benghalensis L.</i>	Fruit, Prop root, Gum and Bark	Fruit is consumed as raw. Prop root is used in many urinogenital problems. Bark is applied on wound. Gum have emollient property.	Bad
28	<i>Ficus racemosa L.</i>	Fruit and bark	Fruit is good source of many minerals. Bark in powdered is known to treat diabetes, leucorrhoea, small pox and Leprosy. Fruit is used to balance hormonal fluctuation. It has aphrodisiac and carminative properties.	Gullar
29	<i>Fumaria indica (Hausskn.) Pugsley</i>	Shoot	Fresh plant juice with black pepper utilised for blood purification. have antipyretic and anti vomiting properties. Shoot juice cures diarrhoea.	Shastra papra
30	<i>Gnaphalium indicum L.</i>	Whole plant	A good healer and swelling remover. Helps to rejoin bone if fractured Leaves are edible.	Gaadi / Raksha
31	<i>Lawsonia inermis L.</i>	Leaves and fruit	Having cooling effect. Leaf provide stain so applied on hand in rituals like marriage. Fruit Paste applied on skin burn and sun burn.	Lythraceae
32	<i>Morus alba L.</i>	Fruit, Leaf and sticks	Fruit are edible and good sources of vitamin and many minerals. Fruit also known to cure sore throat, dyspepsia and melancholia. Leaf are food for silk worm so helps to rear. Sticks are very flexible and strong so used to make house hold utensils like chair and table.	Tut, Tutri
33	<i>Nicotiana plumbaginifolia Viv.</i>	Root and leaves	Leaf as a substitute of Tambhakhu having little narcotic value. Root are valuable remedy for piles if taken in paste form with black pepper and cumin seed in ratio 3:2:1.	Jungli Tambakhu, ban tambhakhu
34	<i>Pedaliium murex L.</i>	Leaf and Fruit	Leaf used as fodder for cattle. Fruit having little aphrodisiac property. .Leaf decoction used to cure diabetes.	Bada Ghokhru
35	<i>Rumex dentatus L.</i>	Whole plant	Used as fodder for cattle. Extract of leaves known to cure mouth sore, wound healing and insect bite. Root in dried powder form if taken cure constipation. Seeds help in post delivery recovery.	Jungli Palak
36	<i>Salvadora oleoides Decne.</i>	Fruit, Leaf	Fruits are good source of many important mineral and water. Leaves are best fodder for camel in desert.	Dungar / Pilu/ jaal
37	<i>Tribulus terrestris L.</i>	Flower, fruit and leaf	Flowers and fruit have aphrodisiac properties so help to improve sex potential. Leaf utilised as cattle feed. Commonly used in folk medicine as diuretic and against colic pain and Hypertension.	Chhota Ghokhru
38	<i>Ziziphus jujuba Lam.</i>	Fruit and leaf	Fruit are nutritious. Goat are fond to eat leaves.	Ber

DISCUSSION

Present survey and study revealed that Fabaceae being the most dominating family is represented by three genera including four species, followed by Amaranthaceae and Moraceae with three genera and three species and two genera three species respectively and then Chenopodiaceae, Euphorbiaceae, Solanaceae and Asteraceae each represented by two genera two species. All other families represented by single genera and single species (Table III).

Table III - Family-wise distribution of genera and species

S. No.	Family	Genus	Species
1	Amaranthaceae	3	3
2	Acanthaceae	1	1
3	Asclepiadaceae	1	1
4	Asteraceae	2	2
5	Cannabinaceae	1	1
6	Caesalpiniaceae	1	1
7	Commelinaceae	1	1
8	Cucurbitaceae	1	1
9	Chenopodiaceae	2	2
10	Euphorbiaceae	2	2
11	Fabaceae	3	4
12	Fumariaceae	1	1
13	Lythraceae	1	1
14	Malvaceae	1	1
15	Menispermaceae	1	1
16	Moraceae	2	3
17	Nyctaginaceae	1	1
18	Papaveraceae	1	1
19	Pedaliaceae	1	1
20	Polygonaceae	1	1
21	Pontederiaceae	1	1
22	Primulaceae	1	1
23	Rhamnaceae	1	1
24	Rutaceae	1	1
25	Salvadoraceae	1	1
26	Solanaceae	2	2
27	Zygophyllaceae	1	1

Present study also suggests that aerial part of plant are in much use than underground part (Fig. I).

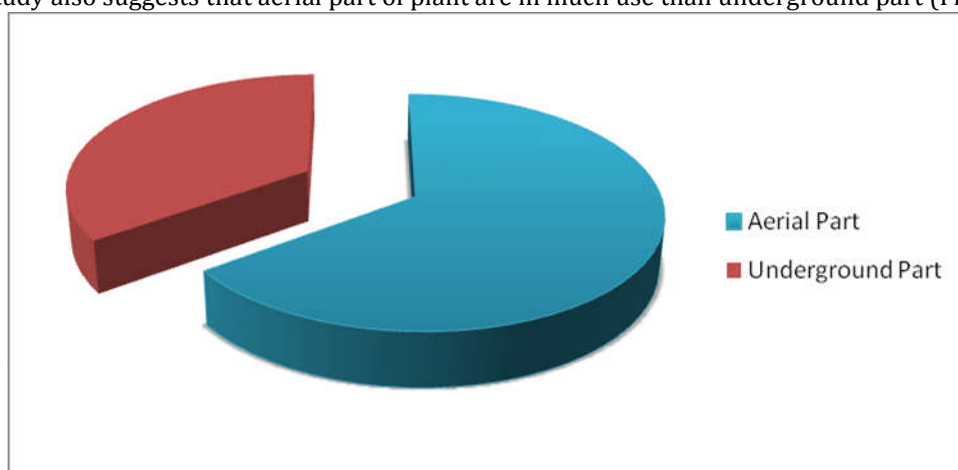


Figure I

From the point of the relative utilisation of plant parts, leaves are most commonly used followed by fruit, root, seed, flower, and stem (Table II).

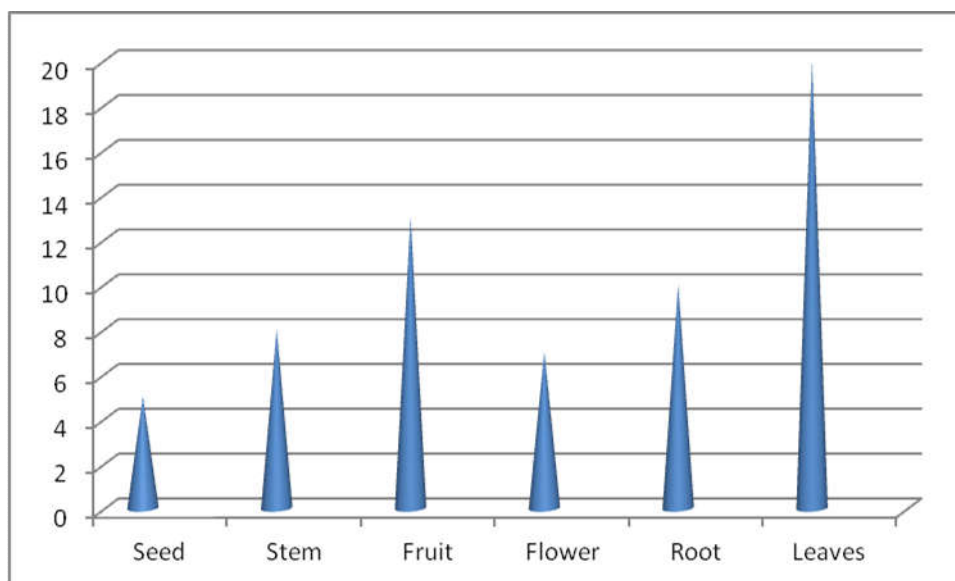


Figure -II

A number of ethnobotanical investigations have been conducted on some parts of Haryana [8-10]. Present study supports the ethnobotanical studies of Singh [11] on district Bhiwani and of district Mohenderagarh by Yadav and Bhandoria [12]. However, Jain *et al.* [7] failed to report majority of the plants being reported in the present study. These include *Abutilon indicum*, *Abrus precatorius*, *Achyranthes aspera*, *Aegle marmelos*, *Anagalis arvensis*, *Barleria prionitis*, *Bauhinia purpurea*, *Cannabis sativa*, *Cassia fistula*, *Cassia tora*, *Chenopodium album*, *C. murale*, *Cocculus hirsutus*, *Croton bonplandianum*, *Dalbergia sissoo*, *Datura stramonium*, *Digera muricata*, *Eichhornia crassipes*, *Eclipta alba*, *Euphorbia hirta*, *Ficus benghalensis*, *F. racemosa*, *Fumaria indica*, *Gnaphalium indicum*, *Lawsonia inermis*, *Morus alba*, *Nicotiana plumbaginifolia*, *Pedaliium murex* and *Tribulus terrestris*, *Ziziphus jujuba*.

CONCLUSION

It may be concluded from the above mentioned survey and study that the Bhiwani district have valuable wealth of flowering plant as well as a rich traditional and folk knowledge of medicinal uses of plant. There is important space of this traditional knowledge in their routine life. The people cure themselves with the help of plants. But this richness in biodiversity and ethnobotany is going to decline now a days due unawareness and proper documentation. Therefore, it become necessary today to document these and to spread awareness among people to preserve.

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