



FLORISTIC DIVERSITY AND ETHNOBOTANY OF FAMILY ASTERACEAE OF DISTRICT BHIWANI (HARYANA), INDIA

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Abstract: The present paper deals with floristic diversity of plants belonging to family Asteraceae growing in district Bhiwani, Haryana, India. A sum of 36 species belonging to 26 genera of family Asteraceae was identified. Exploration was carried out in different seasons from 2014 to 2019. Local inhabitants were interviewed regarding ethnobotanical aspects of collected plants. Out of 36 species identified, 29 species have medicinal value used to treat various diseases and health issues. *Ageratum conyzoides*, *Bidens pilosa*, *Eclipta alba*, *Erigeron canadensis* and *Tridax procumbens* have pharmacological value. The genera *Blumea*, *Gnaphalium* and *Sonchus* were found dominating followed by *Erigeron*, *Bidens*, *Ageratum* and *Launaea*. Most of the species were seen in wild state but few occurred as common crop weeds like *Ageratum*, *Cichorium*, and *Cirsium* etc. while *Glossocardia*, *Dicoma*, *Blainvillea* etc. were found rarely and occurred mainly on hilly slopes. *Parthenium hysterophorus* was found to be the strongest weed followed by *Verbesina* in the areas under investigation. Nearly all the members were herbaceous and grow abundantly throughout the year in the area studied.

Keywords: Asteraceae, Bhiwani, *Blainvillea*, Ethnobotanical, Pharmacological value.

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INTRODUCTION

The traditional medicine is not only a source of healing, but the practice is also an important part of religion and culture. So far as modern medicine is concerned, it is reported that more than half of the world's modern drugs are of biological sources (Prakash and Prakash, 2021; Prakash and Verma, 2021). Medicinal and ethnomedicinal plants are widely used worldwide in numerous disciplines of healthcare from thousand years.

The phytodiversity is the richness of flora and their pattern of distribution (Singh *et al.*, 2019, 2020, 2021a). The biodiversity has become an interesting area since last decade as a matter of the discussion for human survival and sustainability (Ashok, 2018; Verma, 2021). The management of phytodiversity is a necessary need since long years back (Singh *et al.*, 2021b). It plays an immense role in maintaining the health of mankind and there are so many ethno



medicinal plants that play significant role in the manufacturing of herbal medicine (Singh *et al.*, 2017; Devi *et al.*, 2020; Sharma and Pareek, 2021). In Ayurvedic, Unani, and Homeopathic systems, several ethnomedicinal plants standardized extracts are widely used to cure various diseases (Muhammad *et al.*, 2016). Medicinal plants play an important role to understand the relation between biodiversity-sociogenic system (Husain *et al.*, 2008; Mahmood *et al.*, 2011). The India has been known for its higher botanical wealth and numerous diversified plants grown in different parts of the country (Kumar *et al.*, 2021). In Indian subcontinent, the plants have played crucial role in the socio-cultural development of human species concurrently in different parts of human civilization and exerted larger impact because of varied climatic conditions and diversified socio-economic conditions (Prakash, 2017; Pandey, 2019; Jafri and Mishra, 2022). The Indian sub-continent is one of the mega phyto biodiversity countries of the world consisting of more than 17,000 flowering plant species. This comprises nearly 8% of the global biodiversity with only 2.4% of total land or plant cultivation suited area in the world (Reddy, 2008; Sumeet *et al.*, 2010).

Nowadays importance of immunity booster plants and their products are continuously being enhanced since first wave of COVID-19 pandemic (Kumari and Shukla, 2020; Verma and Prakash, 2020). *Allium sativum*, *Piper nigrum*, *Curcuma longa*, *Zingiber officinale*, *Nigella sativa* and *Syzygium aromaticum* and so many plants are used by rural and urban people to enhance the immunity in order to get protection from COVID-19 pandemic (Rao 2021; Upadhyay *et al.*, 2022). Some indigenous plants act as anticancer agents (Prakash and Yadav, 2020; Prakash and Upadhyay, 2021).

The family Asteraceae also known as Compositae is regarded as one of the most evolved and highly specialized families of mainly herbaceous plants. This family includes more than 10% of total flowering plants, which are cosmopolitan in distribution, except Antarctica, which is rich in

algae (Mabberley, 2017; Gupta, 2021). In India family Asteraceae is represented by 138 genera consisting of 708 species distributed almost Pan-India. Members are present as weeds mainly along roadsides; fallow land, cultivated fields etc., generally considered as useless, but local inhabitants have deep association and aesthetic value for these plants (Bagal and Deokule, 2016; Arisdason and Lakshminarasimhan, 2020). They utilized them for different purposes including medicinal values. Although some of them have alien and invasive nature but still occupy a significant space ethnically among local people but there is no significant work to enlist and record them properly. In present paper, an attempt has been made to record the members of family Asteraceae as well as their ethno medicinal and pharmacological values from district Bhiwani, Haryana (India).

MATERIALS AND METHODS

To assess and document the floral diversity and ethnobotany of plants of family Asteraceae, extensive, careful and regular surveys were carried out in different seasons of district Bhiwani, Haryana, India during the years 2014-2019.

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 and preserved. Finally herbarium was prepared by standard method (Jain and Rao, 1977). Side by side the important traditional and folk medicinal uses of plant were also documented with the help of local people. The preserved herbarium specimens were studied in detail and identified with the help of available literature (Duthie, 1903; Maheswari, 1963; Jain *et al.*, 2000).

RESULTS AND DISCUSSION

Author collected and identified about 36 plant species belonging to 26 genera of family Asteraceae that grow in different areas of district Bhiwani, Haryana, India. A list of identified plant species with their habits and flower colour are presented in table 1.

Table 1: Different plant species collected with their vernacular names, habit and floral colour.

S. No.	Botanical name	Vernacular name	Habit	Flower colour
1.	<i>Ageratum conyzoides</i> Linn.	Gandhili, Neelaphool	Herb	Pale blue to purple
2.	<i>Ageratum houstonianum</i> Mill.,	Neela mink	Herb	Purple
3.	<i>Artemisia scoparia</i> Waldst. & Kit.	Seeta-Bani	Herb	Yellow
4.	<i>Blainvillea rhomboidea</i> Cass.	-----	Herb	White or yellow
5.	<i>Bidens biternata</i> (Lour.) Merr. & Sherff	Chirchitta	Herb	Yellow
6.	<i>Bidens pilosa</i> Linn.	Chirchitta	Herb	Yellow
7.	<i>Blumea lacera</i> (Burm. f.) DC.	-----	Herb	Yellowish
8.	<i>Blumea laciniata</i> (Roxb.) DC.	Kakranda	Herb	Purplish yellow
9.	<i>Blumea mollis</i> (D. Don) Merr.	-----	Herb	Pale yellow
10.	<i>Calyptocar pusvialis</i> Less.	-----	Herb	Yellow
11.	<i>Carthamus oxycantha</i> M. Bieb.	Pohli, Kandali	Herb	Yellow
12.	<i>Cichorium intybus</i> Linn.	Kasni	Herb	Purple
13.	<i>Cirsium arvensis</i> (Linn.) Scop.	Kateli	Herb	Pink to purple
14.	<i>Dicoma tomentosa</i> Cass.	Vajardanti	Herb	White
15.	<i>Eclipta alba</i> (Linn.) Hassk.	Bhringraj	Herb	White
16.	<i>Echinops echinatus</i> Roxb.	Unt-kantalo	Shrubby	Purplish
17.	<i>Erigeron canadensis</i> Linn.	Phulni	Herb	White to purplish
18.	<i>Erigeron bonariensis</i> Linn.	Phulni	Herb	White to yellow
19.	<i>Gnaphalium polycaulon</i> Pers.	-----	Herb	Creamy yellow
20.	<i>Gnaphalium leuteoalbum</i> Linn.	Bal-raksha	Herb	Golden-yellow
21.	<i>Gnaphalium pensylvanicum</i> Willd.	-----	Herb	Creamy white
22.	<i>Glossocardia bosvallea</i> (Linn. f.) DC.	-----	Herb	Yellow
23.	<i>Launaea procumbens</i> (Roxb.) Ram.	Van-Gobhi	Herb	Yellow
24.	<i>Launaea residifoila</i> (Linn.) Kuntze	Phoolavalo- untkantalo	Herb	Yellow
25.	<i>Laggera aurita</i> (Willd.) Sch.	-----	Herb	Purplish Pink
26.	<i>Oligochaeta ramose</i> (Roxb.) Wagen.	Rissa	Herb	Purple
27.	<i>Parthenium hysterophorus</i> Linn.	Congress-grass	Herb	White
28.	<i>Pulicaria crispa</i> Schultz-Bip.	Pili-butti	Herb	Yellow
29.	<i>Pluchea lanceolata</i> (DC.) Oliv. & Hiern.	Bai-Surai	Herb	Purplish
30.	<i>Sonchus asper</i> (Linn.) Hill	Kali-jibbi	Herb	white
31.	<i>Sonchus brachyotus</i> DC.	Dodak	Herb	yellowish white
32.	<i>Sonchu soleraceus</i> Linn.	Aakadiyo	Herb	Yellow
33.	<i>Tridax procumbens</i> Linn.	Sda-hari	Herb	Yellow
34.	<i>Vernonia cinerea</i> (Linn.) Less.	Sadodi	Herb	Purplish pink
35.	<i>Verbesina encelioides</i> Cav.	Jungli- surajmukhi	Herb	Yellow
36.	<i>Xanthium strumarium</i> Linn.	Bharut	Shrub	White or green

Table 2: Different plant species collected with parts used and ethnomedicinal value.

S. No.	Botanical name	Parts used	Ethno-medicinal value
1.	<i>Ageratum conyzoides</i> Linn.	Leaves, Stem,	Hypolipidemic; Leaves and flower extract is used as an antidote for snake bite, to cure anal itching in children, cure hair fall problem. Decoction or infusion used in diarrhea, dysentery, rheumatism and fever.
2.	<i>Ageratum houstonianum</i> Mill.	Plant Juice	Fresh juice is applied to cuts and wounds.
3.	<i>Artemisia scoparia</i> Waldst. & Kit.	Flowers	Medicinally its infusion is used as purgative, flowers yields oil.
4.	<i>Bidens pilosa</i> Linn.	Leaves	Vasodilator; relieve hypertension.
5.	<i>Blumea lacera</i> (Burm. f.) DC.	Leaves	Decoction of plant used to treat helminthes; leaves paste used to stop external bleeding as well as excessive bleeding during delivery.
6.	<i>Blumea laciniata</i> (Roxb.) DC.	Root, Leaves	Powdered root paste is used as an antidote for snake bite. Leaves juice applied superficially on bitten portion.
7.	<i>Blumea mollis</i> (D. Don) Merr.	Leaves	Helpful in treatment of leucorrhoea.
8.	<i>Calyptocarpus vialis</i> Less.	Leaves	Leaves used as pot-herb. Used against goiter and baldness.
9.	<i>Carthamus oxycantha</i> M. Bieb.	Leaf	Oil is extracted from the plants is used as hair oil.
10.	<i>Cichorium intybus</i> Linn.	Whole plant	Fodder for grazers.
11.	<i>Cirsium arvensis</i> (Linn.) Scop.	Root	Roots are tonic, diuretic, and astringent; decoction of roots given to children to remove worms.
12.	<i>Dicoma tomentosa</i> Cass.	Root	Roots are used to brush the teeth.
13.	<i>Echinops echinatus</i> Roxb.	Root	Root powder is applied to remove maggots and lice from hairs and skin; also having tonic and diuretic properties.
14.	<i>Eclipta alba</i> (Linn.) Hassk.	Plant Juice, Leaf extract	Hypolipidemic; Plant extract helps in promoting hair growth and urinary tract infections, skin diseases. Plant Juice also has property to cure jaundice issue in children.
15.	<i>Erigeron canadensis</i> Linn.	Flower; Leaves	Antithrombic; Leaves used for lumbago and rheumatism.
16.	<i>Erigeron bonariensis</i> Linn.	Leaves	Leaves are helpful in treatment of rheumatism.
17.	<i>Gnaphalium leuteoalbum</i> Linn.	Leaves	Leaves astringent and vulnerary.
18.	<i>Gnaphalium polycaulon</i> Pers.	Whole plant	Plants crushed and applied to fractured bone for healing.
19.	<i>Laggera aurita</i> (Willd.) Sch.	Leaves	Used to stop bleeding.
20.	<i>Launaea procumbens</i> (Roxb.) Ram.	Whole plant	Plant is good fodder; also used in curries

21.	<i>Parthenium hysterophorus</i> Linn.	Whole plant	Decoction used as an analgesic, to treat urinary tract infection, diarrhea, dysentery. Also have strong allelopathy effect.
22.	<i>Pluchea lanceolata</i> (DC.) Oliv. & Hiern.	Whole Plant	Cattle Feed.
23.	<i>Pulicaria crispa</i> Schultz-Bip.	Leaves	The leaves are used to relieve headache.
24.	<i>Sonchus brachyotus</i> DC.	Plant latex, Root	Latex used to treat eye problems; roots used to treat cough and asthma.
25.	<i>Sonchus asper</i> (Linn.) Hill	Stem, leaves	Good substitute of salad; crushed plant applied to wound and cuts.
26.	<i>Sonchus oleraceus</i> Linn.	Root	Root is used to cure ulcer and wounds and also helpful to treat digestive problems.
27.	<i>Tridax procumbens</i> Linn.	Leaves	Antithrombic; Plant used to treat toothache. Leaves paste applied in treatment of boils.
28.	<i>Vernonia cinerea</i> (Linn.) Less.	Root, Leaves	Root and leaves are used to treat kidney problems, fever, and stomach discomfort.
29.	<i>Xanthium strumarium</i> Linn.	Fruit	Fruits relieve constipation, helps in leprosy, rheumatoid arthritis and diarrhea.



Photo Plate 1: Some plants collected during exploration

(A). *Sonchus asper* (Linn.) Hill, (B). *Bidens pilosa* Linn. (C). *Ageratum conyzoides* Linn. (D). *Eclipta alba* (Linn.) Hassk. (E). *Erigeron bonariensis* Linn. (F). *Xanthium strumarium* Linn. (G). *Laggera aurita* (Willd.) Sch., (H) *Parthenium hysterophorus* Linn. (I). *Dicoma tomentosa* Cass. (J). *Cichorium intybus* Linn. (K). *Cirsium arvensis* (Linn.) Scop. (L). *Glossocardia bosvallea* (Linn.f.) DC.

Author noticed the dominance of genera *Blumea*, *Gnaphalium*, and *Sonchus* each represented by three species, followed by *Ageratum*, *Bidens*, *Erigeron*, and *Launaea* represented by two species each and remaining were mono-specific genera.

It is also worthwhile to mention that 94% member species show herbaceous habit while 3% under shrub and 3% shrubby in nature. The genera *Vernonia*, *Cirsium*, *Carthamus*, *Gnaphalium*, *Laggera*, *Eclipta*, *Ageratum*, and *Sonchus* were very much common in cultivated fields and were obnoxious weeds while others were prevalent in open fields, roadsides, canal banks, wasteland, and wetland. In cultivated fields, their vigorous growth harms the crops while in open uncultivated field, it was observed that they displaced other vegetation due to their aggressiveness. *Parthenium hysterophorus* has taken a lead and shows strong allelopathy (Kaur *et al.*, 2014; Tripathi and Chandra, 2019). Although represented by a single species, the *P. hysterophorus* was strongest weed followed by *Verbena* among all in the areas studied. Genera *Glossocardia*, *Dicoma*, *Blainvillea*, *Tridax*, *Bidens* mainly occupied hilly slopes. Members of the family could be seen almost throughout the year and distributed all spaces including harsh conditions in the areas studied (photo plate 1).

It was very much interesting to describe that among 36 species yellow flowered species were dominating represented almost 55.5% share, followed by purple to bluish or pink purple with 27.8%, then white to creamy white flowered species with 13.9% representation and only one species *i.e.* *Xanthium strumarium* Linn. had green flower representing 2.8% share.

The medicinally valued 29 species out of 36 recorded are given in table 2. It shows the parts of plant used to treat different diseases *i.e.* ethnomedicinal values. *Ageratum conyzoides* Linn. (Atawadi *et al.*, 2017), *Bidens pilosa* Linn. (Dimo *et al.*, 2001), *Eclipta alba* (Linn.) Hassk. (Dhandapani, 2007), *Erigeron canadensis* Linn. (Pawlaczyk *et al.*, 2011) and *Tridax procumbens* Linn. (Naqush and Nazeer, 2011) have significant pharmacological value either in aqueous or alcoholic extract. Leaves have highest ethno medicinal value in treatment of different health issues followed by whole plant, root, flowers, stem and fruits.

It has also been interpreted from ethno-medicinal data that most of the members of family Asteraceae

have multiple utility in curing various ailments and diseases including not only skin related but also abdominal, cardiac, hepatic and renal related issues. 06 members were found helpful in the treatment of abdominal issues like diarrhea, dysentery etc., 05 species in kidney related issue, 09 species in healing wounds and cuts and stop excessive bleeding, 08 species have role in skin allergy and hair related problems, 02 species have property as antidote to snake bite, 04 species in treatment of rheumatism and arthritis, 03 species have analgesic and 02 species antihelminthic properties. 02 species have significant role in treatment of gynecological issues like leucorrhoea. 03 species bore property to give strength to bones and teeth. Only single species has property to cure respiratory problems.

On the basis of above results and discussion, it can be concluded that 36 species of family Asteraceae have significant representation in flora of District Bhiwani. Also it could be understood easily that there is rapid change in traditional use of plants that need to be documented. This would result a decline of ethnic knowledge and reliability. So it is strongly recommended to document this heritage to ensure the preservation and conservation.

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