

Study of some weeds from Saharanpur district of Uttar Pradesh with reference to ethnomedicinal importance

Yogendra Kumar^{1*} and Arvind Kumar Singh²

¹Department of Botany, Government Degree College Nanauta, Saharanpur-247452, U.P.

²Department of Botany, Maharishi University of Information Technology, Lucknow-226013, U.P.

*Corresponding author. Email: ykpanchal4ever@gmail.com

Abstract

An ethnobotanical survey on common weeds of Saharanpur district, Uttar Pradesh, India was conducted from March 2020 to January 2021. The ethnobotanical information was obtained through open interviews and group discussions with local people of study area. The local inhabitants still depend upon their indigenous knowledge in order to treat their various health problems. People collect useful plants from their surrounding plant communities in wild and semi-wild state. A total of 96 plant species were collected, of which 70 ethnomedicinally important plants were documented along with botanical name, local name, family, habit, parts used and ethnomedicinal significance. These 70 plant species belongs to 58 genera and 34 families. The main objective was to explore indigenous knowledge regarding uses of these plants for various ethnomedicinal purposes by the rural people of this area from time immemorial. Present investigation revealed that besides fulfilling basic needs, these plants are widely used for the treatment of various ailments such as asthma, fever, urinary infection, tuberculosis, rheumatism, leprosy, kidney stones, syphilis, leucorrhoea, eye infection and skin disorders by the local people of the study area. The most widely used plant part was leaves, followed by root, seed, whole plant, fruit, bark, stem, wood and flower.

Keywords Ethnomedicinal, weeds, indigenous knowledge, ailments, Saharanpur.

Introduction

From the time immemorial plants have been used as a source of food, shelter, clothing, medicine, fodder, oil, fuel, fibre, gum, resin etc. Documenting the indigenous knowledge through ethno-botanical studies is important for the conservation and utilization of biological resources. Ethnobotany contributes to an understanding of man-plant relationships, as well as for the practical applications of the biological knowledge of aboriginal people in medicine, health, agriculture and industry (Pawar & Patil, 2008). According to WHO 80% of the populations living in the developing countries rely almost exclusively on traditional medicine (Ranbirchandra *et al.*, 2007). India is rich in medicinal plants with all the three levels of biodiversity such as species, genetic and habitat diversity. It has been estimated that only 5 to 10 % of the existing plant species in India have been surveyed for biologically active

compounds. Only 25 % of the medical drugs are based on plants sources in the developed countries (Cragg *et al.*, 1997). In India, the traditionally used medication system plays an important role in health care of rural people. It is reported that in India, traditional healers use 2500 plant species and 100 species of plants serve as regular sources of medicine (Pei, 2001).

Due to its unique geographical location and climatic conditions, the Saharanpur district is well known for its plant wealth including medicinal, edible and aromatic plants species (Dhiman *et al.*, 2006, Prachi *et al.*, 2009, Nagiyan *et al.*, 2003). Many plant species of this area have medicinal value and were being used by local people or curing various diseases and to maintain their health. Recently, the practices and status of all herbal medicinal plants has been declined rapidly due to modernization of synthetic drugs which may lead to the loss of valuable information about healing herbs (Singh & Singh, 2009). In present scenario, developed countries are turning back towards the use of herbal medicines due to side effects of certain drugs (Heinrich, 2000). Hence, documenting and safeguarding Traditional Knowledge System (TKS) have become a big challenge to scientific community throughout the world. The major objective of this survey was to document the ethnomedicinal uses of common weeds of Saharanpur district and their conservation. Through this study, we have attempted to fill the knowledge gap in the context of existing data on diversity, traditional knowledge, economic potential and conservation value of ethnomedicinally important plants from Saharanpur district.

Materials and Methods

Study Area

The Saharanpur district of Uttar Pradesh, India is selected for ethno-botanical studies (Figure 1). The district is located in the North-West edge of Uttar Pradesh. In the east of the district lies district Haridwar of Uttarakhand state, in the west lies districts Yamuna Nagar and Karnal of Haryana state, district Dehradun of Uttarakhand state in the north and district Muzaffarnagar and Shamli in the south. The district is geographically located between 29° 34' and 30° 34' North latitude and 77° 7' and 87° 12' East longitude. This region forms the northern most part of Ganga-Yamuna Doab. The area of district is 3869 sq. km. The climate of the region is tropical due to the proximity of the Himalayan region. Rainfall is most crucial climatic factor which directly affects the vegetation of this area. Approximately 90 percent rainfall occurs during monsoon season from June to September.

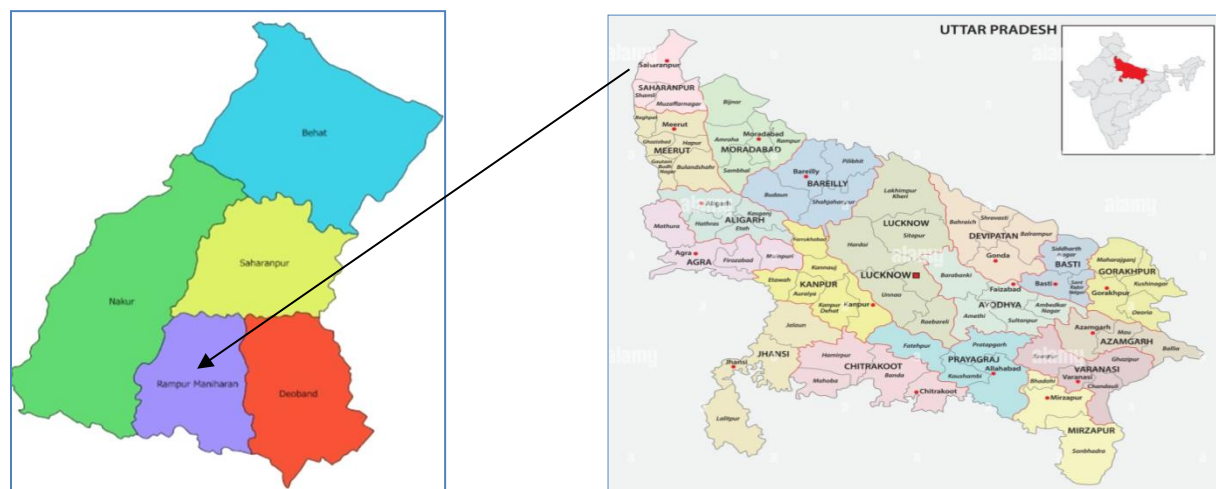


Figure 1. Map of the Study Area (Saharanpur District)

The district is situated in the foothills of Shiwalik that constitute the outer Himalaya. The district is characterized with the Shiwalik, Bhabar, Tarai, Khadar and the plain. Hilly tract of the Shiwalik range along the northern border is stretching from west to east directions. Saharanpur district is divided into 5 tehsils namely Behat, Rampur Maniheran, Nakur, Saharanpur and Deoband. The southern part of the district constitute a major part of plain area. This part is highly fertile and composed of alluvial soil. Yamuna is the main river which flows on the western limit of the district in south direction. Hindon, Panvdhoi and Dhamola are other important rivers of the district. The whole area has rich diversity of valuable angiospermic plants.

Method

An extensive survey of the study area was carried out from March 2020 to January 2021 to get maximum information following the typical protocols for the collection of ethno-botanical facts (Martin, 2004). In order to obtain traditional ethno-botanical information regarding use of different weeds as medicines, interviews and group discussions were organized with rural people of the study area. These informants included recognized healers, villagers, plant collectors, elder people and social workers. Floristic diversity, local name of plants, parts of the plant used, method and forms of preparation were recorded and documented by successive visit to villages. Field visits were arranged in different seasons for the collection of maximum number of plant specimens in their flowering and fruiting stages. Plant specimens were photographed at site for describing their basic details. Whole data of collected specimens were maintained in field note book.

The collected plant samples were further processed following the standard procedure of collection, preservation and maintenance of plant specimens in the herbarium (Jain & Rao, 1977). Identification of the collected specimens was done with the help of important taxonomic literatures and available monographs and floras (Duthie, 1903-29, Kanjilal, 1928, Kanjilal, 1933, Hooker, 1973).

The collected ethnomedicinal information was documented on the basis of plant part used for various medicinal purposes. The collected species were arranged in alphabetical order with their botanical names, local names, family, habit, plant parts used and ethnomedicinal significance (Table 1).

Results and Discussion

The taxonomic description of the collected plant species along with their mode of utilization is shown in Table 1. During the survey a total of 96 plant species were collected from different locations, of which 70 species of ethnomedicinal importance belonging to 58 genera and 34 families were documented. The 10 dominant families of study area as shown in Figure 2, were Papilionaceae (7 species) followed by Solanaceae (6 species), Acanthaceae and Malvaceae (5 species each), Amaranthaceae, Lamiaceae and Moraceae (4 species each) and Asteraceae, Caesalpiniaceae and Convolvulaceae (3 species each). The distribution of plant specimens on the basis of life forms (Figure 3) indicated that herbs constitute the major proportion (57.14%), followed by trees (22.86%), shrubs (15.71%), climbers (2.86%) and undershrubs (1.43%). The study area has greater diversity of angiospermic plant resources. In present study, an attempt was made to document the ethno-botanical information present with the local people of study area about the sustainable utilization of plant resources. The present study revealed that for various ethnobotanical purposes the leaves (32.14%) were the most commonly used part followed by roots (16.96%), seeds (15.18%), whole plant (12.50%), fruits (8.04%), bark (6.25%), stem (4.46%), wood (2.68%) and flower (1.79%) (Figure 4).

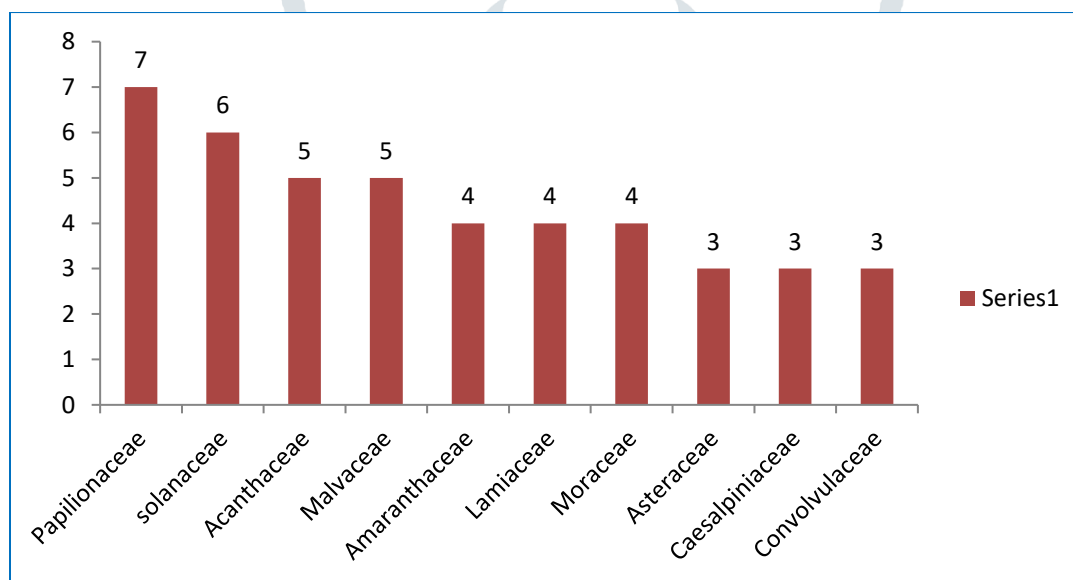


Figure 2. Dominant families with number of species

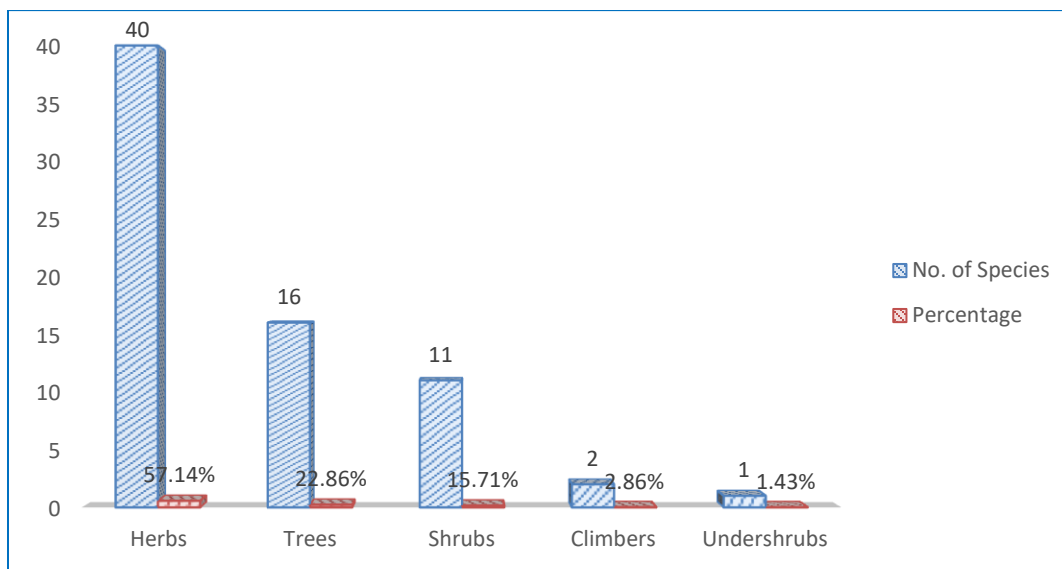


Figure 3. Distribution of species according to life forms

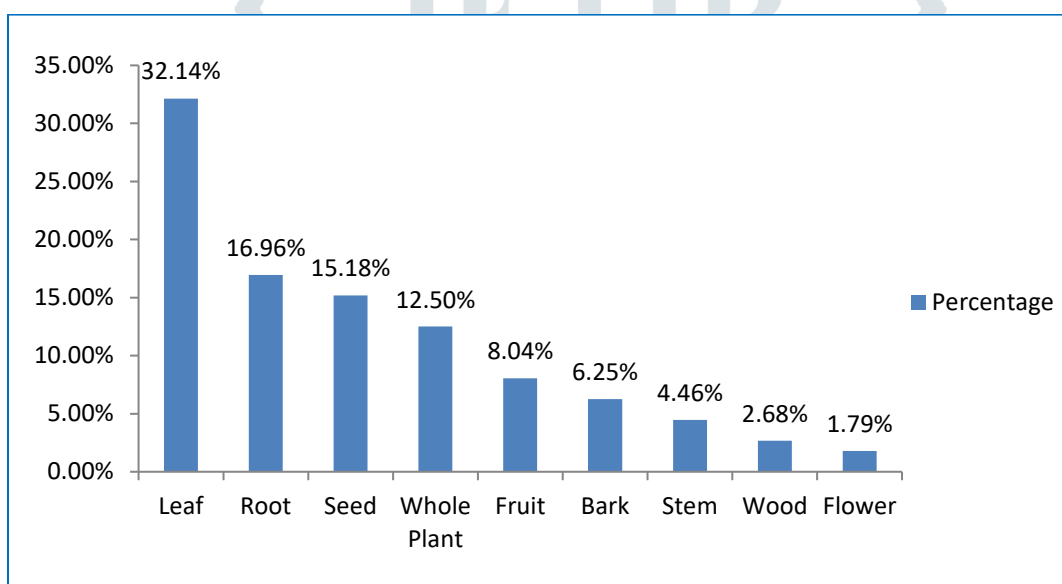


Figure 4. Percentage of plant parts used for medicinal purposes

The rural people of Saharanpur district are highly dependent on these plants for fulfilling their basic needs as well as medicinal requirements as these are easily available and highly effective against various human ailments such as asthma, rheumatism, eye infection, kidney stone, snake bites, urinary infections, fever, tuberculosis, diarrhoea, leprosy and skin disorders. All the medicinal plants are generally found in each of the villages in the Rampur Maniharan tehsil of Saharanpur district. The local inhabitants used to collect plants from their surrounding plant communities in wild, semi-wild and some are cultivated as well. In spite of the advancement in science and technology, most of them are still depends on their traditional knowledge of medicinal plants for their primary health care needs. The assessment and documentation of traditional knowledge about utilization of various wild medicinal plants is highly important for enhancement of the existing understanding of indigenous knowledge system. Several ethno-botanical studies were conducted to take record of the species used by the residents of

different regions for healthcare. The study has also been compared with published literature (Jain, 1991; Chandel et al.,1996; Khare, 2007).

Documentation of this traditional information is highly significant in understanding the biodiversity and making of policies for conservation of ethno-botanically important plants (Singh, 1999). Several studies revealed that many valuable plants of this area are under threat and depleting very fast due to deforestation, overexploitation of plant resources and other human socio-economic developmental activities in the study area. Therefore, there is urgent need of conservation system for protection and conservation of biodiversity including the valuable assets of beneficial plants of this beautiful region.

Table 1. List of Plant Species with Ethnobotanical Uses

Name of Species	Local Name	Family	Habit	Parts Used	Ethnobotanical Uses
<i>Aegle marmelos</i> (L.) Correa.	Bel Patthar, Bel	Rutaceae	Tree	Leaf, Root	Leaves are used for worship of Lord Shiva. Root paste is applied as an antidote against scorpion bite. Juice of ripe fruit is used for the treatment of gastro-intestinal problems. Leaf juice is used to treat jaundice, asthma, fever and diabetes.
<i>Aerva javanica</i> (Burm. f.) Juss. &Schult.	Bhuari	Amaranthaceae	Herb	Root, Seed	The roots are given in the treatment of headache and jaundice. Seeds are useful in rheumatism. Decoction of plant is given in calculi and burning micturition.
<i>Alstonia scholaris</i> (L.) R. Br.	Sapt parni	Apocynaceae	Tree	Bark	Bark is used as blood purifier. Decoction of bark is useful in fever to reduce body temperature.
<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Garundi	Amaranthaceae	Herb	Leaf	Leaf poultice is used for boils. Decoction of plant is given to nursing mother to increase the milk.
<i>Amaranthus viridis</i> L.	Kantili Cholai	Amaranthaceae	Herb	Whole Plant	Plant is considered as a good source of iron and act as appetizer. Leaves and tender shoots are used as vegetables. Whole plant is given to cure kidney stone.
<i>Anisomeles indica</i> (L.) Kuntze	Kala bhangra	Lamiaceae	Herb	Root, Seed	Root paste is applied on rheumatism. It is used as an astringent and carminative. Seed oil is used to cure uterine infections. Plant ash mixed with coconut oil and applied to remove dandruff.
<i>Argemone mexicana</i> L.	Peeli Katili	Papaveraceae	Herb	Seed	Seeds are used as antidote against snake bite. Latex is used to treat eye infection and jaundice. Seed oil is used to treat cutaneous infections.
<i>Barleria prionitis</i> L.	Vajradanti	Acanthaceae	Shrub	Leaf	Raw leaves are chewed to get relief in tooth ache. Leaf ash is used with honey for cough. Leaves paste is useful in boils and cracked heel.
<i>Bauhinia purpurea</i> L.	Kachnar	Caesalpinaceae	Tree	Bark, Wood	Bark is used in the treatment of diarrhea. Leaves are used as fodder. Wood is used to prepare agricultural implements.
<i>Boerhavia diffusa</i> L.	Punarnava	Nyctaginaceae	Herb	Leaf, Root	Root paste is used to cure boils and dropsy. Root paste is applied on pubic area for easy delivery. Leaf juice of is used in treatment of jaundice.
<i>Butea monosperma</i> (Lam.) Taub.	Dhak, Palash	Papilionaceae	Tree	Leaf, Bark	Fresh leaf juice is applied in burning urination. Leaf paste is applied externally for treatment of rheumatic pain. Bark decoction used in diarrhoea.
<i>Calotropis gigantea</i> (L.) Dryand. R. Br.	Safed Aak, Madar	Asclepiadaceae	Shrub	Leaf, Root	Milky juice is applied or ring worm, eczema and swelling. Fresh root twigs are used as tooth brush in toothache. Leaves of the plant are used in treatment of paralysis. Root bark is used in elephantiasis.
<i>Calotropis procera</i> (Ait.) Dryand. R. Br.	Aak, Madar	Asclepiadaceae	Shrub	Whole Plant	Flowers are used for worshipping Lord Shiva. Leaves used in dysentery. Stem fibres are used to prepare rope and cords. Root and latex are used to treat asthma.
<i>Carica papaya</i> L.	Papeeta	Caricaceae	Tree	Fruit	Unripe fruits used as vegetable. Milky juice of unripe fruits used as a cosmetic to remove freckles. Ripe fruits are used for good digestion.

<i>Celosia argentea</i> L.	Makhmali	Amaranthaceae	Herb	Flower, Seed	Flowers are used for the treatment of diarrhea. Seeds are used to cure painful micturition and dysentery.
<i>Centella asiatica</i> L.	Brahmi buti	Apiaceae	Herb	Leaf	Powdered leaves with cow's milk are given to improve memory. Leaf decoction is given in the treatment of leprosy. Leaves are also used to overcome fatigue, stress and mental confusion.
<i>Cleome viscosa</i> L.	Hulhul	Capparidaceae	Herb	Seed	Seeds in the form of poultice are applied on painful joints. Seeds are used as carminative and anthelmintic. Plant is also used as vegetable.
<i>Cordia dichotoma</i> G.Forst.	Lisora	Boraginaceae	Tree	Leaf, Bark	Bark is employed for cough and chest diseases. Leaves juice and honey is given in foot and mouth disease of cattles.
<i>Cuscuta reflexa</i> Roxb.	Amarbel	Convolvulaceae	Herb	Stem	It is utilized in treatment of liver related diseases. Decoction of stem is employed in constipation and flatulence. Stem paste is given with curd to cure diarrhea.
<i>Dalbergia sissoo</i> DC.	Shisham	Papilionaceae	Tree	Leaf, Wood	Fresh leaves and dried bark is used in bleeding piles. Leaf decoction is given in gonorrhoea. Wood is useful in leprosy, boils, and eruptions.
<i>Datura innoxia</i> Mill.	Safed Datura	Solanaceae	Herb	Leaf, Seed	Seeds are used to treat hydrophobia. Seeds are said to be smoked in asthma. Roasted leaves are applied on enlarged testicles.
<i>Datura metel</i> L.	Kala Dhatura	Solanaceae	Herb	Leaf, Seed	Leaves are used as narcotic and anti-spasmodic. Seeds are said to be smoked in asthma. Purified seeds used in jaundice and anemia.
<i>Datura stramonium</i> L.	Dhatura	Solanaceae	Herb	Leaf, Seed	Seeds are used as cerebral depressant. Also used in muscular pain and rheumatism. Leaves are useful in asthma and bronchitis.
<i>Delonix regia</i> (Hook.) Raf.	Gul Mohar	Caesalpinaceae	Tree	Seed, Bark	The seeds are carminative, and also used to purify the blood. Decoction of bark is useful in fever and diarrhoea.
<i>Eclipta prostrata</i> L.	Bhringraj	Asteraceae	Herb	Whole Plant	Plant juice is applied in fever, jaundice, anemia and diabetes. Whole plant is used to treat skin problems and urinary tract infections. Leaf paste mixed with coconut oil is used to prevent hair loss.
<i>Evolvulus alsinoides</i> L.	Phooli	Convolvulaceae	Herb	Leaf	It is used to prepare tonics and medicine for fever. Also used in treatment of syphilis, diarrhoea, bronchitis and asthma.
<i>Ficus benghalensis</i> L.	Bargad, Bar	Moraceae	Tree	Whole Plant	Root paste is applied in leucoderma and ringworm. Fruits are employed in indigestion, sexual debility, piles and general debility. Stem decoction is used to get relief from piles and exudation of puss. Bark infusion used as a tonic and in treatment of dysentery and diabetes.
<i>Ficus racemosa</i> L.	Gular	Moraceae	Tree	Fruit, Root	Unripe fruits are used in jaundice and diarrhoea. Root juice is applied in case of mumps and other glandular swellings.
<i>Ficus religiosa</i> L.	Peepal	Moraceae	Tree	Whole Plant	Twigs are used as tooth brushes. Unripe fruits are useful in premature ejaculation and general debility. Stem bark is used in skin problems, throat and urinary infections. Leaf powder mixed with water is taken orally to get relief from body pain
<i>Fumaria indica</i> (Haussk.) Sabnis	Papra	Fumariaceae	Herb	Whole Plant	The decoction is used as a blood purifier. It is also used against fever and as anthelmintic.
<i>Indigofera linifolia</i> (L. f.) Retz.	Torki	Papilionaceae	Herb	Root	Root paste is applied on swellings. Plant decoction is given in fever. It is also used as a vermifuge.
<i>Indigofera tinctoria</i> L.	Neel	Papilionaceae	Under shrub	Leaf, Root	Roots used in urinary complaints and jaundice. Leaf juice is useful in epilepsy and nervous disorders.
<i>Ipomoea cairica</i> (L.) Sweet	Morning Glory	Convolvulaceae	Climber	Leaf	The plant is useful in treatment of cough, asthma and tuberculosis. Leaf paste is applied in skin diseases.
<i>Justicia adhatoda</i> L.	Bansa	Acanthaceae	Shrub	Leaf	Leaf ash is used for the treatment of cough. Leaf juice is useful in treatment of dysentery, diarrhoea and tumours.
<i>Justicia procumbens</i> L.	Makhania Ghas	Acanthaceae	Shrub	Leaf	Leaves juice is squeezed into the eyes for treatment of ophthalmia. Plant infusion used in asthma, cough, rheumatism and liver disorders.
<i>Lawsonia inermis</i> L.	Mehandi	Lythraceae	Shrub	Leaf	Paste of leaves is applied over skin to cure burns. Leaves are source of red-orange dye and used for

					dyeing the hairs and hands. Gargle with decoction of its leaves is good medicine for gum disease.
<i>Leucas cephalotes</i> (Roth) Spreng.	Gubha	Lamiaceae	Herb	Root, Flower, Seed	Juice of root is given in rheumatism. Juice of flowers is given in coughs, colds and jaundice. Seeds yield an oil, used as an illuminant.
<i>Medicago sativa</i> L.	Lahsun Ghas	Papilionaceae	Herb	Leaf, Seed	The tea made of leaves is used to strengthen digestive system. Sprouts of seed are useful in diabetes.
<i>Mimosa pudica</i> L.	Lajwanti, Chhuimui	Mimosaceae	Shrub	Leaf, Root	Plant powder is used as good medicine for asthma. Plant paste is applied on fistula and piles. Root decoction used in urinary disorders. Leaves juice is helpful in treatment of glandular swellings.
<i>Mirabilis jalapa</i> L.	Gulabas	Nyctaginaceae	Herb	Leaf	Paste of leaves applied on boils, wounds and swellings.
<i>Moringa oleifera</i> Lam.	Sahjan	Moringaceae	Tree	Leaf, Fruit	Root decoction is given to treat asthma and bronchitis. Leaves juice along with honey is dropped into eyes in conjunctivitis.
<i>Morus alba</i> L.	Shahtoot	Moraceae	Tree	Fruit, Leaf, Stem	Leaf paste is useful for healing of wounds. Fruits are eaten and also used for sore throat, dyspepsia and melancholia.
<i>Nicotiana rustica</i> L.	Tambaku	Solanaceae	Herb	Leaf	The plant leaves contains strong narcotic. Leaves used for chewing and smoking in the form of hukkas.
<i>Ocimum americanum</i> L.	Tulsi, Krishna Tulsi	Lamiaceae	Herb	Leaf, Seed	The leaves mixed with the tea are used in fever. Seed decoction in potash water is used as coolant in fever. Seed powder is used in case of leucoderma and other skin diseases.
<i>Ocimum basilicum</i> L.	Tulsi, Sweet Basil	Lamiaceae	Herb	Leaf	Leaf along with honey is used as decoction to cure cold, cough and fever. Plant is considered antipyretic, expectorant and stimulant. The tea made of leaves is used in fever and cough.
<i>Oxalis corniculata</i> L.	Khatti-Booti	Oxalidaceae	Herb	Leaf	The leaves are good source of vitamin C. The leaves are chewed raw due to its sore taste. Juice of its leaves act as antidote against Datura poisoning. Leaf juice is used to treat piles and skin problems.
<i>Parthenium hysterophorus</i> L.	Gajar ghas	Asteraceae	Herb	Root	Decoction of roots is used as tonic. Root decoction is also used in treatment of skin diseases.
<i>Pedaliium murex</i> L.	Vilayti Gokhru	Pedaliaceae	Herb	Leaf	Sap of fresh leaves with water is used to treat gonorrhoea and dysuria. It is also used in calculi and burning micturition.
<i>Polygonum plebeium</i> R. Br.	Machechi	Polygonaceae	Herb	Whole Plant	Plant decoction is given in pneumonia and bowel complaints. Plant ash mixed with oil is applied on eczema, wounds and ulcers.
<i>Pongamia pinnata</i> (L.) Pierre.	Karanj	Papilionaceae	Tree	Seed, Bark	Bark powder is used in treatment of diabetes. Plant decoction is used to cure 'Beri-beri'. Seed oil is antiseptic and useful in cure of skin diseases.
<i>Portulaca oleracea</i> L.	Luni	Portulacaceae	Herb	Leaf	Leaves are used in the treatment of kidney, bladder and spleen disorders. It is also used to treat mouth ulcer.
<i>Putranjiva roxburghii</i> Wall.	Putranjiva	Euphorbiaceae	Tree	Fruit, Seed, Wood	Fruits are used for treatment of fever, cold and rheumatism. Seeds are believed to be conception-promoting. It is also used against vaginal infection and urino-genital disorders.
<i>Ranunculus sceleratus</i> L.	Jaldhania	Ranunculaceae	Herb	Leaf, Stem, Seed	Leaf juice is applied for the treatment of eczema and ringworm. Stem juice is used in asthma and rheumatism. Seeds are used in treatment of stomach pain and kidney problems.
<i>Ruellia prostrata</i> Poir.	Bell weed	Acanthaceae	Herb	Whole Plant	Plant decoction is used in fever, cough, indigestion and liver disorders.
<i>Ruellia tuberosa</i> L.	Blue bell	Acanthaceae	Shrub	Whole Plant	Plant is used as anti-diabetic, analgesic and gastric tonic. Also useful in treatment of gonorrhoea and skin disorders.
<i>Senna occidentalis</i> L.	Kasaundhi	Caesalpiniaceae	Herb	Leaf, Stem, Seed	Seeds are used for treatment of cough and whooping cough. Roasted seeds mixed with coffee are given for strength. Stem, leaf and seed decoction is used as a purgative.
<i>Sida acuta</i> (Burm. f.) Bross.	Baraira	Malvaceae	Shrub	Leaf, Root	Boiled leaves are used against elephantiasis. Roots are used for nervous and urinary disorders.

<i>Sida cordata</i> (Burm. f.) Boiss.	Baharbuta	Malvaceae	Herb	Leaf, Root, Fruit	Fruit decoction is used in sexual debility. Decoction of root is given in leucorrhoea and gonorrhoea. Leaves crushed and applied on cuts.
<i>Sida cordifolia</i> L.	Kharenti	Malvaceae	Herb	Root	Roots infusion is given in nervous and urinary disorders. Root powder is given with milk in frequent micturition.
<i>Sida ovata</i> Forsk.	Dabi	Malvaceae	Herb	Root	Root decoction is given in sexual debility. Powdered seeds mixed with jaggery are given in lumbago.
<i>Solanum nigrum</i> L.	Makoi	Solanaceae	Herb	Whole Plant	The plant used in fevers, diarrhoea and eye troubles. The herb decoction used as narcotic and antispasmodic. The leaf extract is taken orally for whooping cough.
<i>Stellaria media</i> (L.) Vill.	Godal	Caryophyllaceae	Herb	Whole Plant	Paste of the plant applied to cuts and wounds. It also helps to treat constipation. Paste of plant mixed with plaster of paris is applied on the broken bones for healing.
<i>Tephrosia purpurea</i> (L.) Pers.	Sharpunkh ada	Papilionaceae	Herb	Root, Seed, Fruit	Root decoction is used to cure bleeding piles, diarrhoea and dyspepsia. Seed oil is applied on eczema. Decoction made of pods is given in bronchitis.
<i>Terminalia arjuna</i> (Roxb. ex DC.) Wt. & Arn.	Arjun	Combretaceae	Tree	Bark, Leaf, Fruit	The bark is considered to be a tonic for heart. Decoction of leaves is useful in diabetes. Fruit is also helpful in high blood pressure control. Twigs are used as tooth brush in dental disorders.
<i>Tinospora cordifolia</i> (Willd.) Miers.	Giloy, guduchi	Menispermaceae	climber	Whole Plant	Leaf decoction is given in the treatment of gout. Fruit is used to treat jaundice and rheumatism. Dried stem used in polyurea and skin diseases. Stem juice used in general debility.
<i>Tribulus terrestris</i> L.	Gokhru	Zygophyllaceae	Herb	Fruit, Leaf, Root	Fruit decoction is used for the treatment of impotency. Raw leaves are used to treat stone problems. Mixture of fruits and root is used to treat leucorrhoea and urinary problems.
<i>Urena lobata</i> L.	Bachita	Malvaceae	Shrub	Stem, Root	The decoction of stem and roots used for flatulence.
<i>Verbascum chinensis</i> (L.) Santapau	Gadar-Tamakhu	Scrophulariaceae	Herb	Whole Plant	Plant juice is used as febrifuge, and for skin eruptions. Leaf juice is useful in treatment of diarrhoea.
<i>Withania somnifera</i> (L.) Dunal in DC.	Ashwa gandha	Solanaceae	Shrub	Root, Leaf	Powdered roots are employed to improve sexual power. Root powder is used to get relief in inflammation. Root paste is applied to cure rheumatism, ulcers and fever.
<i>Xanthium strumarium</i> L.	Bharunt	Asteraceae	Herb	Whole Plant	Fruits are used in constipation, leprosy and rheumatoid arthritis. Seeds are eaten raw to get relief from headache. Roots are useful in treatment of tumor.

Conclusion

From the present study it can be concluded that the study area has rich forest cover and plant diversity, as a result many valuable plants are found in this region but due to the lack of awareness and proper documentation, this wealth is going to decrease day by day. Therefore, creating awareness and motivating local people for cultivation and conservation of medicinal plants is highly necessary for maintaining this wealth. It is the need of today to preserve the traditional knowledge of medicinal plants used by the rural people for treatment of various diseases. These plants have tremendous potentials for the preparation of various pharmaceutical products of commercial importance. There is an urgent need of great efforts to document traditional knowledge of the local people about medicinal plants in order to make it available for our future generations for ensuring good health. Diversity of medicinal plants and their therapeutic applications discussed in the present article open new vistas for the future researchers to carry out deep pharmacological investigations for the advancement of health care system. Thus, it can be expected that this investigation will be of immense importance to conserve the heritable indigenous

knowledge in the field of herbal treatment particularly in rural areas.

References

- Chandel, K.P., Shukla, S.G., & Sharma, Neelam (1996). Biodiversity in Medicinal and Aromatic Plants in India, conservation and utilization, N.B.P.G.R, New Delhi, pp. 1-239.
- Cragg, G.M., Newman, D.J. & Snader, K.M.(1997). Natural products in drug discovery and development, J. Nat. Prod., 60, 52-60.
- Dhiman, Amit, Praveen, Reshma, Khurana, Seema, Kumar, Sanjay, & Bhargava, A.K. (2006). Antipyretic traditional herbal medicinal plants of District Saharanpur, U.P. India. Plant Archieve, 6 (2), 707- 710.
- Duthie, J. F. (1903-1929). Flora of the Upper Gangetic Plains and of the adjacent Siwalik and Sub- Himalayan Tracts. Government Press, Calcutta.
- Heinrich, M. (2000). Ethnobotany and its role in drug development, Phytother Res, 14, 479-488.
- Hooker, J.D. (1973). The Flora of British India, Reprinted by Bishen Singh Mahendra Pal Singh, vol. 1–7, Dehradun and Periodical Experts, New Delhi, India.
- Jain, S.K. (1991). Dictionary of Indian folk medicine and Ethnobotany. Deep Publications, New Delhi.
- Jain, S.K., & Rao, R.R. (1977). A Handbook of Field and Herbarium Methods, Today and Tomorrow's Printers and Publishers, New Delhi, India.
- Kanjilal, P.C. (1933). A Forest Flora for Pilibhit, Oudh, Gorakhpur and Bundelkhand, Superintendent Printing and Stationary, Allahabad.
- Kanjilal, U.N. (1928). Forest Flora of the Chakrata, Dehradun and Saharanpur forest divisions, Uttar Pradesh, (3rd ed.), Manager of publications, Government of India Press, Delhi.
- Khare, C.P. (2007). Indian Medicinal Plants. An Illustrated Dictionary, vol. I & II, Springer-Verlag Berlin/Heidelberg.
- Martin, G.J. (2004). Ethnobotany: A Methods Manual, Earthscan Publications, London, UK.
- Nagiyan, Paridhi, Dhiman, Amit, Bhargava, A.K. (2003). Medicinal value of gum and raisins secreting plants of district Saharanpur. Annals of Forestry, 11 (2), 245-248.
- Pawar, S. & Patil, DA. (2008). Ethnobotany of Jalgaon District, Maharashtra. Daya Pulishing House, Delhi, India, pp.1-3.
- Pei, S. J. (2001). Ethnobotanical approaches of traditional medicine studies: Some experiences from Asia. Pharmaceutical Biology, 39, 74-79.
- Prachi, Chauhan, N., Kumar, D. & Kasana, M.S. (2009). Medicinal plants of Muzaffarnagar district used in treatment of urinary tract and kidney stones. Indian Journal of Traditional Knowledge, 8 (2), 191–195.
- Ranbirchandra, Mohanty, J. P., Bhuyan, N.R., Kar, P.K. & Nath, L.K. (2007). Medicinal plants used against gastrointestinal tract disorders by traditional healers of Sikkim Himalayas. Indian Journal of Traditional Knowledge, 6 (4), 606-610.
- Singh, Anurag & Singh, P. K. (2009). An ethnobotanical study of medicinal plants in Chandauli District of Uttar Pradesh, India, J. Ethnopharm., 121, 324-329.
- Singh, G.S. (1999). Utility of non-timber forest products in a small watershed in the Indian Himalayas: the threat of its degradation. Natural Resources Forum, 23 (1), 65–77.