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Research Paper

Ethnobotanical uses of some common Medicinal Plants of Sarsawa, District Kotli, Azad Jammu and Kashmir

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Abstract

The exploration, identification, and documentation of Ethnobotanical resources are important in the conservation of plant species for the greater interest of human society. In the present study, an Ethnobotanical survey was conducted to document the traditional and medicinal uses of common plants of Sarsawa, District Kotli (AJK). Ethnomedicinal data was collected by the mean of a semi-structured questionnaire method, interviews, and direct observation. A total of 103 plant species belonging to 53 plant families were collected and identified. Important medicinal lants species included *Justicia adhatoda*, *Terminalia chebula*, *Chenopodium ambrosioides*, *Mentha piperita* and *Solanum nigrum*. Leaves were the most commonly used plant part (53%) in the study area. Family Malvaceae, Poaceae, and Rosaceae were the dominant plant families with 6 species respectively. Leaves were the most frequently used part of plants against different ailments.

Introduction

Ethnobotany is the study of the relationship between plants, people, and the environment. Broadly viewed, it is the cultural study of how people perceive the plants, give names, and use and organize the information about the plants around them (Arshad et al., 2014). It also deals with how the people of a particular culture and region make use of indigenous plants as food, shelter, medicine, clothing hunting, and religious ceremonies. It is the relationship between a given society and its environment and in particular the plant world (Aumeeruddy, 1996). A total of 80% of population in the developing countries rely on indigenous medicinal plants for their basic healthcare due to scarcity and deficiency of modern healthcare facilities (Mehmood et al., 2012). Plants are essential for human beings as they provide food, fuel, fodder, timber, fruit and medicines (Hameed et al., 2011). Ethnobotanical study carried in Ethiopia region describes the importance of different plant species in the treatment of common human diseases (Bekele et al. 2022). In another study 135 plant species belonging to 103 genera from 53 plant families have been reported as medicinally significant and used in traditional herbal medicines (Turpin et al., 2022). Medicinal plants have great importance and are

used for the treatment of several diseases. Some medicinally important plants such as, *Salix album, Solanum nigrum, Chenopodium album, Cannabis sativa, Justicia adhatoda, Morus alba* are used against several aliments and many chronic diseases (Maqsood et al., 2022). Medicinal plants belonging to 27 families were recorded form Leepa Valley. Out of 43 medicinal plants, 4 gymnosperms, 38 angiosperms and 01 fern species were used against different diseases. The major problems treated by 'medicinal plants' were digestive, dermal system problems, hepatic and respiratory diseases (Habib at el., 2013).

Previously sixty-six plant species and their applications against common diseases have been reported from Kotli (Rehman at el., 2006). In another study, 38 plant species belonging to 22 families were reported from Bhimber. Thirteen Hakims and 78 local people were visited to collect the ethno-medicinal data (Mahmood at el., 2011). Ethnobotanical information about plants of Rajh Mehal and Goi, Kotli, Azad Jammu and Kashmir was collected from 112 local inhabitants using a semi-structured, open-ended questionnaire and by free listing method. Aerial parts of 21 plant species were utilized in herbal preparation. Among all the studied species *Zanthoxylum alatum* was found highly important with a relative importance value of 93.75 followed by *Adhatoda zeylanica*. This survey showed that people in study area still use herbal medicines as a primary source of their health care (Qaseem at el., 2021). The Present study was designed to record the Ethnomedicinal importance and applications of common medicinal plants by the rural communities of Sarsawa, Kotli, AJK.

Materials and Methods

Study Area

Kotli is one of the biodiversity-rich areas of Azad Jammu and Kashmir (AJ&K) located some 141 km north of Islamabad, the capital of Pakistan. The region is mountainous and covers an area of about 1860 km^2 with a population is 0.588 million and total area is1862 $km^{2.}$ In Kotli, the summers are long, hot, muggy, wet, and clear. Climatically, the area is dry, subtropical at lower altitudes and subtropical-humid at upper altitudes with a mean annual precipitation of 1250 mm. The highest average monthly precipitation occurs in July (291 mm), while the lowest average monthly precipitation of 19 mm occurs during November. Temperatures are highest in June and July, with average daily minimum temperatures of 23.5 °C and 23.7 °C respectively and maximum temperatures of 37.1 °C and 33.9 °C respectively, while the coldest months are December and January with mean minimum temperatures of 4.8 °C and 3.9 °C respectively and mean maximum temperatures of 20.8 °C and 18.6 °C respectively. The mean maximum relative humidity of 68.2 percent occurs during August and the minimum relative humidity of 33.2 percent occurs during March (Ajaib et al., 2011; Abassi et al. 2011).

Data collection

During the field survey, 120 local inhabitants of 30 villages of District Kotli were interviewed using a semi-structured questionnaire to document the ethnobotanical data on the plant resources, quantities of plant species available, and their utilization by the drug dealers, shopkeepers, timber dealers, fuel wood sellers, farmers, but priority was given to hakims (Herbal practitioners) and local elderly people usually with the age of more than 70 years. In each village 4 informants (respondents) were selected. Plant specimens collected both from the wild and cultivated areas were subsequently dried, pressed and mounted appropriately on herbarium sheets and identified with the help of Flora of Pakistan, Flora ONLINE and Kew Flora.

Previously published literature was also consulted, Nasir & Ali (1970-1989), Ali & Nasir (1990-1992), Nasir & Rafiq (1995) and Ali & Qaiser (1992- 2012) and were submitted Botanical Herbarium University of Kotli, AJK.

Table 1. The Questionnaire used for data collection from rural informants

S. No.	Information on medicinal plants	Respondent
i	Who Collects the plants, women or men?	-
ii	Types of plant species. Wild or cultivated?	-
iii	The folk name of each plant species being collected and uses?	-
iv	Learning ways of traditional knowledge about medicinal plants?	-
v	Basic marketing channels of wild and cultivated edible/medicinal plants?	-
vi	Economic aspects of wild and cultivated edible plants in the studied area?	-
vii	Methods of processing and preservation of plants (freezing, sun drying, or salting?	-
viii	Therapeutic uses of medicinal plants in the traditional pharmacopeia of the region?	-
ix	Part of plant used. Leaf stem, root or any other?	-

Results and Discussion

In the present study, Ethnobotanically important plant of Sarsawa Panjera were recorded. Medicinal plants are very important and mostly used by the local people of Sarsawa against different common ailments. A total 103 medicinal plants belonging to 53 families were collected and identified from the study area Sarsawa Panjera (Table. 2). Dominant plant are from family Malvaceae, Poaceae and Rosaceae with 6 species each respectively followed by Amaranthaceae, Asteraceae and Solanaceae with 5 species. Family Fabaceae with 4 species. Family Apiaceae, Euphorbiaceae, Labiateae and Moraceae with 3 species. Family Brassicaceae, Geraniaceae, Papaveraceae, Plantaginaceae, Polygonaceae, Ranunculaceae, Rutaceae, and Violaceae with 2 species. Family Anacardiaceae, Apocynaceae, Araceae, Boraginaceae, Campanulaceae, Cannabaceae, Caryophyllaceae, Combretaceae, Commenlinaceae, Convolvulaceae, Cyperaceae with one species.

Ethnomedicinal uses of Plants

Out of 103 plants 9 plants, *Emblica officinalis, Cannabis sativa* are reported to use against asthma. Nineteen plant species are recorded to use in skin diseases including *Ziziphus mauritiana, Perthenium hysterphorus*, and *Rosa indica*. Eleven plants were used for cough, 8 for diarrhea. 28 plants are anti- inflammatory and anti-microbial. Four Plant species were used for the treatment of respiratory disorders. Seven species are used against cardiovascular disease and dysentery. Twelve plant species, *Mentha piperita, Solanum surratense, Dicliptera bupleuroides, Dushsnea indicia* and some other are used for stomach disorders. Eight were used for treatment of pain and piles. Seven plants *Erioscirpus comosus, Ammi visnage* and some other are used for kidney disorders. Some plants like, *Justicia adhatoda, Verbascum Thapsus, Terminalia chebula, Chenopodium ambrosioides,*

Mentha piperita, Solanum nigrum have great medicinal value and widely used for the treatment of several diseases.

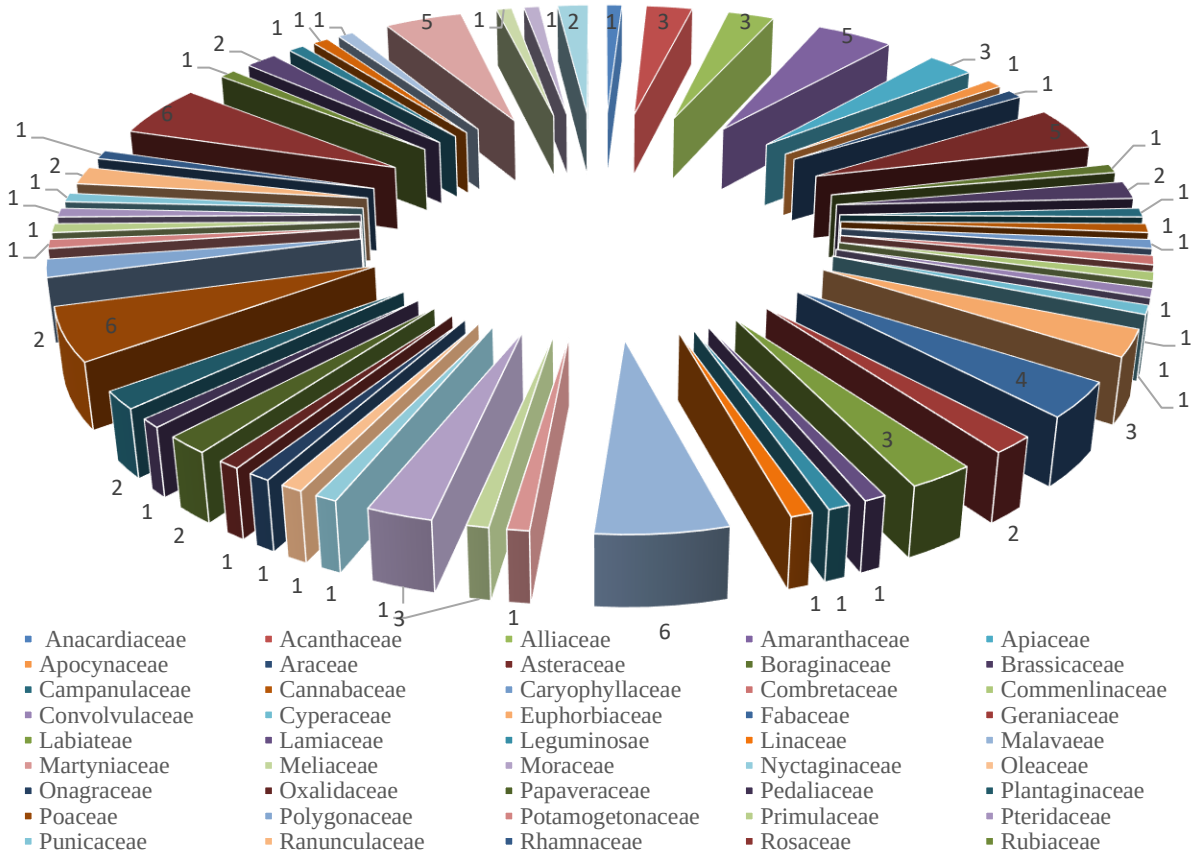

Fig 1: Number of plant families recorded from the study area

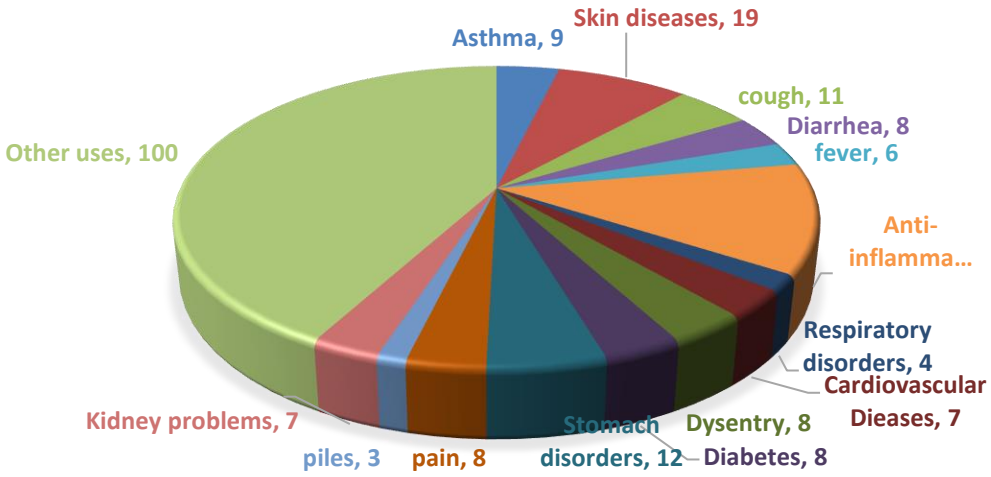

Fig. 2: Number of plants used against different disease

Mostly leaves, flowers, seeds, fruits and roots of plants are used in the preparation of herbal medicines. Leaves of plants were used as herbal medicine with average 53%. Flowers of most plants are used as medicine with average 23%. Fruits of many plants are used as herbal medicine with average of 19%. Some plants like *Scandix pecten-veneris, Euphorbia helioscopia, Melilotus indicus*

and many other and Whole plant is used as herbal medicine with average of 23%. Bulb, seeds, and buds of many plants are used as medicine with an average of 21%.

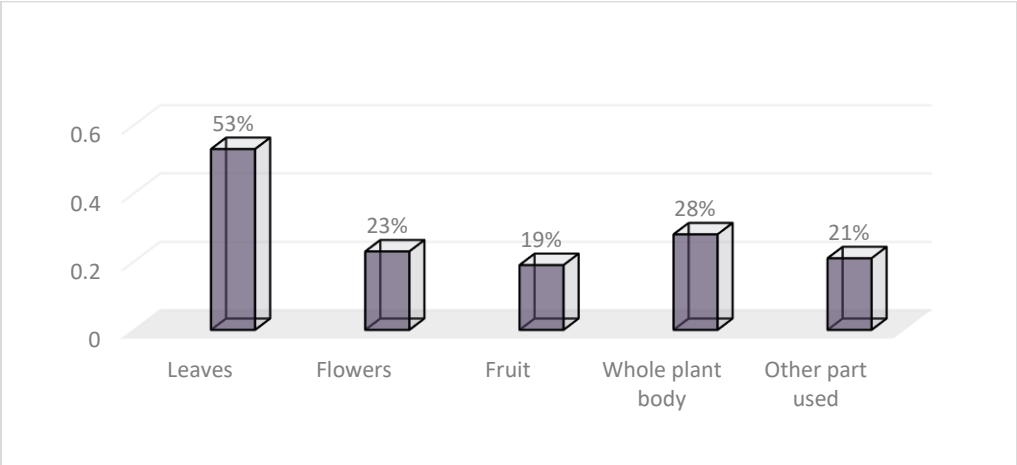

Fig 3: Plant parts used for medicinal purposes

In the study area almost 70 herbs were collected and identified. Herbs were dominant in study area with average 67% *Cannabis sativa*, *Euphorbia helioscopia*, *Solanum nigarum*, *Chenopodium album*, *Parthenium hysterphorus*, *Fumaria indicia*, *Euphorbia prostrata*, *Borago officinalis* are the most dominant herbs in study area. Shrub with almost 17% the most dominant shrubs are *Malvastrum coromandelianum*, *Justicia adhatoda* in study area. Trees with 13% and Grasses like *Saccharum spontaneum*, *Erioscirpus comosus*, *Dactyloctenium aegyptium* and *Dichanthium annulatum* with average 5%.

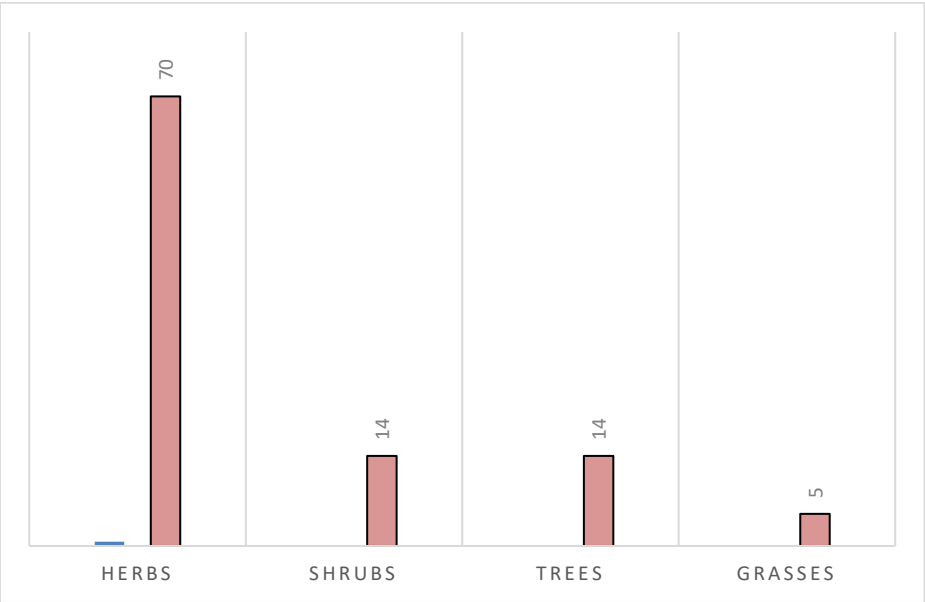

Fig 4: Number of herb shrubs trees and grasses in the study area

Ethnobotanical uses of Some Common Medicinal Plants of Sarsawa

Table. 2: List of medicinal plants used by people of Sarsawa, district Kotli.

Sr. No.	Scientific name	English or Common name	Family	Habit	Local or medicinal uses	Plant part used	Cooked as food	fodder	Medicinal uses	Previous report
1.	*Cannabis sativa* L.	Hemp	Cannabaceae	Herb	*Cannabis sativa* has been used for the treatment of epilepsy, asthma, skin burns and pain.	Leaves	×	✓	✓	(Odieka, et al. 2022).
2.	*Erigeron Canadensis* L.	Horseweed	Asteraceae	Herb	It is affected on fasting blood glucose level.	Flower and leaves	×	✓	✓	(Aslam, at el. 2018).
3.	*Malvastrum coromandelianum (L.)*	Three lobed false mellow	Malvaceae	Shrub	The plant possesses antinoceceptive, anti-inflammatory, analgesic, and antibacterial activities.	leaves	×	✓	✓	(Sanghai, at el. 2013).
4.	*Capsella bursa-pastoris* (L.)	*shepherd's purse*	Brassicaceae	Herb	Used in the treatment of hemorrhoids.	Leaves and flower	×	✓	✓	(Apaydin, at el.2020).
5.	*Scandix pecten-veneris* L.	Shepherd's-needle	Apiaceae	Herb	Mostlty use in Mediterranean diet.	Whole plant	×	✓	✓	(Liopa, at el. 2014).
6.	*Amaranthus viridis L.*	Slender amaranth	Amaranthaceae	Herb	Anti-rheumatic and antiulcer.	Leaves	✓	✓	✓	(Ferdous, et al. 2015).
7.	*Euphorbia helioscopia* L.	Sun spurge	Euphorbiaceae	Herb	Use in treatment of phlegm and cough, malaria, dysentery, scab, osteomyelitis, and cancer.	Whole plant	×	✓	✓	(Yang, at el. 2021).
8.	*Ziziphus mauritiana* L.	Indian pulm	Rhamnaceae	Tree	Used in digestive disorders, urinary troubles, diabetes, skin infections, diarrhea, fever, bronchitis, liver complaints.	Fruit	×	✓	✓	(Sameera, at el. 2015).
9.	*Anagallis arvensis* L.	Scarlet pimpernel	Primulaceae	Herb	Used in treatment of external infections such as wounds and infected pimples.	Leaves and flower	×	✓	✓	(Lopez, at el. 2011).
10.	*Melilotus indicus* L.	Sweet clover	Fabaceae	Herb	It is an anti-inflammatory agent.	Whole plant	×	✓	✓	(Saleem, at el. 2021).
11.	*Allium cepa* L.	Onion	Amaryllidaceae	Herb	Diuretic.	Bulb	✓	✓	✓	(Ajiab, et al. 2014).
12.	*Justicia adhatoda* L.	Malabar nut	Acanthaceae	Shrub	The plant is traditionally used to treat respiratory	Leaves and flower	×	✓	✓	(Mishra, et al. 2021).

					ailments. Plant has antibacterial and anti-inflammatory properties.					
13.	*Emblica officinalis* L.	Amla	Phyllanthaceae	Tree	Bark, leaf, flower, fruit and seed are utilized to improve the digestive process. Decrease fever act as blood purifier, relieve asthma.	Fruit, leaves and bark	×	✓	✓	(Gantait, et al. 2021).
14.	*Solanum nigarum* L.	Kachmach	Solanaceae	Herb	Leaves are used for gouty joints and skin disease. The barriers and flower are used for cough.	Whole plant	✓	✓	✓	(Hameed, et al. 2017).
15.	*Chenopodium album* L.	Bathua or cholai	Amaranthaceae	Herb	The plant is for the treatment of bug bites, sunstroke, skin problems. The leaves are used to treat burn.	Whole plant body	✓	✓	✓	(Siani, et al. 2020).
16.	*Dodonaea viscosa* L.	Sanatha	Sapindaceae	Shrub	The plant has anti-microbial and anti-inflammatory activities.	leaves	×	✓	✓	(Venkatesh, at el. 2008).
17.	*Morus alba* L.	White mulberry	Moraceae	Tree	The plant has antidiabetic, antimicrobial, antimutagenic, antioxidant, anticancer, anxiolytic, anthelmintic, antistress activities.	Fruit and leaves.	×	×	✓	(Devi, et al. 2013).
18.	*Punica granatum* L.	Pomegranate	Punicaceae	Tree	Fruit has anti- bacterial and anti- inflammatory activities. Seed oil has inhibitory effect on skin and breast cancers.	Fruit	×	✓	✓	(Shaygannia, et al. 2016).
19.	*Parthenium hysterophorus* L.	Carrot grass	Asteraceae	Herb	*Parthenium hysterophorus* is confers plant used for the treatment of skin inflammation, rheumatic pain, diarrhoea, urinary tract infections and dysentery.	Seeds and leaves	×	✓	✓	(Patel, et al. 2011).
20.	*Rubus fruticosus* L.	Bramble blackberry	Rosacea	Shrub	Used as antimicrobia, anticancer, antidysentey, antidiabetic, antidiarrheal activities. And also, good	fruit	×	✓	✓	(Verma, et al. 2014).

					antioxidant.					
21.	*Fumaria indicia* L.	Papra	Papaveraceae	Herb	Is one of traditionally known medicinal plant widely used for diverse therapeutic purposes	Whole plant	×	✓	✓	(Shakya, et al. 2014).
22.	*Viola odorata* L	Sweet violet	Violaceae	Herb	The plant leaves and flower have helpful role in blood pressure lowering or lipid-lowering activity.	Whole plant	×	✓	✓	(Siddiqi, et al. 2012).
23.	*Adiantum capillus-veneris* L.	Venus hair fern	Pteridaceae	Herb	Antibacterial, antifungal, antiobesity, anti-asthmatic, anti-inflammatory, antioxidant as well as diuretic	Whole plant	×	×	✓	(Dehdari, et al. 2018).
24.	*Taraxacum officinale* L.	Dandelion	Asteraceae	Herb	Use to treat medicate gout, diarrhea, blister, spleen and liver complaints. Dandelions are specially utilized to cure liver complaints.	Whole plant	×	✓	✓	(Schutz, et al. 2006).
25.	*Mentha piperita* L.	Mint	Lamiaceae	Herb	Used to decrease digestive symptoms such as dyspepsia and nausea. It is used topically as an analgesic and to treat headaches.	Leaves and stem	×	✓	✓	(Shah, et al. 2020).
26.	*Bombax ceiba* L.	Cotton tree	*Malvaceae*	Tree	Almost all parts of the plant are used by tribal Communities for gastro-intestinal and skin diseases, gynecological and urino-genital disorders and general debility.	flowers	×	×	✓	(Jain, et al. 2014).
27.	*Bauhinia variegate* L.	Kalyar	Fabaceae	Tree	The flowers are used in piles and Dysentery. The bark is used in fever. The leaves are used in treatment of skin diseases and stomatitis. The roots of the plant are used as an antidote for snake poisoning.	Flower, leaves and bark.	✓	✓	✓	(Mali, et al. 2007).
28.	*Verbascum*	Great	Scrophulariaceae	Herb	Used for inflammatory	Flower and	×	×	✓	(Turker, et al. 2005).

	Thapsus L.	mullein			diseases, asthma, spasmodic coughs, diarrhea, and migraine headaches.	leaves.				
29.	*Melia azzadirachta* L.	Chinaberry	Meliaceae	Tree	*Melia azedarach* has traditionally been used as anthelmintic, antilithic diuretic, astringent and stomachic.	Flower and leaves	×	✓	✓	(Sen, et al. 2012).
30.	*Xanthoxylum armatum* L.	Yellow wood	Rutaceae	Shrub	Plant is use in the gastrointestinal, respiratory and cardiovascular disorders	Fruit and leaves	×	×	✓	(Gilani, et al. 2010).
31.	*Olea ferruginea* L	Wild olive	Oleaceae	Tree	Plant has antimicrobial and antioxidant activity	Leaves, stem, and fruit	×	✓	✓	(Mehmood, et al. 2018).
32.	*Acacia modesta* L.	Phulai	Fabaceae	Tree	Plant has antibacterial antifungal and antioxidant activity	leaves	×	×	✓	(Abdul, et al. 2012).
33.	*Grewia tenax* L.	Akhray	Malavaeae	Tree	Used in skin and intestinal infections, cough, fever, diarrhoea, dysentery, jaundice, rheumatism and have mild antibiotic properties.	Fruit	×	✓	✓	(Sharma, et al. 2012).
34.	*Ficus palmate* L.	Wild fig	Moraceae	Tree	Used against bleeding disorders, malaria and prostate cancer.	Fruit and leaves	×	✓	✓	(Wadood, et al. 2013).
35.	*Malva sylvestris* L.	Commen mallow	Malvaceae	Shrub	Plant has antioxidant, anticancer, and anti-inflammatory properties.	Leaves and flower	✓	✓	✓	(Gasparetto, et al. 2012)
36.	*Saussurea heteromalla* L.	Snow lotus	Asteraceae	Herb	Used against rheumatoid arthritis.	Flower and leaves	×	✓	✓	(Ajaib, et al. 2014)
37.	*Zanthoxylum armatum* L.	Timber	Rutaceae	Shrub	Leaves, stem, bark, fruits, seeds and roots are used against various diseases like asthma, bronchitis, indigestion, cholera and toothache.	Leaves, seeds and branches	×	×	✓	(Singh, et al. 2015)
38.	*Rubus ellipticus L.*	Peela akhra	Rosaceae	Shrub	Used in Neurodegenerative disease, cardiovascular diseases, aging, gastrointestinal	Fruit	×	✓	✓	(Sharma, et al. 2011)

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					diseases, arthritis, and aging process					
39.	*Prunus persica* L.	Peach	Rosaceae	Tree	Antioxidant and anti-inflammatory.	Fruit	×	✓	✓	(Verma, et al. 2017)
40.	*Eruca sativa* (L.)	Tara mera	Brassicaceae	Shrub	Blood purifier and also used to remove dandruff in hair.	Whole plant	✓	✓	✓	(Present study)
41.	*Convolvulus arvensis* L.	Bind weed	Convolvulaceae	Herb	Diuretic and purgative.	Flower and leaves	×	✓	✓	(Present study)
42.	*Sorghum halepense* (L.)	Baru	Poaceae	Herb	Used for several chronic diseases such as cancer, atherosclerosis, diabetes mellitus, arthritis, and neurodegenerative diseases.	Whole plant	×	✓	✓	(Shah, et al 2019)
43.	*Sesamum orientale* L.	Til	Pedaliaceae	Herb	Antioxidant activity	Leaves	×	✓	✓	(Miraj, et al. 2016).
44.	*Saccharum spontaneum* L.	Wild sugarcane	Poaceae	Grass	Useful in burning sensations, strangury, phthisis, vesical calculi, blood diseases, biliousness and haemorrhagic diathesis.	Whole plant	×	✓	✓	(Khalid, et al 2011).
45.	*Euphorbia prostrata* L.	Ground spurge	Euphorbiaceae	Herb	Anthelmintic, Anti-constipation and purgative.	Roots and stem.	×	✓	✓	(Ajaib, et al. 2014).
46.	*Rosa indica* L.	Rose	Rosaceae	Shrub	Used for cardiovascular and gastrointestinal disorders. Also use for skin.	Flowers and leaves.	×	✓	✓	(Present study).
47.	*Dicliptera bupleuroides* L.	Thorowax foldwing	Acanthaceae	Herb	Antioxidant activities.	leaves	×	✓	✓	(Akbar, et al. 2021).
48.	*Stellaria media* (L.)	Chickweed	Caryophyllaceae	Herb	Used for asthma and diarrhea.	Flower and leaves	×	✓	✓	(Present study).
49.	*Poa annua* L.	Annual Bluegrass	Poaceae	Grass	Antioxidant properties	flower	×	✓	✓	(Present study)
50.	*Nerium oleander L.*	Kandra	Apocynaceae	Shrub	Antioxidant and antimicrobial activities.	Flowers and leaves	×	✓	✓	(Einali, et al. 2018).
51.	*Oenothera rosea* L.	Pink evening primrose	Onagraceae	Herb	Used to Reduced thrombosis, menopause and other degenerative diseases.	Whole plant	×	✓	✓	(Ajaib, et al. 2014).

52.	*Avena sativa* L.	Oats	Poaceae	Shrub	Antioxidant, anti-inflammatory, wound healing, immunomodulatory, antidiabetic.	seeds	✓	✓	✓	(Singh, et al. 2013).
53.	*Silybum marianum* (L.)	Mary thistle	Asteraceae	Shrub	Anti-inflammatory, immunomodulating, antifibrotic, antioxidant, and liver-regenerating properties	leaves	×	✓	✓	(Abenavoli, et al 2018).
54.	*Malva parviflora* L.	Sonchul	Malvaceae	Herb	Anthelmintic and also used as vegetable.	leaves	✓	✓	✓	(Ajiab, et al. 2014).
55.	*Ammi visnage* L.	Khella Baldi	Apiaceae	Herb	Used for the treatment of kidney stone.	Leaves and flower	✓	✓	✓	(Bhagavathula, et al. 2015).
56.	*Atropa belladonna* (L.)	Belladonna	Solanaceae	Herb	Used for the treatment of jaundice.	Leaves and fruit.	×	×	✓	(Berdai, et al.2012).
57.	*Datura stramonium* L.	Thorn apple	Solanaceae	Herb	Leaves are mixed with mustard oil for the treatment of skin disorder. Juice of petals are used for ear pain.	Leaves and flower	×	✓	✓	(Sayyed, 2014).
58.	*Chenopodium ambrosioides* L.	Mexican tea	Amaranthaceae	Shrub	Extract of this plant is used for the treatment of pain, inflammation and diabetes.	Leaves	×	×	✓	(Song, et al. 2011).
59.	*Trichodesma indicum* (L.)	Indian Borage	Hypocreaceae	Herb	Commonly used for arthritis and skin problems.	Leaves and flower.	×	✓	✓	(Present study)
60.	*Fragaria vesca* L.	Wild strawberry	Rosaceae	Herb	This herbal medicine has been used for respiratory system complaints, such as cough and sore throats and cardiovascular diseases, including lowering of blood pressure and heart rate.	Fruit and leaves	×	✓	✓	(Dias, et al. 2015).
61.	*Anethum graveolens* L.	Dill	Apiaceae	Herb	It is used as wound healer and help to increase the appetite and strengthen the stomach.	Flower, seeds and stems.	×	✓	✓	(Hamza, 2017).
62.	*Bergenia ciliate* (Haw*).*	Zakhm- e -hyat	Saxifragaceae	Herb	Anti-pyretic, anti-icteric, tonic, given for liver disorder, wound healing	Whole plant	×	✓	✓	(Ajaib, et al. 2014).

					and muscular pain.					
63.	*Ficus carica* L.	Tosi	Moraceae	Tree	Its fruit, root and leaves are used in the inflammatory and cardiovascular disorders.	Fruit, roots and leaves.	×	✓	✓	(Vikas, et al 2010).
64.	*Trigonlla foenum graecum* L.	fenugreek	Fabaceae	Herb	Anti- inflammatory.	Whole plant	✓	✓	✓	(Present study).
65.	*Euphorbia hitra* L.	Asthma weed	Euphorbiaceae	Herb	Commonly used tumors and digestive problems.	Leaves	×	✓	✓	(Present study).
66.	*Martynia annua* L.	Iceplant	Martyniaceae	Herb	Anti-epileptic, anti-rheumentic and also used in scorpion and snake bite.	Flowers and leaves	×	✓	✓	(Ajiab, et al. 2014).
67.	*Erioscirpus comosus* L.	Babya	Cyperaceae	Grass	Used for kidney pain.	Whole plant	×	✓	✓	(Present study).
68.	*Terminalia chebula* L.	White mangrove	Combretaceae	Tree	Use for the treatment of asthma, sore throat, vomiting, cough, diarrhea, dysentery, bleeding piles, ulcers, gout, heart and bladder diseases.	Fruit and leaves	×	✓	✓	(Bag, et al. 2016).
69.	*Dushsnea indicia* L.	Surkh Akhra	Rosaceae	Herb	Used for stomach disorders.	Fruit and leaves	×	✓	✓	(Present study).
70.	*Rumex crispus* L.	Curly dock	Polygonaceae	Herb	Used for skin irritiaion and wound healing	leaves	✓	✓	✓	(Ajaib, et al. 2014).
71.	*Mentha Piperita* L.	Mint	Lamiaceae	Herb	Stimulant, carminative, anti-dyspeptic, mouth freshener and also used for making sauce, salads and spics.	Leaves, stem and flowers.	×	✓	✓	(Ajaib, et al. 2014).
72.	*Oxalis corniculata* L.	Khati	Oxalidaceae	Herb	Used as vegetable, anti-pyretic and anti- dysentery.	Leaves	✓	✓	✓	(Ajaib, et el. 2014).
73.	*Tulip clusiana stellate* L.	Lady tulip	Liliaceae	Herb	Used for cough and cold.	Flowers and bulb	×	✓	✓	(Present study)
74.	*Plantago ovata* L.	Isabgol	Plantaginaceae	Herb	Sore and wound healing property.	Leaves and stem.	×	✓	✓	(Ajaib, et al. 2014).
75.	*Ranunculus muricatus* L.	Herfli	Polygonaceae	Herb	Diuretic and astringent.	Leaves	✓	✓	✓	(Ajaib, et al. 2014).
76.	*Plantago major* L.	Isbagol	Plantaginaceae	Herb	Anti-diarrheic and anti-dysentery.	Leaves and stem	×	✓	✓	(Ajaib, et al. 2014).
77.	*Ranunculus muricatus* L.	Kor kandolli	Ranunculaceae	Herb	Heal snake and scorpion bite but is also toxic plant can be fatal to cattle.	leaves	×	×	✓	(Ajaib, et al. 2014).

78.	*Physalis divaricate* L.	Wild tomato	Solanaceae	Herb	Used for the treatment of diabetes, asthma, and liver disorders,	Whole plant	×	✓	✓	(Singh, et al.2022).
79.	*Celosia argentea* L.	Lolar sita	Amaranthaceae	Herb	Used for treatment of Diarrhea, anti-inflammatory and also used for treatment of ulcer and skin diseases.	Whole plant	×	✓	✓	(Sharma, et al.2010).
80.	*Cynodon dactylon* (L.)	Bermuda grass	Poaceae	Grass	Diuretic, anti- toxin, heal bone fracture.	Whole plant	×	✓	✓	(Ajiab, et al. 2014).
81.	*Dactyloctenium aegyptium* (L.)	Beach wiregrass	Poaceae	Grass	Having healing properties.	Whole plant	×	✓	✓	(Present study).
82.	*Vicia sativa* (L.)	Garden vetch	Fabaceae	Herb	Asthma and urinary diseases.	Leaves and seeds	✓	✓	✓	(Present study).
83.	*Abelmoschus esculentus* (L.)	Bindi \okra	Malvaceae	Herb	Anti- inflammatory.	Fruit and leaves	✓	✓	✓	(Ajiab, et al. 2014).
84.	*Viola odorata* L.	Banafsha	Violaceae	Herb	Used for cough, cold, flu, fever and malaria.	Flowers and roots	×	✓	✓	(Masood, et al 2014).
85.	*Galium aparine* L.	Lahndra	Rubiaceae	Herb	Used to cure kidney infection, anti-diuretic and antioxidant.	leaves	×	✓	✓	(Present study).
86.	*Geranium ocellatum* L.	Jandorunu	Geraniaceae	Herb	Anti- diuretic.	Leaves and flower	×	✓	✓	(Present study).
87.	*Solanum surratense* L.	Mokhri	Solanaceae	Herb	Anti- diuretic and also used for cough and stomach problem.	Flower, fruit and leaves	×	✓	✓	(Present study).
88.	*Thalictrum foliolosum* L.	Beni	Ranunculaceae	Herb	Anti- pyretic and blood purifier.	Flower and leaves	×	✓	✓	(Present study).
89.	*Sauromatum venosum* L.	Sanp ki makai	Araceae	Herb	Plant has antimicrobial and antifungal activity.	Whole plant	×	×	✓	(Abbasi, et al. 2011).
90.	*Silene conoidea* L.	Dabbri	Caryophyllaceae	Herb	Used for skin whitening.	Fruit, leaves and stem.	×	✓	✓	(Present study).
91.	*Geranium rotundifolium* L.	Jandorunu	Geraniaceae	Herb	Astringent and diuretic.	Whole plant	×	✓	✓	(Ajiab, et al. 2014).
92.	*Lamium amplexicaule* L.	Motcapra	Labiatae	Herb	Anti- inflammatory activities,	Whole plant	✓	✓	✓	(Present study).
93.	*Leucas cephalotes* L.	Chatra	Labiatae	Herb	Used for inflammation and cure jaundice.	Whole plant	×	✓	✓	(Bahadur, et al. 1969).
94.	*Cichorium intybus* L.	Kasni	Asteraceae	Herb	Blood purifier and anti – diarrhea.	Flower and seeds	×	✓	✓	(Present study).
95.	*Linum usitatissimum*	Alsi	Linaceae	Herb	Anti- diabetic, anti-	Flower and	×	✓	✓	(Present study).

	L.				asthmatic, anti-inflammatory and used for heart diseases.	seeds				
96.	*Dicliptera bupleuroides* L.	Kaali buti	Acanthaceae	Herb	Used in fever, stomach troubles and also used in bone fracture.	Leaves and flower	×	✓	✓	(Akbar and Ishtiaq, 2021).
97.	*Dichanthium annulatum* L.	Sheda grass	Poaceae	Grass	Used for hypertension, antidiabetic, and anti-inflammatory,	Whole plant	×	✓	✓	(Awad, et al. 2015).
98.	*Commenlina benghalensis* L.	Day flower	Commenlinaceae	Herb	Anti- inflammatory	Whole plant	✓	✓	✓	(Ajiab, et al. 2014).
99.	*Campanula pallida* L.	Beli flower	Campanulaceae	Herb	Used for liver disorders.	Flowers	×	✓	✓	(Ajiab, et al. 2014).
100	*Boerhavia procumbens* L.	Snati / hog weed	Nyctaginaceae	Herb	Used for the treatment of asthma, cough, cardiac, eyes and kidney problems	Whole plant	×	✓	✓	(Bokhari, et al .2015).
101	*Allium sativum* L.	Lahsan	Alliaceae	Herb	Anti- asthmatic and used for cardiac diseases.	Whole plant	✓	✓	✓	(Present study)
102	*Allium jaquemontii* L.	Jangli piaz	Alliaceae	Herb	Anti- inflammatory.	Whole plant	✓	✓	✓	(Ajiab, et al. 2014).
103	*Achyranthes aspera L.*	Puth Kanda	Amaranthaceae	Herb	Diuretic.	Seeds and shoots	×	✓	✓	(Present study).

DISCUSSION

There is a natural relationship between people and plants as they provide food, fodder, forage and fuel wood. It is a proven fact that the medicinal herbs are important source for the extraction of drugs used in the treatment of number of diseases. Applications of plants in traditional medicines is a common practice worldwide (Turpin et al. 2022). Many plant species have been reported with applications as complementary drugs by Qureshi et al. (2007); Hanif et al. (2013). In this study we investigated the collection of medicinal plants by the local farmers and children while grazing their animals on mountains and in fields. Drying, processing and preservation of plant parts in direct sun and exposed rocks is carried by women mostly. Similar studies were carried by Khan et al. (2011). In the present study it is reported that the people of Kotli use different plants like *Cannabis sativa*, *Malvastrum coromandelianum*, *Euphorbia helioscopia*, *Scandix pecten-veneris*, and *Justicia adhatoda* for the treatment of many diseases like asthma, diabetes, skin disorders, cough, stomach ulcers, pile, kidney stones, heart problems, fever and many other ailments. *Justicia adhatoda* was reported to be effective against lungs infection due to possible anti-inflammatory and anti-bacterial properties Karthikeyan et al., (2009) reported the use of *Justicia adhatoda* against lungs disorder. Crude extract of *Dodonaea viscosa* is reported having anti-microbial activities by Getie et al. (2003). Leaf extract of *Parthenium hysterophorus* is widely used among the tribes of central Punjab and Kashmir. Previously this plant is reported effective against multiple skin and urinary tract infections by Bagchi et al., (2016). *Verbascum thapsus* is also reported against various inflammatory diseases, common cough and cold. Nadeem et al (2021) reported that the leaf extract and stem of *Verbascum thapsus* is used in the treatment of several disorders. In the rural area of Kotli petals of *Rosa indica* are used as a tonic in cardiovascular and stomach problems. Leaves and petals of the plant are used after grinding and mixed with honey. Rose water is commonly used against skin and eyes infections due to different vitamins, A, B, C, D, and E. Rasheed et al., (2015) reported the use of *Rosa indica* in heart and gastro-intestinal infections. In our study we found application of extracts of medicinal plants against common human disease. Similar study was also carried by Ajaib et al. 2011 about the use of medicinal plants against common human ailments.

CONCLUSION

An Ethnobotancial study on the medicinal plants of Sarsawa, district Kotli Azad Kashmir was carried out by using semi-structured questionnaire. During survey 103 medicinal plants belonging to 53 families were reported. Family Malvaceae, Poaceae and Rosaceae were the dominant families with 6 species respectively, followed by Amaranthaceae, Asteraceae and Solanaceae with 5 species. Mostly leaves of plants were used as herbal medicine with average 53% and flowers with 23%. Fruits of many plants are used as herbal medicine with average 19%. Some plants like *Scandix pecten-veneris*, *Euphorbia helioscopia*, and many other are reported to use against common ailments. Bulb, seeds, and buds of many plants are used as medicine with average 21%. In the study area almost 68 Herb were Collected and identified. Herbs were dominant in study area with average 66%, shrubs with almost 16%, Trees with 13% and Grasses like *Saccharum spontaneum*, *Erioscirpus comosus*, *Dactyloctenium aegyptium and Dichanthium annulatum* with average 3%. The whole study area is rich with medicinal plants. Therefore, it is required to conserve the medicinal flora of the area for future studies, biochemical characterization and extraction of drugs.

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