

ETHNOMEDICINAL PLANTS STUDY OF TEHSIL LOI MAMUND, BAJAUR AGENCY, PAKISTAN

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Abstract: Ethnomedicinal study of medicinal plants was conducted to document the indigenous plant based medical knowledge of people in Tehsil Loi Mamund, Bajaur Agency, Pakistan. A total 160 informants were selected to collect the information on medicinal plant use from the study area. Data were collected using semi-structured questionnaires and interviews, field observations and group discussions. Informant consensus factor (ICF) and fidelity level were calculated to assess the agreement of informants on the medicinal value of plants. The introduced plants were collected post interviews and later on pressed on herbarium serial number for reference. Afterwards, the data were analyzed through relative frequency of citation (RFC) Use value (UV) in total, 75 medicinal plant species were use by the local community for treatment of various diseases in the study area. Among the total medicinal plants species, In the study area the ethno-medicinal value of *Opuntia littoralis* (Engelm.) Cockerell and *Viola indica* W.Becker was reported for the first time which has moderate confidential level in terms of their medicinal uses in the study area. Important ethno-medicinal plants of the area with high UV are *Berberis lyceum* Royle (0.94), *Viola indica* (0.90), *Isodon rugosus* (Wall. ex Benth.) Codd (0.88), *Foeniculum vulgare* Mill.(0.87), *Peganum harmala* L (0.86), *Solanum virginianum* L. (0.85), and *Cassia fistula* L. (0.79). Medicinal plants with higher RFC values are *Calotropis procera* (Aiton) Dryand. (0.86), *Cannabis sativa* L. (0.82), *Mentha piperita* L. (0.82), *Mentha longifolia* (L.) Huds.(0.76), *Allium sativum* L. (0.73), *Coriandrum sativum* L. (0.73), and *Foeniculum. vulgare* (0.72). Disease categories such as ear problems, eye disease, tooth ache, head ache; problems of sensory system, evil eye, evil spirit; anemia and malaria had higher problems of respiratory system ICF values, suggesting high incidence of these diseases in the study area and agreement of people on their remedies. Agricultural expansion, firewood collection, and use of plants for construction were reported as major threats to plants of the study area. In order to protect biodiversity erosion and loss of indigenous knowledge, local communities must be taught and involved in conservation and management of plant resources and their indigenous knowledge.

Index-term: Ethnobotany, Informant Consensus Factor, Medicinal plants.

I. INTRODUCTION

The term Ethnobotany first time were used by American botanist John Hershberger in 1896 the term ethnobotany means to all studies which are related to the reciprocal relationship among the plants and people traditional. Generally Ethnobotany refers to the uses of medicinal plants for various purposes of humane need such as food, fiber, medicine, fuel, fodder, and tools in beekeeping (Hamilton, 2002). Most of the local community use herbal medicine for the aliment of different diseases. Due to their ethno medicinal importance. About 30% of the local herbal productions are available in the international market are prepared from medicinal plants (Barbour et al., 2004). The ethno Medicinal plants are very important source of medicine of treating different kinds of human diseases. According to the current research work it is estimated that about 80% people of the developing world still rely on traditional medicines (WHO, 2003). Hence there is a

need for systematic documentation of such useful knowledge through ethno botanical research. The traditional medicine have been defined by World health organization as the sum total of all knowledge and practices whether explicable or not used in the diagnosis prevention and elimination of physical and mental or social imbalances and relying exclusively on practical experience an observation transfer from generation to generation while verbally or in writing. So that type of health care system is also known as folk medicine ethno medicine or indigenous medicine (WHO,2008). About 75-90 % of the rural population in the developing world relies on traditional medicines for their health care. most of the poor people cannot afford to buy the expensive modern drugs, but traditional system is also more culturally acceptable and meet the physiological needs in a way rather than modern medicine, Their value and role of this health care system w ill not diminish in the future, because they are both culturally viable and expected to remain affordable, while the modern health care service is both limited and expensive (WHO, 1998). According to (Konno, 2004) easily accessibility efficacy on treatment and affordable cost in getting health services are also main reasons in preferring traditional medicine to modern medication. Traditional medicine has also draw backs as various authors stated. The drawback of traditional medicine as lack of precision and standardization health care system. Lace of precise dosage which could lead to the toxicity are also the another drawback of traditional medicine (Dawit, 1986). the measurements used to determine the dosage are not standardized and depend on the age and physical appearance of the patient, socio cultural explanation of the illness, diagnosis and experience of individual's herbalist (Jarssoy, 2016).

Research Area

Bajaur Agency is a small valley of Federally Administered Tribal Areas (FATA) and holds strategic importance for Pakistan. It has an area of about 1,291km² and shares boundaries with Dir Lower on the northwest, Malakand Agency on the southeast, Afghanistan on the northwest and Mohmand Agency on the southwest. The mountains of the agency are barred and dry due to harsh climatic condition and deforestation. About 35% of the area is hilly and remaining 65% is open land. Bajaur receives about average 850mm rainfall per year with mean winter temperature ranges from 5 to 10°C and mean summer temperature varies from 23 to 36°C. The total cultivated area of the valley is 75,350 hectares and uncultivated is 53,685 hectares. Bajaur Agency is divided into two sub-divisions i.e. Khar and Nawagai and eight Tehsil viz. Khar, Salarzai, UtmanKheil, Nawagai, Loi Mamund, Wara Mamund, Barang and Chamarkand. Tehsil Loi Mamund adjoins Tehsil Wara Mamund on the south east, Tehsil Nawagai on the south west and Afghanistan on north west (DCR, 1998). The study area has diverse vegetation due to the Himalaya hill range and topography of the soil. The medicinal plant species are found in the area used by local community for various purposes like food, shelter, hedging, fodder and medicine. The natural forest consists of Quercus and Pinus vegetation which support different medicinal plants and fungi including (Morchella) species.

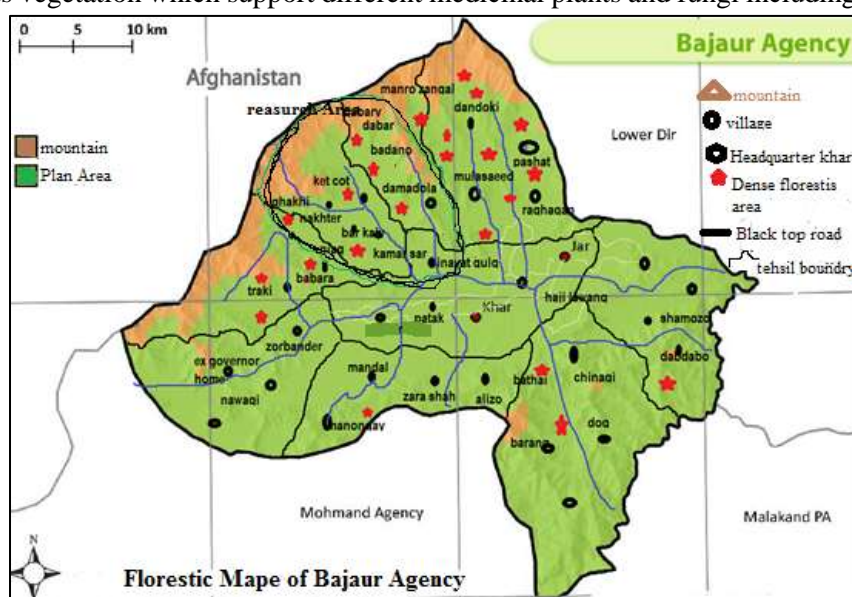


Figure-1: Floristic Map of Bajaur Agency**II. METHODOLOGY**

Frequent field visits were arranged to the study area for Ethnomedicinal data collection between April, 2022 and August, 2022 on two field trips made to the study area. Data collection method and Information regarding local uses of medicinal plants species were gathered through semi-structured questionnaires, interviews and personal observation. Local hakims were also being consulted about the medicinal plants and their uses (Martin, 1995). group discussions and guided field walks with key informants (traditional healers) for field observations.

Key informants were first interviewed individually to mention about the local names of the plants they use to treat diseases, diseases treated, part(s) of plants used, methods of gathering, methods of preparation of remedies, route of administration of remedies, application of the remedies, dosage, side effects of the treatment, use of the plants other than medicine, types of threat and conservation problems. Thereafter, group discussions were made with them based on the checklist of questions and asked for Field walk for onsite observation of the plants. Similar procedure was also applied with randomly selected non-practitioners of traditional medicine. Voucher specimens were collected, pressed, and dried for identification. For some species, preliminary identification was done in the field using keys and illustrations. In addition, further identification of all specimens was done by comparison with authentic specimens, illustrations and taxonomic keys and through available literature and various volumes of Flora of Pakistan (Nasir and Ali, 1970-1989; Ali & Nasir, 1989-1991 and Ali and Qaiser, 1993-2015).

2.1 Data Analysis**2.1.1 Use value (UV)**

This index were used and applied to demonstrate the relative importance of each medicinal plant species used by the local people of the research area. The use value (UV) was calculated as follow: $\sum U V = U_i/N$ where U_i is the number of uses describes by each respondent for a given species and N shows the total number of respondents taking part in the survey (Phillips and Gentry, 1993).

Table 1: Showing the number and data details of the respondents

s/no	Category	Age	Total	Respondent %age
1	Male	30-75	120	75 %
2	Female	35-60	40	25%

Table 2: Showing the occupation of the local respondents

S/no	Occupation	Age	Total	Plants use value% age
1	Farmer	30-75	35	21.88%
2	Shopkeeper	20-35	10	6.25%
3	Labours	22-40	10	6.25%
4	Traditional	40-70	9	5.63%
5	House Wives	40	25	15.63%

2.1.2 Relative Frequency of citation (RFC)

The recorded data of ethno-medicinal plants which are collected during field survey were analyzed quantitatively by the using of index of relative frequency citation (RFC) which as follow

RFC = FC/N (0 < RFC < 1)

In this formula FC is the number of informants mentioning a particular species of medicinal plant while N represents the total number of informants participating in the field survey so there for this index the local importance of each plant species (Vitalini *et al.*, 2013).

III. RESULTS

The total 75 medicinal plant species belonging to 48 families were collected and documented from the study area, which are being used for medicinal purposes by the local community for the treatment of various ailments including gastrointestinal urinary tract problems, infections, reproductive ailments, skeletal system problems and diabetes. All the species were reported from both plain and mountainous areas of the villages. These plants were generally utilized by the local herbalists for treating patients from the local and nearby communities. It was observed that local people from mountainous areas were more dependent and confident on traditional medicines as compared to the plain areas' people. This is mainly due to the introduction of allopathic medicines into the health care system of plain areas' villagers and their easy access to modern health facilities. This trend is greatly affecting the local's perception on using traditional medicinal therapies. In the current investigation, it was found that some of the plants have been reported for one type of disease, while others for different kinds of diseases (Table 3). Occasionally, locally used medicinal herbs are bought from other sources such as national markets of the country. This is not a common practice however this trend draws attention to the fact that medicinal plants still maintained their confidence level, and further stressing the need of cultivation and conservation of such flora. It was interestingly noted down some gender deference's in folk knowledge on certain medicinal plant species. For instance, female members interviewed during the current study were using the root decoction of *Bergenia ciliata* (Haw.) Sternb. For the treatment of fevers, diarrhea, pulmonary infections and used as a tonic. Similarly, the female respondents reported the use of *Solanum esculentum* L. fruits in blood purification, constipation, skin diseases especially the removal of lesions from the face. On the other side, male informants were totally unfamiliar on such uses of these plants. In the study region, most of the plants were being used by the indigenous communities against gastrointestinal diseases.

Table 3: Medicinal plants used by the local people of Tehsil Loi Mamund Bajaur Agency.

S/ no	Botanical name	Local name	Family	Parts used	Medicinal value
1	<i>Acacia modesta</i> Wall.	Palosa	Mimosacea	Leaves and latex	The leaves are used as blood purifier, abdominal pain and redness. Gums of the plant are used as sexual tonic
2	<i>Acacia nilotica</i> L.	Kikar	Leguminosa	Whole plant	The powder is used to treat cough. The infusion of the plants used in pneumonia. Paste is applied topically to treat skin allergy.
3	<i>Acorus calamus</i> L.	Skhawaj	Acoraceae	Roots and leaves	Decoction of the plant is used for the treatment of general body pain
4	<i>Allium sativum</i> L.	Ooga	Amaryllidacea	Bulb leaves	Garlic is medicinally used to maintain blood pressure and diabetes
5	<i>Ajuga bracteosa</i> Wall Buch.-Ham.exD.Don.	Gute	Lamiaceae	Leaves and root	The decoction of leaves and roots is used for cooling and soothing effects. The plant is also used as stimulant, astringent and diuretic. The decoction of its root is used to treat abdominal pain, blood purification and kidney pain
6	<i>Equisetum arvense</i> L.	Bandakay	Equisetaceae	Whole plant	Plant powder Is used to remove kidney stones
7	<i>Berberis lycum</i> Royle.	Kowary (zear largay)	Berberidacea	Leaves, fruit and roots	The decoction of the plant is used in cooling effect. Root powder is used in jaundice, internal wounds, mouth disease and as anti spasmodic.
8	<i>Brassicaca dmea</i> Heldr.	Zangali sharsham	Brassicaceae	Leaves and seed	The extracted oil is used for body massage and hair massage.

9	<i>Cuscuta reflexa</i> Roxb.	Zar boty(msc hi)	Cuscutaceae	Whole plant	The whole plant is used as anti-diabetes
10	<i>Coriandrum sativum</i> L.	Danya	Apiaceae	Leaves and fruits	The leaves and fruit are used in digestive problems. The plant is also utilized as cooling agent, diuretic and stimulant
11	<i>Conyza canadensis</i> L.	Shkandar botay	Asteraceae	Whole plant	The plant is used as anti diabetes
12	<i>Chenopodium album</i> L.	Sarmay	Chenopodiaceae	Leaves and seeds	The powder of leaves is used as purgative, emollient, a limonitic, tranquilizer, and as tonic. Powder of the seed is used for the treatment of liver problems, digestive problems, as carminative, and aphrodisiac. The plant is also useful in treating peptic ulcer, dyspepsia, hemorrhoids, cardiac disorder and ophthalmopathy. Seed and leaves powder are also laxative and used initiated condition so spleen
13	<i>Celtis australis</i> L.	Tagha	Cannabaceae	Bark	Bark powder is used in wound's healing caused due to burning fire.
14	<i>Canna indica</i> L.	Taspaboty	Cannaceae	Fruits and leaves	Fruit and leaves decoction is used for the removal of kidney stones, treatment of rheumatism
15	<i>Cedrus deodara</i> (Roxb.exD.Don)G .Don.	Deayar	Pinaceae	Stem	Oil obtained for its stem is used for cooling effect
16	<i>Cassia fistula</i> L.	Amaltas	Euphorbiaceae	Fruit	Fruit of the plant is used for children to treat intestinal pains. It is also used in body pain, constipation and fever.
17	<i>Calotropis Procera</i> (Aiton) Dryand.	Spalmai	Apocynaceae	Latex and flower	Latex is used for tooth pain and abdominal pain. It is topically applied for wasp, snake and scorpion bites. The plant is also used in chest problems. Flowers of the plant are stake in with water and used in kidney stones
18	<i>Cannabis sativa</i> L.	Bang	Cannabinaceae	Whole plants and fruits	Leaves are used as narcotics, sedative, analgesic, anti spasmotic, diuretic and as tringent. Decoction of the whole plant is used as cooling agent.
19	<i>Calendula arvensis</i> (Vaill.) L.	Shodapi	Asteraceae	Leaves	The leaves are used as stomachic, abdominal pain and as carminative
20	<i>Calendula officinalis</i> L.	Dambarguly	Asteraceae	Flowers	Fresh flowers are used in fever, stomach pain, and against the wasp bite
21	<i>Dodonaea viscosa</i> L.	Ghawras ky	Sapindaceae	Leaves	Powder of the plant is used against Hepatitis, swelling
22	<i>Datura metel</i> L.	Batora	Solanaceae	Leaves	The leaves are used in treating diarrhea and dysentery. Leaves are also poisonous
23	<i>Duchesnea indica</i> (Jacks.) Focke.	Dazmaky	Rosaceae	Roots	The fruit of the plant is laxative
24	<i>Dysphania botrys</i> (L.) Mosyakin & Clemants.	Karwara	Amaranthaceae	Whole plant	The powder of the plant is used to enhance digestive power. Decoction is used for the expulsion of worm sand is laxative
25	<i>Datisca cannabina</i> L.	Jal bang	Datisceae	Leaves	Root decoction is used for tooth pain, joint pain, and general body pain
26	<i>Daphne Mucronata</i> Royle.	Laighona	Thymelaeaceae	Fruits	The fruit is used to stop the running stool and clean the abdomen
27	<i>Euphorbia helioscopia</i> L.	Mandara	Euphorbiaceae	Whole plant	Whole plant is purgative. The herbs also used for chest infection, cough, dysentery, stomach pain, and used for the killing of intestinal worms
28	<i>Euphorbia wallichii</i> Hook.f	Arbay	Euphorbiaceae	Shoot and Inflorescence	Used against intestinal worm

29	<i>Eucalyptus camandulances</i> Dehnh.	Lache	Myrtaceae	Leaves	Leaves of the plant is used to remove bad smell from mouth, and also effective in asthma.
30	<i>Euphorbia helioscopia</i> L.	Mandaru	Euphorbiaceae	Whole plant	Whole plant is purgative. The herb is also used for chest infection, cough, dysentery, stomach pain, and used for the killing of intestinal worms.
31	<i>Ficus carica</i> L.	Enzar	Moraceae	Fruits and leave	Leaves and stem are crushed, and used against warts. The fruits of the plants are used for stomach pain and tooth ache. Three figs are taken orally and considered as nutritive. The fruit is also used as demulcent, emollient and as laxative, and in the purification of blood
33	<i>Foeniculum vulgare</i> Mill.	Kagaelan y	Apiaceae	Leaves fruits and stem	And as laxative, and in the purification of blood. Leaves and stem are used as antipyretic and headache.
34	<i>Grewia optiva</i> J. R.Drumm.ex Burret.	Pastawon y	Malvaceae	Whole plant	Plant powder is used for the intestinal problems and skin allergy
35	<i>Isodon rugosus</i> (Wall.exBenth).	Spairkiy	Lamiaceae	Seed and leaves	Seed powder and paste prepared from leaves is applied on external wounds for blood clotting. It is also used to remove the infections caused by fungus in mouth
36	<i>Indigofera heterantha</i> Brandis.	Ghorej	Fabaceae	Root	Root powder is used for the breakdown of kidney stone. The decoction of root s is used for belly and stomach pain
37	<i>Juglan regia</i> L.	Ghuz	Juglandaceae	Root, bark and fruit are used	Bark is used as“Dandassa”for cleaning of teeth.Fruitis used as brain tonic. Leaves are a stringent and used as tonic,
38	<i>Lotus corniculatus</i> L.	Fatehkha ni	Fabaceae	Whole plant	Plant powder is used for the removal kidney stones. Its decoction is used as diuretic and used for the treatment of urinary tract infection
39	<i>Mentha longifolia</i> L.	Velany	lamiaceae	Leaves	The leaves used in constipation, stomach disorders and diarrhea etc .
40	<i>Mallotus philippensis</i> L.	<u>Kambela</u>	<u>Euphorbiaceae</u>	Plant powder	The plant powder is used in wound healing
41	<i>Marubium vulgare</i> L.	Qurashki	<u>Labiatae</u>	Whole plant	The whole plant is used as tonic, expectorant,diuretic.The herbisal so beneficent for pulmonary infections.
42	<i>Melia azedarach</i> L.	Tura Bakyan	Meliaceae	Leaves, bark and fruit	Dried leaves are used in diabetes. The decoction of roots is effective in chest diseases and lice killing.
43	<i>Mentha piperita</i> L.	Podina	Lamiaceae	Leaves	The plant is used as carminative and for gastric problems. Leaves are also used as stimulant, in vomiting, liver problems and gallbladder infections
44	<i>Morchella esculenta</i> (Buch.Ham).	Gusai	Ascomycota	Whole plant	Powder is used as purgative and treats digestive problems. Also used for lung problems Also use as a food
45	<i>Morus nigra</i> L.	Toorth	moreaceae	Fruits	Fruit is used for cooling effect. Phlegm is minimized by using the fruit. It is also used in sore throat and to overcome iron deficiency.
46	<i>Myrsine africana</i> L.	Manogay a	Primulaceae	Leaves and seeds	The powder of its leaves is used for laxative, gas problem, tooth ache, and bone pain
47	<i>Myrtus communis</i> L.	Mano	Myrtaceae	Leaves and fruits	Powdered leaves and fruit are used for the treatment of cholera, dysentery, diarrhea and stomach pain
48	<i>Nasturtium officinale</i> W.T.Aiton.	Tarmera	Cruciferae	Whole plant	The plant is a good appetizer and used as vermifuge,stimulant, antispasmodic,expectorant,and in gastric problems. The infusion is used as diuretic

49	<i>Nerium oleander</i> L.	Gandera y	Apocynaceae	Leaves flowers	The leaves are considered as poisonous. Infertility is treated by leaves
50	<i>Nigella sativa</i> L.	Klonje	Ranunculaceae	Seed	Seeds are specially used as sexual tonic. It is also used for lactation an decrease mental disturbances.
51	<i>Ocimum basilicum</i> L.	Kashmal o	Labiatae	Leaves & seed	The paste prepared formats leaves are used for swelling and redness. Seed powder is used in throat problem
52	<i>Olea ferruginea</i> Wall.exAitch.	Khona	Oleaceae	Leaves, bark	Bark and leaves of the plant are a stringent,bitter,diuretic,and Leaves are used as tonic, while its decoction in tooth aches. Its oil is beneficial in constipation, rheumatism and dandruff
53	<i>Opuntia littoralis</i> (Engelm).	Zuqam	Cactaceae	Whole plant	Whole plant is used against hepatitis, muscle pain and inflammation
54	<i>Origanum majorana</i> L.	Daghar	Lamiaceae	Whole plant	Whole plant is used against the patitis,muscle pain and inflammation.
55	<i>Paeonia emodi</i> Royle.	Mamekh	paeoniaceae	Rhizome	Rhizome powder is used as sexual tonic, general body tonic and treating abdominal pain
56	<i>Peganum harmala</i> L.	Sponda	Zygophyllaceae	Fruits and seed	Fruit of the plant is used for heart pain. Seed power mixed with honey is used against fever, colic pain and as vormifuge
58	<i>Pinus gerardiana</i> Wall exD.Don.	Nakhter	Pinaceae	Fruits	Fruit is used against diabetes and considered a powerful tonic for brain. People use the fruit as a hot nutritive food during the winter season
59	<i>Pistacia integerrima</i> Stewartex Brandis.	Shanay	Anacardiaceae	Fruits	The fruit is used to treat cough and as analgesic.
60	<i>Platanus orientalis</i> L.	Chinar	Platanaceae	Bark	The powder of bark is used in the treatment of internal and external infections.
61	<i>Punica granatum</i> L.	Anar	Lythraceae	Fruits and bark	Bark powder is used for children who wet(pee) their beds during nighttime
62	<i>Quercus baloot</i> Griff.	Serry	Fagaceae	Seed	Fruit is used for the treatment of hemorrhages. Chronic diarrhea and dysentery is also treated by using its fruits powder.
63	<i>Ricinus communis</i> L.	Randa	Euphorbiaceae	Fruit and leaves	Dysentery is also treated by using its fruits powder Fruit powder and leaves are used for intestinal pain, and given to the diabetic patient
64	<i>Rumex crispus</i> L.	Chalkhay	Polygonaceae	Leaves fruit	Leaves are used for blood purification,andaslaxative.Anemia,dysenteryndstomachpainare alsotreatedbyusingtheleavespowder.Itisalso used is a tonic.Fruit is used for the infection.Low blood pressure increased by using the plant
65	<i>Rumex hastatus</i> D.Don.	Taroky	Polygonaceae	Whole plant	To control blood press are, the plant juice is used for controlling the blood pressure. The root powder Is beneficial to treat abdominal pain. Leaves are also used as condiments
66	<i>Solanum nigrum</i> L.	Kachmac ho	Solanaceae	Arial part like leaves	The aerial parts are used for weight loss, as purgative and sedative
67	<i>Sodon rugosus</i> (Wall.exBenth.) Codd.	Sparky	Lamiaceae	Seed and leaves	Seed powder and paste prepared from leaves is applied on external wounds for blood clotting. It is also used to remove the infections caused by fungus in mouth
68	<i>Solanum esculentum</i> L.	Tamator	Solanaceae	Fruits	Fruits are used in blood purification and constipation, hepatitis, anorexia and skin diseases
69	<i>Solanum virginianum</i> L.	Markody	Solanaceae	Fruit, leaves, Roots	The roots powder and leaves are used for tooth ache and tooth worms. The decoction of fruits is used against fever.
70	<i>Trachy spermvmammi</i> L.	Ajwani	Apiaceae	Seed	Abdominal pain is treated by taking the seeds powder

71	<i>Viola indica</i> W.Becker.	Benosha	Violaceae	Leaves fruit and root	The juice of leaves is used for treating internal body wounds .The leaves powder is used for cough,asthma,fever,and chest problem. The plant is anti pyretic,diaphoretic,and is used a srefrigerant.Flowers are used as demulcent,diuretic,emollient,and as laxative
72	<i>Withiana somnifera</i> L.	Kotilal	Solanaceae	Root	The roots powder is used in anxiety and hyper tension. It increases the sexual power and used as antipyretic
73	<i>Xanthium strumarium</i> L.	Jeshkay	Asteraceae	Leaves fruits seed	The leaves and flowers powder is used to treat chest problems. Seeds are used in stomach problem, and swelling of abdomen.
74	<i>Zanthoxylum armatum</i> DC.	Dambara	Rutaceae	Seeds	Seed powder is used for the treatment of gastrointestinal, respiratory and cardio vascular disorders
75	<i>Ziziphus jujuba</i> Mill.	Beera	Rhamnaceae	Fruit leaves	Fruit of the plants used in blood purification as anti-allergy, and for chronic constipation. Fruits also given to the diabetic patients.
76	<i>Ziziphus nummularia</i> (Burm.f Arn).	Elanai	Rhamnaceae	Root and fruit	Root powder and decoction are used in hepatitis. The plant is also effective in diabetes.

The results showed that the most commonly treated syndromes with plant-based remedies were gastrointestinal disorders (30%), followed by dermatological and topical diseases (28%) and fever, headache, typhoid, and analgesic (11%). Plants were also used for treating urinary complaints and kidney stones (9%), genital and sexual diseases (17%), and other conditions such as wounds, cuts, narcotic, tonic, tumor, and anodyne (16%). The least treated syndromes were nerve disorders (3%), cardiovascular complaints, and circulatory diseases (5%), and respiratory illness (8%).

Table 4: Diseases categories with the number of medicinal plants used.

S/No	Syndrome category	Summation from Table No 1	% Usage
1	Gastrointestinal disorders	Abdominal pain, carminative, Constipation, diarrhea, dysentery, dyspepsia, laxative, piles, purgative, stomachache, ulcer, cholera	30%
2	Dermatological and topical diseases	Biting of scorpion & flies, burn, ear pain, eyes problem, eye sight, emollient, insect repellent, pimple, swelling, scabies, skin itching disease	28%
3	Respiratory illness	Asthma, cough, cold, influenza, pneumonia	8%
4	Skeleto-muscular problems Cardio-vascular complaints and circulatory diseases	Backache, hair loss & dandruff, rheumatism	5%
5	Fever, headache, typhoid analgesic	Fever, headache, pain killer, typhoid	11%
6	Urinary complaints, Kidney Stone	Urinary Diseases, Kidney Stone, Diuretic	9%
7	Dental problems	Gum problems, toothache and teeth cleaning	4%
8	Nerve disorders	Stress relieves	3%
9	Genital and sexual diseases	Aphrodisiacs, male infertility, woman sterility & irregular menstrual cycle	17%

10	Others (wounds, cuts, narcotic, tonic, tumor, Anodyne)	Wound healing, tumor, tonic, narcotic	16%
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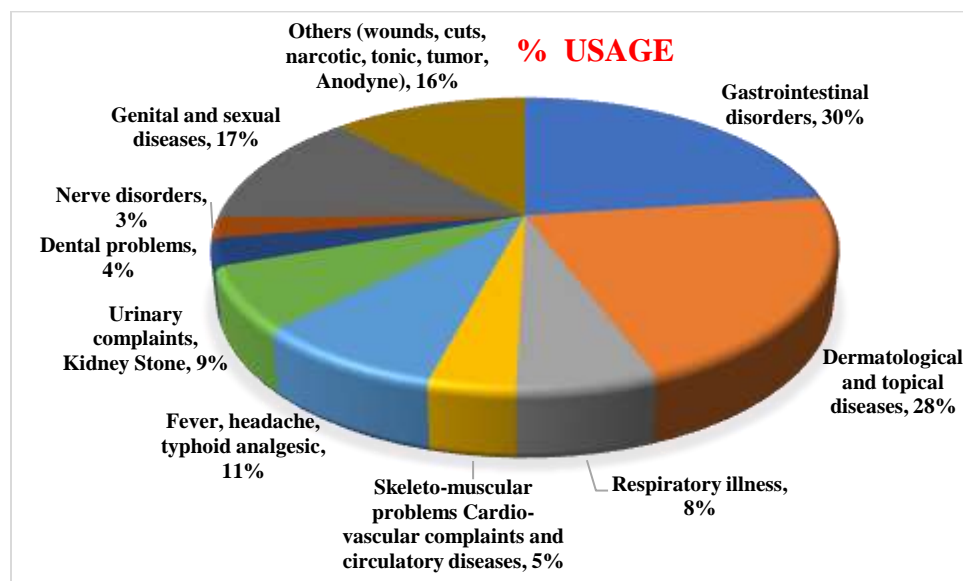


Fig. 2 Diseases categories with the percentage number of medicinal plants used.

The present study aimed to document the ethnobotanical knowledge of the medicinal plants in different habitats in the study area. A total of 75 medicinal plant species were recorded, belonging to 41 families and 69 genera. The highest number of medicinal plants was found in the wild habitat (35 species, 46.66%), followed by road sides (12 species, 16%), agriculture fields (13 species, 17.33%), home gardens (9 species, 12%), and live fences (6 species, 8%).

Table.5. Distribution of medicinal plant in different habitats

S/no	Habitat type	No. of medicinal plants	Percentage
1	Wild	35	46.66%
2	Agriculture fields	13	17.33%
3	Home garden	9	12%
4	Live fence	6	21.33%
5	Road side	12	16%
6	Total	75	100

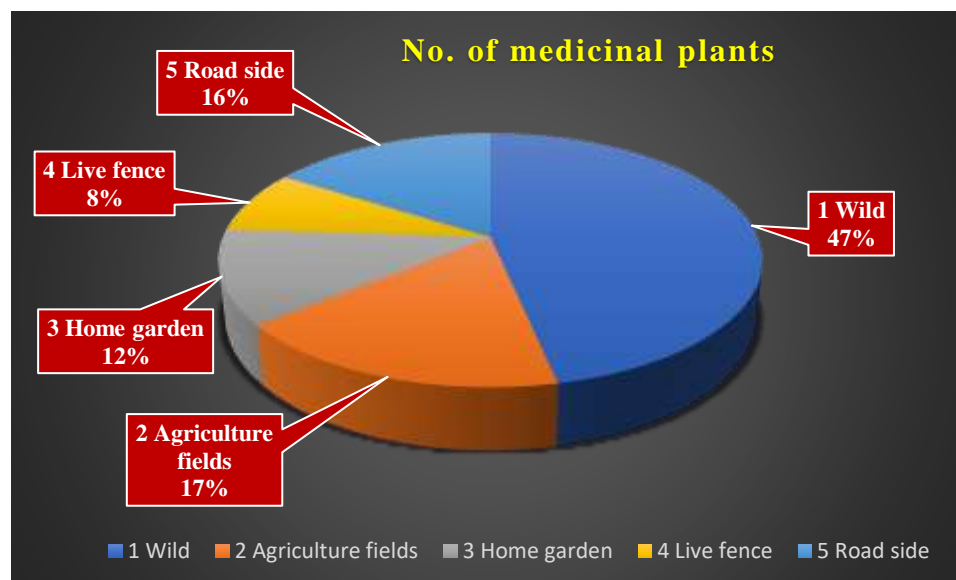


Fig. 3 Percentage Distribution of medicinal plant in different habitats.

IV. DISCUSSION

Ethnobotanical data is important for understanding the traditional uses of plants in different communities. This study aimed to investigate the traditional uses of plants for various syndromes in a particular community. Occasionally, locally used medicinal herbs are bought from other sources such as national markets of the country. This is not a common practice however this trend draws attention to the fact that medicinal plants still maintained their confidence level, and further stressing the need of cultivation and conservation of such flora. It was interestingly noted down some gender deference's in folk knowledge on certain medicinal plant species. For instance, female members interviewed during the current study were using the root decoction of *Bergenia ciliata* (Haw.) Sternb. For the treatment of fevers, diarrhea, pulmonary infections and used as a tonic. Similarly, the female respondents reported the use of *Solanum esculentum* L. fruits in blood purification, constipation, skin diseases especially the removal of lesions from the face. On the other side, male informants were totally unfamiliar on such uses of these plants. In the study region, most of the plants were being used by the indigenous communities against gastrointestinal diseases. Such findings are in line with studies from Chitral district Mastung of Pakistan (Bibi *et al.*, 2014), in which existence of gastric problems have been indicated as a common issue. Similarly, the prevalence of gastrointestinal problems has been mentioned as the common problems all over the country Khan *et al.* (2014). The existence of such health problems may have been a result of harmed issue in the research area, lack of proper sanitation arrangements, no access to clean water, and inhalation of smoke produced by the fuel wood. Another research reported that gastric problems could result in high mortality rate if not properly treated. The gastrointestinal disorders are predominant across the globe and a very large number of medicinal plants are being used by different cultures to treat such diseases (Leonti *et al.*, 2006). Gastric problems are the utmost use category (Ghasemi *et al.*, 2013) due to poor dietary condition and lack of access to clean water, which are the basic reasons for such diseases worldwide (Enole *et al.*, 2021).

The high percentage of gastrointestinal disorders treated with plants is consistent with other studies conducted in different regions. For instance, a study conducted in Nigeria found that plants were commonly used for treating gastrointestinal disorders, such as diarrhea and constipation (Olowokudejo *et al.*, 2008). The high prevalence of dermatological and topical diseases treated with plants is consistent with findings from a study conducted in Brazil (Albuquerque *et al.*, 2007). The low prevalence of respiratory illnesses treated with plants is surprising, given that respiratory infections are common in many communities. Further research is needed to understand why plants are not commonly used

for treating respiratory illnesses in this community. The low prevalence of cardiovascular complaints and circulatory diseases is also surprising, given that these conditions are common in many communities. It is possible that people in this community are not aware of the potential benefits of plants for treating cardiovascular complaints and circulatory diseases. The high percentage of plants used for treating genital and sexual diseases is consistent with findings from other studies. For example, a study conducted in South Africa found that plants were commonly used for treating sexually transmitted infections (Mabogo, 1990).

Ethnobotanical studies have been gaining importance in recent years, as they help to explore the traditional knowledge and practices related to the use of plants for medicinal purposes. In this context, the present study provides valuable information on the distribution and use of medicinal plants in different habitats. The study found that the highest number of medicinal plants was found in the wild (46.66%), followed by agriculture fields (17.33%), home gardens (12%), live fences (21.33%), and road sides (16%). These findings are consistent with previous studies that have reported a higher diversity of medicinal plants in natural habitats such as forests, grasslands, and wetlands (Enole et al., 2021; Paudel and Smith-Hall, 2022). The high percentage of medicinal plants found in the wild highlights the importance of conserving natural habitats for the sustainable use of medicinal plants. The destruction of natural habitats due to anthropogenic activities such as deforestation, urbanization, and agriculture can lead to the loss of valuable plant species with potential medicinal properties (Leonti et al., 2006). The study also found that agriculture fields, home gardens, live fences, and road sides are important habitats for medicinal plants. These habitats are often associated with human settlements and provide easy access to medicinal plants for local communities. However, the use of agrochemicals and other modern farming practices can have negative impacts on the diversity and abundance of medicinal plants in these habitats (Ghasemi et al., 2013; Gautum et al., 2021). In conclusion, the present study provides valuable information on the distribution and use of medicinal plants in different habitats. The findings highlight the importance of conserving natural habitats for the sustainable use of medicinal plants and the need to promote traditional practices for the cultivation and use of medicinal plants in human-dominated landscapes.

CONCLUSION

The current study found that 75 plant species were being used by the local community for the treatment of various diseases. *Berberis lyceum* Royle, *Viola indica*, *Isodon rugosus*, *Foeniculum vulgare* Mill., *Peganum harmala* L., *Solanum virginianum* L., and *Cassia fistula* L. were identified as important ethno-medicinal plants in the area with high use values. *Calotropis procera* (Aiton) Dryand., *Cannabis sativa* L., *Mentha piperita* L., *Mentha longifolia* (L.) Huds., *Allium sativum* L., *Coriandrum sativum* L., and *Foeniculum vulgare* had higher relative frequency of citation values, indicating their widespread use in the study area. The study also highlighted the high incidence of ear problems, eye disease, toothache, headache, problems of the sensory system, evil eye, evil spirit, anemia, and malaria in the study area. The findings suggest that local communities must be involved in the conservation and management of plant resources and their indigenous knowledge to protect biodiversity erosion and loss of indigenous knowledge.

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