

**ETHNOBOTANICAL USES OF MEDICINAL PLANTS IN TEHSIL UTMAN KHEL  
DISTRICT BAJAUR KHYBER PAKHTUNKHWA PAKISTAN**

**Hussain Shah<sup>1</sup>, Hamida Bibi<sup>2</sup>, Ali Hazrat<sup>1\*</sup> and Khan Sher<sup>3</sup>**

DOI: <https://doi.org/10.28941/pjwsr.v26i3.845>

**ABSTRACT**

*The ethnobotanical uses of medicinal plants were documented in tehsil Utman Khel district Bajaur Khyber Pakhtunkhwa Pakistan. 76 plant species belong to 47 families of herbs, shrubs, mushrooms, trees and vegetables were recorded for their medicinal use. These include 74 plants (96%) of angiosperms, 1 (1%) of gymnosperms, 2 (2%) of fungi and 1 (1%) of Pteridophytes. Asteraceae was a dominant family having 5 species follows by Brassicaceae and Moraceae each one is represented by 4 species. Among angiosperms 73 (63.01%) was herbs, 4 (5.47%) was shrubs and 20 (27.39%) was trees. The local community is currently using these plants species along with mushrooms for different diseases and also used as a timber wood, as fodder and as a fuel.*

**Keywords:** Ethnobotanical plants, Teshil Utman Khel, District Bajaur, Pakistan

**Citation:** Shah, H., H. Bibi, A. Hazrat, A. K. Sher. 2020. Ethnobotanical Uses of Medicinal Plants in Tehsil Utman Khel District Bajaur Khyber Pakhtunkhwa Pakistan. *Pak. J. Weed Sci. Res.*, 26(3): 287-298, 2020

---

<sup>1</sup>Department of Botany of University of Malakand, Chakdara, Dir Lower, Pakistan

<sup>2</sup>Department of Soil and Environmental Sciences, The University of Agriculture Peshawar Pakistan

<sup>3</sup>Department of Botany SBBU Sheringal Dir Upper, Pakistan  
Corresponding author email address: [aliuom@gmail.com](mailto:aliuom@gmail.com)

## INTRODUCTION

The concept of Ethnobotany is old as human civilization on earth (Amjad, 2015). Most of the peoples use these plants for different purposes like nutrition and medicine since the start of human civilizations (Amjad, *et al*, 2017). Pakistan is full of medicinal plants that are used by rural people for a variety of purposes (Aziz, *et al*, 2018, 2017, Hazrat *et al*, 2020). Natural remedies were found to be profoundly viable to treat an extensive variety of illnesses (Rokaya, *et al*, 2014), as well as digestive ailments (Heinrich, *et al*, 1992, Manandhar, 2002, Street and Prinsloo, 2013). For the previous around 34-years, verbally pass on information because of its economic importance has been expanding and allowed the collection of such an essential data in regards to therapeutic plants effectively explored in less-developed regions in Pakistan Hussain, *et al*, 1996, Haq, 1983, Khan and Zaidi 1991, Shinwari *et al*, 2000, Gilani, *et al*, 2000, Ahmad *et al*, 2009, Qureshi, *et al*, 2009, Abbasi, *et al*, 2013 and Ijaz, *et al*, 2016 ). In this modern era the Ethnobotanical studies have grown motivation at global level to make sure that plants are used for the treatment of different diseases, medicines and natural drugs are discovering day by day for the treatment of diseases (Mbaveng *et al*, 2014). In the local communities the traditional information almost, the practice of medicinal plants is transferred from generation to generation (Pieroni, *et al*, 2005), although the plants have traditionally helped as the most important weapon against pathogen and human beings (Khaled, *et al*, 2014). Medicinal plants are widely used almost in every community either directly or indirectly in current medicine system (Mahmood, *et al*, 2011).

The study area tehsil Utman Khel is situated in the southeast of district Bajaur KP Pakistan. The total area spreads on 194.35 square km, east to west it is surrounded by Matako (lower Dir) up to Jar and North to south by mountainous

areas of Pandoki upto Arang Gar shmozoo. The Utman Khel area is famous due to its beauty and natural scenes. The area has rich flora due to its suitable climatic condition. The total rural population of the tehsil Utman Khel is about 107,356 and the total house hold population is 9,600. It occupies mountainous land with a variety of highly valuable medicinal plants. The ethno medicinal information is basically limited to the members of the local community and traditional health practitioners. It's a dire need of the day to document this traditional knowledge in a scientific way and conserve these medicinal plants before it lost (Aziz, *et al*, 2017). The ethnic composition of the people is the same most of them are from the races of Umar Khel, Sarni Khel, Sarkani Khel, Panda Khel, Matakhi, Shamozi, Sayyedan (Sayyed), and Mulan. The primary language is Pushto. The current research project the Ethnobotanical applications of the medicinal plants in tehsil Utman Khel, district Bajaur is the first ever scientific approach to document medicinal uses of plant species from the area. The urgent need for this kind of information is meaningful because the vegetation in the desire area of the Bajaur is extensively poor due to high Biodiversity. Most of the plants in the area are used for medicine, timber, fodder for cattle and fuel. Our present research work is to file unique information of wild medicinal plant of tehsil Utman Khel District Bajaur, KP, Pakistan to provide medicinal values for further reference.

## MATERIALS AND METHODS

This research work was conducted during the year 2019-20 in the area of tehsil Utman khel, district Bajaur, KP-Pakistan. In order to compile the ethnobotanical uses of plants, data was collected about the names and uses of plants by the local people through interviews and questionnaire. After gathering enough information from inhabitant people, hakims, elderly women and herbal medicine practitioners, the medicinal uses

of plants were described. Interviews were randomly conducted and preference was given to the aged people of the upper parts of the area, as these people are more exposed to nature, so they occupy a better understanding and use of medicinal values of plants. The data collected from the people through interviews and questionnaire will be converted into our literature as demanded by our research project. Plants were gathered, preserved, and identified with the help of the flora of Pakistan and compared with herbarium specimen at the department of botany, University of Malakand KP Pakistan for further reference.

## RESULTS

Ethno-botany is a vital part of knowledge of a specific area, as ethno-botany is interlinked with local population of a

particular area. In our present research work 76 plant species, belonging to 47 families were collected (Table-1). Different categories of plants such as herbs, shrubs, trees, vegetables and mushrooms were recorded as a source of medicinal uses. Out of these plant species 76 (96%) plants were angiosperms, 1 (1%) were gymnosperms, 1 (1%) were Pteridophytes and 2 (2%) were fungi. Among angiosperms 73 (63.01%) herbs, 4 (5.47%) shrubs and 20 (27.39%) trees were recorded. These plants were used for more than one purpose. Local people generally use these plants for medicines, wood as a fuel, timber, energy source as a food, and food for cattle such as sheep, goat and buffalos. In our present research work a total of 76 plants species only 73 plants used as a medicinal value is given in Figure. (2, 3).

**Table- 1. Check list of selected medicinal plants**

S #	Plant name	Local name	Family	Habit	Ethnobotanical uses
1	<i>Acacia Arabica</i>	Kikaar	Mimosaceae	Tree	Its leaves are used for cough and fruit for dysentery.
2	<i>Acacia modesta</i>	Paloosa	Mimosaceae	Tree	Gum is used as a tonic in back, joints pains, dysentery and impotence agent. Branches are used for toothbrush, burning purposes and leaves as fodder for cattle.
3	<i>Acacia nilotica</i>	Kikaar	Mimosaceae	Tree	Use of Gum is an expulsion of parasitic worms and flower as expectorant agent.
4	<i>Agaricus campestris</i>	Kharrerlai	Agricaceae	Mushroom	Cooked as a food and used as energy source.
5	<i>Adiantum capillus</i>	Sambaal	Adiantaceae	Herb	Uses as an expectorant, fever and pain of abdomen cure itch, scorpion bites.
6	<i>Avena sativa</i>	Jawdar	Poaceae	Herb	Used a tonic for nerve, healing of wounds also foods for cattle.

7	<i>Atropa acuminata</i>	Bhangi Dewana	Solanaceae	Herb	Used to sooth excitement of the nervous system (sedative), brain disorder and breathing problems
8	<i>Amaranthus viridis</i>	Chulyai	Amaranthaceae	Herb	Leaves are used as a vegetable; soften the skin, also used in snake and scorpion bite.
9	<i>Alisma plantago</i>	Jaabi	Alismataceae	Herb	Uses of leaves for treatment of diabetes, strength, vigor the body, and for dysentery, renal and digestive problems
10	<i>Artemisia vulgaris</i>	Tarkha	Asteraceae	Herb	Used as anthelmintic and anti-malarial agent
11	<i>Ammi visnaga</i>	Sparkai	Apiaceae	Herb	Used in breathing problems (asthma), Diuretic and antispasmodic
12	<i>Allium sativum</i>	Ooga	Liliaceae	Herb	Used in domestic as cooking and flavorings agent, condiment and aromatic. Also used healing wounds, expectorant and diaphoretic.
13	<i>Allium cepa</i>	Piaz	Liliaceae	Herb	Bulbs are used as stimulant and leaves as diuretic, exacting sexual desire, expectorant and antiseptic.
14	<i>Aristida cyanatha</i>	Waakha	Poaceae	Grass	Uses as a food for cattle.
15	<i>Brassica campestris</i>	Sharsham	Brassicaceae	Herb	Used as vegetable and fodder for cattle. Oil is obtained from its seeds which is used in cooking, hair and ointment.
16	<i>Brassica oleraceae var. botrytis</i>	Ghoobi	Brassicaceae	Vegetable	Used as vegetable and in gas trouble.
17	<i>Berberis lyceum</i>	Korai	Berberidaceae	Shrub	Uses as a purifying of blood, infection of throat. Remove warm of body (maintain body temperature) and fuel.
18	<i>Cuscuta reflexa</i>	Zelaai	Cuscutiaceae	Herb	Uses of stem in skin itching and infertility source.
19	<i>Cupressus</i>	Sarwah	Cupressaceae	Tree	Remove warm of body,

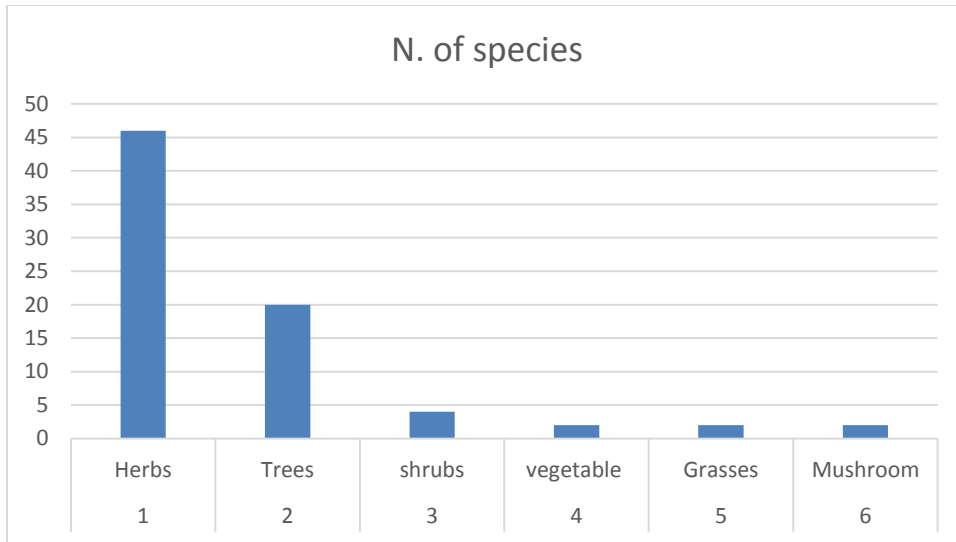
	<i>sempervirence</i>				astrigent, anthelmintic and Wood is used for fuel. Grown in garden ornamental.
20	<i>Chenopodium ambrosioides</i>	Sakhaboti	Chenopodiaceae	Herb	Juice is extracted from its shoots which are used in fever and malaria (anti-fever for malaria disease). Also used to remove intestinal worms.
21	<i>Coriandrum sativum</i>	Dhanya	Apiaceae	Herb	Used as condiment, aromatic, stimulant, flavorings agent, Remove extra gases from body, digestive and good appetizer.
22	<i>Cucurbita maxima</i>	Khoog kado	Cucurbitaceae	Herb	Used as vegetable, exciting the action of stomach and ulcer. Kadoo halwa is prepared from the fruit. Seeds are used in cakes, confectionery and anthelmintic agent.
23	<i>Cucumis sativus</i>	Baadran g	Cucurbitaceae	Herb	Used as salad. It gives a feeling of cooling and relieves thirst
24	<i>Cynodon dactylon</i>	Kaabal	Poaceae	Grass	Used as diuretic and relief constipation also fodder for cattle.
25	<i>Chenopodium album</i>	Chalwai	Chenopodiaceae	Herb	Uses in constipation and anthelmintic agent.
26	<i>Cannabis sativa</i>	Bhaang	Cannabinaceae	Herb	Extracts of leaves (juice) is obtained and used as a anti-malaria and relief colic pains and enhances sexual desire. Female plants are used in making of hashish (chars).
27	<i>Calotropis procera</i>	Spulami	Asclepiadaceae	Herb	Oil is extracted from leaves which are used as an analgesic. Bark of roots is used in constipation, malaria and cholera.
28	<i>Datura innoxia</i>	Dhatura	Solanaceae	Herb	Leaves extracts is used in toothache, headache, earache, hydrophobia, warming agent and analgesics
29	<i>Diospyrus lotus</i>	Tore	Ebenaceae	Tree	Edible fruit, which is

		Amlook			uses to relief flatulence. Wood is used for fuel and furniture
30	<i>Dodonea viscosa</i>	Ghwarski	Sapindaceae	Shrub	Used as astringent, textures of joints and other parts of body, swelling and wood is used for fuel.
31	<i>Equisitum arvense</i>	Bandaki	Equisetaceae	Herb	Used in the inflammation of urinary bladder also used as hair tonic
32	<i>Eruca sativa</i>	Tarmera	Brassicaceae	Herb	Source of vegetable, stimulant, constipation and diseases of skin
33	<i>Euphorbia hirta</i>	Jaghjei	Euphorbiaceae	Herb	Seed is used as a tonic and also for diarrhea
34	<i>Ficus carica</i>	Inzaar	Moraceae	Tree	Fruit is edible, stomach pain, demulcent, constipation and problems of urinary bladder
35	<i>Foeniculum vulgare</i>	Kaaga	Apiaceae	Herb	Fruit is used as carminative, anti-emetic, arise the levels of hemoglobin in blood.
36	<i>Fumaria parviflora</i>	Shahtara	Fumariaceae	Herb	Used as diuretic and remove worms of body
37	<i>Hedera nepalensis</i>	Srazeela	Geraniaceae	Herb	Tonic, antipyretic and also used in treatment of cough, cancer and diabetes
38	<i>Helianthus annuus</i>	Nwarparast	Asteraceae	Herb	Seeds yield edible oil used for cooking, diuretics and laxative
39	<i>Ipomoea purpurea</i>	Prewatai	Convolvulaceae	Herb	Used as ornamental
40	<i>Juglan regia</i>	Ghuaz	Juglandaceae	Tree	Dry fruit is edible. Bark (Dandasa) is used for cleaning teeth. Wood is used in timber and furniture.
41	<i>Luffa acutangula</i>	Tora toorai	Cucurbitaceae	Vegetable	Used as digestive tonic.
42	<i>Morus nigra</i>	Toor toot	Moraceae	Tree	Uses of fruit as tonic for body, cough, throat and chest infection. Wood is used in furniture and fuel.
43	<i>Mentha arvensis</i>	Podina	Lamiaceae	Herb	Used as diuretic, stimulant, carminative problems of gastric. Flavouring agent in

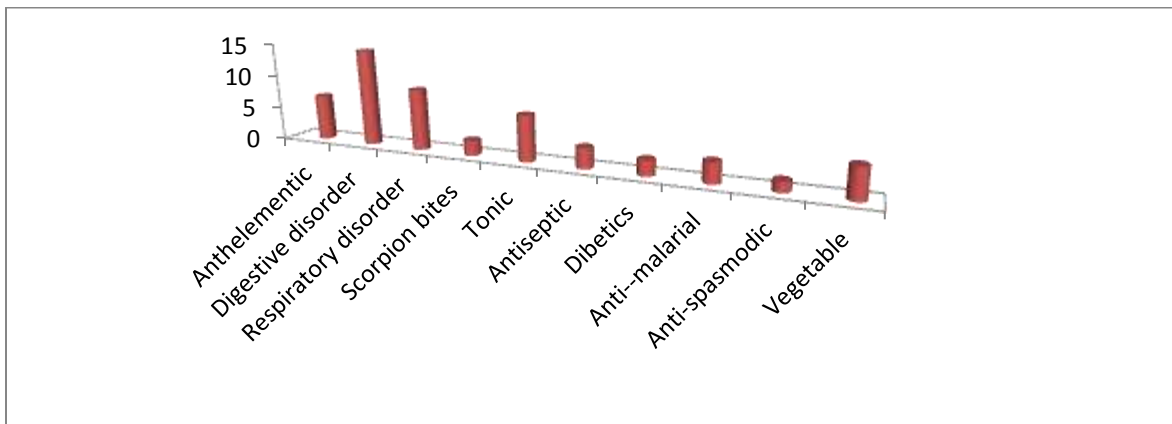
					various food items and relief abdominal pains.
44	<i>Mentha longifolia</i>	Enaly	Lamiaceae	Herb	Used as astringents, stimulant and stomachic.
45	<i>Morus alba</i>	Speen toot	Moraceae	Tree	Edible fruit and uses in rheumatism.
46	<i>Monothecha buxifolia</i>	Gwargra	Sapotaceae	Shrub	Edible fruit. Wood is used for burning purposes.
47	<i>Morchella esculanta</i>	Gosai	Morchellaceae	Mushroom	Used as a food high energy source
48	<i>Melia azedarch</i>	Dherak	Meliaceae	Tree	Used as a source of antibiotic, antiseptic, blood purifier and skin tonic.
49	<i>Morus lavaegata</i>	Shahtot	Moraceae	Tree	Uses of leaves as a feed for cattle and have edible fruit.
50	<i>Nasturtium officinale</i>	Talmeera	Brassicaceae	Herb	Source of vegetable also used in treatment of tetanus.
51	<i>Narcissus poeticus</i>	Ghulinargaas	Amaryllidaceae	Herb	Uses of flower for ornamental purposes, grown on graves.
52	<i>Ocimum basilicum</i>	Kashmal yi	Lamiaceae	Herb	Uses of leaves in cough, emetic agent, seeds add in cold drinks also grown in ornament
53	<i>Olea ferruginea</i>	Khoonah	Oleaceae	Tree	Oils are used as to kill germs and cure body pains. Uses of leaves in diabetics
54	<i>Oxalis corniculata</i>	Taroki	Oxalidaceae	Herb	Used as antidiarrheal agent.
55	<i>Pyrus communis</i>	Nashpati	Rosaceae	Tree	Fruit is eatable, laxative and spasmodic
56	<i>Pinus roxburghii</i>	Nakhtar	Pinaceae	Tree	Used as diuretic, Expectorant and stimulant
57	<i>Punica granatum</i>	Anaar	Punicaceae	Tree	Edible fruit. Uses of fruit as in the problems of digestion and urinary tract
58	<i>Populus nigra</i>	Sperdad	Salicaceae	Tree	Wood is useful in making furniture and fuel
59	<i>Portulaca oleracea</i>	Warkharai	Portulacaceae	Herb	Cooked as vegetable and used as demulcent.
60	<i>Platanus orientalis</i>	Chinar	Platanaceae	Tree	Uses of leaves in dysentery problems
61	<i>Papaver somniferum</i>	Apium	Papaveraceae	Herb	Yield puppy oil, Used as a stimulant

62	<i>Rumex dentatus</i>	Shalkhi	Polygonaceae	Herb	Cooked as a vegetable also used in constipation of animals.
63	<i>Rumex hastatus</i>	Taaroki	Polygonaceae	Herb	Leaves are used as cerminitive and diuretic
64	<i>Rubus fruticosus</i>	Karwara	Rosaceae	Shrub	Fruit is eatable and plants are used in making hedges
65	<i>Solanum nigrum</i>	Kack macho	Solanaceae	Herb	Fruit is used in liver problems
66	<i>Sonchus asper</i>	Shawdapi	Asteraceae	Herb	Used as a fodder for cattle. Ash of plant is used as analgesic and tonic
67	<i>Spinacea oleraceae</i>	Palak	Chenopodiaceae	Herb	Used in treatment of anemia, enhance functions of bones and produce bloods.
68	<i>Salix babylonica</i>	Wala	Salicaceae	Tree	Uses of leaves as to relief pains.
69	<i>Taraxacum officinale</i>	Halak jenays	Asteraceae	Herb	Used as a stimulant and to promote functions of body.
70	<i>Tribulus terrestris</i>	Markondi	Zygophyllaceae	Herb	Seeds are used for the cure of painful urination, tonic and impotency agent.
71	<i>Trifolium repens</i>	Shwtal	Papilionaceae	Herb	Used as a food for cattle.
72	<i>Urtica dioica</i>	Sezonki	Urticaceae	Herb	Using in diuresis and icterus.
73	<i>Verbascum thapsus</i>	Khardug	Scrophulariaceae	Herb	Uses of leaves as in analgesic also used in fever and expectorant
74	<i>Xanthium stramarium</i>	Jishkai	Asteraceae	Herb	Stem is used as antipyretic and leaves for asthma
75	<i>Zizyphus mauritiana</i>	Beera	Rhamnaceae	Tree	Eatable fruit as emollient
76	<i>Zizyphus oxyphyla</i>	Elaanai	Rhamnaceae	Tree	Edible fruits are used as heart tonic. Fruit and leaves are used antidibetic. Wood is used as fuel.

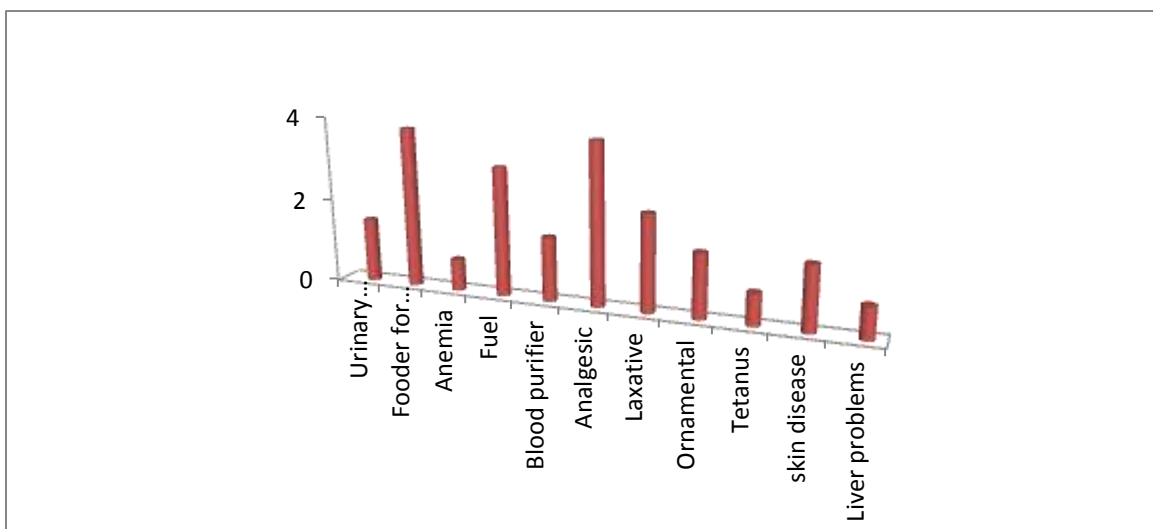




**Figure: 01. Life form representations of medicinal plants**



**Figure: 2. Uses of medicinal plants**



**Figure: 3. Medicinal plants and their uses**

## DISCUSSION

The knowledge about local uses of plants are presented in Table 1. In some of the lower parts of Tehsil Utman Khel KP-Pakistan, the health facilities like hospitals, clinics and pharmacies are easily available so the local peoples in this part do not use the medicinal plants and this practice is not common but use herbal medicine for the treatments of various diseases such as digestive, urinary and respiratory problems. While the inhabitants in the upper parts of tehsil, especially in Bandagai, Mano dari, Matakko, Pandoki and Arang where facilities of health care and BHU (basic health unit) are not easily available to local peoples that's why the people of those areas frequently use herbal medicine. In our present research work, 73 (96.05%) plants including *Acacia modesta*, *Acacia nilotica*, *Atropa acuminata*, *Amaranthus viridis*, *Ammi visnaga*, *Brassica campestris*, *Coriandrum sativum*, *Cannabis sativa*, *Cupressus sempervirence*, *Datura innoxia*, *Ficus carica*, *Foeniculum vulgare*, *Mentha arvensis*, *Mentha longifolia*, *Olea ferruginea*, *Punica granatum*, *Papaver somniferum*, *Taraxicum officinale*, *Xanthium stramarium*, *Urtica dioica* and *Zizyhus oxyphylla* used for their medicinal values in various ailment of health. Related work was done also done by (Aziz et al, 2017, Hazrat et al, 2020 and Abidullah et al, 2019). Most of the people belongs to this area are farmers. The local people of the area also keep pet animals, like cows, buffaloes, goat and sheeps. Mostly in the upper parts of the area the income of the people is selling milk and other dairy products. On the other hand there are some non-cultivated plants and trees which were being used as foods for

these animals. During this research project the plants that were used by various animals as a food counts 19 (14.44%) including *Acacia modesta*, *Avena sativa*, *Aristida cyanatha*, *Cynodon dactylon*, *Chenopodium album*, *Nasturtium officinale*, *Sonchus asper*, *Zizyphus mauritiana* and some others which were also used as fodder for cattle. The inhabitants of the upper part of the research especially the folks, live a simple life. They only used plants and dairy products for food. The locals used such types of plants as *Allium sativum*, *Nasturtium officinale*, *Chenopodium album* and *Amaranthus viridis* for eating and cooking purposes. Mainly the trees are grown for the purpose of fuel and wood. Most of the wild plants in the study area are used as a fuel. The reason for such case as that mostly the people of the area is economically not strong. The locals used plants like *Artemisia scoparia*, *Melia azedarach*, *Acacia modesta* and *Dodonea viscosa* as fuel. These plants are important in building of local mud houses and in making furniture. *Juglan regia*, *Morus alba*, *Morus nigra*, *Melia azedarach* are locally used for burning and for making furniture. Some Plants such as *Artemisia scoparia* and *Dodonea viscosa* are used in construction of muddy houses. The present research work reveals that the study area is under great biotic pressure in the form of deforestation and overgrazing. Due to poor management woody plants have been damaged. Proper management is necessary to conserve the natural resources of the study of area for sustainable use of plants by the locals. The study area has also high values for wildlife and medicinal plants, but proper management including protections is required so that incoming generation is made happy with natural resources.

## REFERENCES CITED

- Abbasi, A.M., M. A. Khan, M. H. Shah M. R. Shah, A. Pervez and M. Ahmad. 2013. Ethnobotanical appraisal and cultural values of medicinally important wild edible vegetables of Lesser Himalayas-Pakistan. *J. Ethnobiol. Ethnomed.*, 9: 66.
- Abidullah, S., A. Rauf, W.S. Khan, Mehnaz, A. Bibi, A. Rauf and S. Fazal. 2019. Traditional uses of medicinal plants in their conservation in Charmang village, Bajaur, KP, Pakistan, *Int. J. Bioorganic Chem.*, 4 (1): 70-83.
- Ahmad, M., R. Qureshi, M. Arshad, M. A. Khan and M. Zafar. 2009. Traditional herbal remedies used for the treatment of diabetes from district Attock (Pakistan). *Pak. J. Bot.*, 41: 2777-2782.
- Amjad, M. S., M. Arshad, A. Saboor, S. Page and S. K. Chaudhari. 2017. Ethnobotanical profiling of the medicinal flora of Kotli, Azad Jammu and Kashmir, Pakistan: Empirical reflections on multinomial logit specifications. *Asian Pacific J. Tropical Biomed.*, 10(5):503-514.
- Amjad, M. S. 2015. Ethnobotanical profiling and floristic diversity of Bana Valley, Kotli (Azad Jammu and Kashmir), Pakistan. *Asian Pacific J. Tropical Biomed.*, 5(4):292-299.
- Aziz, M. A., M. Adnan, A. H. Khan, A. A. Shahat, M. S. Said and R. Ullah. 2018. Traditional uses of medicinal plants practiced by the indigenous communities at Mohmand Agency, FATA, Pakistan. *J. Ethnobiol. Ethnomed.*, 14(1):30-40.
- Aziz, M. A., A. H. Khan, M. Adnan and I. Izatullah. 2017. Traditional uses of medicinal plants reported by the indigenous communities and local herbal practitioners of Bajaur Agency, Federally Administrated Tribal Areas. *J. Ethnopharmacol.*, 198: 268-281.
- Aziz, M. A., A. H. Khan, H. Ullah, M. Adnan, A. Hashem and E.F. Abidullah. 2018. Traditional phytomedicines for gynecological problems used by tribal communities of Mohmand Agency near the Pak-Afghan border area. *Revista Brasileira de Farmacognosia.*, 28 (4): 503-511.
- Gilani, A. S., R. A. Qureshi, and U. Farooq. 2001. Ethnobotanical studies of Ayubia national park district Abbottabad. *Online J. Pak. J. Biol. Sci.*, 1 (4): 284-286.
- Heinrich, M., H. Rimpler and N. A. Barrera. 1992. Indigenous phytotherapy of gastrointestinal disorders in a lowland mix community (Oaxaca, Mexico): Ethnopharmacologic evaluation. *J. Ethnopharmacol.*, 36: 63-80.
- Hussain, F., A. Khaliq and M. J. Durrani. 1996. Ethnobotanical studies on some plants of Dabargai Hills. Swat. Proc. First Training Workshop on Ethnobotany and its application to Conservation. pp. 207-215.
- Hazrat, A., K. Sher, Z. Ahmad, M. Mukhtiar, Z. Fazal, S. Bibi, J. Zada, G. Rahim, A. Ullah, and M. Nisar. 2020. Taxonomic and medicinal survey of Lamiaceae in the hilly area of Dir Kohistan, Khyber Pakhtunkhwa, Pakistan. *BIOSCIENCE RESEARCH*, 2020 17(2):969-975.
- Hazrat, A. 2020. Floral diversity of Rosaceae family in Dir Kohistan Forest Khyber Pakhtunkhwa Province-Pakistan, *Pak. J. Weed Sci. Res.*, 26(2): 157-165.
- Ijaz, F., Z. Iqbal I. U. Rahman, J. Alam, S. M. Khan, G. M. Shah, K. Khan and A. Afzal. 2016. Investigation of

- traditional medicinal floral knowledge of Sarban Hills, Abbottabad, KP, Pakistan. *J. Ethnopharmacol.*, 179: 208-233.
- Khaled, N., L. Boulekbache-Makhlouf, and K. Madani. 2014. Phytochemical screening of antioxidant and antibacterial activities of methanolic extracts of some Lamiaceae. *Industr. Crops Prod.*, 61: 41-48.
- Khan, A.A., and S. H. Zaidi. 1991. Cultivation process of *Mentha arvensis* Linn. *Pak. J. For.*, 41: 170-172.
- Mahmood, A., A. Mahmood, H. Shaheen, R. Qureshi, A. Sangi, Y. Gilani. 2011. Ethno medicinal survey of plants from district Bhimber Azad Jammu and Kashmir, Pakistan. *Journal of Medicinal Plants Research*, 5(11): 2348-2360.
- Manandhar, N.P. 2002. Ethnomedicinal plants diversity and their conservation in Nepal. Recent Progress in Medicinal Plants. Singh VK, JN Govil and G Singh, editors. In: *Publ Stadium Press LLC: USA*. 1: 41-46.
- Mbaveng, A. T., Q. Zhao and V. Kuete. 2014. Harmful and protective effects of phenolic compounds from African medicinal plants. In book: Toxicological Survey of African Medicinal Plants (Edition I). Elsevier Publishers, pp. 577-609.
- Pieroni, A., H. Muenz, M. Akbulut, K. H. C. Baser and C. Durmuskahya. 2005. Traditional phytotherapy and trans-cultural pharmacy among Turkish migrants living in Cologne, Germany. *J. Ethnopharmacol.*, 102(1): 69-88.
- Qureshi R., A. Waheed, M. Arshad and T. Umbreen. 2009. Medico-ethnobotanical inventory of tehsil Chakwal. Pakistan. *Pak. J. Bot.*, 41: 529-538.
- Rokaya M.B., Y. Uprety, R.C. Poudel, B. Timsina, Z. Munzbergova, H. Asselin, A. Tiwari, S. Shrestha, and S. Sigdel. 2014. Traditional uses of medicinal plants in gastrointestinal disorders in Nepal. *J. Ethnopharmacol.*, 158: 221-229.
- Shinwari, M.I., and M.A. Khan. 2000. Folk use of medicinal herbs of Margalla Hills National Park, Islamabad. *J. Ethnopharmacol.*, 69: 45-56.
- Street, R.A. and G. Prinsloo. 2013. Commercially important medicinal plants of south Africa: a review. *J. Chem.* <http://dx.doi.org/10.1155/2013/205048>.