

A CONTRIBUTION TO ETHNOBOTANICAL STUDY OF WILD PLANTS OF TEHSIL JATLAN AZAD JAMMU & KASHMIR

MUHAMMAD AJAIB¹, AYESHA ISLAM¹ AND MUHAMMAD FAHEEM SIDDIQI²

¹*Department of Botany (Bhimber Campus), Mirpur University of Science and Technology (MUST),
Mirpur-10250 (AJK), Pakistan*

²*Department of Botany, University of Karachi, Karachi-Pakistan*

**Corresponding Author's E-mail: majaibchaudhry@yahoo.com*

Abstract

Plants are the major source of nutrition and medicine in the world. In this regard a survey was carried out in Tehsil Jatlan, Mirpur District, Azad Jammu & Kashmir to explore ethnobotanical potential in the area. Jatlan is situated 20 km away from Mirpur Azad Jammu & Kashmir. The purpose of survey was to investigate wild plants and their use in the area by local people. The emphasis was laid down on taxonomy of these plants. During study 102 plant species including herbs, shrubs and trees belonging to 41 different families were recorded. The most dominant families among dicots was Asteraceae with 10 species and among monocot poaceae with 7 species. The plants collected were classified in three different categories which were single usage, double usage and multiple usage plants. Out of 102 plant species, 58 were single usage, 33 were two usage and 11 were multiple usage species. The result revealed that some wild medicinal plants were under severe biotic and abiotic pressure and demand to formulate indigenous and national level policy and biodiversity plan should be implemented promptly. Local communities and concerned government department should cooperate and coordinate with universities for protection and conservation of local Flora of Jatlan, AJK.

Introduction

Plants are utilized man to fulfill different daily needs. Plants provide people with food, medicines and fodder for livestock as well as material for construction of houses (Harshberger, 1896). All human societies depend on plants. Plants are fundamental to the functioning of all cultures. Along with the photosynthetic bacteria and algae, plants are responsible for the capture of almost all of the energy that we consume. Ethnobotany along with the related disciplines of ethnobiology and ethnoecology are of central importance for understanding and improving the sustainability of our relationships with the living world. The plants are used to manufacture crafts, agricultural tools and many other products like fuel, resin, paints and poison (Ajaib *et al.*, 2010).

At present, ethnobotany has shifted its focus from people's use of plants to the relationship between people and plants, which include use, cognition, and ecology. Recent definitions of ethnobotany demonstrate a consensus on the move to include more than just use by focusing on the relationship between people and plants. However, there is not a consensus on whether the discipline should focus on all people or on traditional and indigenous people. It is evident that people who have lived in one locality for a long time have particularly rich sets of knowledge about and cognition of plants and local ecology. A more fundamental issue relative to knowledge, however, is found within the discussion of the relationship between knowledge as practice and as heritage (Ajaib *et al.*, 2014; Jabeen *et al.*, 2015).

Ethnobotany plays an important role in life of humans, not from today, from the beginning of civilization. People used plants as their basic needs. Ethnobotany is an interdisciplinary science which has both aspects of science and humanities (Ajaib *et al.*, 2013).

Pakistan has been endowed with rich and diversified vegetation by the nature. The exploration and documentation of significance of endemic and exotic flora is very imperative because plants are part and folklore medical and nutritive therapies with their historical and cultural perspectives from each area of country. Pakistan has more than 6,000 species of wild plants of which about 600-2000 are used partially or holistically in folklore medicines. A considerable ethnomedicinal and ethnobotanical research has been conducted on different areas of Pakistan (Zareen *et al.*, 2013).

In the present paper, ethnobotanical study was conducted in Jatlan a town situated in the Mirpur District of Azad Kashmir, Pakistan. Jatlan is situated 5 miles from Khari Sharif. Its geographical coordinates are 33°2'1" North, 73°50'31" East. Jatlan links Mirpur city with Bhimber and Gujrat districts. Over the years Jatlan has become a major business and commercial hub for the region due to its geographical location.

Its climate is quite hot during the summer times, where maximum average temperature per annum is 40 degree centigrade and other geographical conditions closely resemble those of Jhelum and Gujarat, adjoining districts of Pakistan (Mehmood *et al.*, 2011) Topography of Jatlan AJK consists of plains and the foot hills of the Himalayas. The main crop cultivated during summer is Millet and Pulses. However, other cash crops such as

Wheat, Maize, Fruits like Water melon and Vegetables are also grown along the Jatlan canal. The product of quality rice from the paddy fields of Khari Sharif between Upper Jhelum Canal and River Jhelum are famous for its aroma and taste.

Materials and Method

The present study was conducted during 2015. Several visits were made in study area on monthly basis. The study was based on more than 30 respondents in addition to personal observations and informal discussions. The present work included taxonomic study and ethnobotany of wild plants of the area. Various plants were collected in different seasons and ethnobotanical information gathered from the local inhabitants. Visits were made during spring and autumn seasons in 2015. The information collected from local tribal included local names, local uses, recipe for preparations, part used, occurrence and other related data.

To collect the data from local communities their local language was used which is very important to know the real knowledge about local Flora. New generation have lesser knowledge about local plants and herbal medicines due to modernization and advancement of science and lack of interest. A standardized voucher numbering system was used to label all collections and cross reference them with the field notes to validate their authenticity.

The plant collected and preserved according to the standard process. The plants identified with Flora of Pakistan. The herbaria was prepared and placed in the herbarium of Department of Botany, Mirpur University of science & Technology (MUST) Bhimber Campus, Bhimber (AK) Pakistan for future reference.

Results and Discussion

In the investigated area, 102 plant species belonging to 41 families, i.e. Acanthaceae (2), Aizoaceae (1), Amaranthaceae (7), Apocynaceae (1), Asclepiadaceae (2), Asteraceae (10), Boraginaceae (1), Brassicaceae (2), Caesalpiniaceae (2), Cactaceae (1), Cannabaceae (1), Caryophyllaceae (1), Celastraceae (1), Chenopodiaceae (2), Convolvulaceae (3), Cuscutaceae (1), Cyperaceae (2), Euphorbiaceae (5), Fumariaceae (1), Geraniaceae (1), Labiateae (6), Malvaceae (3), Menispermaceae (2), Mimosaceae (3), Moraceae (2), Moringaceae (1), Nyctaginaceae (1), Oxalidaceae (1), Papilionaceae (6), Plantaginaceae (2), Poaceae (7), Polygonaceae (2), Primulaceae (1), Ranunculaceae (1), Rhamnaceae (1), Rubiaceae (1), Scrophulariaceae (2), Solanaceae (4), Tiliaceae (2), Typhaceae (1), Verbenaceae (4), Vitaceae (1) and Zygophyllaceae (1) were recorded (Table 1).

Asteraceae was the most distinguished family with 10 species, then Amaranthaceae and Poaceae with 07 species, following Labiateae and Pailionaceae with 06 species; Euphorbiaceae with 05 species; Solanaceae and Verbenaceae with 04 species each; Convolvulaceae, Malvaceae and Mimosaceae with 03 species each; Acanthaceae, Asclepiadaceae, Brassicaceae, Chenopodiaceae, Cyperaceae, Menispermaceae, Moraceae, Plantaginaceae, Polygonaceae, Scrophulariaceae, Caesalpiniaceae and Tiliaceae with 02 species each and Aizoaceae, Apocynaceae, Boraginaceae, Cactaceae, Cannabaceae, Caryophyllaceae, Celastraceae, Cuscutaceae, Fumariaceae, Geraniaceae, Moringaceae, Nyctaginaceae, Oxalidaceae, Primulaceae, Ranunculaceae, Rhamnaceae, Rubiaceae, Typhaceae, Vitaceae and Zygophyllaceae with 01 species each.

Single-Usage plants: The plants used for one purpose are called single-usage plants, e.g. *Kyllinga brevifolia* Rottb. is a fodder plant only and *Echinops echinatus* Robx. is only a medicinal plant. Out of 102 plant species reported, 58 were single usage, used for medicinal, fodder, vegetable and fuel purpose. Out of these 58 plants, Medicinal plants were 43, while fodder, vegetable and fuel were 11, 1 and 3 respectively. In term of percentage medicinal were 42%, whereas fodder, vegetable and fuel were 10%, 0.98% and 2.94%.

Among single usage plants, Dicotyledons were in 53 number, while 5 were monocotyledons. Plants used for medicinal purpose were 43, for fodder were 11, for fuel purpose were 3 and 1 is used as vegetable. The percentage of these plants is given in **Fig 1**.

Two-Usage Plants: The plants which are used for two purposes, e.g. *Fumaria indica* (Hausskn.) Pugsley is used for both medicinal & fodder purposes. Out of 102 plant species, 33 represented two usage plants. There were 7 categories of two-usage plants, i.e. Medicinal & Fodder (11), Medicinal & Vegetable (7), Medicinal and Fuel (6), Fodder & fuel (3), Vegetable and fodder (2), Medicinal & Ornamental (2), and Medicinal & handicrafts (2). The percentage of these two usage plants is given in **Fig 2**.

Multi-Usage Plants: The plants used for more than two purposes are called as Multi-Usage Plants, *Senegalia modesia* Wall. is used for Medicinal, Fodder and Fuel purposes. Out of 102 plants 11 were for multi purposes. Multi usage plants were categories into 5 groups which were medicinal, fodder and fuel (5); medicinal fodder and vegetable (2); fodder, fuel and vegetable (2); fodder fuel and handicrafts (1) and medicinal, fuel and other use (1) (**Fig 3**).

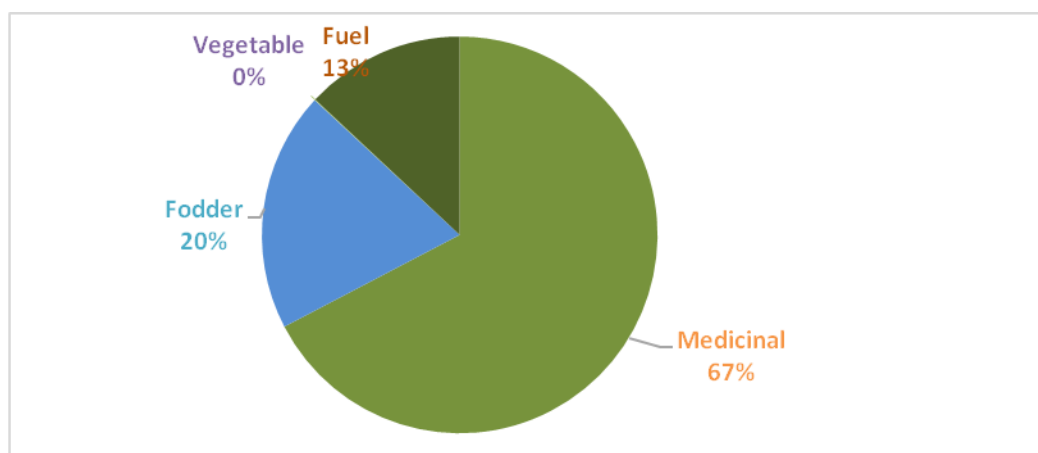


Fig 1: Proportion of the single-usage plants of Jatlan District Mirpur, AJK

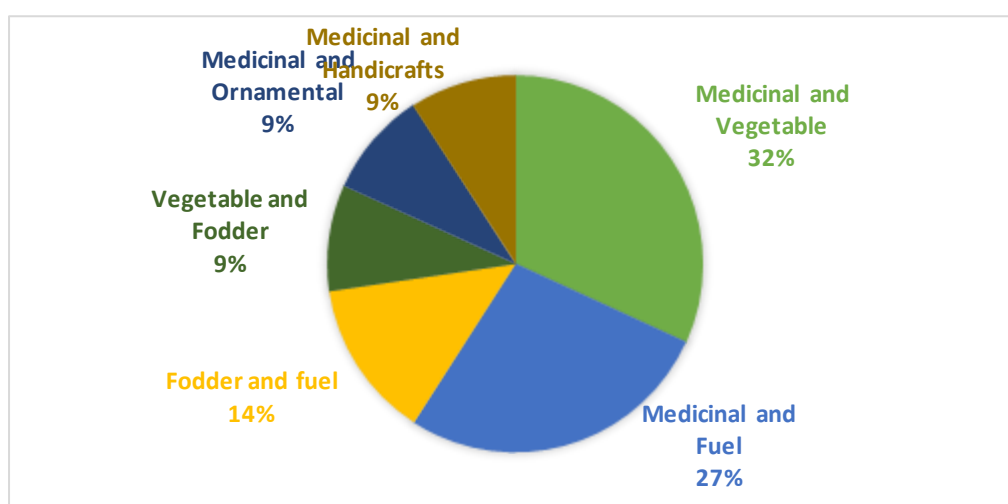


Fig 2: Proportion of the two-usage plants Jatlan District Mirpur, AJK

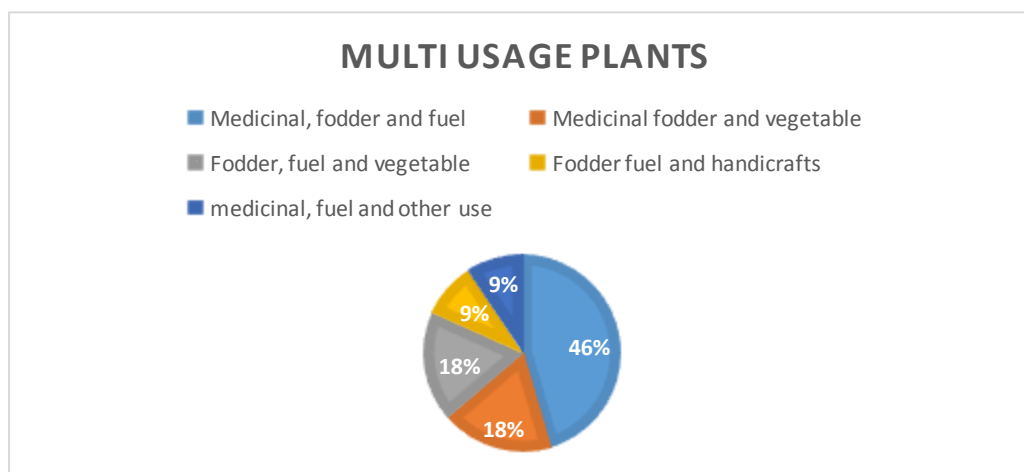


Fig 3: Proportion of multi usage plants Jatlan District Mirpur, AJK

Table 1: List of plants and their uses in Jatlán Azad Jammu & Kashmir

Species	Family	Local Name	Traditional Use
<i>Achyranthes aspera</i> L.	Amranthaceae	Puth kanda	It is bitter, pungent, heating, laxative, stomachic, carminative and useful in treatment of vomiting, bronchitis, heart disease, piles, itching abdominal pains, ascites, dyspepsia, dysentery, blood diseases etc.
<i>Aerva javanica</i> (Burm. f.) Juss. Ex Schult	Amranthaceae		Boiled seeds are fed to animals suffering from foot and mouth disease. A paste made of green leaves, used for healing wounds and inflammation. It is a forage plant.
<i>Ajuga bractosa</i> Wall. Ex Benth.	Labiatae	Kori buti	Bitter in taste, used in fish poison and to treat throat sore.
<i>Albizia lebbek</i> (L.) Benth	Mimosaceae	Sreeia	Leaves are used as fodder for cattle they are weight increasing. Flowers are used as honey bee collection. Wood is used as fuel wood and for making milk stirrer. Seeds are used for curing kidney infections.
<i>Alternanthera pungens</i> Kunth.	Amranthaceae	Khaki booti	Leaves are blood purifier. A decoction is used internally to treat gonorrhea.
<i>Amaranthus viridis</i> L.	Amranthaceae	Ganar	Plant is used as vegetable. A decoction of the entire plant is used to stop dysentery and inflammation. The plant is emollient and vermifuge. The root juice is used to treat inflammation during urination. It is also taken to treat constipation.
<i>Amaranthus spinosus</i> L.	Amranthaceae	Kanda Ghanar	It is used internally in the treatment of internal bleeding, diarrhoea and excessive <i>menstruation</i> .
<i>Anagallis arvensis</i> L.	Primulaceae	Bili buti	It is used as fodder for cattle. Leaves are used for stomach disorders.
<i>Bauhinia variegata</i> L.	Caesalpiniaceae	Kachnar	The bark of plant is acrid, sweet, appetizing, cooling, and astringent to the bowels; cures biliousness, cough, ulcers, vaginal discharges, anthelmintic and thirst burning sensation. The buds are indigestible, used in piles, cough, eye diseases, and liver complaints. The root is used for dyspepsia and flatulency, it is also laxative.
<i>Boerhavia procumbens</i> Banks.	Nyctaginaceae	Itsit	Juice of plant is used against Dysmenorrhea. Flowers and root extract is used as tonic.
<i>Broussonetia papyrifera</i> (L.) Herit.	Moraceae	Jangli toot	Wood is used as fuel. Plant is toxic and cause allergy.
<i>Butea monosperma</i> (Lam.) Taubert	Papilionaceae	Chechra	It is Diuretic. Leaves are palatable for goats and wood is used as fuel.
<i>Calendula arvensis</i> L.	Astraceae	Gul e Asharfi	It is diaphoretic and antiemetic. Decoction is used against digestive ailments. Plant is also used as an ornamental plant.
<i>Calotropis procera</i> (Ait.)	Asclepiadaceae	Aak	Latex is commonly used for ring worms and skin diseases. It is used to treat snake bite and joint pains. Fiber of its fruit is used for stuffing of pillows.
<i>Cannabis sativa</i> L.	Cannabaceae	Bhang	Root and leaf extract is used for liver disorders. A strong narcotic is derived from the resin of stem, leaves, flowers and even the fruits, charas is synthesized from it. Leaves are used for constipation and stomach diseases.
<i>Carissa opaca</i> Stapf ex Haines.	Apocynaceae	Garanda	The fruits are astringent, antiscorbutic and also used as a remedy for biliousness. Leaf decoction is used against fever, diarrhea, and earache. The roots serve as a stomachic, vermifuge and remedy for itches. Stem is used for fuel wood. Leaves are palatable for goat.
<i>Cassia occidentalis</i> L.	Caesalpiniaceae	Kasondi	It is used to treat fever, typhoid and malaria. It is also used in treatment of skin diseases.
<i>Celebrookea oppositifolia</i> Smith.	Labiatae	Bansa	Leaves are applied on wounds. Root is used in epilepsy.

<i>Chenopodium ambrosioides</i> L.	Chenopodiaceae	Gandi booti	Leaves are applied on wound. Oil obtained from plant is useful for constipation and intestinal parasites.
<i>Chenopodium murale</i> L.	Chenopodiaceae	-	Leaves and young shoots, raw or cooked as a spinach.
<i>Cissapelos pariera</i> L. var. <i>hirsute</i> (DC.) Forman	Menispermaceae	Batrrarr	The extract of plant inhibits tumor growth. It is mildly toxic to some grazing animals. It has diuretic activity.
<i>Cissus carnosa</i> (L.) Lamk.	Vitaceae	Dakh	Fruit is eaten. It is used in chatnis and sauces. It is good for abdominal diseases and also purify blood.
<i>Cocculus pendulus</i> (J.R.Forst. & G.Forst.) Diels	Menispermaceae	-	Plant is soaked in water and decoction is used for motion and dysentery. Powder of leave is mixed with small amount of milk and is applied on the eye for freshness.
<i>Coronopus didymus</i> (L.) Smith.	Brassicaceae	Thandi booti	Used as cooling and refrigerant. The plant is used as fumigants for insect repellent. Whole plant is used as fresh fodder for animals.
<i>Croton bonplandianum</i> Baill.	Euphorbiaceae	Jangli Tulsi	Leaf past is used to treat skin diseases. It is used as fuel. First the stem and branches are used as fuel. Then the ash is collected and kept in a bottle for five or six days, then this ash is put in warm water and used as a detergent for cleaning cotton garments.
<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Akas bail	It is used for stomach ache. Smoke produced by burning the plant is inhaled to treat fever. Its infusion is antilice.
<i>Cyperus rotundus</i> L.	Cyperaceae	Muthar	Rhizome of this plant is used to cure stomach diseases. It is crushed and ground to make powder. By mixing in water it is used thrice a day
<i>Dactyloctenium aegyptium</i> (L.) Willd.	Poaceae	Madhana ghas	It is an average fodder grass, used when good ones are not available.
<i>Datura innoxia</i> Mill.	Solanaceae	Datura	It is given during child birth to help with pain. Decoction of leaves is consumed to treat diarrhea, and paste of leaves is applied externally to treat pain.
<i>Digera muricata</i> (L.) Mart.	Amranthaceae	-	Plant is used as fresh fodder for cattle.
<i>Digitaria eriantha</i> Steud.	Poaceae	Methri	It is used as fodder for cattle.
<i>Echinops echinatus</i> Robx.	Astraceae	Kandyara	Seeds are used as nerve tonic and aphrodisiac.
<i>Ehretia laevis</i> Roxb.	Boraginaceae	Charorr	Plant is used against chest infections.
<i>Emex spinosa</i> (L.) Campd.	Polygonaceae		It is used as an appetizer.
<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Dhodhal	Latex is toxic and cause skin irritation. Seeds are used against constipation.
<i>Euphorbia heterophylla</i> L.	Euphorbiaceae	Dodhal	Leaves and roots are antiseptic
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Choti dodhal	Whole plant extract is diuretic.
<i>Ficus palmata</i> Forssk.	Moraceae	Phugwar	Leaves are used as fodder for cattle. Fruit is edible, laxative and soothes the bee sting by simple rubbing on the skin. Wood is used as fuel.
<i>Fumaria indica</i> (Hausskn.) Pugsley.	Fumariaceae	Papra	The plant is crushed and mixed with sugar and then it is used for blood purification, digestion, allergies and leprosy. It is also used as fodder for cattle.
<i>Galium aparine</i> L.	Rubiaceae	Landhra	It cures kidney infections, skin disorders and high blood pressure. Its seeds can be roasted to prepare a sort of coffee substitute. It is also used in cancer and pus blister.
<i>Geranium rotundifolium</i> L.	Geraniaceae	Jandoru	It is used against Urinary disorders. It is used as fresh fodder for cattle.
<i>Grewia optiva</i> Drummond ex Burret	Tiliaceae	Dhaman	It is used as fodder. Leaves are highly palatable for goat. Wood is used as fuel wood.

<i>Grewia tenax</i> (Forsk.) Fiori	Tiliaceae	Dhamni	Leaves are used to cure hepatitis. It is used as fodder by grazing animals.
<i>Imperata cylindrica</i> (L.) Beauv.	Poaceae	dibb	It is used as dry and fresh fodder.
<i>Indigofera linifolia</i> (L.f.) Retz.	Papilionaceae	-	It is used for skin disorders.
<i>Ipomoea carica</i> L.	Convolvulaceae	Budhi Bail	Its leaves possess strong anti-inflammatory activity.
<i>Ipomoea pestigridis</i> L.	Convolvulaceae	-	It is used for wound healing. It is also used against poisonous stings, snake bites, etc.
<i>Ipomoeae carnea</i> Jacq.	Convolvulaceae	Jangli Bhaikar	It is grown for its attractive flowers and as a living fence which is not grazed by livestock and is also used medicinally as an antirheumatic remedy.
<i>Justicia adhatoda</i> L.	Acanthaceae	Desi Bhaiker	Leaves are used for ripening of bananas and to remove bad odor from feet. Ash of plant is used for asthma.
<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae		It is used as fodder for cattle.
<i>Lamium amplexicaule</i> L.	Labiatae	Mot Kapra	Leaves are used as vegetable. Whole plant is used as fodder.
<i>Lantana camara</i> L.	Verbenaceae	Panj phuli	Leaves are used to treat cuts, rheumatisms and ulcers. Powdered root in milk was given to children for stomach-ache and as a vermifuge.
<i>Lathyrus aphaca</i> L.	Papilionaceae	-	It is used as fodder for cattle.
<i>Malva parviflora</i> L.	Malvaceae	Sonchal	Whole plant is boiled in water to make decoction which is used to cure cough, flu and fever. Leaves are also used as vegetable.
<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae		Leaves are crushed and made in to paste to relieve pain. Flowers are used as diaphoretic. Decoction is resolvent.
<i>Maytenus royleanus</i> (Wall. Ex Lawson) Cuf.	Celastraceae	Ptaki	Leaves are used as fodder. Whole plant is used as fuel wood.
<i>Mazus pumilus</i> (Burm.f.) Van Steenis	Scrophulariaceae		It is used as fodder for cattle.
<i>Medicago polymorpha</i> L.	Papilionaceae	Sriri	It is used as fodder.
<i>Melilotus indica</i> (L.) All.	Papilionaceae	Jangli methi	It is used as fodder for cattle and externally used as poultice or plaster on swelling.
<i>Mentha royleana</i> Benth.	Labiatae	Jangli podina	Leaves are stimulant, aromatic and carminative.
<i>Moringa oleifera</i> Lam.	Moringaceae	Sohanjana	It is used against snake bite. Wood is used for fuel purpose.
<i>Nasturtium officinale</i> R.Br	Brassicaceae	-	It is Purgative, emetic and also used as vegetable.
<i>Ocimum tenuiflorum</i> L.	Labiatae	Tulsi	Scent of tulsi wards off insects and purifies air. Antiseptic and anti-inflammatory properties.
<i>Opuntia monacantha</i> (Willd.) Haw.	Cactaceae	Chitar thor	The plant is bitter, laxative, stomachic, carminative and antipyretic. It is used in urinary complaints tumors, piles, inflammations, anemia, ulcers, and enlargement of the spleen. The flowers cure bronchitis and asthma. It is used in ophthalmic and liver complaints. The juice is used as a cure for earache. The fruit is used in gonorrhea.
<i>Oxalus corniculata</i> L.	Oxalidaceae	Khati booti	It is used as vegetables. Plant sap is used to cure skin diseases. Leaves are used in snake bite. Leaves are used as cooling agent and refrigerant in stomach disorders, fever and acute headache. Plant pounded with cumin seeds are taken with water thrice a day for dysentery. It is also used for sensitive teeth.

<i>Parthenium hysterophorus</i> L.	Astraceae	Buti	It is a harmful weed. Different parts of the plant have been reported to be used in traditional medicine against fever, diarrhea, neurologic disorders, urinary tract infections, dysentery and malaria. It is also used as remedy for skin rashes.
<i>Pentatropis spiralis</i> (Forssk.)	Asclepiadaceae	-	The flowers are used medicinally and the tubers are eaten.
<i>Peristrophe paniculata</i> (Forssk.)	Acanthaceae	Kalu	Juice of root is given in case of vomiting or if there are some traces of blood in vomiting. Plant is mixed with <i>Piper longum</i> and water and is taken as antirabies medicine.
<i>Phragmites karka</i> (Retz.) Trin. Ex. Steud.	Poaceae	Narr	It is used for fuel. Roots are cooling, diuretic and very useful in Diabetes.
<i>Phyla nodiflora</i> L. Greene	Verbenaceae		Leaves are used for cough and cold.
<i>Plantago lanceolata</i> L.	Plantaginaceae	Isbagol	Seeds are purgative. Leave extract is applied in wounds.
<i>Pupalia lappacea</i> (L.) Juss.	Amranthaceae	Lehndara	Leaves are used to treat constipation and cough.
<i>Ranunculus muricatus</i> L.	Ranunculaceae	Kar-kandoli	Decoction of the plant is useful in various diseases of cattle's and also effective in cough and asthma. It is toxic plant and can be fatal to cattle.
<i>Ricinus communis</i> L.	Euphorbiaceae	Harnoli	The ripe seeds of the plant are pressed to make castor oil. Castor oil is more commonly used as a laxative. It is also used to induce labor and stimulate lactation.
<i>Rumex dentatus</i> L.	Polygonaceae	Harfli	Leaves are diuretic and astringent.
<i>Saccharum bengalense</i>	Poaceae	Sarkanda	The leaves and stem are used for thatching huts for animals, and for making baskets. Its stem is also used for making pens (Kalam).
<i>Saccharum spontaneum</i> L.	Poaceae	Kai	Dry plant is served as fodder for cattle. It is also used for making ropes and for roof thatching. The stem is used to woven winnowing trays (Chaj) that is used to separate chaff from grain.
<i>Salvia plebeian</i> R.Br	Labiatae	Samandr sokh	Seeds are used with gur sharbat for bleeding diarrhea.
<i>Saussurea heteromalla</i> (D. Don) Handel-Mazzetti	Astraceae	Kuth	Seeds carminative, used in horse bite. Root is used for skin diseases.
<i>Senegalia modesta</i> (Wall.) P. J. Hurter,	Mimosaceae	Phulai	Leaves are used as fodder for goat. The wood is hard and durable. It is used for cane crushers. Persian wheels and agricultural implements. It is also used as fuel. The gum is used in medicine and the tender twigs for cleaning the teeth.
<i>Sida cordifolia</i> L.	Malvaceae	-	It leaves are cooked and eaten in case of bleeding piles. Its oil is effective as medicated oil. Juice of whole plant with little water is given for treating gonorrhea.
<i>Silybum marianum</i> Gaertn.	Astraceae	Kandyara	It is used for cardiac disorders and stems is eaten as fresh vegetable. Seeds are used for liver disorders.
<i>Solanum nigrum</i> L.	Solanaceae	Katch match	Fresh leaves are eaten. It is used against kidney diseases. Poultice of the leaves is effective in skin disease. Juice of the fruit is useful in jaundice and hears diseases. Fruits are also used as tonic and diuretic.
<i>Solanum surratense</i> Burm.	Solanaceae	Mokhri	The grinded fruits are used in intestinal diseases and abdomen pain. Fruits decoction is found effective in toothache. Fruits are useful in diabetes.
<i>Sonchus asper</i> (L.) Hill	Astraceae	Dodhal	Latex is used to treat warts. The plant is crushed to form a paste. The paste is applied as a poultice on wounds and boils. This is traditionally recommended to be very useful for the said purpose Fresh plant is served as fodder for cattle.

<i>Sorghum helipense</i> (L.) Pers.	Poaceae	Baru	It is laxative, used in burning sensation, phthisis and in diseases of blood. It is also used as fodder for cattle.
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Bin Batorri	It is used as fodder for cattle.
<i>Taraxacum officinale</i> Weber.	Astraceae	Methi Hund	Young leaves are cooked as spinach. Plant is also grazed by cattle, goats and sheep. Rhizoms are dried and are boiled in water. When half water is left it is strained with a thin cloth. This decoction is given to patients suffering from jaundice.
<i>Trianthema portulacastrum</i> L.	Aizoaceae	Itsit	Used as fodder for cattle
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Pakhra	Fruit powder is given orally to cure urinary disorders and mixed with sugar is given to ease delivery. The powder of fruits is taken orally with a glass of milk by rural men to cure impotency.
<i>Tridax procumbens</i> L.	Astraceae	Kuthi	It is anti-diabetic plant. A fine paste of the leaves is applied externally to reduce swelling of hemorrhoids and to stop bleeding. The leaf juice possesses insecticidal and parasitical properties. Smoke produced by burning the plant is used to repel mosquitoes.
<i>Typha domingensis</i> Pers.	Typhaceae	Barya	Leaves are used for making mats and baskets. Leaves are used to cover compressed wheat straw heap. Rhizome decoction is used for amenorrhea.
<i>Vachellia nilotica</i> (L.) P.J. Hurter & Mabb	Mimosaceae	Kikar	It is used as tonic, fodder for cattle, wood is used as fuel wood, timber and is used to make agriculture tools.
<i>Verbascum thapsus</i> L.	Scrophulariaceae	Gidar tambaco	Leaves and flowers are used in cough and pulmonary diseases.
<i>Verbena officinalis</i>	Verbenaceae	Karenth	Leaves and roots decoction is used as tonic.
<i>Veronica polita</i> Fr.	Plantaginaceae	Sriri	It is used as fodder for cattle.
<i>Vicia sativa</i> L.	Papilionaceae	Jangli Matar	Whole plant is used as fodder for cattle.
<i>Vitex negundo</i> L.	Verbenaceae	Banna	Stem and leaves are aromatic. Stem is use to clean teeth by local people. Dried leaves are smoked for relief of headache.
<i>Withania somnifera</i> (L.) Dunal.	Solanaceae	-	It is diuretic, and also used against asthma and allergy.
<i>Xanthium strumarium</i> L.	Astraceae	Bakhra	Leaf extract is useful for fever.
<i>Youngia japonica</i> (L.) DC.	Astraceae	Chirota	It is used against constipation, for blood purification and to treat boils. It also act as an appetizer.
<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn.	Rhamnaceae	Bair	Fruit is eaten although sour in taste. Branches and leaves are fodder for animals. Dry branches are used as fence and fuel purposes.

Jatlan is beautiful and fabulous part of Mirpur Azad Kashmir and it provides good resource of plant biodiversity. Vegetation of Jatlan is dominated by Herbs, shrubs and wild trees. In the area, trees are used for multiple purposes such as construction, furniture, agro-agriculture instruments, honey production, fodder, medicines, fuel wood, fencing, timber wood, production of kitchen utensils. It is determined that ethnobotanical knowledge on the usefulness of these woody plants remains high, poor methods of exploitation, agriculture and over-exploitation are putting the most species under pressure of extinction (Ishtiaq *et al.*, 2006).

In the investigated area, a total of 102 plant species belonging to 41 families were recorded. 10 species belonged to 3 families of monocotyledonous while 92 species belonged to 38 dicotyledonous families. The most abundant family among monocots was Poaceae with 7 species following Cyperaceae and Typhaceae with 2 and 1 species respectively. Among dicots the most abundant families recorded was Asteraceae with 10 species following Amaranthaceae with 7, Labiateae and Papilionaceae with 6 species each, Euphorbiaceae with 5, Verbenaceae with 4, Convolvulaceae, Mimosaceae and Malvaceae with 3, Acanthaceae, Asclepiadaceae, Brassicaceae, Chenopodiaceae, Menispermaceae, Moraceae, Plantaginaceae, Polygonaceae, Scrophulariaceae, Caesalpiniaceae and Tiliaceae with 2 species each and Aizoaceae, Amaranthaceae, Apocynaceae, Boraginaceae, Cactaceae, Cannabaceae, Caryophyllaceae, Celastraceae, Cuscutaceae, Fumariaceae,

Geraniaceae, Moringaceae, Nyctaginaceae, Oxalidaceae, Primulaceae, Ranunculaceae, Rhamnaceae, Rubiaceae, Vitaceae and Zygophyllaceae each with 1 species.

In Jatlán, a plant is used to treat many diseases at times. For example *Achyranthes aspera* L. is laxative, useful in treatment of vomiting, bronchitis, piles and also used for treatment of heart diseases. *Cissapelos pariera* L. var. *hirsute* (DC.) Forman extract has ability to inhibit tumor growth and it also has diuretic activity, *Malvastrum coromandelianum* (L.) Garcke it is used to relieve pain and its decoction is muscle relaxant; *Ranunculus muricatus* L. is used for diseases of cattle's and also effective in cough and asthma, *Cocculus pendulus* (J.R.Forst. & G.Forst.) Diels is used against motion and dysentery and *Rumex dentatus* L. is diuretic and astringent. Some plants are only used as fodder for cattle, no other use has been recorded in study area for example, *Stellaria media* (L.) Vill. is only a fodder plant and some plants have other uses like handicrafts etc. this include *Saccharum bengalense* Retz. (Ajaib *et al.*, 2010).

Vegetation of study area is dominated by *Justicia adhatoda* L., which is found almost everywhere along road sides and in grazing lands. It is used for various purposes by local people e.g. leaves are used for ripening of Bananas. Leaves are boiled in water and feet are washed by this water which remove bad odor of feet. The plant is burned and its ash is used for asthma. Among trees the most dominant species was *Butea monosperma* (Lam.) Taubert, which is called as chechra by the local people. Its wood is used for fuel by the inhabitants.

In the investigated area, a total of 102 plant species belonging to 41 families were recorded. 10 species belonged to 3 families of monocotyledonous while 92 species belong to 40 dicotyledonous families. The most abundant family among monocots was Poaceae with 7 species following Cyperaceae and Typhaceae with 2 and 1 species respectively. Among dicots the most abundant families recorded was Asteraceae with 10 species, followed by Amaranthaceae with 7, Labiateae and Papilionaceae with 6, Euphorbiaceae with 5, Verbenaceae with 4, Convolvulaceae Mimosaceae and Malvaceae with 3, Acanthaceae, Asclepiadaceae, Brassicaceae, Chenopodiaceae, Menispermaceae, Moraceae, Plantaginaceae, Polygonaceae, Scrophulariaceae Caesalpiniaceae and Tiliaceae with 2 species each and Aizoaceae, Amaranthaceae, Apocynaceae, Boraginaceae, Cactaceae, Cannabaceae, Caryophyllaceae, Celastraceae, Cuscutaceae, Fumariaceae, Geraniaceae, Moringaceae, Nyctaginaceae, Oxalidaceae, Primulaceae, Ranunculaceae, Rhamnaceae, Rubiaceae, Vitaceae and Zygophyllaceae each with 1 specie.

In Jatlán, a single plant is used to treat many diseases. For example *Achyranthes aspera* L. is laxative, useful in treatment of vomiting, bronchitis, piles and also used for treatment of heart diseases. *Cissapelos pariera* L. var. *hirsute* (DC.) Forman extract has ability to inhibit tumor growth and it also has diuretic activity, *Malvastrum coromandelianum* (L.) Garcke it is used to relieve pain and its decoction is muscle relaxant; *Ranunculus muricatus* L. is used for diseases of cattle's and also effective in cough and asthma, *Cocculus pendulus* (J.R.Forst. & G.Forst.) Diels is used against motion and dysentery and *Rumex dentatus* L. is diuretic and astringent. Some plants are only used as fodder for cattle, no other use has been recorded in study area for example, *Stellaria media* (L.) Vill. is only a fodder plant and some plants have other uses like handicrafts etc. this include *Saccharum bengalense* Retz. (Ajaib *et al.*, 2010).

Vegetation of study area is dominated by *Justicia adhatoda* L., which is found almost everywhere along road sides and in grazing lands. It is used for various purposes by local people e.g. leaves are used for ripening of Bananas. Leaves are boiled in water and feet are washed by this water which remove bad odor of feet. The plant is burned and its ash is used for asthma. Among trees the most dominant specie was *Butea monosperma* (Lam.) Taubert, which is called as chechra by the local people. Its wood is used for fuel by the inhabitants.

The present study revealed that local people used some plant species for single purpose e.g. *Amranthus spinosus* L. is only a medicinal plant and *Digera muricata* (L.) Mart. is only a fodder plant. The plants which are placed in single-usage category were divided into four groups which are medicinal, fodder, vegetable and fuel purpose plants. Some plants are used for two purposes by local people like *Fumaria indica* (Hausskn.) Pugsley is used for blood purification and for fodder. Two usage plants were divided into different categories which include Medicinal & Fodder, 11 species were placed in this category, Medicinal & Vegetable, it include 7 species, Medicinal and Fuel it has six species, Fodder & fuel includes 3 species, and Vegetable and fodder, Medicinal & Ornamental and Medicinal & handicrafts include 2 species each. Beside the single usage and two usage plants species, the local people used some plants species for multi-purpose. Some of important multi-usage plants include *Senegalia modesta* (Wall.) P. J. Hurter, *Vachellia nilotica* (L.) P. J. Hurter & Mabb and *Ficus palmata* Forssk. Similar reports are presented about these plants in District Kotli Azad Kashmir by Ajaib *et al.* 2014.

Conclusion

This study concludes that the investigated area host many endemic and endangered plant species, many of them are medicinally important. Indigenous knowledge is present in the study area and is practiced by hakims. This treasure of knowledge is transferred to these people from generation to generation by their forefathers. This treasure is in hazard and is being eroded by the modern generation because of lack of interest, lack of

knowledge and other short cuts in life. Even the educated modern generation is not aware of importance of plants. This treasure is needed to be conserved so that next generation can grow in well facilitated environment. The transition to sustainable reforestation should be as rapid as possible to allow the conservation of valuable medicinal plants. More research work is needed to be conducted on the area to conserve all the indigenous knowledge. Institutions with proper system on education of medicinal plants, their medicinal properties, chemical constituents, their action in curing the ailments and conservation strategies related to medicinal plants and indigenous knowledge should be introduced and promoted on national level.

References

- Ajaib, M. and Khan, Z. (2014b). Ethnobotanical Studies of Useful Trees of District Kotli, Azad Jammu and Kashmir. *Biologia (Pakistan)*, 60(1): 63-71.
- Ajaib, M. Khan, N. and Wahab, M., (2010). Ethnobotanical studies on useful shrubs of District Kotli, Azad Kashmir, Pakistan. *Pak. J. Bot.*, 42(3): 1407-1415.
- Ajaib, M. Khan, Q. and Khan, Z., (2013). A contribution to Ethnobotanical studies of some plants of Loralai district, Bolochistan. *Biologia (Pakistan)*, 59(2): 323-327.
- Ajaib, M., Haider, S.K. Zikrea, A. and Siddiqi, M.F., (2014a). Ethnobotanical studies of herbs of Agra Valley, Parachinar, Upper Kurram Agency, Pakistan. *Int. J. Biol. Biotech.*, 11(1): 71-83.
- Harshburger, J.W. (1896). Purpose of Ethnobotany. *Botanical Gazette*. 21: 146-154.
- Martin, J. (1995). Ethnobotany, A people and plants conservation Manual. Champa and Hall, London.
- Ishtiaq, M., Khan M.A. and Hanif, W. (2006). An ethnomedicinal inventory of plants used for family planning and sex diseases treatment in Samahni Valley, (A.K.) Pakistan, *Pak. J. Biol. Sci.*, 9(14): 2546-2555.
- Jabeen, N., Ajaib, M., Siddiqui, M.F., Ulfat, M. and Khan, B. 2015. A survey of ethnobotanically important plants of District Ghizer, Gilgit-Baltistan. *FUUAST J. Biol.*, 5(1): 153-160.
- Mehmood, A. R.A. Qreshi, A. Mahmood, Y. Sangi, H. Shaheen, I. Ahmed (2011). Ethnobotanical Survey of plants from District Bhimber Azad Kashmir, Pakistan. *JMPR*, 5(11): 2348-2360.
- Zareen, A., Khan, Z. and Ajaib, M. (2013). Ethnobotanical evaluation of the shrubs of Central Punjab, Pakistan. *Biologia (Pakistan)*, 59(1): 139-147.