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**Nazim Hassan**

Institute of Grassland Science, and  
Key Laboratory of Vegetation  
Ecology, Northeast Normal  
University, Changchun, Jilin,  
China

**Mohammad Nisar**

Department of Botany University  
of Malakand, Pakistan

**Saeed Ur Rehman Kakar**

Department of Botany, University  
of Balochistan, Quetta Pakistan

**Faiz Ul Hassan**

Veterinary Research and  
Diagnostic Laboratory, Balogram,  
Swat Pakistan

**Zhiwei Zhong**

Institute of Grassland Science, and  
Key Laboratory of Vegetation  
Ecology, Northeast Normal  
University, Changchun, Jilin,  
China

**LiYi Nong**

Institute of Grassland Science, and  
Key Laboratory of Vegetation  
Ecology, Northeast Normal  
University, Changchun, Jilin,  
China

**Mohammad Ijaz Khan**

Department of Botany University  
of Malakand, Pakistan

**Mohammad Shuaib**

School of Ecology and  
Environmental Science, Yunnan  
University, No.2 North Cuihu  
road, Kunming Yunnan, 650091,  
PR. China

**Deli Wang**

Institute of Grassland Science and  
Key Laboratory of Vegetation  
Ecology, Northeast Normal  
University, Changchun, Jilin,  
China

**Correspondence**

**Deli Wang**

Institute of Grassland Science  
and Key Laboratory of  
Vegetation Ecology, Northeast  
Normal University, Changchun,  
Jilin, China

## Determination of informant consensus factor of medicinal plants used as therapy in district Dir Lower Pakistan

**Nazim Hassan, Mohammad Nisar, Saeed Ur Rehman Kakar, Faiz Ul Hassan, Zhiwei Zhong, LiYi Nong, Mohammad Ijaz Khan, Mohammad Shuaib and Deli Wang**

### Abstract

The aim of this research was to identify and file Informant Consensus Factor of Medicinal Plants used as remedy in District Dir lower Northern Pakistan. Ethno medicinal information was achieved through semi structured interviewees and group discussions. The inhabitants use 52 medicinal plant species from 33 families for different health disorders. Family Lamiaceae (11.53%) was the most leading family. The mode of herbal formulation was mostly observed as crushed (38.46%) and decoction (30.76%). High fic value were observed for diuretic (0.96) and high FL value (100) for *Olea ferruginea*. DMR results showed high rank for *Olea ferruginea* (23). Among 51 informants male were (72.54%) and female (27.45%). Herbs were observed (69.23%), Shrubs (17.30%), trees (13.46%) and parts used as whole plant (53.84%), fruit (13.46%), seeds (11.53%), leaves (9.61%), bark (5.76%), roots (3.84%) and gum (1.92%). Medicinal flora was observed at the edge of extinction due to over grazing and unwise harvesting which needs proper protection. Furthermore, the study conducted to identify the most important medicinal plant species for further pharmacological activities

**Keywords:** Informant consensus factor, medicinal plants, diseases, conservation status, Dir Lower.

### 1. Introduction

Ethno botany is the relationships and dealings between peoples and plants with respect to their cultural values etc. Interactions and relationship between peoples and plants is different from place to place because of their relative importance, uses and different social, ethnic and cultural factors Cultural values of plant exploration plays a key role in pharmaceutical and nutritional industrial sectors [1]. The use of medicinal plant species for different purposes are in practice everywhere to justify their basic requirements of daily life like therapeutic and modern agents, to provide new active constituents for making modern and traditional medicines. Medicinal flora is under stress and extinction and there is a dire need for its conservation. In short at global level about 80% depends on old-style herbal system to cure their health disorders [2]. Due to shortage of doctor and Hakims in past the peoples used medicinal plant species for various diseases because such kind of medicines can be considered as having less side effects and can be easily obtainable. Unani system of herbal medicine has been observed in the remote areas of Pakistan [3]. It is essential to know about herbal medicines and its use. Plant species produce organic compound thus provide a source active chemicals used for medicinal purposes in the form of herbal medicines [4]. Medicinal Plants have been used throughout the world by human beings as a drug and remedies for the treatment of various diseases to treat since time immemorial [5]. About 0.259 million plant species of higher plants have been testified from all over the world [6] and out of these round about 53,000 plant species are used for disease treatment [7]. On the other hand about 80 % of world population use medicinal flora for their basic health care system because they are conveniently easily available and have less side effects as of the other pharmaceuticals substances [5]. Worldwide aromatic and medicinal plants worth was \$62 billion was recorded for the year 2002 in future its worth may reach \$5 trillion by 2050 [6]. Apart from agricultural reliance on crop plants, custom of taking wild plant species has not disappeared from the world, due to its nutritional value and curing health disorders [8] Edible plant species have an important socio-economic role as shelter, fibers, medicines, fuel, dyes, poisons, religious and cultural formalities.

About eighty percent population of the world take plants for their primary health care. Ethno botanical understanding illustrates traditional knowledge to create awareness in local populations [9].

In Pakistan approximately 50 % population is cured by 50,000 practitioners of traditional medicine. Pakistan has more than 6,000 species of higher plants, about 12% are used to cure different health disorders [10]. A huge number of medicinal plant species are found in some western and northern parts of Pakistan. Apart from local use collection they are transported to different parts of the country for manufacturing herbal medicines [11]. Herbal doctors (traditional practitioners) are giving health disorder coverage to seventy five percent population in and rural areas and villages. Traditional practitioners give herbal medicines for the treatments of various disease. The local peoples especially the elder peoples of these area also collect plant species to cure different

common diseases. Farmers, Local collectors and medicinal plant dealers get their financial support by selling plant species in different forms. Herbal markets in Pakistan have a good momentum in exports and imports of herbal material. The aim of the study was to identify, to know accurate application and how local peoples used medicinal plants to cure different health disorders and to verify the facts of ethno botany amongst the peoples.

## 2. Material and Methods

**2.1. Study Area:** The study area District Dir is located in the Khyber Pakhtunkhwa province of Pakistan located at 35° 50' & 34° 22' North and 71° 2' & 72° 3' East. The valley is surrounded by district Swat in the East, district Chitral in north-west, and Malakand Agency in the south. The district has 5284 sq. km area and 1.294 million populations [12].

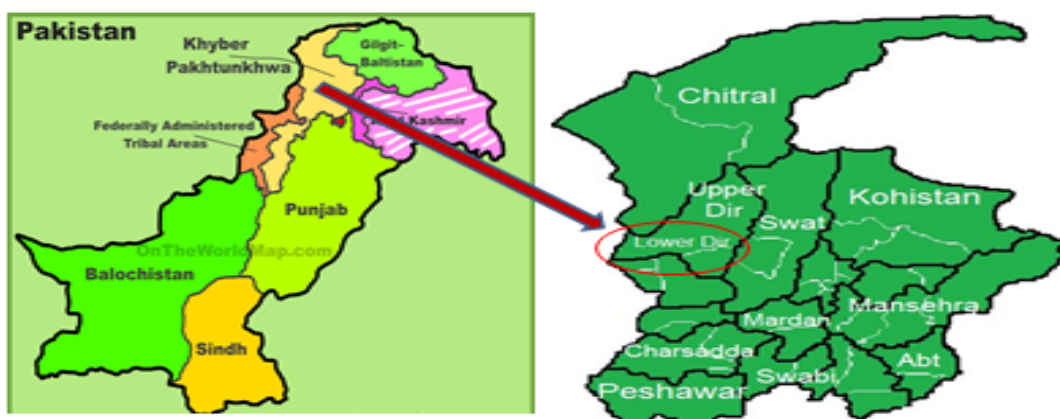


Fig 1: Map of study area (District Dir, Lower) Pakistan

## 2.2. Data Collection

Data was collected through semi structured interviews and group discussions by conducting seven plant collection trips from May 2014 to August 2015. Informants were knowledgeable elders and local authorities of the study area. Randomly selected 51 (37 men and 14 women) as key informants. The informers were local inhabitants of the area of different ages. Ethnobotanical survey was conducted to collect information on traditional plants use by the local healers for different health disorders in the district as done by [13]. A questionnaire was organized in English in which Key questions were local name, remedy preparation, types of disease cured, part used, form, sociocultural information and dose taken etc. Informations were collected in their local language Pashto in order to remove their hesitation and to get a comprehensive knowledge regarding plant species.

## 2.3. Herbarium Specimen preparation and identification

Plant specimens collected from locality were organized as complete herbarium specimen by passing the process of pressing, drying, poisoning, mounting and identification as per rules of herbaria. Used apparatus from collection up to preparation of complete herbarium specimen like, collecting bags, cutter, news halves, field presser, field notebook, hand lens, ethanol, mercuric chloride, pencil, cardboard, camera, hand Pruner, blotting paper, rope, GPS, No. tags and ethanol etc. Dried and poisoned plant specimens were mounted on herbarium sheets with glue and cloth tape. Identification was done from Herbarium University of Malakand Pakistan through taxonomist and flora of Pakistan [14]. Deposited it in Herbarium University of Malakand as future reference (Table.

1).

## 2.4. Data organization

The collected data was installed into Excel spreadsheet 2007 and summarized by statistical methods like percentage etc. Plant species were classified with respect to habit as herbs, shrubs and trees while part used as whole Plant, fruit, seed, leaves, bark and root. Disorders were categorized into 17 classes like diuretic, gastrointestinal, anti-diarrheal, antiasthmatic, astringent, antiseptic, purgative, laxative, pain Killer, tonic, ant diabetic, carminative, emetic, expectorant, flavoring agent, relaxant and sedative. Literacy level like (Illiterate, Secondary, Higher Secondary, Graduate), Professional level, Teacher, Farmers, Hakeem and nomads, House wives, Shopkeepers, Labors, Female and Male, age classes were the parts of the questionnaire designed.

## 2.5. Analysis

Informant Consensus Factor (Fic).

Factor informant consensus (Fic) was measured to study total usage of plant species according to culture applicability. Health disorders were categorized into groups like plant with high Fic value can be consider as more pharmacologically active as compared to low Fic value. High Fic value was observed as 0.96 for diuretic and gastrointestinal. Fic values will be high if maximum respondents acknowledge one or few plants to treat a specific disease [15]. Fic value can be calculated by the formula  $Fic = \frac{nur - nt}{nur - 1}$

Where Fic = informants consensus factor, nur = number of use citation, nt = number used species.

## 2.6. Fidelity Level (FL)

The plant species which were medicinally important used by the peoples of the locality had high Fidelity Level (FL) than those which were less important. To identify medicinally important plant species of the study area Fidelity Level (FL) was calculated. Aliments were grouped into different classes before computing Fidelity Level. Fidelity Level (FL) was calculated by using formula  $FL = Ip/Iu \times 100$ . Ip is respondents number used medicinal plants for a specific disease and Iu is the number of respondents used same plant for any disease [16].

## 2.7. Direct Matrix Ranking (DMR).

To identify multipurpose plant species of the locality DMR was calculated during informants were interviewed for values such as (5= best, 4= very good, 3= good, 2= less, 1= least used and 0= not used). The values calculated were ranked for each plant species.

## 3. Results and Discussion

### 3.1. Research survey

In current research survey a total of 52 medicinal plant species from 34 families were studied. Habit wise plant species were classified into herbs (69.23%), shrubs (17.30%) and trees (13.46%). Plant parts used, were observed as whole plant (53.84%), fruit (13.46%), seeds (11.53%), leaves (9.61%), bark (5.76%), roots (3.84%) and gum (1.92%). Lamiaceae (11.53%) was the most leading family (Table. 1). It was observed that local healers take herbs more than shrubs and trees to cure different kind of diseases; it may be due to their easy availability, collection, less side effects and abundance in the area. Results obtained are in close connection with ethno botanical survey surveys conducted in different area of the of country [5, 13, 17], where local peoples use mostly herbs than shrubs and trees for the preparation of ethno medicine belongs to family Lamiaceae, Euphorbiaceae, Rosaceae, Brassicaceae, Mimosaceae, Papilionaceae, Solanaceae, Asteraceae, Asparagaceae, Equecitaceae, Myrtinaceae, Papilionaceae, Malvaceae, Meliaceae and Rutaceae.

### 3.2. Common Ailments in the Study Area

The local inhabitants of the study area take 52 plant species for the treatment of various diseases were classified into 17 main disease classes were categorized into 17 classes like diuretic, gastrointestinal, anti-diarrheal, antiasthmatic, astringent, antiseptic, purgative, laxative, pain Killer, tonic, ant diabetic, carminative, emetic, expectorant, flavoring agent, relaxant and sedative. Plant species were used by the locals as diuretic (10), gastrointestinal (8), anti-diarrheal (7), antiasthmatic (4), Laxative (2), astringent (4), antiseptic (3), purgative (3), pain killer (2), tonic (2), antidiabetic, carminative, emetic, expectorant, flavoring agent, relaxant, sedative (1 each) see (Table 1.).

Current results are in connotation with other ethno botanical studies where the peoples use medicinal plant species as gastrointestinal, antiasthmatic, laxative, diuretic, expectorant and anti-diarrhoeal [18,19]. Top five Informant consensus results have declared high mark of consensus for laxative (0.98) followed by antiseptic (0.97), diuretic, gastrointestinal, tonic (0.96), antiasthmatic (0.95), anti-diarrheal (0.93). Plant species with high citation were diuretic (225), gastrointestinal (198) and anti-diarrheal (88) and lowest was recorded for sedative (6) (Table. 2). While high FL value (100) observed for *Olea ferruginea* and lowest (76) for *Cichorium intybus*

(Table.3). Plant species having high FL value needs further analysis to investigate bioactive compounds [20]. The peoples of the locality take more medicinal plants as diuretic, gastrointestinal and antiasthmatic which might be due to poverty, fuel smoke, un purified water and bad hygiene. It became obvious from values that above mentioned diseases are common in the area. Plant species with high pic values can be considered for high chemical constituents. The results are in connection with [21,22,23] who found that healers used plant species for different health at different ratios.

### 3.3. Preparation of ethno medicines

For the preparation of ethno medicines the local healer use whole Plant (53.84%), fruit (13.46%), seeds (11.53%), leaves (9.61%), bark (5.76%), roots (3.84%) and gum (1.92%) (Figure. 2). Out of total recipes preparation crushed form was observed (38.46%), decoction (30.76%), powder (11.53%), extract (9.61%) and Paste (9.61%) (Figure 3). The method of crushing and decoction of plant species for ethno medicines may be due to show good results as described by [24], that crushing, decoction, and grinding techniques are applied for active compounds extraction. The plant species were used as fresh, dried, mixed and in separate form. Our results are in association with [25-27]. Where the healers depends on herbal medicines passed through the process of crushing and decoction for quick results.

### 3.4. Route of Administration and Dosage

Route of administration for ethno medicines was mostly observed orally with additives like, sugar, milk, fruits water and desi ghee. There was not a proper dosage observed like modern medicines but were taking according to disorder and need. Ethno medicines were used with tea spoon and finger tips which passing from generation to generation. Some aged peoples were observed who used ethno medicines like barbris in crushed form for stomach disorder regularly. The results are in line with [28, 29] who observed same from different parts of Pakistan.

### 3.5. Plant status and (DMR)

To know the conservation status and stress degree of plant species DMR is considered as a good tool. Rank was observed high for *Olea ferruginea* (23) and lowest (09) for *Dedonea viscosa* (Table 4). Generally trees followed by shrubs and herbs were observed. They are under stress due to unsustainable and improper harvesting. The peoples used plant species as agricultural tools, fire wood, construction and fodder etc. and subject these plant species towards decline. Grazing was observed very common in the area. Our results are in connection with [30, 31], who described that peoples used plant species for their basic needs and medicinal value ultimately put pressure on biodiversity.

### 3.6. Gender, age classes, literacy level, and occupation

Out of 51 informants 37 were male (72.54%) and 14 were female (27.45%) (Table 5). Males were more knowledgeable than female. Age wise the informants were observed as above 45 years. According to literacy level illiterate (45.09%), teachers (14.03%), farmers (33.33%), hakeem and nomads (5.26%), house wives (11.76%) (Table 5). It was observed that literate people had less knowledge than that of illiterate peoples. The study is in connection with [32], who described ethno medicinal knowledge with respect to conservation status, age factor, literacy level and future planning.

**Table 1:** Medicinal plant species collected from study area with different aspects and its usage for different health disorders.

Botanical Name	Family	L. Name	Habit	Part Use	Medicinal Uses	Herbal formulation	Mode of application	Dosage/Day	V. Number
<i>Acacia farnesiana</i> L.	Mimosaceae	Vilayati Kikar	Tree	Bark	Antiseptic	Powder	External	Twice	H.UOM.BG.231
<i>Acacia nilotica</i> L.	Mimosaceae	Kikar	Tree	Bark	Anti-diarrhoeal	Powder	Oral	Twice	H.UOM.BG.232
<i>Ajuga bracteosa</i> Wall.	Lamiaceae	Tharkha Booti	Herb	Whole Plant	Diuretic	Decoction	Oral	Once	H.UOM.BG.233
<i>Berberis lyceum</i> Royle.	Berberidaceae	Kwaray	Shrub	Roots	Gastrointestinal	Powder	Oral	Twice	H.UOM.BG.234
<i>Boerhavia procumbens</i> B.	Nyctaginaceae	Baskapra	Herb	Whole Plant	Antiasthmatic	Decoction	Oral	Twice	H.UOM.BG.235
<i>Brassica campestris</i> L.	Brassicaceae	Sharsham	Herb	Seeds	Relaxant	Extract	External	Twice	H.UOM.BG.236
<i>Calotropis procera</i> W.	Campanulaceae	Spalmi	Shrub	Whole Plant	Antiasthmatic	Powder	Oral	Twice	H.UOM.BG.237
<i>Cannabis sativa</i> L.	Cannabinaceae	Bhang	Herb	Leaves	Pain Killer	Crushed	External	Thrice	H.UOM.BG.238
<i>Capsella bursa-pastoris</i> L.	Brassicaceae	Bambesa	Herb	Arial Parts	Anti-diarrhoeal	Decoction	Oral	Twice	H.UOM.BG.239
<i>Centaurea iberica</i> T.	Celastraceae	Kareza	Herb	Seeds	Gastrointestinal	Decoction	Oral	Twice	H.UOM.BG.240
<i>Chenopodium botrys</i> L.	Chenopodiaceae	Kharawa	Herb	Whole Plant	Laxative	Decoction	Oral	Twice	H.UOM.BG.241
<i>Chorozophora tinctoria</i> L.	Euphorbiaceae	Kuronda	Herb	Whole Plant	Emetic	Decoction	Oral	Once	H.UOM.BG.242
<i>Cichorium intybus</i> L.	Asteraceae	Han	Herb	Leaves	Antiasthmatic	Decoction	Oral	Twice	H.UOM.BG.243
<i>Convolvulus arvensis</i> (Linn.)	Convolvulaceae	Prewathkai	Herb	Whole Plant	Anti-diarrhoeal	Decoction	Oral	Twice	H.UOM.BG.244
<i>Cotoneaster microphyllus</i> W.	Rosaceae	Mamanra	Shrub	Fruit	Astringent	Extract	Oral	Once	H.UOM.BG.245
<i>Cymbopogon citrates</i> (DC.)	Poaceae	Lemon Grass	Grass	Leaves	Gastrointestinal	Decoction	Oral	Once	H.UOM.BG.246
<i>Daphne mucronata</i> Royle	Thymelaceae	lagonay	Shrub	Whole Plant	Gastrointestinal	Decoction	Oral	Twice	H.UOM.BG.247
<i>Dedonea viscosa</i> L.	Spindaceae	Ghwaraskay	Shrub	Seed	Astringent	Powder	Oral	Once	H.UOM.BG.248
<i>Datura innoxia</i> Mill.	Datisceae	Dathora	Herb	Seed	Sedative	Crushed	Oral	Once	H.UOM.BG.249
<i>Euphorbia helioscopia</i> Linn.	Euphorbiaceae	Mndano	Herb	Whole Plant	Anti-diarrhoeal	Crushed	Oral	Once	H.UOM.BG.250
<i>Euphorbia hirta</i> Linn.	Euphorbiaceae	Zmakin Ghoz	Herb	Whole Plant	Diuretic	Decoction	Oral	Once	H.UOM.BG.251
<i>Filago Hurdwarica</i> (Wall.)	Asteraceae	Khard Botay	Herb	Whole Plant	Expectorant	Decoction	Oral	Twice	H.UOM.BG.252
<i>Fumaria indica</i> (Hausskn.)	Fumaricaceae	Papra	Herb	Whole Plant	Antiasthmatic	Powder	Oral	Twice	H.UOM.BG.253
<i>Mentha arvensis</i> Linn.	Lamiaceae	Podina	Herb	Whole Plant	Gastrointestinal	Crushed	Oral	Twice	H.UOM.BG.254
<i>Mentha longifolia</i> L.	Lamiaceae	Welanay	Herb	Whole Plant	Gastrointestinal	Crushed	Oral	Twice	H.UOM.BG.255
<i>Morus alba</i> L.	Moraceae	Spin Tooth	Tree	Fruit	Tonic	Extract	Oral	Once	H.UOM.BG.256
<i>Morus nigra</i> L.	Moraceae	Thoor Tooth	Tree	Fruit	Tonic	Extract	Oral	Once	H.UOM.BG.257
<i>Nerium oleander</i> L.	Apocynaceae	Ghanderay	Shrub	Whole Plant	Diuretic	Crushed	Oral	Once	H.UOM.BG.258
<i>Olea ferruginea</i> Royle	Oleaceae	Khona	Tree	Fruit	Astringent	Extract	Oral	Once	H.UOM.BG.259
<i>Otostegia limbata</i> (Benth)	Lamiaceae	Spin Azghay	Shrub	Whole Plant	Antiseptic	Crushed	External	Twice	H.UOM.BG.260
<i>Oxalis corniculata</i> L.	Oxalidaceae	Zmakin Tharokay	Herb	Whole Plant	Gastrointestinal	Paste	Oral	Once	H.UOM.BG.261
<i>Physalis minima</i> L.	Solanaceae	Aknaj	Herb	Fruit	Diuretic	Crushed	Oral	Twice	H.UOM.BG.262
<i>Plantago lanceolata</i> Linn.	Plantaginaceae	Ghwa Jabai	Herb	Whole Plant	Purgative	Crushed	Oral	Twice	H.UOM.BG.263
<i>Platanus orientalis</i> L.	Platanaceae	Chinar	Tree	Bark	Anti-diarrhoeal	Crushed	Oral	Twice	H.UOM.BG.264
<i>Ricinus communis</i> L.	Euphorbiaceae	Arhanda	Shrub	Seeds	Purgative	Crushed	Oral	Twice	H.UOM.BG.265
<i>Rumex dentatus</i> L.	Polygonaceae	Shalkhay	Herb	Whole Plant	Astringent	Paste	Oral	Once	H.UOM.BG.266
<i>Rumex nepalensis</i> L.	Polygonaceae	Tharokay	Herb	Roots	Purgative	Paste	Oral	Once	H.UOM.BG.267
<i>Salvia moorcroftiana</i> L.	Lamiaceae	Khardag	Herb	Whole Plant	Pain Killer	Crushed	Oral	Twice	H.UOM.BG.268
<i>Solanum nigrum</i> Auct.	Solanaceae	Kamacho	Herb	Whole Plant	Laxative	Decoction	Oral	Twice	H.UOM.BG.269
<i>Solanum surattense</i> Burm f.	Solanaceae	Maraghonay	Herb	Whole Plant	Diuretic	Crushed	Oral	Once	H.UOM.BG.270
<i>Teucrium stocksianum</i> Boiss.	Lamiaceae	Khar batay	Herb	Whole Plant	Antidiabetic	Decoction	Oral	Twice	H.UOM.BG.271
<i>Tribulus terrestris</i> Linn.	Zygophyllaceae	Markundai	Herb	Fruit	Diuretic	Crushed	Oral	Once	H.UOM.BG.272
<i>Verbascum thapsus</i> L.	Scrophulariaceae	Khar Ghwag	Herb	Whole plant	Anti-diarrhoeal	Decoction	Oral	Twice	H.UOM.BG.273
<i>Xanthium strumarium</i> Linn.	Asteraceae	Gesh kay	Herb	Whole Plant	Diuretic	Crushed	Oral	Twice	H.UOM.BG.274
<i>Asparagus officinalis</i> L.	Asparagaceae	Tendoray	Herb	Leaves	Diuretics	Crushed	Oral	Twice	H.UOM.BG.275
<i>Equisetum arvense</i> L.	Equecitateae	Bandakay	Herb	whole plant	Gastrointestinal	Crushed	Oral	Twice	H.UOM.BG.276
<i>Eucalyptus lanceolata</i> L.	Myrtinaceae	Lachi	Herb	Gum	Antiseptic	Paste	Oral	Once	H.UOM.BG.277
<i>Lathyrus lyceum</i> L.	Papilionaceae	Kurkamanay	Herb	Whole Plant	Flavoring agent	Paste	Oral	Twice	H.UOM.BG.278
<i>Lipidum sativum</i> L.	Brassicaceae	Halam	Herb	Whole Plant	Diuretic	Crushed	Oral	Thrice	H.UOM.BG.279
<i>Malva sylvestris</i> Wall.	Malvaceae	Panerak	Herb	Whole Plant	Anti-diarrhoeal	Decoction	Oral	Once	H.UOM.BG.280
<i>Melia azedarach</i> L.	Meliaceae	Thorashandai	Tree	Fruit	Diuretics	Crushed	Oral	Twice	H.UOM.BG.281
<i>Zanthoxylum armatum</i> Dco.	Rutaceae	Dambara	Shrub	Seed	Carminative	Crushed	Oral	Twice	H.UOM.BG.282

**Table 2:** Fic values of traditional medicinal plants used as remedy in district Dir (L.)

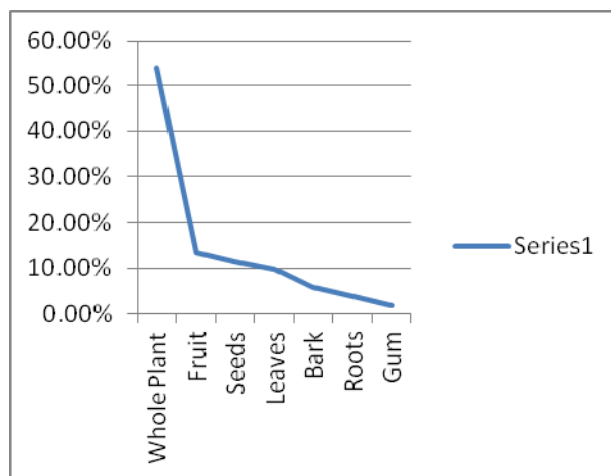
	Disease	Nt	Nur	Fic
1	Diuretic	10	225	0.96
2	Gastrointestinal	8	198	0.96
3	Anti-diarrhoeal	7	88	0.93
4	Antiasthmatic	4	57	0.95
5	Astringent	4	29	0.89
6	Antiseptic	3	75	0.97
7	Purgative	3	19	0.89
8	Laxative	2	65	0.98
9	Pain Killer	2	17	0.94
10	Tonic	2	24	0.96
11	Antidiabetic	1	14	1.00
12	Carminative	1	12	1.00
13	Emetic	1	8	1.00
14	Expectorant	1	11	1.00
15	Flavoring agent	1	9	1.00
16	Relaxant	1	7	1.00
17	Sedative	1	6	1.00

**Table 3:** FL values of frequently used traditional medicinal plants as remedy in district Dir (L.)

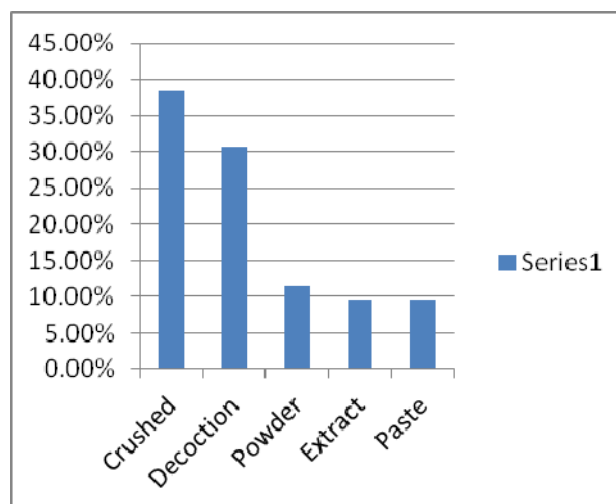
Botanical Name	Disorders	LP	LU	FL Value
<i>Olea ferruginea</i> Royle	Antiseptic	22	22	100
<i>Melia azedarach</i> L.	Anti-diarrhoeal	17	17	100
<i>Acacia farnesiana</i> . L.	Diuretic	15	15	100
<i>Zanthoxylum armatum</i> Dco.	Antiasthmatic	21	22	95.5
<i>Berberis lyceum</i> Royle.	Anti-diarrhoeal	23	25	92.0
<i>Dedonea viscosa</i> L.	Expectorant	15	17	88.2
<i>Mentha longifolia</i> L.	Gastrointestinal	22	25	88.0
<i>Plantago lanceolata</i> Linn.	Antiasthmatic	23	27	85.2
<i>Otostegia limbata</i> (Benth)	Pain Killer	10	12	83.3
<i>Fumaria indica</i> (Hauskn.)	Emetic	19	23	82.6
<i>Mentha arvensis</i> Linn.	Astringent	19	23	82.6
<i>Teucrium stocksianum</i> Boiss.	Astringent	14	17	82.4
<i>Malva salvestris</i> Wall.	Anti-diarrhoeal	9	11	81.8
<i>Lipidum sativum</i> L.	Sedative	7	9	77.8
<i>Cichorium intybus</i> L.	Diuretic	19	25	76.0

**Table 4:** DMR Score of most frequently used medicinal plants species

Botanical Name	Agriculture tools	Construction	Fodder	Fuel	Medicinal Value	Rank
<i>Olea ferruginea</i> Royle	4	4	5	5	5	23
<i>Melia azedarach</i> L.	5	5	3	5	5	23
<i>Acacia farnesiana</i> . L.	5	5	1	5	3	19
<i>Zanthoxylum armatum</i> Dco.	0	1	3	5	5	18
<i>Otostegia limbata</i> (Benth)	0	0	5	5	5	15
<i>Berberis lyceum</i> Royle.	0	0	4	5	5	14
<i>Fumaria indica</i> (Hauskn.)	0	0	5	1	5	11
<i>Plantago lanceolata</i> Linn.	0	0	5	1	5	11
<i>Mentha arvensis</i> Linn.	0	0	4	1	5	10
<i>Mentha longifolia</i> L.	0	0	4	1	5	10
<i>Teucrium stocksianum</i> Boiss.	0	0	4	1	5	10
<i>Lipidum sativum</i> L.	0	0	4	1	5	10
<i>Malva salvestris</i> Wall.	0	0	5	1	4	10
<i>Cichorium intybus</i> L.	0	0	3	1	5	9
<i>Dedonea viscosa</i> L.	0	0	0	5	4	9



**Fig 2:** Part used for preparation of ethno medicine.



**Fig 3:** Methods for preparation of ethno medicines

**Table 5:** Gender, age classes, literacy level, and occupation of peoples

Gender	Density	% Contribution
Male	37	72.54
Female	14	27.45
Age classes		
41-45	6	11.76
46-50	7	13.72
51-55	5	9.80
56-60	10	19.60
61-65	12	23.52
66-70	8	15.68
71-75	3	5.88
Literacy level		
Illiterate	23	45.09
Primary	15	29.41
Secondary	10	19.60
Graduate	3	5.88
Professional level		
House wives	6	11.76
Teacher	8	14.03
Shopkeepers	11	19.29
Farmers	19	33.33
Labors	4	7.01
Hakeem and nomads	3	5.26

## References

- Radio AH, Lozada M. Patterns of use and knowledge of wild edible plants in distinct ecological environments: a case study of a Mapuche community from northwestern Patagonia. *Biodivers. Conserv.* 200; 13(6):1153-1173.
- Hazrat A, Shah J, Nisar M. Medicinal Plants of Sheringal Valley, Dir Upper, Kpk, Pakistan. *Fuust J Biol.* 2011; 1(2):131-133
- Williams JT, Ahmad Z. Priorities for medicinal plants research and development in Pakistan, 1999.
- Bussmann RW, Sharon D. Traditional medicinal plant use in Northern Peru: tracking two thousand years of healing culture. *J Ethnobiol Ethnomed.* 2006; 2(1):47.
- Shinwari ZK. Medicinal plants research in Pakistan. *J. Med. Plants Res.* 2010; 4(3):161-176.
- Hamilton AC. Medicinal plants, conservation and livelihoods. *Biodivers. Conserv.* 2004; 13(8):1477-1517.
- Barkatullah B, Ibrar M. Plants profile of Malakand Pass Hills, District Malakand, Pakistan. 2011; 10(73):16521-16535.
- Heywood V, Skoula M. The medusa Network: Conservation and sustainable use of wild plants of the Mediterranean region. *New Crops and New Uses.* 1999, 148-151.
- Ibrar M, Hussain F, Sultan A. Ethnobotanical studies on plant resources of Ranyal hills, District Shangla, Pakistan. *Pak. J Bot.* 2007; 39(2):329.
- Shinwari ZK, Qaiser M. Efforts on conservation and sustainable use of medicinal plants of Pakistan. *Pak. J. Bot.* 2011; 43(1):5-10.
- Ali SI, Qaiser M. Flora of Botany Deptt. Uni. of Karachi. Karachi, 1995-2005.
- Hazrat A, Shah J, Ali M, Iqbal I. Medicinal value of Ranunculaceae of Dir valley. *Pak. J Bot.* 2007; 39(4):10-37.
- Shuaib M, Khan I, Sharifullah RK, Hashmatullah SM, Naz R. Ethnobotanical studies of spring flora of Dir Lower, Khyber Pakhtunkhwa, Pakistan. *Pak. J. Weed Sci. Res.* 2014; 20(1):37-49.
- Stewart RR. Check list of the plants of Swat State, Northwest Pakistan. publisher not identified, 1967.
- Canales M, Hernandez T, Caballero J, De Vivar AR, Avila G, Duran A *et al.* Informant consensus factor and antibacterial activity of the medicinal plants used by the people of San Rafael Coxcatlán, Puebla, México. *J. Ethno. Pharmacol.* 2005; 97(3):429-439.
- Khan I, AbdElsalam NM, Fouad H, Tariq A, Ullah R, Adnan M. Application of ethnobotanical indices on the use of traditional medicines against common diseases, 2014. Article ID 635371, 21.
- Hadi F, Razzaq A, Rahman A, Rashid A. Ethnobotanical Notes on woody Plants of Rech Valley, Torkhow, District Chitral, Hindu-Kush Range, Pakistan. *SJAS.* 2013; 3(11):468-472.
- Balemie K, Kelbessa E, Asfaw Z. Indigenous medicinal plant utilization, management and threats in Fentalle area, Eastern Shewa, Ethiopia. *Ethiop J bio Sci.* 2004; 3(1):37-58.
- Adnan SM, Ashiq AA, Abdul LK, Zabta KS. Threats to the sustainability of ethno-medicinal uses in northern Pakistan; a case history of Miandam valley, district Swat, NWFP, Pakistan. *Lyonia.* 2006; 11(2):91-100.
- Giday K, Lenaerts L, Gebrehiwot K, Yirga G, Verbist B, Muys B. Ethnobotanical study of medicinal plants from degraded dry afro-montane forest in northern Ethiopia: Species, uses and conservation challenges. *J Herb Med.* 2016; 6(2):96-104.
- Lulekal E, Asfaw Z, Kelbessa E, Van Damme P. Ethnomedicinal study of plants used for human ailments in Ankober District, North Shewa Zone, Amhara region, Ethiopia. *J Ethnobiol Ethnomed.* 2013; 9(1):63.
- Chin YW, BalunasMJ, Chai HB and Kinghorn AD. Drug discovery from natural sources. *AAPS journal,* 2006; 8(2):239-253.
- Hamayun M, Khan MA, Begum S. Marketing of medicinal plants of Utror-Gabral valleys, Swat, Pakistan. *Ethnobotanical Leaflets.* 2003; (1):13.
- Deeba F. Documentation of ethno veterinary practices in urban and peri-urban areas of Faisalabad, Pakistan [Ph.D. thesis], University of Agriculture, Faisalabad, Pakistan, 2009.
- Ali H, Sannai J, Sher H, Rashid A. Ethnobotanical profile of some plant resources in Malam Jabba valley of Swat, Pakistan. *J. Med. Plants Res.* 2011; 5(18):4676-4687.
- Khan SW, Khatoon S. Ethnobotanical studies on some useful herbs of Haramosh and Bugrote valleys in Gilgit, northern areas of Pakistan. *Pak. J Bot.* 2008; 40(1):43.
- Alamgeer TA, Rashid M, Malik MNH, Mushtaq MN. Ethnomedicinal Survey of plants of Valley Alladand Dehri, Tehsil Batkhela, District Malakand, Pakistan. *IJBMS.* 2013; 3(1):2049-4963
- Akhtar N, Rashid A, Murad W, Bergmeier E. Diversity and use of ethno-medicinal plants in the region of Swat, North Pakistan. 2013; 9(1):25.
- Hussain F, Shah SM, Sher H. Traditional resource evaluation of some plants of Mastuj, District Chitral, Pakistan. *Pak. J Bot.* 2007; 39(2):339-354
- Hazrat A, Shah J, Khan N. Medicinal plants of Timergara valley Dir, Pakistan. *Int. J. Biol. Biotechnol.* 2007; 4(2):249-251
- Razaq A, Rashid A, Ali H, Hamad H, Islam M. Ethnomedicinal potential of plants of Changa Valley district Shangla, Pakistan. *Pak. J. Bot.* 2010; 42:3463-3475.
- Panhwar AQ, Abro H. Ethno botanical studies of Mahal Kohis (Khirthar National Park)" *Pak. J Bot.* 2007; 39(7):2301-2315.