Volume 8, Issue 5, 2018, 3575 - 3582 **ISSN 2069-5837**

Biointerface Research in Applied Chemistry

www.BiointerfaceResearch.com

Original Research Article **Open Access Journal**

Received: 16.08.2018 / Revised: 27.09.2018 / Accepted: 03.10.2018 / Published on-line: 15.10.2018

Ethnobotanical study of medicinal plants used for primary health care in Shergarh, District Mardan, Pakistan

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ABSTRACT

The aim of this research work was to file medicinal uses of local medicinal plant species and to develop an ethnobotanical inventory of medicinal plants used by the inhabitants of Shergarh, Mardan district, Pakistan. Semi-structured interviews were conducted from 54 inhabitants of different ages (25 to 70 years). Analyzed the data using Informant consensus factor (ICF), Direct matrix ranking (DMR), Percentage and Fidelity level (FL) indices. Total of 61 plant species belonging to 35 families was interviewed. Family Asteraceae was the most leading family with 8 species (13%). The informant consensus factor (0.93) was noted high for antidiarrheal and lowest (0.63) for anthelmintic. Fidelity level was noted high (94.11%) for *Cannabis sativa* and lowest (56.52%) for *Fumaria indica*. High Direct matrix ranking was noted (22) for *Dalbergia sissoo* and lowest (7) for *Lepidium sativum*. Herbs (78.68%) were prominent for the preparation of ethnomedicines. Part used (54.10%) was observed as the whole plant. Crushing (52.46%) was the most prominent method for preparation of ethnomedicine with oral intake (91.80%). The dose of ethnomedicines (50.82%) was found high twice a day. The study highlighted that these medicinal plant species are under practice for children, mother, adult and aged people for primary health care. Medicinal plant species with high Informant consensus factor and fidelity level need further chemically and pharmacologically exploration for further drug discovery. Further in this study could be useful in biodiversity conservation.

Keywords: *Ethnomedicinal Survey, Traditional Knowledge, informant consensus factor, Shergarh Pakistan.*

1. INTRODUCTION

History of medicinal plants remained an essential part of the earliest civilizations because of the unavailability of doctors, therefore people used plants to cure different health disorders [1]. Ethnobotany is the interdisciplinary field of science which shields all kind of relations between people and plants including future planning [2]. Interactions between plants and people are different from region to region due to its relative importance regarding traditional understanding [3]. The accumulation of traditional knowledge of medicinal plant species has added many important drugs for the welfare of mankind [4]. Presently twenty-five percent of herbal medicines in modern pharmacopeia are plant-derived while numerous synthetic drugs are made by means of substances quarantined from plant species. It has already been observed that about 80% of the populations in emerging countries take traditional medicines for primary health care [5]. Even currently knowledgeable and aged people use plant-based medicines due to easy accessibility, fear side effects and they have noticed that medicinal company depend on elements taken from plants for manufacturing of English medicines [2,6]. According to different studies 442000 flowering plants have been acknowledged, out of these 50000 are used as herbal medicines whereas 5000 plants have been subjected to phytochemistry. Due to the high price of English medicines poor people use herbal medicines for the treatment of different health disorders throughout the globe [7,8].

In Pakistan, about six thousand (6000) plant species have been reported in which 500 plant species are in practice for the preparation of herbal medicines [9]. Apart from that three hundred and fifty (350) plants species are traded at a national and international level for vast income (billions of dollars) [10]. Whereas in mountainous areas eighty-four percent (84%) population depends on ethnomedicines for primary health care [11]. Due to rich plant diversity, ethnobotany is considered as a subject of interest in Pakistan. Many localities have already been surveyed for data collection and many of them are still under practice. Medicinal flora in different localities of Pakistan has been studied in Mansehra by [12] , Dir lower by [13] Kotli flora

by [14], Kurram by [15], Chitral by [16], Chail valley by [17] and Swat by [18].

Ethnobotanical surveys play a key role to save record regarding traditional herbal remedies and predict future planning for improvement. Due to advanced educational and technological systems, traditional knowledge has been exchanged with modern knowledge which needs proper documentation. The aim of the study was 1. To identify and document the important medicinal flora of Shergarh District Mardan, Pakistan; 2.To know traditional cures against different ailments, with preparation method, plant part usage, and application.

2. EXPERIMENTAL SECTION

Study Area. The study area "Shergarh" is situated in Mardan District, Khyber Pakhtunkhwa Pakistan. Its geographical coordinates are 34° 23' 27" North, 71° 53' 36" East (Fig. 1). The main crop is grown in Shergarh (District Mardan) is tobacco which is one of the income sources of farmers. The people are very hardworking and Pashto speakers. June and July are the hottest while January and February are the coldest months of the year. The climate of the area is semi-arid with 22.2^0C average temperature. The Annual averages precipitation is 559 mm. The driest month is October with 12 mm average rainfall, whereas August is the wettest month, with 122 mm an average precipitation.

Ethnobotanical data collection, Identification and Preservation. Collection trips, group discussions, semi-structured interviews were carried out to collect data on ethnomedicinal uses of plant species from 54 informants including male 36 (66.66%) and female 18 (33.33%) respondents of different age classes. In order to get comprehensive information data was collected in their own language (Pashto). Ethnobotanical data like local name, part use, preparation and application of ethnomedicine, route of administration and dosage per day was collected [8,13]. The collected plant species were confirmed through plant name index (http://www.ipni.org) and the plant list (www.theplantlist.org), [19]. The collected plants were classified into herbs, shrubs, and trees. Plants were identified through flora of Pakistan [20] and Herbarium Department of Botany at the University of Malakand Pakistan. The collected plant specimens were dried, poisoned and mounted over herbarium sheet and submitted to Herbarium Department of Botany University of Malakand Pakistan, for future reference [21].

Data Analysis. Data were installed into MS Excel spreadsheet 2007 for data analysis. Both percentage and descriptive statistics were applied.

Informant consensus factor (ICF). Informant consensus factor is widely used in quantitative ethnomedicinal studies. It is very useful to file consensus on- usages of medicinal plant species for a particular disease [22,23]. The Informant consensus factor can be calculated by the following formula.

$$ICF = \frac{nur - nt}{nur - 1}$$

Where "nur" is the number of use reports for each disease class while "nt" is the number of species used in that class. It ranges from "0" to "1", where high values specify a high degree of informant consensus of a plant species [24].

Fidelity level (FL). Fidelity level can be applied to choose best fit medicinal plant species to treat a particular disease [25, 26]. High FL value indicates a high occurrence of plant usages against a particular disease where the as low value indicates fewer usages against a particular disease. Fidelity level (FL)can be calculated by the formula

$$FL = \frac{Ip}{Iu} x100$$

Where "Ip" is the number of informants stated the usage of a plant species for a specific disease group whereas "Iu" is the number of informants mentioned usage for any other disease group [27,46].

Direct Matrix Ranking (DMR). Direct Matrix Ranking (DMR) was carried to rank and compare medicinal plant species based on data obtained from respondents. [28, 29].A total of 15experienced and practiced informants were selected for DMR data collection. Experienced informants were allowed for ranking like (0= Not used, 1 = Least used, 2 = Less used, 3 = Good, 4 = Very good, 5 = Best) to each plant species [30].

Figure 1. Map of the study area.

3. RESULTS SECTION

Demographic Data. In current research survey, 54 local informants were questioned for ethnobotanical data collection. Out of the total 36 (66.66%) comprising male and 18 (33.33%) female. All the Informants were categorized into three main groups age-

wise, 50-60 years (50%), 60-70 (29.62%) and 25-50 (20.37%). Mostly (57.40%) were illiterately followed by primary education (25.92%) and secondary education (16.66%). At professional level farmers (38.88%) were high followed by housewives (33.33%), teachers (14.81%), and shopkeeper (9.25%), Hakim (3.70%). Illiterates were noted highly knowledgeable as compared to educated ones. Hakeem had a very good knowledge of traditional medicines (Table 1). The same method was also used by [13] for demographic data scoring and observed Male (72.54%), Female (27.45%), Hakeem and Nomads (5.26%), Illiterate (45.09%), Teachers (14.03%), Housewives (11.76%) and Farmers (33.33%).

Table 1. Demographic data of informants in Shergarh District, Pakistan

Gender	Density	% Contribution
Male	36	66.66
Female	18	33.33
Age classes		
25-50	11	20.37
50-60	27	50.00
60-70	16	29.62
Literacy level		
Illiterate	31	57.40
Primary	14	25.92
Secondary	9	16.66
Professional level		
Housewives	18	33.33
Teacher	8	14.81
Shopkeepers	5	9.25
Farmers	21	38.88
Hakeem	2	3.70

Taxonomic classification and Plant Habit.

In a survey, a total of 61 plant species belonging to 35 families were documented. Family Asteraceae was the most leading family with 8 species (13%) followed by Solanaceae, Lamiaceae 5 species each (8%), Mimosaceae 4 species (7%), Poaceae, Chenopodiaceae, Brassicaceae 3 species (5%), Euphorbiaceae, Zygophylaceae 2 species (3%),whereas remaining families comprised only one plant species (Table 2,6). The huge number of plants from family Asteraceae is in agreement with [31,32] and from family Lamiaceae with (Hassan et al. 2017) where the local inhabitants use medicinal plant species from family Asteraceae and Lamiaceae for the preparation of ethnomedicines. The high number of medicinal plant species from family Asteraceae might be a duty to easy availability, high medicinal value, and wide distribution. Habit wise herbs (78.68%) were prominent for the preparation of ethnomedicines followed by trees (14.75%) and shrubs (6.55) (Fig. 2). The study is in agreement with [33]who observed in Tormik valley, Karakorum range, Pakistan where herbs (88 %) were broadly used for the preparation of herbal medicines followed by trees (8 %) and shrubs (4 %).

Table 3. Informant consensus factor (ICF) of important medicinal plant species against various disorders.

Disease	NT	NUR	FIC
Febrifuge	3	19	0.88
Pain killer	5	23	0.81
Asthmatic	4	36	0.91
Anthelmintic	6	18	0.63
Stimulant	8	33	0.78
Purgative	3	11	0.8
Laxative	5	14	0.69
Tonic	6	41	0.87
Antidiarrhoeal	4	47	0.93
Stomachic	10	49	0.75

Part used, preparation and application.

For ethno preparation, the inhabitants used whole plant (54.10%), leaf (11.48%), seed (9.84%), fruit (8.20%), aerial part (4.92%), root (3.28%) and tuber (1.64%) (Fig 3). Our findings are in close agreement with [34], where the local people use the whole plant (53.84%) for the preparation of herbal medicines. The use of the whole plant for ethnomedicines preparation might be due to save time and to get more and more chemicals constituents for good outcomes. For the preparation of ethnomedicines, the people of the study area use plant materials in crushed form (52.46%) followed by decoction, paste (11.48%), powder (9.84%) and oil (1.64%) (Fig. 4). Our study is in agreement with [35] who also observed the local people prepare ethnomedicines in crushed form.

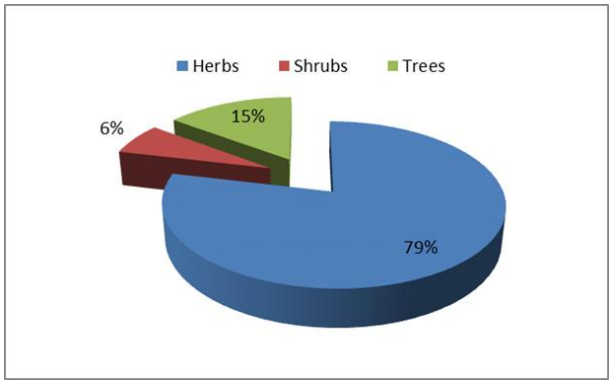

Figure 2. Plant habit of medicinal plant species.

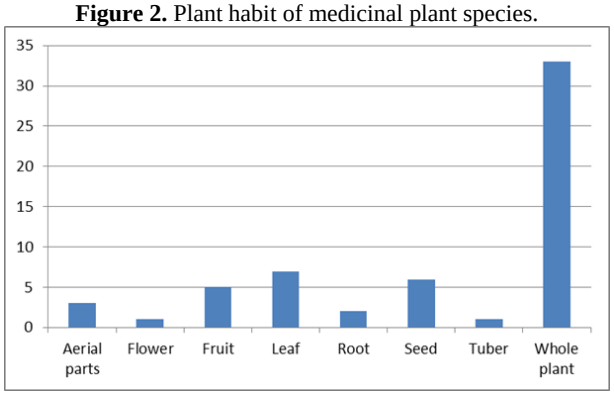

Figure 3. Part used of medicinal plant species.

Table 4. Highly utilized plant species along with Fidelity level and major disorders.

Plant	Disease	LP	LU	FL
***Ajuga bracteosa* W.**	Febrifuge	11	15	73.33
***Cannabis sativa* L.**	Painkiller	16	17	94.11
***Cichorium intybus* L.**	Asthmatic	9	19	47.36
***Fumaria indica* P.**	Anthelmintic	13	23	56.52
***Lepidium sativum* L.**	Stimulant	17	19	89.47
***Ricinus communis* L.**	Purgative	7	15	46.66
***Solanum nigrum* L.**	laxative	10	13	76.92
***Albizia lebbeck* B.**	Tonic	8	11	72.72
***Mentha longifolia* L.**	Antidiarrhoeal	19	21	90.47
***Acacia modesta* W.**	Stomachic	15	24	62.6

People of the study area take ethnomedicines mostly in a crushed form which might be due to make it more effective, get rid of the bad taste and to consume it easily. Ethno-medicines mostly have a very bitter and unpleasant taste therefore additive like sugar, salt, milk, water, honey etc. are mixed with ethnomedicines for good taste. The route of administration for ethnomedicines was generally oral intake (90.16%) followed by

(9.84%) dermal (Fig. 5). Doze taken of ethnomedicines was found high as twice a day (50.82%) followed by one (45.90%) and thrice (3.28%) (Fig 7). Our results are in close agreement with [36, 37] who also found in their studies that people took ethnomedicines orally with twice a day as compared to other routes.

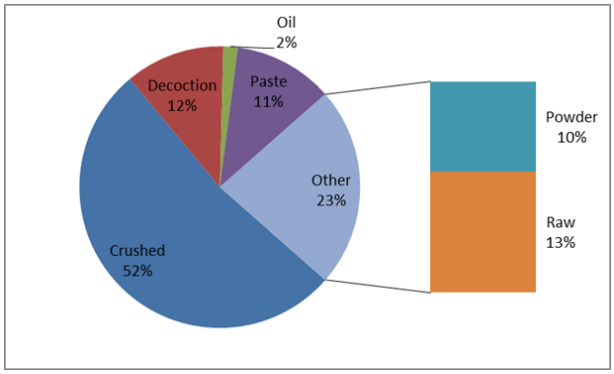

Figure 4. Method of preparation of Ethno medicines.

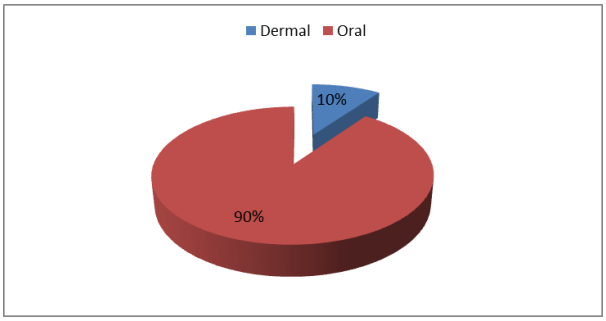

Figure 5. The route of administration of Ethno medicines.

Informant consensus factor (ICF) and Fidelity level (FL) and Data Matrix ranking (DMR).

For a selection of best fit medicinal plant species, informant consensus factor was applied. Informant consensus factor is a very good tool to choose best fit medicinal plant species for further phytochemical and pharmacological activity [29, 38]. For calculation of Informant consensus factor (ICF), ailments were categorized into different ailment groups like febrifuge, painkiller, asthmatic, anthelmintic, stimulant, purgative, laxative, tonic, antidiarrheal and stomachic. Informant consensus factor (0.93) was noted high for antidiarrheal whereas lowest (0.63) for anthelmintic (Table 3). In the present survey, mostly plant species were used as antidiarrheal, which might be due to bad hygiene and unpurified drinking water. Our study is in line with [13] who also found high Informant consensus factor, ICF (0.93) for antidiarrheal ailments in Dir district, Pakistan where ethnomedicines are taken as antidiarrheal and with [39, 50, 51] who observed (0.89) informant consensus factor as antidiarrheal in (Lakki Marwat , Dera Ismail Khan, Karak, Bannu, and Kohat) of Khyber Pakhtunkhwa, Pakistan. Fidelity level displays the percentage of informants appealing the consumption of definite plant species for the similar main purpose [8,40]. Fidelity level of different plant species has previously been detected for numerous ailments i.e. antimalarial by [41], purgative by [42], diabetic disorders by [43] and pain-killer by [44]. Fidelity level (FL) was observed for medicinal plant species from 94.11 to 56.52. Fidelity level was noted high (94.11) for *Cannabis sativa* as a painkiller and lowest (56.52) for *Fumaria indica* as anthelmintic (Table 4). Our results are in connection with [2] where local inhabitants in Miandam valley, Swat district, Khyber Pakhtunkhwa, Pakistan use *Cannabis sativa* as painkiller with fidelity level (FL) (69.23%), as narcotic (91.6%) in Hangu district , Pakistan by [30, 45, 46, 47], as febrifuge (24%) in District Forward Khahuta Azad Kashmir, Pakistan [45], and painkiller by [42] in Swat district, Pakistan. Direct Matrix Ranking (DMR) was carried to rank and compare medicinal plant species based on data obtained from respondents. [28, 29, 48, 49]. A total of 15 experienced and practiced informants were selected for DMR data collection. Experienced informants were allowed for ranking like (0 = Not used, 1 = Least used, 2 = Less used, 3 = Good, 4 = Very good, 5 = Best) to each plant species [30]. On the basis of DMR *Dalbergia sissoo* got a first rank (22) and lowest (7) by *Lepidium sativum* (Table 5).

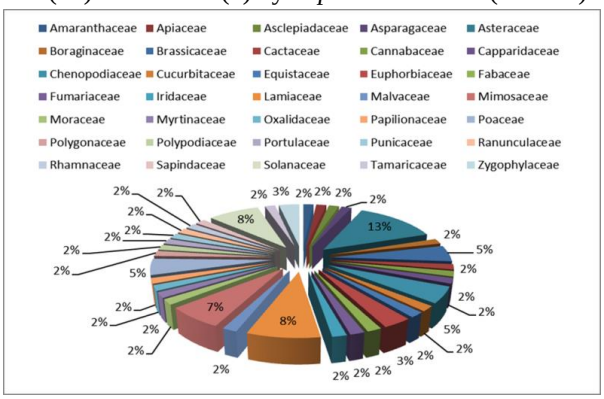

Figure 6. Plant Family Percentage.

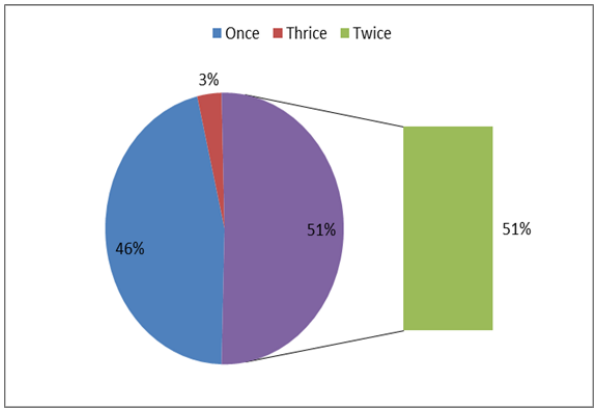

Figure 7. Doze taken of Ethno medicines.

Table 5. DMR Score of most frequently used medicinal plants species.

Plant	Agriculture tools	Construction	Fodder	Fuel	Medicinal Value	Rank
Dalbergia sissoo R.	5	4	4	5	4	22
Zizyphus mauritiana L.	4	4	3	5	4	20
Acacia modesta W.	5	4	3	5	3	19
Ficus palmata L.	2	2	3	5	4	16
Tamarix aphyla L.	0	0	3	5	5	13
Ricinus communies L.	0	0	3	5	4	12
Dodonaea viscosa L.	0	0	3	5	4	11
Canabis sativa L.	0	0	2	4	4	10
Menth longifolia L.	0	0	4	0	5	9
Lepidium sativum L.	0	0	3	0	4	7

Table 2. Ethnomedicinal plant species of Shergarh District, Mardan, Pakistan.

Botanical name	Family	Common Name	Habit	Part use	Medicinal Uses	Herbal Formulation	Mode	Dosage	V. Number
***Acacia modesta* W.**	Mimosaceae	Kekar	Tree	Bark	Painkiller, stomach problems, healing of wounds, tonic	Crushed	Oral	Once	H.UOM.BG.601
***Acacia nilotica* L.**	Mimosaceae	Palusa	Tree	Bark	Wound healing, anti diabetic,anti-diarrheal, Pain killer	Crushed	Oral	Twice	H.UOM.BG.602
***Adiantum capillus-veneris* L.**	Polypodiaceae	Sanra	Herb	Whole plant	Febrifuge,expectorant,emollient	Paste	Oral	Twice	H.UOM.BG.603
***Ajuga bracteosa* W.**	Lamiaceae	Boti	Herb	Whole plant	Hepatitis,tonic,diuretic,febrifuge,cardiac stimulant	Powder	Oral	Twice	H.UOM.BG.604
***Albizia lebbeck* B.**	Mimosaaceae	Sreekh	Tree	Whole plant	Curing piles, Blood clotting, tonic, seed are used as a diuretic	Crushed	Oral	Twice	H.UOM.BG.605
***Amranthus caudatus* L.**	Amaranthaceae	Chalwai	Herb	Whole plant	Blood purification, diuretic, abortifacient	Decoction	Oral	Twice	H.UOM.BG.606
***Asparagus gracilis* O.**	Asparagaceae	Tendoney	Herb	Young shoot	Diuretic and aphrodisiac	Crushed	Oral	Twice	H.UOM.BG.607
***Avena sativa* L.**	Poaceae	Jawder	Herb	Whole plant	Nerve tonic, stimulant, laxative, antiseptic	Crushed	Oral	Once	H.UOM.BG.608
***Barasica cumpestris* L.**	Brassicaceae	Sharsham	Herb	leaves	Hairs restorer, muscle relaxment, improve digestive disorders	Paste	Dermal	Once	H.UOM.BG.609
***Calendula arvensis* L.**	Asteraceae	Ziar guley	Herb	Flower	Facilitates healing of the wound, cure Hepatitis, antiseptic	Crushed	Dermal	Twice	H.UOM.BG.610
***Calotropis procera* A.**	Asclepiadaceae	Spalmay	Herb	Whole plant	Cold cough, asthma, dysentery, Diaphoretic and expectorant	Powder	Oral	Twice	H.UOM.BG.611
***Canabis sativa* L.**	Cannabaceae	Bhang	Herb	Leaves	Anti malaria, blood poisoning, anthrax, and dysentery, painkiller	Raw	Dermal	Twice	H.UOM.BG.612
***Capparis decidua* F.**	Capparidaceae	Khierla	Shrub	Whole plant	Laxative, diaphoretic, anthelmintic, fever and rheumatism	Powder	Oral	Once	H.UOM.BG.613
***Carthamus lanatus* L.**	Asteraceae	Poli	Herb	whole plant	Anthelmintic, diaphoretic, febrifuge	Crushed	Oral	Once	H.UOM.BG.614
***Carthamus oxycantha* L.**	Asteraceae	Kareza	Herb	Seeds	Dressing ulcers and against itch,	Powder	Dermal	Twice	H.UOM.BG.615
***Chenopodium album* L.**	Chenopodiaceae	Sarmey	Herb	Whole plant	Laxative, anthelmintic, diuretic, anti-Hepatic, blood cleaner.	Decoction	Oral	Once	H.UOM.BG.616
***Chenopodium ambrosioides* L.**	Chenopodiaceae	Kekarwanda	Herb	Whole plant	Cough, as a vermifuge, used in hepatitis and for piles.	Decoction	Oral	Once	H.UOM.BG.617
***Chrozophoran tinctoria* L.**	Euphorbiaceae	Rangaty	Herb	Whole plant	Emetic, cathartic	Crushed	Oral	Once	H.UOM.BG.618
***Cichorium intybus* L.**	Asteraceae	Khasni	Herb	Whole plant	Promote digestion, tonic, asthma and spleen enlargement.	Decoction	Oral	Twice	H.UOM.BG.619
***Cirsiun arvense* L.**	Chenopodiaceae	Ghana	Herb	Seeds	Increase sperms, ulcer and leukemia	Crushed	Oral	Once	H.UOM.BG.620
***Crocus sativus* L.**	Iridaceae	Zafran	Herb	Aerial parts	Stomachic,carminative,stimulant,asthma	Crushed	Oral	Twice	H.UOM.BG.621
***Cnicus benedictus* L.**	Asteraceae	Kindyari	Herb	Whole plant	Promote lactation, digestive complaints, astringent, Bitter	Crushed	Oral	Once	H.UOM.BG.622
***Cucurbita maxima* D.**	Cucurbitaceae	Kado	Herb	Fruit	diuretic,tonic,anthelmintic	Paste	Oral	Once	H.UOM.BG.623
***Cymbopogon citratus* D.**	Poaceae	Shinchay	Herb	Leaves	Herbal tea,relaxant,digestive disorders,weight loss	Raw	Oral	Twice	H.UOM.BG.624
***Dalbergia sissoo* R.**	Fabaceae	Shawa	Tree	Root	Stimulant, decoction as used in gonorrhea, blood purifier	Crushed	Oral	Once	H.UOM.BG.625
***Datura innoxia* M.**	Solanaceae	Bathora	Herb	seed	Toothache, headache, and epilepsy, swollen limbs	Crushed	Oral	Twice	H.UOM.BG.626
***Desmostachya bipinnata* L.**	Poaceae	Dela	Herb	tuber	Tuber oil is obtain used for hair fall, tonic, asthma	Oil	Oral	Twice	H.UOM.BG.627
***Dodonaea viscosa* L.**	Sapindaceae	Ghwaraskey	shrub	Leaves	Heal creak skin, wound, burns, and swelling,	Crushed	Dermal	Twice	H.UOM.BG.628
***Ehretia obtusifolia* H.**	Boraginaceae	Zwan mewa	Shrub	Root	Sore throat, pain killer, anti-inflammatory	Crushed	Oral	Twice	H.UOM.BG.629
***Equisetum arvensis* L.**	Equistaceae	Bandaky	Herb	Whole plant	Hair, bone and nail tonic and antilice, washing utensils	Powder	Dermal	Twice	H.UOM.BG.630
***Eucalyptus camaldulensis* L.**	Myrtinaceae	Lachi	Tree	Whole plant	Astringent, antiseptic, condiment	Crushed	Oral	Once	H.UOM.BG.631
***Euphorbia helioscopia* L.**	Euphorbiaceae	Mandano	Herb	Areal part	Cause allergy of the skin, causes skin scrofula, constipation	Crushed	Oral	Once	H.UOM.BG.632
***Fagonia cretica* L.**	Zygophylaceae	Azghakey	Herb	Whole plant	Purify blood, antipyretic, decrease the heat of blood	Crushed	Oral	Once	H.UOM.BG.633
***Ficus palmata* L.**	Moraceae	Enzar	Tree	Fruit	Laxative, asthama, sexual debility,	Raw	Oral	Twice	H.UOM.BG.634
***Fumaria indica* P.**	Fumariaceae	papra	Herb	Whole plant	Anthelmintic, diuretic, aperients, blood purification, constipation	Crushed	Oral	Once	H.UOM.BG.635
***Lactuca sativa* L.**	Asteraceae	Salad	Herb	Leaves	Antidiabetic, digestive disorders, reduce blood sugar	Raw	Oral	Twice	H.UOM.BG.636
***Lepidium sativum* L.**	Brassicaceae	Halam	Herb	Seeds	Stimulant,aphrodisiac,diuretic,	Raw	Oral	Once	H.UOM.BG.637
***Lathyrus aphaca* L.**	Papilionaceae	Kurkamanay	Herb	Seeds	Narcotic, the source of protein, edible	Raw	Oral	Once	H.UOM.BG.638
***Malva sylvestris* L.**	Malvaceae	Panerak	Herb	Whole plant	Mild purgative, emollient, demulcent, antiseptic	Decoction	Oral	Once	H.UOM.BG.639
***Menth longifolia* L.**	Lamiaceae	Enaly	Herb	Whole plant	Carminative, diarrhea,antiseptic, colic,stimulant	Crushed	Oral	Twice	H.UOM.BG.640

***Mentha paperata* L.**	Lamiaceae	Podina	Herb	Whole plant	Antispasmodic, laxative, carminative, stomachic, stimulant	Crushed	Oral	Twice	H.UOM.BG.641
***Mirabilis jalapa* L.**	Mimosaceae	Gula basi	Herb	leaves	Purgative, cathartic, emetic, ulcer	Crushed	Oral	Once	H.UOM.BG.642
***Nasturtium officinale* C.**	Brassicaceae	Tarmera	Herb	Whole plant	Tonic, painkiller, antiscorbic, diuretic; an expectorant or anemia	Decoction	Oral	Twice	H.UOM.BG.643
***Ocimun bascilicum* L.**	Lamiaceae	Khasmaly	Herb	Whole plant	Digestive, stimulant, carminative, diuretic, demulcent, dysentery	Crushed	Oral	Once	H.UOM.BG.644
***Oeanthe javanica* D.**	Apiaceae	Dopwot	Herb	Whole plant	Depurative, febrifuge, styptic, condiment	Crushed	Oral	Twice	H.UOM.BG.645
***Opentia dilleni* H.**	Cactaceae	Zuqam	Herb	Fruit	Diabetes, painkiller, increases sperms acnr rippning.	Raw	Oral	Once	H.UOM.BG.646
***Oxalis corniculata* L.**	Oxalidaceae	Threwaky	Herb	Whole plant	Cure scurvy, anti-ascorbic refrigerant, cooling and stomachic	Paste	Oral	Once	H.UOM.BG.647
***Parthenium hysterophorus* L.**	Asteraceae	Ganda boty	Herb	leaves	Skin inflammation, urinary tract infections, dysentery, malaria	Crushed	Oral	Once	H.UOM.BG.648
***Physalis minima* L.**	Solanaceae	Kakanj	Herb	Fruit	Diuretic, tonic, aperients, otitis	Crushed	Oral	Once	H.UOM.BG.649
***Punica granatum* L.**	Punicaceae	Anar	Tree	Fruit	Antidiarrhoeal, cardiac, digestive disorders, anthelmintic	Raw	Oral	Twice	H.UOM.BG.650
***Portulaca oleracea* L.**	Portulaceae	Kalpa sag	Herb	Whole plant	Demulcent, astringent,diuretic,refregerant	Paste	Oral	Once	H.UOM.BG.651
***Ranunculus muricatus* L.**	Ranunculaceae	Zair guly	Herb	whole plant	Intermittent fevers, gout, and asthma	Crushed	Oral	Twice	H.UOM.BG.652
Ricinus communies L.	Polygonaceae	Arhanda	Shurb	Seed	Purgative,counter irritant in scorpion sting, hair restorer	Powder	Oral	Once	H.UOM.BG.653
Salvia plebia R.	Lamiaceae	Gwamly	Herb	Shoot	Antimicrobial activity, diuretic, astringent, vermifuge,	Decoction	Oral	Once	H.UOM.BG.654
***Solanum nigrum* L.**	Solanaceae	Karhmacho	Herb	whole plant	Sedative, diuretic,expectorent, and lexative, purify blood	Paste	Oral	Twice	H.UOM.BG.655
***Solanum surattense* B.**	Solanaceae	Maraghoney	Herb	whole plant	Diuretic, cough, asthma, painkiller, rheumatism and gout	Paste	Oral	Thrice	H.UOM.BG.656
***Sonchus oleraceous* L.**	Asteraceae	Shawdapae	Herb	whole plant	Febrifuge, cathartic, stimulant	Crushed	Oral	Twice	H.UOM.BG.657
***Tamarix aphyla* L.**	Tamaricaceae	Ghaz	Tree	Bark	Astringent, bitter, healing of wounds,toothache	Crushed	Oral	Thrice	H.UOM.BG.658
***Tribulus terestris* L.**	Zygophylaceae	Markundae	Herb	Whole plant	Urinary disorders, cough, heart diseases, Increase sperms	Crushed	Oral	Twice	H.UOM.BG.659
***Withania somnifera* L.**	Solanaceae	Kotilal	Herb	Whole plant	Diuretic, narcotic, aphrodisiac, rheumatism, dyspepsia	Crushed	Oral	Twice	H.UOM.BG.660
***Zizyphus mauritiana* L.**	Rhamnaceae	Behra	Tree	Whole plant	Diarrhea, mucilaginous, pectoral, blood purification and digestion	Crushed	Oral	Twice	H.UOM.BG.661

4. CONCLUSIONS

The study area found rich in ethnomedicinal and commercially important plant species. The local inhabitants' specifically experienced and aged people taking ethnomedicines for the treatment of different health disorders although English medicines are reachable. The inhabitants claimed that they are using ethnomedicines since childhood like; heated leaves of *Cannabis sativa* are applied on crack bones to relieve pain, *Lepidium sativum* as a stimulant and *Mentha longifolia* as colic. Harvesting of medicinal plant species was found common in the locality as the inhabitants were observed unaware regarding sustainable use, preservation, and conservation. The inhabitants were willing to transfer traditional knowledge to investigators. The plant species with high fidelity level should be further analyzed for phytochemical investigations for novel drug discovery. Further exploration, conservation, awareness, Joint collaboration and wise use of plant resources are recommended.

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6. Acknowledgments

The authors are very thankful to Herbarium Department of Botany University of Malakand for Plant identification and to the people of the study area for sharing their traditional knowledge. This research work received no specific grant from any donor agency in the public, commercial, or not-for-profit sectors, and these organizations have had no involvement in the analysis and interpretation of data, in the writing of the draft, and in the decision to submit the article for publication.

Conflict of interest: All the authors have conflict of interest.