



Quantitative Ethnomedicinal study of the Flora of Tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan

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Ethnobotany Research and Applications 25:64 (2023) - <http://dx.doi.org/10.32859/era.25.64.1-21>

Manuscript received: 21/03/2023 – Revised manuscript received: 20/05/2023 - Published: 22/05/2023

Research

Abstract

Introduction: The current study expresses the folk knowledge of medicinal plants of the Flora of tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan. The presenting study for the first time provides a deep sight into folk medicinal knowledge of the study area through quantitative analysis.

Materials and Methods: The native knowledge of the medicinal plant has been documented with the help of the local people of the area through the interviews of the experts of the area and also used the questionnaire methods from January to December 2018.

Results: A total of 100 plants taxa belonging to 87 genera and 50 families were documented. In our findings, the Poaceae was the leading family with 8 taxa each (16%), while the Asteraceae and Euphorbiaceae were considered as the second leading families with 7 taxa each (28%) followed by third Solanaceae having 6 taxa with (12%). Amongst them 2 taxa were Pteridophytes, and 98 taxa were Angiosperms. Habit wise 76 taxa were herbs, while 13 taxa were shrubs, and 11 taxa were trees. Regarding the parts used whole plants were utilized with 43% dominantly. Regarding the quantitative analysis, the RFC ranged from 0.80 for *Peganum harmala* to 0.05 for *Cannabis sativa*, UV ranged from 0.21 for *Mentha longifolia* to 0.03 for *Ricinus communis*, ICF ranged from 0.66 for whooping cough to 0.77 for diabetes, while the highest FL was found for *Oxalis corniculata* (91.8), followed by *Fumaria indica* (91), and *Datura innoxia* (90). The highest rank order priority (ROP) was reported for *Otostegia limbata* (212.8), followed by *Lindenbergia indica* (205.2).

Conclusions: The diversity of medicinal plant taxa and their association with traditional knowledge has huge importance in primary healthcare systems. Most of the people in the study area were dependent on therapeutic taxa for the treatment of many disorders such as curing whooping cough, snake bite, anemia, psoriasis, and tooth decay.

Keywords: Ethnomedicinal, Traditional, Lahor, Swabi, Pakistan.

Background

Ethnomedicinal studies are very important to study the native knowledge of the local peoples of the area because they have a strong correlation with these medicinal plants (Jan *et al.* 2021b). The knowledge of native uses of plants for various medical purposes is transferred from one generation to another generation among different communities. Mostly the plant species are used for an ethnomedicinal purpose in hilly Northern, rural, and tribal residents of Pakistan (Butt *et al.* 2015; Abdin *et al.* 2022). The use of plants ethnomedicinally is getting the top point slowly in the developed world because the use of plants has a low ratio of side effects (Agbor & Naidoo 2016; Ahmad *et al.* 2021; Sher *et al.* 2022; Ullah *et al.* 2018).

The examination of traditional uses of medicinal plants provides a way that could lead to the novel discovery of new modern drugs (Estrada *et al.* 2014; Iftikhar *et al.* 2019). The old recipes of the medicinally important plant have been used for centuries ago in different communities around the world (Boesi 2014; Irfan *et al.* 2018f; Irfan *et al.* 2019; Asif *et al.* 2021).

Medicinal plants have certain active biochemical constituents and have proper physiological responses against certain ailments (Herndon *et al.* 2009; Ullah *et al.* 2014; Jan *et al.* 2021a; Musa *et al.* 2022). Due to the development in the field of modern medicines the application of plants for different disorders the petition for medicinal plants is becoming on the top day by day (Sher *et al.* 2011; Younis *et al.* 2018). In Pakistan still, the maximum population has the dependency on therapeutic potential plants for treating different sorts of disorders (Batool *et al.* 2017; Jan *et al.* 2022b; Sher *et al.* 2023). Recently the importance of medicinal plants are increasing day by day in Pakistan, that's why it urged us to identify them properly (Mahmood *et al.* 2013; Jan *et al.* 2020a). New species with highly medicinal importance have been added to the flora of Pakistan that can be used for the further extraction of phytochemicals and pharmacological activities (Ali *et al.* 2017).

The main aim of the study was to examine the native medicinal use plants by the resident people of the area. The obtained data were qualitatively analyzed the recipes of plants for effective action, their part uses, drugs formation, and carrier of recipes. Quantitatively the data was analyzed with various statistical indexes such as relative popularity level (RPL) which ranked the plants based on their popularity, and fidelity level (FL) which shows the disease specificity of specific plants. Also with that the Rink order priority (ROP) determined by the combination of fidelity and popularity, for the determination of particular plant usage. The Relative frequency citation (RFC) had performed. The informant's consensus factor (ICF) was performed for the determination and categorization of various ailments followed by the use values (UV) of each plant were also determined.

Materials and Methods

Study site

The study site is termed as "chota Lahor" in the list of tehsils in District Swabi, Khyber Pakhtunkhwa, Pakistan. The area is located at 34.0517°N and 72.3725°E with an elevation of ca. 308 meters. It is bounded by District Nowshera towards West side District Attock towards the South-Western side, tehsil Razar towards East side, and towards the West tehsil Swabi with the bank of River Indus is situated (Fig. 1). Its climate is extreme viz. temperature rise from May to September; June, July months are having the highest temperature in the area but the temperature become lowered in December, including the months of January and February (Murad *et al.* 2013; Irfan *et al.* 2018g) The major crops of the area are *Arachis hypogea*, *Allium sativa*, *Brassica campestris*, *Brassica napus*, *Cicer arietanum*, *Cucurbita maxima*, *Helianthus annuus*, *Hibiscus esculentus*, *Nicotiana rustica*, *Nicotiana tabacum*, *Oryza sativa*, *Phaseolus vulgaris*, *Saccharum officinarum*, *Triticum aestivum* and *Zea mays* (Akhtar *et al.* 2013; Jan *et al.* 2020b).

Plants having religious and spiritual belief

Some plants have great religious values that why peoples conserved them these plants are *Phoenix dactylofera*, *Ficus carica* and *Ziziphus jujube* etc. (Ullah *et al.* 2022a)

Wild plants used as food

The wild plants used as vegetables and majority of the people dependent on these plants. These plants were *Amaranthus viridis*, *Medicago denticulate*, *Rumix dentatus* and *Chenopodium album*, etc., (khan *et al.* 2023).

Reserved and protected areas plants

The graveyards were some places that is not interrupted by the local people (Ullah *et al.* 2022b).

Ornamental Plants

Some plants like *Jasminum officinale*, *Rosa indica*, *Mirabilis jalapa*, *Rosa sinesis* etc., were mostly used by the people for ornamental purposes (Rehman *et al.* 2023)

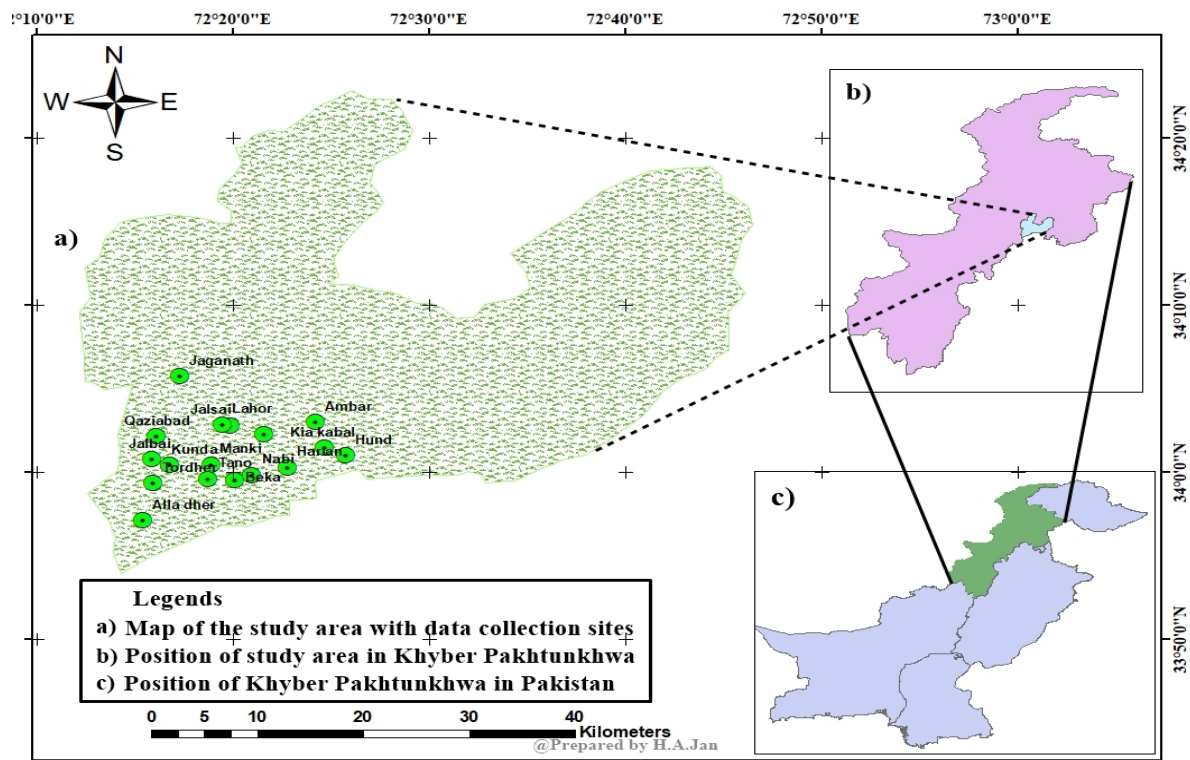


Figure 1. Map of Tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan

Data collection identification and preservation of plants species

The ethnomedicinal and traditional knowledge of the therapeutic taxa from different localities of studied area were collected with the help of the local residents. Initially available relevant literature of flora of Pakistan (Ali and Qaiser, 1993-2012) were studied, brief field visits for data collection were conducted from January to December 2018. The valuable native knowledge of therapeutic taxa was obtained through random interviews and questionnaires from the local people of study area similar to (Irfan *et al.* 2019). Elder peoples and hakims were given preference by asking questions about different plants parts application for the medication of particular disorders Elder person and local hakims were given preference by asking different question about different plants that how it is use for to treat a disease because they well known the best uses of plants species for different diseases. Names of the plants uses and other information will be documented by interviewing and questionnaire form filling (Ullah *et al.* 2022b) The actual medicinal plant was collected from various localities and preserved in dried form on the standard herbarium sheet with proper care according to (Irfan *et al.* 2018c), all specimen examined taxonomically for identification and also identified with relevant flora of (Ali and Qaiser, 1993-2012) and finally deposited to the herbarium for the future reference of (Abdul Wali khan university Mardan).

Quantitative Data Analysis

Informant consensus factor (ICF)

The ICF based index approached had analyzed with the help of informers of each taxon for various ailments. ICF was one of the informative indices which used the frequencies of informants for documenting the curing of various diseases. The index was approached according to (Heinrich *et al.* 1998) by using the given equation.

$$ICF = \frac{(Nur - Nt)}{Nur - 1}$$

"Nur" is indicating the frequency of the whole taxa reporting by informants for each class of diseases. And "Nt" is representing the total number of species in the reports.

Fidelity Level (FL)

The fidelity level indexed for the determination by informer who had mentioned the application of therapeutic taxa for a definite disease in the area. FL had calculated by the sum of the total frequencies of informants divided by the frequency of formants for specific diseases. The needed findings were calculated according to the given equation by (Ogeron *et al.* 2018) below.

$$L = \frac{Np}{N} \times 100$$

NP stands for the entire frequency of informer and N is indicating the total frequency of informants of plants used for specific ailments.

Use value (UV)

The index of (UV) determined for the indicating the vital significance of the uses of plant species. The approach of index analyzed by the below-given equation (Jan *et al.* 2021b).

$$UV = \frac{\sum U_i}{N_i}$$

UV representing the frequencies of individuals who had reported the use of plant, U_i is the frequencies of the recorded use of particular plant species, and "N" is indicating the overall frequency of informants.

Relative Frequency Citation (RFC)

The calculation of Relative Frequency based on citation performed for estimating the local vitality of each species. The index was calculated according to the equation of (Ali-Shtayeh *et al.* 2008) below.

$$RFC = \frac{FC}{N} (0 < RFC < 1)$$

Where FC is representing the frequency of informants reports about used of a particular taxon and "N" is the total frequency of informants for a specific plant species.

Relative Popularity Level (RPL)

The index of Relative popularity level of the data is used to estimate the ratio between the overall frequency of informants reported an exact ailment, and the overall frequency of disorders treated with specific plant species. The index was approached with previous examination of (Ali-Shtayeh *et al.* 2008) on the basis of popular and unpopular.

Rank Order Priority (ROP)

ROP originated index from the FL and RPL indexes, determined for the ranking of therapeutically vital plants. The calculation was performed based on the equation of (Rosero *et al.* 2018) below.

$$ROP = FL \times RPL$$

Results**Demographic Features of Informants**

During field walk majority of the people (37.5%) had family size 9-12 members. The lowest percentage was (12.5%) peoples where the respondents were small families comprising of 1-4 members. (18.75%) people respondents had family size between 5-8 members and (31.5%) had family size above than 12. 80 houses were selected for the study each had family members 9 and the total number of residents was 720. The population was involved in agriculture and rearing of livestock for their earnings were (37.5%) (22%) respectively while the percentage of government servants and labor were 15% and 22.5 % respectively (Table 1). It was well known fact that education level influences the efficiency of farmers in the use of natural resources. The techniques of the recent technologies adopted by educated farmers could high yield than those which were unaware of the recent technologies.

Table 1. Demographic features of the informants of Tehsil Lahor, District Swabi, Pakistan.

No. of family members	Frequency	Percent
1-4	10	12.5
5-8	15	18.75
9-12	30	37.5
>12	25	31.25
Total	80	100
Occupation	Frequency	Percent
Agriculture	30	37.5
Livestock	20	25
Government servant	12	15
Labors	18	22.5
Total	80	100
Education level	Frequency	Percent
Illiterate	40	50
Primary	20	25
Middle	15	18.75
Metric	5	6.25
Total	80	100
Who collects	Frequency	Percent
Children	14	17.5
Men	20	25
Woman	10	12.5
Children + Men	26	32.5
Total	80	100
Sources	Frequency	Percent
Forest	46	57.5
Farmland	18	22.5
Others	16	20
Total	80	100
Purpose	Frequency	Medicinal plants collection
Income generation	18	22.5
Self-consumption	35	43.75
Livestock treatment	22	27.5
Others	5	6.25
Total	80	100
Income	Frequency	Percent
1 – 100	28	35
101 – 200	26	32.5
201 – 300	16	20
> 300	10	12.5
Total	80	100
Expenditures in rupees	Frequency	Percent
101 – 200	42	52.5
201 – 400	18	22.5
401 – 600	15	18.5
> 600	5	6.2
Total	80	100
Cultivation	Frequency	Percent
No	70	87.5
Yes	10	12.5
Total	80	100

The data indicates that that majority of the (50%) people of sampled households were illiterate, while percentage of educated farmers up to primary, middle and metric levels were 25%, 18.75% and 6.25% respectively. Majority of medicinal plants were collected by men plus children's collectively whose percentage was 32.5% followed by men only 25%, by children's only 17.5% and the low percentage was 12.5% was done by women's. The majority of medicinal plants were collected from bottom hill plains which was non cultivated. The percentages of which was (57.5%) followed by farmland collections 22.5% and the low percentage was 20% were collected from forests due to overgrazing and deforestation. Majority of medicinal plants that were up to 43.75% were collected by people for self-consumptions 27% were collected for livestock while 22.5% for income and 6.25% for other purposes respectively. Regarding commercial importance of medicinal plants, the 35% of the people had low returns of 1 to 100 rupees per month while 32.5% earned 101 to 200 rupees per month. 20% population earned from 201 to 300 rupees per month while 12.5% population earned above 300 rupees. Research work on area revealed that 52.5% of population spent up to 200 on local purchase of allopathic medicines. 22.5% of population spent 201 – 400 rupees on purchase of allopathic medicines while 18.75% and 6.25% of the population spent from 401-600 and above 600 rupees respectively. The reason of not cultivating medicinal plants were less land holding size, lack of awareness, lack of identification, low prices and no local purchase (Table 1).

Diversity of medicinal Flora

In the current study, the quantitative ethnomedicinal and native uses of the 100 plants consisting of 87 genera and 50 families were documented from tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan. Amongst them the Poaceae was the leading family with 8 taxa each (16%), while the Asteraceae and Euphorbiaceae were considered as the second leading families with 7 plant taxa each (28%) followed by third Solanaceae having 6 taxa with (12%). In the remaining Amaranthaceae, Brassicaceae had 5 taxa each with (20%), Lamiaceae, Fabaceae, and Malvaceae with 4 taxa each (24%), Apocynaceae, Apiaceae, Cucurbitaceae, Nyctaginaceae, Polygonaceae, Verbenaceae, Papaveraceae, Pteridaceae, Rhamnaceae having 2 taxa each (36%), and Zygophyllaceae, Amaryllidaceae, Alliaceae, Acanthaceae, Aizoaceae, Boraginaceae, Caryophyllaceae, Caesalpiniaceae, Convolvulaceae, Cuscutaceae, Cyperaceae, Canabaceae, Asphodelaceae, Moraceae, Menispermaceae, Oleaceae, Oxalidaceae, Lythraceae, Plantaginaceae, Sapindaceae, Cannabaceae, Pedaliaceae, Nitrariaceae, Portulacaceae, Orobanchaceae, Scrophulariaceae, Rosaceae, Primulaceae, Rutaceae, Ranunculaceae, Vitaceae and Rubiaceae with one species each (64%) (Table 3).

In findings the two taxa were Pteridophytes while the remaining 98 taxa were Angiosperms; amongst Angiosperms 12 taxa were Monocotyledonous while 86 taxa were Dicotyledonous. In our findings the habit wise the 76 plant taxa were herbs while the 13 were shrubs and the trees was 11 documented. The plants taxa were normally used in the medication of diarrhea, asthma, diabetes, Hepatitis, stomach ulcer, Malaria and Arthritis (Table 3).

Regarding the parts mostly used leaves were utilized with 39% application, while whole plants were utilized with 30%, followed by seeds with 11%, fruits with 9%, Flowers with 5%, Roots with 4%, while gums were used 2% (Fig 2). The plants were used by the method of powdered drug and decoction of 22 taxa each, extraction of 17 taxa, infusion of 14 taxa, oil of 9 taxa, boiled form 6 taxa, and paste of 5 taxa, poultice form 3 taxa, juice and gums 2 taxa each were used to prepare different recipes for the effective curing of various disorders (Fig 3).

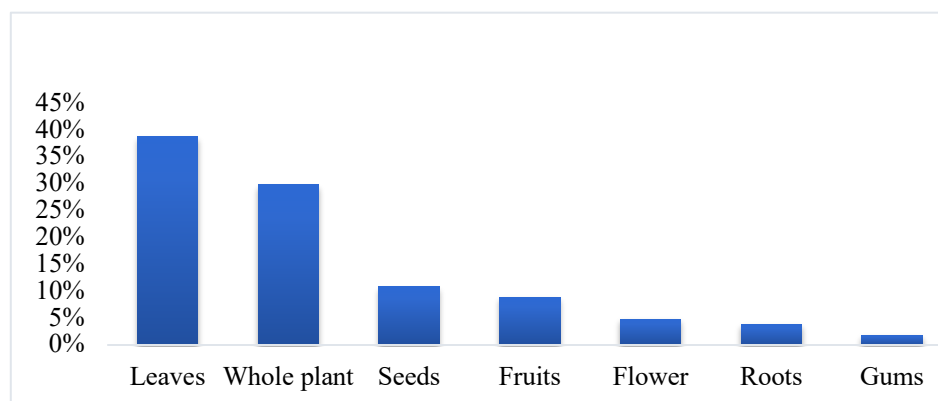


Figure 2. Percentage of part/s used of the Flora of Tehsil Lahor, District Swabi, Pakistan

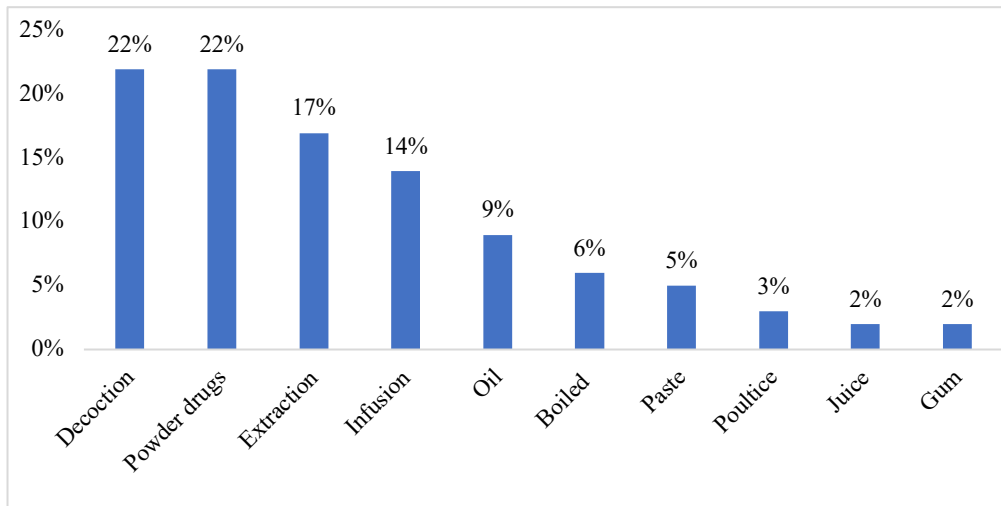


Figure 3. Percentage of different recipes used of the Flora of Tehsil Lahor, District Swabi, Pakistan

Quantitative analysis

Informant consensus factor (ICF)

The ICF index categorized the ailments based on the reports of informants. The highest ICF was reported for anthelmintics, arthritis, laxatives, mumps, measles, obesity, and scorpion bite with (1), cholera with (0.969), followed by epilepsy with (0.954), while the lowest ICF was reported for Snakebite, Jaundice each with (0.5), diuretic with (0.647), followed by constipation with (0.75) (Table 2).

Table 2. Informants consensus factors of major disorders in tehsil Lahor, District Swabi, Pakista

Name of ailments	Nt	Nur	Informant consensus factor
Anthelmintics	1	5	1
Arthritis	1	14	1
Asthma	16	46	0.666
Bronchitis	10	38	0.756
Osteomalacia	3	14	0.846
Cholera	2	34	0.969
Constipation	9	33	0.75
Dermatitis	4	37	0.916
Diarrhea	7	32	0.806
Diabetes	5	19	0.777
Diuretic	7	18	0.647
Dysentery	4	14	0.769
Emphysema	7	37	0.833
Epilepsy	2	23	0.954
Hepatitis	2	5	0.75
Infertility	3	15	0.857
Jaundice	2	3	0.5
Kidney stone	5	14	0.692
Laxative	1	5	1
Mumps	1	8	1
Malaria	2	12	0.909
Measles	1	4	1
Obesity	1	11	1
Piles	3	7	0.666
Snake bite	2	3	0.5
Stomach ulcer	7	24	0.739
Scorpion bite	1	58	1
Toothache	3	12	0.818
Whooping Cough	16	46	0.666

Relative frequency citation (RFC)

To predict the RFC-based approach was done on the citation which indicates the vital role of each plant specimen in the resident area. In the assessment the highest relative index of citation had resulted by the *Peganum harmella* with (0.80), and in the remaining *Ziziphus jujuba* with (0.79), *Ziziphus nummularia* with (0.76), *Verbascum thapsus* with (0.76), *Punica granatum* with (0.72), *Foeniculum vulgare* with (0.71), were documented. The lowest indexes had resulted to the *Adiantum incisum* and *Trianthema portulacastrum* with (0.07) each, *Adiantum capillus-veneris* with (0.06) followed by the owing of the bane of cultivation *Cannabis sativa* with (0.05) value (Table 3).

Use value (UV)

The use value of the selected data indicated the relative importance frequency and the traditional use of plants taxa in the study area. In the documented data the highest frequency was reported for the species *Mentha longifolia* with (0.21) value, in the rest of the data secondly highest value showed by *Artimesia scoparia* (0.18), the third highest index shown by *Otostegia limbata* with (0.17). in the remaining top taxa were *Dactyloctenium aegyptium*, *Emix spinosa*, *Mirabilis jalapa*, and *Ziziphus nummularia*, have (0.16) each, *Artemisia maritime*, *Verbascum Thapsus*, *Withania somnifera*, *Euphorbia hypericifolia* showed (0.15) each, *Carthamus oxyantha*, *Digitaria sanguinali*, *Medicago minima*, *Solanum nigrum*, *Brassica campestris*, *Mesopates orontium*, *Momordica balsamina* resulted (0.04) each, and *Ricinus communis* had resulted (0.03) value. (Table 3).

Fidelity level (FL)

The analysis of the FL indexes of all collected data was documented. In the represented data most significant plant species were reported between 33.3 and 91.8. In our assessed index represented data analysis is indicating the frequency for the specific ailments of the selected area and including the plant taxa which used by community for various disorder. In the collected data the topped ranked fidelity index was resulted to *Oxalis corniculata* (91.8), *Fumaria indica* (91.0), *Datura innoxia* (90.0), *Jasminium officinale* (89.9), *Chrozophora tinctoria* (89.9), *Emix spinosa* (88.8), *Cymbopogon citratus* (88.4), *Digera muricata* (87.21), *Cannabis sativa* (87.4), *Cyperus rotundus* (86.56) that used for fever, stomach bugs, whooping cough, stomach ulcer, toothache and diarrhea, while the lowest fidelity level was reported for *Ziziphus nummularia* (45.67), *Trianthema portulacastrum* (41.6), *Verbena officinalis* (33.3) and *Adiantum incisum* (7.58) respectively that were used for jaundice, obesity and urinary infections (Table 3).

Relative popularity level (RPL)

In the represented analysis the top 10 RPLs parameters were reported for *Ricinus communis* (1.32), followed by for *Tribulus terrestris* (1.25), *Vitex negundo* (1.19), *Ziziphus jujuba* (1.19), *Ranunculus sceleratus* (1.16), *Withania somnifera* (1.15), *Solanum surattense* (1.13), *Peganum harmala* (1.10) while the *Brassica campestris*, *Carthamus oxyacantha*, and *Prosopis juliflora* with (0.98) each, and *Verbena officinalis* reported with (0.97). According to the rules of the analysis those plant taxa which were reported with lowest numerals were considered in unpopular category, but it doesn't specify that these plants haven't the medicinal importance. In the data the unpopular 5 taxa were *Rosa indica* with (0.12), *Setaria glauca* and *Jasminum officinale* (0.13) each, *Cyperus rotundus* (0.16), *Conyza ambigua* and *Misopates orontium* (0.19) each, *Achyranthes aspera*, *Artemisia maritime*, and *Cordia myxa* with (0.21) resulted (Table 3).

Rank Order Priority (ROP)

The ROP index had calculated for categorizing the plants species using the RPL and FL indexes. The topped rank order priority (ROP) frequency resulted for *Peganum harmala* (164.7), *Dodonaea viscosa* (147.9), *Coronopus didymus* (144.5), *Asphodelus tenuifolius* (130.8), *Ricinus communis* (103.4) *Ranunculus sceleratus* (99.4), *Otostegia limbata* (92.7), *Withania somnifera* (92.0), *Punica granatum* (90.2), *Brassica campestris* (81.6), followed by the lowest parameters were indexed for *Adiantum incisum* (5.68), *Misopates orontium* (9.91), *Setaria glauca* (9.04), *Rosa indica* (10.1), *Jasminum officinale* (11.8) resulted respectively (Table 3).

Table 3. Ethnomedicinal uses of plants taxa of tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan

Botanical name	Family name	Local name	Habit	Part used	Disease treated	UV values	RFC values	FL values	RPL values	ROP values
<i>Justicia adhatoda</i> L.	Acanthaceae	Baikar	S	L	Paste of leaves used in curing of asthma and bronchitis.	0.19	0.12	51.1	0.95	48.54
<i>Trianthema portulacastrum</i> L.	Aizoaceae	Insit	H	Wp	Infusion of whole plant used for constipation and rheumatism.	0.02	0.07	50.85	0.67	34.0
<i>Allium sativum</i> L.	Alliaceae	Oga	H	Fr	Paste of fruit used for asthma, whooping cough and high blood pressure.	0.06	0.45	69.4	0.44	30.53
<i>Achyranthes aspera</i> L.	Amaranthaceae	Puthkanda	H	L	Decoction of leaves used for kidney stones, ulcer, chest pain and asthma.	0.12	0.19	57.4	0.21	12.05
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Gnar	H	L	Leaves extract is used for constipation and stomach ulcer.	0.05	0.35	80.0	0.34	27.2
<i>Amaranthus viridis</i> L.	Amaranthaceae	Ganhar	H	L	Leaves extract is used for softening of stomach, whooping cough, asthma and snake bite.	0.10	0.39	77.5	0.82	63.55
<i>Chenopodium album</i> L.	Amaranthaceae	Sarmy	H	S	Seeds powder is anthelmintics and soften the stools and expel it easily.	0.12	0.55	73.4	0.38	27.89
<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Lesua	H	Wp	Extract of whole plant used as antibacterial, antifungal infections and is also diuretic.	0.07	0.26	87.21	0.81	70.64
<i>Agave americana</i> L.	Amaryllidaceae	Kanwar panra	S	L	Leaves extract mixed with sugar is used for stomach ulcer and constipation.	0.07	0.21	86.1	0.50	43.05
<i>Ammi visnaga</i> (L.) Lam.	Apiaceae	Sperki	H	S	Seeds Powder orally with water is used for stomach ulcer.	0.06	0.29	81.1	0.89	72.17
<i>Foeniculum vulgare</i> Mill.	Apiaceae	Kaga	H	S	Seeds have minerals and fibers that are used as a carminative and a stimulant in powder form orally.	0.09	0.71	82.99	0.76	55.60
<i>Calotropis procera</i> (Aiton) R. Br.	Apocynaceae	Spulmai	S	L	Leaves in fresh grinded form used for curing of cholera, asthma and against snake bite in poultice form.	0.09	0.32	72.2	0.38	27.43
<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Madagascar or rose periwinkle	H	F	Decoctions of flowers have vinblastine and vincristine an anticancer agent.	0.08	0.61	83.3	0.42	34.98
<i>Asphodelus tenuifolius</i> Cav.	Asphodelaceae	Piaze	H	L	Leaves powder mixed with milk used for curing of piles and scorpion bite.	0.04	0.25	69.99	0.87	130.8

<i>Artemisia maritime</i> L.	Asteraceae	Tharkha	H	Wp	Whole plant powder is used to remove intestinal worms and for skin disorders.	0.15	0.25	74	0.21	15.54
<i>Artemisia scoparia</i> Waldst. & Kitam.	Asteraceae	Chaho	H	L	Decoction of leaves is used for cardiac problems and purgative.	0.18	0.45	54.76	0.82	44.90
<i>Carthamus oxyacantha</i> M.Bieb.	Asteraceae	Kareeza	H	S	Seeds powder orally with the carrier of warm milk is used as a tonic.	0.04	0.29	79.9	0.98	78.30
<i>Cirsium arvense</i> (L.) Scop	Asteraceae	creeping thistle	H	Wp	Whole plant extract used for chronic cough, bronchitis and wound healings.	0.06	0.16	68.75	0.45	30.93
<i>Conyza ambigua</i> DC.	Asteraceae	Horse weed	H	L	Decoction and infusion of leaves used to treat diarrhea, dysentery and diabetes.	0.12	0.26	73.99	0.19	14.05
<i>Erigeron Canadensis</i> L.	Asteraceae	Bambotakee	H	F	Infusion of dried flower used for gastric disorders and as a tonic.	0.06	0.56	76.90	0.56	43.06
<i>Sonchus asper</i> (L.) Hill	Asteraceae	Shoda pai	H	R	Roots decoction is effective in fever reducing body temperature.	0.08	0.41	78.32	0.23	18.0
<i>Cordia myxa</i> L.	Boraginaceae	Lasura	T	Fr	Decoction and infusion of fruits is used for knee problems.	0.07	0.61	80.7	0.21	16.94
<i>Brassica campestris</i> L.	Brassicaceae	Sharsham	H	S	Seed oil is used as a cooling agent and as an antimicrobial agent.	0.04	0.29	83.3	0.98	81.63
<i>Capsella bursa-pastoris</i> Moench.	Brassicaceae	Batwa boty	H	S	Seeds powder orally with water is used against varicose veins.	0.08	0.46	85.9	0.78	67.0
<i>Coronopus didymus</i> (L.) Sm.	Brassicaceae	Shanaghat	H	Wp	Decoction of whole plant used for bone fracture and fever.	0.08	0.41	86.57	0.67	144.5
<i>Nasturtium officinale</i> W.T. Aiton	Brassicaceae	Tirmera	H	L	Boiled leaves are eaten twice a day for increasing milk in breast.	0.05	0.32	78.89	0.59	46.5
<i>Sisymbrium irio</i> L.	Brassicaceae	Khoob kalan	H	Wp	Infusion of whole plant used to treat mumps, measles and face pimples.	0.09	0.31	79.4	0.58	46.05
<i>Cassia fistula</i> Schimp. ex Oliv.	Caesalpiniaceae	Amaltas	T	L	Decoction of leaves is used as a lubricant during deliveries.	0.09	0.41	70.0	0.53	37.1
<i>Cannabis sativa</i> L.	Canabaceae	Bhung	H	L	Paste of young leaves used as narcotic and laxative.	0.11	0.05	87.4	0.51	44.57
<i>Humulus scandens</i> (Lour.) Merr.	Cannabaceae	Japanese hops	H	Wp	Dried powder of whole plant used to reduce body heat, as a detoxifying agent and diuretic.	0.09	0.52	86.7	0.56	48.55
<i>Stellaria media</i> (L.) Cirillo	Caryophyllaceae	Chickweed	H	Wp	Extract of whole plant used to treat joints swelling and bones fracture.	0.07	0.38	77.55	0.49	37.9
<i>Convolvulus arvensis</i> L.	Convolvulaceae	Prewaty	H	Wp	The whole plant powder used to increase hunger in animals and for digestive problems in sheep.	0.10	0.31	75.3	0.80	60.24
<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Kurtamah	S	Fr	Fresh Fruits orally are used for constipation and liver cirrhosis.	0.05	0.38	77.6	0.47	36.47

<i>Momordica balsamina</i> L.	Cucurbitaceae	Jangali karela	H	Fr	Extract of fruit used for diabetes, obesity, gas trouble and constipation.	0.03	0.45	71.56	0.49	35.0
<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Akash Bail	H	Wp	Whole plant paste applied on hairs as an anti-dandruff agent.	0.04	0.46	56.68	0.45	25.50
<i>Cyperus rotundus</i> L.	Cyperaceae	Deela	H	Wp	Infusion of whole plant used to treat diarrhea and fever.	0.08	0.43	86.1	0.16	13.77
<i>Chrozophora tinctoria</i> (L.) A. Juss.	Euphorbiaceae	Neeli booti	H	L	Boiled leaves are used to relive chest infections and stomach ulcer.	0.04	0.68	89.7	0.83	74.4
<i>Euphorbia helioscopia</i> (Hurus.) Oudejans	Euphorbiaceae	Mandaro	H	R	Infusion of roots is purgative, relieves chronic cough and dysentery.	0.15	0.26	75.99	0.84	63.83
<i>Euphorbia hypericifolia</i> L.	Euphorbiaceae	Dhodwaki	H	Wp	Whole plant powder mixed with water orally used for the treatment of gastrointestinal disorders.	0.04	0.52	85.43	0.51	43.56
<i>Euphorbia pilulifera</i> L.	Euphorbiaceae	Shodapai	H	L	Juice of leaves used for curing asthma, constipation and cholera.	0.05	0.46	77.56	0.78	60.4
<i>Euphorbia prostrata</i> Aiton	Euphorbiaceae	Hazar dani	H	R	Roots powder used to relive stomach and cholic disorders.	0.11	0.36	69.89	0.45	31.45
<i>Phyllanthus fraternus</i> G.L.W ebster	Euphorbiaceae	Gulf leaf flower	H	Wp	Dried whole plant boiled in water used orally to treat jaundice and hepatitis.	0.09	0.31	76.66	0.92	70.4
<i>Ricinus communis</i> L.	Euphorbiaceae	Gadpana	S	L	Decoction of leaves is purgative, sedative also used for constipation.	0.03	0.25	78.35	1.32	103.4
<i>Acacia modesta</i> wall.	Fabaceae	Palosa	T	G	Gums used in powder form for binding of tablets in capsules covering also used as a tonic and against back pain.	0.10	0.46	67.6	0.56	37.8
<i>Acacia nilotica</i> (L.) Delile.	Fabaceae	Kikar	T	G	Gums in powder form used for binding of tablets in capsules covering also used as a tonic.	0.10	0.46	70.1	0.43	30.1
<i>Medicago minima</i> (L.) Grufberg	Fabaceae	Nari shpeshty	H	Wp	Powdered form of whole plant used to treat digestive and abdominal disorders.	0.04	0.46	72.5	0.22	15.95
<i>Prosopis juliflora</i> (Sw.) DC	Fabaceae	Masquit pod	S	L	Decoction of leaves used for kidney stones, toothache and asthma.	0.14	0.58	78.2	0.98	76.6
<i>Mentha arvensis</i> L.	Lamiaceae	Podina	H	L	Leaves boiled in water and mixed with green tea used to treat vomiting and nausea.	0.4	0.36	78.99	0.34	26.85
<i>Mentha longifolia</i> (L.) L	Lamiaceae	Velany	H	L	Dried leaves powder used as carminative and to prevent vomiting.	0.21	0.41	70.58	0.41	28.93
<i>Otostegia limbata</i> (Benth) Boiss.	Lamiaceae	Azghaky	S	L	Dried leaves used to treat mouth sore, throat pain and wound healings.	0.17	0.52	85.12	1.09	92.7
<i>Vitex negundo</i> L.	Lamiaceae	Marmandy	T	F	Extract of flowers used to reduce libido.	0.02	0.32	51.1	1.19	60.8

<i>Punica granatum</i> L.	Lythraceae	Anaar	T	Fr	Fruits enhanced blood secretion, used as blood purifier and as a tonic and demulcent.	0.07	0.72	84.34	1.07	90.2
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Gurhal	T	L	Extract of leaves used as a stimulant, heart burn, cough and sneezing.	0.09	0.39	70.7	0.23	16.26
<i>Malva neglecta</i> Wallr.	Malvaceae	Panarak	H	L	Decoction of leaves used in bronchitis, inflammation of bladder and constipation.	0.12	0.31	86.45	0.55	47.54
<i>Malva parviflora</i> L.	Malvaceae	sonchal	H	L	Decoction of leaves used for whooping cough, bronchitis, fever, constipation and throat pain.	0.09	0.35	80.7	0.87	70.20
<i>Malvastrum tricuspidatum</i> (W.T. Aiton) A. Gray	Malvaceae	Dhamnibuti	H	L	Extract of leaves used to treat asthma and diarrhea.	0.06	0.21	58.0	0.47	27.26
<i>Tinospora cordifolia</i> (Willd.) Miers	Menispermaceae	Gilo	H	Wp	Grinded powder of whole plant used to treat diabetes, cough cold and infertility.	0.07	0.42	41.6	0.41	17.0
<i>Ficus carica</i> L.	Moraceae	Inzar	T	Fr	Fruits are used as a tonic and for digestive problems.	0.08	0.32	66.6	0.51	33.96
<i>Peganum harmala</i> L.	Nitrariaceae	Spelani	H	S	Seeds powder mixed with water used for purification of blood.	0.05	0.80	82.77	1.10	164.7
<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Insut	H	L	Infusion of leaves is used as laxative and expectorant.	0.06	0.45	73.98	0.57	60.89
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Gulabasy	H	L	Fresh leaves poultice used for skin infections, warts and give freshness to skin.	0.16	0.46	66.6	0.67	44.6
<i>Jasminum officinale</i> L.	Oleaceae	Jasmine	H	L	Decoction of leaf used to treat fever and skin infections.	0.09	0.24	89.9	0.13	11.68
<i>Lindenbergia indica</i> (L.) Vatke	Orobanchaceae	pathar chatty	H	Wp	Extract of whole plant used for chronic bronchitis.	0.06	0.51	76.0	0.87	66.12
<i>Oxalis corniculata</i> L.	Oxalidaceae	Trewaky	H	Wp	Dried powder of whole plant is grinded used for curing of fever, cough, powder mixed with flour placed on bone fracture used as a poultice.	0.08	0.41	91.8	0.48	44.0
<i>Fumaria indica</i> L.	Papaveraceae	Shatara	H	Wp	Decoction of whole plant used to prevent ulcer and to treat fever.	0.04	0.45	91.0	0.69	62.79
<i>Papaver somniferum</i> L.	Papaveraceae	Doda	H	S	Seeds boiled in water used to relive severe pain.	0.08	0.39	75.6	0.23	17.3
<i>Sesamum indicum</i> L.	Pedaliaceae	Kunzale	H	S	Seeds oils used to prevent cancer, improves heart health, also used to treat male infertility.	0.12	0.47	83.87	0.78	65.4
<i>Misopates orontium</i> (L.) Raf.	Plantaginaceae	Bandaky	H	S	Paste of seeds used in the treatment of stomach ulcer.	0.03	0.66	52.2	0.19	9.91
<i>Cymbopogon citratus</i> (DC) Stapf	Poaceae	Lemon grass	H	L	Leaves used as teas, soup, curries, as pesticide and preservative.	0.05	0.62	88.4	0.71	62.76
<i>Dactyloctenium aegyptium</i> (L.) Willd.	Poaceae	Leawanee	H	Wp	The decoction of whole plant used for kidney stones and stomach ulcer.	0.16	0.65	81.2	0.38	30.85

<i>Desmostachya bipinnata</i> (L.) Stapf	Poaceae	Drab	H	Wp	Decoction of whole plant used to kill intestinal worms in animals.	0.06	0.22	74.66	0.83	61.96
<i>Dichanthium annulatum</i> (Forssk.) Stapf	Poaceae	Murghagha	H	Wp	Decoction of whole plant used for digestion and to treat diarrhea.	0.09	0.41	71.44	0.45	52.09
<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	Madhana	H	Wp	Whole plant decoction used to treat fever, dysentery and diabetes.	0.09	0.19	74.65	0.51	38.07
<i>Imperata cylindrica</i> (L.) P. Beauv.	Poaceae	Cogan grass	H	Wp	Decoction of whole plant used as a tonic and for healing of wounds.	0.07	0.42	77	0.67	51.59
<i>Setaria glauca</i> (L.) P.B eauv.	Poaceae	Bajra	H	L	Decoction of leaves used for wound healings, ring worm and as a hair tonic.	0.5	0.27	69.56	0.13	9.04
<i>Sorghum halepense</i> (L.) Pers.	Poaceae	Dadum	H	L	Decoction of leaves used for indigestion and cough.	0.09	0.18	74.87	0.41	30.6
<i>Emex spinosa</i> (L.) Campd.	Polygonaceae	Toothed dock	H	Wp	Extract of whole plant used to relieve stomach ulcer and colic disorders.	0.16	0.29	88.8	0.38	28.4
<i>Rumex crispus</i> L.	Polygonaceae	Curled dock	H	L	Leaves is best source of vitamin A, irritates urinary tract and increase the risk of developing kidney stone.	0.06	0.22	71.38	0.31	22.1
<i>Portulaca oleracea</i> L.	Portulacaceae	Verdolaga	H	Wp	Infusion of whole plant used for kidney disorders and anuria.	0.04	0.46	79.0	0.37	29.2
<i>Anagallis arvensis</i> L.	Primulaceae	Billi booti	H	L	Decoction of leaves used for skin infections, epilepsy and hepatitis.	0.09	0.21	69.9	0.67	46.83
<i>Adiantum capillus-veneris</i> L.	Pteridaceae	Shapozy	H	L	Infusion of leaves used as an expectorant and diuretic.	0.09	0.06	68.2	0.47	32.9
<i>Adiantum incisum</i> Forssk.	Pteridaceae	Shapogy	H	L	Infusion of leaves is used for curing of fever, whooping cough, diabetes and dermatitis.	0.08	0.07	7.58	0.75	5.68
<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Gui e Ashrafi	H	Wp	Whole plant powder used for asthma, fever and urinary infections.	0.04	0.38	85.7	1.16	99.4
<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Marhani	T	L	Extract of fresh leaves is drunk to stop diarrhea and purify the blood.	0.07	0.79	46.87	1.17	54.8
<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Rhamnaceae	Bera	T	L	Leaves are boiled in water and applied on hairs for long healthy and shining life.	0.16	0.76	45.67	0.89	40.6
<i>Rosa indica</i> L.	Rosaceae	Gulab	S	F	Three to four almonds and petals of flowers are mixed in cold milk and used for protection of heat stroke.	0.05	0.24	84.40	0.12	10.1
<i>Galium aparine</i> L.	Rubiaceae	Zag	H	Wp	Extract of whole plant used as diuretic and as a tonic.	0.11	0.35	73.6	0.50	36.08
<i>Citrus medica</i> L.	Rutaceae	Lambo	T	Fr	Infusion of fruits contains citric acid, used to remove prickles of face and for long growth of hairs.	0.11	0.45	65.2	0.50	32.6

<i>Dodonaea viscosa</i> (L.) Jacq.	Sapindaceae	Ghurasky	S	L	Leaf infusion is used for gas trouble and it is laxative.	0.12	0.46	75.5	0.69	147.9
<i>Verbascum Thapsus</i> L.	Scrophulariaceae	Khardag	H	L	Leaves in poultice form applied on skin infections.	0.15	0.76	33.3	0.42	13.9
<i>Datura innoxia</i> Mill.	Solanaceae	Batura	H	L	Leaves fresh extract used for epilepsy and toothache.	0.08	0.56	82.3	0.67	55.1
<i>Datura stramonium</i> L.	Solanaceae	Batura	S	S	Seeds contain alkaloids that are used to relive body pain orally with sugar.	0.05	0.36	90.0	0.56	50.4
<i>Solanum nigrum</i> L.	Solanaceae	Kachmacho	H	L	The juice of the leaves is sedative, diuretic and expectorant.	0.05	0.21	71.4	0.89	63.5
<i>Solanum surattense</i> Burm. f.	Solanaceae	Maraghoni	H	Wp	Infusion of whole plant used for curing of cough, cold, asthma and respiratory problems.	0.12	0.26	66.9	1.13	75.5
<i>Solanum xanthocarpum</i> Schrad. & J.C. Wendl.	Solanaceae	Kantkari	H	Fr	Dried fruits berries used in curing of diabetes, sore throat and dental infections.	0.06	0.65	84.67	0.56	47.4
<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Koti lal	S	Wp	Powder of whole plant is used to treat swellings of testes and kidney stones.	0.15	0.46	80.0	1.15	92.0
<i>Lantana camara</i> L.	Verbenaceae	Sage guli	S	F	Extract of flowers used for headache, ring worm, cold and cough.	0.07	0.22	81.89	0.47	38.48
<i>Verbena officinalis</i> L.	Verbenaceae	Shamaky	H	Wp	Whole plant powder with water orally was used for fever.	0.05	0.54	78.2	0.97	75.8
<i>Vitis vinifera</i> L.	Vitaceae	Angoor	S	Fr	Extract of fruits used as a general tonic, laxative and excrete urine.	0.05	0.30	76.54	0.93	71.1
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Markundi	H	R	Roots powder used for urinary tract infections, dysentery, diarrhea and irregular menstruation.	0.09	0.66	48.9	1.25	61.1

Legend: T: Tree, H: herb, S: shrub, F: flower, Fr: Fruit, L: leaves, R: roots, S: seed, Wp: whole plant

Discussion

The first documented and primary report on the based on statistical quantitative analysis of therapeutic and native uses of the Flora of tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan. The findings had 100 medicinal plants distributed in 87 genera and 50 families, and Habit wise 76 taxa were herbs recorded as dominant with a previous same assessment of (Jan *et al.* 2021a-2022a) followed by 13 taxa were shrubs and 11 taxa were trees documented. In our findings, the application of whole plant as part use showed dominancy, and the same correlated result were previously explored (Mir *et al.* 2021; Rehman *et al.* 2023). Amongst the collection the Poaceae was the leading family with 8 taxa each (16%), while the Asteraceae and Euphorbiaceae were considered as the second leading families with 7 plant taxa each (28%) followed by third Solanaceae having 6 taxa with (12%) due the well climatic adaptation of these families in study area (Mussarat *et al.* 2014). Also with that ferns and gymnosperms also becoming famous due to their active potential in medication (Sher *et al.* 2023).

The preparation of recipes for the purpose use and also preparation of decoction and infusion of plants is the best way is reported for the uses of plants in the ethnopharmacological studies from other parts and similarly supported work had done by the (Hassan *et al.* 2022; Bussmann 2006; Mir *et al.* 2022a). In our findings the use of medicinal plants is usually homemade based remedies and usually these remedies were used for effective work against a disease, and the correlation of our work was similar to the previous work of (Majeed *et al.* 2021; Arshad *et al.* 2022; Mir *et al.* 2022b). Our work providing a first sight in the study area, and according to (Arif *et al.* 2021; Arshad *et al.* 2022) previously maximum studied does not represented the statistical aspects for medicinal plants. Also with us, it is vital for the international people to realize the main problem of local communities with the advanced technologies to realize the main aim of the uses natural resources of people and also provided the access to these technologies to them (Irfan *et al.* 2017).

Such a similar maximum assessment had previously been suggested the method of preparation of specific medicines by various people from Pakistan such as (Mussarat *et al.* 2014; Adnan *et al.* 2015; Irfan *et al.* 2021), even though other countries also suggested the method of preparation according to (Orech *et al.* 2007) also with that the whole plant utilization having the same resulted correlation with the (Irfan *et al.* 2018a). The local people and Hakeem are using various carriers of recipes for easily orally taking drugs such as adding warm milk and boiled water etc. In our findings, the large-scale uses of decoction and powder from had compared to the study of (Farooq *et al.* 2019; Yebouk *et al.* 2020) they reported the most common utilization of decoction and powder for effective work.

The same method of preparation had been reported by the residents of Gujranwala about the decoction of leaves by the resulting boiling which prevents the body pain (Abbas *et al.* 2017; Zahoor *et al.* 2017).

The preparation of decoction and recipes is the basic way for the effective use of drugs in the field of traditional uses, to prepare a decoction for the healing system is vital to make it with water, tea, or soup for effective work (Khan *et al.* 2014; Gidey *et al.* 2015; wali *et al.* 2019). Although the preparation of decoction performed in boiled water even the water volume reduces from its original volume whereas a layer is formed of crude quotation obtained by squeezing plant contents (Aziz *et al.* 2018; Younis *et al.* 2018; Irfan *et al.* 2018b; wali *et al.* 2021). As regard up till now, various methods had mentioned for therapeutic dose taking, and more than half 55% of doses are taken orally, typically the 15% with an external application, 3% applying off in drops level in the eyes. These application findings had mentioned earlier by the reports of (Haq *et al.* 2011; Bhatia *et al.* 2018; Rashid *et al.* 2022).

In the documented data the species were having highest informant consensus factor (ICF) was represented for cholera (0.969), and then for epilepsy calculated (0.954) and for skin problem is (0.916). The lowest categories of (ICF) does not specify that they are not vital for curing the various disease but it is due to the less uses' reports by the people of resident area (Hussain *et al.* 2018; Irfan *et al.* 2021).

The species with top ranked relative frequency citation was represented for *Peganum harmella* was calculated (0.80), and for *Ziziphus jujuba* the calculated value was (0.79), in addition the second top value for *Ziziphus nummularia* was represented (0.76), in the remaining the data the species *Verbascum Thapsus* was resulted with (0.76), and the *Punica granatum* was (0.72), also with that *Foeniculum vulgare* calculated value was (0.71). The lowest value of use index couldn't be underestimated, these specimens also have used the local residents base approaches (Bano *et al.* 2014; Ijaz *et al.* 2016; Ouelbani *et al.* 2018).

In the analysis based on use value were reported for *Mentha longifolia* was in top ranked value (0.21), the second largest calculated value was having the species *Artimesia scoparia* with (0.18), the third one was *Otostegia limbata* with calculated value (0.17). In the rest of the taxa the four taxa the *Dactyloctenium aegyptium*, *Emix spinosa*, *Mirabilis jalapa* and *Ziziphus nummularia* with resulted (0.16) each, also with that *Artemisia maritime*, *Verbascum Thapsus*, *Euphorbia helioscopia*, *Withania somnifera* resulted with (0.15) each. The plants taxa that were not investigated in the past that have maximum use value should be assessed to investigated for phytochemical screening and pharmacogolocial activities that can lead to drug discovery (Ahmed *et al.* 2015; Ahmad *et al.* 2016; jan *et al.* 2017; irfan *et al.* 2018e).

In the approached of the fidelity level was reported for all taxa. Among them the species *Oxalis corniculata* represented with (91.8), and the second high calculated value was documented for *Fumaria indica* (91), and the third were *Datura innoxia* with (90) calculated value. The approached of fidelity level (FL) specifies the best curing ability of plant taxa against various specific disorder and having similarities with previous work of (Giday *et al.* 2003; jan *et al.* 2022a; Mir *et al.* 2022c).

The highest relative popularity level (RPL) for *Tribulus terrestris* (1.25), *Vitex negundo* (1.19), *Ziziphus jujuba* (1.19), *Ranunculus sceleratus* (1.16), *Withania somnifera* (1.15), *Solanum surattense* (1.13), *Peganum harmala* (1.10) dominantly which suggest the statical sight in resident area based on popularity of these medicinal taxa in study site, and the lowest parameter doesn't specify the no use of the species (Albuquerque, 2009; Irfan *et al.* 2018d).

The highest rank order priority (ROP) was reported for *Otostegia limbata* (212.8), *Lindenbergia indica* (205.2), *Cymbopogon citratus* (185.6), *Cannabis sativa* (183.5), *Vitex negundo* (177.6), *Brassica campestris* (164.9), followed by *Peganum harmala* (164.7), the ROPs parameters are the derivatives of fidelity index and RPLs this parameter suggested the stability and the positions of taxa in resident area (Hussain *et al.* 2018; jan *et al.* 2022c).

Conclusions

In current study the 100 medicinal plant documents with authentic sources and with traditional knowledges regarding folk medicines. The diversity of medicinal plants taxa and their association with traditional knowledge has huge importance in primary health care system. Many people in the area depends on therapeutic uses of plants taxa for the treatment of many disorders viz. whooping cough, snake bite, anemia, psoriasis and tooth decay. The local physician of medicinal plants is having a good connection with patients and this would expand the knowledge of medicinal plant and the quality of health care. Ethnomedicinal and old system of medicines for the treatment of many disorders is very ancient, but due to dearth of interest amongst the young generation and their tendency of using the modern allopathic medicines leads to the extinction of this knowledge. However further comprehensive studies regarding phytochemistry and pharmacology of these medicinal plants is necessary to determine their active biochemical ingredients that can leads to novel drug discovery that will also validate the ethnomedicinal knowledge.

Declarations

Ethics approval: The ethical committee reviewed and approved the research entitled "Quantitative analysis of Ethnomedicinal and Traditional uses of the Flora of Tehsil Lahor, District Swabi, Khyber Pakhtunkhwa, Pakistan" conducted at Department of Botany, Abdul Wali Khan, University, Mardan, Pakistan.

Competing Interests: The authors declared no competing interests.

Author's contribution: AA wrote the very first draft of the manuscript and performed the experiments, GJ supervised the study, MI designed the project, FGJ & FU reviewed and revised the manuscript. All the authors read and approved the final version of the manuscript.

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