

Ethnobotanical survey of medicinal flora of Harighal, Azad Jammu & Kashmir, Pakistan

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ABSTRACT

Background: The present study is the first quantitative ethnobotanical evaluation of Harighal, an inaccessible and unexplored area of District Bagh Azad Jammu and Kashmir (AJK). The major objectives of the present study were exploration, quantification and comparison of ethnobotanical knowledge among different rural communities of the study area.

Methodology: Data about traditional uses of important medicinal plants was gathered from 79 informants (49 men and 34 women) using a semi-structured questionnaire. To assess novelty and agreement of informants about plant use, various quantitative indices including use value, relative frequency of citation, relative importance, fidelity level and informant consent factor were employed. Furthermore, data presented in the present study was also compared with twenty-two papers published from adjoining areas.

Result: A total of 150 medicinal plants belonging to 98 genera and 60 families were documented. Asteraceae, Fabaceae and Rosaceae were the dominant families having 15 species each. Herbs were the most used life form, and leaves were the most exploited plant part. Decoctions were the most preferred method used in preparation of herbal recipes. *Mentha longifolia* had the highest use value, *Berberis lycium* had the highest relative frequency of citation and *Galium aparine* had the highest relative importance value (1.05, 0.81 and 96, respectively). The highest informant consensus factor (ICF) was reported for digestive disorders. *Mentha longifolia*, *Punica granatum*, *Zanthoxylum alatum* and *Olea ferruginea* had 100% fidelity values. The Jaccard index revealed that uses of plants were more similar in two neighboring areas i.e. Pearl Valley and Toli Peer.

Conclusion: In spite of living in the twenty first century, people of the study area still rely very much on herbal medicines as an effective way to treat various ailments. Elders and health practitioners of the study area are well aware of indigenous knowledge about medicinal plants, but young people are not much interested in herbal practices. Thus, valuable knowledge about the use of plants is on the verge of getting lost. The documentation of indigenous knowledge from such an unexplored area and the subsequent pharmacological and phytochemical validation of novel plant uses could serve as baseline for drug development.

Key words: Ethnobotany, Medicinal flora, Use value, Fidelity level, Azad Jammu & Kashmir, Pakistan

Background

Ethnobotany designates a complex connection between local inhabitants and indigenous plants of an area [1-4]. Traditional knowledge is often orally transmitted from to children [5-8] and contributes to the maintenance of indigenous culture and natural resource management [9-13]. In traditional cultures, plants are being utilized for various purposes [14-18]. Differences and similarities in traditional knowledge and practice among two different cultural groups living within the same ecological region are fascinating, as they can provide understanding of how cultural reflection can change individual viewpoints about the environment and also guide interactions between human beings and resources in the ecosystem [19]. Quantitative ethnobotanical indices help to elucidate and reflect the importance of plants to local inhabitants of any area and are used to measure the cultural significance of food and medicinal plant species [20-23].

Medicinal plants are imperative for the livelihoods of underprivileged communities across the world [24-29]. In developing countries, 80% population are still relying on plant-based medicines as an economical and safe alternative to often inaccessible allopathic medicine [30,31]. Even in the developed world, herbal remedies are extensively used, e.g. 30-50% of the population in China, 40–50% in Germany, 48% in Australia, 42% in the USA and 49% in France use herbal medicine as supplementary health care [32-34]. However, traditional knowledge on plant species is decreasing gradually across the globe [14]. This knowledge is usually held by hakims (traditional healers) and elderly people and be passed to the next generation via verbal communication only [35], thus there is a serious danger of knowledge loss due to the progression in the modern health care system, rapid urbanization and poor relations between younger and old generation [36-39]. The documentation of traditional ethnomedicinal knowledge is of high importance, and may contribute to the development of new drugs.

Pakistan has a large wealth of medicinal and aromatic plants due to its diverse habitat, climate and soil types and harbors about 1572 plant genera and 5521 species [40]. Among them, 400-600 species are used for therapeutic purposes. Eighty percent of this medicinal flora restricted in Northwestern areas of Pakistan and Azad Kashmir [41-43]. In the early 1950s, 84% of population of Pakistan depended upon plants for treating various ailments but nowadays this practice is restricted to remote areas due to modernization and rapid change in lifestyle [44]. A few ethnobotanists documented the traditional knowledge about medicinal plants and herbal

80 recipes from Pakistan and Azad Jammu and Kashmir [45-49]. However, Tehsil Harighal of
81 District Bagh is still unexplored, especially due to topographical challenges like hilly terrain and
82 steep slopes, and cultural and religious restrictions that limits researcher access to document
83 ethnobotanical knowledge. Therefore, the current study was designed to document the
84 indigenous knowledge about medicinal plants used for primary health care particularly focusing
85 on methods of preparation and administration of herbal recipes. The data was further analyzed by
86 using various numerical indices and compared with previous studies to determine the novelty of
87 work. We hypothesized that due to the remoteness of the area, the ethnobotanical knowledge
88 would considerably differ from other areas of Pakistan.

90 **Materials and methods**

91 ***Study area***

92 Harighal (33°54'34°08' N to 73°01'73°38' E), a Tehsil of District Bagh, is located in
93 western Himalayan foothills of Pirpanjal, with altitude ranges between 900-2300m (Fig. 1) [50].
94 The climate is subtropical-temperate with about 1500mm average annual precipitation. The
95 summers are hot with temperature ranges between 21°C - 40°C while winters re cold with
96 temperatures around 2°C during January (Fig. 2) [51].

97 The area is remote, with difficult mountainous terrain and quite far from urban centers. Local
98 inhabitants have poor socioeconomic conditions, lacking government services and modern
99 healthcare facilities. The roads and other infrastructure are poorly developed, and many
100 inhabitants are dedicated to agriculture, livestock, and their own small-scale business. Some are
101 educated and are government servants, while very few are serving abroad. Indigenous
102 ethnomedicinal knowledge which is mostly in the hand of elder people and health practitioners.

104 ***Data collection***

105 Ethnomedicinal data was collected from 79 informants including 45 men and 34 women
106 during April 2017 to March 2018, using semi structured questionnaires and group discussions,
107 after obtaining prior informed consent from the participants. Questionnaires were prepared
108 according to Edward *et al.* [52]. The ethical guidelines provided by International Society of
109 Ethnobiology (<http://www.ethnobiology.net/>) were strictly followed. The ethical approval to
110 conduct the study was given before initiating surveys from the Ethics Committee of the Women

University of Azad Jammu & Kashmir, Bagh. In addition to this, legal permission to conduct interviews was given by members of municipality committee. A Prior Informed Consent form (PIC) was signed by all the informants after explaining the objective and consequence of study. The PIC was translated into local *Pahari* language. Sample size was determined by following Kadam and Bhalerao [53].

Plant collection and identification

The medicinal plants were collected dried, pressed and mounted on standard herbarium sheets following [54]. The specimens were identified with the help of plant taxonomist and confirmed using flora of Pakistan (https://http://www.efloras.org/flora_page.aspx?flora_id=5) [55,56]. Further verification of identified specimens was done at Herbarium of Medicinal and Aromatic Plant in AJ&K established by Pakistan Agriculture and Research Council (PARC). Tropicos and international plant name index (IPNI) were used to obtain correct and legitimate scientific names. The final voucher specimens were deposited in herbarium of the Women University of AJ&K, Bagh.

Ethnobotanical indices

The homogeneity and validation of collected ethnomedicinal data was checked by applying following quantitative indices:

Informant consensus factor (ICF)

The agreement between the respondents about usage of plants for curing various groups of ailments was checked by informant consent factor. It was calculated by following Heinrich *et al.* [57] using given formula:

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

Where;

Nur = Use-reports in selected group of diseases, Nt = Species used for treating various diseases of that group

Relative frequency of citation (RFC)

The harmony between respondents on medicinal uses of plants in the study area was determined by RFC. It was calculated by following Vijayakumar *et al.* [58] using given formula:

$$RFC = FC/N$$

Where;

FC = Informants reporting use of a given species, N = total number of informants.

Use value index

Use value reflects the relative importance of reported plant species in area and was determined by following Vijayakumar *et al.* [58] using given formula:

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

Where;

U_i = Use reports cited by each respondent for given species, N= Total number of respondents.

Relative importance

It was calculated following Khan *et al.* [24] by using given formula.

$$RI = (RelPH + RelBS) \times 100/2$$

PH = Pharmacological attribute of the selected plant, Rel PH = Relative pharmacological attributes of a given plant.

$$RelPH = \frac{\text{PH of a selected plant}}{\text{maximum PH of all plant species}}$$

BS =Body systems treated by selected plant species, Rel BS = Relative body systems treated by selected species.

$$RelBS = \frac{BS \text{ of a given plant}}{\text{maximum BS of all reported plant species}}$$

Fidelity level (FL)

Fidelity level indicates the preference of particular plant species by informants to treat specific disease. It was calculated following Alexiades and Sheldon, [59] by using given formula

$$FL\% = Np/N \times 100$$

Where;

Np= Informants reporting use of particular plant species for a specific disease category, N= total number of informants who mentioned uses for a specific plant species for all disease category.

Jaccard index (JI)

The similarity of knowledge between different communities was determined by comparing the findings of current study with already published work in neighboring areas applying Jaccard index. It was calculated following Gonza *et al.* [60] by using given formula:

$$JI = \frac{C \times 100}{(a + b) - c}$$

Where;

a = Species of the study area, b= Species of the neighboring area, C= Number of species common to both area.

RESULTS AND DISCUSSION

Demography and knowledge variation

A total of 79 informants were interviewed to collect medicinal plant knowledge based on their gender, age and education (Table 1). The first category used for classification of informants was gender and 45 men and 34 women were interviewed. The easier availability and approachability to male informants and the prohibition of interaction of women with strangers, as well as and veiling (*parda*) forced us to interview more men than women. Demographic data demonstrates that women (average known species = 5.72; average cited uses = 9.38) had more knowledge about plants than men (average known species = 4.98; average cited uses = 8.05). Division of labor between genders in the area may be one reason for this difference, as men generally manage the fieldwork and earning, while women manage the indoor activities and domestic life, which are highly associated with herbal preparations to keep the family healthy. Similar findings were reported by other studies including Qaseem *et al.* [45] from Kotli, Ahmad *et al.* [49] from Neelum valley and Kyani *et al.* [61] from Abbottabad. Age was used as second classification criterion and informants were classified into three major categories i.e. above 60, between 40-60 and less than 40. Elders (age above 60) had more knowledge about plants than young people (age less than 40). Another reason for lower knowledge of young informants was their limited interest in herbal preparations due to changes in lifestyle with advent of

191 industrialization and modernization. These findings were supported by other reports including
192 Qaseem *et al.* [45] from Kotli and Umair *et al.* [62] from Hafizabad. Education was a third
193 influential factor. Uneducated informants had a vast ethnobotanical knowledge, while tan
194 educated informants had a more limited knowledge of plants. Likewise, traditional health
195 practitioners had a broad traditional knowledge about medicinal uses of plants compared to other
196 professions. Highly educated informants usually relied on allopathic medicines for their
197 immediate healthcare, and had least knowledge about herbal medicines and their preparation
198 methods. These finding are supported nationally by Kayani *et al.* [61]; Yaseen *et al.* [63] and
199 internationally by Giday *et al.* [64]; Tugume *et al.* [65].

201 ***Diversity of ethnomedicinal flora***

202 A total of 150 medicinal plants belonging to 60 families and 98 genera were reported
203 from study area (Table 2). The herbaceous life form was dominantly (78 sp.; 52%) used in herbal
204 preparation followed by shrubs (27 sp.; 18%), trees (25 sp.; 16.6 %), grasses (12 sp.; 8%), ferns
205 (5 sp.; 3.3%) and epiphytes or climbers (Fig. 3). These findings are in accordance with previous
206 reports [45,46,66,67]. The predominance of the herbaceous habit in mountainous areas is a
207 common ecological phenomena throughout the world [34,49,68]. The reason might be the high
208 rainfall and moisture content at higher altitudinal areas [23,46,61].

209 Asteraceae, Fabaceae and Rosaceae were the dominant families having 15 species each
210 (Table 2; Fig. 3). They were followed by Lamiaceae and Poaceae having 12 species each (Fig.
211 4). Our results are in accordance with Amjad *et al.*, [46]; Kayani *et al.* [61]; Tariq *et al.* [69]. The
212 prevalence of these families might be due to their abundance, easy availability, familiarity of
213 their members to local inhabitants of the study area. The member of these families might contain
214 high amount of secondary metabolites to cure various ailments [70-73].

216 ***Plant part(s) used***

217 Herbal recipes were prepared by using different plant parts in investigated area. Leaves
218 (30.2%), whole plants (16.6%) and roots (14.4%) were the more preferred plant parts used in
219 herbal preparations (Fig. 5). Similar results were documented in other studies from Pakistan and
220 other countries [45,49,74-77]. Presence of a high amount of easily extractable crude drugs,
221 phytochemicals and other bioactive ingredients and easy collection and abundant availability of

leaves might be the reason for their extensive utilization [24,49,78-80]. Roots were second plant part extensively used in herbal preparations followed by whole plant as these too are easily assessable and contain high amount of bio-active metabolites ([30,31,81]. But in spite of the importance of whole plant and roots in herbal preparation their use is not recommended, as uprooting plants for roots could cause their extension. The excessive use of roots or whole plants should be discouraged in the case of threatened species as this practice has negative impact on population and growth, often leading to extinction of species [82,83].

Method of preparation and administration

Different recipes were prepared from medicinal plants by using different methods based on the actual site and type of disease treated. Decoction was the most common method (41 sp.; 17%) for preparation of herbal recipes, followed by paste (36 sp.; 15%), powder (30 sp.; 13%), extract (28 sp.; 12%) and juice (30 pp.; 13%) (Fig.6). Our findings are supported by previous documentation [22,34,45,46,67,84]. Ease of preparation might be a reason for the extensive use of decoctions to treat ailments, as it can be prepared by mixing specific part of plants with soup, tea, water, honey, milk and butter [85]. The availability of active metabolic compounds might increase due to the fact of heating which speed up the biological reactions [86-89]. Sometime whole plants were used in herbal preparations. Very few plant species were used in combination with other herbs. The amount of medicinal plants and frequency of dose varied based on patient condition, health, age and disease severity. The frequent mode of application was internal (76.2%) and only few preparations from some plant species were practiced externally (Fig 4). Our findings are in accordance with Qaseem *et al.*, [45]; Ahmad *et al.* [49]; Kayani *et al.* [61].

Informant consensus factor (ICF)

The informant consensus factor was analyzed based on disease categories, as a single plant might be used to treat 3-4 or more disease categories. A high ICF value reflects high dependence of local inhabitants on medicinal plants [90] and low ICF values indicate less consistency of informant's knowledge. Ailments were classified in to 18 categories to develop informant consensus. The ICF value ranged from 0.23 to 0.95. The maximum value of ICF was estimated for digestive disease category (0.95) followed by skin problems (Fig. 7). This was strongly supported by Qaseem *et al.* [45]; Umari *et al.* [91], Shaheen *et al.* [47]Amjad *et al.* [46];

Ahmad *et al.* [49] and Bib *et al.* [34] who also reported the maximum ICF for digestive diseases in their investigated area. The digestive disorder was also reported as first use class by other ethnic communities across world [92-98]. The prevalence of digestive disorders among the local inhabitant might be due to inadequate availability of hygienic food and drinking water [45,47,99,100]. The most important plants mentioned in the digestive disease category were *Helianthus annuus*, *Berberis lycium*, *Cannabis sativa*, *Ailanthus altissima*, *Micromeria biflora*, *Mentha longifolia*, *Thymus linearis*, *Punica granatum*, *Melia azadirachta*, *Acacia nilotica*, *Morus alba*, *Ficus palmata*, *Oxalis corniculata*, *Rubus ellipticus*, *Rubus niveus*, *Fragaria nubicola*, *Eriobotrya japonica*, *Rosa indica*, *Pyrus pashia*, *Prunus armeniaca*, *Prunus persica*, *Zanthoxylum armatum* and *Galium aparine*. Due to wide variety of biochemical with diverse biological activities in plants, the local people were well-known with these plants. They play an important in the lives of human beings to treat various illnesses.

Relative frequency of citation and use value

Relative frequency of citation (RFC) is used to identify the highly important species in various ailments as cited by local people [36]. The value of RFC ranged between 0.93 - 0.04. *Berberis lycium* had highest RFC value (0.81). Other plant species with significant RFC value were *Ajuga bracteosa*, *Prunella vulgaris*, *Adiantum capillus-veneris*, *Desmodium polycarpum*, *Pinus roxburgii*, *Rosa brunonii*, *Punica granatum*, *Zanthoxylum armatum* and *Jasminum mesnyi* (Table 3). The plants species with high RFC value were abundant in the area therefore the local people were much familiar with them particularly with reference to ethnomedicinal perspective over a long time period. Likewise, the plants with special properties to cure particular disease were well known among the local culture therefore, their precise properties to treat particular disease have got famous and deep rooted. The plant species with high RFC values would be interesting for phytochemical and pharmacological profiling and possible future drug discovery, as well as authentication at a commercial level [45,49,61,101].

Use value reflects the relative importance of every species with reference to more use reports cited by local informants. The use value ranged between 1.05-0.08. *Mentha longifolia* (1.05), *Olea ferougea* (1.02), *Zanthoxylum armatum* (1.01) had high use value while other species with significantly high use value were *Solanum villosum* (0.93), *Cynoglossom lanceolatum* (0.94), *Rosa indica* (0.95) and *Punica granatum* (0.97) (Table 3). UV value is

directly related with use reports. Plant species with more use reports have high use value and vice versa [22,45,46]. These plant species are used in repetitive manner and are biologically more active [102]. It is not necessary that the plant which has low UV value become unimportant or not biologically active as the RFC and UV are constant in particular area but they may be change according to the variation in the knowledge of indigenous people from area to area or within area.

Species with high RFC and UV show high healing potential for particular disease. Species with high RFC and UV were often overharvested by inhabitants so prioritized for conservation and sustainable use otherwise will extinct from the area in near future [49,61,103]. The ethnomedicinal knowledge is at risk because there might be no resource left for younger generations. The main reason for this is that the local inhabitants of the area, especially young generations have little interest and understanding or knowledge about ethnomedicinal plants, and are already dependent upon allopathic medicine for their healthcare [23,103,104].

Relative importance

Relative importance value is used to determine the diversity of a species for treating various ailments. *Galium aparine* (96) and *Mimosa pudica* (91) had highest RI values while *Verbena officinalis* (81.5), *Fragaria nubicola* (81), *Verbascum thapsus* (79) and *Melia azadirachta* (73) had high RI values (Table 3). It was observed that species with high RI value was used frequently for treating several ailments. The natives have too much ethnomedicinal knowledge regarding these plants. Therefore, importance of these species increase as the number of treated systems increases [46,103,105].

Fidelity level

The fidelity value reflects the preference of particular plant species as reported by local people for curing particular ailment in the area. The FL value of reported species ranged from 18.2 to 100%. Fidelity values of four plant species viz *Mentha longifolia*, *Punica granatum*, *Zanthoxylum armatum* and *Olea ferruginea* were found 100% and these species were used to cure stomachache, dysentery, rheumatism and other digestive disorders. Other medicinal plants having high FL value were *Solanum villosum* (93.8), *Cynoglossum lanceolatum* (91.8), *Dalbergia sissoo* (83.8), *Bidens biternata* (85.7%), *Rubus ellipticus* (86.5%) and *Melia*

azadirachta (84.6%) (Fig. 8). These species were mostly used to cure the digestive problems like diarrhea, dysentery, indigestion, stomach-ache and gastrointestinal pain etc. High FL of a species reflects extensive use of a specific plant species to treat a specific disease dominant in area [30,34,103]. Species with high FL value are important model plants which can be subjected to further pharmacological studies [49,61,106]. Some other studies in literature also recoded high fidelity level for species used to cure digestive problems [30,103,107]. The species with low FL values were not well known by the natives in term of ethnomedicinal knowledge. This forecast that may be in upcoming generation the ethnobotanical knowledge about these plant species may be completely depleted [49,103,108].

Novel uses

In this study we compared our results with 22 published papers from adjoining and areas with similar vegetation across Pakistan and world. The highest values for the Jaccard Index (JI) were result of the studies published by Amjad *et al.* [46] and Shaheen *et al.* [23] on Toil peer (AJK) and Perl valley respectively. The least value for JI was found in the studies of Jadhava *et al.* [109] on Sangli, Maharashtra, India and and Gidey *et al.* [110] on the Kunama ethnic group in Northern Ethiopia. High similarity reflects similar culture, traditions vegetation and geography among the areas along with high level of cross-cultural exchange of traditional knowledge among the community while high differences or lest value of JI reflects that areas don't share common cultural values. Further the ethno-ecological knowledge is often specifically influenced by origin and culture of indigenous communities.

The comparative study of current findings with reported research revealed some novel uses which were not reported earlier from this region. These included the use of the extract of the whole plant of *Crepis multicaulis* and *Maytenus nemorosa* to treat eye infections. An extract iof the aerial parts of *Swertia cordata* was used to treat hepatic disorders. Leaves of *Cotoneaster racemiflora* aerewre used to stop bleeding and pus. The root extract of *Spiraea canescens* is was to as enema to treat venereal conditions. A bark infusion of *Dichanthium annulatum* was used to cure cough. A pasted based on the whole plant of *Polygonum ramosissimum* was used to treat urinary tract infections. The seeds of *Persicaria maculosa* were used in powdered form to treat cholera.

Conclusion

This study is first to report the traditional uses of the indigenous medicinal plants from the remote areas of tehsil Harigal, Bagh. The documented data reflect that local peoples are still highly dependent upon medicinal plants for treating various diseases, as public health facilities are hard to reach, and still have a large knowledge of medicinal plants. Digestive disorders were most common in the area due to unavailability of clean water and hygienic food. The plant species with high RFC, UV and FL were *Mentha longifolia*, *Berberis lycium*, *Zanthoxylum armatum*, *Punica granatum*, *Galium aparine*, *Mimosa pudica* and *Verbena officinalis*. These species have good healing potential due to the presence of high amount of bioactive constituent. UV and RFC are strongly correlated with each other. Many medicinal plants are used extensively by the inhabitants of the area, but unfortunately the inhabitants who reside near to cities are already unaware of the ethnobotanical knowledge. The knowledge is mainly in the hand of elder people and health practitioners, and young generation are not much interested in herbal recipes. This lack of interest, as well as impacts like overgrazing, deforestation and soil erosion are reducing the medicinal flora in the area, and strategies related to resource conservation and further ethnobotanical and pharmacological research are highly recommended for the conservation of this precious treasure.

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Declarations

**Ethics approval and consent to participate*

The present research work is purely based on field survey. The ethical approval to conduct the study was given before initiating surveys from the Ethics Committee of the Women University of Azad Jammu & Kashmir, Bagh. In addition to this, legal permission to conduct interviews was given by members of municipality committee. A Prior Informed Consent form (PIC) was signed by all the informants after explaining the objective and consequence of study. The PIC was

translated into local *Pahari* language. The ethical guidelines provided by the International Society of Ethnobiology (<http://www.ethnobiology.net/>) were strictly followed.

**Consent for publication*

Present paper does not contain any individual's person data; therefore this section is Not Applicable to our study

**Availability of data and materials*

All data are included in the manuscript

**Funding*

No funding was provided by any source to conduct this survey

**Competing interest*

The authors declare that they have no competing interest.

**Authors Contribution*

MSA, UZ and AMA designed project, involve in data collection, analysis and prepared final draft of manuscript, MA and SMHG, helped in statistical analysis, RBU completely revised and commented the manuscript.

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758 **Table 1.** Demographic information of the Informants

Variables	IC	Number	ANSRI	ANURI
Gender	Men	45	4.98	8.05
	Women	34	5.72	9.38
	Total	79		
Age-Class	20-40	22	3.96	3.10
	41-60	46	8.40	4.96
	60-80	11	12.70	11.35
Education	Illiterate	26	5.95	4.08
Level	Elementary education	18	12.25	6.70
	Secondary education	13	11.90	6.11
Professions	HSE	10	6.60	5.55
	Bachelor degree	7	6.15	5.01
	Higher education	5	10.80	6.71
	THPs	13	25.55	13.64
	Mid Wives	10	13.2	10.43
	Herders	06	9.10	8.12
	Housewives	18	6.85	6.15
	Farmers	08	5.25	4.45
	Teachers	10	6.71	7.10
	Others	14	4.55	3.93

759 IC. Informants category, ANSRI. Average number of species reported by each informant,
760 ANURI. Average Number of Use reported by each informant, HSE. Higher secondary education,
761 THPs. Traditional health practionaires

762 **Table 2.** Medicinal uses of the reported taxa and their comparison with previous reports

Scientific name / Voucher number	Local name	Habit	Part used	Method of preparation	Mode of application	Diseases treated	Previous use reports
Acanthaceae							
<i>Dicliptera bupleuroides</i> Nees in Wall. UZ-02	Somni	H	LV	PT DT	External Internal	Wounds Cough, Diabetes	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Justicia adhatoda</i> L. UZ-31	Baikher	S	BK LV RT	PD PD PD	Internal Internal Internal	Stomachache , Constipation Asthma Cough	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Amaranthaceae							
<i>Achyranthes aspera</i> L. UZ-90	Puthcanda	H	W.P LV RT	PT JC DT	External Internal Internal	Scorpion stings and Snake bites Eye diseases Inflammation	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22
<i>Alternanthera pungens</i> Kunth UZ-79	Khaki buti	H	LV	DT	Internal	Infection, Cuts and external injury	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Amaranthus spinosus</i> L. UZ-71	Jungli Ganayar	H	LV	DT	Internal	Biliousness, Eye infection Constipation	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Amaranthus viridis</i> L. UZ-50	Ganyar	H	W.P LV	PD PT	Internal External	Diarrhea, Malaria , Jaundice Antidote against snake and spider bites	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22
Amaryllidaceae							
<i>Allium griffithianum</i> Boiss. UZ-42	Piazi	H	A.P	CK	Internal	Carminative, Dyspepsia , Flatulence	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Apiaceae							
<i>Angelica glauca</i> Edgew. UZ-101	Choora	H	RT	IF	Internal	Fever , Colds	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Torilis japonica</i> (Houtt.) DC. UZ-69	Lahndara	H	SD RT	PD DT		Antifungal, Antiviral, Expectorant, Tonic, Acidosis and Scabies Indigestion	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Apocynaceae							
<i>Carissa opaca</i> Stapf.	Garanda	S	W.P	PD	Internal	Joint pain, Scabies, Jaundice ,	10, 20, 30, 40, 50, 60, 70, 80, 90, 100,

ex. Haines. UZ-110 <i>Nerium oleander</i> L. UZ-122	Kanair	S	FL LV	JC JC	Internal Internal	Inflammation Cough Flu, Fever , Toothache, Blood pressure, Antidote	110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Araliaceae <i>Hedera nepalensis</i> K. Koch. UZ-147	Bail	H	LV	DT	Internal	Stimulant, Rheumatism , Diaphoretic	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Asclepiadaceae <i>Vincetoxicum hirundinaria</i> Medik. UZ-131	Medhshingi	H	A.P	DT	Internal	Boils, Pimples	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Aspleniaceae <i>Asplenium dalhousiae</i> Hook. UZ-108	Gutti	F	W.P	DT	Internal	Typhoid	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Asteraceae <i>Achillea millefolium</i> L. UZ-117	kangi.i	H	FL LV	PT DT	Internal Internal	Laxative, Diuretic , Stimulant, Brain tonic, Female organ problems Colds and Fever	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Anaphalis adnata</i> Wall. ex DC. UZ-111	Dialect	H	LV	PD	External	Bleeding, Wound healing	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Artemisia vulgaris</i> L. UZ-20	Chaow	H	LV	JC	Internal	Anthelmintic , Skin diseases	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Bidens biternata</i> (Lour.) Merr. & Sherff. UZ-74	Palouthi	H	LV RT	JC PT	Internal External	Sore throat Toothache	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Cirsium vulgare</i> (Savi) Ten. UZ-32	Kandiara	H	RT W.P	PO S	Internal Internal	Sore jaws Rheumatic joints	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Conyza Canadensis</i> (L.) Cronquist UZ-01	Kali Buti	H	LV	DT	Internal	Homeostatic, Stimulant, Astringent, Diuretic, Dysentery , Diarrhea, Hemorrhages Eye infection	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Crepis multicaulis</i> Ledeb.	Shina	H	FL	PT			10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220

UZ-11 <i>Gerbera gossypina</i> (Royle) Beauverd	Put putiola	H	LV	PT	External	Bone fractures, Wounds, Cuts, Pain, Skin diseases	80,190,200,210,220 10, 20, 3 ▲, 4 ☉, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
UZ-129 <i>Helianthus annuus</i> L.	Souraj	H	FL	PT	External	Skin diseases	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
UZ-104	mukhi		SD	ET	Internal	Diuretic, Curing chest infections , Liver ailments	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
			LV	EX	Internal	Lung ailments, Piles, Kinney problems	
<i>Launaea procumbens</i> (Roxb.) Ram. & Raj.	Hund	H	W.P	R.F	Internal	Diabetes, Pain	10, 20, 30, 40, 50, 60, 70, 8 ▲,90,100,110,120,130,140,150,160,170, 180,190,200,21 ▲,220
UZ-41 <i>Silybum marianum</i> (L.) Gaertn.	Kandiyar	H	LV	EX	Internal	Astringent, Bitter, Diaphoretic, Diuretic, Stimulant, Stomachic , Tonic, Respiratory tract infection	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,16 ▲,170, 180,190,200,210,220
UZ-52 <i>Sonchus oleraceus</i> (L.)L.	Dodak	H	LV	CK	Internal	Abdominal pain	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
UZ-62 <i>Tagetes minuta</i> L.	Sadberga	H	LV	JC	Internal	Earache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 8 ▲,190,200,210,220
UZ-150 <i>Taraxacum officinale</i> (L.) Weber ex F.H.Wigg.	Hend	H	RT	JC	Internal	Diuretic , Liver tonic, Diabetes	1 ☉, 2 ☉, 3 ☉, 4 ☉, 5 ▲, 6 ☉, 70, 80,9 ▲,100,110,12 ▲,130,140,150,160,170 ,18 ▲,190,20 ▲,210,22 ▲
UZ-93 <i>Xanthium strumarium</i> L. UZ-81	Souriyala	S	LV FT	JC PD	Internal Internal	Chronic mild fever Cooling, Infections, Urinary problems	1 ☉, 2 ☉, 3 ☉, 4 ☉, 5 ☉, 6 ☉, 7 ☉, 8 ▲,9 ▲,10 ▲,110,120,130,140,150,160,17 0,180,190,200,21 ▲,22 ▲
Asparagaceae <i>Polygonatum</i> <i>geminiflorum</i> Decne.	Noorialam	H	LV	IF	Internal	Analgesic, Aphrosidiac, Treat pain, Fever , Inflammation, Allergy, weakness	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Balsaminaceae <i>Impatiens edgeworthii</i> Hook.f.	Batmandar / buntil	H	W.P W.P	EX PT	Internal External	Urinary tract infection, Fever Burns	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,12 ▲,130,140,150,160,170, 180,190,200,210,220
UZ-21 Berberidaceae <i>Berberis lycium</i> Royle	Sumbal	S	FT BK	ET DT	Internal Internal	Expectorant Skin problems, Liver	1 ▲, 2 ☉, 3 ▲, 4 ▲, 5 ▲, 6 ▲, 7 ▲, 80,90,10 ▲,110,120,13 ▲,140,150,160,170
UZ-12							

problems							,18▲,19▲,20▲,21◇,22▲
Boraginaceae							
<i>Cynoglossum lanceolatum</i> Forssk. UZ-140	Churoun	H	RT	EX	Internal	Throat ache	1◇, 2◇, 3◇, 4◇, 5◇, 6▲, 7◇, 8◇,9◇,10◇,11◇,12▲,13◇,14◇,15◇,16◇,17◇, 18◇,19◇,20▲,21◇,22◇
<i>Trichodesma indicum</i> (L.) Lehm. UZ-03	Handusiboti	H	FL LV / RT	FG EX	Internal Internal	Brain refreshment Diuretic , Blood purifier	1◇, 2◇, 3◇, 4▲, 5▲, 6◇, 7◇, 8◇,9▲,10◇,11◇,12◇,13◇,14◇,15◇,16◇,17◇, 18▲,19◇,20◇,21▲,22◇
Brassicaceae							
<i>Capsella bursa-pastoris</i> (L.) Medic. UZ-33	Saag	H	W.P SD SD	ET PD FU	Internal Internal Internal	Astringent Stimulant, Chest infections Bleeding	1◇, 2◇, 3◇, 4◇, 5◇, 6▲, 7◇, 8◇,9◇,10◇,11◇,12◇,13◇,14◇,15◇,16◇,17◇, 18◇,19◇,20◇,21◇,22◇
Buxaceae							
<i>Sarcococca saligna</i> (D. Don) Muel UZ-43	Ladan/bansathra	H	LV RT	DT JC	Internal Internal	Joint pain , Purgative (motion) Gonorrhea	1◇, 2▲, 3◇, 4◇, 5◇, 6◇, 7◇, 8◇,9◇,10◇,11◇,12◇,13◇,14◇,15◇,16◇,17◇,18◇,19◇,20◇,21◇,22◇
Cannabaceae							
<i>Cannabis sativa</i> L. UZ-54.	Bhang	H	LV	PD	Internal	Astringent that bowels stomachic , Leprosy, Tonic, Narcotic action	1▲, 2◇, 3◇, 4◇, 5▲, 6◇, 7▲, 8◇,9◇,10▲,11▲,12◇,13▲,14◇,15◇,16◇,17▲,18▲,19▲,20▲,21▲,22▲
Caprifoliaceae							
<i>Viburnum grandiflorum</i> Wall. ex DC. UZ-72	Guch	S	SD	JC	Internal	Typhoid , Whooping cough	1▲, 2◇, 3◇, 4◇, 5◇, 6◇, 7◇, 8◇,9◇,10▲,11◇,12◇,13▲,14◇,15◇,16◇,17◇,18◇,19◇,20◇,21◇,22◇
Celastraceae							
<i>Maytenus nemorosa</i> Marais UZ-82	Patakhi	S	W.P	EX	External	Toothache , Eye inflammation	1◇, 2◇, 3◇, 4◇, 5◇, 6◇, 7◇, 8◇,9◇,10◇,11◇,12◇,13◇,14◇,15◇,16◇,17◇,18◇,19◇,20◇,21◇,22◇
Chenopodiaceae							
<i>Chenopodium album</i> L. UZ-61	SkhaBotey	H	W.P	DT	External	Skin diseases	1▲, 2▲, 3◇, 4◇, 5◇, 6▲, 7◇, 8◇,9◇,10◇,11▲,12▲,13▲,14◇,15▲,16◇,17◇,18▲,19▲,20◇,21▲,22▲
Convolvulaceae							
<i>Convolvulus arvensis</i> L. UZ-103	Hirrankhuri	C	W.P	EX	Internal	Piles, Dandruff, Constipation	1◇, 2◇, 3◇, 4◇, 5◇, 6◇, 7◇, 8▲,9◇,10◇,11◇,12◇,13◇,14▲,15◇,16◇,17▲,18◇,19▲,20◇,21▲,22◇
<i>Ipomoea purpurea</i> (L.) Roth	Bahrwa	H	W.P SD	PO PD	External Internal	Skin disease , Cancer Tonic, Purgative	1◇, 2▲, 3◇, 4◇, 5◇, 6◇, 7◇, 8◇,9◇,10◇,11◇,12◇,13◇,14◇,15◇,16◇,17◇,18◇,19◇,20◇,21◇,22◇

UZ-2							80,190,200,210,220
Commelinaceae <i>Commelina benghalensis</i> L. UZ-128	Kanchara	S	W.P	PO	External	Skin diseases	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Cornaceae <i>Cornus macrophylla</i> Wall. UZ-133	Kandar	T	BK	PD	Internal	Backache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Cuscutaceae <i>Cuscuta reflexa</i> Roxb. UZ-12	Neeladari	H	WP	JC	Internal	Jaundice, Dandruff	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Cyperaceae <i>Cyperus rotundus</i> L. UZ-145	Kah	H	RT	MX	Internal	Dysentery, Gastric problems, Intestinal disorders	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Dryopteridaceae <i>Dryopteris filix-mas</i> (L.) Schoot UZ-120	Kungi	F	FD	VG	Internal	Antibacterial activity	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Elaeagnaceae <i>Elaeagnus umbellata</i> Thunb. UZ-22	Kankolii	S	SD OL FL	PD EX PT	Internal Internal Internal	Stimulant in cough Pulmonary infections Astringent, Cardiac problems	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Euphorbiaceae <i>Euphorbia helioscopia</i> L. UZ-13	Dhouthal	H	W.P W.P W.P	EX PD LX	External Internal Internal	Anthelmintic Healing wounds Poisonous effect that cause swelling in skin	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Ricinus communis</i> L. UZ-04	Arind	S	SD LV	OL DT	Internal External	Laxative, Constipation Skin diseases, Joint pain, Muscles swelling , Eye infection	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Fabaceae <i>Acacia modesta</i> Wall. UZ-63	Kikar	T	BR	RB	Internal	Anti-inflammatory, Toothache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Acacia nilotica</i> (L.) Delile	Desi kikar	T	BK	PT	Internal	Astringent, Piles, Dysentery, Diarrhea	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220

UZ-84 <i>Astragalus canadensis</i> L.	Tindni	H	P LV	PD IF	External Internal	Anti-dandruff Stomachache	180,190,20▲,21▲,220 10, 20, 30, 40, 50, 60, 70, 8090,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-125 <i>Bauhinia variegata</i> L.	Kachnar	T	FL	IF	Internal	Tonic, Carminative , Tanning agent	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-14 <i>Crotalaria juncea</i> L.	Sunn	H	SD	PT	External	Hair tonic , Skin diseases	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-95 <i>Dalbergia sissoo</i> DC.	Shishm	T	RT LV	EX DT	Internal Internal	Colic, Astringent in epistaxis. Eye pain, Body pain, Diarrhea, Jaundice, Abdominal pain , Skin diseases	80,90,100,110,120,130,140,150,160,170,180,190,200,210,220 10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-55 <i>Desmodium elegans</i> DC.	Halphaat	S	RT	TE	Internal	Hypertension, Antidote	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-142 <i>Indigofera linifolia</i> (L. f.) Retz.	Jund	H	LV	RB	External	Skin allergy	10, 20, 30, 40, 50, 6, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-46 <i>Lathyrus aphaca</i> L.	Jangli matter	H	U.SD	PD	Internal	Narcotic	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
UZ-136 <i>Lespedeza juncea</i> (L.f.) Pers.	Kuchani	H	RT	JC	Internal	Diarrhea, Dysentery	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-78 <i>Lotus corniculatus</i> L.	Sriri	H	FL	PO	Internal	Antispasmodic, Cardiotonic, Sedative	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-105 <i>Medicago polymorpha</i> L.	Maina	H	W.P LV	PO EX	External Internal	Carminative Tonic Skin inflammation Dysentery , Indigestion	80,90,100,110,120,130,140,150,160,170,180,190,200,210,220 10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-66 <i>Mimosa pudica</i> L.	Choi Moi	H	LV	DT	Internal	Hemorrhoids, Urinary infections, Cancer, Diabetes , Hepatitis, Obesity, Sores, Piles, Glandular swellings	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
UZ-118 <i>Trifolium resupinatum</i> L.	Tilpetra	H	SD	CH	Internal	Digestive disorder like Abdominal pain .	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220

UZ-85 <i>Vicia sativa</i> L. UZ-25	Phalli	C	W.P	IF	Internal	Indigestion, Tonic, Diuretic, Demulcent, Laxative, Asthma , Cough, Bronchitis, Skin diseases, Urinary problems	80,190,200,210,220 10, 20, 30, 40, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Geraniaceae <i>Geranium rotundifolium</i> L. UZ-34	Rattan joge	H	RT	IF	Internal	Mouth ulcers , Stomach ulcer, Hemorrhoids	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Gentianaceae <i>Swertia cordata</i> (Wall. ex G. Don) C.B. Clarke UZ-44	Cheratbotay	H	A.P	EX	Internal	Digestive problem, Liver problems, Diabetes , Nausea	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Juglandaceae <i>Juglans regia</i> L. UZ-53	Akhrot	T	FT LV / BK	R.F RB	Internal External	Brain and physical weakness Toothache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Lamiaceae <i>Ajuga bracteosa</i> Wall. ex Benth. UZ-94	Rattibotti	H	A.P LV	EX EX	Internal Internal	Blood purifier , Pimples Inflammation, Earache, pain	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Callicarpa macrophylla</i> Vahl UZ-77	Bengli	S	LV RT	DT IF	External Internal	Alleviating pain in rheumatism , Diarrhea, Dysentery Relieving rashes of tongue	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Mentha spicata</i> L. UZ-132	Bebrii	H	BK LV	PT PT	External Internal	Wounds and cuts Cooling agent, Gastric problem	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Mentha longifolia</i> (L.) L. UZ-83	Podina	H	W.P LV	DT B.T	Internal Internal	Stimulant, Carminative Cough, Flatulence, Digestive disorders	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Micromeria biflora</i> (Buch.-Ham. ex D.Don) Benth UZ-76	Shahibooti	S	LV LV	OL JC	Internal Internal	Headache Digestive disorders	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Ocimum sanctum</i> L. UZ-134	Bebrii	H	LV	PT	Internal	Cooling agent, Gastric problem	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220

[illegible]

<i>Ficus carica</i> L. UZ-135	Injeer / Barh Phugwarah	T	FT LX	R.F PT	Internal External	Constipation Wound healing, Extract thrones from skin, Antidote	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Ficus palmata</i> Forssk. UZ-126	Phugwarah	T	FT LX LV LV	R.F RB PT VG	Internal External External Internal	Laxative, Alterative Extract thorns from skin Skin problems Diabetes	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Morus alba</i> L. UZ-96	Toot	T	LV FR	DT PD	Internal Internal	Throat inflammation Cooling, Alterative, Laxative	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Morus nigra</i> L. UZ-116	Shatoot	T	FT	R.F	Internal	Cooling, Alterative, Laxative	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Myrtaceae <i>Eucalyptus</i> <i>camaldulensis</i> Schlecht UZ-143	Safeda	T	BK	RB	External	Toothache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Oleaceae <i>Jasminum officinale</i> L. UZ-15	Chambili	S	RT LV LV	DT CH PD	Internal Internal External	Ringworm Mouth ulcer Antidandruff, Muscular pain	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Olea ferruginea</i> Wall. ex Aitch. UZ-24	Kao	T	LV OL BR	DT EX RB	Internal Internal External	Antiseptic, Antiperiodic, Diuretic, Astringent, Throat infection Anti-rheumatic Toothache, Mouth infection	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Onagraceae <i>Oenothera rosea</i> L. Her. ex Aiton UZ-06	Buti	H	LV	IF	Internal	Hepatic pain, Kidney disorders	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Oxalidaceae <i>Oxalis corniculata</i> L. UZ-36	Khattiboti	H	W.P LV LV	EX PO DT	Internal Internal Internal	Diarrhea, Skin diseases, Dysentery, Blood purification Inflammation Cooling property in fever	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Pinaceae <i>Pinus roxburghii</i> Sarg. UZ-16	Chir	T	RS	PT	External	Wound healing, Healing cracks in feet, Antidote	1, 2, 3, 4, 5, 6, 7, 8, 90,100,110,120,130,140,150,160,170,180,190,200,210,220

Plantaginaceae							
<i>Plantago lanceolata</i> L. UZ-07	Ispgol	H	LV	DT	External Internal	Wound inflammation Astringent for healing throat sores	1 ▲, 2 ▲, 3 ☉, 4 ☉, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ▲, 11 ♀, 12 ▲, 13 ♀, 14 ▲, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ☉, 20 ♀, 21 ♀, 22 ▲
<i>Veronica laxa</i> Benth. UZ-27	Sriri	H	SD W.P	PD TE	Internal Internal	Purgative Nervous system disorder, Respiratory tract, Cardiovascular system, Metabolism	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
Poaceae							
<i>Chrysopogon serrulatus</i> Trin. UZ-86	Bari Gaas	G	W.P	PT	External	Used for skin care	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
<i>Cynodon dactylon</i> (L.) Pers. UZ-138	Khabbal	G	LV	PT	External	Muscle and joint fractures	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ☉, 7 ♀, 8 ▲, 9 ▲, 10 ♀, 11 ▲, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ▲, 19 ♀, 20 ♀, 21 ▲, 22 ♀
<i>Dactylis glomerata</i> L. UZ-17	Gadu	G	W.P W.P	PT EX	Internal Internal	Allergies Estrogenic, Anti-tumor, Kidney ailments, Bladder ailments	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
<i>Dichanthium annulatum</i> (Forssk.) Stapf UZ-75	Murgah Ghass	G	BK	IF	Internal	Astringent, Cough	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ▲, 22 ♀
<i>Digitalis ciliata</i> Trautv. UZ-124	Diljit	G	SD	PD	Internal	Cardiac treatments, Anti-proliferative, Used for suppressing tumors	1 ♀, 2 ♀, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
<i>Echinochloa colona</i> (L.) Link UZ-10	Sanawakri	G	W.P	IF		Antimicrobial, Antioxidant	1 ♀, 2 ♀, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
<i>Eleusine indica</i> (L.) Gaertn. UZ-107	Madhana ghass	G	RT LV W.P	PO DT EX	Internal Internal	Gonorrhea Diuretic Fever, Anti-inflammatory, Jaundice	1 ♀, 2 ♀, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ▲, 22 ♀
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult. UZ-26	Sariyalagh ass	G	RT	IF	Internal	Stimulant Diuretic	1 ♀, 2 ♀, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀
<i>Imperata cylindrica</i> (L.) Raeusch.	Dibb	G	W.P	EX	Internal	Asthma, Bruises, Anthelmintic activity in	1 ♀, 2 ▲, 3 ♀, 4 ♀, 5 ♀, 6 ♀, 7 ♀, 8 ♀, 9 ♀, 10 ♀, 11 ♀, 12 ♀, 13 ♀, 14 ♀, 15 ♀, 16 ♀, 17 ♀, 18 ♀, 19 ♀, 20 ♀, 21 ♀, 22 ♀

UZ-115						paralysis, Antioxidant, Anti-inflammatory	80,190,200,21▲,220
<i>Lolium temulentum</i> L. UZ-65	Grass	G	SD	PD	Internal	Sedative	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Setaria pumila</i> (Poir.) Roem. & Schult.	Kangni, Loomar	G	LV LV	EX PO	Internal External	Eye drops Fast healing	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
UZ-97	Gaas		GR	JC	Internal	Cooling agent	80,190,200,210,220
<i>Themeda anathera</i> (Nees ex Steud.) Hack. UZ-98	Bari ghash	G	A.P	PO	External	Backache , Blood purifier	10, 2▲, 3©, 4©, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Polygalaceae							
<i>Polygala abyssinica</i> R. Br. ex Fresen. UZ-37	Arna	H	RT	JC	External	Evil eye, Antidote to snake bite	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Polygonaceae							
<i>Persicaria maculosa</i> Gray UZ-51	Ochi	H	SD RT	PD PT	Internal Internal External	Dysentery, Cholera Astringent, Scabies Wound healing	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Polygonum ramosissimum</i> Michx. UZ-40	Bannali	H	W.P	PT	Internal	Urinary tract infection	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Rumex hastatus</i> D.Don UZ-59	Jnglipalak	H	LV RT	DO PT	Internal External	Laxative Astringent in skin disorder	10, 2▲, 3▲, 4▲, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 8▲,190,200,210,220
Primulaceae							
<i>Anagallis arvensis</i> L. UZ-47	Billibooti	H	W.P	EX	Internal	Lowering fever , Depression, Tuberculosis, Liver problems, Epilepsy	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
			W.P	PT	External	Improving the complexion, especially for freckle	
<i>Androsace rotundifolia</i> Hardw. UZ-58	Thandijarri	H	RH LV	EX IF	Internal Internal	Ophthalmic Stomachache , Emetic	10, 2▲, 3©, 4©, 50, 60, 70, 80,90,100,110,12▲,130,140,150,160,170, 180,190,200,210,220
Pteridaceae							
<i>Adiantum tenerum</i> Sw. UZ-130	Hansraj	F	FD	JC	Internal	Cough, Fever, Dysentery, Ulcers	
				PT	External	Burning sensation, Epileptic fits	
<i>Onychium japonicum</i>	Pathba	F	LV &	JC	Internal	Dysentery, Diarrhea	

(Thunb.) Kunze UZ-28 <i>Pteris vittata</i> L. UZ-149	Nanore	F	FD	PT	External	Antibacterial for wounds	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Ranunculaceae							
<i>Clematis grata</i> Wall. UZ-89	Tootal	S	LV IF	DT IF	Internal Internal	Diabetes Cough	10, 2▲, 3©, 4©, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Ranunculus arvensis</i> L. UZ-80	Chachumb a	H	A.P	CK	Internal	Asthma	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 8▲,190,200,210,220
<i>Ranunculus muricatus</i> L. UZ-91	Kor- Kandoli	H	A.P	MX	Internal	Asthma	10, 20, 3©, 4©, 50, 6©, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,22▲
<i>Thalictrum revolutum</i> DC. UZ-112	Beni	H	W.P	JC	Internal	Blood purifier, Curing fever	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Rosaceae							
<i>Cotoneaster racemiflora</i> Wall. ex Lindl. UZ-08	Luni	S	LV	TE	Internal	Stop bleeding and pus	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Duchesnea indica</i> (Jacks.) Focke UZ-48	Budimewa	H	FL W.P	BO EX	Internal	Blood circulation Swelling, Boils, Burns	10, 2▲, 3▲, 4▲, 50, 6▲, 70, 80,90,100,11▲,120,130,140,150,160,170, 180,19▲,200,210,220
<i>Eriobotrya japonica</i> (Thunb.) Lindl. UZ-29	Loukat	T	W.P LV	D PT	Internal Internal	Cough, Constipation Nose bleeds, Coughing up blood, Diarrhea, Depression , Skin diseases	10, 20, 3▲, 4▲, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
			FT	R.F	Internal	Demulcent, Expectorant, Digestive disorders, Respiratory problems	
<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita UZ-148	Boodimava	H	FL FT	BO JC	Internal Internal	Common cold Anti-diarrheal, Anti- dysenteric , Diabetes, Sexual diseases	10, 2▲, 3▲, 4▲, 50, 60, 7▲, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,22▲
<i>Potentilla reptans</i> L. UZ-137	Gul bota	H	W.P	JC	Internal	Anti-diarrheal , Intestinal infections	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1

<i>Prunus armeniaca</i> L. UZ-70	Hari, Khubani, Apricot	T	FT SD	ET OL	Internal External	Laxative Softening effect on the skin	80,190,200,210,220 10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Prunus domestica</i> L. UZ-87	Alucha	T	FT	ET	Internal	Irregular menstruation, Miscarriage , Alcoholic beverages and liqueur	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Prunus persica</i> (L.) Batsch UZ-68	Aruu, Peach	T	LV	JC	Internal	Gastritis , Cough, Bronchitis, Anthelminthic	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Pyrus malus</i> L. UZ-99	Saib	T	FT	JC	Internal	Rheumatism, Hypertension , Tonic for vigorous body, Strengthen bones, face spots	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Pyrus pashia</i> Buch. - Ham. ex D. Don UZ-38	Tangi	T	FT FT	PT ET	Internal Internal	Dark eye circles Constipation	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Rosa brunonii</i> Lindl. UZ-121	Chal	S	FL FL	PD DT	Internal Internal	Heart tonic, Skin diseases Constipation	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Rosa indica</i> L. UZ-30	Galab	S	FL	EX	Internal	Eye diseases , Stomachache, Fever, Pneumonia	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Rubus ellipticus</i> Sm. UZ-109	Aakhara	S	LV	DT PD	Internal Internal	Diarrhea, Bleeding Against skin diseases especially female genitalia	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Rubus niveus</i> Thunb. UZ-19	Garachi	S	LV	PD	Internal	Diarrhea, Fever, Blood purifier	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Spiraea canescens</i> D. Don UZ-57	Jhar, Mariala		RT	EX		Dysentery, Colic, Pain, Whooping Cough Enema and to treat venereal conditions	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Rubiaceae							
<i>Galium aparine</i> L. UZ-119	Boora	H	W.P	MX	Internal	Constipation, Stomachic diseases	10, 20, 30, 40, 50, 60, 70, 80, 90,100,110,120,130,140,150,160,170,180,190,200,210,220
			W.P.	JC	Internal	Anti-ascorbic; Diuretic , Aperients	
Rutaceae							

<i>Zanthoxylum armatum</i> DC. UZ-106	Timber	S	SD / BK BR	R.F RB	Internal Internal	Tonic, Cholera, fever, Dyspepsia, Stomachache Toothache	10, 2▲, 3☉, 4☉, 50, 6▲, 70, 80,90,10▲,11▲,120,130,140,150,160,170 ,18☉,190,200,210,220
Salicaceae							
<i>Populus nigra</i> L. UZ-123	Sfeeda	T	BK	EX	Internal	Arthritis, Gout, Lower back pain , Urinary complaints, Gout, Digestive disorders, Liver disorders, Fever, Relieve the pain of menstrual cramps	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
			BK LV	PT PT	External External	Hemorrhoids Infected wounds and sprains, Caries of teeth and bones	
Sapindaceae							
<i>Aesculus indica</i> (Wall. ex Camb.) Hook. UZ-141	Bankhore	T	FT SD	R.F PD	Internal Internal	Colic, Rheumatism Leucorrhoea	10, 20, 3☉, 4☉, 50, 60, 70, 80,90,10▲,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Dodonaea viscosa</i> (L.) Jacq. UZ-139	Snathaa	S	LV	PD	External	Healing agent	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Scrophulariaceae							
<i>Verbascum thapsus</i> L. UZ-18	Gidar	H	LV	DT	External	Sunburn, Ulcers, Tumors, Piles	10, 2▲, 3▲, 4▲, 50, 6▲, 70, 80,90,10▲,110,120,13▲,140,150,160,170 ,18▲,190,200,210,220
			W.P.	IF	Internal	Antibacterial, Sedative, Narcotic	
			RT	EX	Internal	Toothache, Relieve cramps, Convulsions	
Simaroubaceae							
<i>Ailanthus altissima</i> (Mill.) Swingle UZ-92	Draviyae	T	BK LV	IF EX	Internal Internal	Dysentery , Diarrhea Blood purifier	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Solanaceae							
<i>Solanum villosum</i> Mill. UZ-09	Kaach, Maach	H	LV FT	DT R.F		Diuretic Tongue infection in children	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
Urticaceae							
<i>Debregeasia salicifolia</i> (D. Don) Rendle UZ-39	Sindari	S	A.P	IF	External	Eczema, Dermatitis	10, 20, 3☉, 4☉, 50, 6☉, 70, 80,90,100,110,120,130,140,150,160,170,1 80,190,200,210,220
<i>Urtica dioica</i> L.	Kinjii	H	RT	IF	Internal	Diuretic	10, 20, 30, 40, 50, 60, 7▲,

UZ-49			RT	PT	Internal	Anti-allergic	80,90,100,11▲,120,13▲,140,15▲,160,170,180,190,200,210,22▲
Valerianaceae							
<i>Valeriana jatamansi</i> Jones. UZ-60	Mushk bala	H	RH	EX	Internal	Intestinal pain , Neurosis, Constipation	10, 20, 3▲, 4▲, 50, 60, 7▲, 80,90,10▲,110,12▲,130,140,150,160,170,180,190,200,210,22▲
Verbenaceae							
<i>Vitex agnus-castus</i> L. UZ-88		T	LV	EX		Female reproductive system disorders, Diuretic, Digestive disorders, Antifungal, Anti-Anxiety, Stomachache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Verbena officinalis</i> L. UZ-67	Chandni	H	W.P	IF	Internal	Diuretic, Reduces inflammation , Control bleeding, Anti-malarial, Nervous exhaustion, Depression, Asthma, Migraine, Jaundice	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Violaceae							
<i>Viola odorata</i> L. UZ-100	Banafshan	H	W.P	BO	Internal	Flu, Cough, Jaundice	10, 20, 30, 40, 5▲, 60, 70, 80,90,10▲,110,120,130,140,150,16▲,170,180,190,200,210,220

763 Habit: H, Herbs; S, Shrubs; T, Trees; F, Ferns; E, Epiphyte2. Part(s) Used: LV, Leaf; FT, Fruit; RT, Root; ST, Stem; A.P, Aerial Parts; W.P, Whole Plant; FD,
764 Fronds; SD, Seed; FL, Flower; BK, Bark; BL, Bulb; RH, Rhizome; IF, Inflorescence; SH, Shoot; LX, Latex; BR, Branches; RS, Resin; GR, Grain ; Pods , P;
765 Pulp, PL; Oil, OL3. Method of Preparation: PD, Powder; DT, Decoction; EX, Extract; PT, Paste; JC, Juice; PO, Poultice; IF, Infusion; CH, Chewed; VG,
766 Vegetable; TE, Tea; RB, Rubbing; ET, Eaten; CK, Cooked; Boiled, BO; Ash, AS; Fluid , FU; Fragrance, FG; Mixture, MX4. Rel PH, Relative number of
767 pharmacological properties attributed to a single plant 5. Rel BS, Relative number of body systems treated by a single species 6. RI, Relative Importance 7. FC,
768 Frequency of Citation 8.RFC, Relative frequency of citation 9. UV, Use value (©) = Plants with similar use(s); (▲) = Plants with dissimilar use (s); (◇) = Plants
769 not reported in previous study; **Bold written** uses highlights the frequent use for a given plant

Scientific name	FC	RFC	Ui	UV	RelPH	RelBS	RI
<i>Abutilon ramosum</i>	3	0.04	3	0.04	0.08	0.13	10.5
<i>Acacia modesta</i>	30	0.4	33	0.44	0.17	0.25	21
<i>Acacia nilotica</i>	64	0.86	65	0.87	0.42	0.38	40
<i>Achillea millefolium</i>	38	0.15	46	0.62	0.5	0.75	62.5
<i>Achyranthes aspera</i>	50	0.67	66	0.88	0.25	0.38	31.5
<i>Adiantum tenerum</i>	19	0.25	21	0.28	0.58	0.63	60.5
<i>Aesculus indica</i>	34	0.45	39	0.52	0.33	0.5	41.5
<i>Ajuga bracteosa</i>	42	0.56	54	0.72	0.42	0.5	46
<i>Ailanthus altissima</i>	60	0.81	64	0.86	0.25	0.25	25
<i>Allium griffithianum</i>	42	0.56	48	0.64	0.25	0.13	19
<i>Alternanthera pungens</i>	10	0.13	23	0.31	0.17	0.13	15
<i>Amaranthus spinosus</i>	36	0.48	39	0.52	0.25	0.25	25
<i>Amaranthus viridis</i>	51	0.68	57	0.77	0.42	0.5	46
<i>Anagallis arvensis</i>	22	0.29	29	0.39	0.5	0.5	50
<i>Anaphalis adnata</i>	14	0.18	18	0.24	0.17	0.25	21
<i>Androsace rotundifolia</i>	6	0.08	11	0.14	0.25	0.38	31.5
<i>Angelica glauca</i>	20	0.27	27	0.36	0.17	0.25	21
<i>Artemisia vulgaris</i>	52	0.7	55	0.74	0.17	0.25	12.67
<i>Asplenium dalhousiae</i>	34	0.45	34	0.45	0.08	0.13	10.5
<i>Astragalus canadensis</i>	8	0.1	8	0.1	0.08	0.13	0.5
<i>Bauhinia variegata</i>	44	0.59	47	0.63	0.25	0.25	50
<i>Berberis lycium</i>	60	0.81	67	0.9	0.25	0.38	31.5
<i>Bidens biternata</i>	53	0.71	61	0.82	0.17	0.25	12.65
<i>Callicarpa mycrophylla</i>	39	0.52	43	0.58	0.42	0.5	46
<i>Cannabis sativa</i>	58	0.78	60	0.81	0.33	0.5	41.5
<i>Capsella bursa-pastoris</i>	25	0.33	44	0.59	0.33	0.38	35.5
<i>Carissa opaca</i>	32	0.43	38	0.51	0.33	0.38	35.5
<i>Cirsium vulgare</i>	32	0.43	41	0.55	0.25	0.38	31.5
<i>Chenopodium album</i>	19	0.25	19	0.25	0.08	0.13	10.5
<i>Chrysopogon serrulatus</i>	4	0.05	4	0.05	0.08	0.13	10.5
<i>Clematis grata</i>	2	0.027	2	0.027	0.17	0.25	21
<i>Commelina benghalensis</i>	5	0.06	5	0.08	0.13		10.5
<i>Convolvulus arvensis</i>	52	0.7	58	0.78	0.58	0.63	60.5
<i>Conyza canadensis</i>	40	0.54	47	0.63	0.58	0.5	54
<i>Cornus macrophylla</i>	8	0.1	12	0.16	0.08	0.13	10.5
<i>Cotoneaster racemiflora</i>	2	0.02	2	0.02	0.17	0.25	21
<i>Crepis multicaulis</i>	10	0.13	10	0.13	0.08	0.13	10.5

<i>Crotalaria juncea</i>	2	0.02	4	0.05	0.33	0.5	41.5
<i>Cuscuta reflexa</i>	57	0.77	60	0.81	0.17	0.25	21
<i>Cynodon dactylon</i>	60	0.81	64	0.86	0.08	0.13	10.5
<i>Cynoglossum lanceolatum</i>	69	0.93	70	0.94	0.08	0.13	10.5
<i>Cyperus rotundus</i>	4	0.05	9	0.12	0.25	0.13	19
<i>Dactylis glomerata</i>	6	0.08	19	0.25	0.42	0.63	52.5
<i>Dalbergia sissoo</i>	60	0.81	62	0.83	0.5	0.63	56.5
<i>Debregeasia salicifolia</i>	33	0.44	38	0.51	0.17	0.25	21
<i>Desmodium elegans</i>	26	0.35	26	0.35	0.17	0.25	21
<i>Dichanthium annulatum</i>	10	0.13	10	0.13	0.17	0.25	21
<i>Dicliptera bupleuroides</i>	10	0.13	20	0.27	0.25	0.38	31.5
<i>Digitalis ciliata</i>	8	0.1	16	0.21	0.25	0.38	31.5
<i>Dodonaea viscosa</i>	60	0.81	60	0.81	0.25	0.38	31
<i>Dryopteris filix-mas</i>	60	0.81	60	0.81	0.08	0.13	10.5
<i>Duchesnea indica</i>	30	0.4	38	0.51	0.17	0.25	21
<i>Echinochloa colona</i>	2	0.02	4	0.05	0.17	0.25	21
<i>Elaeagnus umbellata</i>	42	0.56	54	0.72	0.33	0.38	35.5
<i>Eleusine indica</i>	9	0.12	14	0.18	0.42	0.63	52.5
<i>Eriobotrya japonica</i>	61	0.82	63	0.85	0.33	0.5	41.5
<i>Eucalyptus camaldulensis</i>	43	0.58	46	0.62	0.08	0.13	6.33
<i>Euphorbia helioscopia</i>	64	0.86	68	0.91	0.25	0.25	25
<i>Ficus carica</i>	61	0.82	63	0.85	0.33	0.38	19.08
<i>Ficus palmata</i>	50	0.67	70	0.94	0.42	0.5	25.42
<i>Fragaria nubicola</i>	46	0.62	48	0.64	1.00	0.63	81.5
<i>Galium aparine</i>	54	0.72	56	0.75	0.92	1.00	96.0
<i>Geranium rotundifolium</i>	46	0.62	49	0.66	0.25	0.38	31.5
<i>Gerbera gossypina</i>	38	0.51	40	0.54	0.42	0.38	40.0
<i>Hedera nepalensis</i>	20	0.27	35	0.47	0.25	0.38	31.5
<i>Helianthus annuus</i>	50	0.67	61	0.82	0.58	0.63	60.5
<i>Heteropogon contortus</i>	10	0.13	14	0.18	0.17	0.25	21.0
<i>Impatiens edgeworthii</i>	14	0.18	25	0.33	0.25	0.38	31.5
<i>Imperata cylindrica</i>	7	0.09	24	0.32	0.42	0.5	46
<i>Indigofera linifolia</i>	24	0.32	28	0.37	0.08	0.13	10.5
<i>Ipomoea purpurea</i>	49	0.66	52	0.7	0.33	0.5	41.5
<i>Jasminum officinale</i>	54	0.72	59	0.79	0.33	0.5	25.33
<i>Juglans regia</i>	58	0.78	66	0.89	0.17	0.25	21
<i>Justicia adhatoda</i>	40	0.54	53	0.71	0.33	0.25	29
<i>Lathyrus aphaca</i>	15	0.2	17	0.22	0.08	0.13	0.5
<i>Launaea procumbens</i>	15	0.2	27	0.36	0.17	0.25	21

<i>Lespedeza juncea</i>	5	0.06	8	0.1	0.17	0.13	15
<i>Lolium temulentum</i>	2	0.02	3	0.04	0.08	0.13	10.5
<i>Lotus corniculatus</i>	5	0.06	7	0.09	0.5	0.75	62.7
<i>Malva parviflora</i>	65	0.87	65	0.87	0.08	0.13	0.5
<i>Malvastrum coromandelianum</i>	42	0.56	48	0.64	0.17	0.13	5
<i>Maytenus nemorosa</i>	4	0.05	7	0.09	0.17	0.25	21
<i>Medicago polymorpha</i>	44	0.59	49	0.66	0.17	0.13	15
<i>Melia azadrachta</i>	65	0.87	69	0.93	0.58	0.88	73
<i>Mentha spicata</i>	55	0.74	57	0.77	0.17	0.25	21
<i>Mentha longifolia</i>	64	0.86	78	1.05	0.5	0.38	44
<i>Micromeria biflora</i>	33	0.44	53	0.71	0.17	0.13	15
<i>Mimosa pudica</i>	3	0.04	5	0.06	0.83	0.1	91.5
<i>Morus alba</i>	61	0.82	66	0.89	0.33	0.38	35.5
<i>Morus nigra</i>	44	0.59	60	0.81	0.25	0.25	50
<i>Nerium oleander</i>	50	0.67	54	0.72	0.5	0.63	56.5
<i>Ocimum sanctum</i>	55	0.74	57	0.77	0.17	0.25	21
<i>Oenothera rosea</i>	15	0.2	20	0.27	0.17	0.25	35.5
<i>Olea ferruginea.</i>	64	0.86	76	1.02	0.58	0.75	38.08
<i>Onychium japonicum</i>	17	0.22	24	0.32	0.17	0.13	15
<i>Origanum vulgare</i>	16	0.21	28	0.37	0.25	0.25	50
<i>Otostegia limbata</i>	3	0.04	8	0.1	0.17	0.13	15
<i>Oxalis corniculata</i>	60	0.81	65	0.87	0.5	0.5	50
<i>Persicaria maculosa</i>	7	0.09	15	0.2	0.42	0.38	40
<i>Phlomis bracteosa</i>	8	0.1	11	0.14	0.25	0.25	50
<i>Pinus roxburghii</i>	60	0.81	64	0.86	0.25	0.25	50
<i>Plantago lanceolata</i>	30	0.4	36	0.48	0.25	0.25	50
<i>Polygala abyssinica</i>	2	0.02	2	0.02	0.08	0.13	10.5
<i>Polygonatum geminiflorum</i>	6	0.08	11	0.16	0.58	0.5	54
<i>Polygonum ramosissimum</i>	5	0.06	5	0.06	0.08	0.13	10.5
<i>Populus nigra</i>	53	0.71	56	0.75	0.08	0.13	10.5
<i>Potentilla reptans</i>	4	0.05	6	0.08	0.17	0.13	15
<i>Prunella vulgaris</i>	31	0.41	48	0.64	0.25	0.38	31.5
<i>Prunus armeniaca</i>	35	0.47	38	0.51	0.25	0.38	31.5
<i>Prunus domestica</i>	39	0.52	42	0.56	0.33	0.25	29
<i>Prunus persica</i>	43	0.58	49	0.66	0.42	0.5	46
<i>Pteris vittata</i>	21	0.28	27	0.36	0.08	0.13	10.5
<i>Punica granatum</i>	68	0.91	72	0.97	0.42	0.38	40
<i>Pyrus malus</i>	46	0.62	51	0.68	0.5	0.5	50
<i>Pyrus pashia</i>	38	0.51	38	0.51	0.33	0.25	29

<i>Ranunculus arvensis</i>	29	0.39	29	0.39	0.08	0.13	10.5
<i>Rauanculus muricatus</i>	20	0.27	20	0.27	0.08	0.13	1050
<i>Ricinus communis</i>	28	0.37	51	0.68	0.5	0.5	50
<i>Rosa brunoni</i>	50	0.67	52	0.7	0.25	0.38	31.5
<i>Rosa indica</i>	69	0.93	71	0.95	0.08	0.13	0.5
<i>Rubus ellipticus</i>	58	0.78	60	0.81	0.42	0.5	46
<i>Rubus niveus</i>	55	0.74	59	0.79	0.67	0.63	65
<i>Rumex hastatus</i>	51	0.68	55	0.74	0.17	0.25	21
<i>Salvia lanata</i>	18	0.24	28	0.37	0.25	0.25	50
<i>Sarcococca saligna</i>	2	0.02	6	0.08	0.25	0.38	31.5
<i>Setaria pumila</i>	6	0.08	13	0.17	0.25	0.38	31.5
<i>Silybum marianum</i>	25	0.33	53	0.71	0.67	0.63	65
<i>Solanum villosum</i>	66	0.89	69	0.93	0.17	0.25	21
<i>Sonchus oleraceus</i>	52	0.7	52	0.7	0.08	0.13	10.5
<i>Spiraea canescens</i>	14	0.18	17	0.22	0.17	0.25	21
<i>Swertia cordata</i>	3	0.04	9	0.12	0.33	0.25	29
<i>Tagetes minuta</i>	14	0.2	25	0.35	0.09	0.41	115
<i>Taraxacum officinale</i>	54	0.72	59	0.79	0.25	0.38	31.5
<i>Thalictrum revolutum</i>	11	0.14	16	0.21	0.17	0.25	21
<i>Themeda anathera</i>	16	0.21	18	0.24	0.17	0.25	21
<i>Thymus linearis</i>	22	0.29	39	0.52	0.25	0.25	50
<i>Torilis japonica</i>	14	0.18	19	0.25	0.5	0.63	32
<i>Trichodesma indicum</i>	14	0.18	19	0.24	0.25	0.38	31.5
<i>Trifolium resupinatum</i>	20	0.27	27	0.36	0.08	0.13	10.5
<i>Urtica dioica</i>	44	0.59	47	0.63	0.17	0.25	21
<i>Valeraina jatamansi</i>	26	0.35	30	0.4	0.25	0.25	25
<i>Verbascum thapsus</i>	10	0.13	12	0.16	0.83	0.75	79
<i>Verbena officinalis</i>	25	0.33	27	0.36	0.75	0.88	81
<i>Veronica laxa</i>	9	0.12	13	0.17	0.83	0.75	79
<i>Viburnum grandiflorum</i>	53	0.71	57	0.77	0.17	0.25	21
<i>Vicia sativa</i>	44	0.59	51	0.68	0.83	0.88	85.5
<i>Vincetoxicum hirundinaria</i>	15	0.2	28	0.37	0.17	0.13	15
<i>Viola odorata</i>	62	0.83	65	0.87	0.25	0.25	25
<i>Vitex agnus-castus</i>	54	0.72	58	0.78	0.5 0	0.5	50
<i>Xanthium strumarium</i>	62	0.83	128	1.72	0.33	0.38	35.5
<i>Zanthoxylum armatum</i>	68	0.91	75	1.01	0.42	0.5	46

771 FC, Frequency of Citation. RFC, Relative frequency of citation. Ui, Use reports cited by each
772 respondent for given species. UV, Use value. Rel. PH, Relative number of pharmacological
773 properties attributed to a single plant. Rel. BS, Relative number of body systems treated by a
774 single species. RI, Relative Importance.

Table 4. Jaccard index comparing the present study with previous articles

Area	SY	NRPs	NPSU	NPDU	TSCBA	SEAA	SESA	PPSU	PPDU	JI	C
Comparison with article from Azad Jammu & Kashmir											
Toil peer (AJK), Pakistan	2017	121	27	18	45	76	105	22.3	14.8	33.08	[46]
Perl valley (AJK), Pakistan	2017	136	29	21	50	86	100	21.3	15.4	36.7	[23]
Neelum Valley (AJK), Pakistan	2011	40	2	7	9	31	141	5	17.5	5.2	[111]
Kotli, AJK, Pakistan	2017	202	21	19	40	162	110	10.3	9.4	17.2	[114]
Bhimber (AJK), Pakistan	2011	38	3	8	11	27	139	7.8	21.05	7.09	[117]
Khahuta (AJK), Pakistan	2013	45	5	9	14	31	136	11.1	20	9.15	[113]
Muzaffarabad (AJK), Pakistan	2014	52	5	13	18	34	132	9.61	25	12.1	[119]
Kotli (AJK), Pakistan	2019	80	11	24	35	45	105	13.7	30	30.4	[45]
Sharda, Neelum Valley (AJK),	2012	39	2	9	11	28	139	5.1	23	7.05	[37]
Comparison with article from KPK and Northern area											
Kabal valley (KPK), Pakistan	2015	45	2	10	12	33	138	4.4	22.2	7.54	[112]
Skardu valley, Karakoram-	2014	50	1	4	5	45	145	2	8	2.7	[44]
Ayubia National Park,	2006	21	3	4	7	14	143	14.2	19.04	4.66	[115]
Tormik valley, Baltistan,	2015	63	0	3	3	60	147	0	4.76	1.47	[120]
Northern Pakistani Afghan	2018	92	2	18	20	72	148	2.17	19.5	10	[121]
Malakand KPK, Pakistan	2018	25	2	7	9	16	141	8	28	6.08	[122]
Mohmand Agency (FATA),	2018	64	1	14	15	49	135	1.56	21.8	8.87	[31]
Comparison with article from other areas of Pakistan											
Wazirabad, Punjab, Pakistan	2018	31	0	4	4	27	146	0	12.9	2.36	[123]
Chenab, Punjab, Pakistan	2019	129	3	24	27	102	123	2.32	18.6	13.6	[91]
Dera Ghazi Khan, Punjab,	2012	66	7	9	16	50	134	10.6	13.6	9.52	[116]
Comparison with article from rest of world											
Sikles area, Nepal	2015	42	2	5	7	35	143	4.76	11.9	4.09	[118]
Sangli, Maharashtra, India	2015	21	0	3	3	18	147	0	14.2	1.85	[109]
Kunama ethnic group in	2015	115	1	3	4	111	146	0.86	2.6	1.58	[110]

777 SY. Study year, Number of reported plant species, NPSU. Number of plants with similar uses, NPDU. Number of plants with different uses,
778 TSCBA. Total species common in both area, SEAA. Species enlisted in aligned areas, SESa. Species enlisted only in study area, PPSU.
779 Percentage of plant with similar uses, PPDU. Percentage of plant with different uses, JI. Jaccard index, C. citation

Figure legends

Fig. 1 Map of the study area

Fig. 2 Precipitation and temperature of the study area

Fig. 3 Life form distribution pattern of the reported plant species in the study area

Fig. 4 Family contribution of medicinal flora in the study area

Fig. 5 Plant parts used in herbal recipes

Fig. 6 Method of preparation of herbal recipes

Fig. 7 Informant consensus factor of diseases with use reports and total number of species used.

Ntax, total species used by all the informants for group of ailments; UR, total number of use reports in each group of disease; ICF, informant consensus factor; MTD, Mouth-Throat Diseases; EED, Eye and Ear Diseases; D, Diabetes; RD, Respiratory diseases; MJD, Muscular and Joint Diseases; DLS, Digestive system and Liver diseases; SD, Skin diseases; CSD, Circulatory system diseases; URD, Urinary and Reproductive system diseases; F, Fever; C, Cancer; HP, Hair problems; NSD, Nervous System Disorders; BLSD, Blood and Lymphatic system diseases; A, Antidotes; O, Others

Fig. 8 Top ranked plant species with above 80% fidelity

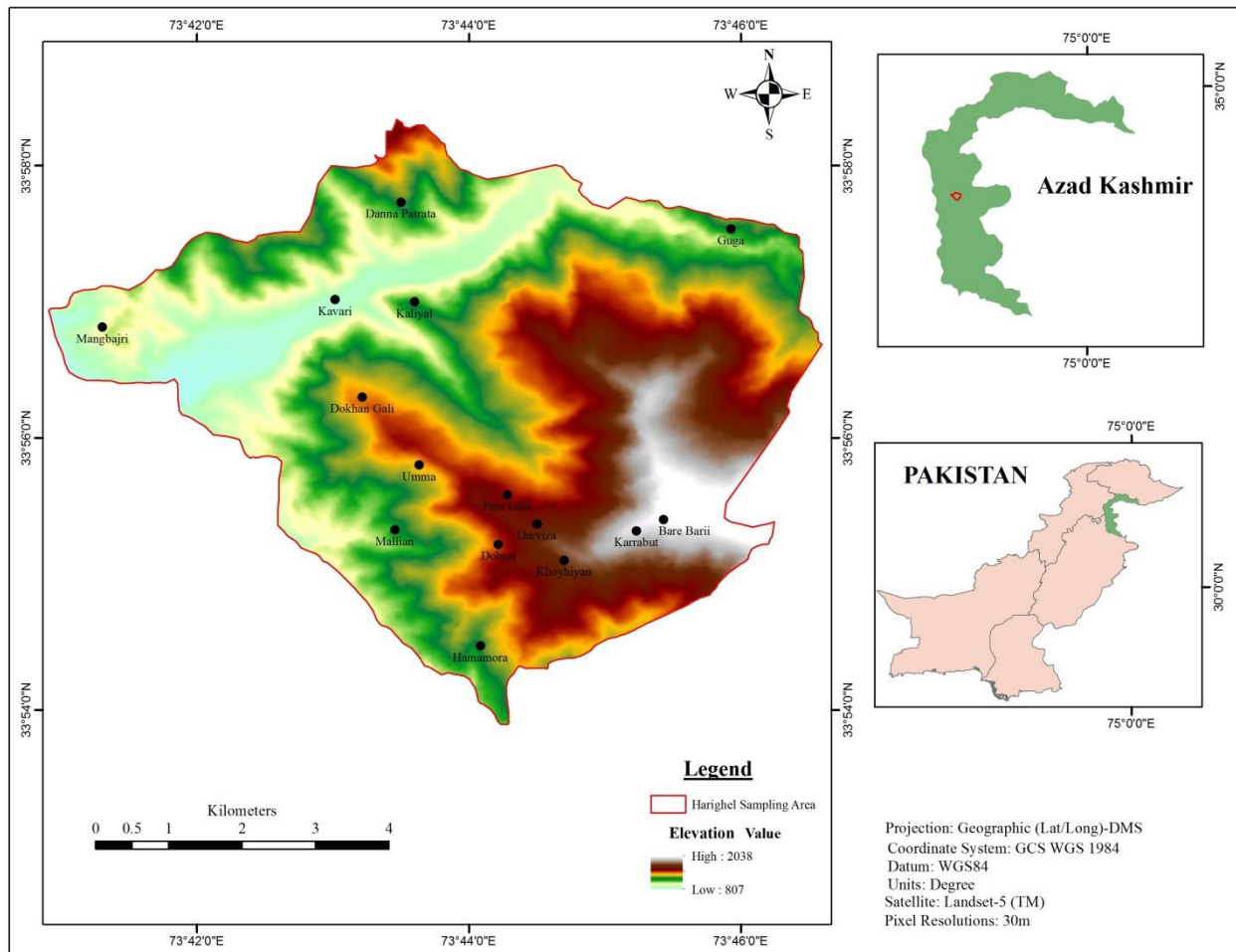


Fig. 1 Map of the study area

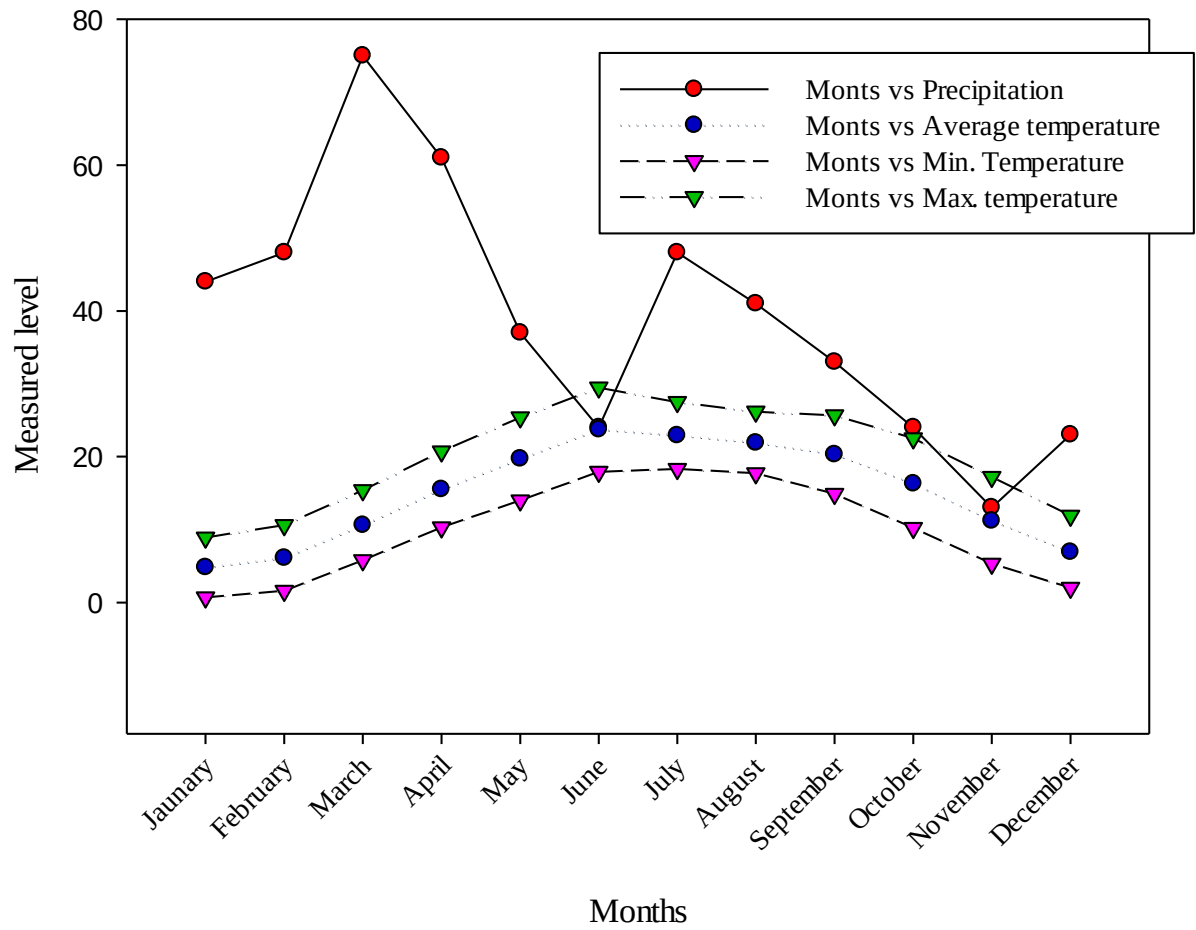


Fig. 2 Precipitation and temperature of the study area

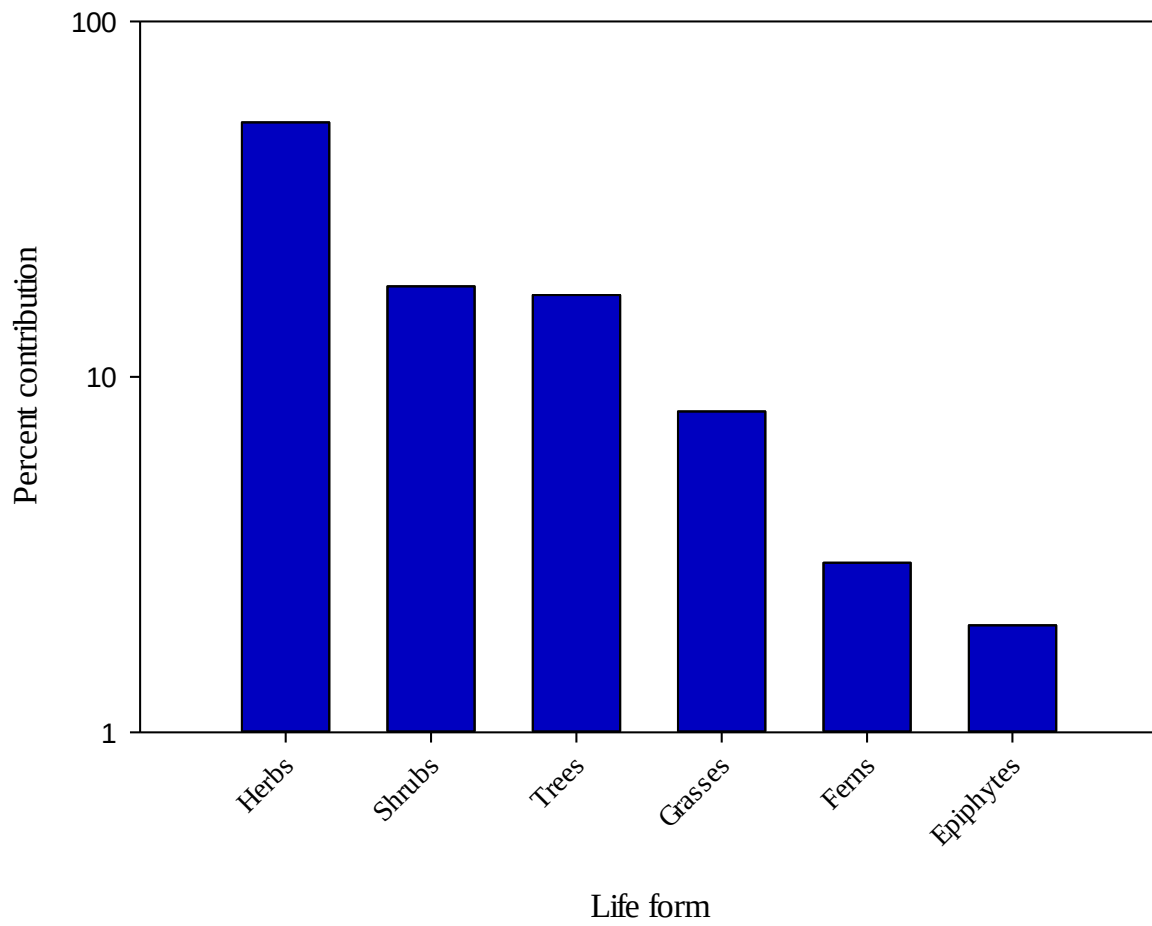


Fig. 3 Life form distribution pattern of the reported plant species in the study area

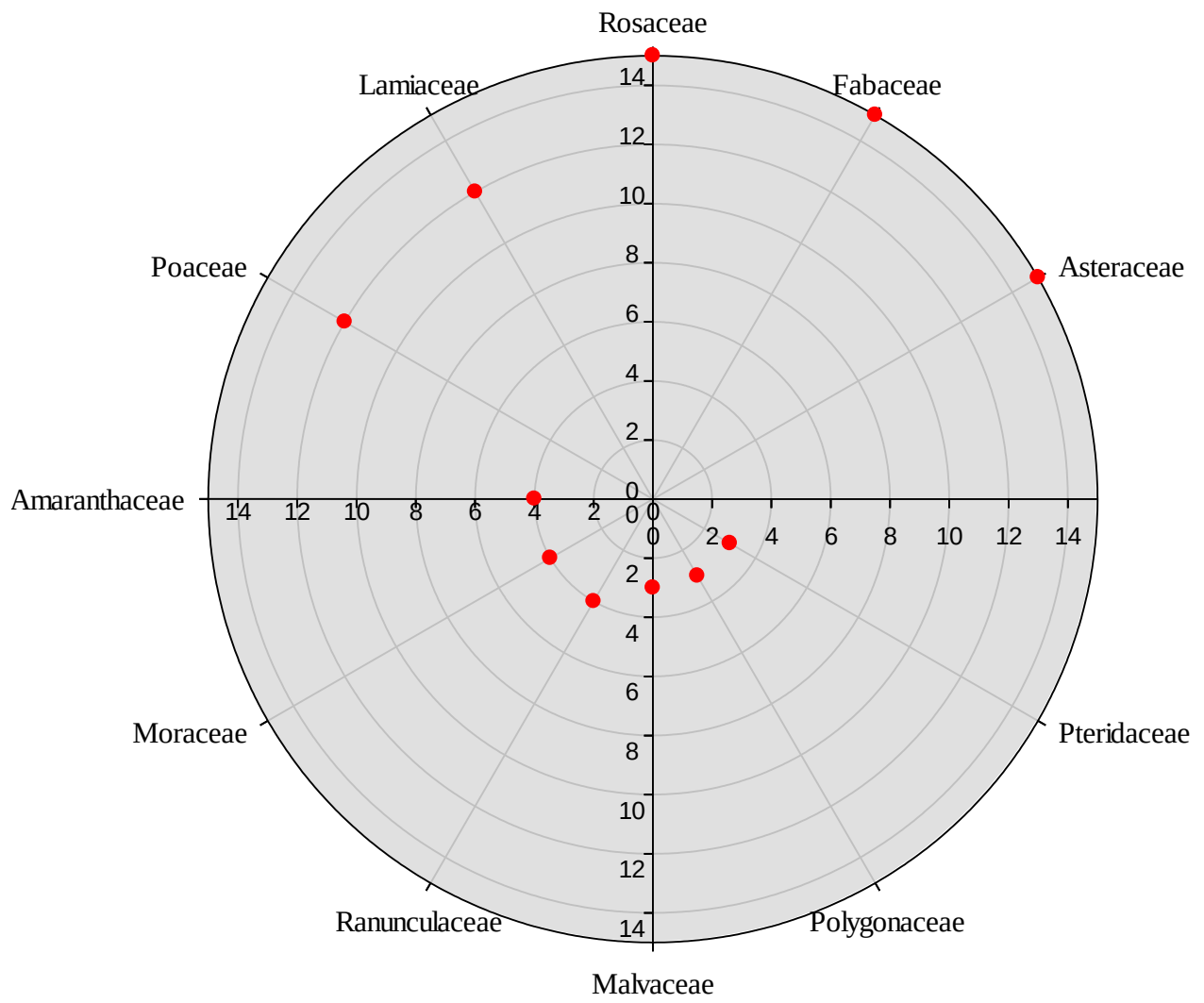


Fig. 4 Family contribution of medicinal flora in the study area

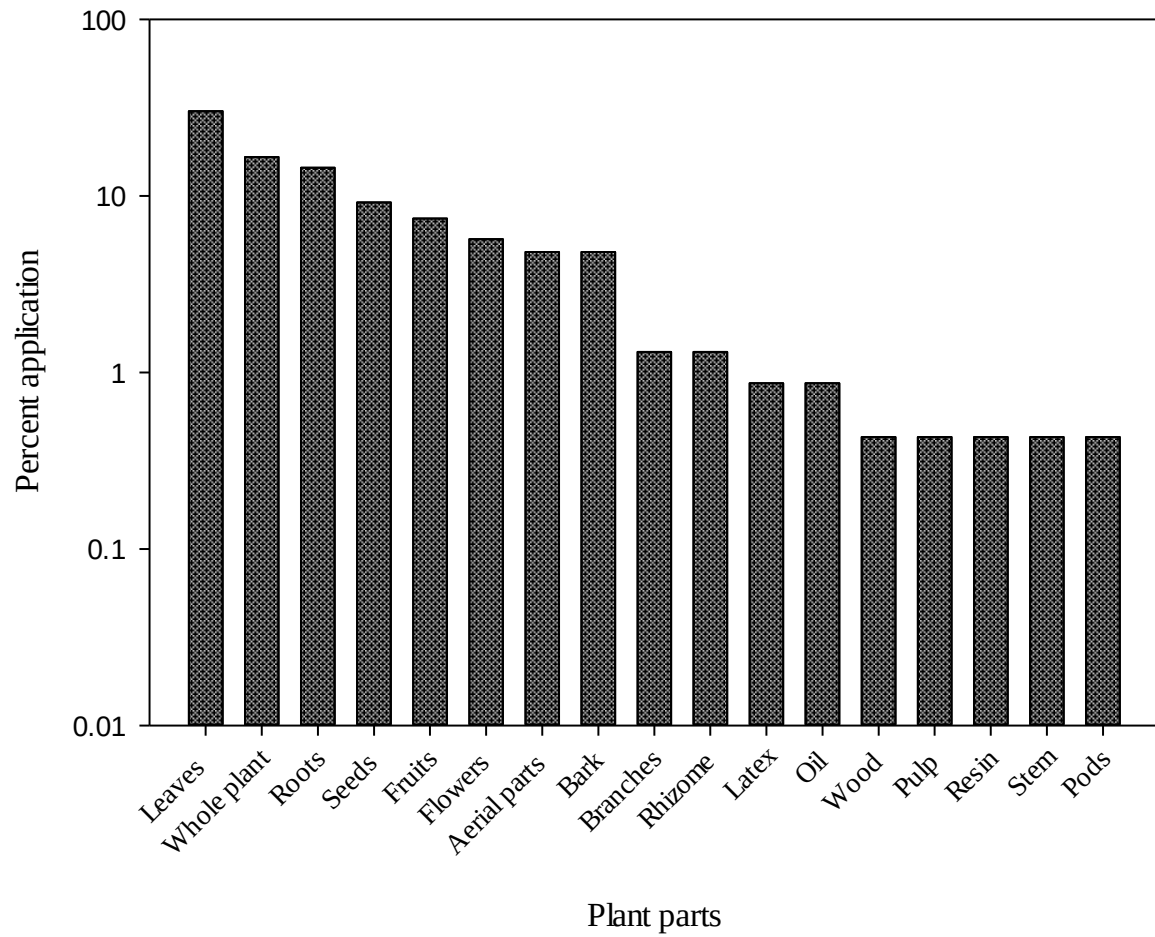
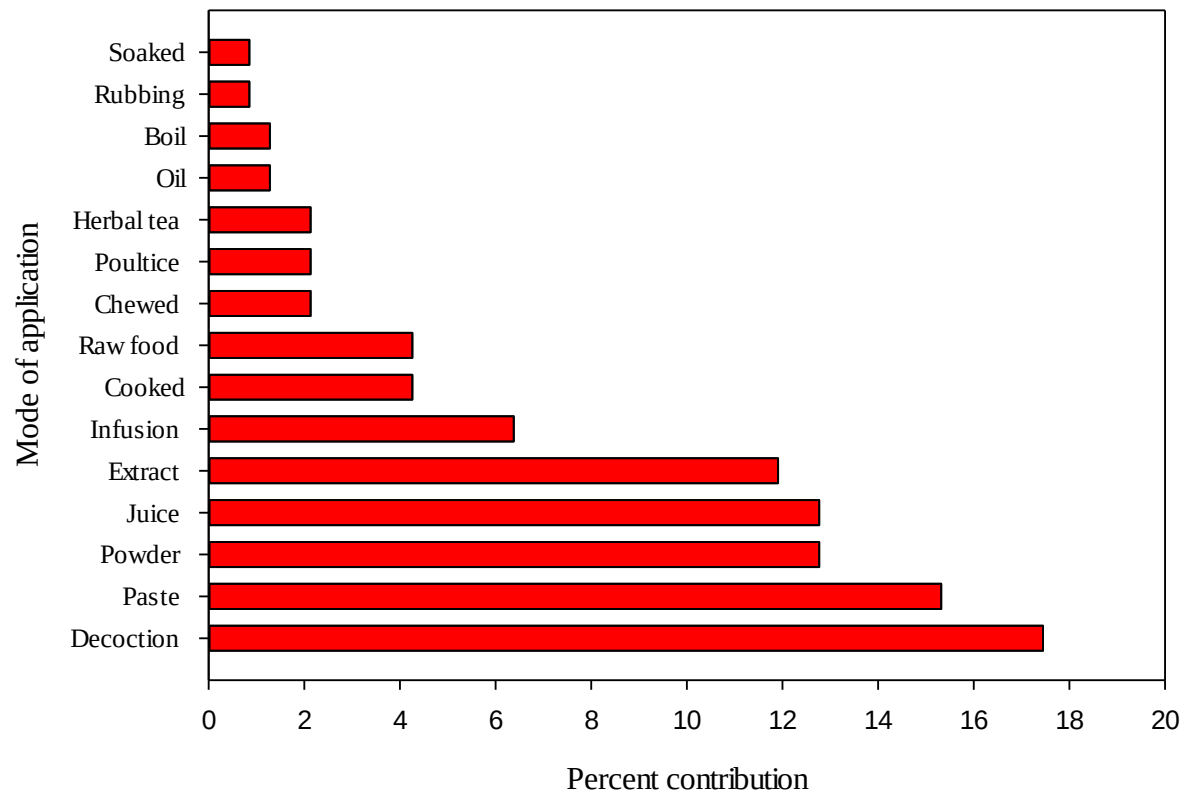


Fig. 5 Plant parts used in herbal recipes



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820 Fig. 6 Method of preparation of herbal recipes

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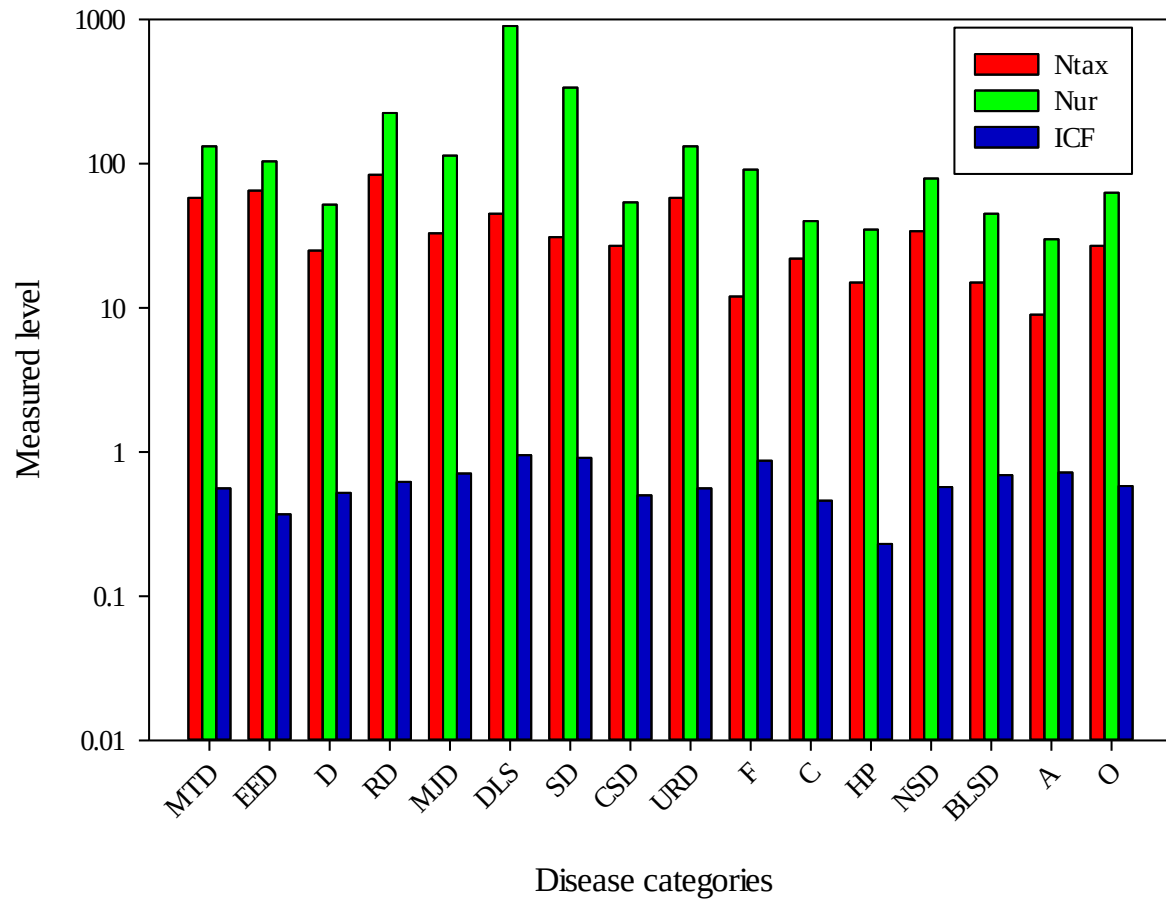


Fig. 7 Informant consensus factor of diseases with use reports and total number of species used.

Key: Ntax, total species used by all the informants for group of ailments; UR, total number of use reports in each group of disease; ICF, informant consensus factor; MTD, Mouth-Throat Diseases; EED, Eye and Ear Diseases; D, Diabetes; RD, Respiratory diseases; MJD, Muscular and Joint Diseases; DLS, Digestive system and Liver diseases; SD, Skin diseases; CSD, Circulatory system diseases; URD, Urinary and Reproductive system diseases; F, Fever; C, Cancer; HP, Hair problem; NSD, Nervous System Disorder; BLSD, Blood and Lymphatic system diseases; A, Antidotes; O, Others

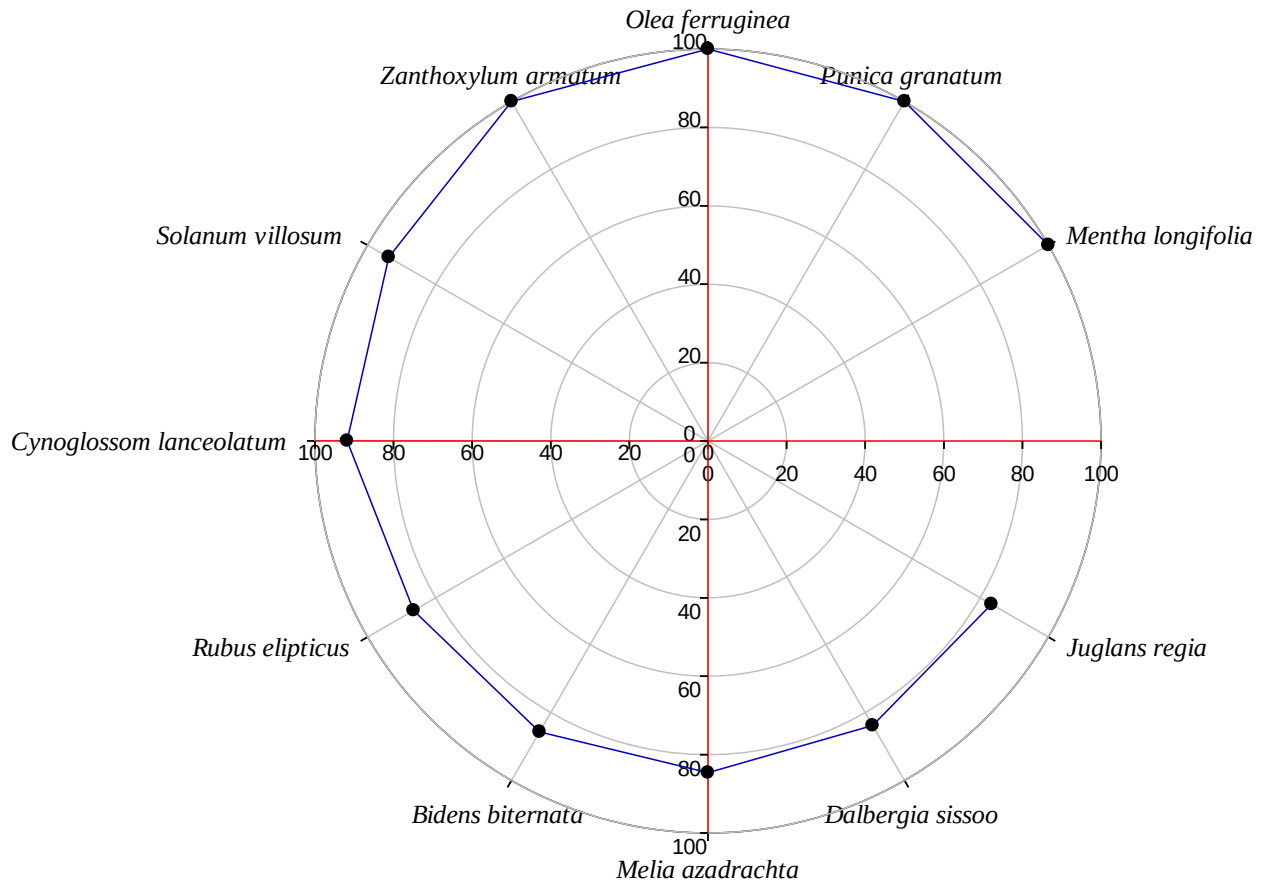


Fig. 8 Top ranked plant species with above 80% fidelity