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Ethnobotanical survey of the 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 exploration, quantification and comparison of ethnobotanical knowledge among different rural communities of the study area were mainly focused during field survey.

Methodology: In total, 79 informants (49 men and 34 women) were selected randomly to collect data using a semi-structured questionnaire. Various quantitative indices, including use value, relative frequency of citation, relative importance, fidelity level and informant consent factor were employed to evaluate the gathered information. Furthermore, primary data were 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. Of these 76 species were indigenous, 74 exotic, 136 were collected in the wild, 10 cultivated and 4 both wild-collected and cultivated. Herbaceous taxa 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. Three species viz. *Mentha longifolia*, *Berberis lycium* and *Galium aparine* had the highest use value (1.05), relative frequency of citation (0.81) and relative importance value (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: Local inhabitants still prioritize herbal medicines as an effective way to treat a wide variety of 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 decline.

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

Background

Ethnobotanical surveys focus on the complex connection between local inhabitants and local plants, including practices and cultural beliefs associated with different forms of uses [1-4]. These studies are important in highlighting the value of native plant species, e.g. for discovering novel drugs [5]. Medicinal plants are imperative for the livelihoods of underprivileged communities across the world [6-11]. Globally, 35000-70000 plant species are used in folk medicine [12]. In developing countries, 60-80% of the population is still relying on plant-based medicines because they are economical and safe alternative to often inaccessible allopathic medicine [13, 14]. 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 reported using herbal medicine as supplementary health care [15-17]. About 25% of modern allopathic drugs are derived directly from plants or synthetic analogues of different compounds isolated from medicinal plants [18]. Plant based drugs are effective and often have less side effects. This can be best explained by comparison between the extract bark of important medicinal plant *Salix alba* (white willow) with the synthetic drug aspirin which has more reported side effects. Different studies confirmed that extract of *Salix alba* bark can avoid the side effects caused by aspirin [19].

The traditional knowledge of medicinal plants is held by many rural communities even in our time [20-24]. Such knowledge is transmitted from generation to generation [5, 25-27]. 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 [28]. However, traditional knowledge on plant species is decreasing gradually across the globe [29]. This knowledge is usually held by hakims (traditional healers) and elderly people and be passed to the next generation via verbal communication only [30], 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 [31-34]. The documentation of traditional ethnomedicinal knowledge is of high importance and may contribute to the development of new drugs. Furthermore, this may also contribute to the maintenance of indigenous culture and natural resource management.

Pakistan has a large wealth of medicinal and aromatic plants due to its diverse habitat, climate and soil types and harbors about 6000 wild plant species [35]. 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 [36-38]. 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 [39]. Previously, different ethnobotanical studies were conducted to document the traditional knowledge about medicinal plants and herbal recipes in remote areas of Pakistan and Azad Jammu and Kashmir [40-44]. However, Tehsil Harighal of District Bagh is still unexplored ethnobotanically, especially due to topographical challenges like hilly terrain and steep slopes, and cultural and religious restrictions that limits researcher access to document ethnobotanical knowledge. We hypothesized that due to the remoteness of the area, the ethnobotanical knowledge of Harighal would considerably differ from other areas of Pakistan. This study was planned with the objective to document the indigenous knowledge about medicinal plants used for primary health care particularly focusing on methods of preparation and administration of herbal recipes. The data was further analyzed by using various numerical indices and compared with previous studies to determine the novelty of work.

Materials and methods

Study area

Harighal (33°54'34°08' N to 73°01'73°38' E), a Tehsil of District Bagh, is located in western Himalayan foothills of Pirpanjal, with altitude ranges between 900-2300m (Fig. 1) [45]. It is 155 km away from Islamabad, the capital of Pakistan and 98 km away from the Muzaffarabad, the capital of Azad Jammu & Kashmir. The total area of Harighal is 712 km² and its population is about 120000 according to the 2017 census. The climate is subtropical-temperate with about 1500mm average annual precipitation. The summers are hot with temperature ranges between 21°C - 40°C while winters is cold with temperatures around 2°C during January (Fig. 2) [46]. The vegetation is mainly dominated by *Olea ferruginea* at lower altitude, *Pinus roxburghii* and *Quercus incana* at mid altitudes and *Pinus wallichiana* at higher altitude of the forest belt. Most of the area is occupied by open grassland.

The region has a diverse and complex ethnic composition with Rajputs, Maldial, Sudhan, Khawaja, Gujar and Jat. Rajput tribes spread across the region and the Maldial tribe regarded as the most influential ethnic group in Harigal, Azad Kashmir. Almost all of the inhabitants are Muslims. Popular languages are Pahari, Hindko, Gojri and Kashmiri, but most inhabitants are also familiar with Urdu.

The area is remote, with difficult mountainous terrain and quite far from urban centers. Local inhabitants have poor socioeconomic conditions, lacking government services and modern healthcare facilities. The roads and other infrastructure are poorly developed, and many inhabitants are dedicated to agriculture, livestock, and their own small-scale business. Some are educated and are government servants, while very few are serving abroad. Agriculture is mainly dependent upon rain fed cropping system and maize is the main crop of the region. Basic health facilities are mainly provided by few public health dispensaries in the region, but locals residing at higher altitudes have very limited access to them and are mainly dependent upon herbal preparations for curing most ailments. Indigenous ethnomedicinal knowledge is mostly in the hand of elder people and health practitioners.

Data collection

Ethnomedicinal data was collected from 79 informants including 45 men and 34 women during April 2017 to March 2018, using semi structured interviews and group discussions, after obtaining prior informed consent from the participants. Informants were selected randomly by convenience sampling (i.e., a sampling method in which units are selected based on easy access or availability) [47] and sometimes by using a snowball method [14]. Questionnaires were prepared according to Edward *et al.* [48]. The ethical guidelines provided by International Society of Ethnobiology (<http://www.ethnobiology.net/>) were strictly followed. 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. Sample size was determined by following Kadam and Bhalerao [49].

Plant collection and identification

The medicinal plants were collected dried, pressed and mounted on standard herbarium sheets following standard taxonomic methods [50]. The specimens were identified with the help of plant taxonomist and confirmed using flora of Pakistan (<https://http://www.efloras.org>) [51, 52]. Further verification of identified specimens was done at the Herbarium of Medicinal and Aromatic Plants in AJ&K established by the Pakistan Agriculture and Research Council (PARC). APG IV (2016) [53] was used for family taxonomy while The Plant List (2013) [54] was used to verify 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)

Emic use types were grouped in to 16 etic use categories following International Classification of Primary Care (ICPC) with some modification [55]. 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.* [56] 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. ICF values varied from 0–1, where value (close to 1) indicates that plant species are selected by using well-defined criteria or information and its uses are extremely exchanged among the informants and low values (close to 0) are obtained when plant species are chosen randomly or information about their use are not exchange among informants [20].

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.* [57] using given formula:

$$RFC = FC/N$$

Where;

FC = Informants reporting use of a given species, N = total number of informants. This index is used to identify the most utilized/preferred plants in the area. FC value varies from 0 (when a plant species is not under any use in that area), to 1 (if all the informants refer plant species as useful). FC exhibits the local importance of each species without considering the use categories [31, 58].

Use value index

The use value of plant species was determined by following Vijayakumar *et al.* [57] 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. Use value reflects the relative importance of reported plant species in area. High use value shows that plant species have many use reports and is important in the region, whereas low use value (approach to 0) shows that species have few use reports related to its use. However, use report is not meaningful to differentiate whether a plant species is used for single or manifold purposes [20].

Relative importance

It was calculated following Khan *et al.* [6] 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.

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

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. High FL value shows maximum frequency of use by the informants to treat a particular disease [20].

Jaccard index (JI)

The similarity of knowledge between different communities was determined by comparing the findings of the current study with 22 published peer reviewed papers at regional, national and global level by applying Jaccard index. These includes 9 studies from Azad Jammu & Kashmir, 7 from Khyber Pakhtunkhwa and 3 from other areas of Pakistan. The studies conducted on the areas with similar, vegetation, climatic condition and culture were considered for comparison. Further the findings were also compared with 3 studies conducted in other developing countries including Nepal, India and Ethiopia. JI 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. [40] from Kotli, Ahmad et al. [44] from Neelum valley and Kyani et al. [20] 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 industrialization and modernization. These findings were supported by other reports including Qaseem et al. [40] from Kotli and Umair et al. [61] from Hafizabad. Education was a third influential factor. Uneducated informants had a vast ethnobotanical knowledge, while tan educated informants had a more limited knowledge of plants. Likewise, traditional health practitioners had a broad traditional knowledge about medicinal uses of plants compared to other professions. Highly educated informants usually relied on allopathic medicines for their immediate healthcare, and had least knowledge about herbal medicines and their preparation methods. These finding are supported nationally by Kayani et al. [20]; Yaseen et al. [22] and internationally by Giday et al. [62]; Tugume et al. [63].

Diversity of ethnomedicinal flora

A total of 150 medicinal plants belonging to 60 families and 98 genera were reported from study area (Table 2). Out of total 150 species, 76 were endemic or native and 74 exotic and among them, 136 plant species were wild, 10 were cultivated and 4 were both wild-collected and cultivated (Table 1S). The herbaceous life form was dominantly (78 sp.; 52%) used in herbal preparation followed by shrubs (27 sp.; 18%), trees (25 sp.; 16.6 %), grasses (12 sp.; 8%), ferns (5 sp.; 3.3%) and epiphytes or climbers (Fig. 3). These findings are in accordance with previous reports [40, 41, 64, 65]. The predominance of the herbaceous habit in mountainous areas is a

common ecological phenomena throughout the world [17, 44, 66]. The reason might be the high rainfall and moisture content at higher altitudinal areas [20, 41, 47].

Asteraceae, Fabaceae and Rosaceae were the dominant families having 15 species each, followed by Lamiaceae and Poaceae having 12 species each (Fig. 4). Our results are in accordance with Amjad et al. [41]; Kayani et al. [20]; Tariq et al. [21]. The prevalence of these families might be due to their abundance and easy accessibility in the study area. Moreover, majority of the reported species of these families possess significant pharmaceutical, pharmacological and organoleptic properties [67-70].

Plant part(s) used

Herbal recipes were prepared using different plant parts in investigated area. As shown in Table 2, leaves, whole plant and roots were the most preferred plant parts used in herbal preparations (30.2, 16.6 and 14.4%, respectively). These findings were similar as reported earlier from Pakistan and other countries [40, 44, 71-74]. Local preference of leaves in herbal recipes is because of their collection and availability. Leaves, whole plant and roots are rich in health beneficial secondary metabolites that contribute significantly in the prevention and treatment of various health disorders [6, 44, 75-77]. Though, local inhabitants prefer to use whole plant and roots but their use is not recommended, as exploitation of whole plant species or their uprooting could cause harmful effect on regeneration and may cause species extension [78, 79].

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. 5). Our findings are supported by previous documentation [17, 40, 41, 65, 80, 81]. 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 [82]. The availability of active metabolic compounds might increase due to the fact of heating which speed up the biological reactions [83-86]. Sometime whole plants were used in herbal preparations. Most of the herbal recipes were prepared using single plant species assuming non-toxicity, palatability and high efficacy. Some

288 recipes were based on application of two or more plants to attain maximum therapeutic effects.
289 The amount of medicinal plants and frequency of dose based on patient condition, health, age
290 and disease severity. In the study area, constipation was commonly treated using the fruits of
291 *Ficus carica*, and for adults 4-5 fruits were used, while 2-3 were regarded as effective for
292 children. The frequent mode of application was internal (76.2%) and only few preparations were
293 applied topically (Table 2), as paste, body wash or rubbed on the affected body parts. These
294 findings were comparable to previous reports [20, 40, 44].

295 296 ***Informant consensus factor (ICF)***

297 A total 127 emic use reports were categorized in to 16 etic use categories (Table 2S). The
298 informant consensus factor was analyzed based on disease categories, as a single plant might be
299 used to treat 3-4 or more disease categories. A high ICF value reflects high dependence of local
300 inhabitants on medicinal plants [90] and low ICF values indicate less consistency of informant's
301 knowledge. Ailments were classified in to 18 categories to develop informant consensus. The
302 ICF value ranged from 0.23 to 0.95. The maximum value of ICF was estimated for digestive
303 disease category (0.95) followed by skin problems and respiratory disorders (Fig. 6). This was
304 strongly supported by Qaseem et al. [40]; Umari et al. [87], Ullah et al. [42] Amjad et al. [41],
305 Ahmad et al. [44] and Bib et al. [17] who also reported the maximum ICF for digestive diseases
306 in their investigated area. ICF values are generally influenced by the number of informants and
307 are more significant when calculated for uses cited by many informants. In general, ICF values
308 were high in our study, revealing that the informants tend to agree on; which plants used in the
309 treatment of common illnesses. According to Heinrich [88], high ICF can help in identifying
310 potentially effective medicinal plants. It was observed that in our study, the highest agreement
311 level was recorded for diseases reported as the most widespread in rural communities of the
312 Bagh district and other areas of Pakistan. The digestive disorder was also reported as first use
313 class by other ethnic communities across world [89-95]. The prevalence of digestive disorders
314 among the local inhabitant might be due to inadequate availability of hygienic food and drinking
315 water and also the common inhalation of fuel wood's smoke [40, 42, 96, 97]. Moreover, the
316 devastating earthquake of 2005 caused extensive damage to water resources (freshwater springs)
317 and water supply schemes, causing the drinking water quality to be very poor, with local
318 communities usually using contaminated water. The second highest ICF was recorded for

respiratory disorders which may be due to prevalence of cold and moist conditions at high altitude Kayani et al. [20]. Besides, study area is a rich source of flowering plants and mushrooms and the prevalence of pollen and spore present in air also cause respiratory problem. Skin disorders also have high ICF value, and UV radiations, unhygienic conditions and combine family systems (where many members live together in one room or home even some time with domesticated animals) could be the possible reasons of the prevalence of skin infections in the study area.

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 [31]. 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 [20, 40, 44, 98].

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 ferouginea* (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 [40, 41, 80]. These plant species are used in repetitive manner and are biologically more active [99]. 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 [20, 44, 100]. 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 [47, 100, 101].

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 [41, 100, 102].

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 [13, 17, 100]. Species with high FL value are important model plants which can be subjected to further pharmacological studies [20, 44, 103]. Some other studies in literature also recoded high fidelity level for species used to cure digestive problems [13, 100, 104]. 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 [44, 100, 105].

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. [41] and Shaheen et al. [47] on Toil peer (AJK) and Perl valley respectively. The least value for JI was found in the studies of Jadhava et al. [106] on Sangli, Maharashtra, India and and Gidey et al. [107] 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.

Threats to medicinal plants and indigenous knowledge

The majority of the local inhabitant in the rural areas of Harighal are illiterate and their main source of income are agriculture and livestock. Some of them collect medicinal plants and sell them at very low prices to local herb sellers. The herbal sellers export herbs to pharmaceutical companies. Over-exploitation of medicinal plant species by untrained collectorxs, e.g. uprooting of medicinal plants, forest fires, deforestation, over-grazing and urbanization are contributing

significantly towards the decline of medicinal plant species of the study area, and may finally lead to their extinction. Therefore, authorities should take strict control over protection, conservation and sustainable utilization of economic plants of the study area. Furthermore, universities, agriculture extension department and local management may contribute significantly to promote the cultivation of medicinal plants in the area, this will definitely improve the socioeconomic condition of local people of the area.

The traditional practices are highly affected by exposure to modern pharmaceuticals and changing lifestyles. The traditional knowledge about medicinal plants in the study area is gradually declining because this knowledge is now mainly restricted to the older members of the community members which are passing away. The younger generation is not interested in learning about traditional plant use, and makes more use of allopathic medicine. The traditional health practitioners (*Hakeems*) have profound traditional knowledge, but many are not willing to share it with other people. These factors may lead to the erosion of traditional medicinal knowledge among the rural communities of area.

Conclusion

This study is the first to report the traditional uses of indigenous medicinal plants from the remote areas of tehsil Harigal, Bagh. The documented data reflect that local peoples are still highly dependent on medicinal plants for treating various diseases, as public health facilities are hard to reach, and still have a large knowledge of medicinal plants. The traditional knowledge is mainly in the hand of elder people and health practitioners (hakims), but the young generation is 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

443

444 ***Authors Contribution***

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

448

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450 No funding was provided by any source to conduct this survey

451 ***Availability of data and materials***

452 All data are included in the manuscript

453 ***Competing interest***

454 The authors declare that they have no competing interest.

455

456 ***Ethics approval and consent to participate***

457 The present research is purely based on field surveys. The ethical approval to conduct the study
458 was given by the Ethics Committee of the Women University of Azad Jammu & Kashmir, Bagh
459 before initiating the surveys. In addition to this, legal permission to conduct interviews was given
460 by members of municipality committee. A Prior Informed Consent form (PIC) was signed by all
461 the informants after explaining the objective and consequence of study. The PIC was translated
462 into local *Pahari* language. The ethical guidelines provided by the International Society of
463 Ethnobiology (<http://www.ethnobiology.net/>) were strictly followed.

464

465 ***Consent for publication***

466 *Not applicable*

467

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802 **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 group	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
	Midwives	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

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

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

Scientific name / Voucher number/ Habit	Local name	Part used	Method of preparation /Mode of Application	Diseases treated	Previous use reports
Acanthaceae					
<i>Dicliptera bupleuroides</i> Nees in Wall./UZ-02/H	Somni	Lf	pas, ext dec, int	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/S	Baikher	Bk Lf Rt	pow, int pow, int pow, int	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/H	Puthcanda	Wp Lf Rt	pas, ext jui, int dec, int	Scorpion stings and Snake bites Eye diseases Inflammation	1, 2, 3, 4, 5, 6▲, 70, 8▲, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 21▲, 220
<i>Alternanthera pungens</i> Kunth/UZ-79/H	Khaki buti	Lf	dec, int	Skin 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/H	Jungli Ganayar	Lf	dec, int	Biliousness, Eye infection Constipation	10, 2▲, 30, 40, 50, 6▲, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 21▲, 220
<i>Amaranthus viridis</i> L./UZ-50/H	Ganyar	Wp Lf	Pas, int pow, int Pas, ext	Diarrhea, Malaria , Jaundice Antidote against snake and spider bites	1▲, 2▲, 30, 40, 50, 6▲, 70, 8▲, 90, 100, 110, 120, 13▲, 140, 150, 160, 170, 18▲, 190, 200, 21▲, 22▲
Amaryllidaceae					
<i>Allium griffithianum</i> Boiss./UZ-42/H	Piazi	Ae	coo, int	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/H	Choora	Rt	inf, Int	Fever , Colds	10, 20, 30, 40, 5▲, 60, 70, 80, 90, 100, 110, 120, 13▲, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Torilis japonica</i> (Houtt.) DC./UZ-69/H	Lahndara	Sd Rt	pow, int dec, int	Skin diseases, 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. ex. Haines./UZ-110/S	Garanda	Wp	pow, int	Joint pain, Scabies, Jaundice , Inflammation	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Nerium oleander</i> L./UZ-122/S	Kanair	Fl Lf	jui, int jui, int	Cough Flu, Fever , Toothache, Blood pressure, Antidote	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/H	Bail	Lf	dec, int	Nervous system disorders, Rheumatism , Abnormal sweating	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</i> <i>hirundinaria</i> Medik./UZ-131/H	Medhshingi	Ae	dec, int	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/F	Gutti	Wp	dec, int	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/H	kangi.i	Fl	pas, int	Digestive problems , 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/H	Dialect	Lf Lf	dec, int pow, ext	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/H	Chaow	Lf	jui, int	Kill worms , 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/H	Palouthi	Lf Rt	jui, int pas, ext	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/H	Kandiara	Rt Wp Wp	pow, int ash, int Inf, int	Sore jaws Rheumatic joints Bleeding piles	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/H	Kali Buti	Lf	dec, int	Scanty Urination, Dysentery , Diarrhea, Hemorrhages	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./UZ-11/H	Shina	Fl	pas, ext	Eye infection	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170,

<i>Gerbera gossypina</i> (Royle) Beauverd/UZ-129/H	Put putiola	Lf	pas, ext	Bone fractures, Wounds, Cuts, Pain, Skin diseases	180,190,200,210,220 10, 20, 3 ▲, 4 ©, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Helianthus annuus</i> L./UZ-104/H	Souraj mukhi	Fl Sd	pas, ext eat, int	Skin diseases Scanty urination, Curing chest infections , Liver ailments Lung ailments, Piles, Kinney problems	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Launaea procumbens</i> (Roxb.) Ram. & Raj./UZ-41/H	Hund	Lf Wp	ext, int rfo, Int	Diabetes, Pain	10, 20, 30, 40, 50, 60, 70, 8 ▲,90,100,110,120,130,140,150,160,17 0,180,190,200,21 ▲,220
<i>Silybum marianum</i> (L.) Gaertn./UZ-52/H	Kandiyar	Lf	exr, int	Liver problems, Scanty urination, Stomachic , Tonic, Respiratory tract infection Abdominal pain	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,16 ▲,17 0,180,190,200,210,220
<i>Sonchus oleraceus</i> (L.) L./UZ-62/H	Dodak	Lf	coo, int		10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Tagetes minuta</i> L./UZ-150/H	Sadberga	Lf	jui, int	Earache	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18 ▲,190,200,210,220
<i>Taraxacum officinale</i> (L.) Weber ex F.H.Wigg./UZ-93/H	Hend	Rt	jui, int	Scanty urination , Liver tonic, Diabetes	1 ©, 2 ©, 3 ©, 4 ©, 5 ▲, 6 ©, 70, 80,9 ▲,100,110,12 ▲,130,140,150,160,1 70,18 ▲,190,20 ▲,210,22 ▲
<i>Xanthium strumarium</i> L./UZ-81/S	Souriyala	Lf Fr	jui, int pow, int	Chronic mild fever Cooling, Infections, Urinary problems	1 0, 2 ©, 3 0, 4 0, 5 0, 6 0, 7 0, 8 ▲,9 ▲,10 ▲,110,120,130,140,150,160, 170,180,190,200,21 ▲,22 ▲
Asparagaceae					
<i>Polygonatum geminiflorum</i> Decne./UZ-146/H	Noorialam	Lf	inf, int	Treat pain, Fever , Inflammation, Allergy, weakness	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Balsaminaceae					
<i>Impatiens edgeworthii</i> Hook.f./UZ-21/H	Batmandar / buntil	Wp Wp	exr, int past, ext	Urinary tract infection, Fever Burns	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,12 ▲,130,140,150,160,17 0,180,190,200,210,220
Berberidaceae					
<i>Berberis lycium</i> Royle/UZ-12/S	Sumbal	Fr Bk	eat, int dec, int	Cough Skin problems, Liver problems	1 ▲, 2 ©, 3 ▲, 4 ▲, 5 ▲, 6 ▲, 7 ▲, 80,90,10 ▲,110,120,13 ▲,140,150,160,1 70,18 ▲,19 ▲,20 ▲,210,22 ▲
Boraginaceae					

<i>Cynoglossum lanceolatum</i> Forssk./UZ-140/H	Churoun	Rt	exr, int	Throat ache	10, 20, 30, 40, 50, 6▲, 70, 80,90,100,110,12▲,130,140,150,160,170,180,190,20▲,210,220
<i>Trichodesma indicum</i> (L.) Lehm./UZ-03/H	Handusiboti	Fl Lf / Rt	fra, int exr, int	Brain refreshment Scanty urination , Blood purifier	10, 20, 30, 4▲, 5▲, 6©, 70, 80,9▲,100,110,120,130,140,150,160,170,18▲,190,200,21▲,220
Brassicaceae <i>Capsella bursa-pastoris</i> (L.) Medic./UZ-33/H	Saag	Wp Sd Sd	eat, int pow, int flu, Int	Chest infections Bleeding	10, 20, 30, 40, 50, 6▲, 70, 8©,90,100,110,120,13©,140,150,160,170,180,190,200,210,220
Buxaceae <i>Sarcococca saligna</i> (D. Don) Muel /UZ-43/H	Ladan/ bansathra	Lf Rt	dec, int jui, int	Joint pain , Dysentery Gonorrhea	10, 2▲, 3©, 4©, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Cannabaceae <i>Cannabis sativa</i> L./UZ-54/H	Bhang	Lf	pow, int	Astringent that bowels stomachic , Leprosy, Tonic, Narcotic action	1▲, 20, 30, 40, 5▲, 60, 7▲, 80,90,10▲,11▲,120,13▲,140,150,160,17▲,18▲,19▲,20▲,21▲,22▲
Caprifoliaceae <i>Viburnum grandiflorum</i> Wall. ex DC./UZ-72/S	Guch	Sd	jui, int	Typhoid , Whooping cough	1▲, 20, 3©, 4©, 50, 60, 70, 80,90,10▲,110,120,13▲,140,150,160,170,180,190,200,210,220
Celastraceae <i>Maytenus nemorosa</i> Marais /UZ-82/S	Patakhi	Wp	ext, ext	Toothache , Eye inflammation	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Chenopodiaceae <i>Chenopodium album</i> L./UZ-61/H	SkhaBotey	Wp	dec, ext	Skin diseases	1▲, 2▲, 30, 40, 50, 6▲, 70, 8©,90,100,11▲,12▲,13▲,140,15▲,160,170,18▲,19▲,200,21▲,22▲
Convolvulaceae <i>Convolvulus arvensis</i> L./UZ-103/C	Hirrankhuri	Wp	ext, int	Piles, Dandruff, Constipation	10, 20, 30, 40, 50, 60, 70, 8▲,90,100,110,120,130,14▲,150,160,17▲,180,19▲,200,21▲,220
<i>Ipomoea purpurea</i> (L.) Roth /UZ-2/H	Bahrwa	Wp Sd	pou, Int pow, Int	Skin disease , Cancer Tonic, constipation	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220

Commelinaceae <i>Commelina benghalensis</i> L./UZ-128/S	Kanchara	Wp	pou, Ext	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/T	Kandar	Bk	pow, int	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/H	Neeladari	Wp	jui, int	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/H	Kah	Rt	mix, int	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/F	Kungi	Fd	veg, int	Constipation	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/S	Kankolii	Sd Ol Fl	pow, int exr, int dec, int	Stimulant in Cough Pulmonary infections 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/H	Dhouthal	Wp Wp Wp	ert, ext pow, int lat, Int	Kill worms 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/S	Arind	Sd Lf	oil, int dec, ext	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/T	Kikar	Br	rfo, int	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/UZ-84/T	Desi kikar	Bk	pas, int	Piles, Dysentery, Diarrhea Anti-dandruff	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220

<i>Astragalus canadensis</i> L./UZ-125/H	Tindni	Pd Lf	pow, ext inf, int	Stomachache	0,180,190,20▲,21▲,220 10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Bauhinia variegata</i> L./UZ-14/T	Kachnar	Fl	inf, int	Tonic, Gastric problems	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Crotalaria juncea</i> L./UZ-95/H	Sunn	Sd	pas, ext	Hair tonic , Skin diseases Colic, Epistaxis	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Dalbergia sissoo</i> DC./UZ-55/T	Shishm	Rt Lf	exr, int dec, int	Eye pain, Body pain, Diarrhea, Jaundice, Abdominal pain , Skin diseases	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,190,200,21▲,220
<i>Desmodium elegans</i> DC./UZ-142/S	Halphaat	Rt	tea, int	Hypertension, Antidote	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Indigofera linifolia</i> (L. f.) Retz./UZ-46/H	Jund	Lf	rfo, ext	Skin allergy	10, 20, 30, 40, 50, 6, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Lathyrus aphaca</i> L./UZ-136/H	Jangli matter	Sd	pow, int	Narcotic	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
<i>Lespedeza juncea</i> (L.f.) Pers./UZ-78/H	Kuchani	Rt	jui, int	Diarrhea, Dysentery	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Lotus corniculatus</i> L./UZ-105/H	Sriri	Fl Rt	pou, Int exr, int	Cardiotonic, Sleeping problems Gastric problems Tonic	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Medicago polymorpha</i> L./UZ-66/H	Maina	Wp Lf	pou, ext exr, int	Skin inflammation Dysentery , Indigestion	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,19▲,200,210,220
<i>Mimosa pudica</i> L./UZ- 118/H	Choi Moi	Lf	dec, int	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
<i>Trifolium resupinatum</i> L./UZ-85/H	Tilpetra	Sd	che, int	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
<i>Vicia sativa</i> L./UZ-	Phalli	Wp	inf, int	Indigestion, Tonic, Scanty urination,	10, 20, 30, 40, 50, 6▲, 70,

25/C				Asthma , Cough, Bronchitis, Skin diseases, Urinary problems	8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
Geraniaceae <i>Geranium rotundifolium</i> L./UZ-34/H	Rattan joge	Rt	inf, int	Mouth ulcers , Stomach ulcer, Hemorrhoids	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
Gentianaceae <i>Swertia cordata</i> (Wall. ex G. Don) C.B. Clarke/UZ-44/H	Cheratbotay	Ae	exr, int	Digestive problem, Liver problems, Diabetes , Nausea	1☉, 2▲, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
Juglandaceae <i>Juglans regia</i> L./UZ-53/T	Akhrot	Ft Lf / Bk	rfo, int rfo, ext	Brain and physical weakness Toothache	1☉, 2☉, 3▲, 4▲, 5☉, 6☉, 7☉, 8☉,9☉,10▲,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18▲,19▲,20▲,21☉,22▲
Lamiaceae <i>Ajuga bracteosa</i> Wall. ex Benth./UZ-94/H	Rattibotti	Ae Lf	exr, int exr, int	Blood purifier , Pimples Inflammation, Earache, pain	1☉, 2☉, 3☉, 4☉, 5, 6▲, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17▲,18☉,19☉,20▲,21☉,22☉
<i>Callicarpa macrophylla</i> Vahl/UZ-77/S	Bengli	Lf Rt	dec, ext inf, int	Alleviating pain in rheumatism , Diarrhea, Dysentery Relieving rashes of tongue Wounds and cuts	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
<i>Mentha spicata</i> L./UZ-132/H	Bebrii	Bk Lf	pas, ext pas, int	Cooling agent, Gastric problem	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11,▲,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
<i>Mentha longifolia</i> (L.) L./UZ-83/H	Podina	Wp Lf	dec, int pas, Int	Stimulant, Cough, Flatulence, Digestive disorders	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
<i>Micromeria biflora</i> (Buch.-Ham. ex D.Don) Benth/UZ-76/S	Shahibooti	Lf Lf	oil, int jui, int	Headache Digestive disorders	1☉, 2▲, 3☉, 4☉, 5☉, 6▲, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22
<i>Ocimum sanctum</i> L./UZ-134/H	Bebrii	Lf	pas, int	Cooling agent, Gastric problem	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11,▲,12☉,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
<i>Origanum vulgare</i> L./UZ-102/H	Sahthar	Wp	pow, int	Stomach-ache , Skin infections	1☉, 2▲, 3☉, 4☉, 5☉, 6▲, 7☉, 8☉,9☉,10▲,11☉,12▲,13☉,14☉,15☉,16☉,17☉,18☉,19☉,20☉,21☉,22☉
<i>Otostegia limbata</i> (Benth.) Boiss./UZ-	Chittipatak i	Rt Rt	ash, ext dec, ext	Wound healing Skin diseases	1☉, 2☉, 3☉, 4☉, 5☉, 6☉, 7☉, 8☉,9☉,10☉,11☉,12☉,13☉,14☉,15☉

23/S <i>Phlomis bracteosa</i> Royle ex Benth./UZ-144/H	Cropo	Lf Rt	exr, int pou, int	Fever, Cough Skin diseases	,160,170,18▲,190,200,210,220 10,2◇,30,40,50,60,70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Prunella vulgaris</i> L./UZ-114/H	Harswa	Wp	exr, int	Relieve respiratory difficulties, Joint problems, Gastric spasm	10,2▲,3▲,4▲,5©,60,70, 80,90,100,110,12▲,130,14▲,150,160,170,180,190,200,210,220
<i>Salvia lanata</i> Salisb./UZ-127/H	Kianar	Ae Rt	vef, int pow, int	Cough, Common cold Ease bowel evacuation	10,2▲,3▲,4▲,50,60,70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Thymus linearis</i> Benth. UZ-64/H	Chikal	Wp Ae	jui, int pow, int	Stomachache, Liver complaints Cough	10,20,3▲,4▲,50,60,70, 80,90,10▲,110,12▲,13©,14▲,15▲,160,170,180,190,200,210,22▲
Lythraceae					
<i>Punica granatum</i> L./UZ-05/S	Darhou	Sd Pl Fr Fr	pow, int jui, int rfo, int exr, int	Stomachache Cardiac problems, Dysentery , Diarrhea	10,20,3▲,4▲,50,6▲,70, 80,90,100,110,120,130,140,150,16▲,17▲,18▲,19▲,200,210,22▲
Malvaceae					
<i>Abutilon ramosum</i> (Cav.) Guill. & Perr./UZ-35/S	Shrub	Rt	pow, int	Stomach ailment	10,20,30,40,50,60,70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Malva parviflora</i> L./UZ-45/H	Sonchal	Lf	dec, int	Constipation	10,20,30,40,50,6©,70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Malvastrum coromandelianum</i> (L.) Garcke/UZ-56/H	Bariar	Ae	dec, int	Kill worms , Dysentery	10,20,3©,4©,50,6▲,70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Meliaceae					
<i>Melia azadirachta</i> L./UZ-73/T	Daraik	Fr/Sd Lf	pow, int dec, int	Diabetes, Blood pressure, Blood purifier Throat infection, Jaundice, Skin problems, High fever	10,20,30,40,50,60,70, 80,90,100,11▲,120,130,140,150,160,170,180,190,200,210,220
Moraceae					
<i>Ficus carica</i> L./UZ-135/T	Injeer / Barh Phugwarah	Fr Lt	rfo, int pas, ext	Constipation Wound healing, Extract thrones from skin, Antidote	10,2©,3©,4©,50,60,70, 80,90,10▲,110,120,130,140,150,16▲,177▲,180,19▲,200,210,22▲
<i>Ficus palmata</i> Forssk./UZ-126/T	Phugwarah	Fr Lt Lf Lf	rfo, int rub, ext pas, ext veg, int	Digestive problems Extract thorns from skin Skin problems	10,20,3▲,4,5,60,70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220

<i>Morus alba</i> L./UZ-96/T	Toot	Lf Fr	dec, int pow, int	Diabetes Throat inflammation	10, 2▲, 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/T	Shatoot	Fr	rfo, int	Cough, Cold, Constipation Cough, Constipation	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,190,200,21▲,220
Myrtaceae <i>Eucalyptus camaldulensis</i> Schlecht/UZ-143/T	Safeda	Bk	rub, ext	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/S	Chambili	Rt Lf Lf	dec, int che, int pow, ext	Ringworm Mouth ulcer Antidandruff, Muscular pain	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,13▲,140,150,160,17 0,180,190,200,21▲,220
<i>Olea ferruginea</i> Wall. ex Aitch./UZ-24/T	Kao	Lf	dec, int	Scanty urination, Throat infection	10, 20, 30, 40, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170 ,180,190,20▲,210,22▲
		Ol Br	exr, int rfo, ext	Anti-rheumatic Toothache, Mouth infection	
Onagraceae <i>Oenothera rosea</i> L. Her. ex Aiton/UZ-06/H	Buti	Lf	inf, int	Hepatic pain, Kidney disorders	10, 2▲, 30, 40, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Oxalidaceae <i>Oxalis corniculata</i> L./UZ-36/H	Khattiboti	Wp Lf Lf	exr, int pou, int dec, int	Diarrhea, Skin diseases, Dysentery, Blood purification Inflammation Cooling property in fever	10, 2▲, 30, 40, 5, 6▲, 70, 80,9▲,10▲,110,12▲,130,140,150,160, 170,18▲,190,200,210,22▲
Pinaceae <i>Pinus roxburghii</i> Sarg./UZ-16/T	Chir	Rs	pas, ext	Wound healing, Healing cracks in feet, Antidote	1, 2▲, 3▲, 4▲, 5, 6, 7, 8, 90,100,110,120,130,140,150,160,170,18 ▲,190,200,210,220
Plantaginaceae <i>Plantago lanceolata</i> L./UZ-07/H	Ispgol	Lf Sd	dec, ext pow, int	Wound inflammation Throat sores	1▲, 2▲, 30, 40, 50, 60, 70, 80,90,10▲,110,12▲,130,14▲,150,160, 170,180,190,200,210,22▲

<i>Veronica laxa</i> Benth./UZ-27/H	Sriiri	Wp	tea, int	Constipation Nervous system disorder, Respiratory tract, Cardiovascular system	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Poaceae					
<i>Chrysopogon serrulatus</i> Trin./UZ-86/G	Bari Gaas	Wp	pas, ext	Used for skin care	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Cynodon dactylon</i> (L.) Pers./GUZ-138/G	Khabbal	Lf	pas, ext	Muscle and joint fractures	10, 2▲, 30, 40, 50, 60, 70, 8▲,9▲,100,11▲,120,130,140,150,160, 170,18▲,190,200,21▲,220
<i>Dactylis glomerata</i> L./UZ-17/G	Gadu	Wp Wp	pas, int exr, int	Allergies Anti-tumor, Kidney ailments , Bladder ailments	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Dichanthium annulatum</i> (Forssk.) Stapf/UZ-75/G	Murgah Ghass	Bk	inf, int	Cough	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,21▲,220
<i>Digitalis ciliata</i> Trautv./UZ-124/G	Diljit	Sd	pow, int	Cardiac treatments, Anti-proliferative, Used for suppressing tumors	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Echinochloa colona</i> (L.) Link/UZ-10/G	Sanawakri	Wp	inf, int	Hemorrhage problems	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Eleusine indica</i> (L.) Gaertn./UZ-107/G	Madhana ghass	Rt Lf Wp	pou, int dec, int exr, int	Gonorrhea Scanty urination	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,21▲,220
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult./UZ-26/G	Sariyalagh ass	Rt	inf, int	Fever , Anti-inflammatory, Jaundice Scanty urination	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Imperata cylindrica</i> (L.) Raeusch./UZ-115/G	Dibb	Wp	exr, int	Asthma , Bruises, Paralysis, Anti-inflammatory	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,21▲,220
<i>Lolium temulentum</i> L./UZ-65/G	Grass	Sd	pow, int	Sedative	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Setaria pumila</i> (Poir.) Roem. & Schult./UZ-	Kangni, Loomar	Lf Lf	exr, int pou, ext	Eye drops Fast healing	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,

97/G <i>Themeda anathera</i> (Nees ex Steud.) Hack./UZ-98/G	Gaas Bari ghass	Gr Ae	jui, int pou, ext	Cooling agent Backache , Blood purifier	180,190,200,210,220 10, 2▲, 3☉, 4☉, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Polygalaceae <i>Polygala abyssinica</i> R. Br. ex Fresen./UZ- 37/H	Arna	Rt	jui, ext	Evil eye, Antidote to snake bite	10, 2▲, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Polygonaceae <i>Persicaria maculosa</i> Gray/UZ-51/H	Ochi	Sd Rt Lf	pow, int pas, int pas, ext	Dysentery, Cholera Scabies 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>Polygonum</i> <i>ramosissimum</i> Michx./UZ-40/H	Bannali	Wp	pas, int	Urinary tract infection	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Rumex hastatus</i> D.Don/UZ-59/H	Jnglipalak	Lf Rt	boi, int pas, ext	Constipation Skin disorder	10, 2▲, 3▲, 4▲, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,190,200,210,220
Primulaceae <i>Anagallis arvensis</i> L./UZ-47/H	Billibooti	Wp	exr, int	Lowering fever , Depression, Tuberculosis, Liver problems, Epilepsy Improving the complexion, especially for freckle	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Androsace rotundifolia</i> Hardw./UZ-58/H	Thandijarri	Wp Rh Lf	pas, ext ext, int inf, int	Cataract Stomachache , Emetic	10, 2▲, 3☉, 4☉, 50, 60, 70, 80,90,100,110,12▲,130,140,150,160,17 0,180,190,200,210,220
Pteridaceae <i>Adiantum tenerum</i> Sw./UZ-130/F	Hansraj	Fd	jui, int pas, ext	Cough, Fever, Dysentery, Ulcers Burning sensation, Epileptic fits	
<i>Onychium japonicum</i> (Thunb.) Kunze/UZ- 28/F	Pathba	Lf & Rh	jui, int	Dysentery, Diarrhea	
<i>Pteris vittata</i> L./UZ- 149/F	Nanore	Fd	pas, ext	Wound healing	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Ranunculaceae <i>Clematis grata</i> Wall./UZ-89/S	Tootal	Lf In	dec, int inf, int	Diabetes Cough	10, 2▲, 3☉, 4☉, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170,

<i>Ranunculus arvensis</i> L./UZ-80/H	Chachumb a	Ae	coo, int	Asthma	180,190,200,210,220 10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,190,200,210,220
<i>Ranunculus muricatus</i> L./UZ-91/H	Kor- Kandoli	Ae	mix, int	Asthma	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,22▲
<i>Thalictrum revolutum</i> DC./UZ-112/H	Beni	Wp	jui, int	Blood purifier, Curing fever	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
Rosaceae					
<i>Cotoneaster</i> <i>racemiflora</i> Wall. ex Lindl./UZ-08/S	Luni	Lf	tea, int	Stop bleeding and pus	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Duchesnea indica</i> (Jacks.) Focke/UZ- 48/H	Budimewa	Fl Wp	boi, int exr, int	Blood circulation Swelling, Boils, Burns	10, 2▲, 3▲, 4▲, 50, 6▲, 70, 80,90,100,11▲,120,130,140,150,160,17 0,180,19▲,200,210,220
<i>Eriobotrya japonica</i> (Thunb.) Lindl./UZ- 29/T	Loukat	Wp Lf Fr	dec, int pas, int rfo, int	Cough, Constipation Nose bleeds, Coughing up blood, Diarrhea, Depression , Skin diseases, Digestive disorders, Respiratory problems Common cold	10, 20, 3▲, 4▲, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita/UZ-148/H	Boodimava	Fl Fr	boi, int juj , int	Diarrhea, Dysentery , Diabetes, Sexual diseases	10, 2▲, 3▲, 4▲, 50, 60, 7▲, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,22▲
<i>Potentilla reptans</i> L./UZ-137/H	Gul bota	Wp	jui, int	Diarrhea , Intestinal infections	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170, 180,190,200,210,220
<i>Prunus armeniaca</i> L./UZ-70/T	Hari, Khubani, Apricot	Fr Sd	eat , int oil, ext	Constipation Softening effect on the skin	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/T	Alucha	Fr	eat, int	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/T	Aruu, Peach	Lf	jui, int	Gastritis , Cough, Bronchitis, Kill worms	10, 20, 30, 40, 50, 6▲, 70, 80,90,100,110,120,130,140,150,160,170, 18▲,190,200,210,220

<i>Pyrus malus</i> L./UZ-99/T	Saib	Fr	jui, int	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/T	Tangi	Fr Fr	pas, int eat, int	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/S	Chal	Fl Fl	pow, int dec, int	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/S	Galab	Fl	exr, int	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/S	Aakhara	Lf	dec, int pow, int	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/S	Garachi	Rt / Bk Lf	exr, int pow, int	Dysentery Diarrhea, Fever, Blood purifier Dysentery, Colic, Pain, Whooping Cough	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/H	Jhar, Mariala	Rt Rt	dec, int exr, int	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
		Sd	pow, int	Insomnia	
Rubiaceae					
<i>Galium aparine</i> L./UZ-119/H	Boora	Wp	mix, int	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
		Wp	jui, int	Scanty urination , Constipation	
Rutaceae					
<i>Zanthoxylum armatum</i> DC./UZ-106/S	Timber	Sd / Bk Bk	rfo, int rub, int	Tonic, Cholera, fever, Dyspepsia, Stomachache Toothache	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
Salicaceae					
<i>Populus nigra</i> L./UZ-123/T	Sfeeda	Bk	exr, int	Arthritis, Gout, Lower back pain , Urinary complaints, Gout, Digestive disorders, Liver disorders, Fever, Relieve the pain of menstrual cramps Hemorrhoids Infected wounds and sprains, Caries of teeth and bones	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220
		Bk Lf	pas, ext pas, ext		
Sapindaceae					

<i>Aesculus indica</i> (Wall. ex Camb.) Hook. /UZ-141/T	Bankhore	Fr Sd	rfo, int pow, int	Colic, Rheumatism Leucorrhoea	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Dodonaea viscosa</i> (L.) Jacq./UZ-139/S	Snathaa	Lf	pow, ext	Healing agent	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Scrophulariaceae <i>Verbascum thapsus</i> L./UZ-18/H	Gidar	Lf Wp Rt	dec, ext inf, int ext, int	Sunburn, Ulcers, Tumors, Piles , Sedative, Narcotic Toothache, Relieve cramps, Convulsions	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Simaroubaceae <i>Ailanthus altissima</i> (Mill.) Swingle/UZ-92/T	Draviyae	Bk Lf	inf, int ext, int	Dysentery , Diarrhea Blood purifier	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Solanaceae <i>Solanum villosum</i> Mill./UZ-09/H	Kaach, Maach	Lf Fr	dec, int rfo, Int	Scanty urination Tongue infection in children	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Urticaceae <i>Debregeasia salicifolia</i> (D. Don) Rendle/UZ-39/S	Sindari	Ae	inf, ext	Eczema, Dermatitis	10, 20, 30, 40, 50, 60, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
<i>Urtica dioica</i> L./UZ-49/H	Kinjii	Rt Rt	inf, int pas, int	Scanty urination Anti-allergic	10, 20, 30, 40, 50, 60, 70, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Valerianaceae <i>Valeriana jatamansi</i> Jones./UZ-60/H	Mushk bala	Rh	exr, int	Intestinal pain , Neurosis, Constipation	10, 20, 30, 40, 50, 60, 70, 70, 80,90,100,110,120,130,140,150,160,170,180,190,200,210,220
Verbenaceae <i>Vitex agnus-castus</i> L./UZ-88/T		Lf	exr, int	Female reproductive system disorders, Scanty urination, Digestive disorders, 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/H	Chandni	Wp	inf, int	Scanty urination, Reduces inflammation , Control bleeding, Malaria, Nervous exhaustion, Depression, Asthma, Migraine, Jaundice	10, 20, 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/H	Banafshan	Wp	boi, int	Flu, Cough, Jaundice	1◊, 2◊, 3◊, 4◊, 5▲, 6◊, 7◊, 8◊, 9◊, 10▲, 11◊, 12◊, 13◊, 14◊, 15◊, 16▲, 17◊, 18◊, 19◊, 20◊, 21◊, 22◊
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807 Habit: H, Herbs; S, Shrubs; T, Trees; F, Ferns; E, Epiphyte. Part(s) Used: Lf, Leaf; Fr, Fruit; Rt, Root; St, Stem; Ae, Aerial Parts; Wp, Whole Plant; Fd, Fronds;
808 Sd, Seed; Fl, Flower; Bk, Bark; Bl, Bulb; Rh, Rhizome; In, Inflorescence; Sh, Shoot; Lt, Latex; Br, Branches; Rs, Resin; Gr, Grain; Pd, Pods; Pl, Pulp; Ol, Oil.
809 Method of Preparation: pow, Powder; dec, Decoction; ext, Extract; pas, Paste; jui, Juice; pou, Poultice; inf, Infusion; che, Chewed; veg, Vegetable; rub,
810 Rubbing; eat, Eaten; coo, Cooked; boi, Boiled; flu, Fluid; fra, Fragrance, mix, Mixture. Mode of Administration: int, Internal; exr, External. Previous use reports:
811 (©) = Plants with similar use(s); (▲) = Plants with dissimilar use (s); (◊) = Plants not reported in previous study; **Bold written** uses highlights the frequent use
812 for a given plant. 1: Mahmoodet al., [108]; 2: Khan et al., [109]; 3: Amjadet al., [41];. 4: Shaheen et al., [47]; 5: Ishtiaq et al., [110] 6: Amjadet al., [111]; 7:
813 Gilaniet al., [112]; 8: Gulshan et al., [113]; 9: Mahmoodet al., [114]; 10: Rana et al., [115]; 11: Jadhav, [106]; 12: Gidey et al., [107]; 13: Dar [116]; 14: Bano et al.,
814 [39]; 15: Khan et al., [117]; 16: Hussain et al., [118] 17: Ullah and Bibi [119] 18: Qaseem et al. [40]; 19: Aziz et al. [14]; 20. Ahmad et al. [32]; Umair et al. [87];
815 22. Hussain et al. [118]

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 palmate</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

FC, Frequency of Citation. RFC, Relative frequency of citation. Ui, Use reports cited by each respondent for given species. UV, Use value. Rel. PH, Relative number of pharmacological properties attributed to a single plant. Rel. BS, Relative number of body systems treated by a 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
From Azad Jammu & Kashmir											
Toil peer (AJK), Pakistan	2017	121	27	18	45	76	105	22.3	14.8	33.08	[41]
Perl valley (AJK), Pakistan	2017	136	29	21	50	86	100	21.3	15.4	36.7	[47]
Neelum Valley (AJK), Pakistan	2011	40	2	7	9	31	141	5	17.5	5.2	[108]
Kotli, AJK, Pakistan	2017	202	21	19	40	162	110	10.3	9.4	17.2	[111]
Bhimber (AJK), Pakistan	2011	38	3	8	11	27	139	7.8	21.05	7.09	[114]
Khahuta (AJK), Pakistan	2013	45	5	9	14	31	136	11.1	20	9.15	[110]
Muzaffarabad (AJK), Pakistan	2014	52	5	13	18	34	132	9.61	25	12.1	[116]
Kotli (AJK), Pakistan	2019	80	11	24	35	45	105	13.7	30	30.4	[40]
Sharda, Neelum Valley (AJK), Pakistan	2012	39	2	9	11	28	139	5.1	23	7.05	[32]
From KPK											
Kabal valley (KPK), Pakistan	2015	45	2	10	12	33	138	4.4	22.2	7.54	[109]
Skardu valley, Karakoram-Himalayan	2014	50	1	4	5	45	145	2	8	2.7	[39]
Ayubia National Park, Abbottabad,	2006	21	3	4	7	14	143	14.2	19.04	4.66	[112]
Tormik valley, Baltistan, Pakistan	2015	63	0	3	3	60	147	0	4.76	1.47	[117]
Northern Pakistani Afghan borders	2018	92	2	18	20	72	148	2.17	19.5	10	[118]
Malakand KPK, Pakistan	2018	25	2	7	9	16	141	8	28	6.08	[119]
Mohmand Agency (FATA), Pakistan	2018	64	1	14	15	49	135	1.56	21.8	8.87	[14]
From other areas of Pakistan											
Wazirabad, Punjab, Pakistan	2018	31	0	4	4	27	146	0	12.9	2.36	[120]
Chenab, Punjab, Pakistan	2019	129	3	24	27	102	123	2.32	18.6	13.6	[87]
Dera Ghazi Khan, Punjab, Pakistan	2012	66	7	9	16	50	134	10.6	13.6	9.52	[113]
From rest of world											
Sikles area, Nepal	2015	42	2	5	7	35	143	4.76	11.9	4.09	[115]
Sangli, Maharashtra, India	2015	21	0	3	3	18	147	0	14.2	1.85	[106]
Kunama ethnic group in Northern Ethiopia	2015	115	1	3	4	111	146	0.86	2.6	1.58	[107]

822 SY. Study year, Number of reported plant species, NPSU. Number of plants with similar uses, NPDU. Number of plants with different uses,
823 TSCBA. Total species common in both area, SEAA. Species enlisted in aligned areas, SESA. Species enlisted only in study area, PPSU.
824 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 Method of preparation of herbal recipes

Fig. 6 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. 7 Top ranked plant species with above 80% fidelity

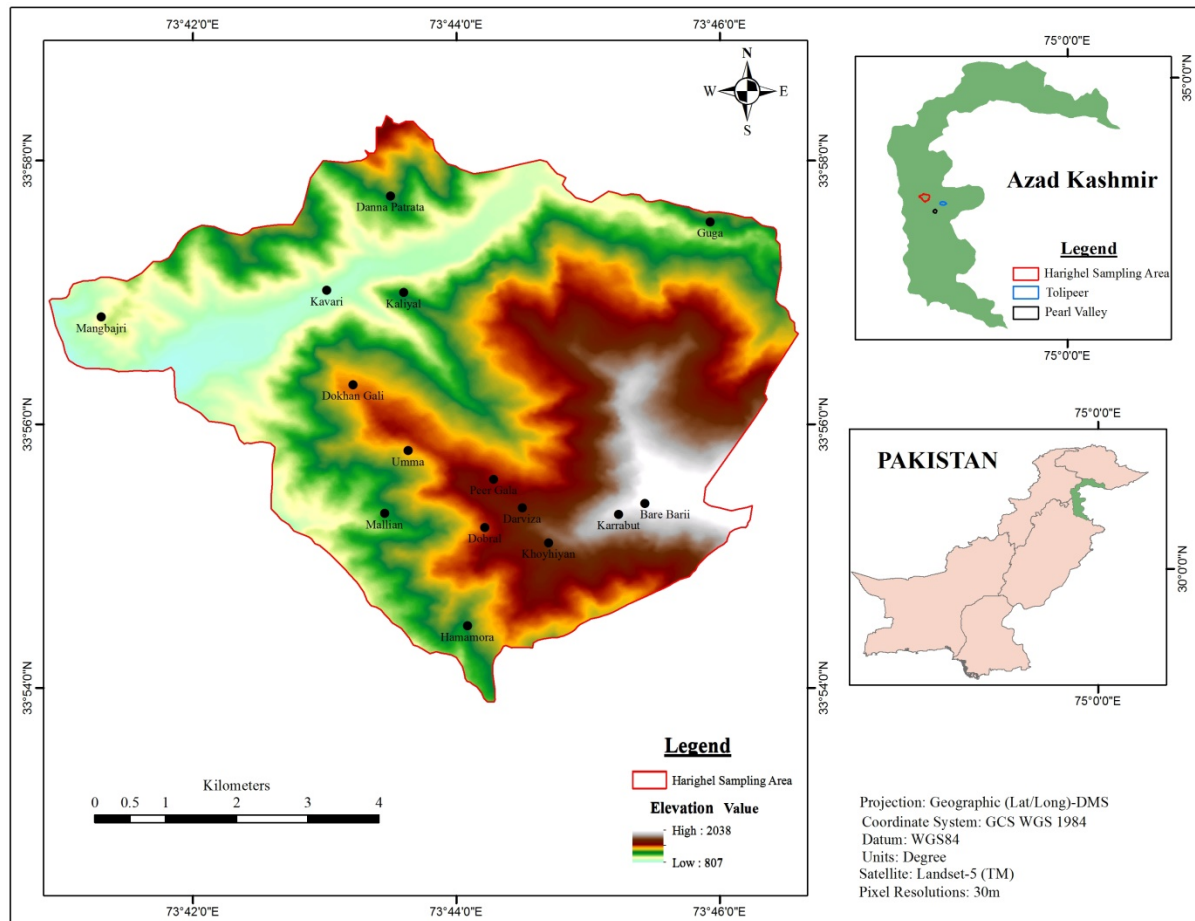


Fig. 1. Map of the study area

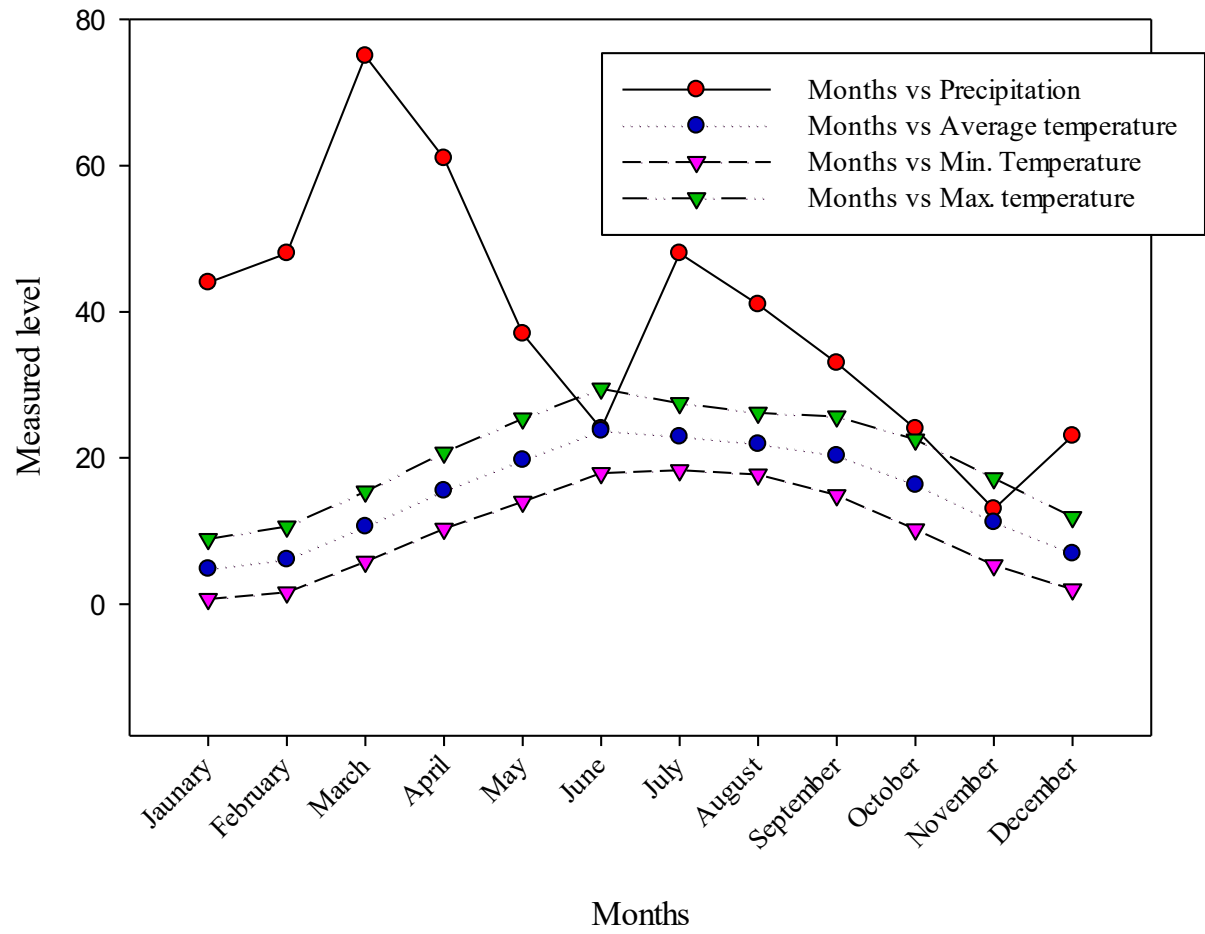


Fig. 2. Precipitation and temperature of the study area

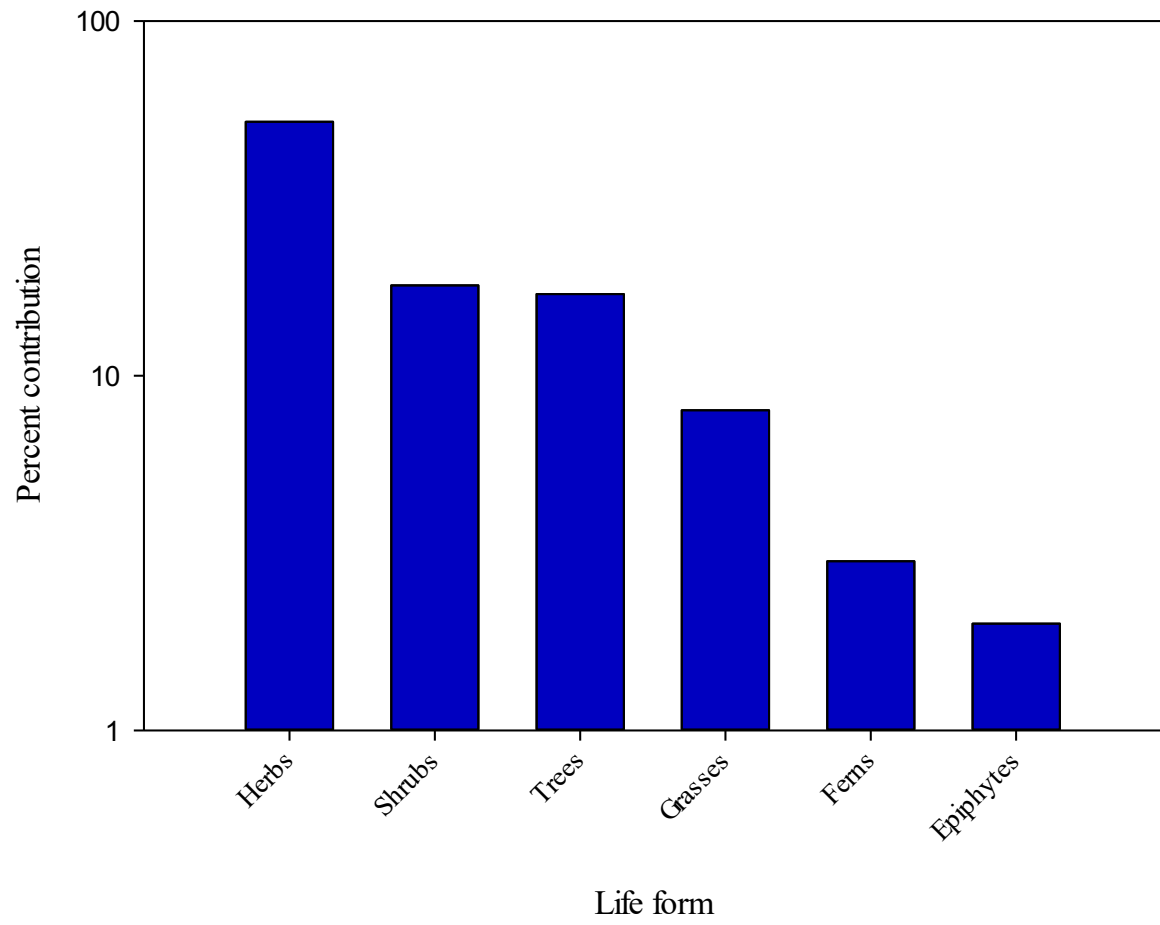


Fig. 3. Life form distribution pattern of the reported plant species in the study area

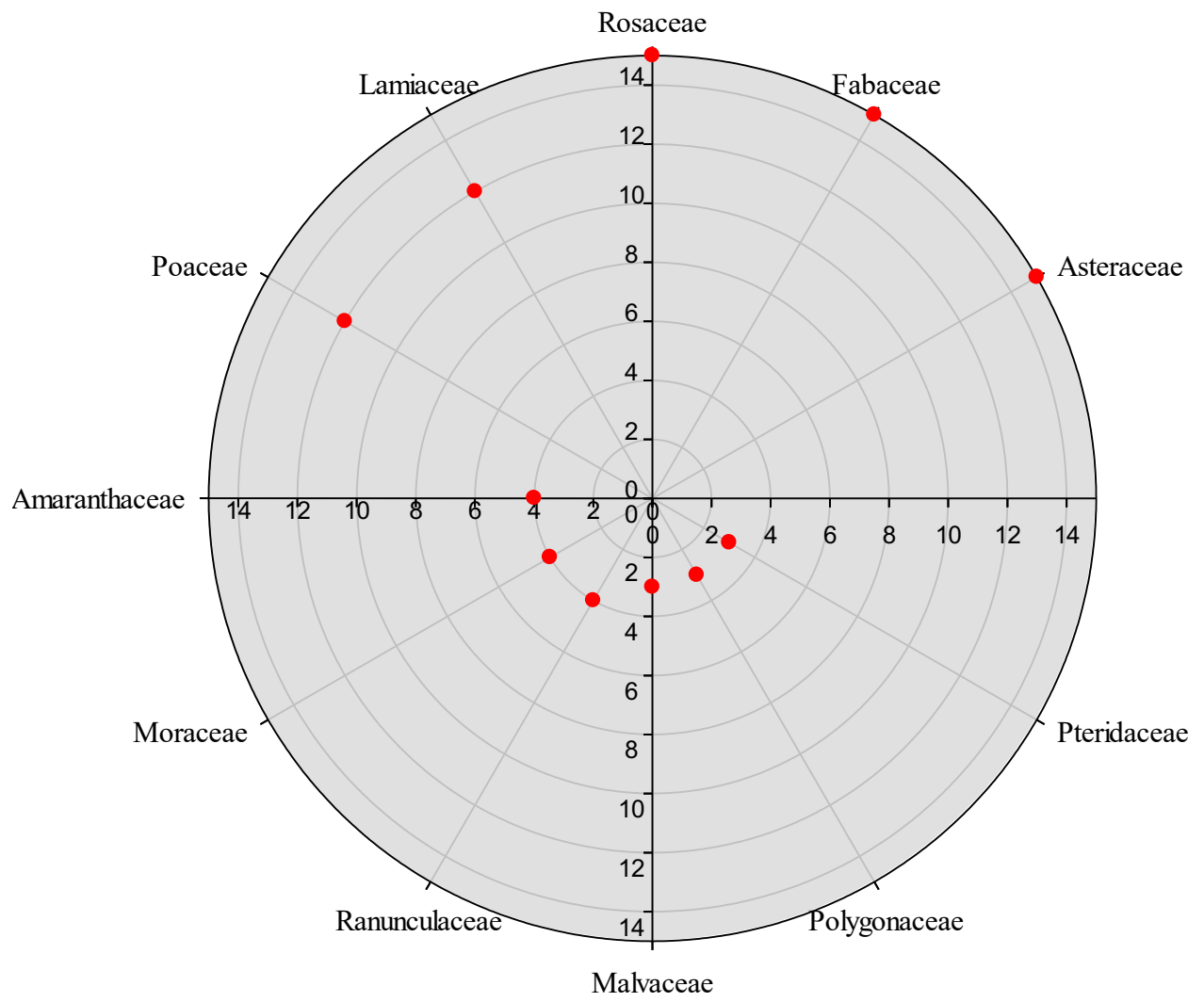


Fig. 4. Family contribution of medicinal flora in the study area

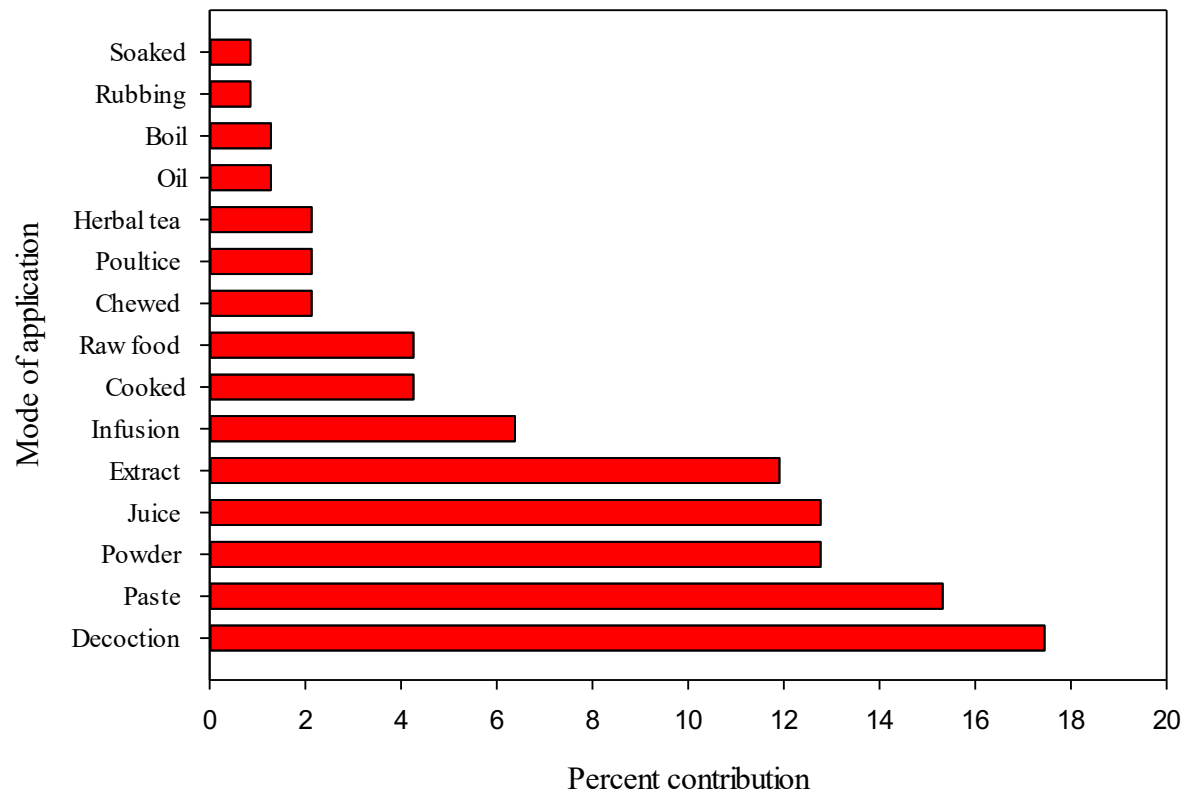


Fig. 5. Method of preparation of herbal recipes

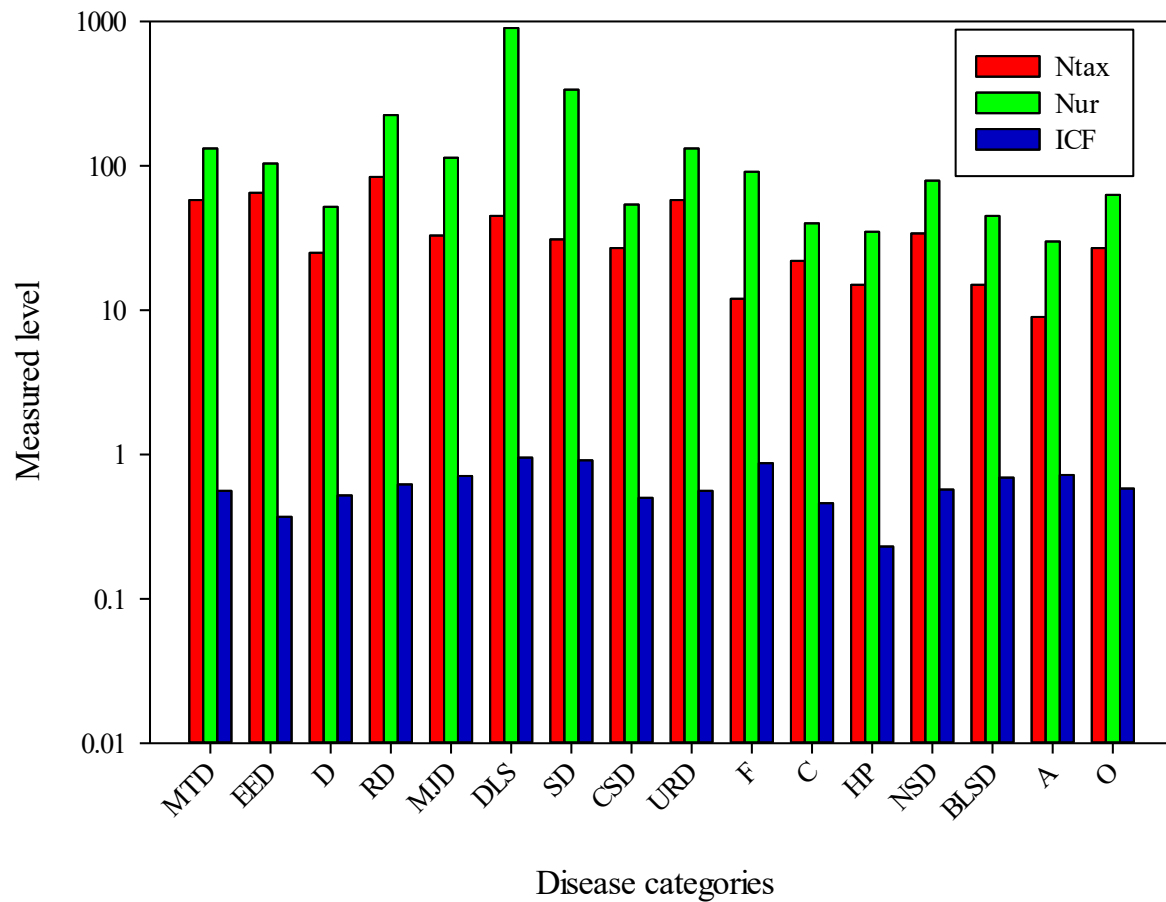


Fig. 6. Informant consensus factor of diseases with use reports and total number of species used.

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

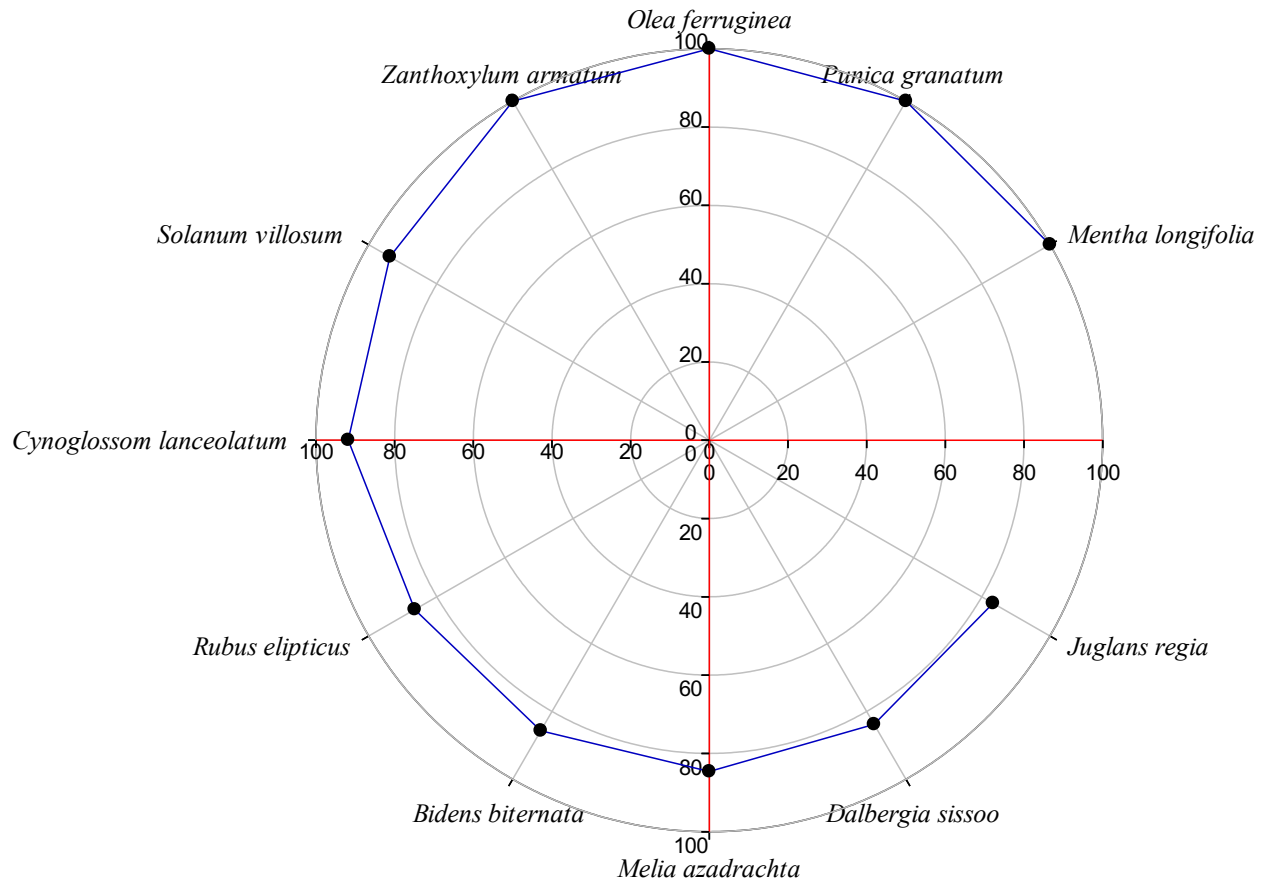
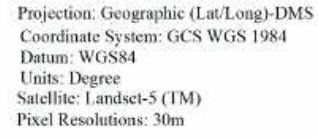


Fig. 7. Top ranked plant species with above 80% fidelity

Map of the study area



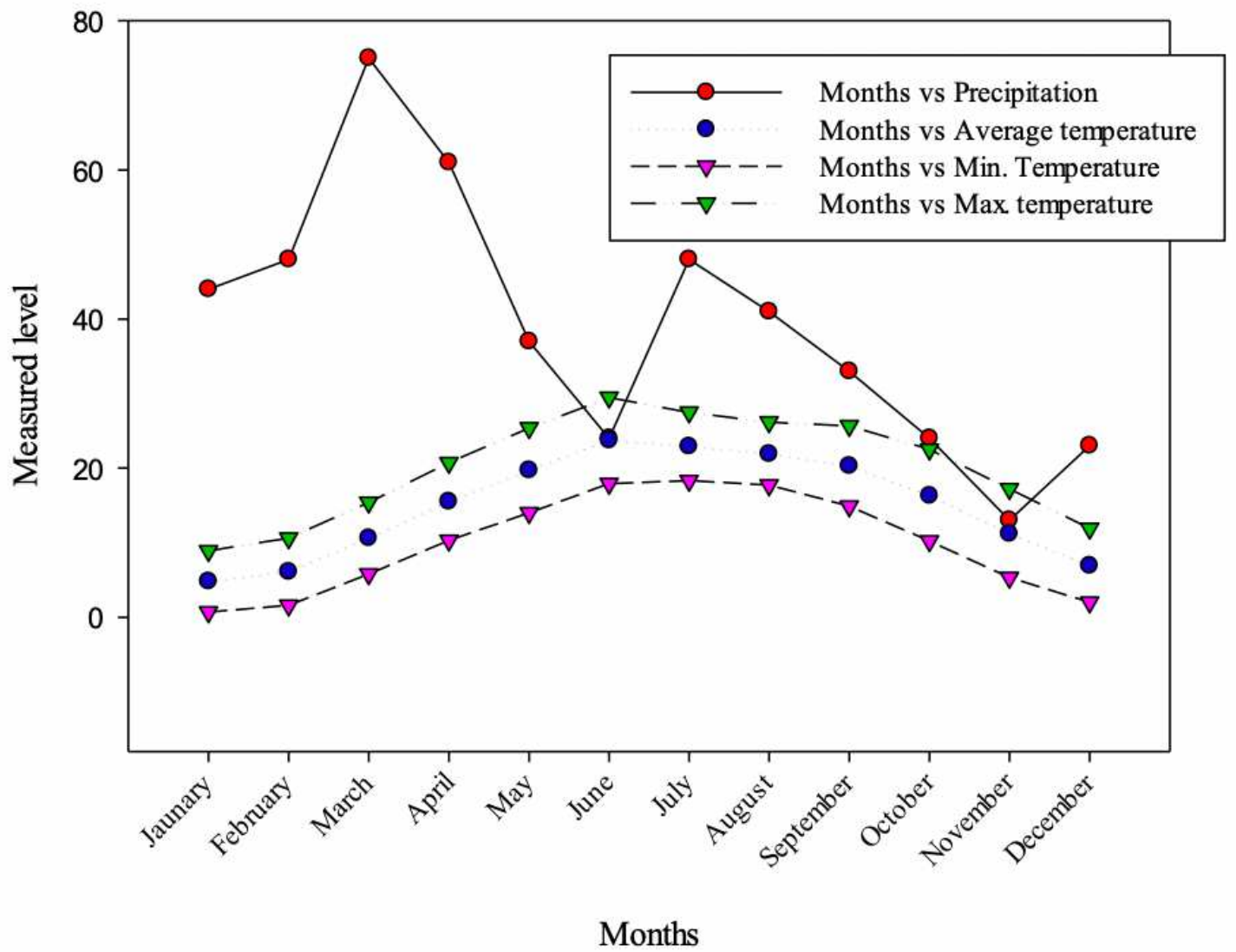


Figure 2

Precipitation and temperature of the study area

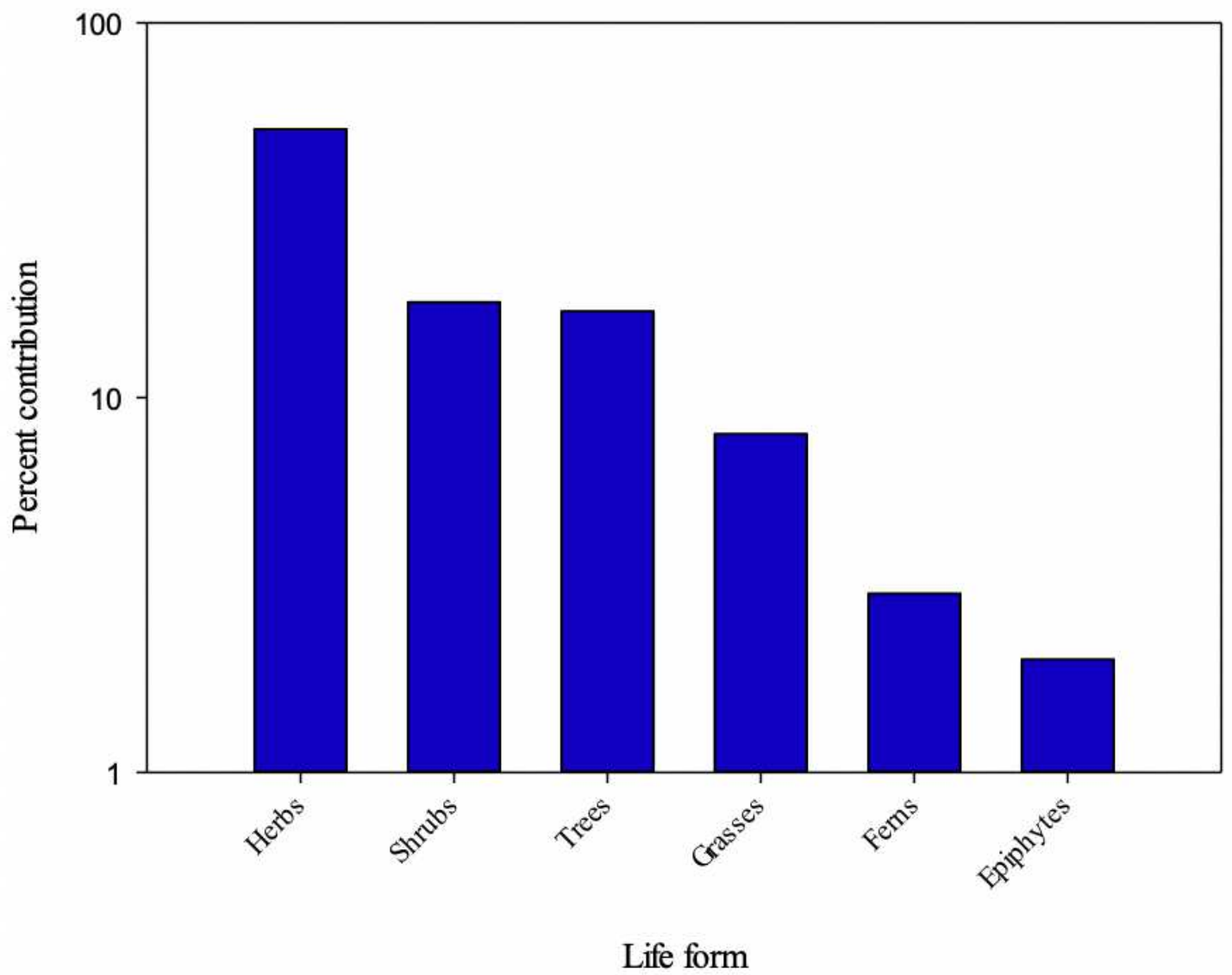


Figure 3

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

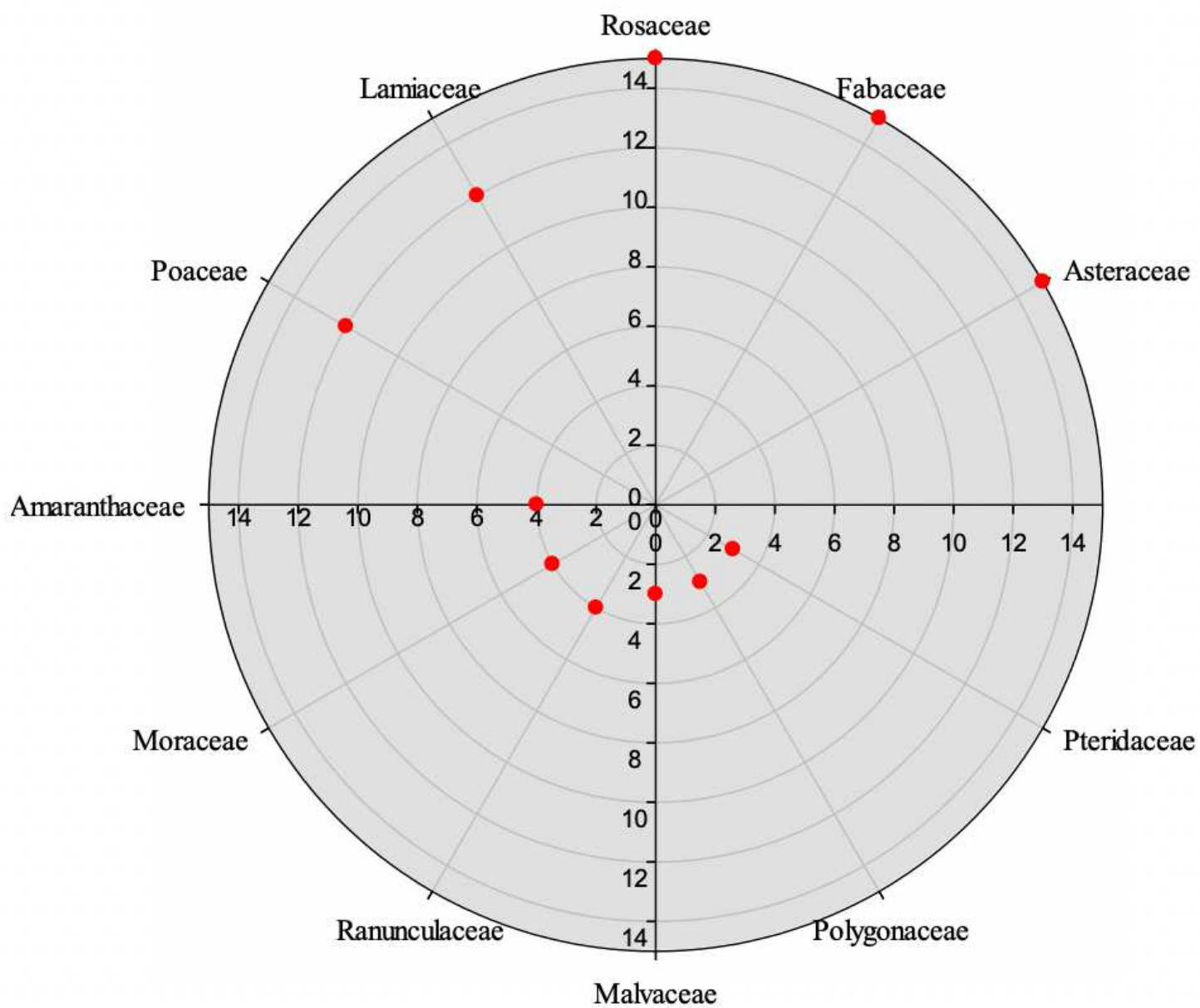


Figure 4

Family contribution of medicinal flora in the study area

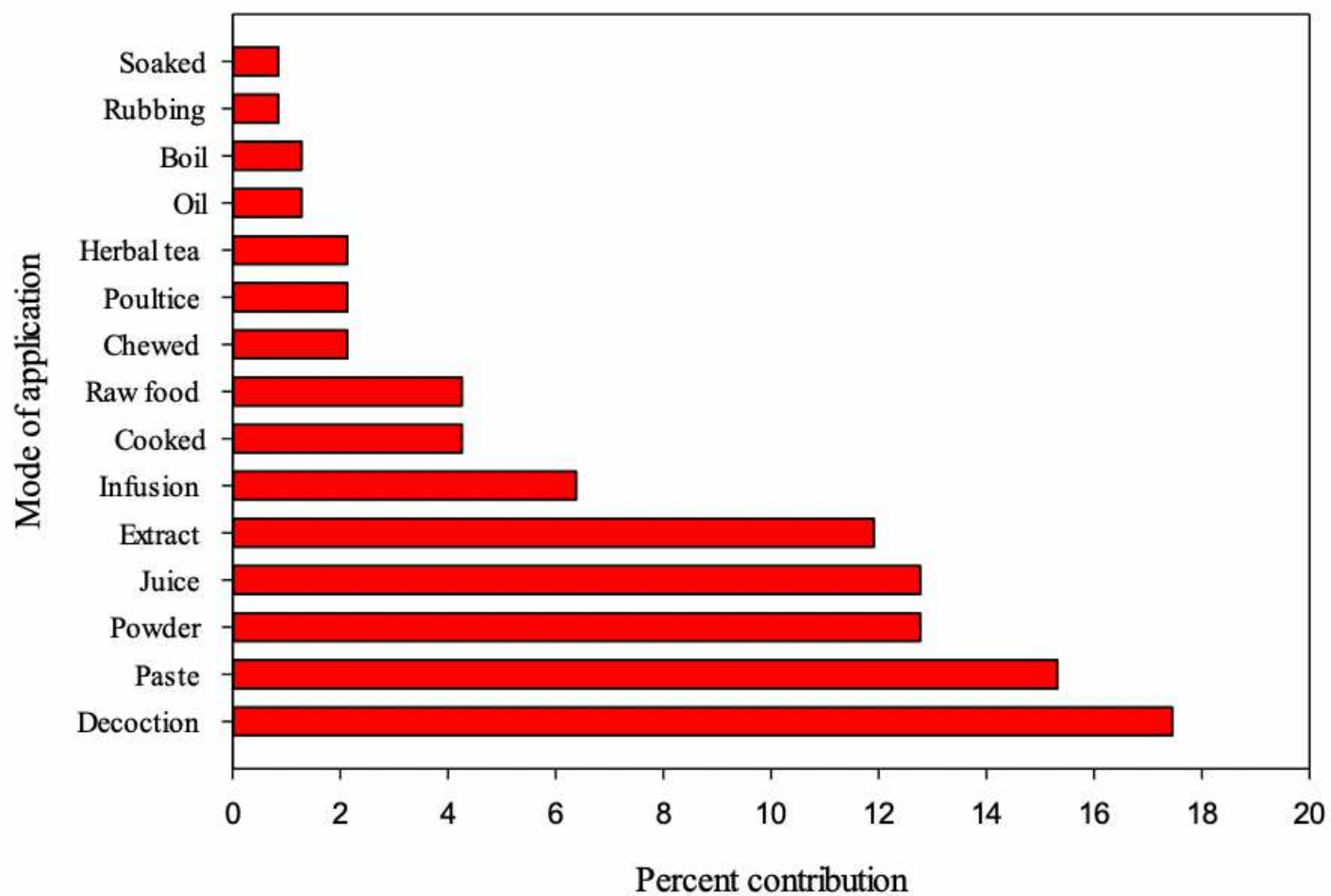


Figure 5

Method of preparation of herbal recipes

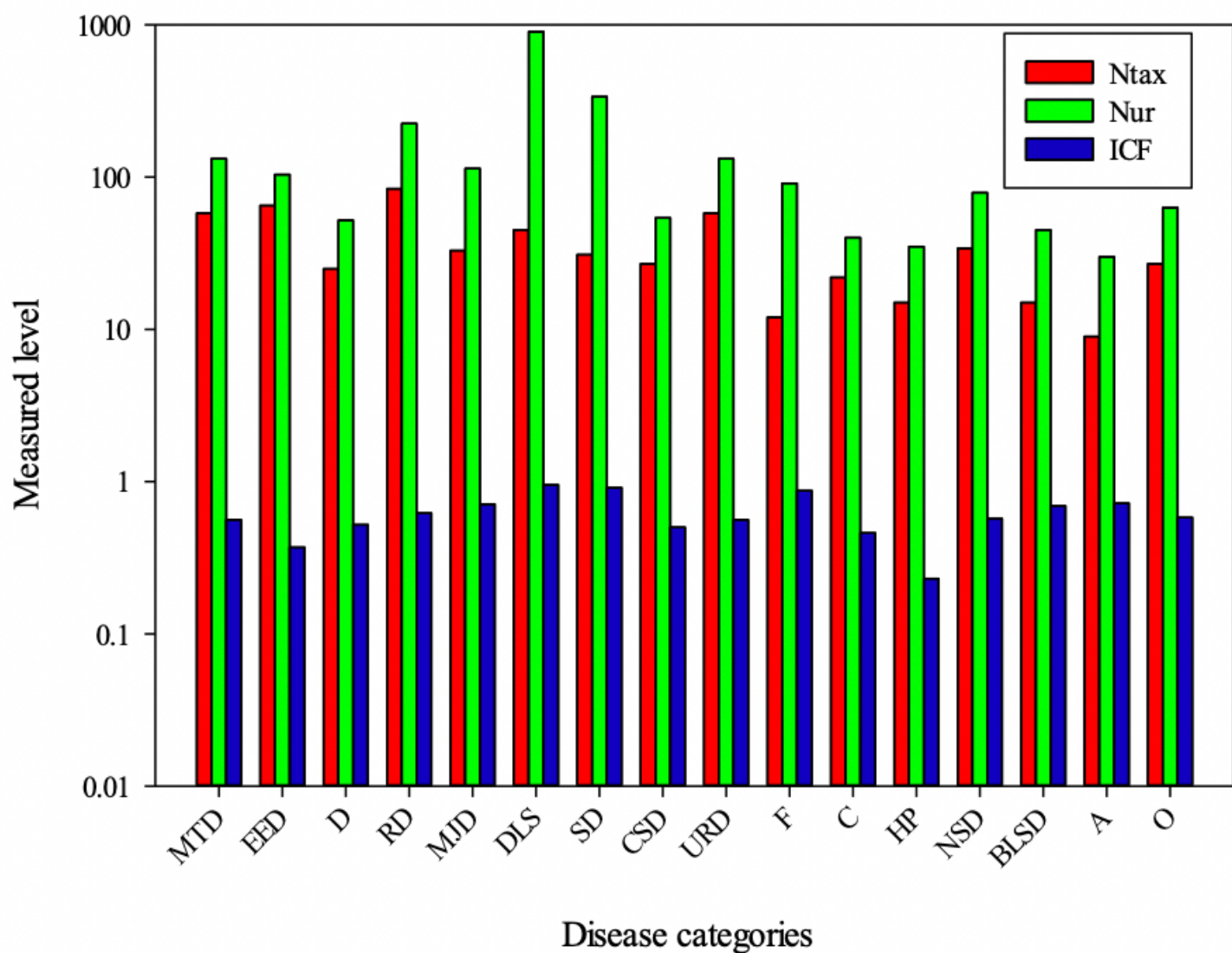


Figure 6

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

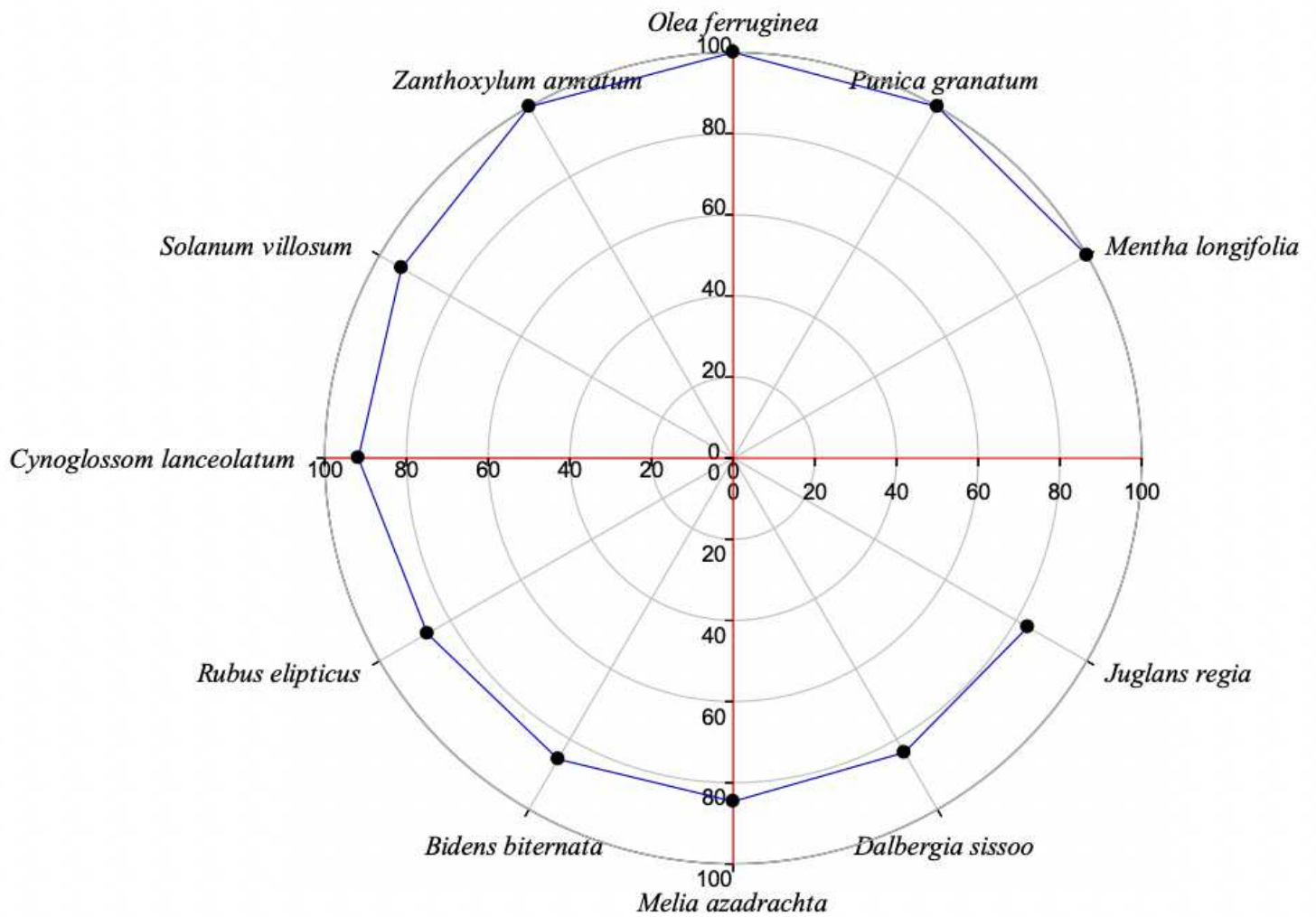


Figure 7

Top ranked plant species with above 80% fidelity

Supplementary Files

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- [Table1S.docx](#)
- [Table2S.docx](#)