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Medicinal Plants and Related Ethnomedicinal Knowledge in the Communities of Khadukhel Tehsil, Buner District, Pakistan

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Abstract: The local communities of Pakistan have vast traditional knowledge about local medicinal plants that is centuries old and transferred from generation to generation, but now, the survival of this precious ethnic knowledge is threatened. This study aimed to document the ethnomedicinal information residing within the communities of the Khadukhel Tehsil, Buner District, Pakistan. To conserve this valuable traditional knowledge, data were collected through a semi-structured questionnaire, one-on-one interviews, and group discussions. From 2018 to 2021, 853 people were interviewed regarding 317 plant species. Most of the ethnomedicinal data were obtained from members of the 60–69 age group. The most dominant plant family was Asteraceae (27 sp.). Leaves (124 sp.) were the most dominant plant part used in medicines, and paste (80 sp.) was the most common herbal formulation method. Most (88) medicinal plants were used to cure digestive system diseases. The collected medicinal plants and related indigenous medicinal knowledge were compared with previously published work on the surrounding areas. We suggest a phytochemical and pharmacological evaluation of the collected medicinal plants for the discovery of new drugs.

Keywords: ethnopharmacology; local perception; conserving knowledge; Northern Pakistan

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1. Introduction

Most (60.78%) of the population of Pakistan lives in rural parts of the country. Poverty, illiteracy, the poor quality of drinking water, the low status of women, and poor sanitation have a profound effect on their health [1]. Furthermore, the main health limitations across Pakistan, although especially in the rural areas, are inadequate awareness about health and illnesses, health service perceptions, and barriers within society. The healthcare system of Pakistan is divided into two main sectors: the public sector and the private sector. The allopathic healthcare system is the main pillar of the public-sector healthcare system, which is well-organized and regulated. However, it is underutilized due to shortcomings such as the poor attention paid to the upgrading of healthcare facilities [1], political interference, below-par human resources, and poor management and policy development [2]. The private sector of the healthcare system comprises a few recognized hospitals and health centers and several unrecognized hospitals, medical practitioners, homeopathists, hakims (physicians using traditional remedies), Unani (Grecoarab) herbalists, and local herbalists and spiritual therapists [3]. The local population consults these institutions and practitioners due to easy availability and access, affordability, family pressure, and the community's strong opinions [1]. They are the primary choice for the treatment of illnesses such as depression, epilepsy, infertility, and psychosomatic troubles [3].

Medicinal plant research in Pakistan primarily comprises the documentation of their ethnic values. The local communities of Pakistan have vast traditional knowledge about local medicinal plants that is centuries old and transferred from generation to generation, but now, this knowledge is threatened [1] because of a lack of interest among the younger generations. Therefore, it needs proper documentation and conservation. Up till now, several studies have been carried out in different parts of the Buner District [1,4–9], but no single ethnomedicinal study has been conducted in the Khadukhel Tehsil. Therefore, the present survey was carried out to assess and conserve the ethnomedicinal knowledge of the Khadukhel Tehsil. This study will help to familiarize the local and surrounding communities with the novel medicinal uses of already known medicinal plants as well as newly reported medicinal plants.

2. Materials and Methods

2.1. Literature Review

Before starting the fieldwork, the online databases Google Scholar, ISI Web of Science, MEDLINE, Science Direct, and Scopus were searched using the terms "alternative medicines", "therapeutic plants", "medicinal plants", "Tehsil Khadukhel", and "District Buner, Pakistan". The term "Tehsil Khadukhel and Buner Pakistan" was used to constrain the topographical extent of the search. The criteria for the selection of published articles were climate condition, forest type, closeness to the study area, and cultural similarity. The correctness of the botanical name(s) of various species mentioned in the current study depends upon that of the original sources.

2.2. Study Area

The study area is located in the south part of Buner District [9]. The geographical position of the Khadukhel Tehsil is 34.193301 N and 72.4924707 E (Figure 1). The dominant shrubs and tree species of the local flora are *Acacia modesta*, *Butea monosperma*, *Dodonea viscosa*, *Grewia optiva*, *Gymnosporia royleana*, *Justicia adhatoda*, *Mallotus actinoneurus*, *Myrsine africana*, *Otostegia limbata*, *Olea ferruginea*, *Pinus roxburghii*, *Ziziphus jujube*, *Ziziphus nummularia*, and *Ziziphus oxyphylla* [7]. The tehsil contains two hospitals; one is located in Totalai, with MBBS 1 or 2 doctors, and the other is located in Bagh, although it is nonfunctional. The population of the study area is 118,185, according to the 2017 Census. The covered area is 343 km^2. Most of the population is Sunni Muslim, but Sikh families also live in this area as the minority population, especially in Ghurghostu and Chinglai [10]. Most of the inhabitants live in rural areas, and their primary source of income is agriculture and farming.

2.3. Collection of Medicinal Plants

The plant specimens were collected during different seasons of the year. Eighteen different locations were selected randomly to collect medicinal plants and document ethnomedicinal data (Figure 1). Furthermore, randomly, four to five field trips were arranged during each season for the collection of maximum plants. During each field trip, we had a local guide show us essential medicinal plants for collection, and after collecting the plants, we met with local informants to document the medical uses of the collected plants. During the interviews with people, we observed that several species were not endemic to the study region yet were utilised to cure a variety of ailments. These non-native plants were either cultivated by residents or imported from other parts of the country. Their medicinal uses were also documented. The collected plant specimens were preserved according to the technique of Forman and Birdson [11]. During field work photographs of the vegetative parts, fruits and flowers were captured with the help of a Fuji digital camera for identification purposes. Furthermore, self and informants' photographs were also captured during interviews. The collected specimens were identified by Dr. Zahid Ullah (Assist. Prof. in UoS) and with the help of the available literature and the Flora of Pakistan Tropicos [12]. The botanical names were further confirmed from the databases International Plant Names Index [13], The Plants list [14], and medicinal plants name service [15]. All

the collected specimens were acquiesced to the Herbarium of the Department of Botany, Islamia College Peshawar, Pakistan for future reference.

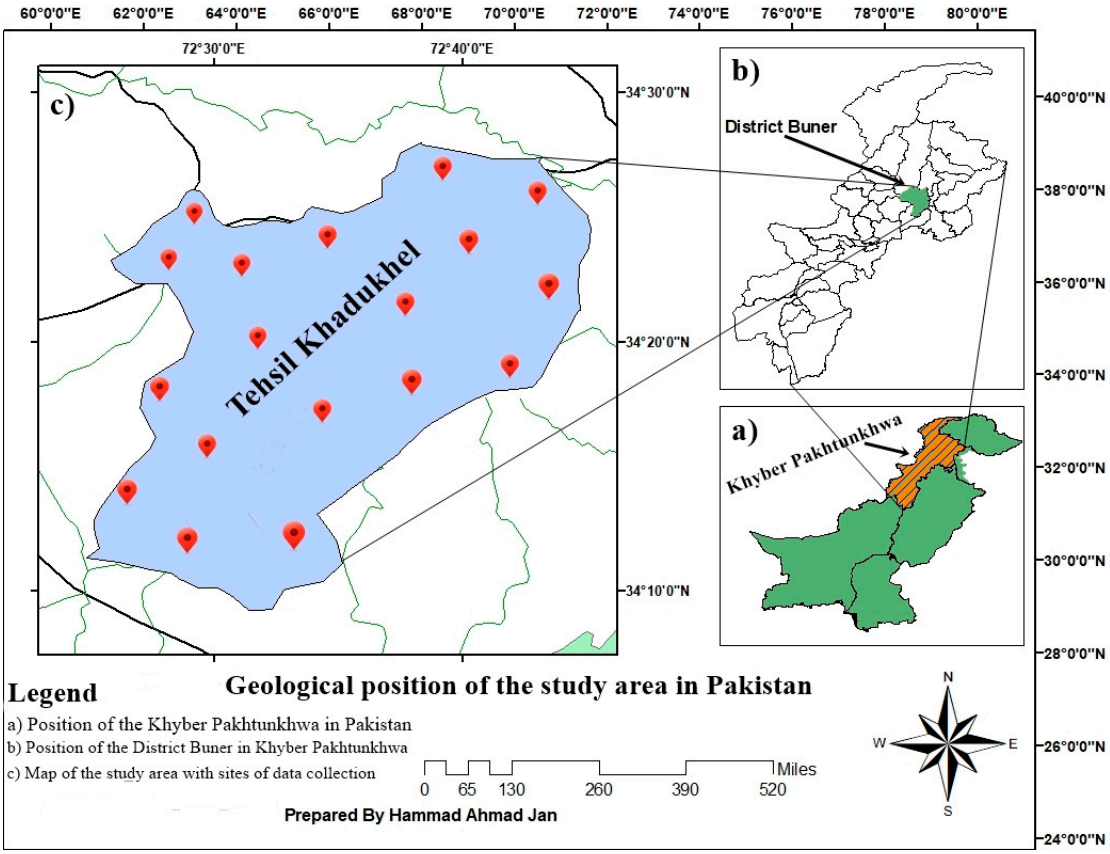

Figure 1. Map of the study area, (**a**) Position of Khyber Pakhtunkhwa in Pakistan, (**b**) Position of District Buner in Khyber Pakhtunkhwa, (**c**) Map of the study area with sites of data collection.

2.4. Ethnomedicinal Data Documentation of Medicinal Plants

The present work was conducted from 2018 to 2021. A semi-structured questionnaire was used as a tool for ethnomedicinal data collection (Appendix A). The informants were interrogated through one-on-one interviews and group discussions. The snowball method was used for selecting the informants [16]. Detailed interviews were mostly followed by free listing. We encouraged the local population to enlarge the free listing. The collected ethnomedicinal data was cross-checked among the informants to confirm the genuineness of the data. Prior verbal consent was always taken from each informant [17]. We interviewed 853 local people, comprising 639 males, including 19 herbalists (*Hakims*), and 214 females, of which 26 were *dayiahs* (women famous for treating female-specific diseases). The native language (Pashto) was used during the interview to collect complete and correct data. Male informants were interviewed in the field, Hujra, or Baithaks, while female informants were interviewed at home. Local herbalists (hakims) were also interviewed at their herbal stores to document the current status of traditional knowledge. The questionnaire was mainly comprised of questions about the local name, part used as medicine, use for disease(s), complete method of preparation of recipes/medicine, and amount/dosage of medicine. Unceremonious talks and field walks were undertaken with key informants (185), which included herders, farmers, teachers, housewives, shepherds, and students (from school to university), to improve comprehension of the documented ethnomedicinal data. The ages of the informants varied from 20 to 113. The information they provided us was carefully documented using the technique of Mengistu and Hager [18]. To confirm the validity of the ethnomedicinal data collected about medicinal plants, it was

cross-checked in different communities by presenting the plant's fresh or dried specimen, telling the local name/s of the plant, or showing the plant's photograph/s to the informants.

2.5. Ethical Considerations

The current work has been permitted by the ethical committee of the Department of Botany, Islamia College Peshawar, and Biodiversity Action Plan (BAP-2010–2020) for Pakistan. Prior consent was obtained from all participants before conducting interviews. This study has been conducted under the provisions of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization of the Convention on Biological Diversity.

2.6. Software Used for Documentation and Analysis of Data

MS-Excel-2010 and PAST 4.10 version (Microsoft, Redmond, Washington DC, USA) were used for sorting the collected ethnomedicinal data and basic quantitative analysis and figure making. For the index used, the questionnaire was analyzed in two ways: firstly, responses of the informants were documented, and in the second step, binary values for the questions were considered: the 0 value was allotted to answer "NO" and the value 1 allotted to the answer "YES" [19].

2.7. Informant Consensus Factor (ICF)

This index is used to find out the agreement or similarity among the informants of the study area about the uses of plants for a particular group of diseases. The *ICF* is determined with the help of the succeeding formula [20]:

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

In the above formula, *Nur* is representing the use-reports number for a specific group of diseases and *Nt* is representing the taxa number used as medicine for that specific group of diseases by all the local respondents.

All the diseases were grouped according to the local people's preferences in 14 different categories to determine the informant consensus factor (*ICF*). The *ICF* identifies the informants' agreement about each category of disease. The *ICF* is used to determine the effectiveness of medicinal plants in treating a certain group of diseases. Furthermore, the *ICF* pointed out the most effective medicinal plants against the common group of diseases. The value of *ICF* varies between 0 and 1. If the value of *ICF* is near one, it shows the homogeneity of uses of plants for multiple purposes, well-defined selection criteria are present in the community, and the informants regularly exchanged ethnomedicinal knowledge. A value of *ICF* closer to zero indicates that the medicinal plants are selected randomly or there is a limited exchange of ethnomedicinal knowledge among informants of the community.

3. Results and Discussion

3.1. The Socio-Demographic Distribution and Characteristics of the Local Informants

To document the ethnic knowledge about the medicinal plants used for the cure of various diseases, a total of 853 indigenous people were interviewed including *dayiahs*, drivers, farmers, housewives, labors, shepherds, teachers, students (school to university), shopkeepers, *hakims*, *herbalists* (*person who sells herbal medicines*), and *pansaries*, etc. Of these, 639 were male informants. In terms of male informants, 19 were *hakims*, *herbalists*, and *pansaries* while 26 female informants were *Dayiahs*. The informants that were interviewed ranged in age from 20 to 113. These respondents were subsequently divided into seven groups of varying ages and seven groups of different literacy levels. Most of the ethnomedicinal data were obtained from the age group 60–69, followed by the 70–79 age group and 50–59. A decline in the ethnic knowledge of medicinal plants was observed in the informant groups with ages under 50. The informants aged 20 to 29 had the least

knowledge about herbal remedies (Table 1). This may be due to the modernity of lifestyle, which encourages younger generations to choose allopathic medicines over natural remedies. [21]. Furthermore, according to the literacy classification with a rising literacy rate, there was a decreasing tendency in informants' ethnomedicinal knowledge observed. This may be because educated individuals prefer the more advanced healthcare system over the conventional healthcare system [7]. Furthermore, other studies observed similar findings [7,22]. Furthermore, it has been noticed that males and females have almost similar ethnomedicinal knowledge. This might be because males harvest medicinal plants while women prepare herbal medications and treat patients at home. As a result, both men and women are more or less aware of the medicinal properties of plants [7,23].

Table 1. Demographic profile of the study area.

S/No.	**Informants Interviewed**			
	Gender		**No. Informants**	
1	Male		639	
2	Female		214	
	Traditional Knowledge of Medicinal Plants			
	Age Group	No. of Informants	Medicinal Plants Reported	Complete Recipes
1	20–29	67	24	19
2	30–39	107	67	53
3	40–49	131	104	97
4	50–59	165	126	131
5	60–69	215	178	189
6	70–79	97	151	156
7	80–Above	71	137	105
	Total Informants		853	
	Literacy Rate of Informants			
	Age Group	No. of Informants	% age	Complete Recipes
1	20–29	58/67	86.56%	19
2	30–39	46/107	42.99%	53
3	40–49	35/131	26.71%	97
4	50–59	29/165	17.57%	131
5	60–69	23/215	10.69%	189
6	70–79	9/97	09.27%	156
7	80-Above	2/71	02.81%	105
	Total	202/853	23.68%	

3.2. Diversity of Families and Life Forms

The collected medicinal plants belong to 91 families. The most dominant family in terms of species number was Asteraceae (27 species), followed by Poaceae (21 species), Fabaceae and Lamiaceae (19 species each), and Rosaceae (14 species) (Figure 2). The widespread distribution of these families in the study area may be a contributing factor to their dominance. Asteraceae is also the most prevalent family in Pakistan, according to the Flora of Pakistan. Additionally, the Asteraceae family is abundantly distributed across the study area [24]. In addition, the dominancy of the Asteraceae is reported from the surrounding areas in different studies [24–27]. Fabaceae as a dominant family was reported by other studies from surrounding areas [28]. The main reason for the therapeutic usage of Lamiaceae members in the study area is their vast distribution and the

presence of monoterpenes in the form of volatile oils and other metabolically significant secondary metabolites [29]. The dominancy of the family Lamiaceae is also reported by other studies from the surrounding areas [7,30,31]. The dominance of the Rosaceae family may be attributed to suitable habitats, favorable environmental conditions for the growth of its species, and increased interactions of local communities with them. As a result, the traditional usage of these species is commonly known by the inhabitants [32].

The collected medicinal plants belong to different life forms. The most dominant life form was herbs (230 species), followed by trees (47 species), and shrubs (40 species) (Table 2). Herbs may have better adaptability to the climate and geography of the research area, which may be the cause of their domination. In addition, compared to shrubs or trees, herbs are more potent and grow rapidly [33]. Moreover, the availability of herbs is easy [34]. Additionally, herbs have different types of bioactive compounds which help them to adapt to any climatic condition easily [35]. Also, herbs have a higher concentration of various bioactive compounds than other life forms. Lastly, compared to shrubs and trees, herbs often have more medical efficacy [29]. High-altitude regions have a more herbaceous flora [34]. Furthermore, a similar result was reported in other studies from surrounding areas [7,25,29,32,34–36].

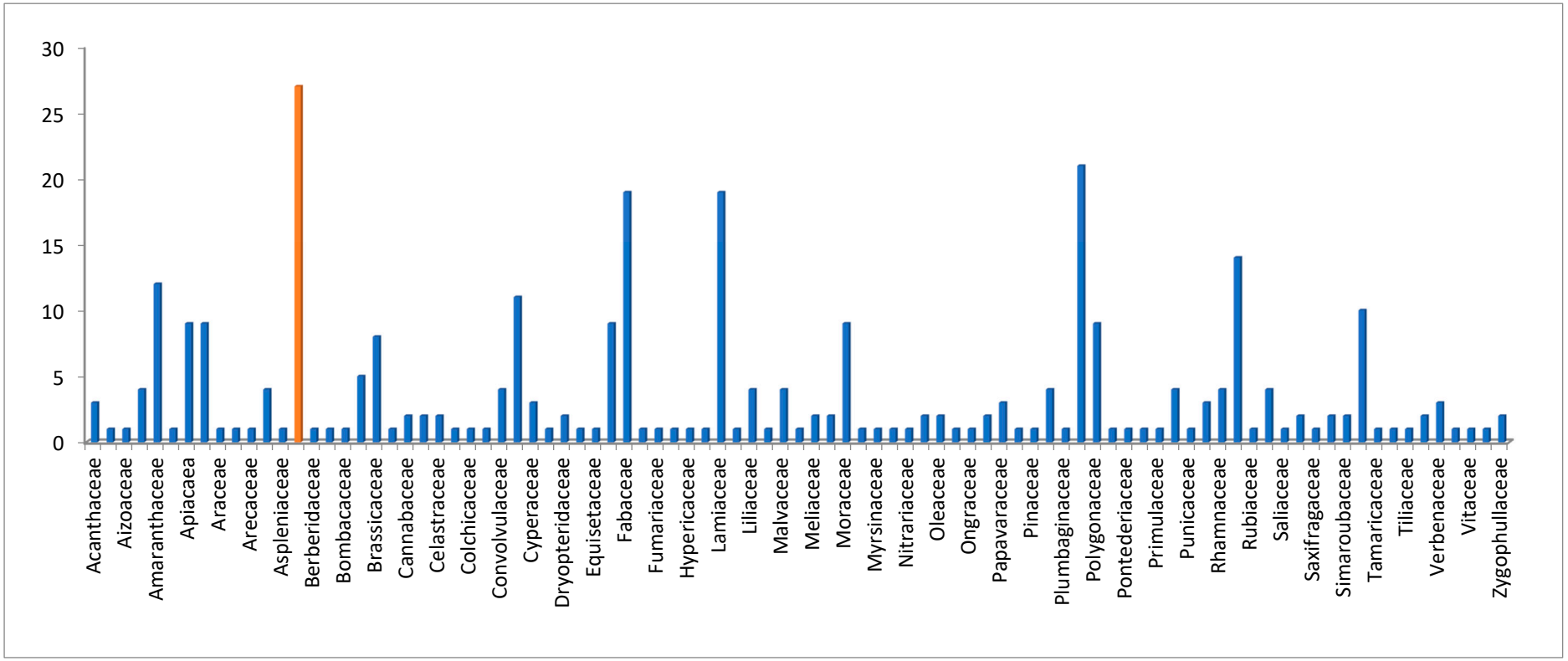

Figure 2. Families and number of species in each family.

Table 2. Medicinal plants of Tehsil Khadukhel and their local medicinal uses along with quantitative data.

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Acanthaceae										
Barleria cristata L. (HAJ-15)	Kuladaya	H	W	Lf, Rt, Wp	Pt, Et	Wounds (6), stomachache (11)	17	31	2	[4,37]
Dicliptera bupleuroides Nees (HAJ-16)	Kirachay	H	W	Lf	Rw	Wounds (11)	11	19	1	[38,39]
Justicia adhatoda L. (HAJ-18)	Bekar	S	W	Lf	Pt	**Rheumatism** (23)	23	30	1	[7–9,26,30,38–49]
Acoraceae										
Acorus calamus L. (HAJ-19)	Skhawaja	H	W	Re	Et, Dn	**Dyspepsia** (4), **dysentery** (7)	11	24	2	[4,7–9,30,39–41,43,45–47,50,51]
Aizoaceae										
Trianthema portulacastrum L. (HAJ-21)	Sathi	H	W	Rt	Pt	Wounds (22)	22	31	1	[45]
Alliaceae										
Allium cepa L. (HAJ-22)	Piaz	H	C	Bb	Dn, Ta	**Wounds** (13), stop vomiting (22)	35	42	2	[4,7,9,30,40–44,51–54]
Allium humile Kunth (HAJ-23)	Orakay	H	W	Lf	Pr	Fever (14)	14	29	1	[55,56]
Allium jacquemontii Kunth (HAJ-24)	Ogakay	H	W	Bb	Rw, Pt	**Hypertension** (9), unequal mammary gland size (8)	17	23	2	[7,8,23,57]
Allium sativum L. (HAJ-25)	Owga	H	C	Bb	Dn, Pt, Rw	Stomach bloating (8), **blood pressure** (32)	41	50	2	[4,7,9,30,40,42,43,43–45,47,51–54]
Amaranthaceae										
Achyranthes aspera L. (HAJ-28)	Geshkay	H	W	Lf, Rt, Bk	Pt, Dn, Rw	**Piles** (4), **boils** (7), toothache (12), gum inflammation (4)	27	46	4	[4,7–9,30,38–45,47,58–60]
Aerva javanica (Burm. f.) Juss. ex Schult. (HAJ-29)	Sassa/Shorakay	H	W	Lf, Wp	Pt, Pr	Wounds (8), urinary tract stones (3)	11	23	2	[42,49,59]
Alternanthera pungens Kunth (HAJ-30)	Khaki bootay	H	W	Wp	Dn	Jaundice (8)	8	15	1	[30,37,58]
Alternanthera sessilis (L.) R.Br. ex DC. (HAJ-31)	Suba	H	W	Lf	Et	Leucorrhea (7)	7	19	1	[42]
Alternanthera spinosa (Hornem.) Schult. (HAJ-32)	Chlaveray	H	W	Lf, Ft, Fr, Rt	Pe, Ah, Pt, In	Jaundice (5), scorpion bite (2), eczema (1), throat infection (2)	10	31	4	[50]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Amaranthus caudatus L. (HAJ-33)	Chalveray	H	W	Lf, Rt	Pt, Cd, Et	Boils (9), blood purification (5), fever (6)	20	37	3	[4,39,43,45,58]
Amaranthus viridis L. (HAJ-34)	Junhar	H	W	Lf	Pt	**Scorpion sting, snakebite** (8)	8	21	2	[4,7,8,30,38–45,49,50,52,53,58–61]
Chenopodium album L. (HAJ-36)	Sarmai	H	W	Sd, Lf	In, Rw	**Intestinal worms** (12), **joint pain** (5)	17	23	2	[4,7,8,20,39,40,42,43,50,53,56,57,59,61]
Chenopodium murale L. (HAJ-27)	Chalweray	H	W	Lf	In	**Jaundice** (40)	40	63	1	[37,39,40,57,59]
Digera muricata (L.) Mart. (HAJ-35)	Surguli Saag	H	W	Lf	Pt, Cd	Boils (3), **constipation** (6)	9	22	2	[50]
Dysphania ambrosioides (L.) Mosyakin & Clemants (HAJ-26)	Kharawa	H	W	Lf, Sm	Dn	Scabies (13)	13	29	1	[30,38,40–43,47,48,53,60]
Dysphania botrys (L.) Mosyakin & Clemants (HAJ-37)	Skha kharawa	H	W	Lf	Je	Expel leeches from cattle nose (7)	7	26	1	[40]
Anacardiaceae										
Pistacia integerrima J. L. Stewart ex Brandis (HAJ-38)	Shnay	T	W	Lf	Ah	**Cough** (24)	24	31	1	[7–9,30,39,40,43–45,58]
Apiacaea										
Ammi visnaga (L.) Lam. (HAJ-39)	Spirkay	H	C	Sd	Rw	Stomachache (21)	21	30	1	[26,30,40,45]
Bunium persicum (Boiss.) B.Fedtsch (HAJ-40)	Tora zeera	H	C	Ft	Pr, Rw	Whooping cough (8), foul breath (4)	12	18	2	[30,40,47]
Coriandrum sativum L. (HAJ-41)	Dhanya	H	C	Ft, Lf	Dn, Pt	Dysentery (35), **asthma** (11), **carminative** (39)	85	93	3	[7,30,40,42,43,45,47,54,57,62,63]
Daucus carota L. (HAJ-42)	Gazara	H	C	Rt, Sd	Rw, Dn	**Urinary problems** (21), regulation of menstrual cycle (18)	39	45	2	[41,42,54]
Eryngium coeruleum M-Bieb. (HAJ-333)	Ghata kareza	H	W	Fr, Rt	Pt, Pr	Ringworm (19), increase appetite (8)	27	42	2	
Foeniculum vulgare Mill. (HAJ-44)	Kagu	H	C	Sd	Pr	**Increase eyesight** (17), **digestive system disorders** (14)	31	45	2	[4,7,9,30,39–43,47,49,51,54,57–59]
Pimpinella acuminate (Edgew.) C.B.Clarke (HAJ-45)	Tarpakay	H	W	Wp	Dn	Dysentery (7)	7	13	1	
Torilis leptophylla (L.) Reichb. f. (HAJ-334)	Danyal panra	H	W	Lf	Pr	**Gastric problems** (26)	26	44	1	[50]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Trachyspermum ammi (L.) Sprague (HAJ-46)	Sperkay	H	C	Sd	Dn	**Stomachache in children** (17)	17	22	1	[4,40–42,48,51,52]
Apocynaceae										
Calotropis procera (Aiton) Dryand. (HAJ-47)	Spalmay	H	W	Rt	In	Obesity (17)	17	27	1	[7–9,26,30,39–45,50–52,57,59,60,63]
Caralluma tuberculata N.E.Br. (HAJ-48)	Pamunkay	H	W	Sm	Pt, Pr	**Antidiabetic** (28), **carminative** (19)	47	63	2	[23,30,30,39,40,42,61]
Carissa spinarum L. (HAJ-49)	Garanda	S	W	Rt	Pr	Wounds (5), skin sores (11)	16	34	2	[38,42,44,45,49]
Nerium oleander L. (HAJ-50)	Ganderai	S	C/W	Bh	Dn	Stomachache (7), constipation (9)	16	27	2	[8,23,39,40,42,43,49]
Oxystelma esculentum (L.f.) Sm. (HAJ-51)	Tendoray	H	W	Rt	Et	Asthma (15)	15	22	1	
Periploca aphylla Decne. (HAJ-52)	Barrha	H	W	Ft, Sm	Je	Swellings (8)	8	21	1	[26,39,40,42,49,58]
Rhazya stricta Decne. (HAJ-53)	Ghandaray	H	W	Lf, Rt	Dn, Et	Antidiabetic (4), **toothache** (15)	19	32	2	[42,57]
Telosma cordata (Burm. f.) Merr. (HAJ-54)	Gilo	H	W	Fr	Cd	Tonic (17)	17	41	1	
Tylophora hirsuta Wight (HAJ-55)	Goganda	H	W	Rt	Pr	**Rheumatism** (21)	21	34	1	[40,51]
Araceae										
Arisaema jacquemontii Blume. (HAJ-335)	Marjarai	H	W	Tr	Pt	Snakebite (37)	37	49	1	[20,37,39,40]
Araliaceae										
Hedera nepalensis K.Koch (HAJ-57)	Phalul	H	W	Ft	Pr	Remove leeches from cattle body (9)	9	21	1	[23,30,37–40,42,43,53]
Arecaceae										
Phoenix dactylifera L. (HAJ-336)	Kajora	T	C/W	Ft	Rw	Tonic (41), **laxative** (32)	73	80	2	[40,57]
Asparagaceae										
Asparagus filicinus Buch.-Ham. Ex D.Don (HAJ-58)	Shin lakhtay	H	W	Sd	Dn	Easy delivery (6)	6	13	1	[37]
Asparagus officinalis L. (HAJ-59)	Shal guttay	H	W	Re	Pr	**Dysentery** (9)	9	17	1	[7,8,37,40,43,47,56,61]
Asparagus racemosus Willd. (HAJ-60)	Indoray	H	W	Rt, Lf	Et, Pt	Heel cracks (6), increase fertility in women (8)	14	26	2	[8,40,58]
Polygonatum verticillatum (L.) All. (HAJ-61)	Noor-e-alam	H	W	Rt	Pr	Gastric complaint (11)	11	19	1	[39,40,46,61]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Aspleniaceae										
Ceterach officinarum Willd. (HAJ-62)	Pasta botay	H	W	Lf	Pt, Je	Ringworm (9), antidiuretic (4)	13	21	2	
Asteraceae										
Argemone mexicana L. (HAJ-64)	Zangalay	H	W	Lf, Lx, Sd	Pt, Rw, Ol	Snakebite (5), leprosy (4), ringworm (9), gonorrhea (8)	26	34	4	[58,59]
Artemisia annua L. (HAJ-65)	Terkha	H	W	Lf	Et	Sore eyes (8)	8	11	1	[23,45]
Artemisia scoparia Waldst. & Kitam. (HAJ-66)	Jaokai	H	W	Rt	Pt	Vomiting (10)	10	18	1	[26,30,37,39,40,42,44,45,47,52,57,58]
Artemisia vulgaris L. (HAJ-67)	Tarkha	H	W	Lf	Pt	Bleeding from nostrils (13)	13	18	1	[4,7,8,23,30,37,39,40,43,56,57]
Calendula arvensis M.Bieb. (HAJ-69)	Gul-e-ashrafi/Prevatai	H	W	Ap	In	Cancer (26)	26	29	1	[4,39,43,44]
Calendula officinalis L. (HAJ-70)	Ziar Gulay	H	W	Fr, Lf	Pt	Skin burns (14)	14	21	1	[4]
Carthamus oxyacantha M.Bieb. (HAJ-71)	Kareza	H	W	Sd	Ol	Remove skin white spots (6)	6	17	1	[26,39,40,42,59,63]
Centaurea calcitrapa L. (HAJ-72)	Kariza	H	W	Rt, Wp	Pr, Dn	Kidney stones (5), cold (6)	11	29	2	
Cichorium intybus L. (HAJ-73)	Han, Kansi, Qasmi	H	W	Rt	Et	**Typhoid** (20)	20	25	1	[8,23,26,30,39,40,42,43,45,47–50,54,57]
Cirsium falconeri (Hook.f.) Petr. (HAJ-74)	Bangi	H	W	Rt	Pr	Gastric problem (15)	15	27	1	[37]
Eclipta prostrata (L.) L. (HAJ-75)	Naray panra	H	W	Lf	Et	Antidandruff (25)	25	43	1	[41,42,45,60]
Erigeron canadensis L. (HAJ-76)	Maloch	H	W	Wp	Pt	Indigestion in cattle (6), dysentery in cattle (4)	10	22	2	[41]
Eryngium biehersteinianum L. (HAJ-77)	Alikhanda	H	W	Rt	Pt	Blood purification (5)	5	17	1	[52]
Inula cappa (Ham. ex D. Don) DC. (HAJ-372)	Shoda gulai	S	W	Wp, Rt	Pr, Dn	Cough (23), epilepsy (6)	29	45	2	
Lactuca serriola L. (HAJ-78)	Kahu	H	W	Wp, Lf	Pr, Rw	Malaria (13), abdominal pain in cattle (7)	20	38	2	[39,41,42,45,50]
Launaea procumbens (Roxb.) Ramayya & Rajagopal (HAJ-79)	Shodapay	H	W	Ap, Lf	In, Et	**Antidiabetic** (8), eczema (6)	14	25	2	[40,43,52,59]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Onopordum acanthium L. (HAJ-80)	Rijakay	H	W	Sm	Dn	**Stomach ulcer** (7)	7	16	1	[49]
Senecio chrysanthemoides DC. (HAJ-82)	Sra Jabay	H	W	Lf	Ol	Ringworm (18)	18	25	1	[7,8,20,39,42,45,61]
Silybum marianum (L.) Gaertn. (HAJ-83)	Dum	H	W	Lf	Et	**Jaundice** (31)	31	46	1	[2,39,40,46,48,59]
Sonchus arvensis L. (HAJ-84)	Shodabotay	H	W	Wp	Pt	Wounds (41)	41	53	1	[40,43,45,50]
Sonchus asper (L.) Hill (HAJ-85)	Shodapai	H	W	Lf	Pt	Boils (29)	29	40	1	[7,38–40,42,45,49,59,60,63]
Tagetes erecta L.(HAJ-86)	Nachagulay	H	W	Fr	Et	Piles (9)	9	13	1	[41]
Tagetes minuta L. (HAJ-87)	Pesholakay	H	W	Lf	Pt	Burns (14), wounds (17)	31	44	2	[38,43,44,49]
Taraxacum officinale (L.) Weber ex F.H.Wigg. (HAJ-88)	Zyar gulay	H	W	Lf	Cd	**Tonic** (16)	16	21	1	[7,8,20,37,39,40,42,43,48–50,55,56,59]
Verbesina encelioides (Cav.) Benth. & Hook.f. ex A.Gray (HAJ-337)	Zangali nwar paras	H	W	Wp	In	Inflammation (39)	39	55	1	
Xanthium strumarium L. (HAJ-90)	Geshay	H	W	Lf	Et	Cephalalgia (17)	17	21	1	[7,8,38–40,43,46,48,59,63]
Youngia japonica (L.) DC. (HAJ-91)	Perzakay	H	W	Lf	Pt	Wounds (21)	21	39	1	
Berberidaceae										
Berberis lycium Royle (HAJ-94)	Ziar largay, Karoskay	S	W	Bk, Rt	Tt, Dn, Pr	Increase male potency (8), **internal wounds** (24), **antidiabetic** (16), eyes infection (9)	57	60	4	[7–9,26,30,37,39,40,42,43,43,44,46,47,49,51,53,54,58]
Bitulaceae										
Alnus nitida (Spach) Endl. (HAJ-96)	Geray	T	W	Bk	Pt	**Boils** (12)	12	21	1	[26,30,39,50]
Bombacaceae										
Bombax ceiba L. (HAJ-338)	Sumbal	T	C	Rt	Dn	**Dysentery** (11)	11	17	1	[39,40,43,44,51]
Boraginaceae										
Buglossoides arvensis (L.) I.M.Johnst. (HAJ-97)	Speer saba	H	W	Lf	In	Diuretic (6)	6	11	1	[61]
Cordia dichotoma G.Forst. (HAJ-98)	Lashora	T	W	Bk	Pr	Menstrual cycle disorder (21)	21	39	1	[43]
Heliotropium europaeum L. (HAJ-339)	Akrri	H	W	Wp, Fr	Pe, In, Pr	Leprosy (7), diabetes (13), constipation (9)	29	44	3	
Heliotropium strigosum willd (HAJ-340)	Akrri	H	W	Lf, Wp	Pt, Pr	Wounds (11), blood purification (5)	16	27	2	[58]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Trichodesma indicum (L.) Lehm. (HAJ-101)	Rijakay	H	W	Lf	Pt	Swelled mammary glands of cattle (23)	23	31	1	[7,8,39,42,45,49]
Brassicaceae										
Brassica rapa L. (HAJ-102)	Sharsham	H	C	Sd	Ol	Foot and mouth disease of cattle (17)	17	39	1	[7,30,40,43,46,51,52,60]
Capsella bursa-pastoris (L.) Medik. (HAJ-103)	Bambaisa	H	W	Lf, Ap	Rw, Dn	Abdominal pain (10), **gynecological disorders** (12)	22	40	2	[7,8,39–43,50,56]
Lepidium didymum L. (HAJ-104)	Thandi botay	H	W	Lf, Bh	Dn	Jaundice (33)	33	56	1	
Lepidium virginicum L. (HAJ-105)	Halun	H	W	Fr, Lf	In	Wounds (26)	26	41	1	[38,61]
Nasturtium officinale R.Br. (HAJ-106)	Tarmera	H	W	Lf	Je	Stomach ulcer (43)	43	60	1	[4,7,8,8,26,30,39,40,43,50,53,61,63]
Sisymbrium irio L. (HAJ-107)	Khubkala	H	W	Sd	Pr	**Pimples** (5), measles (9)	14	17	1	[38,39,42,46,54,56,60,61]
Buxaceae										
Buxus wallichiana Baill. (HAJ-108)	Shamshad	S	W	Bk	Pe	Wounds (15)	15	23	1	[8,26,37,40,43,51]
Cactaceae										
Opuntia dillenii (Ker Gawl.) Haw. (HAJ-110)	Gedar mewa	H	W	Ft	Je	Throat infection (31)	31	47	2	[7,8,23,26,39,40,51]
Cannabaceae										
Cannabis sativa L. (HAJ-111)	Bang	H	W	Lf, Bh	Pr, Dn	To stop bed urination at night in children (17), **wounds** (13)	30	41	3	[7,8,26,30,38–40,42–46,48,49,51–54,57,59,60,63]
Celtis australis L. (HAJ-112)	Taghaz	T	W	Lf	Pt	Herpes (18)	18	25	1	[40,45,58]
Caryophyllaceae										
Silene conoidea L.(HAJ-114)	Mangotay	H	W	Rt	Dn	Washing wounds (28)	28	43	1	[4,39,40,50,54,61]
Stellaria media (L.) Vill. (HAJ-115)	Spin gulay	H	W	Sd	Pr	**Skin allergy** (12)	12	25	1	[7,8,20,39,40,50,60,61]
Celastraceae										
Gymnosporia royleana Wall. ex M.A.Lawson (HAJ-116)	Soor azghay	S	W	Bk	Dn	Colic pain (5), diarrhea (11), dysentery (4)	20	35	3	[7,8,38,40,58]
Maytenus royleanus (Wall. ex Lawson) (HAJ-117)	Jiral	S	W	Rt	Et	Abortifacient (9)	9	23	1	[23,39,46]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Cleomaceae										
Cleome viscosa L. (HAJ-118)	Kusturi	H	W	Sd	Pt	Swelling (7), wounds (10)	17	22	2	
Colchicaceae										
Colchicum luteum Baker (HAJ-341)	Panpor	H	W	Cm	Pt, Pr	Antidandruff (4), laxative (16)	20	28	2	[39,44–47,56,58]
Commelinaceae										
Commelina benghalensis L. (HAJ-119)	Quarhmay	H	W	Lf	Je	Rabies (9)	9	14	1	[38,39,50,61]
Convolvulaceae										
Convolvulus arvensis L. (HAJ-120)	Prewatay	H	W	Wp	Pr	To cure sexual debility (30)	30	41	1	[7,8,39,42,43,48,52,54,56,57,59–61]
Cuscuta reflexa Roxb. (HAJ-121)	Maraz botay	H	W	Wp	Pt	Galactogogue for cattle (8)	8	19	1	[8,26,30,39–41,43,45,52,58,63]
Ipomoea carnea Jacq. (HAJ-388)	Bekar gulai	S	W	Lf	Pt	Boils (18)	18	40	1	
Ipomoea purpurea (L.) Rath (HAJ-342)	Jardhay	H	W	Lf	Dn	Bronchitis (15), diarrhea (10)	25	34	2	[40,43]
Cucurbitaceae										
Citrullus colocynthis (L.) Schrad. (HAJ-122)	Tarkha endwana	H	W	Ft	Dn	Toothache (28)	28	35	1	[4,9,26,39,41,51,59,61]
Cucumis melo L. (HAJ-343)	Indwana	H	C	Ft	Rw	Jaundice (21), cooling agent (6)	27	46	2	[40,57]
Cucumis melo var agrestis (HAJ-123)	Karkunday	H	W	Ft	Cd	Laxative (27)	27	44	1	[57]
Cucumis prophetarum L. (HAJ-124)	Karkunday	H	W	Lf, Ft	Pt, Cd	Wounds (6), antidiabetic (9)	15	34	2	
Cucumis sativus L. (HAJ-344)	Badrang	H	C	Ft	Rw, Je	Treat black circles around eyes (13), urinary problems (8), sunburns (17)	38	51	3	[44]
Cucurbita maxima Duchesne (HAJ-345)	Peta Kado	H	C	Ft, Sd	Cd, Rw	Jaundice (13), general body tonic (10), brain tonic (6)	29	47	3	[46,54,57,61]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/ Informants No.	Ni	Nt	UR	Literature Review
Cucurbita pepo L. (HAJ-346)	Speen Kado	H	C	Ft	Je, Cd	Jaundice (48), refrigerant (15)	63	79	2	[40]
Luffa cylindrica (Linn.) Roem. (HAJ-125)	Toray	H	C	Lf	Je	Snakebite (48)	48	58	1	[59]
Momordica charantia L. (HAJ-126)	Karela	H	C	Ft	Je	**Antidiabetic** (91)	91	125	1	[30,40–42,46,63]
Momordica dioica Robx. ex Willd. (HAJ-127)	Kakora	H	W	Rt	Et	Gangrene (19)	19	25	1	
Mukia maderaspatana (L.) M.Roem. (HAJ-128)	Spe kakora	H	W	Rt	Rw	Toothache (19)	19	26	1	[42]
Cyperaceae										
Cyperus difformis L. (HAJ-129)	Motkopragha	H	W	Wp	Pt	Wounds (9), ringworm (11), other skin infections (6)	26	42	3	
Cyperus niveus Retz. Observ. (HAJ-347)	Churlakai	H	W	Lf	Dn	Diarrhea (11)	11	21	1	
Cyperus rotundus L. (HAJ-130)	Deela	H	W	Re	Et	Tonic (23)	23	41	1	[37,38,40,42,44,60,63]
Dennstaedtiaceae										
Pteridium aquilinum (L.) Kuhn (HAJ-02)	Hatoye	H	W	Re	Et	Aphrodisiac (9)	9	17	1	[37,44,61]
Dryopteridaceae										
Dryopteris filix-mas (L.) Schott (HAJ-04)	Gunjaye	H	W	Lf	Cd	Tonic (11)	11	16	1	[37]
Dryopteris juxtaposita Christ (HAJ-03)	Kwanigai	H	W	Lf	Et	**Bone weakness** (21)	21	38	1	[8,40,47,56]
Elaeagnaceae										
Elaeagnus umbellata Thunb. (HAJ-348)	Silvaray	S	W	Ft, Fr	Rw, Dn	**Cooling effect** (14), cough (11)	25	53	2	[7,43,47,53]
Equisetaceae										
Equisetum arvense L. (HAJ-05)	Bandakay	H	W	Wp	Et, In	**Kidney stones** (13), **urinogenital problems** (13)	26	32	2	[4,7,8,26,30,40,41,43,51,56,58]
Euphorbiaceae										
Chrozophora tinctoria (L.) A.Juss. (HAJ-133)	Kuronda	H	W	Lf	Dn	Stomach acidity (50)	50	76	1	[58–60]
Euphorbia chamaesyce L. (HAJ-349)	Warmaga	H	W	Wp	Pt	Dysentery (7)	7	13	1	
Euphorbia helioscopia L. (HAJ-134)	Piryanu dolagay	H	W	Rt, Lf	Pr, Dn	**Skin problems** (11), constipation (5)	16	37	2	[7,8,37,39,40,44,46,47,57–60]
Euphorbia hirta L. (HAJ-135)	Warmaga	H	W	Wp	Je	Gonorrhea (10)	10	28	1	[7,8,26,39,40,42,45,58,59]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/ Informants No.	Ni	Nt	UR	Literature Review
Euphorbia parviflora L. (HAJ-136)	Warmaga	H	W	Lx	Dt	Boils (18)	18	34	1	[41]
Euphorbia prostrata Ait. (HAJ-350)	Skha botay	H	W	Lf, Bh	Dn, Pt	**Asthma** (12), **ringworm** (9)	21	30	2	[4,7,26,40,42,43,49,59,60]
Mallotus actinoneurus Airy Shaw. (HAJ-138)	Kambela	T	W	Fr, Lf, Bk	Pt	Rheumatism (25), vertigo (10)	35	54	2	[7,8,26,37,40,41,43,44,46,51]
Ricinus communis L. (HAJ-139)	Arhand	T	W	Sd, Lf	Rw	**Easy delivery** (29), constipation (46)	65	71	2	[26,30,39–44,46,48,52,59,63]
Sapium sebiferum (L.) Roxb. (HAJ-351)	Unkown	T	W	Lf	Pt	Boils (26), ringworm (16)	42	52	2	
					Fabaceae					
Acacia modesta Wall. (HAJ-140)	Palosa	T	W	Gm	Cd	**Tonic after delivery** (27)	27	41	1	[7,9,26,37–40,40,41,45,46,51,52,57,59,60]
Acacia nilotica (L.) Delile (HAJ-141)	Kiker	T	W	Flr	Et	Earache (19)	19	24	1	[8,9,26,39,40,42,43,45,46,57,59,60]
Albizia lebbeck (L.) Benth. (HAJ-142)	Srikh	T	C/W	Bk	Dn	**Diarrhea** (19)	19	32	1	[20,38–40,43,45]
Alhagi maurorum Medic (HAJ-352)	Taranjabin	H	W	Ap	Dn	Jaundice (16)	16	29	1	[42,60]
Astragalus grahamianus Benth. (HAJ-143)	Azghai botay	H	W	Lf	Pt	Gum infection (22)	22	35	1	[20]
Bauhinia variegata L. (HAJ-144)	Kachnar	T	W	Bk, Rt	Dn, Pt	Tuberculosis (9), **dysentery** (10), snakebite (4)	23	37	3	[26,38–43,48–50]
Butea monosperma (Lam.) Taub. (HAJ-145)	Palay	T	W	Bk	Et, Rw	Expel intestinal worms (12), stop bleeding after child birth (19)	31	37	2	[7,9,26,39–41,43,45,51]
Caesalpinia decapetala (Roth) Alston (HAJ-146)	Jarai	S	W	Rt, Bh, Lf, Sd	Rw, Pt	Toothache (9), burned body parts (14)	23	31	2	[4,50]
Cassia fistula L. (HAJ-147)	Landes	T	W	Bk, Ft	Pt, Dn	Snakebite (3), pneumonia (6), **fever** (16)	25	39	3	[7,8,42,43,52,57,59,60,63]
Dalbergia sissoo DC. (HAJ-148)	Shawa	T	C/W	Lf	In	Jaundice (16)	16	27	1	[9,38,39,42–44,57,59,60]
Indigofera heterantha Wall. ex Brandis (HAJ-150)	Kintai	S	W	Re	Pr	**Gastric diseases** (16)	16	29	1	[7,20,26,30,37–39,43,46,48,50,51,56]
Lathyrus aphaca L. (HAJ-151)	Kurkamanay	H	W	Sd	Pr	Diarrhea (21)	21	37	1	[38–40,61]
Medicago polymorpha L.(HAJ-154)	Sinji	H	W	Lf	Cd	Menopause (56)	56	72	1	[38,39,48,50,61]
Melilotus indicus (L.) All. (HAJ-155)	Zyar gulay	H	W	Wp	Rw	Tonic for cattle (42)	42	61	1	[50]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Mimosa himalayana Gamble (HAJ-156)	Gulabi gulay	S	W	Rt	Dn	Vomiting (8)	8	21	1	[40]
Robinia pseudoacacia L. (HAJ-158)	Kiker	T	W	Bk	Pr	Toothache (28)	28	42	1	[8,9,26,39,40]
Senna occidentalis (L.) Link (HAJ-159)	Gul rang	S	W	Ft	Pr	Stomach problems (17)	17	24	1	[59]
Trigonella foenum-graecum L. (HAJ-160)	Malkhoza	H	C	Sd	Pr	High blood pressure (28)	28	35	1	[51,52]
Vigna vexillata (L.) A.Rich. (HAJ-161)	Bangi	H	W	Lf	Pt	Poisonous spider bite (6)	6	21	1	
Fagaceae										
Quercus incana Bartram (HAJ-163)	Toor Banj	T	W	Ft	Pr	Metritis (55)	55	62	1	[7–9,37,39,40,42,43]
Fumariaceae										
Fumaria indica (Hausskn.) Pugsley (HAJ-164)	Papra	H	W	Wp	Pr	**Jaundice** (28), **diarrhea** (9)	37	53	2	[4,7,8,23,26,30,39,40,42–44,46,47,53,54,59,63]
Geraniaceae										
Geranium collinum Stephan ex Willd. (HAJ-165)	Sra zeela	H	W	Re	Cd	Tonic (14)	14	36	1	[4]
Hypericaceae										
Hypericum oblongifolium Choisy (HAJ-168)	Shin panra	S	W	Fr	Pr	Jaundice (13)	13	27	1	[7,39]
Iridaceae										
Iris ensata Thunb. (HAJ-170)	Oogakay	H	W	Sd	Pr	Burning sensation in stomach (6)	6	37	1	
Lamiaceae										
Ajuga integrifolia Buch.-Ham. (HAJ-172)	Khwaga Boti	H	W	Wp	Dn	Cure breathing shortness in infants (9)	9	16	1	[7,9,26,30,37–43,47–49,52,53,58]
Ajuga parviflora Benth. (HAJ-173)	Tarkha Boti	H	W	Wp	Dn	**Stomachache** (11)	11	20	1	[4,26,37,40,43,53,58]
Colebrookea oppositifolia Sm. (HAJ-174)	Banasa	S	W	Lf, Rt	Pt, Pr	Wounds (6), epilepsy (4)	10	21	2	[37,39]
Isodon rugosus (Wall. ex Benth.) Codd (HAJ-175)	Sperkay	H	W	Lf	Rw	**Toothache** (13)	13	19	1	[9,30,39,40,43,43,49,53]
Lamium album L. (HAJ-176)	Speen gulay	H	W	Fr	Et	Cough (49)	49	67	1	[7,37]
Lamium amplexicaule L. (HAJ-177)	Soor gulaka	H	W	Wp	Pr	Antidiabetic (54)	54	71	1	[38,50]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Leucas cephalotes (Roth) Spreng. (HAJ-178)	Gomma	H	W	Lf	Rw	Sore gums (18), sore Mouth (18)	18	34	2	[49]
Litsea cubeba (Lour.) Pers. (HAJ-190)	Khadang	T	W	Bk	Pr	Foot and mouth disease of cattle (28)	28	45	1	[51]
Marrubium vulgare L. (HAJ-390)	Darshul	H	W	Lf	Dn	**Cough** (13), diabetes (17)	30	47	2	[42]
Mentha longifolia (L.) L. (HAJ-179)	Velanay	H	W	Lf	Pr	Headache (63)	63	71	1	[4,7,8,23,26,30,37,39–43,47–49,51,53,54,56,57,59,61]
Mentha royleana Wall. Ex Benth. (HAJ-180)	Podina	H	W	Lf	Pr	Stomachache (59)	59	71	1	[9,61]
Mentha spicata L. (HAJ-181)	Podina	H	W	Bh	Je	Diarrhea (63)	63	72	1	[4,7,8,39–43,52,53,61]
Micromeria biflora (Buch.-Ham. ex D.Don) Benth. (HAJ-182)	Nari shamaki	H	W	Lf	Et	Gastroenteritis (22)	22	30	1	[9,38,40,42]
Ocimum basilicum L. (HAJ-183)	Kashmalu	H	C	Sd, Lf	Dn, Rw	Enhance digestion (5), vomiting (12)	17	21	2	[23,30,40,42,49,57,59]
Origanum vulgare L. (HAJ-184)	Shamakay	H	W	Lf	Rw	**Toothache** (13)	13	20	1	[4,9,20,23,26,30,37,38,40,43,50–52,56,63]
Otostegia limbata Benth Boiss. (HAJ-185)	Pishkand	H	W	Lf	Dn	**Mouth ulcer** (70)	70	95	1	[7–9,23,26,39,44]
Salvia canariensis L. (HAJ-186)	Kianer	H	W	Wp	Rw	Vomiting (36)	36	54	1	
Salvia moorcroftiana Wall. ex Benth. (HAJ-187)	Khar dug	H	W	Sm	Rw	Increase sexual desire (21)	21	27	1	[4,30,39,40,44,45,48,52,56]
Vitex negundo L. (HAJ-189)	Marvandai	S	W	Ft	Pr	Jaundice (16)	16	38	1	[7–9,26,30,38–41,44,46,48,53,59]
Liguminosae										
Prosopis juliflora (Sw.) DC. (HAJ-353)	Kikar	S	W	Ft, Lf	Pr, Dn	Male sexual strength (18), toothache (11), increase milk in lactating women (19)	48	62	3	[60]
Liliaceae										
Asphodelus tenuifolius Cav. (HAJ-191)	Piaze gulay	H	W	Lf	Pt	Scorpion sting (8)	8	19	1	[4,8,26,40,42]
Notholirion thomsonianum (Royle) Stapf (HAJ-192)	Pyazi gulay	H	W	Bb	In	Muscular pain (4)	4	29	1	
Tulipa clusiana DC. (HAJ-193)	Shundi gul	H	W	Bb	Pr	Tonic for heart (31)	31	46	1	[39,50,61]
Reinwardtia trigyna (Roxb.) Plan (HAJ-194)	Basnt	H	W	Lf	Pt	Wounds of cattle (40)	40	59	1	

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Lythraceae										
Woodfordia fruticosa (L.) Kurz (HAJ-195)	Gil-e-Makhtom, Gul-i-dhawai	S	W	Bk	Dn	Cold (16), cough (22)	38	49	2	[7,9,39,41,44,46]
Malvaceae										
Abutilon indicum (L.) Sweet (HAJ-196)	Tuthi	S	W	Lf	Et	Easy delivery (12)	12	35	1	[42]
Malva neglecta Wallr. (HAJ-198)	Panirak	H	W	Lf	Pt	**Wounds** (14), **constipation** (24)	38	44	2	[4,20,30,39,40,42,43,46,47,49,52,56,59,61,63]
Malvastrum coromandelianum (L.) Garcke (HAJ-199)	Tar panra	S	W	Lf	Pt	Ringworm (28)	28	39	1	
Sida cordifolia L. (HAJ-200)	Kharenti	H	W	Rt	Dn	Asthma (9)	9	15	1	[41]
Martyniaceae										
Martynia annua L. (HAJ-201)	Khkaro	H	W	Lf	Pt	Nails pain (11)	11	28	1	
Meliaceae										
Melia azedarach L. (HAJ-202)	Bekyana	T	C/W	Bk	Pr	**Fever** (27)	27	31	1	[7–9,26,30,38–44,47,51,52,57,59,60,63]
Toona sinensis (Juss.) M.Roem. (HAJ-203)	Meem	T	C	Lf	Rw	Purgative for cattle (21)	21	49	1	
Menispermaceae										
Cissampelos pareira L. (HAJ-204)	Tangapanra	H	W	Lf	Je	Wounds (15)	15	21	1	[38,44,51]
Tinospora sinensis (Lour.) Merr. (HAJ-205)	Gilo	H	W	Sm	Pr	Jaundice (21)	21	27	1	[7,8,39,41,59]
Moraceae										
Ficus benghalensis L. (HAJ-206)	Barr	T	W	Bk	Dn	Antidiabetic (30)	30	41	1	[9,39–43,45]
Ficus carica L. (HAJ-207)	Inzar	T	W	Ft	Rw	**Constipation** (45)	45	60	1	[7,8,26,30,38–40,43,46,47,50,51,53,54,59,63]
Ficus grossularioides Burm. f. (HAJ-208)	Inzar	T	W	Ft	Rw	Increase haemoglobin in blood (34)	34	47	1	[43]
Ficus racemosa L. (HAJ-209)	Oormal	T	W	Rt	Pr	Dysentery (28)	28	43	1	[8,26,37,39–41,43,45,50,60]
Ficus religiosa L. (HAJ-210)	Pepal	T	W	Bh	Et	Digestive problems (12)	12	19	1	[7,9,41,43,45,60]
Ficus sarmentosa Buch.-Ham. ex. Sm. (HAJ-211)	Bar	T	W	Ft	Rw	Blood tonic (26)	26	39	1	[7,37,38]
Morus alba L. (HAJ-212)	Speen tooth	T	C/W	Ft	Je	Jaundice (42)	42	55	1	[7,8,26,39,40,42,43,49,53,54,58–60,63]
Morus laevigata Wall.Ex Brandis. (HAJ-391)	Shah toot	T	C/W	Ft	Je	Blood cooling (36)	36	55	1	[26,40,43]
Morus nigra L. (HAJ-213)	Thoor tooth	T	C/W	Ft	Rw	Constipation (40)	40	55	1	[7,8,39,40,49,57–59,63]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Morchellaceae										
Morchella esculenta (L.) Pers. (HAJ-01)	Gojai	H	W	Ft	Dn	Cold, cough (31)	31	47	2	[8,40,47,57,61]
Myrsinaceae										
Myrsine africana L. (HAJ-214)	Marorang	S	W	Ft	Rw	**Expel intestinal worms** (17)	17	22	1	[7,8,30,38–40,43,44,47,58]
Myrtaceae										
Psidium guajava L. (HAJ-2015)	Amrud	T	C	Lf	Pt	Diarrhea (5), **constipation** (12)	17	26	2	[9,40,41,45,60]
Nitrariaceae										
Peganum harmala L. (HAJ-216)	Spelanay	H	W	Sd	Pr	Antidiabetic (57)	57	80	1	[4,26,40,42,47,52,54,63]
Nyctaginaceae										
Boerhavia diffusa L. (HAH-217)	Ensatt	H	W	Wp	Et	Antidiabetic (18)	18	30	1	[4,8,26,40,42,60]
Boerhavia procumbens Banks ex Roxb. (HAJ-218)	Bash khira	H	W	Wp	Dn	Jaundice (22)	22	37	1	[58,63]
Oleaceae										
Jasminum humile (L.) Banfi (HAJ-219)	Rambil chambil	S	C/W	Fr, Lf	Dn, Ta	**Jaundice** (15), **intestinal ringworms** (24)	39	61	2	[7,37–39,42,45]
Jasminum officinale L. (HAJ-220)	Rambil chambil	S	C/W	Lf	Dn	Mouth freshness (23), germicide (7)	30	58	2	[26,60]
Olea ferruginea Royle. (HAJ-221)	Khonu	T	W	Lf	Ta	Cough (19), **sore mouth** (15), **sore throat** (17)	51	65	3	[7–9,23,30,39,40,42–44,47,52]
Onagraceae										
Oenothera rosea LHer. Ex Aiton (HAJ-222)	Zar gul	H	W	Wp	In	**Cough** (6)	6	34	1	[42,43,49]
Oxalidaceae										
Oxalis corniculata L. (HAJ-223)	Thrukay	H	W	Ap	Et	Earache (16)	16	21	1	[4,7,8,20,26,30,38–44,48–50,53,59,60,63]
Oxalis stricta L. (HAJ-224)	Thrukay	H	W	Wp	Pe	Body swellings (18)	18	43	1	
Papavaraceae										
Papaver nudicaule L. (HAJ-227)	Zangale doda	H	W	Ft	Ta	Cough (19)	19	53	1	
Papaver rhoeas L. (HAJ-228)	Zangale doda	H	W	Lf	Et	Diarrhea (12)	12	23	1	[7,8,46]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Papaver somniferum L. (HAJ-229)	Apim, Khaskhas, Doda	H	C	Ft	Dn	**Cold** (29), **cough** (40)	69	74	1	[7,8,30,40–43,52–54,63]
Phyllanthaceae										
Phyllanthus emblica L. (HAJ-231)	Lashora	T	W	Ft	Cd	Chest pain (22)	22	30	1	[41,45,46]
Pinaceae										
Pinus roxburghii Sarg. (HAJ-11)	Nakhtar	T	W	Ce	Dn	**Antidiabetic** (28)	28	33	1	[7,8,26,37–40,43,44,51,52]
Plantaginaceae										
Plantago lanceolata L.(HAJ-232)	Wara Jabay	H	W	Lf	Rw	Headache (19)	19	28	1	[4,20,26,30,39,40,42,43,45,47,50,53,56, 57,61]
Plantago major L. (HAJ-233)	Bartang	H	W	Sd	Cd	Baby food (32)	32	41	1	[4,20,26,37,39,40,43,48,53,56,61]
Plantago ovata Forssk. (HAJ-234)	Epsabgul	H	C/W	Sd	Rw	Constipation (71)	71	80	1	[40–42,45]
Veronica persica Poir (HAJ-355)	Wadi gulai	H	W	Wp	Pr, Et	Dermatitis (26), dyspepsia (15)	41	55	2	
Plumbaginaceae										
Plumbago zeylanica L. (HAJ-236)	Ghesha gulay	H	W	Rt	Pr	Stomachache (12)	12	15	1	
Poaceae										
Apluda mutica L. (HAJ-237)	Wakhu	H	W	Wp	Pt	Sore mouth of cattle (5)	5	15	1	[37]
Avena sativa L. (HAJ-238)	Jamdar	H	W	Sd	Pt	Tonic (10)	10	33	1	[40,42,60,63]
Cenchrus ciliaris L. (HAJ-239)	Pesholakay	H	W	Rt	Dn	Wormicide (25)	25	29	1	
Cymbopogon citratus (DC.) Stapf (HAJ-240)	Lemon grass	H	W	Re	Rw	Giddiness (7)	7	20	1	[40,49]
Cymbopogon jwarancusa (Jones) Schult. (HAJ-392)	Drab	H	W	Ap	Dn	Seasonal fever (12)	12	17	1	
Cynodon dactylon (L.) Pers. (HAJ-241)	Kabal	H	W	Lf, Wp, Ap, Rt	Et, Pt, Je	**Wounds** (2), **leucorrhea** (3), bleeding nose (1), rheumatic swellings (1)	7	16	4	[4,8,9,26,39,40,42–44,53,57,59,60,63]
Dactyloctenium aegyptium (L.) Willd. (HAJ-356)	Kabal	H	W	Wp	Et	Fever (12)	12	23	1	[60]
Dichanthium annulatum (Forssk.) Stapf (HAJ-242)	Wakha	H	W	Lf	Pr	Gonorrhea (5)	5	13	1	[39,43]
Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult. (HAJ-357)	Surmal	H	W	Rt	Dn	Diuretic (8)	8	20	1	
Hordeum murinum L. (HAJ-358)	Warbashay	H	W	Ft	Dn	Urinary tract infection (36)	36	52	1	

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Hordeum vulgare L. (HAJ-243)	Warbusha	H	C	Sd	Pr	Jaundice (49)	49	53	1	[40,51,52,59,63]
Imperata cylindrica (L.) P. Beauv (HAJ-359)	Speen wakhu	H	W	Rt	Et	Fever (19), body pain (14)	33	44	2	[37]
Pennisetum orientale Rich. (HAJ-360)	Spin drab	H	W	Wp	Pr	Painful urination (14)	14	21	1	[43]
Pennisetum setaceum (Forssk.) Chiov. (HAJ-361)	Sur gulay drab	H	W	Lf	Pt	Wound healing (17)	17	25	1	
Phalaris minor Retz (HAJ-362)	Wakhu	H	W	Wp	Et	Gonorrhea (11), fever (11)	22	35	2	[39]
Saccharum bengalense Retz. (HAJ-244)	Shurghashy	H	W	Lf	Dn	Menstrual problems (13)	13	20	1	
Saccharum spontaneum L. (HAJ-363)	Kaan	H	W	Wp, Bh	Dn, Rw	Stomachache (4), diabetes (12)	16	21	2	[43]
Setaria pumila (Poir.) Roem. & Schult.(HAJ-245)	Wakhu	H	W	Rt	Pr	Antiseptic for cattle wounds (8)	8	22	1	
Sorghum halepense (L.) Pers. (HAJ-246)	Dadum	H	W	Wp	Je	Fever (7)	7	13	1	[8,39,40,43,60]
Triticum aestivum L. (HAJ-247)	Ghanum	H	C	Sd	Pr	Backache (82)	82	93	1	[41,51,52,60]
Zea mays L. (HAJ-248)	Juwar	H	W	Fr	Ah	Asthma (21)	21	35	1	[40,51,63]
Polygonaceae										
Bistorta amplexicaulis (D.Don) Greene (HAJ-249)	Tarva panra	H	W	Lf	Pt	Wounds (9)	9	14	1	[20,37,39,40,45,55,56,61]
Emex spinosus (L.) Campd. (HAJ-364)	Markonday	H		Ft	Dn	Kidney problems (18)	18	34	1	
Persicaria barbata (L.) H.Hara (HAJ-250)	Palpulak	H	W	Wp	Pt	Joint swelling (9)	9	25	1	[40,53]
Persicaria decipiens (R.Br.) K.L.Wilson (HAJ-365)	Palpulak	H	W	Lf	Pt	Worm removal from cattle skin (7)	7	15	1	
Persicaria hydropiper (L.) Delarber (HAJ-251)	Palpulak	H	W	Lf	Pt	Fungal skin infections (16)	16	31	1	[45]
Persicaria orientalis (L.) Spach (HAJ-252)	Palpulak	H	W	Lf	Cd	Diarrhea (7)	7	19	1	
Rumex dentatus L. (HAJ-254)	Shalkhay	H	W	Rt	Et	**Constipation** (47)	47	59	1	[4,7–9,30,37,39,40,43,43,45,46,50,51,53,56,60,61]
Rumex hastatus D.Don (HAJ-255)	Trookay	H	W	Rt	Pt	Boils (17)	17	32	1	[4,7–9,26,30,38–40,42,43,46,50,53,54]
Rumex nepalensis Spreng. (HAJ-256)	Lablabo	H	W	Lf	Rw	Skin eruption (19)	19	28	1	[4,56]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Polypodiaceae										
Hypodematium crenatum (Forssk.) Kuhn & Decken (HAJ-06)	Wazar panra	H	W	Lf	Pr	Conception in women (14)	14	26	1	
Pontederiaceae										
Eichornia crassipes (Mart.) Solms (HAJ-257)	Azghay botai	H	W	Lf	Pt, Dn	Goiter (9), fever (12), cough (12)	33	47	3	
Portulaceae										
Portulaca oleracea L. (HAJ-258)	Warkharay	H	W	Wp	Pr, Pt	**Jaundice** (15), toothache (11)	26	38	2	[4,8,26,30,38–43,48,53,59,61]
Primulaceae										
Anagallis arvensis L. (HAJ-259)	Udegulai	H	W	Lf, Wp	Rw, Et, Pr	Pain killer for cattle (6)	6	13	1	[37,38,40,58,60]
Pteridaceae										
Adiantum abscissum Schrad. (HAJ-07)	Sambal	H	W	Lf	Dn	Asthma (7), chest congestion (6)	13	21	2	
Adiantum caudatum L. (HAJ-08)	Samdal	H	W	Re	Pr	Contraception in menstrual cycle (7)	7	15	1	[43]
Adiantum incisum Forssk. (HAJ-09)	Marghaywazar	H	W	Lf	Pt	Wounds (15)	15	25	1	[4,39]
Adiantum venustum D. Don (HAJ-10)	Mandaro	H	W	Lf	Dn	Sore eyes (13)	13	19	1	[4,8,26,40,43,45,49,53,54,56]
Punicaceae										
Punica granatum L. (HAJ-260)	Anar	T	C/W	Ft	Pr	Stomachache (37)	37	41	1	[26,30,38–49,52–54,57,63]
Ranunculaceae										
Actaea spicata L. (HAJ-265)	Kaya	H	W	Rt	Et	**Rheumatic pain** (6)	6	11	1	[20,37,40,50,56]
Delphinium denudatum Wall. ex Hook.f. & Thomson (HAJ-270)	Lajwar	H	W	Re	Pr	Constipation (9), hypothermia (7)	16	29	2	[58]
Ranunculus aquatilis L. (HAJ-271)	Jaghagha	H	W	Wp	Et	Asthma (7)	7	13	1	[4,26]
Rhamnaceae										
Sageretia thea (Osbeck) M.C. Johnst. (HAJ-272)	Momana	T	W	Rt	Dn	**Jaundice** (82)	82	109	1	[7–9]
Ziziphus jujuba Mill. (HAJ-273)	Bera	T	C/W	Ft	Pr	Insomnia (30)	30	41	1	[7,30,37–40,42,52,59,63]
Ziziphus nummularia (Burm. f.) Wight & Arn. (HAJ-274)	Karkanda	S	W	Bh	Rw	Bleeding gums (41)	41	56	1	[7,8,26,37–44,49,59,60]
Ziziphus oxyphylla Edgew. (HAJ-275)	Elanai	S	W	Sd, Fr, Lf	Pt	Piles (26)	26	41	1	[7,8,23,30,39,40,43,44,52]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Rosaceae										
Duchesnea chrysantha (Zoll. & Moritzi) Miq. (HAJ-279)	Zmakintooth	H	W	Ft	Je	**Refrigerant** (18)	18	31	1	[4,7,8,26,37–40,43]
Fragaria indica Andrews (HAJ-277)	Zamkintoot	H	W	Wp	Dn	**Urinary tract stone removal** (29)	29	44	1	[43,43,47]
Geum elatum Wall. ex G.Don (HAJ-278)	Shunkar	H	W	Lf	Et	Jaundice (44)	44	59	1	[20,37,49]
Potentilla reptans L. (HAJ-281)	Zyar Kunachi	H	W	Lf	Pt	Toothache (16)	16	33	1	[55]
Prunus armeniaca L. (HAJ-282)	Khurmanai	T	C	Sd	Rw	Rheumatism (18)	18	25	1	[39,40,43,52–54]
Prunus domestica L. (HAJ-283)	Aluchay/Alubukhara	T	C	Ft	Et	Jaundice (97)	97	115	1	[40,42,57]
Pyrus pashia Buch.-Ham. ex D.Don (HAJ-284)	Tango	T	C	Ft	In	Antidiabetic (24)	24	31	1	[8,38–40,43,44,46,51]
Rosa alba P.Gaertn., B.Mey. & Scherb. (HAJ-285)	Gulab	S	C	Fr	In	Antidiabetic (23)	23	29	1	[54]
Rosa brunonii Lindl. (HAJ-286)	Zangali gulad	S	W	Fr	Pt, Et	Wounds (8), pimples (8)	16	26	2	[20,23,43,44]
Rosa macrophylla Lindl. (HAJ-366)	Qurach	S	W	Rt, Fr	Dn	Sore eyes (5), cough (9), cold (7)	21	26	3	[40]
Rosa moschata Herrm. (HAJ-287)	Kwarrch	S	W	Fr	Pt, Et	Sore eyes (18)	18	34	1	[40,52,53]
Rosa webbiana Wall. ex Royle (HAJ-288)	Zangale gulab	S	W	Fr	Pt, Et	**Chest infection** (5), jaundice (7)	12	27	2	[7,8,20,26,40,42,54,56]
Rubus ellipticus Sm. (HAJ-289)	Guraj	S	W	Ft	Je	**Cough** (34)	34	46	1	[26,40,41,43]
Rubus fruticosus L. (HAJ-290)	Karwara	S	W	Lf, Rt	Dn	**Cough** (16), diarrhea (19)	35	46	2	[7,8,26,30,39,40,42,43,49,54]
Rubiaceae										
Galium aparine L. (HAJ-292)	Geshlay	H	W	Wp	Pt	**Wounds** (11)	11	23	1	[37,38,40,50,56]
Rutaceae										
Citrus aurantiifolia (christm.) swingle (HAJ-367)	Galgal	T	C	Ft	Je	Jaundice (31)	31	36	1	[63]
Citrus limon (L.) Osbeck (HAJ-293)	Limbu	S	C	Ft	Je	Dehydration (17), diarrhea (16)	33	38	2	[9,40,43,44,46,52,53]
Skimmia laureola Franch. (HAJ-294)	Nazar panra	S	W	Lf	Et	Urinary tract infection (30)	30	47	1	[4,9,20,30,37,39,40,43,44,55]
Zanthoxylum armatum DC. (HAJ-295)	Dambara	S	W	Bk, Fit	Dn	Sore throat (44)	44	52	1	[7–9,30,39,40,43,44,47–49,51,52]
Saliaceae										
Salix babylonica L. (HAJ-296)	Wala	T	W	Bk	Pt	Diarrhea (18)	18	33	1	[40,52]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Sapindaceae										
Aesculus indica (Wall. ex Cambess) Hook. (HAJ-297)	Jawaza	T	C	Lf	Et, Dn	Whooping cough (7), **stomachache** (10)	17	28	2	[37,43,51]
Dodonaea viscosa (L.) Jacq. (HAJ-298)	Ghoraskay	S	W	Lf	Pt	Rheumatism (10), body swellings (12), burns (18)	40	58	3	[7–9,26,30,37,39–41,43,44,47,51,59,63]
Saxifragaceae										
Bergenia ciliata (Haw.) Sternb. (HAJ-300)	Kamar Panra	H	W	Re	Rw, Pt	Toothache (13), **wounds** (17)	28	36	2	[9,20,37,39,40,43,44,49,53,55,56]
Schrophulariaceae										
Nanorrhinum ramosissimum (Wall) Betsche (HAJ-368)	Spe gulai	H	W	Wp	Et, Dn	Milk induction (6), diabetes (20)	26	39	2	
Verbascum Thapsus L. (HAJ-301)	Gkhar ghwag/Gedar tambaku	H	W	Lf	Dn	**Bronchitis in cattle** (20)	20	38	1	[4,7–9,26,30,38–40,43,44,47–49,51,56]
Simaroubaceae										
Ailanthus altissima (Mill.) Swingle (HAJ-302)	Ghata bakyana	T	C	Bk	Dn	Dysentery (7)	7	22	1	[8,26,39,40,43,50,52]
Brucea javanica (L.) Merr. (HAJ-303)	Titray	T	W	Ft	Dn	Diarrhea (11)	11	29	1	
Solanaceae										
Capsicum annuum L. (HAJ-305)	Marchakay	H	C	Sd	Rw	Expel stomach worms (6)	6	15	1	[9,30,40]
Datura innoxia Mill. (HAJ-306)	Daltora	H	W	Lf	Rw	**Pimples** (17)	17	22	1	[4,7,7–9,26,40,45,46,60,63]
Datura stramonium L. (HAJ-307)	Daltora	H	W	Sd	Pe	**Breast inflammation** (9)	9	21	1	[39–41,43–45,59]
Nicotiana rustica L. (HAJ-308)	Naswaro tamaku	H	C	Lf	Pt	Remove leeches from cattle's body (20)	20	27	1	
Nicotiana tabacum L. (HAJ-309)	Tamaku	H	C	Fr	Ah	Asthma (54)	54	69	1	[9,52]
Physalis minima L. (HAJ-310)	Taqtakay	H	W	Ft	Je	Purgative (5)	5	16	1	
Solanum americanum Mill. (HAJ-311)	Kachmachu	H	W	Lf	Et	Earache (17)	17	26	1	[7,8,26,30,39–43,47,49,54,57,59,60,63]
Solanum surattense Burm. f. (HAJ-312)	Maraghonay	H	W	Sd	Se	Decaying teeth (16)	16	22	1	[4,7–9,26,40,42,43,49,51,57,59,60]
Solanum virginianum L. (HAJ-313)	Ghata kareza	H	W	Fr	Pe	Gonorrhea (10)	10	19	1	[9,45,49]
Withania somnifera (L.) Dunal. (HAJ-314)	Kuti lal	H	W	Rt	Pr	**Rheumatism** (25)	25	32	1	[7–9,23,26,40–42,46,47,52,59,60]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Tamaricaceae										
Tamarix aphylla (L.) H.Karst. (HAJ-315)	Ghaz	T	W	Lf	Se	Measles (11)	11	23	1	[8,9,26,40,59,60]
Thymelaeaceae										
Daphne oleoides Schreb. (HAJ-318)	Layghonai	S	W	Bk, Lf, Fr	Pt, Pr	Wounds (10), worm expulsion from cattle (11)	21	32	2	[26,43,51,52]
Tiliaceae										
Grewia optiva Drum. Ex. Burret. (HAJ-319)	Pastonay	T	W	Lf	Pt	**Joint pain** (19)	19	31	1	[9,38–41,43,51,52]
Urticaceae										
Debregeasia saeneb (Forssk.) Hepper & J.R.I.Wood (HAJ-320)	Ajalay	S	W	Ap	Pe	Antifungal (13), **skin rashes** (12)	25	32	2	[8,37–40,43,58]
Urtica dioica L. (HAJ-321)	Senzonkai	H	W	Lf, Bh	Dn	Antidiabetic (13)	13	21	1	[4,23,39,40,42,47,53,61]
Verbenaceae										
Lantana camara L. (HAJ-322)	Barepas	S	W	Lf	Dn	Malaria (8)	8	24	1	[38,59,60]
Phyla nodiflora (L.) Greene (HAJ-323)	Hapzapurai	H	W	Lf	Rw	Stomachache (5)	5	17	1	[42,44]
Verbena officinalis L. (HAJ-324)	Shamakay	H	W	Lf	Et	**Stomachache** (15), diarrhea (12)	27	41	2	[23,26,40,41,43,49,59]
Violaceae										
Viola canescens Wall. (HAJ-326)	Banafsha	H	W	Lf	Pt	**Cough** (34)	34	42	1	[7,8,23,37,39,40,42,43,45,46,49,55,56,61]
Vitaceae										
Cayratia trifolia (L.) Domin (HAJ-329)	Gedar angur	H	W	Lf	Pt	Sore neck of cattle (24)	24	41	1	
Zingiberaceae										
Zingiber officinale Roscoe (HAJ-330)	Adrak	H	C	Re	Pr	Cold (37), cough (38)	75	89	2	[9,40,41,44,52]

Table 2. *Cont.*

Family/Botanical Name/Voucher No.	Local Name	Life Form	Habit	Part Used	Administration Mode	Medicinal Uses/Informants No.	Ni	Nt	UR	Literature Review
Zygophullaceae										
Zygophyllum olivieri (DC.) Christenh. & Byng (HAJ-369)	Azghakay	H	W	Wp	In	Blood purification (53), jaundice (33)	86	127	2	
Tribulus terrestris L. (HAJ-332)	Markundai	H	W	Ft	Pr	**Urinary tract infection** (28)	28	34	1	[7,8,23,26,30,40–43,46,52,60]

Life form: H = Herb, S = Shrub, T = Tree; **Habit:** C = Cultivated, W = Wild; **Plant Part:** Aerial parts = Ap, Bark = Bk, Branch = Bh, Bulb = Bb, Cone = Ce, Corm = Cm, Flower = Fr, Fruit = Ft, Gum = Gm, Latex = Lx, Leaf = Lf, Rhizome = Re, Root = Rt, Seed = Sd, Stem = Sm, Tuber = Tr, Whole plant = Wp; **Administration Mode:** Ash = Ah, Cooked = Cd, Decoction = Dn, Extract = Et, Infusion = In, Juice = Je, Oil = Ol, Paste = Pt, Poultice = Pe, Powder = Pr, Raw = Rw, Smoke = Se, Tablet = Tt, Tea = Ta; **Ethnobotanical Indices Used**: UR = Use Reports, IV = Importance Value, UV = Use Value, RFC = Relative Frequency of Citation, RII = Relative Importance Index, DCI = Disease Consensus Index; **Ni** = Number of informants who reported the medicinal uses, **Nt** = Total number of informants interviewed for the specific medicinal plant species, **Ur** = Medicinal uses reported by informant for the particular plant species.

3.3. Diversity of the Plants' Parts and Formulation Methods

Different plant parts are used in herbal medicines to treat a variety of ailments. In this study, 17 vegetative and reproductive plant parts were documented to be used for therapeutic reasons. The most dominant plant part used was the leaf (124 sp.) followed by fruit and root (46 sp.), and the whole plant (44 sp.) (Figure 3). These results are in agreement with the studies from the surrounding areas [7,25,26,29,36,64,65]. Furthermore, as the plant's leaves are its primary photosynthetic organ and contain a variety of metabolites in great numbers, they are often used in herbal medicines [7,29]. Moreover, leaves are the only part that is easy to collect and produced in large quantities [23]. Additionally, from a conservation point of view, the use of leaves is sustainable and with limited negative consequences for plants [7]. Root as a frequently used part in herbal recipes is also reported in other studies of the surrounding areas [34,66]. But from the conservation point of view, the use of roots in herbal recipes is not sustainable and safe for plants' survival [33]. The use of whole plants more common in herbal medicine may be due to the ease of collection, availability, and presence of a large number of different chemical constituents [58]. The same results were also reported elsewhere [58,66]. The frequent use of fruit in herbal recipes is due to the presence of bioactive compounds in high proportion because in most plants, fruit serves as a storage organ [32]. A similar result to this study was also reported by others [67,68].

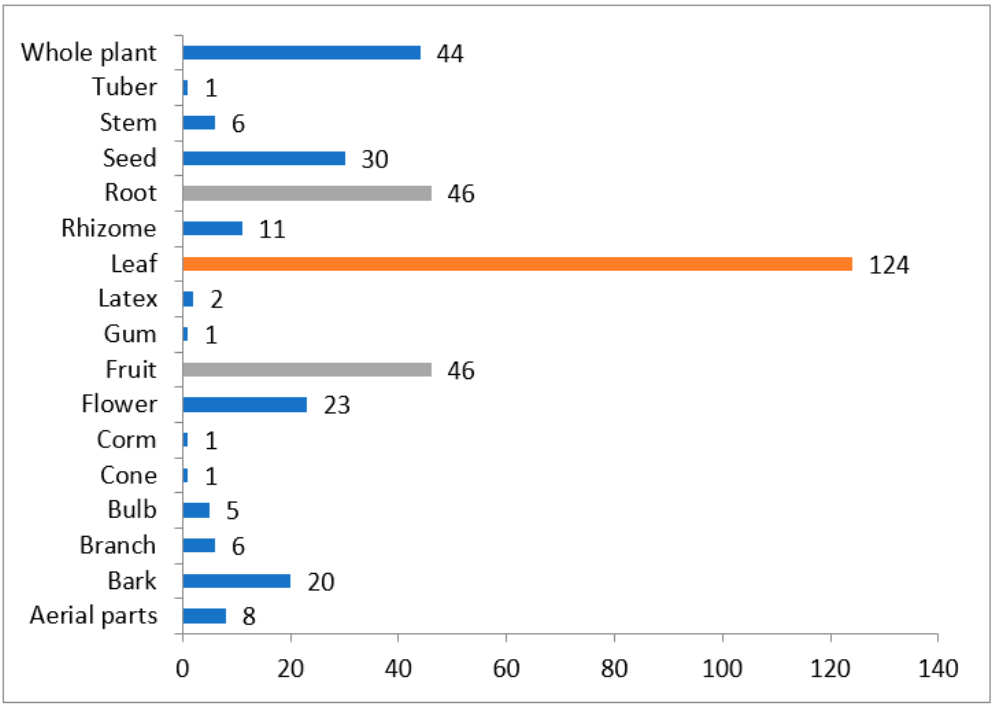

Figure 3. Plants' parts used in herbal medicines.

The preparation of medications involves a variety of formulation techniques. The documented formulation methods were classified into 14 groups. The most prominent herbal formulation method was paste (80 sp.) followed by decoction (72 sp.) and powder (64 sp.) (Figure 4). Paste was the dominant mode of administration of herbal medicine; a similar result was documented from the surrounding areas [58,62,68–70]. The study area is mountainous, and as a result, the locals experience more external wounds and injuries. Additionally, locals utilise pond water to wash their bodies and clothing since it contains germs that cause skin infections to treat these types of issues. Therefore, herbal paste medications were more popular among the local populace. For physical trauma and skin problems, the application of the paste is thought to be more effective [71]. Furthermore, the frequent use of paste may be due to its easy preparation [72]. The second most common method of administration was a powder; similar results were reported from the

surrounding areas [33,73,74]. Decoction was the third most common medication preparation technique. A possible reason may be the simplicity of the preparation process [34]. Another reason is that boiling of the plant(s) in water leads to the extraction and availability of different compounds for the curing of diseases [75]. Also, similar findings were reported by others [7,8,23,38,72,76,77].

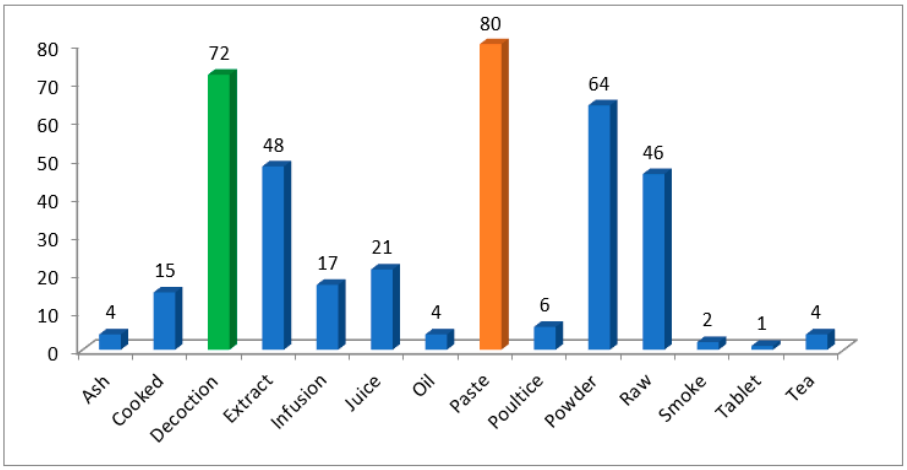

Figure 4. Method of formulation of herbal medicines.

3.4. Informant Consensus Factor (ICF)

In this study, the highest value of *ICF* was obtained for fevers (0.96), and the lowest *ICF* was for digestive system diseases (0.76) (Table 3 and Figure 5). The low *ICF* value suggested that there is a lower degree of consensus about the usage of a certain medicinal plant to treat a particular illness category. Furthermore, the low value of *ICF* suggests that numerous plants have almost equally high potential for treating a variety of ailments. The low *ICF* value also means that alternative allopathic medications are easily accessible to the local populace. These alternative allopathic medicines may reduce the use of traditional medicines for that particular group of diseases [7,36,78]. Furthermore, an almost similar result was reported by others [7,8,20,74,79–81].

Table 3. Disease categories and medicinal plants used for their treatment.

Disease Categories	No. of Medicinal Plants Used	No. of Informants	*ICF*
Antidote	7	83	0.92
Digestive system diseases	88	374	0.76
Eye and ear diseases	8	73	0.90
Fevers	11	251	0.96
Genitourinary and gynecological diseases	41	286	0.85
Heart and circulatory system diseases	12	149	0.92
Liver and endocrine system diseases	45	325	0.86
Mouth and dental diseases	13	92	0.86
Musculoskeletal diseases	18	237	0.92
Nervous system diseases	9	118	0.93
Other	8	165	0.95
Respiratory system diseases	29	189	0.85
Skin and subcutaneous diseases	70	315	0.78
Tonic and health drinks	12	158	0.92

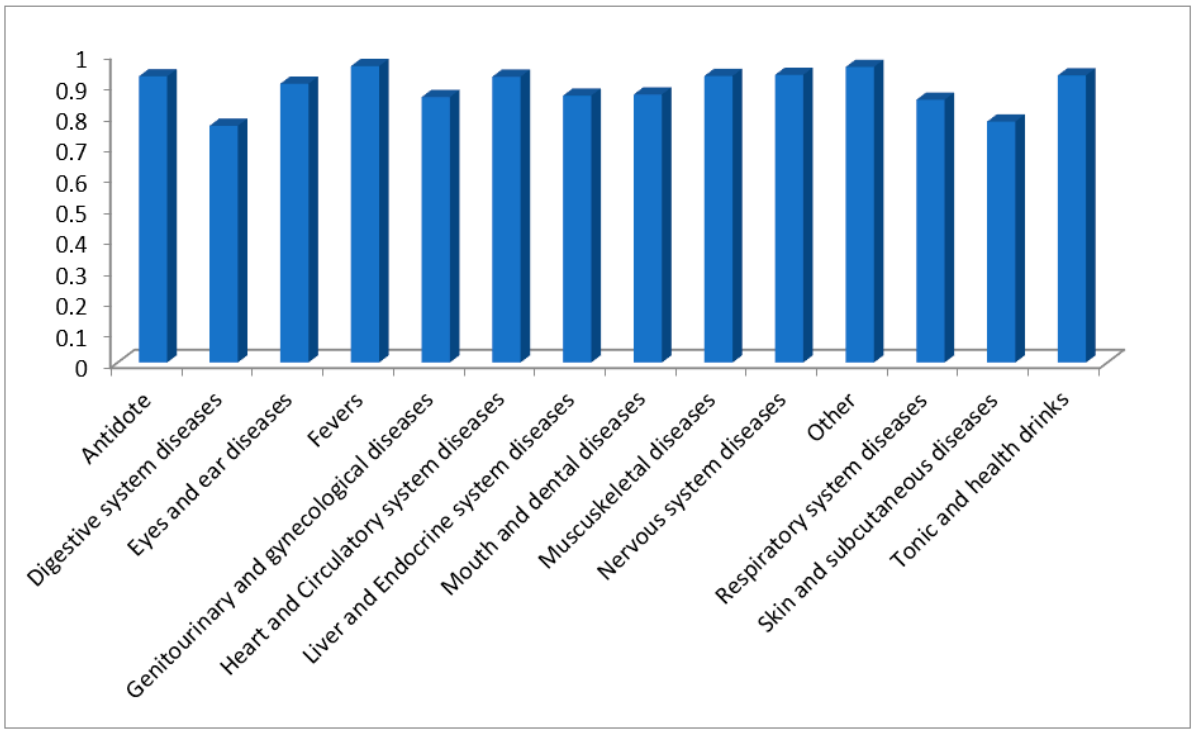

Figure 5. *ICF* values of various disease groups.

3.5. Comparison of Medicinal Flora and Their Uses

The collected medicinal plants and their indigenous knowledge were compared with previously published work from the surrounding areas. The highest similarity was documented in the study carried out by Rahman et al. [41] and the lowest was documented in that conducted by Sher et al. [55] as listed in Table 4 and Figure 6. The local communities of the two compared areas share their traditional knowledge because they are close and in a similar geological zone, which means they have similar flora and also have similar socioeconomic and cultural characteristics. Meanwhile, the lowest similarity of the medicinal flora indicates that there is less similarity in the flora because the areas are distant and located in different geological zones, as a result of which, sharing of ethnic knowledge about medicinal plants is also limited. [29].

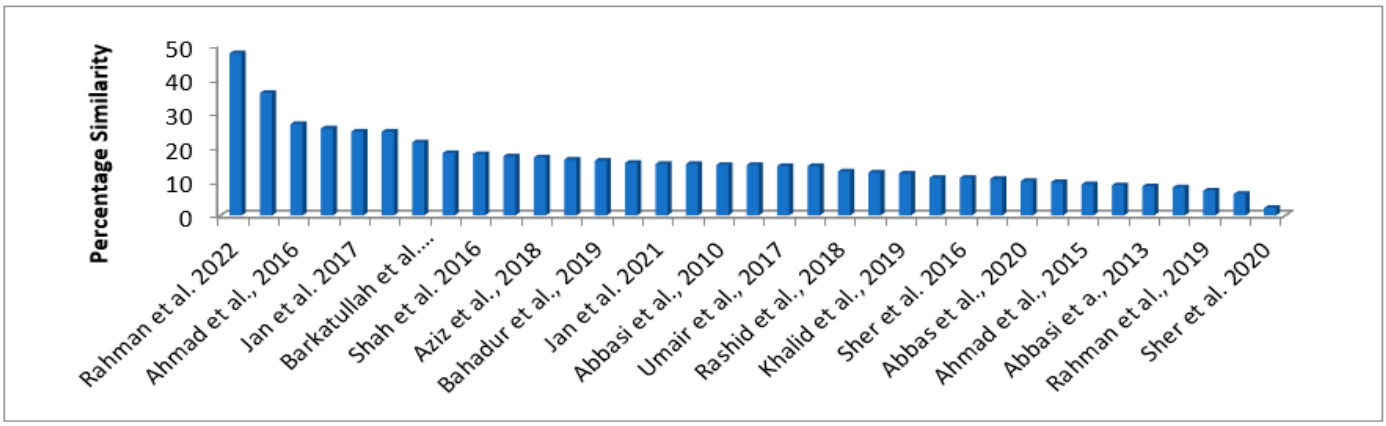

Figure 6. Comparison of the present study with previously published work [4,7–9,20,23,26,30,37–61,63].

Table 4. Floristic comparison of the present work with previously published work.

Previous Literature	Common Medicinal Plants between the Two Regions	Medicinal Plants Present Only in the Other Area	Medicinal Plants Present Only in the Study Area
Rahman et al., [40]	151	131	166
Shah et al., [39]	114	136	203
Jan et al., [7]	78	2	239
Sulaiman et al., [8]	81	17	236
Ahmad et al., [42]	85	35	232
Hussain et al., [43]	78	62	239
Barkatullah et al., [26]	68	24	249
Shah et al., [30]	57	21	260
Hassan et al., [58]	58	32	259
Jan et al., [41]	52	8	265
Bahadur et al., [59]	51	20	266
Aziz et al., [82]	54	40	263
Jan et al., [9]	48	7	269
Ijaz et al., [38]	49	25	268
Hamayun et al., [4]	48	22	269
Abbasi et al., [44]	47	19	270
Farooq et al., [37]	55	85	262
Umair et al., [60]	46	39	271
Ali et al., [37]	46	45	271
Kayani et al., [45]	47	73	270
Akhtar et al., [63]	40	15	277
Khan et al., [51]	39	11	278
Rashid et al., [49]	41	32	276
Shinwari et al., [53]	35	26	282
Sher et al., [47]	35	41	282
Bibi et al., [46]	34	32	283
Abbas et al., [61]	32	23	285
Shuaib et al., [57]	31	28	286
Ahmad et al., [23]	29	17	288
Abbasi et al., [83]	27	18	290
Wali et al., [54]	26	22	291
Khan et al., [84]	28	73	289
Rahman et al., [48]	23	4	294
Kayani et al., [20]	20	105	297
Sher et al., [55]	7	46	310

The study by Rahman et al. [41] in the Buner District reported that *Justicia adhatoda* L. is used locally for wounds, pus release, general body pain, as a cooling agent, fever, and TB treatment, whereas we observed that it is used for rheumatism. The study carried out by Shah et al. [39] in the Torghar District reported that the Basikhel tribe uses Artemisia scoparia Waldst. & Kitam. as a purgative anthelmintic and to treat malaria, but we have reported that it

is used to treat vomiting. Jan et al. [7] reported in their study conducted in the Chinglay Valley of the Buner District that *Allium jacquemontii* Kunth is locally used to treat stomachache and hypertension, while our study reported that the plant is used for the treatment of hypertension and unequal mammary gland size. Furthermore, Sulaiman et al. [9] reported that *Berberis lycium* Royle is used by the local community for diabetes, wound healing, fractured bones, body pain, and diarrhoea, whereas we documented it is used to increase male potency, treat internal wounds, and cure antidiabetes and eye infection.

Calotropis procera (Aiton) Dryand was utilised locally as an antimalarial medicine [42], and we have reported that the plant is used to treat obesity. The study conducted by Hussain et al. [43] reported that *Melia azedarach* L. is used for treating scrofula, pimples, and rheumatism, and *Ziziphus nummularia* (Burm. f.) Wight & Arn. is used for blood purification, digestion, healing wounds, and ulcers, while in our study, we reported that *Melia azedarach* L. is used for the treatment of fever and *Ziziphus nummularia* (Burm. f.) Wight & Arn. is used to manage bleeding gums. Similarly, Barkatullah et al. [26] documented that *Senegalia modesta* (*Acacia modesta* Wall.) is used as a tonic, aphrodisiac, pain killer for backache, and wound healer, while we documented that it is used as a tonic after delivery. Likewise, Shah et al. [30] reported *Achyranthes aspera* L. is locally used for treating jaundice, while our study reported that it is used to cure piles, boils, toothache, and gum inflammation; other studies reported that *Caralluma tuberculata* N.E.Br. is used in antidiabetic, carminative, and analgesic applications, while we reported antidiabetic and carminative medicinal uses for it. Furthermore, Hassan et al. [58] reported *Acorus calamus* L. and *Actaea spicata* L. are locally used as antiasthmatics and *Anagallis arvensis* L. as an antiseptic, while we reported that these plants are used to treat dyspepsia and dysentery, rheumatic pain, and body pain in cattle, respectively.

Moreover, Jan et al. [41] documented that *Butea monosperma* (Lam.) Taub. is locally used to cure leucorrhea, *Equisetum arvense* L. is for treating gonorrhea, *Ficus racemosa* L. for the treatment of menorrhagia, and *Momordica charantia* L. is used to induce abortion, while we reported that these plants are used locally for the treatment of intestinal worms, stopping bleeding after childbirth, kidney stones, urinogenital problems, and for dysentery and as an antidiabetic, respectively. Furthermore, Bahadur et al. [59] reported that *Taraxacum officinale* (L.) Weber ex F. H. Wigg is locally used as a diuretic and tonic, *Cannabis sativa* L. is used to cure respiratory disorders, and *Sonchus asper* (L.) Hill is used to cure fever and constipation, while we reported that *Taraxacum officinale* (L.) Weber ex F. H. Wigg is used as a tonic, *Cannabis sativa* L. is used to stop bed urination at night in children and for wound healing, and *Sonchus asper* (L.) Hill is used to cure boils.

Aziz et al. [82] reported in their study that *Cassia fistula* L. is locally used to treat gastric problems and fever, and *Celtis austtalis* L. is used to cure skin problems, while we reported that *Cassia fistula* L. is used for snakebites, pneumonia, and fever, and *Celtis austtalis* L. is used in the study area for the treatment of herpes. Jan et al. [9] reported in their study that *Acorus calamus* L. is used by the local people for gum ache and toothache and *Dalbergia sisso* DC. is used to kill worms of the teeth, while we reported that *Acorus calamus* L. is used to cure dyspepsia and dysentery and *Dalbergia sisso* DC. is used for treating jaundice. Furthermore, Ijaz et al. [38] documented that *Cyperus rotundus* L. is used to treat respiratory infections, while in our area, we reported that it is used as a tonic. Similarly, we reported that *Ficus sarmentosa* Buch.-Ham. ex. Sm. is used as a tonic for blood, the same use that was reported by Ijaz et al. [38] too.

Hamayun et al. [4] reported that *Adiantum venustum* D. Don is used as an expectorant, emetic, and diuretic, while we reported that it is used to treat sore eyes; furthermore, they reported that *Adiantum incisum* Forssk. is used to cure skin diseases, fever, cough, and diabetes, and in our study, we reported that it is used to cure wounds. Abbasi et al. [44] reported that *Bergenia ciliata* (Haw.) Sternb. is used for wound healing and in our study, we reported that it is used for wound healing as well as for toothache; moreover, they reported that *Calendula arvensis* M.Bieb. is also used for wound healing and we documented in our study that it is used to treat cancer. Farooq et al. [37] reported that *Hedera nepalensis* K.Koch

is used for treating diabetes, indigestion, and ulcer and we documented that it is used for the removal of leeches from the body of cattle. Furthermore, they reported that *Ipomoea purpurea* (L.) Rath is used as a diuretic, to treat mental disorders, and constipation and we have documented that it is used to treat bronchitis and diarrhea.

Umair et al. [60] reported that *Chrozophora tinctoria* (L.) A. Juss. is used to cure stomachache, sore throat, emetic, and cataracts and we reported that it is used for treating stomach acidity. Furthermore, they documented that *Euphorbia helioscopia* L. is used as an anthelmintic and to treat athlete's foot, sore eyes, asthma, constipation, and cholera, and in our work, we reported that it is used for the treatment of skin problems and constipation. Similarly, they reported that *Euphorbia prostrata* Ait. is used to treat diarrhea and dysentery; used as a liver tonic; used for the treatment of ringworm, diabetes, and kidney stones; and used as a blood purifier, and we reported in our study that it is used for the treatment of asthma and ringworm.

Ali et al. [37] reported that the fruit of the *Elaeagnus umbellate* Thunb. is used as a cardiac simulator and we reported that it is used as a cooling agent and to cure cough; furthermore, they reported that *Lamium album* L. is used to treat liver disorders and we documented that it is used for the treatment of cough. Kayani et al. [45] reported that *Actaea spicata* L. is used to treat asthma and we reported that it is used for rheumatic pain; similarly, *Bistorta amplexicaulis* (D. Don) Greene is used for treating sore throat while we reported that it is used for treating wounds. Akhtar et al. [63] reported in their study that the plant is used to treat eczema and for blood purification and we reported that it is used to treat cephalalgia; furthermore, they reported that *Peganum harmala* L. is used as a diuretic while we reported in our study that it is used as antidiabetic medicine.

3.6. Novelty of the Study

The present study is the first ever of its kind conducted in the study area to conserve the ethnic knowledge of medicinal plants. In this study, a total of 317 medicinal plant species were documented for their medicinal uses. The result clearly shows that 50 plant species are new that were not previously reported from the study area or the surrounding areas. New medicinal uses for 272 medicinal plant species are also reported from the study area (Table 2).

4. Conclusions

The results of the current work clearly show that the study area has rich floristic and cultural diversity, due to which the local population has rich ethnomedicinal knowledge. Furthermore, most of the study area is mountainous and remote and lacks modern health facilities; therefore, local people rely on medicinal plants. The present study mainly highlights the important indigenous ethnomedicinal knowledge associated with the local medicinal flora. It was noted that the valuable indigenous ethnomedicinal knowledge of the study area is at risk of extinction because the younger generation does not take interest in it. Moreover, the local population transfers this valuable treasure of knowledge orally from generation to generation which is a major factor in the loss of this valuable knowledge. During the survey, a total of 317 medicinal plant species belonging to 91 families along with their indigenous ethnomedicinal knowledge were documented. Most of the knowledge was shared by the age group 50–59. Asteraceae was the leading family with 27 species. The conservation of traditional knowledge for future generations, its protection by placing the knowledge in the public domain, and its use as the starting point for further study and conservation initiatives are just a few of the many uses for which it was documented. We recommend that future research projects should be designed to develop awareness in the local community about the conservation of medicinal plants. Furthermore, phytochemical and pharmacological evaluation of these medicinal plants should be carried out for the exploration of new medicines.

Author Contributions: H.A.J. and H.M.A. designed the research work. H.A.J. collected the data. A.K.A., S.Z.U.A. and M.Z.B. contributed to the data analysis. A.K.A., H.A.J. and L.A. contributed to the write-up. Review and editing were done by H.A.J., H.M.A. and M.Z.B. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement: The original data are presented in the article.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Data about Informant

Informant's Name: _____ Age: _____
Village Name: _____ Education: _____
Occupation: _____ Date: _____
Gender: _____ Marital Status: _____

Data about medicinal plants

Local name: _____ Botanical name/Family: _____
Part used: _____ Used for disease(s): _____
Locality: _____
Complete method of preparation of Recipes/Medicine:
_____
_____
_____
Amount/dosage of medicine: _____
Number of times per day of taking medicine: _____
Medicine taken before meal: _____ Medicine taken after meal: _____
Side/poisonous effects of plant: _____
The uses of medicinal plants are increasing/deceasing/remains the same?
If deceasing then why? _____
What are the most recent diseases, your family members, suffered from?
What kind of treatment you get? Allopathic/ Herbal/ Religious/ Homeopathic
Have you got any herbal medicine, why? _____
What is the availability status of herbal medicine? Easily/Difficult
Affectivity of herbal medicine: _____
How many medicinal Plants you know? _____
How you got the knowledge about the use of medicinal plants? _____
Who collect Men/Women/Children/Herbalist/Others?

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