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Traditional healing practices of kumaun Himalayan communities: Ethnobotanical exploration

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Abstract
The present study mainly focuses on the identification, documentation, and conservation of ethnomedicinal plants which are traditionally used by villagers for treating various diseases and ailments. This investigation was carried out in three blocks of districts Nainital, Almora, and Bageshwar of Uttarakhand. A total of 131 species of medicinal plants from 61 families were identified throughout the investigation. Out of these 54 were herbs followed by 36 trees, 20 shrubs, 12 climbers, 6 grass, and a single species of fungus, bryophyta and fern. These plants are being used by the local communities for the treatment of different diseases. The main purpose of this was to document the traditional knowledge of experienced people (locally called Vaidyas). Information regarding the conservation of these medicinal plants was also documented.

Keywords: Biodiversity, ethnomedicinal plants, traditional knowledge, vaidyas

Introduction

Plants play an important role in an individual's life. Our country, India is rich in plant diversity and has vast ethnomedicinal knowledge. More than 8000 different species of vascular plants are found in the Indian Himalayas, out of which 1748 are medicinally important because of their therapeutic qualities. The Himalayan region was home to a wide range of flora and fauna. Uttarakhand occupies 15.5% geographical area of the western Himalayas, in which most of the area is covered by snow-clad peaks, higher Himalayan glaciers, and deep mid-Himalaya forest cover (Gangwar *et al*., 2010) [4]. The indigenous population makes use of the region's abundant biodiversity for a variety of uses, including medicine, food (wild edible), fuel, fodder, timber, farming, grazing, fiber, aesthetic and religious purposes (Sharma *et al*., 2011). According to the Ramayana, Hanuman ji saved Laxman ji's life by retrieving the herb Sanjeevani booti (*Selaginella bryopteris*) from the Himalayas (Amirthalingam *et al*., 2013) [2]. The majority of people living in the past were reliant on the natural world, especially the plants that grow nearby. *Samhitas* records the applications of medicinal herbs. In *Charak Samhita* (1000-800 BC) and *Sushruta Samhita* (800-700 BC), more than 500 medicinal plants are mentioned out of which 340 medicinal plants are used for medicinal purposes or herbal production (Kala 2009) [7]. Ancient scriptures including the *Atharveda*, *Rigveda*, *Charak Samhita*, and others mention medicinal herbs and their benefits. According to *Charaka Samhita* and *Sushruta Samhita*, *Ayurveda* aims to preserve good health and eradicate sickness in those who are ill. The oldest known text is the *Rigveda*, which is primarily made up of several plant-based hymns (Balkrishna *et al*., 2019) [3].

The current study was carried out in Uttarakhand's hilly districts. Forests include a wide variety of plant forms including trees, shrubs, and herbs, and additionally, they perform a significant function as reservoirs of plant diversity. Forest also provides various wild and edible medicinal plants (Kumari *et al*., 2011) [8]. However, as a result of habitat loss, over-exploitation, and medicine extraction, the majority of these medicinal plants are now classified as threatened (Jain *et al*., 2020) [5]. Therefore, the conservation of these important plants is very essential. The rapidly depleting traditional knowledge based on medicinal plants and their uses is also needed to document for future generations.

Material and methods

Study area

The present study was conducted in three blocks namely Ramgarh of Nainital district, Hawalbagh of Almora district, and Kapkot of Bageshwar district of Uttarakhand state. Geographically, Ramgarh block is located at 23°37´49´´N latitude and 85°31´09´´E longitude, Hawalbagh is located at 29°44´23´´N latitude and 79°43´50´´E longitude and Kapkot block is located at 29°93´79´´N latitude and 79°90´25´´E longitude respectively.

Data collection

A total of nine villages such as Kaphura, Chapar, and Kwarab villages of Ramgarh block; Chausali, Matela, and Udiyari of Hawalbagh block; Farsali Walli, Nargada and Bhesudi Kuter of Kapkot block were selected randomly to collect various information on medicinal plants. For this purpose, a questionnaire survey was conducted from June to November 2022. A total of 90 informers of different age groups i.e., young (below 30 years), middle (30-60 years), and old age (60-90 years) were interviewed respectively. We also spoke with a few local *Vaidyas*, or traditional healers, who felt at ease imparting their wisdom. Because the majority of *Vaidyas* nowadays don't impart their knowledge.

With the help of esteemed professors, Dr. Manjulata Upadhyay and Dr. Balwant Kumar from the Department of Botany, S.S.J University, Almora, Uttarakhand ethnomedicinal plants are identified. Also, the plant species were further cross-checked with existing literature (Pandey *et al*., 2017, Gangwar *et al*., 2010, Mehra *et al*., 2014 and Kapkoti *et al*., 2014) [11, 4, 12, 13] and the Royal Botanic Gardens, Kew (https://powo.science.kew.org/) provided the most recent botanical name confirmation for the plant species.

Data analysis

Data was gathered during the survey based on the number of informants who used ethnomedicinal plants to treat a certain ailment. Collected data was analyzed by Microsoft Excel spreadsheet with quantitative methods such as Use value, ICF value, and Fidelity level as follows

Use value is used to determine the relative importance of plant species by the informers. It can be calculated by the subsequent equation:

$$UV = \Sigma U/N$$

where U represents the number of use reports using a plant species to treat different diseases; N= total number of informants interviewed (Phillips and Gentry 1993) [9]. It will be high when a plant species has many uses.

ICF value or Informant's consensus factor (ICF) estimates the variability of medicinal plants and the level of homogeneity of information provided by different informants. It is calculated by the following formula:

$$ICF = Nur - Nt/Nur - 1$$

Where, Nur = number of use reports for each disease category; Nt = number of plant species used for each disease category by all the informants (Trotter and Logan 2019) [10]. Its value ranges between 0 and 1.

Fidelity level (FL) is the percentage of those informer's use of a certain plant species for the same major purpose, which will be calculated for the most frequently reported diseases or illnesses as:

$$\text{Fidelity level (FL)} = Np/N * 100$$

Where, Np = Number of use reports of plant species for particular diseases; N = Total informants (Alexiades 1996) [1]. The high value of FL is close to 100% if plants are used by informers for the same uses while low FL indicates that plants are used for different purposes.

Results and discussion

This study is based on the traditional knowledge of the local people of different age groups residing in hilly areas of the study area. These people live in a village with little medical resources, so these plants serve as first aid. When illnesses and minor injuries like fever, snake bites, and hand cuts occur, their traditional knowledge of first aid helps them recover. A total of 131 plant species were found as wild as well as cultivated in the study area. These plants belong to 61 families, out of which 54 were herbs followed by 36 trees, 20 shrubs, 12 climbers, 6 grass, and a single species of fungus, bryophyta and fern. The locals use all of these plants for ethnomedicinal purposes and other uses. In all, 80 plant species were identified as therapeutic wild plants during the investigation, with 51 plant species identified as cultivated in the study area.

Out of 61 families, family Lamiaceae with 10 species were recorded as excessively used for ethnomedicinal purposes in the study area. It was followed by Rosaceae with 9 species, Poaceae and Asteraceae with 8 species each, and 5 species each of Fabaceae, Rutaceae, and Solanaceae. Minimum 4 species each of Amaranthaceae, Cucurbitaceae, and Euphorbiaceae and so on are also used for medicinal purposes in the area. It was also observed that leaves of a maximum of 38 medicinal plant species were utilized, fruits of about 15 medicinal plants followed by roots of 10 plants were also utilized. Besides seeds of 9 plant species followed by barks ingredients of 3 and stems of 3 species were also used by applying different methods in the region.

Quantitative data analysis of ethnomedicinal plants

The highest Use value (UV) range for ethnomedicinal plant uses in the study site was 0.0111-0.3333. The highest UV was recorded for *Berberis asiatica* Roxb. ex Dc. (0.3333), followed by *Bergenia ciliata* (Haw.) Sternb. (0.2889), *Zanthoxylum acanthopodium* DC. (0.2444) and *Urtica dioica* L. (0.2333) (Table 1).

Informant's consensus factor (ICF) indicates that a High ICF value is close to 1, which means only one or few plant species are used by informants to treat each disease, whereas, if it is a low ICF value it means, informers disagree. In Table 2. ICF ranged between (0.0-0.87). Nephrolithiasis has the highest ICF value 0.87, followed by Dental problems (0.69), Diabetes (0.68), and Cut and Wound (0.61).

The fidelity level of collected data was varied from 1.11% to 95.56%. The highest FL was recorded for Cut and Wound (95.56), followed by Gastrointestinal problems (90%), Common cold (63.33%), and Musculoskeletal disorder (52.22%). While low FL was found in Cancer (2.22%) and cardiovascular disease (1.11) (Table 2).

Table 1: Ethnomedicinal plants used to treat various disease in the study area

S.N.	Medicinal plant	Local name	*Part used	**Ethnobotanical uses	Use value
1	*Achyranthes aspera*	Lat kura/Ulta kumar	Ls, Rt	Leaves paste is used for[5]; root paste for[7,17]	0.0222
2	*Aesculus indica*	Paangar	Fr	Fruit seeds are eaten to cure[8]	0.0111
3	*Agave americana*	Rambas	Rt	Soap of its root is used for[7]	0.0111
4	*Ageratina adenophora*	Nargadiya/Basela	Ls	Use of leaves paste for[5]	0.0778
5	*Ageratum conyzoides*	Nirphulli/Bhubani	Ls	Leaves paste is used for[5]	0.0444
6	*Ajuga parviflora*	Rat patiya	Rt	Root juice is used for[18]	0.0111
7	*Allium sativum*	Lehsun	Bb	Bulb is used for[10,15]	0.0556
8	*Aloe vera*	Aloe vera	Gl	The Gel is used to relieve[7,17]	0.0444
9	*Amaranthus spinosus*	Kate wali cholayi	Ls	Vegetables of its leaves are used for[11]	0.0111
10	*Amaranthus viridis*	Cholayi/Chua	Rt, Se	Root paste is for[7,11,15]	0.0444
11	*Angelica glauca*	Gadhreni	Rt	Drink its boiled root water to cure[11]	0.0111
12	*Aremonia agrimonoides*	Pila phool/Hari dwai	Ls	Leaves are used for[9,17]	0.0222
13	*Arisaema tortuosum*	Sarf ped	Se	Seed paste is used for[7,17,18]	0.0111
14	*Artemisia nilagirica*	Paati	Ls, Rt	Leaves are used to cure[7-9]; the root powder is used to relieve[4]	0.0667

15	*Asparagus racemosus*	Kerau/Keruwa/Shatavar	Tn, Rt, Bl	Thorn is used for[9]; root is used to cure[10,18]; baby leaves are used for[19]	0.0667
16	*Asplenium dalhousieae*	Ron	Fs, Rt	Root to cure[6]; fronds paste used for[7]	0.0222
17	*Azadirachta indica*	Neem	Ls	Drink-soaked leaves water for[3,7]	0.0111
18	*Baccharoides anthelmintica*	Kapeel/Hari patti/Hari ghas	Ls	Leaves are used to cure[5,9,13]	0.0444
19	*Begonia picta*	Lalpatti	Ls	Leaves used for[7]	0.0111
20	*Berberis asiatica*	Kilmora	Rt, St	Root is used to cure[1,3,7-10,13,16]; stem is used for[6]	0.3333
21	*Bergenia ciliata*	Silphoda/Silkhoda	Rh	Used root to cure[9,10,16]	0.2889
22	*Bergera koenigii*	Kari patta	Ls	Leaves are used for[4]	0.0111
23	*Bidens pilosa*	Kumar/Katari	Ls, F	Used leaves for[5,17]; flower used to cure[7]	0.0333
24	*Bombax ceiba*	Simol/Simou	Fr, F	Fruit or flowers cure[10]	0.0222
25	*Brassica rapa*	Sarso	Se	Seeds are applied on[5]; seed oil for[7]	0.0222
26	*Callicarpa macrophylla*	Daya	Fr	Fruit is used to cure[9]	0.0111
27	*Cannabis sativa*	Bhang	Ls, Rt, Se	Root decoction is used for[17]; leaves paste used for[5]; seeds used to cure[4]	0.0889
28	*Capsicum annuum*	Mirch	Fr	Powder form of fruit is used[18]	0.0111
29	*Cinnamomum tamala*	Tejpatta	Ls	Decoction of leaves is drunk to cure[4,8]	0.0444
30	*Cinnamomum verum*	Dalchini	B	The powder form of its bark is used to cure[4]	0.0111
31	*Cirsium verutum*	Simkanya	Ls	Boil water of its leaves to cure[15]	0.0222
32	*Cissampelos pareira*	Paari	Ls	Leaves paste is used to cure[9,17]	0.0222
33	*Citrus × aurantiifolia*	Kangazi nimbu	Fr	Fruit is used to cure[10,18]	0.0667
34	*Citrus × limon*	Pahadi-Bada Nimbu	Rt, Fr	Root paste is to cure[6,13,17]; fruit is used to relieve[15]	0.1000
35	*Citrus hystrix*	Jamir	Fr	Leaves are used to relieve[10]	0.0333
36	*Cucumis sativus*	Kakdi/Pahadi Kakdi	Se, Fr	Powder of its seeds or cucumber fruit juice is used to cure[17]	0.0333
37	*Curcuma longa*	Haldi/Kacchi haldi	Rh	Rhizome cures[4,5,7,15,17]	0.1889
38	*Cuscuta reflexa*	Aakash laguli	Ls	Leaves juice is used for[13]	0.0111
39	*Cynodon dactylon*	Doob	Ls, Rt, W	Leaves are used for[9,14]; root paste is to cure[9]; paste of its whole plant for[15]	0.0444
40	*Cynoglossum lanceolatum*	Chatkuri/Chatkur	Ls	Leaves juice used for[5]	0.1556
41	*Dicliptera foetida*	Ldhuri/Kagar/Kali ghodi	Ls	Paste of its leaves is for[17]	0.0444
42	*Digitaria ciliaris*	Katwari	Ls	Leaves paste is used for[7]	0.0111
43	*Dioscorea bulbifera*	Gethiya/Gethi	Fr, Rt	Burnt fruit is used to cure[4,10,19]; paste of its root is used for[15]	0.0667
44	*Dioscorea deltoidea*	Ban gethi	Fr	Boiled fruit is eaten to cure[10]	0.0111
45	*Diploknema butyracea*	Chura	Fr	Seed paste is used to cure[7]	0.0111
46	*Dysphania ambrosioides*	Bajar bhang	Ls	Juice of leaves is used for[5]	0.0111
47	*Eleusine coracana*	Maduwa	Se	Seed flour is used to cure[7,8,10]	0.0444
48	*Eulaliopsis binate*	Babil	Ls	Leaves is used for[15]	0.0111
49	*Euphorbia royleana*	Siyun/Sayun	L	Latex of the stem is used to relieve[6]	0.0222
50	*Falconeria insignis*	Khin	Ls	Latex of its leaves is used for[7]	0.0111
51	*Ficus auriculata*	Timul	Fr	Fruit is used for[3,4,10]	0.0333
52	*Ficus palmata*	Anjir/Bedu	Fr, Ls, L	Fruit is eaten to cure[10]; leaves latex is used for[5,17]	0.0444
53	*Fragaria vesca*	Jungli strawberry	Ls	Leaves paste is used for[5]	0.0333
54	*Galinsoga parviflora*	Khusani jhad/March jhad	Ls	Leaves are used for[5]	0.0333
55	*Galium aparine*	Kur	Ls	Leaves are used for[17]	0.0111
56	*Geastrum saccatum*	Jungli mushroom	P	Extract powder is used for[17]	0.0333
57	*Gonostegia hirta*	Gipho jad/Chiphyu jad/Visho jad	Ls, Rt	Leaves paste is used to cure[12]; root paste is used for[7]	0.0333
58	*Grewia optiva*	Bhingal	B	Powder of bark is used for[12]	0.0111
59	*Hedychium spicatum*	Jungli haldi	Rh	Rhizome paste is used to cure[5,10,15]	0.0222
60	*Hordeum vulgare*	Jaw	Ls	The juice of its leaves is used to cure[9]	0.0111
61	*Jacaranda mimosifolia*	Jagdanda	Ls	Burnt leaves with sesame oil are used for[17]	0.0444
62	*Juglans regia*	Akhrot	Ls, B, Fr	Leaves juice is used to relieve[6,7,9]; paste of its unripe fruit is to cure[12]	0.0778
63	*Kalanchoe pinnata*	Patharchatta	Ls, Rt	Leaves or root is used to cure[16]	0.0667
64	*Lagenaria siceraria*	Loki	Se	Seed paste is helpful to get rid of[13]	0.0111
65	*Lawsonia inermis*	Pahadi mehandi	Ls	Leaves juice is used to cure[9]	0.0111
66	*Luffa acutangula*	Turai	Se	Seeds paste is eaten with water to cure[10]	0.0222
67	*Lyonia ovalifolia*	Agyun	B, Ls, Rt	Leaves or root paste and bark is used for[7]	0.0333
68	*Macrotyloma uniflorum*	Gehat	Se	Seeds help in curing[16]	0.0333
69	*Mallotus philippensis*	Roli/Sindoor	Rt, Fr	Roots are used to cure[10]; fruit powder is used in[9]	0.0222
70	*Marchantia papillata*	Phodi	T	Paste of its thallus is used for[5]	0.0111
71	*Melia azedarach*	Pahadi neem/Bataid	Ls, Be, St,	Leaves are used in[3,7,10]; decoction of berries	0.0778

			Rt, B	is used for[7]; stem is used to cure[6]; boiled bark water is used for[10]	
72	*Mentha × piperita*	Pudhina	Ls	Paste its leaves to cure[10,13]	0.1333
73	*Mimosa rubicaulis*	Aal	Rt	Paste of its root is used for[7]	0.0111
74	*Momordica charantia*	Karela	Fr, Ls	Fruit is used for[8,15]; leaves paste is used to relieve[4,13]	0.0778
75	*Musa balbisiana*	Kela	St, Fr	Stem juice is used for[9,17]; fried fruit is used to cure[11]	0.0444
76	*Myrica esculenta*	Kafal	B, Fr	Powder form of bark is used in[4,5,17]; ripe fruit is eaten with water to cure[10]	0.0333
77	*Nerium oleander*	Kanel	Rt	Paste of its root is used for[6]	0.0111
78	*Ocimum tenuiflorum*	Tulsi	Ls	Leaves are used to cure[4,7,13]	0.1556
79	*Opuntia monacanthos*	Naag Phani	L, W	Latex of its plant is used to cure[6]	0.0222
80	*Origanum vulgare*	Jungli tulsi	Ls	Rubbed leaves on hand to cure[7]	0.0222
81	*Oryza sativa*	Chawal/Dhan	Se	Paste of cooked rice with ash cures[10]	0.0222
82	*Oxalis latifolia*	Chalmodi	Ls	Leaves are used for[5,7, 9,18]	0.1000
83	*Perilla frutescens*	Bhangir/Bhangira	Ls	Leaves juice is used to cure[9]	0.0222
84	*Phaseolus vulgaris*	Sheemi/Chimmi	Se, Fr	Fruit is used to cure[4]; seed paste is for[5]	0.0222
85	*Phyllanthus emblica*	Aamla	Fr	Fruit powder cure[4,1]	0.0222
86	*Pinus roxburghii*	Chir	Ls, R	Resin is used to cure[5,7,15]; needle leaves paste is also used for[5]	0.0667
87	*Piper nigrum*	Kali mirch	Fr	The powder form of its fruit is used to cure[4]	0.0111
88	*Polygonatum cirrhifolium*	Meuda	Ls	Leaves paste with a few drops of cow's urine is applied for[15]	0.0111
89	*Premna mollissima*	Agliyo	St, B	Stem or bark is used for[5,7]	0.0444
90	*Prunus armeniaca*	Khubani	Se, G	Seed oil relief from[15]; gum is used for[5]	0.0333
91	*Prunus cerasoides*	Payiya	Rt, B, Se	Root paste is used for[17]; drink-soaked bark or seeds water to cure[10]	0.0222
92	*Prunus persica*	Aadu	Fr, Ls, Se	Ripe fruit or leaf juice is curing[10]; leaves paste cures[5,7]; seed oil is used for[13]	0.0889
93	*Psidium guajava*	Amrod	Ls, Fr	Leaves is used to cure[4,6,9,10]; paste of unripe fruit cures[12]	0.0556
94	*Punica granatum*	Dadim/Anar	Fr	Burnt fruit peel is drunk with milk to cure[4]	0.0667
95	*Pyracantha crenulata*	Ghingaru	Fr	Ripe fruit is eaten to cure[2]	0.0111
96	*Pyrus pashia*	Mehal	Fr, Ls	Raw fruit is eaten to get relief from[10,15]; leaves paste is used in[5]	0.0222
97	*Quercus leucotrichophora*	Banjh	B, G	Bark paste is used for[5]; gum is used to relieve[6]	0.0222
98	*Raphanus raphanistrum*	Muli/Mooli	Ls	Leaves are eaten raw to cure[14]	0.0111
99	*Rheum australe*	Dolu	Rt	Boiled root water is used to reduce[15]	0.0111
100	*Rhododendron arboreum*	Buransh	F	The juice of its flower is drunk in[3]	0.0444
101	*Ricinus communis*	Eenadee/Ein/Arandi	Ls, St, Fr	Leaves are used to cure[6,10,13,15]; stem cured[6]; fruit cure[12,15]	0.1000
102	*Rosa indica*	Gulab	Ls	Paste of its leaves is used for[5]	0.0111
103	*Rubus ellipticus*	Hisalu	Rt	The root is used to cure[8,10]	0.1778
104	*Saccharum officinarum*	Ganna	St	Juice of its stem is drunk to cure[14]	0.0222
105	*Salvia Rosmarinus*	Rose merry	Ls	Leaves are used for[4]	0.0111
106	*Sapindus mukorossi*	Reetha	Fr	The powder form of its fruit is used for[12]	0.0111
107	*Senna tora*	Banar	Fr	Baked dry fruit is used for[7]	0.0111
108	*Smilax aspera*	Kuku ded	Rt	Burn root is used in[7]	0.0111
109	*Solanum melongena*	Baigan	St	Burn stem is used for[18]	0.0222
110	*Solanum nigrum*	Giwayi	Ls, Be, Rt	Leaves juice is used for[9]; ripe berries are eaten to cure[4]; root paste is used for[7]	0.0333
111	*Solanum tuberosum*	Aalu	Tr	A small piece of potato is used for[17]	0.0222
112	*Stellaria media*	Hari dwa	Ls	Leaves paste is used for[5,7]	0.0333
113	*Stephania glabra*	Gunjhad	Rt, B	Root powder cures[10,17]; boiled bark water is used to cure[12]	0.0333
114	*Swertia chirayita*	Chiret	Ls	A mixed paste of its leaves and 1 egg is used for[15]	0.0222
115	*Syzygium cumini*	Jamun/Jamad	B	Bark powder form is used for[8]	0.0222
116	*Tagetes erecta*	Hajri	Ls, F	Leaves juice is used for[5,9]; boiled flower water is drunk to cure[11]	0.2111
117	*Terminalia chebula*	Harad	Fr, Se	Seeds paste cures[10]; fruit used for[4,10]	0.0667
118	*Thalictrum foliolosum*	Chayoni jhad	Rt	Powder form of its root cures[10]	0.0111
119	*Thymus linearis*	Jayuni jhad (Thyme)	Ls	Leaves cure[4,7,10]	0.0222
120	*Tinospora cordifolia*	Gurj/Giloy	St	Stem is used to cure[4,8,10,11]	0.1111
121	*Trachyspermum ammi*	Ajwain	Se	Boiled water of its seeds is used for[4,10]	0.0333
122	*Urtica dioica*	Bichu/Sisun	W, Rt, Ls	Leaves or whole plants are used for[3,5,10,13,15]	0.2333

123	*Vanda cristata*	Hardojan	Fr, Rt	Fruit cure[10,17]; root paste used for[5]	0.0222
124	*Verbascum thapsus*	Eekanbir	Ls	Extracted juice from its leaves is used to cure[13]	0.0111
125	*Vigna mungo*	Maas/Urad	Se	Paste of its seed used for[15]	0.0111
126	*Vitex negundo*	Siwayi/Siyayi	W, Ls	Whole plant used for[13,15]; leaves are used for[9]	0.0333
127	*Withania somnifera*	Ashwagandha	Ls	Boiled leaves are eaten to cure[4,10]	0.0111
128	*Zanthoxylum acanthopodium*	Timur	B, Fr, St	Bark or stem is used to cure[6,18]; fruit is used to cure[4,7]; stem cure[10]	0.2444
129	*Zea mays*	Makka	Fr	A paste of fruit ear is used for[7]	0.0111
130	*Zingiber officinale*	Adarak	Rh	The rhizome is used to cure[4]	0.0556
131	*Ziziphus mauritiana*	Pahadi beri/Beri	Rt	The root is used to cure[6,19]	0.0333

Abbreviations: *Bl- Baby leaves, B- Bark, Be- Berries, Bb- Bulb, F- Flower, Fs- Fronds, Fr- Fruit, Gl- Gel, G- Gum, L- Latex, Ls- Leaves, P- Pileus (cap), R- Resin, Rh- Rhizome, Rt- Root, Se- Seeds, St- Stem, T- Thallus, Tn- Thorn, Tr- Tuber, W- Whole plant; **1-Cancer, 2-Cardiovascular-disease, 3- Circulatory, 4- Common cold, 5- Cut and wound, 6- Dental problem, 7- Dermatological, 8- Diabetes, 9- ENT, 10-Gastrointestinal problem, 11- Gynocological problem, 12- Hair Problem, 13- Headache, 14- Liver disease, 15- Musculoskeletal disorder, 16-Nephrolithiasis, 17- Others, 18- Poisonous bite, 19- Respiratory.

Table 2: Informant consensus factor (ICF) and Fidelity level (FL) for each disease category

S. No	Disease category	No. of uses reported (Nur)	No. of species used (Nt)	ICF	Fidelity level (%)
1	Cancer	2	2	0.00	2.22
2	Cardiovascular disease	1	1	0.00	1.11
3	Circulatory	11	5	0.60	12.22
4	Common cold	57	25	0.57	63.33
5	Cut and wound	86	34	0.61	95.56
6	Dental problem	43	14	0.69	47.78
7	Dermatological	46	32	0.31	51.11
8	Diabetes	29	10	0.68	32.22
9	ENT	45	22	0.52	50.00
10	Gastrointestinal problem	81	36	0.56	90.00
11	Gynocological problem	6	5	0.20	6.67
12	Hair Problem	6	6	0.00	6.67
13	Headache	16	13	0.20	17.78
14	Liver disease	4	3	0.33	4.44
15	Musculoskeletal disorder	47	22	0.54	52.22
16	Nephrolithiasis	31	5	0.87	34.44
17	Others	28	20	0.30	31.11
18	Poisonous bite	16	10	0.40	17.78
19	Respiratory	3	3	0.00	3.33

Conclusions

As everyone knows from Covid-19, a lot of people used common domestic medicines to treat fever, colds, and other ailments. In such circumstances, people are able to use these plants as an alternative to modern medicine if they are aware of the traditional knowledge about plants. If they possess traditional knowledge, people who live in remote areas of the hills with an abundance of naturally occurring medicinal herbs can also cultivate these plants and use them to treat a variety of minor ailments. It can save their life, money, and time instead of costly treatment by moving outside the region. Local organizations can help with activities relating to medicinal plant conservation and awareness. They can help in the documentation of old knowledge and identifications of these valuable plants and they may ignite young people's interest in the preservation of knowledge and the protection of these plants for the benefit of future generations. These awareness campaigns will reduce the overuse of these plants and encourage the community to cultivate and trade therapeutic herbs as a substitute source of income. In addition, it will reduce the region's migratory issues.

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