

ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS OF NAMAL VALLEY, SALT RANGE, PAKISTAN

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Abstract. This paper presents the first quantitative ethnobotanical knowledge and practices of using native plants for different ailments from Namal Valley of Pakistan. Data was gathered by interviewing 350 informants through semi-structured questionnaires. A total of 217 taxa belonging to 166 genera and 70 families were documented. Fabaceae and Asteraceae families were found to be the most cited families (with 19 and 18 species receptively). Herbs represent the most cited life form (71%) and flower was the most widely used part (34.8%) with decoction as main mode of the utilization (41.5%). On the basis of use values, the most commonly used ethnobotanical taxa in the Valley were reported to be *Euphorbia heterophylla* (0.7) and *Merremia dissecta* (0.6). The highest RFC value was noted for *Aloe vera* (0.14) while highest ICF value was estimated for dental problems category (0.7). Maximum similarity index was found in the studies with Bana Valley (JI 23.9). Similarity percentage of plants uses ranges from 0% to 15.7 (Bana Valley), while dissimilarity percentage varies up to 32.5% (Soon Valley). This study highlights the medicinal flora of study area that will serve as baseline for conservation and sustainable utilization through future research on bio prospecting of potential species to develop novel drugs.

Keywords: *medicinal flora; conservation; Fabaceae; novel drugs; informant consensus factor*

Introduction

Ethnobotanical studies on medicinal flora are crucial for developing novel drugs based on traditional knowledge of the local people (Heinrich and Gibbons, 2001; Mesfin et al., 2009; Vitalini et al., 2013). The usage of medicinal plants for medicinal and therapeutic purposes has been studied and documented globally (Kunwar et al., 2015; Bulut et al., 2017; Fortini et al., 2016; Menale et al., 2016; Shah and Rahim, 2017). The role of herbal treatment in curing various diseases is vital because of the fact that a large number of ailments are cured by plant based medications (Rehecho et al., 2011). In this context ethnobotanical researches demonstrate high significance and prominence of medicinal plants in cognitive pluralistic perspective. Such studies not only play an important role in upgrading the social status and economic values of an area but also preserve the aboriginal medico-ethnobotanical data of the indigenous communities that consequently preserve the global heritage (Sanz-Biset et al., 2009). Medicinal plants are considered very important among the rural communities due to their potential to cure health related problems for which several of remote communities are unreachable of modern health care facilities (Heinrich, 2000; Tabuti et al., 2003; Verma and Singh, 2008). Out of approximately 6000 plants species in Pakistan 600 to 700 are reported to have medicinal value. Among them 456 plants species are used in

the formulation of approximately 350 synthetic drugs (Ahmad and Husain, 2008). Pakistan has variations on climatic conditions, ecological zones and topography where diverse flora of medical importance flourishes in dry to temperate habitats. Limited number of ethnobotanical expeditions have been conducted in well-known valleys of Pakistan (Ahmad et al., 2014; Amjad, 2015; Bano et al., 2014; Haidar and Qaiser, 2009; Haq, 2012; Hazrat et al., 2011; Khan et al., 2010; Khan et al., 2013; Khan and Khatoon, 2008; Shah and Rahim, 2017; Zabihullah et al., 2006) but most of the remote valleys are still unexplored. There could be hundreds of plant species growing in these valleys having medicinal, industrial and economic potential. Local communities of various regions use these species in different ways on the basis of their cultural beliefs and inherited experience. However, little attention is being paid to the conservation and sustainable utilization of several of potential species. Salt Range of Pakistan is one of such region which is least explored regarding the documentation of medicinal wealth present in several of its valleys. Namal Valley is among the most fascinating area awaiting systematic study of its ethnobotanical knowledge associated with native flora of the region. Recently (Shah et al., 2018) has documented sixty eight (68) medicinal plants used in snakebite and scorpion sting used by the inhabitants of this valley who are predominantly pastoralists, peasants and farmers. Namal Valley is naturally gifted with diverse flora with social, economic and environmental importance. The objectives of this study were to collect record and document information regarding the plants used ethnobotanically by the aboriginal people especially with respect to the medicinal wealth of the plants. This extensive study carried out throughout the Valley revealed an exhaustive list profile of medicinal plants, based on quantitative evaluations adopting several ethnobotanical indices like use value (UV), frequency of citation (FC), relative frequency citation (RFC), family importance value (FIV), informant consensus factor (ICF) and the Jaccard index (JI).

Material and Methods

Study area

Geographically, the study area was located in the northwest of Punjab Province geographically ranging at 71°48'45" E longitude and 32°40'10" N latitude, spreading over an area of 5.5 square kilometers. The valley is bounded by Salt Range Mountains and touches western border of Mianwali district (Fig. 1). Historical and scenic places of the Valley include Namal College Mianwali, Namal Dam, Namal Lake, Sulphur spring and shrines of Hafiz Jee and Khaki Shah. Namal valley is included among the oldest civilization in Pakistan. Rearing of cattle and goats provides a livelihood for the local people. Most part of the Valley is covered by forests and pastures. The climate of the Valley is characterized by cold, dry weather at high altitudes and humid, warm in low altitude-lying areas. Several native tribes with a rich historical background and that use the native medicinal flora and have their own traditional healers known as tabeeb or hakeem are in the Valley. These tribes are awan, malik, niazi, shah, mian etc. Climate variation and complex topography gives way to diverse flora and fauna in the Valley. Valley is carpeted with *Dodonaea viscosa*, *Prosopis glandulosa*, *P. juliflora*, *Tamarix aphylla*, *T. dioica*, *Tephrosia pupurea*, *Withania coagulans*, *Pluchea arabica*, *Pulicaria glutinosa* and *Rhazya stricta* in the low altitudes while *Acacia modesta* mixed with *Salvadora oleoides* are commonly seen in high altitudes. *Viola cinerea* and *Pseudogaiellonia hymnostephana* are among the rare taxa of the Valley that have also rare occurrence not only from the Pakistan but also globally (Shah et al., 2018).

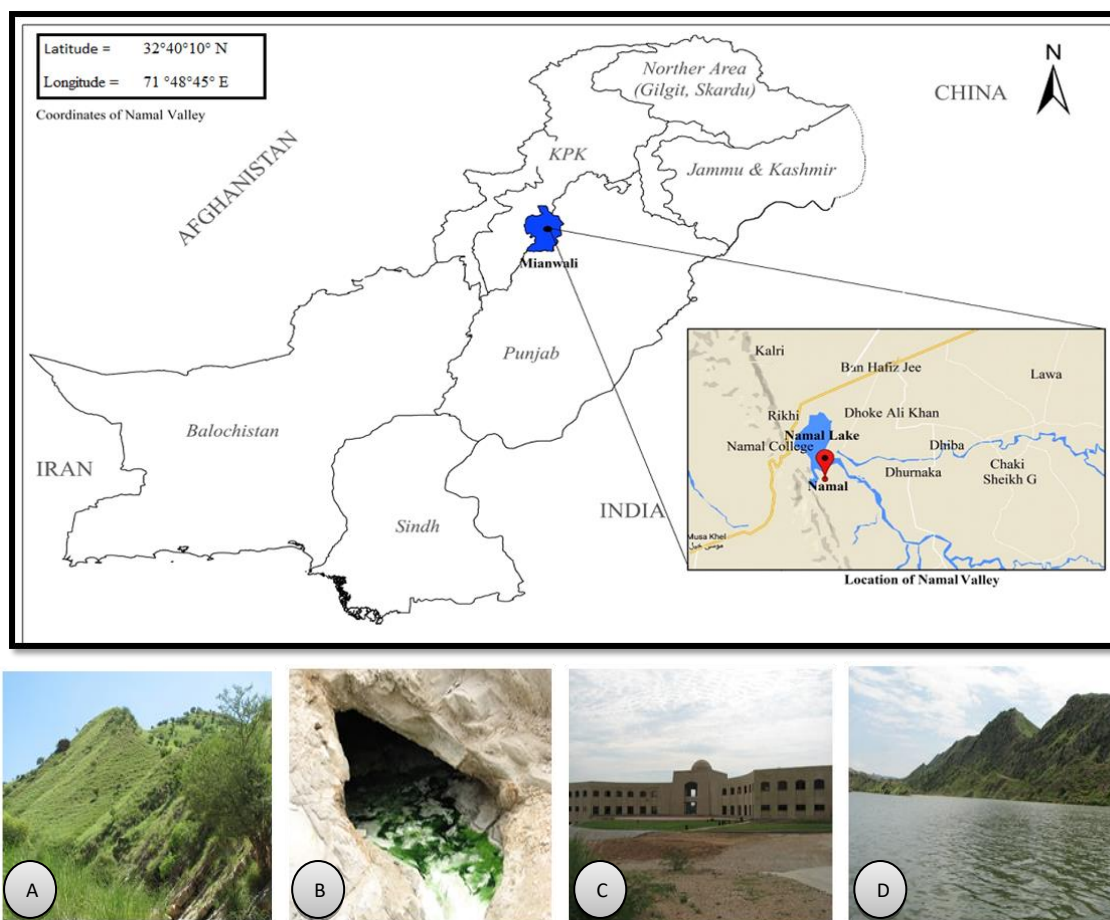





Figure 1. Map and Panoramic views of the Namal Valley





(A- Lush green scenic Valley hills; B- Sulphur Spring; C- Namal college; D- Namal Lake)





Ethnobotanical data collection





Data were collected from all the villages of the Valley from 2013-2016 representing all the seasons following the method of (Martin, 1985; Heinrich et al., 2009). A total of 16 field trips (representing all seasons) were carried out to collect plants and to document ethnobotanical information. Keeping in view the aim of quantitative approach to record ethnobotanical information, the participant observation method was used along with open-ended interviews and questionnaires. Knowledgeable people of the Valley including 12 traditional healers, shepherds, herbal medicinal venders, were consulted. The people in the local area speak Saraiki language and therefore, interviews were conducted in Saraiki language. All the documented data was later translated into English. A total of 350 informants (240 males and 110 females) of all group ages (25 to ≥ 65) were interviewed. Information regarding vernacular names, ethnobotanical uses etc. was recorded and the details are presented in *Table 1*.





Table 1. Ethnobotanical uses of plants in Namal Valley, Salt Range, Pakistan




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
1	<i>Abutilon indicum</i> (L.) Sweet/ Malvaceae SAN-SR-06	Shrub / W	Flower, leaves/ Decoction	Respiratory disorders, menstrual disorders	2	0.2	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
2	<i>Acacia modesta</i> Wall./ Fabaceae Phulahi SAN-SR-55	Tree/ W	Twigs, pods/ Raw, decoction	Gummosis, miswak sticks, toothache, diarrhea, Expectorant, Gynaecological problems	6	0.17	35	0.1	1*, 2 [▲] , 3*, 4*, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
3	<i>Acacia nilotica</i> (L.) Delile./ Fabaceae Kikar, Babool SAN-SR-64	Tree/ W	Twigs, pods / Raw, decoction	Gummosis, miswak sticks, toothache, Expectorant, Gynaecological problems	5	0.2	25	0.07	1*, 2*, 3*, 4*, 5 [▲] , 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
4	<i>Achyranthes aspera</i> L./ Amaranthaceae Puthkanda SAN-SR-45	Herb/ W	Whole plant/ Decoction	Cough, cold, febrifuge, menstrual problems, kidney pain	5	0.42	12	0.03	1*, 2*, 3*, 4 [▲] , 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23 [▲]	
5	<i>Adiantum capillus-veneris</i> L./ Pteridaceae Paersichhayon SAN-SR-33	Herb/ W	Whole plant/ Decoction	Hair tonic, febrifuge, respiratory problems	3	0.43	7	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
6	<i>Aerva javanica</i> (Burm.f.) Juss. ex Schult./ Amaranthaceae Bui SAN-SR-91	Herb/ W	Leaves/ Decoction	Skin problems, joint pain, vomiting, eye infection	4	0.2	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23 [▲]	
7	<i>Ageratum conyzoides</i> (L.) L. / Asteraceae Osarri SAN-SR-109	Herb/ W	Whole plant/ Decoction, juice	Skin problems, fever, cough	3	0.2	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9 [▲] , 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
8	<i>Ajuga bracteosa</i> Wall. ex Benth./ Lamiaceae SAN-SR-75	Herb/ W	Whole plant/ Decoction	Malaria fever, vomiting, headache	3	0.43	7	0.02	1*, 2 [▲] , 3*, 4*, 5 [▲] , 6 [▲] , 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
9	<i>Albizia lebbek</i> (L.) Benth./ Fabaceae Kala Shrin SAN-SR-145	Tree/ W,C	Leaves/ Decoction	Cardio tonic, diarrhea. Aphrodisiac, skin problems,	4	0.16	25	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
10	<i>Albizia procera</i> (Roxb.) Benth./ Fabaceae Safed shrin SAN-SR-139	Tree W,C	Leaves/ Decoction	Inflammation, menstrual problems, Hepatic pain , epilepsy	4	0.11	35	0.1	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
11	<i>Alhagi maurorum</i> Medik./ Fabaceae Oont katara SAN-SR-128	Shrub/ W	Pods, leaves	Piles, laxative, obesity	3	0.5	6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
12	<i>Aloe vera</i> (L.) Burm.f. Syn. <i>Aloe barbadensis</i> Mill./ Asphodelaceae Kowar gandali SAN-SR-100	Herb / W,C	Leaves/ Latex	Skin problems, febrifuge, malaria, inflammation, obesity, digestive problems	6	0.12	50	0.14	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
13	<i>Alternanthera pungens</i> Kunth/ Amaranthaceae Khaki booti SAN-SR-68	Herb/ W	Leaves/ Decoction	Menstrual disorders, febrifuge, body pain	3	0.23	13	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
14	<i>Amaranthus graecizans</i> L./ Amaranthaceae Mariერი SAN-SR-112	Herb/ W	Leaves/ Cooked	Laxative, gastrointestinal problems, galactagogue	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
15	<i>Amaranthus viridis</i> L./ Amaranthaceae Bathu SAN-SR-01	Herb/ W	Leaves/ Cooked	Laxative, gastrointestinal problems, respiratory disorders	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
16	<i>Anagallis arvensis</i> L./ Primulaceae Bili booti SAN-SR-118	Herb/ W	Whole plant/ Infusion	Depurative, skin problems, inflammation	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
17	<i>Anisomeles indica</i> (L.) Kuntze/ Lamiaceae Bili poodina SAN-SR-85	Herb/ W	Aerial parts/ Decoction	Malaria, gastrointestinal disorders, hypertension	3	0.17	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
18	<i>Argemone mexicana</i> L./ Papaveraceae Satia nasi SAN-SR-124	Herb/ W	Flower/ Infusion	Post-partum, menstrual problems, obesity,	3	0.27	11	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
19	<i>Arisaema tortuosum</i> var. <i>curvatum</i> (Roxb.) Engler/ Araceae Zahr mora SAN-SR-217	Herb/ W	Rhizome/ Raw, decoction	Snake bite, scorpion stings, antidote	3	0.23	13	0.04	1*, 2*, 3*, 4 [▲] , 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
20	<i>Arundo donax</i> L./ Poaceae Narrki SAN-SR-189	Herb/ W	Aerial parts/ Decoction	Fever, bloating, menstrual problems	3	0.42	7	0.02	1*, 2*, 3 [▲] , 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
21	<i>Asparagus capitatus</i> Baker/ Asparagaceae SAN-SR-210	Herb/ W	Whole plant/ Decoction	Body pain, fever, gastrointestinal problems	3	0.16	19	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
22	<i>Asphodelus tenuifolius</i> Cav./ Asphodelaceae Wassli SAN-SR-54	Herb/ W	Seeds/ Raw	Piles, febrifuge, anthelmintic, ring worm	4	0.18	22	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
23	<i>Azadirachta indica</i> A. Juss. / Meliaceae Neem SAN-SR-93	Tree/ W	Seeds stem Leaves, fruit/ Raw, smoke, infusion, decoction	Anthelmintic, cleaning teeth, Antidiabetic, chronic malaria, piles, chicken pox, skin problems	7	0.24	29	0.08	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
24	<i>Azolla pinnata</i> R. Br./ Saviniaceae SAN-SR-09	Fern/ W	Whole plant/ Poultice	Inflammation, wounds, skin burn	3	0.17	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
25	<i>Bacopa monnieri</i> (L.) Wettst./ Plantaginaceae Barhami booti SAN-SR-44	Herb/ W	Leaves, flowers/ Decoction	Mental disorders, anxiety, depression, tonic	4	0.25	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
26	<i>Barleria cristata</i> L. / Acanthaceae SAN-SR-161	Herb/ W	Aerial parts/ Decoction	Respiratory disorders, blood purifier	2	0.25	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
27	<i>Boerhavia procumbens</i> Banks ex. Roxb. /Nyctaginaceae It-sit SAN-SR-61	Herb/ W	Leaves/ Decoction	Poor appetite, febrifuge, snake bite, piles, diuretic	5	0.31	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
28	<i>Broussonetia papyrifera</i> (L.) Vent./ Moraceae Kagazi toot SAN-SR-214	Tree/ W	Leaves/ Infusion	Dysentery	1	0.5	2	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
29	<i>Calligonum comosum</i> L'Hér./ Polygonaceae Khippi SAN-SR-200	Shrub/ W	Leaves/ Decoction	Digestive problems, body pain, headache,	3	0.17	17	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
30	<i>Calotropis procera</i> (Aiton) Dryand/ Apocynaceae Akrra SAN-SR-16	Shrub/ W	Leaves, flower/ Latex	Snake bite, rheumatism, wound healing, febrifuge, mumps, toothache	6	0.13	45	0.13	1*, 2 [▲] , 3*, 4*, 5 [●] , 6*, 7*, 8 [●] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [●] , 18*, 19*, 20*, 21*, 22*, 23*	





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31	<i>Cannabis sativa</i> L./ Cannabaceae/ Bhang SAN-SR-22	Herb/ W	Leaves/ Raw, Decoction	Insomnia, hypertension, abdominal pain, toothache	4	0.16	25	0.07	1*, 2*, 3*, 4 [▲] , 5*, 6*, 7 [▲] , 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16 [▲] , 17*, 18*, 19*, 20*, 21*, 22*, 23*	
32	<i>Capparis decidua</i> (Forssk.) Edgew./ Capparaceae Karein SAN-SR-03	Tree/ W	Fruit, flower/ Raw, juice	Digestive problems, tonic, obesity	3	0.1	30	0.08	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
33	<i>Capparis spinosa</i> L./ Capparaceae SAN-SR-47	Shrub/ W	Stem, flower/ Juice	Toothache, abortifacient	2	0.25	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10 [▲] , 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
34	<i>Capsella bursa-pastoris</i> (L.) Medik./ Brassicaceae SAN-SR-102	Herb/ W	Leaves/ Paste, decoction	Skin problems, postpartum, cardiotoxic	3	0.16	19	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12 [▲] , 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





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35	<i>Caralluma tuberculata</i> N.E.Br./ Apocynaceae Chungan SAN-SR-134	Herb/ W	Whole plant/ Cooked, raw	Diabetes, blood purifier, skin problems,	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7 [▲] , 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
36	<i>Cardamine hirsuta</i> L./ Brassicaceae SAN-SR-27	Herb/ W	Aerial parts/ Decoction	Intestinal worms	1	0.33	3	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
37	<i>Cardaria draba</i> (L.) Desv./ Brassicaceae SAN-SR-190	Herb/ W	Aerial parts/ Infusion	Abdominal pain, vomiting,	2	0.33	6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
38	<i>Carthamus oxyacantha</i> M. Bieb./ Asteraceae Poli SAN-SR-212	Herb/ W	Leaves/ Decoction	Skin problems, febrifuge, wound healing	3	0.12	25	0.07	1, 2, 3, 4, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




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39	<i>Cenchrus echinatus</i> L./ Poaceae SAN-SR-24	Herb/ W	-----	-----	0		6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
40	<i>Centaurium pulchellum</i> (Sw.) Druce/ Gentianaceae SAN-SR-66	Herb/ W	Leaves/ Decoction	Fever, kidney pain, diuretic	3	0.18	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
41	<i>Ceratonia siliqua</i> L./ Fabaceae SAN-SR-125	Tree/ W	Seeds/ Decoction	Gastrointestinal problems, obesity	2	0.08	25	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
42	<i>Chenopodium murale</i> L./ Chenopodiaceae Dosaga SAN-SR-43	Herb/ W	Leaves/ Cooked	Digestive problems, menstrual problems	2	0.12	17	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	



Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
43	<i>Chenopodium album</i> L./ Chenopodiaceae Chulaii SAN-SR-122	Herb/ W	Leaves/ Cooked	Digestive problems, menstrual problems	2	0.12	17	0.05	1*, 2 [▲] , 3 [▲] , 4*, 5 [▲] , 6 [▲] , 7*, 8*, 9*, 10 [▲] , 11*, 12 [▲] , 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
44	<i>Chloris gayana</i> Kunth/ Poaceae Pankha Ghaas SAN-SR-148	Herb/ W	-----	-----	0		12	0.03	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
45	<i>Chrozophora tinctoria</i> (L.) A. Juss./ Euphorbiaceae Hathi sundi SAN-SR-81	Herb/ W	Flowers/ Infusion, decoction	Fever, stomach ache, vomiting, wound healing	4	0.22	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
46	<i>Cichorium intybus</i> L./ Asteraceae Kasni SAN-SR-101	Herb/ W	Aerial parts/ Decoction	Kidney pain, gallbladder stone, stomach ache	3	0.25	12	0.03	1*, 2*, 3 [▲] , 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
47	<i>Cirsium vulgare</i> (Savi) Ten./ Asteraceae Laih SAN-SR-133	Herb/ W	Seeds/ Raw	Tonic, obesity	2	0.28	7	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
48	<i>Cistanche tubulosa</i> (Schenk) Wight/ Orobanchaceae Khar ghainrr SAN-SR-56	Herb/ W	Whole plant/ Decoction	Aphrodisiac	1	0.2	5	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
49	<i>Citrullus colocynthis</i> (L.) Schrad./ Cucurbitaceae Tuma SAN-SR-147	Herb/ W	Seeds/ Raw	Diabetes, malaria, stomach problems	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
50	<i>Clematis grata</i> Wall./ Ranunculaceae SAN-SR-203	Shrub/ W	Leaves/ Paste, infusion	Skin problems, vomiting, body pain	3	0.33	9	0.02	1*, 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
51	<i>Clerodendrum phlomidis</i> L.f./ Lamiaceae SAN-SR-211	Shrub/ W	Leaves/ Decoction	Sore throat, respiratory problems	2	0.5	4	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
52	<i>Cocculus hirsutus</i> (L.) Diels/ Menispermaceae SAN-SR-174	Shrub/ W	Fruit/ Decoction	Malaria, body pain, obesity	3	0.43	7	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18 [▲] , 19*, 20*, 21*, 22*, 23*	
53	<i>Cocculus pendulus</i> (J.R.Forst. & G.Forst.) Diels/ Menispermaceae SAN-SR-215	Shrub/ W	Fruit/ Decoction	Malaria, body pain, obesity	3	0.37	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
54	<i>Coix lacryma-jobi</i> L./ Poaceae SAN-SR-79	Herb/ W	-----	-----	0	0	10	0.02	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
55	<i>Convolvulus arvensis</i> L./ Convolvulaceae Verri SAN-SR-10	Herb/ W	Whole plant/ Decoction	Wound healing, stomach problems	2	0.12	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
56	<i>Convolvulus prostratus</i> Forssk./ Convolvulaceae SAN-SR-13	Herb/ W	Whole plant/ Decoction	Wound healing, stomach problems	2	0.12	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
57	<i>Conyza canadensis</i> (L.) Cronquist./ Asteraceae Paleet SAN-SR-126	Herb/ W	Aerial parts/ Decoction	Dysentery, diarrhea	2	0.06	32	0.09	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
58	<i>Croton bonplandianum</i> Baill./ Euphorbiaceae SAN-SR-25	Herb/ W	Leaf, seeds/ Infusion, raw	Blood purifier, cardiotoxic, constipation	3	0.2	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
59	<i>Cucumis melo</i> var. <i>agrestis</i> Naudin/ Cucurbitaceae Chibbarr SAN-SR-80	Herb/ W	Fruit, seeds/ Raw,	Purgative, cooling effect, bloating, tonic	4	0.21	19	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
60	<i>Cuscuta reflexa</i> Roxb./ Convolvulaceae Akash-bail SAN-SR-07	Herb/ W	Whole plant/ Decoction	Gastrointestinal problems	1	0.5	2	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
61	<i>Cymbopogon commutatus</i> (Steud.) Stapf/ Poaceae Jangli lemon grass SAN-SR-157	Herb/ W	Aerial parts/ Decoction	Respiratory disorders, obesity, digestive problems, menstrual pain	4	0.17	24	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
62	<i>Cynodon dactylon</i> (L.) Pers./ Poaceae Tulla SAN-SR-166	Herb/ W	Leaves/ Decoction	Dysmenorrhea, vomiting, piles,	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
63	<i>Dactyloctenium aegyptium</i> (L.) Willd. / Poaceae Pankha Khabbal SAN-SR-153	Herb/ W	-----	-----	0	0	17	0.05	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
64	<i>Dalbergia sissoo</i> DC./ Fabaceae Shisham, Tahli SAN-SR-23	Tree/ W,C	Leaves, stem/ Juice, bark	Eye ailments, scabies, dysmenorrhea	3	0.10	29	0.08	1*, 2*, 3 [▲] , 4*, 5 [▲] , 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18 [▲] , 19*, 20*, 21*, 22*, 23*	
65	<i>Datura metel</i> L./ Solanaceae Dhatura SAN-SR-106	Herb/ W	Seeds/ Powder	Body pain, wound healing	2	0.08	25	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
66	<i>Desmostachya bipinnata</i> (L) Stapf./ Poaceae Dabb Ghaas SAN-SR-168	Herb/ W	-----	-----	0	0	22	0.06	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
67	<i>Dichanthium annulatum</i> (Forssk.) Stapf/ Poaceae SAN-SR-196	Herb/ W	-----	-----	0	0	4	0.01	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
68	<i>Dicliptera bupleuroides</i> Nees/ Acanthaceae SAN-SR-213	Herb/ W	Leaves/ Decoction	Stomach problems, constipation	2	0.33	6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22▲, 23*	
69	<i>Digera muricata</i> (L.)Mart./ Amaranthaceae Tandla SAN-SR-198	Herb/ W	Whole plant/ Cooked, juice	Urinary problems, constipation, inflammation	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20▲, 21*, 22*, 23*	
70	<i>Dodonaea viscosa</i> (L.) Jacq./ Sapindaceae Sanatha SAN-SR-204	Shrub/ W	Twigs, Leaves/ Infusion, raw	Skin problems, toothache, oral problems	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8▲, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17▲, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
71	<i>Echinops echinatus</i> Roxb./ Asteraceae SAN-SR-130	Herb/ W	Whole plant/ Decoction	Hepatitis, vomiting, nausea	3	0.2	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
72	<i>Eclipta prostrata</i> (L.)L./ Asteraceae Bhangra SAN-SR-132	Herb/ W	Aerial parts/ Decoction	Jaundice, cooling effect, constipation	3	0.33	9	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
73	<i>Ehretia obtusifolia</i> Hochst. ex A. DC./ Boraginaceae SAN-SR-36	Shrub/ W	Seeds, leaves/ Infusion, decoction	Fever, liver problems, body pain	3	0.2	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
74	<i>Eichhornia crassipes</i> (Mart.) Solms/ Pontederiaceae Gul-e-rana SAN-SR-74	Herb/ W	Flowers/ Infusion	Malaria, fever, body pain	3	0.3	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
75	<i>Ephedra foliata</i> Boiss. ex C.A.Mey. sy, <i>Ephedra ciliata</i> Fisch. & C.A.May. Ephedraceae SAN-SR-92	Shrub/ W	Aerial parts/ Decoction	Asthma, cough, bronchitis, flu, headache, sore throat	6	0.26	23	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
76	<i>Epilobium hirsutum</i> L./ Onagraceae SAN-SR-120	Herb/ W	Leaves/ Infusion	Eczema, skin allergy, wound healing	3	0.33	9	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
77	<i>Equisetum arvense</i> L./ Equisetaceae Naarri SAN-SR-34	Herb/ W	Whole plant/ Paste, infusion	Epistaxis, diabetes, skin problems	3	0.33	9	0.02	1*, 2▲, 3*, 4*, 5*, 6*, 7▲, 8*, 9*, 10*, 11*, 12▲, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
78	<i>Eruca sativa</i> Mill./ Brassicaceae Jhamayon SAN-SR-152	Herb/ W,C	Seeds/ Oil	Anti-lice, hair tonic, anti-allergic, inflammation, dandruff, itching	6	0.17	35	0.1	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
79	<i>Eucalyptus camaldulensis</i> Dehnh./ Myrtaceae Sufeda SAN-SR-15	Tree/ C	Leaves/ Decoction	Respiratory disorders, febrifuge, malaria, insect repellent, vomiting, nausea,	6	0.21	29	0.08	1*, 2*, 3*, 4*, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
80	<i>Euphorbia helioscopia</i> L./ Euphorbiaceae Chhatri dodak SAN-SR-04	Herb/ W	Leaves/ Latex	Warts	1	0.33	3	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
81	<i>Euphorbia heterophylla</i> L./ Euphorbiaceae SAN-SR-65	Herb/ W	Whole plant/ Infusion, paste	Scabies , warts,	2	0.66	3	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
82	<i>Euphorbia hirta</i> L./ Euphorbiaceae SAN-SR-154	Herb/ W	Whole plant/ Decoction	Cough, obesity, constipation, blood purifier	4	0.36	11	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
83	<i>Euphorbia peplus</i> L./ Euphorbiaceae SAN-SR-177	Herb/ W	Leaves/ Latex, infusion	Skin problems, wound healing, blood purifier, anti-allergic	4	0.25	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
84	<i>Euphorbia prostrata</i> Aiton/ Euphorbiaceae SAN-SR-206	Herb/ W	Leaves/ Decoction	Piles, constipation, gynecological problems	3	0.5	6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19 [▲] , 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
85	<i>Euphorbia serpens</i> Euphorbiaceae SAN-SR-171	Herb/ W	Whole plant/ Decoction	Skin problems, warts, asthma, cough,	4	0.33	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
86	<i>Evolvulus alsinoides</i> (L.) L./ Convolvulaceae SAN-SR-52	Herb/ W	Whole plant/ Decoction	Obesity, fever, hypertension	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
87	<i>Fagonia indica</i> Burm.f./ Zygophyllaceae/ Dhamasa SAN-SR-108	Herb/ W	Aerial parts/Decoction	Cooling effect, vomiting, bloating	3	0.3	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
88	<i>Ficus benghalensis</i> L./ Moraceae/ Borrh SAN-SR-140	Tree/ W,C	Leaves/ Latex	Chicken pox, small pox, piles	3	0.14	22	0.06	1 [▲] , 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20 [▲] , 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
89	<i>Ficus racemosa</i> L./ Moraceae Gular SAN-SR-73	Tree/ W,C	Fruit, leaves/ Raw, decoction	Gynecological disorders, diabetes, cough, fever	4	0.27	15	0.04	1 [▲] , 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20 [▲] , 21*, 22*, 23*	
90	<i>Ficus religiosa</i> L./ Moraceae Peepal SAN-SR-110	Tree/ W,C	Leaves/ Decoction	Sexual diseases, obesity, diabetes	3	0.17	17	0.05	1 [▲] , 2*, 3*, 4*, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16 [▲] , 17*, 18*, 19*, 20*, 21*, 22*, 23*	
91	<i>Ficus virgata</i> Reinw. ex Blume/ Moraceae Jangli Injeer SAN-SR-26	Tree/ W	Fruit, leaves/ Raw	Stomach ache, constipation, menstrual problems	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
92	<i>Filago hurdwarica</i> (Wall. ex DC.) Wagenitz/ Asteraceae SAN-SR-58	Herb/ W	Leaves/ Decoction	Sore throat, cough, fever, fatigue	4	0.26	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
93	<i>Forskaolea tenacissima</i> L./ Urticaceae Nettle SAN-SR-82	Herb/ W	Whole plant/ Decoction	Hypertension, ulcer, stomach ache	3	0.18	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
94	<i>Fumaria indica</i> (Hausskn.) Pugsley/ Papaveraceae Paaprra SAN-SR-135	Herb/ W	Flowers/ Infusion	Depurative, vomiting, jaundice, stomach ache	4	0.44	9	0.02	1*, 2▲, 3*, 4*, 5●, 6*, 7*, 8▲, 9*, 10*, 11●, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
95	<i>Galium aparine</i> L./ Rubiaceae SAN-SR-08	Herb/ W	Whole plant/ Tea, infusion decoction	Obesity, hypertension, skin problems, body pain	4	0.26	15	0.04	1*, 2*, 3*, 4▲, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12▲, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
96	<i>Gastrocotyle hispida</i> (Forssk.) Bunge/ Boraginaceae Khatol SAN-SR-113	Herb/ W	Leaves/ Decoction	Purgative, constipation, vomiting	3	0.37	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
97	<i>Geranium mascatense</i> Boiss./ Geraniaceae SAN-SR-129	Herb/ W	Aerial parts/ Decoction	Epilepsy, back ache, joint pain,	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
98	<i>Glandularia pulchella</i> (Sweet) Tronc. (Syn. <i>Verbena tenisecta</i> Briq.)/ Verbenaceae SAN-SR-136	Herb/ W	Whole plant/ Infusion	Hypertension, anxiety, fever	3	0.43	7	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
99	<i>Grewia optiva</i> J.R.Drumm. ex Burret/ Malvaceae SAN-SR-143	Tree/ W	Fruit/ Raw	Jaundice, digestive problems, tonic	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
100	<i>Grewia tenax</i> (Forssk.) Fiori/ Malvaceae Gungair SAN-SR-150	Shrub/ W	Fruit/ Raw	Jaundice, digestive problems, tonic	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
101	<i>Grewia villosa</i> Willd./ Tiliaceae SAN-SR-156	Shrub/ W	Fruit/ Raw	Jaundice, digestive problems, tonic	3	0.15	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14 [▲] , 15*, 16*, 17*, 18*, 19*, 20 [▲] , 21*, 22*, 23 [▲]	
102	<i>Gymnosporia spinosa</i> (Blanco) Merr. & Rolfe/ Celastraceae Pattassi SAN-SR-162	Shrub/ W	Seeds/ Ash	Toothache, oral infections	2	0.33	6	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
103	<i>Gynandropsis gynandra</i> (L.) Briq./ Cleomaceae Badal banga SAN-SR-11	Herb/ W	Aerial parts/ Juice	Epilepsy, menstrual pain, vomiting	3	0.33	9	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
104	<i>Heliotropium currasavicum</i> L. Boraginaceae SAN-SR-21	Herb/ W	Leaves/ Juice, decoction	Wasp bite, skin problems, cough	3	0.3	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
105	<i>Heliotropium europaeum</i> L./ Boraginaceae Hathi sundi SAN-SR-51	Herb/ W	Leaves/ Paste	Wound healing	1	0.33	3	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
106	<i>Hibiscus mutabilis</i> L./ Malvaceae Gul-e-ajab SAN-SR-69	Shrub/ W	Flowers, leaves/ Decoction	Cough, sore throat, body pain,	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
107	<i>Ipomoea carnea</i> Jacq./ Convolvulaceae Morning glory SAN-SR-97	Herb/ W	Leaves, flowers/ Decoction	Hypertension, asthma, anxiety	3	0.18	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
108	<i>Juncus elegans</i> Royle ex Sam./ Juncaceae Water Dila SAN-SR-78	Herb/ W	-----	-----	0	0	15	0.04	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
109	<i>Justicia adhatoda</i> L./ Acanthaceae Bhaikarr SAN-SR-20	Herb/ W	Flower/ Decoction	Cold, cough, body pain, headache	4	0.2	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
110	<i>Kickxia ramosissima</i> (Wall.) Janch./ Plantaginaceae SAN-SR-40	Herb/ W	Whole plant/ Decoction, paste	Febrifuge, body pain, inflammation	3	0.37	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
111	<i>Lactuca serriola</i> L./ Asteraceae SAN-SR-60	Herb/ W	----	----	0	0	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
112	<i>Lantana camara</i> L./ Verbenaceae Bhang SAN-SR-86	Shrub/ W	Leaves/ Infusion	Carminative, febrifuge, malaria, cough, cold	5	0.26	19	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16▲, 17▲, 18▲, 19*, 20▲, 21*, 22*, 23*	
113	<i>Lathyrus aphaca</i> L./ Fabaceae SAN-SR-121	Herb/ W	Leaves, seeds/ Infusion, raw	Hypertension, insomnia, fever	3	0.23	13	0.04	1*, 2*, 3*, 4*, 5▲, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
114	<i>Launaea capitata</i> (Spreng.) Dandy/ Asteraceae SAN-SR-142	Herb/ W	----	----	0	0	12	0.03	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
115	<i>Leptadenia pyrotechnica</i> (Forssk.) Decne/ Apocynaceae Khip SAN-SR-77	Shrub/ W	Leaves/ Decoction	Blood purifier, pimples, wound healing	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
116	<i>Leucaena leucocephala</i> (Lam.) de Wit./ Fabaceae Angrezi shareen SAN-SR-96	Tree/ W	Pods/ Decoction, raw	Skin problems, laxative, vomiting, colic	4	0.22	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
117	<i>Lindenbergia abyssinica</i> Hochst. ex Benth./ Scrophulariaceae SAN-SR-175	Herb/ W	Whole plant/ Decoction, infusion, juice	Stomach problems, epilepsy, body pain, headache	4	0.26	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
118	<i>Lindenbergia indica</i> Vatke/ Scrophulariaceae SAN-SR-207	Herb/ W	Whole plant/ Decoction, infusion, juice	Stomach problems, epilepsy, body pain, headache	4	0.26	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
119	<i>Linum strictum</i> L./ Linaceae Alsi SAN-SR-182	Herb/ W	Leaves/ Paste	Poultice, inflammation, skin irritation	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
120	<i>Maerua arenaria</i> Hook. f. & Thomson/ Capparaceae SAN-SR-201	Shrub/ W	Leaves, bark/ Decoction	Gynecological problems, blood purifier, pimples	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
121	<i>Malvastrum coromandelianum</i> (L.) Garcke/ Malvaceae SAN-SR-195	Herb/ W	Leaves/ Infusion	Diarrhea, vomiting, heart burn	3	0.16	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
122	<i>Marsilea quadrifolia</i> L./ Marsileaceae SAN-SR-188	Herb/ W	Whole plant/ Paste, decoction	Antidote, stomach problems, skin allergy	3	0.37	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
123	<i>Medicago sativa</i> L. Fabaceae Maina SAN-SR-202	Herb/ W	Flower/ Infusion	Hair tonic,	1	0.33	3	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
124	<i>Melilotus indicus</i> (L.) All./ Fabaceae Maina SAN-SR-216	Herb/ W	Whole plant/ Juice	Wasp bite, inflammation	2	0.12	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
125	<i>Mentha longifolia</i> (L.) L./ Lamiaceae Senji SAN-SR-89	Herb/ W	Whole plant/ Infusion, decoction	Gastrointestinal disorders, obesity, aphrodisiac, febrifuge,	4	0.09	45	0.13	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
126	<i>Merremia dissecta</i> (Jacq.) Hallier f./ Convolvulaceae SAN-SR-107	Herb/ W	Whole plant/ Decoction	Cough, fever, headache	3	0.6	5	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
127	<i>Millettia pinnata</i> (L.) Panigrahi/ Fabaceae Sukh chain SAN-SR-63	Tree/ W,C	Leaves/ Decoction	Febrifuge, respiratory disorders,	2	0.16	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
128	<i>Minuartia hybrida</i> (Vill.) Schischk./ Caryophyllaceae SAN-SR-41	Herb/ W	----	----	0	0	8	0.02	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
129	<i>Misopates orontium</i> (L.) Raf./ Plantaginaceae SAN-SR-32	Herb/ W	----	----	0	0	6	0.02	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
130	<i>Momordica balsamina</i> L./ Cucurbitaceae Jangli karela SAN-SR-37	Herb/ W	Fruit/ Raw	Diabetes, skin problems, blood purifier, stomach problems, throat infection, liver problems	6	0.24	25	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
131	<i>Monothecha buxifolia</i> (Falc.) A. DC./ Sapotaceae Gurgura SAN-SR-159	Tree/ W	Fruit/ Raw	Constipation, laxative, cooling effect, liver problems	4	0.2	20	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
132	<i>Moringa oleifera</i> Lam./ Moringaceae/ Sohanjna SAN-SR-103	Tree/ W,C	Pods, leaves/ Raw, powder	Skin problems, wounds, boils, depurative, febrifuge, jaundice, stomach problems	7	0.23	30	0.08	1 [▲] , 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20 [▲] , 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
133	<i>Morus alba</i> L./ Moraceae Safaid toot SAN-SR-146	Tree/ C	Fruit/ Raw	Laxative, expectorant, respiratory disorders, jaundice	4	0.12	33	0.09	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
134	<i>Morus laevigata</i> Wall. ex Brandis/ Moraceae Shah toot SAN-SR-149	Tree/ C	Fruit/ Raw	Laxative, expectorant, respiratory disorders, jaundice	4	0.18	22	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
135	<i>Morus nigra</i> L./ Moraceae Kala toot SAN-SR-209	Tree/ C	Fruit/ Raw	Laxative, expectorant, respiratory disorders, jaundice,	4	0.13	29	0.08	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
136	<i>Nannorrhops ritchieana</i> (Griff.) Aitch./ Arecaceae Mazri SAN-SR-186	Shrub/ W	Fruit, leaves/ Raw	Tonic	1	0.2	5	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
137	<i>Nelumbo nucifera</i> Gaertn./ Nelumbonaceae Kanwal SAN-SR-197	Herb/ W	Seeds/ Raw	Cardio tonic, cooling effect, hypertension	3	0.21	14	0.04	1 [▲] , 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
138	<i>Nerium oleander</i> L./ Apocynaceae Knair SAN-SR-181	Shrub/ W,C	Stem/ Latex	Snake, scorpion and wasp bite	3	0.07	40	0.11	1 [▲] , 2*, 3*, 4*, 5 [▲] , 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
139	<i>Ocimum americanum</i> L./ Lamiaceae SAN-SR-28	Herb/ W	Leaves, seeds/ Decoction, raw	Cough, malaria, depression, constipation	4	0.25	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
140	<i>Ocimum basilicum</i> L./ Lamiaceae Niazbo SAN-SR-57	Herb/ W,C	Leaves/ Decoction	Obesity, fever, hypertension, malaria, anxiety	5	0.15	32	0.09	1*, 2*, 3*, 4 [▲] , 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
141	<i>Olea ferruginea</i> Wall. ex Aitch./ Oleaceae SAN-SR-111	Tree/ W	Fruit/ Oil	Laxative, obesity, stomach ache, tonic, rheumatism	6	0.22	27	0.08	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11 [▲] , 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
142	<i>Opuntia dillenii</i> (Ker Gawl.) Haw./ Cactaceae SAN-SR-115	Shrub/ W	Fruit, leaves/ Juice, extract	Cooling effect, liver problems, inflammation	3	0.16	19	0.05	1 [▲] , 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23*	
143	<i>Otostegia limbata</i> (Benth.) Boiss/ Lamiaceae SAN-SR-205	Shrub/ W	Flowers, leaves/ Decoction, infusion	Hypertension, insomnia, cough, sore throat	4	0.33	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11 [▲] , 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
144	<i>Oxalis corniculata</i> L./ Oxalidaceae Khatti buti SAN-SR-169	Herb/ W	Whole plant/ Decoction	Digestive problems, nausea, vomiting, bloating	4	0.23	17	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20 [▲] , 21*, 22*, 23*	
145	<i>Oxalis corymbosa</i> DC./ Oxalidaceae SAN-SR-173	Herb/ W	Whole plant/ Decoction	Digestive problems, nausea, vomiting, bloating	4	0.23	17	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
146	<i>Papaver dubium</i> L./ Papaveraceae Jangli afyun SAN-SR-14	Herb/ W	Leaves, seeds/ Infusion, juice	Laxative, fatigue, insomnia, cooling effect, respiratory problems, tonic	6	0.26	23	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
147	<i>Parthenium hysterophorus</i> L./ Asteraceae Dhania booti SAN-SR-39	Herb/ W	Whole plant/ Paste, infusion decoction	Piles, poor appetite, gynaecological disorders	3	0.18	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
148	<i>Peganum harmala</i> L./ Nitrariaceae Harmal SAN-SR-67	Herb/ W	Seeds/ Powder	Piles, malaria, febrifuge, measles, gastrointestinal disorders	5	0.13	36	0.10	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
149	<i>Pentatropis spiralis</i> (Forssk.) Decne./ Asclepiadaceae SAN-SR-127	Liana/ W	Leaves/ Infusion	Blood purifier, antidote,	2	0.25	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
150	<i>Periploca aphylla</i> Decne./ Apocynaceae Batta SAN-SR-83	Shrub/ W	Aerial parts/ Decoction	Antitumor	1	0.2	5	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
151	<i>Persicaria glabra</i> (Willd.) M. Gomez/ Polygonaceae SAN-SR-138	Herb/ W	Leaves/ Infusion, decoction	Malaria fever, headache, body pain, fatigue	4	0.31	13	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
152	<i>Persicaria lapathifolia</i> (L.) Delabre (Syn. <i>Polygonum lapathifolium</i> L./ Polygonaceae SAN-SR-123	Herb/ W	Leaves/ Infusion, decoction	Malaria fever, headache, body pain, fatigue	4	0.28	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
153	<i>Phoenix sylvestris</i> (L.) Roxb. / Arecaceae Khajoor SAN-SR-95	Tree/ W	Fruit/ Raw, infusion	aphrodisiac, tonic, stomach problems, expectorant, gonorrhoea,	5	0.22	22	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
154	<i>Phragmites australis</i> (Cav.) Trin. ex Steud./ Poaceae Narri SAN-SR-35	Herb/ W	-----	-----	0	0	15	0.04	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
155	<i>Phyla nodiflora</i> (L.) Greene/ Verbenaceae Bhukkan SAN-SR-84	Herb/ W	Whole plant/ Decoction	Constipation, respiratory problems, skin problems,	3	0.3	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
156	<i>Physalis minima</i> L./ Solanaceae Jangli cherry SAN-SR-12	Herb/ W	Whole plant/ Powder, paste, infusion	Chest infections, cough	2	0.25	8	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
157	<i>Physorrhynchus chamaerapistrum</i> (Boiss.) Boiss./ Brassicaceae SAN-SR-19	Herb/ W	Whole plant/ Infusion, paste	Skin problems, headache	2	0.16	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	


Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
158	<i>Pistia stratiotes</i> L./ Araceae SAN-SR-208	Herb/ W	Leaves/ Decoction	Malaria, fever, headache, sore throat	4	0.30	13	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
159	<i>Plantago boissieri</i> Hausskn. & Bornm.L./ Plantaginaceae Jangli isabgol SAN-SR-179	Herb/ W	Husk	Digestive problems, cooling effect, obesity, poor appetite	4	0.33	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
160	<i>Pluchea arabica</i> (Boiss.) Qaiser & Lack/ Asteraceae SAN-SR-86	Herb/ W	Whole plant/ Decoction	Obesity, stomach ache, cough, fever	4	0.44	9	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
161	<i>Polygonum persicaria</i> L./ Polygonaceae SAN-SR-104	Herb/ W	Whole plant/ Decoction	Stomach pain, indigestion, vomiting	3	0.3	10	0.02	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
162	<i>Polygonum plebeium</i> R. Br./ Polygonaceae SAN-SR-17	Herb/ W	Whole plant/ Paste, decoction, infusion	Epilepsy, body pain, wound healing	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12 [▲] , 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
163	<i>Portulaca oleracea</i> L./ Portulacaceae Qulfa SAN-SR-53	Herb/ W	Leaves/ Cooked	Laxative, digestive problems, eczema	2	0.13	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9 [▲] , 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20 [▲] , 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
164	<i>Prosopis glandulosa</i> Torr./ Fabaceae Angrezi kikri SAN-SR-90	Shrub/ W	Pods/ Decoction	Gynaecological disorders	1	0.25	4	0.01	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
165	<i>Prosopis cineraria</i> (L.) Druce/ Fabaceae Jand, Jandi SAN-SR-119	Tree/ W	Leaves/ Smoke	ENT problems, inflammation,	2	0.16	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
166	<i>Prosopis juliflora</i> (Sw.) DC./ Fabaceae Kikri SAN-SR-18	Shrub/ W	Leaves, pods/ Decoction	Poultice, gynaecological disorders	2	0.08	23	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
167	<i>Pseudogaillonia hymenostephana</i> (Jaub. & Spach) Linchevskii/ Rubiaceae SAN-SR-49	Herb/ W	Whole plant/ Decoction	Malaria fever, fatigue, body pain, cough, cold	5	0.26	19	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
168	<i>Pulicaria glutinosa</i> (Boiss.) Jaub. & Spach/ Asteraceae SAN-SR-31	Herb/ W	Whole plant/ Smoke, infusion	Evil eye, measles, skin allergy, inflammation, malaria, blood purifier	6	0.35	17	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
169	<i>Punica granatum</i> L./ Lythraceae SAN-SR-71	Shrub/ W	Fruit, peel/ Juice, paste	Malaria, pimples, anemia, cooling effect, fatigue, weakness	6	0.24	25	0.07	1▲, 2▲, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18▲, 19*, 20*, 21*, 22▲, 23*	
170	<i>Pupalia lappacea</i> (L.) Juss./ Amaranthaceae Gol Puthkanda SAN-SR-76	Herb/ W	Leaves/ Paste	Wound healing	1	0.05	21	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17▲, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
171	<i>Ranunculus hispidus</i> Michx./ Ranunculaceae SAN-SR-176	Herb/ W	Whole plant	Vomiting, nausea, headache, fatigue	4	0.27	15	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
172	<i>Ranunculus muricatus</i> L./ Ranunculaceae SAN-SR-194	Herb/ W	Leaves/ Powder	Malaria	1	0.08	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
173	<i>Rhazya stricta</i> Decne./ Apocynaceae Weirran SAN-SR-46	Herb/ W	Leaves, stem/ Paste, miswak	Chronic wound healing, oral infection	2	0.12	17	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
174	<i>Ricinus communis</i> L./ Euphorbiaceae Harnoli SAN-SR-02	Shrub/ W	Seeds, leaves/ Oil, paste	Inflammation, abortion, hypertension, headache,	4	0.11	35	0.1	1 [▲] , 2 [●] , 3*, 4*, 5*, 6*, 7*, 8*, 9 [▲] , 10*, 11 [▲] , 12*, 13*, 14*, 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23 [●]	
175	<i>Ruellia nudiflora</i> (Engelm. & A. Grey) Urb./ Acanthaceae Pataki SAN-SR-05	Herb/ W	Flowers, leaves/ Decoction	Cancer, pain, cough, constipation,	3	0.11	27	0.08	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
176	<i>Ruellia tuberosa</i> L./ Acanthaceae SAN-SR-42	Herb/ W	Flowers, leaves/ Decoction	Cancer, pain, cough, constipation,	3	0.11	27	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
177	<i>Rumex dentatus</i> L./ Polygonaceae Jangli palak SAN-SR-38	Herb/ W	Leaves/ Raw, cooked	Skin problems, obesity	2	0.06	32	0.09	1*, 2 [▲] , 3*, 4*, 5 [▲] , 6*, 7*, 8*, 9*, 10*, 11*, 12 [●] , 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
178	<i>Rumex vesicarius</i> L./ Polygonaceae SAN-SR-70	Herb/ W	Leaves/ Decoction, paste	ENT problems, scorpion bite, wasp bite, indigestion,	4	0.15	26	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
179	<i>Saccharum bengalense</i> Retz./ Poaceae Kana SAN-SR-98	Herb/ W	-----	-----	0	0	19	0.05	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
180	<i>Saccharum revennae</i> (L.) L./ Poaceae Sarkanda SAN-SR-62	Herb/ W	-----	-----	0	0	13	0.03	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
181	<i>Saccharum spontaneum</i> L./ Poaceae Kahn SAN-SR-72	Herb/ W	-----	-----	0	0	20	0.05	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
182	<i>Salvadora persica</i> L./ Salvadoraceae Jaal, peelu SAN-SR-88	Tree/ W	Fruits, bark/ Raw, Decoction	Toothache, epilepsy, abortion	3	0.07	40	0.11	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14 [▲] , 15*, 16*, 17 [▲] , 18*, 19*, 20*, 21*, 22*, 23 [▲]	
183	<i>Salvia moorcroftiana</i> Wall. ex Benth./ Lamiaceae SAN-SR-99	Herb/ W	Leaves/ Poultice, decoction	Itching skin, kidney pain, colic, bloating	4	0.16	25	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12 [●] , 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
184	<i>Salvinia natans</i> (L.)All./ Salviniaceae SAN-SR-87	Herb/ W	Whole plant/ Poultice	Wound, inflammation, itching skin,	3	0.17	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
185	<i>Schweinfurthia papilionacea</i> (L.) Boiss./ Plantaginaceae SAN-SR-199	Herb/ W	Leaves/ Smoke, decoction	Skin allergy, cough, sore throat	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
186	<i>Senecio</i> sp./ Asteraceae SAN-SR-178	Herb/ W	-----	-----	0	0	4	0.01	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
187	<i>Sisymbrium irio</i> L./ Brassicaceae Khoob kalan SAN-SR-170	Herb/ W	Flowers/ Decoction	Chest infections, expectorant	2	0.08	23	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
188	<i>Solanum elaeagnifolium</i> Cav./ Solanaceae SAN-SR-192	Herb/ W	Fruits, flower/ Infusion	Analgesic, toothache, menstrual pain	3	0.14	22	0.06	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
189	<i>Solanum incanum</i> L./ Solanaceae SAN-SR-105	Herb/ W	Fruits, flower/ Infusion	Respiratory problems, gastrointestinal problems	2	0.14	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	





Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
190	<i>Solanum nigrum</i> L./ Solanaceae Mako SAN-SR-30	Herb/ W	Fruits, seeds/ Decoction	Hepatitis, respiratory problems, body pain	3	0.19	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
191	<i>Solanum surattense</i> Burm. f./ Solanaceae Mahorri SAN-SR-131	Herb/ W	Fruit/ Juice, raw	Respiratory problems, febrifuge, pain	3	0.19	16	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
192	<i>Solanum xanthocarpum</i> Schrad. & H. Wendl./ Solanaceae Mahorri SAN-SR-48	Herb/ W	Fruit, leaves/ Decoction, infusion	Cough, cold, malaria, headache, febrifuge	5	0.28	18	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	




Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
193	<i>Sonchus asper</i> (L.) Hill/ Asteraceae Dhodak SAN-SR-59	Herb/ W	Whole plant/ Decoction	Stomach ache, head ache, migraine	3	0.2	15	0.04	1*, 2*, 3 [▲] , 4*, 5 [▲] , 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
194	<i>Stellaria media</i> (L.) Vill./ Caryophyllaceae Banbatorr SAN-SR-50	Herb/ W	Aerial parts/ Paste, infusion	ENT problems, piles, jaundice	3	0.21	14	0.04	1*, 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
195	<i>Tamarix aphylla</i> (L.) H. Karst./ Tamaricaceae Khaggal SAN-SR-114	Tree/ W	Leaves/ Smoke	Measles, respiratory disorders, febrifuge, body pain	4	0.10	39	0.11	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
196	<i>Tamarix dioica</i> Roxb. Ex Roth./ Tamaricaceae Khaggal SAN-SR-94	Tree/ W	Leaves/ Smoke	Measles	4	0.09	42	0.12	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	



Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
197	<i>Taraxacum officinale</i> (L.) Weber F. H. Wigg./ Asteraceae Duddal SAN-SR-116	Herb/ W	Flower/ Infusion	Stomach problems, hepatitis,	2	0.09	22	0.06	1*, 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8 [●] , 9*, 10*, 11*, 12 [▲] , 13*, 14*, 15 [▲] , 16*, 17*, 18*, 19*, 20*, 21*, 22 [●] , 23*	
198	<i>Taverniera glabra</i> Boiss./ Fabaceae SAN-SR-117	Shrub/ W	Leaves, bark/ Decoction	Body pain, obesity, poor appetite	3	0.3	10	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
199	<i>Taverniera sparteae</i> (Burm.f.) DC./ Fabaceae SAN-SR-137	Shrub/ W	Stem/ Decoction	Cancer, blood purification, pimples	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	



Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
200	<i>Tecomella undulata</i> (sm.) Seem./ Bignoniaceae Roheerra SAN-SR-141	Tree/ W	Bark/ Decoction	Urinary problems,	1	0.08	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
201	<i>Tephrosia apollinea</i> (Delile) DC./ Fabaceae SAN-SR-144	Herb/ W	Pods, flower/ Decoction	Inflammation, toothache, respiratory problems	3	0.21	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
202	<i>Trianthema portulacastrum</i> L./ Aizoaceae It sit SAN-SR-151	Herb/ W	Leaves/ Juice	Antidote, gynaecological disorders, stomach problems, eye infections	4	0.14	28	0.08	1▲, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	

Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
203	<i>Tribulus terrestris</i> L./ Zygophyllaceae Bhakrra SAN-SR-155	Herb/ W	Aerial parts/ Decoction	Aphrodisiac, respiratory problems, febrifuge, headache, laxative	5	0.14	36	0.10	1 [▲] , 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
204	<i>Trichodesma indicum</i> (L.) Lehm./ Boraginaceae	Herb/ W	Leaves/ Decoction, infusion	Antidote, laxative, body pain, fever	4	0.2	20	0.05	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
205	<i>Typha angustata</i> Bory & Chaub./ Typhaceae Koondar SAN-SR-158	Herb/ W	Whole plant/ Decoction	Respiratory disorders, stomach problems, gynaecological problems	3	0.07	39	0.11	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
206	<i>Typha latifolia</i> L./ Typhaceae Koondar SAN-SR-165	Herb/ W	Whole plant/ Decoction	Respiratory disorders, stomach problems, gynaecological problems	3	0.07	38	0.11	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	

Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
207	<i>Urtica dioica</i> L./ Urticaceae Bichho bboti SAN-SR-167	Herb/ W	Flowers/ Infusion	Body pain, head ache	2	0.06	32	0.09	1*, 2 [▲] , 3*, 4 [▲] , 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15 [▲] , 16 [▲] , 17*, 18*, 19 [▲] , 20*, 21*, 22*, 23*	
208	<i>Verbascum thapsus</i> L./ Scrophulariaceae Kamla Tambaco SAN-SR-184	Herb/ W	Flowers/ Infusion	Headache, febrifuge, aphrodisiac, malaria, respiratory problems, gynaecological problems	6	0.26	23	0.06	1*, 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11 [▲] , 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
209	<i>Verbena officinalis</i> L./ Verbenaceae SAN-SR-183	Herb/ W	Leaves/ Decoction	Digestive problems, fever, menstrual problems	3	0.37	8	0.02	1*, 2 [▲] , 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
210	<i>Vernonia arabica</i> Boiss./ Asteraceae SAN-SR-163	Herb/ W	Aerial parts/ Decoction	Stomach ache, fever, colic, liver problems	4	0.28	14	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	

Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
211	<i>Vicia sativa</i> L./ Fabaceae Rewarri SAN-SR-180	Herb/ W	Aerial parts/ Decoction	Inflammation, back ache, skin problems	3	0.25	12	0.03	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
212	<i>Viola cinerea</i> Boiss/ Violaceae SAN-SR-172	Herb/ W	Whole plant/ Infusion, decoction	Blood purifier, malaria, gynaecological disorders	3	0.12	26	0.07	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	
213	<i>Withania coagulans</i> (Stocks) Dunal /Solanaceae Khamjeera SAN-SR-29	Shrub/ W	Fruit/ Raw, infusion	Depurative, gastrointestinal disorders, menstrual disorders, obesity, respiratory disorders	5	0.14	35	0.1	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	

Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
214	<i>Withania somnifera</i> (L). Dunal /Solanaceae Kutai lal SAN-SR-193	Herb/ W	Fruit/ Infusion	Abdominal pain, gastrointestinal problems, vomiting, skin problems, depurative, cough, cold, throat infections, insomnia	9	0.25	35	0.1	1*, 2 [▲] , 3, 4, 5 [▲] , 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13 [▲] , 14*, 15*, 16*, 17 [●] , 18*, 19*, 20*, 21*, 22 [▲] , 23 [●]	
215	<i>Xanthium strumarium</i> L./ Asteraceae Chhota Dhatura SAN-SR-187	Herb/ W	Leaves, aerial parts/ Infusion, powder	Oral infection, dysmenorrhea, hypertension, malaria	4	0.31	13	0.04	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8 [▲] , 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19 [▲] , 20*, 21*, 22*, 23*	

Sr. No.	Species/ Family Name/ Vernacular Name/ Voucher number	Habit /Type	Part(s) used/ Mode of utilization	Medicinal Value/ Disease treated	UR*	UV*	FC*	RFC*	Previous reports for comparison**	Picture
216	<i>Ziziphus mauritiana</i> Lam./ Rhamnaceae Beri SAN-SR-185	Tree/ W	Leaves, seeds, fruits/ Raw, paste	Tonic, laxative, hair tonic, gastrointestinal problems	4	0.1	40	0.11	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20▲, 21*, 22*, 23*	
217	<i>Ziziphus nummularia</i> (Burm.f.) Whigt. & Arn./ Rhamnaceae Karkinna SAN-SR-164	Shrub/ W	Fruits, leaves, seeds/ Raw, paste	Tonic, laxative, hair tonic, stomach problems	4	0.09	42	0.12	1*, 2*, 3*, 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*, 13*, 14*, 15*, 16*, 17*, 18*, 19*, 20*, 21*, 22*, 23*	

1= Yabesh et al. (2014); 2= Haq. (2012); 3= Khan et al. (2010); 4= Phondani et al. (2010); 5= Zabihullah et al. (2006); 6= Hazrat et al. (2011); 7= Khan and Khatoon (2008); 8= Amjad. (2015); 9= Jiofack et al. (2009); 10= Bano et al. (2014); 11= Ahmad et al. (2014); 12= Khan et al. (2013); 13= Belayneh et al. (2012); 14= Teklehaymanot and Giday. (2010); 15= Pieroni and Giusti. (2009); 16= Pradhan and Badola. (2008); 17= Shah and Rahim. (2017); 18= Tetali et al. (2009); 19= Ali and Qaiser. (2009); 20= Rasingam. (2012); 21= Sanz-Biset et al. (2009); 22= Sharma et al. (2004); 23= Teklehaymanot and Giday. (2010)

UR*: Use Report, UV*: Use Value, FC*: frequency of Citation, RFC*: Relative Frequency Citation

W; Wild, C; Cultivated

** (●) – Similar use, (▲) – Dissimilar use, (*) – Use not reported

Collection and taxonomic identification of plants

Plants were collected with the help of traditional healer and local respondents just after the formal and informal discussion on ethnobotanically important plants of the area. Local informants guided researchers to the natural habitat of the discussed species and in some cases also helped to collect voucher specimens. After recording information about plants, voucher specimen were pressed in the field and dried properly. Plants were identified following the Flora of Pakistan (Nasir and Ali, 1970-2001). The list of plant species used ethnobotanically in the area was checked and updated after verification from the online website (<http://www.theplantlist.org>) of the Royle Botanic Garden, Kew, assessed on April 3, 2014. Voucher specimens were preserved and deposited in the Herbarium of University of Sargodha for their taxonomic identification by comparison with specimen in the herbarium and for future reference.

Quantitative analyses of ethnobotanical data

Ethnobotanically important plant species were arranged in alphabetic order by botanical name, family, habit, parts used, modes of utilization and disease treated. Different quantitative indices including use value (UV), frequency of citation (FC), relative frequency citation (RFC), family importance value (FIV), informant consensus factor (ICF) and the Jaccard index (JI) were applied to analyze the documented data.

Use Value (UV)

The UV is a quantitative index used to determine the relative importance of an indigenous plant species. According to Phillips et al. (1994), the use value was calculated by using the formula :

$$UV = \sum U / n \quad (\text{Eq.1})$$

Where, “U” refers to the number of uses mentioned by the participant for a given species and “n” refers to the total number of informants interviewed that used the given species. High UV score indicates that there are many use reports for that plant and vice versa.

Frequency of Citation (FC) and Relative Frequency Citation (RFC)

The Frequency of Citation (FC) is number of informants mentioning the use of plant species.

Moreover, Relative Frequency Citation (RFC) index was evaluated by using the formula :

$$RFC = FC / N (0 < RFC < 1) \quad (\text{Eq.2})$$

N is the total number of informants participating in the study. The RFC index ranges from “0” when nobody referred to a plant as useful to “1” when all informants referred to as useful. (Vitalini et al., 2013).

Informant Consensus Factor (ICF)

Informant Consensus Factor (ICF) was calculated using the formula (Heinrich et al., 1998):

$$ICF = (Nur - Nt) / Nur - 1 \quad (\text{Eq.3})$$

Where, “Nur” refers to the total number of use reports mentioned for a particular disease category and “Nt” refers to the total number of plant taxa used for particular disease category. This formula was opted to find out the homogeneity in the ethnomedicinal information documented from the traditional informants.

To calculate ICF, reported medicinal plant species were grouped into 16 categories of various diseases reported in the study area by the informants. ICF is useful to focus and to determine the consistency of the data concerning certain sorts of disease categories (Canales et al., 2005; Heinrich et al., 1998). The result of this consensus ranges from 0 to 1. A high value (close to 1) predicts that plants are used by the high percentage of the informants for a number of illness related to that comprehensive category, whereas, the low value (close to 0) shows that the plants are selected arbitrarily for a few or a single complaint or that informants did not share or exchange facts and data about the usage of plants (Abu-Irmaileh and Afifi, 2003; Akerele, 1988; Kloutsos et al., 2001). Medicinal plants for which very few diseases are referred are supposed to be pharmacologically less active and thereby have low lower ICF values (Gazzaneo et al., 2005; Sharma et al., 2012; Teklehaymanot, 2009), *Table 2*.

Jaccard Index (JI)

Jaccard index is used to compare the reported data with that of other ethnobotanical studies conducted in other areas of Pakistan and abroad (González-Tejero et al., 2008). JI is calculated by using the formula :

$$JI = c \times 100 / a + b - c \quad (\text{Eq. 4})$$

Where, “a” is the recorded number of species of the study area “A”(Namal Valley) and “b” is the documented number of species of the area “B”. Where “c” is the number of species common to both “A” and “B”. As far as indigenous communities are concerned, “a” is the number of species reported by indigenous community “A”, “b” is the number of species cited by the indigenous community “B” and the “c” is the number of species reported by both “A” and “B” communities, *Table 2*.

Results

A total of 350 local informants were interviewed. The age of informants ranged from 25 years to above 65. Education wise, 24.3% informants were illiterate, 20% completed their five years education, 18.6% completed their eight years education and only 13.1% informants had higher education (University level). A total of 217 plant species belonging to 166 genera and 70 families were collected from the Valley. The ethnobotanical uses of plants (vernacular name, habit/type, part used/ mode of utilization, disease treated and other information like UR, UV, FC, RFC, previous report) are included in the *Table 1*. The highest number of reported species belong to family Fabaceae (19 species) followed by Asteraceae (18 species), Poaceae (13 species), Euphorbiaceae and Solanaceae (9 species each) and Lamiaceae and Moraceae (8 species each) etc. Most of the documented species were herbs (71%), followed by shrubs (15%) and trees (14%) (*Fig. 2*).

Table 2. Comparison of present study with previous reports at national and global level (JI*; Jaccard index)

Sr. No.	Reference	Valley name/ Region	No. of documented plant species	Plants with similar use	Plants with dis-similar use	No. of species common in both areas	%age of species common in both areas	Species enlisted only in aligned area	Species enlisted only in study area	%age of plants with similar use	%age of dis-similar uses	JI* ^(*)
1	Yabesh et al., 2014	Silent Valley/ Kerala, India	102	5	12	17	16.7	85	184	4.9	11.8	6.7
2	Haq, 2012	Allai Valley/ Western Himalaya Pakistan	172	15	17	32	18.6	140	169	8.7	9.9	11.5
3	Khan et al., 2010	Poonch Valley/ Azad Kashmir (Pakistan)	169	6	7	13	7.7	156	188	3.5	4.1	3.9
4	Phondani et al., 2010	Niti Valley/ Central Himalaya, India	86		8	8	9.3	78	193	0	9.3	3.04
5	Zabihullah et al., 2006	Kot Manzaray Baba Valley/ Malakand Agency, Pakistan	82	9	15	24	29.3	58	177	10.1	18.3	11.4
6	Hazrat et al., 2011	Dir Kohistan Valley/ Khyber Pukhtunkhwa, Pakistan.	40	1	2	3	7.5	37	198	2.5	5	1.3
7	Khan and Khatoon, 2008	Haramosh and Bugrote Valleys/ Gilgit, Pakistan	98	6	5	11	11.2	87	190	6.1	5.1	4.1
8	Amjad, 2015	Bana Valley/ Kotli, Pakistan	86	12	28	40	46.5	46	161	13.9	32.5	23.9
9	Jiofack et al., 2009	Upper Nyong Valley/ Cameroon	140	0	3	3	2.1	137	198	0	2.14	0.9
10	Bano et al., 2014	Skardu Valley/ karakoram-Himalayan range, Pakistan	50	1	2	3	6	47	198	2	4	1.2
11	Ahmad et al., 2014	Chail Valley/ Swat- Pakistan	50	6	4	10	20	40	191	12	8	4.5
12	Khan et al., 2013	Naran Valley/ Western Himalaya, Pakistan	101	4	6	10	9.9	91	191	3.9	5.9	3.7
13	Belayneh et al., 2012	Erer Valley/ Eastern Ethiopia	51	2	1	3	5.9	48	198	3.9	1.9	1.23
14	Teklehaymanot and Giday, 2010	Lower Omo River Valley/ Ethiopia	38	0	3	3	7.9	35	198	0	7.9	1.30
15	Pieroni and Giusti, 2009	Upper Varaita Valley/ Piedmont	88	0	3	3	3.4	85	198	0	3.4	1.07
16	Pradhan and Badola, 2008	Dzongu Valley/ North Sikkim, India	118	3	4	7	5.9	111	194	2.5	3.4	2.34
17	Shah and Rahim, 2017	Soon Valley/ Khushab, Pakistan	70	11	17	28	40	42	173	15.7	24.3	14.9
18	Tetali et al., 2009	Parinche Valley/ Maharashtra, India	28	0	5	5	17.8	23	196	0	17.8	2.34
19	Ali and Qaiser, 2009	Chitral Valley/ Pakistan	83	4	6	10	12.04	73	191	4.8	7.2	3.9
20	Rasingam, 2012	Pillur Valley/ Tamil Nadu, India	74	0	12	12	16.2	62	189	0	16.2	5.02
21	Sanz-Biset et al., 2009	Chazuta Valley/ Peruvian Amazon	289	1	0	1	0.3	288	200	0.3	0	0.20
22	Sharma et al., 2004	Parvati Valley/ western Himalaya, India	50	4	3	7	14	43	194	8	6	3.04
23	Teklehaymanot and Giday, 2010	lower Omo River Valley/ Ethiopia	57	2	4	6	10.5	51	195	3.5	7.01	2.5

The high numbers of species recorded in the present work were wild (92.6%). In the current study, the most frequent plant part used ethnobotanically by the local people was flowers (35%), followed by leaves (18%), whole plant (12%), pods (10%), twigs (8%), aerial parts (8%), rhizome and seeds (3% each), stem (1.6%) and fruit (1%) (Fig. 3). A total of 261 preparations were recorded and the most preferred method of preparation was decoction (41%), followed by infusion (18%), raw form (14%), paste (8%), juice (5%), cooked form (3%), latex, smoke, poultice and powder (2% each), oil, ash and extract (1% each) (Fig. 4).

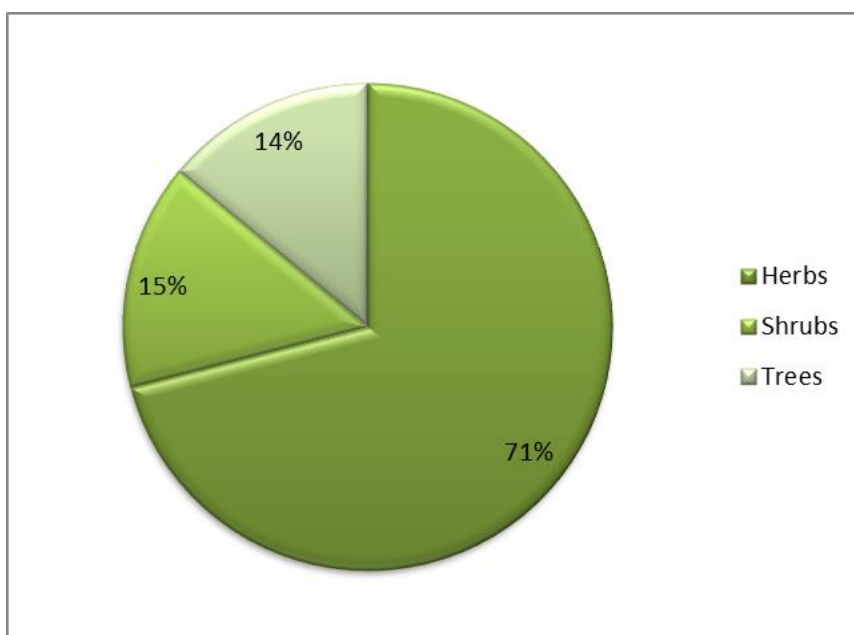


Figure 2. Life form of reported medicinal plants

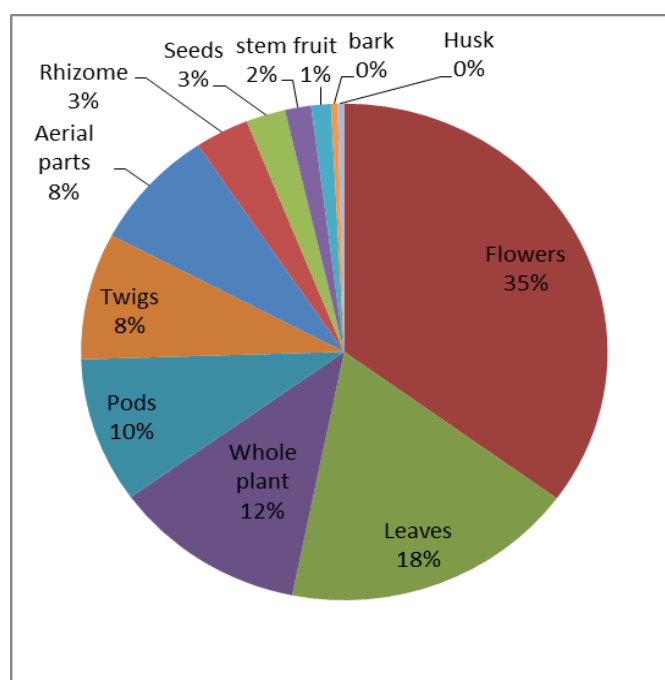


Figure 3. Percentage of part used of plant species

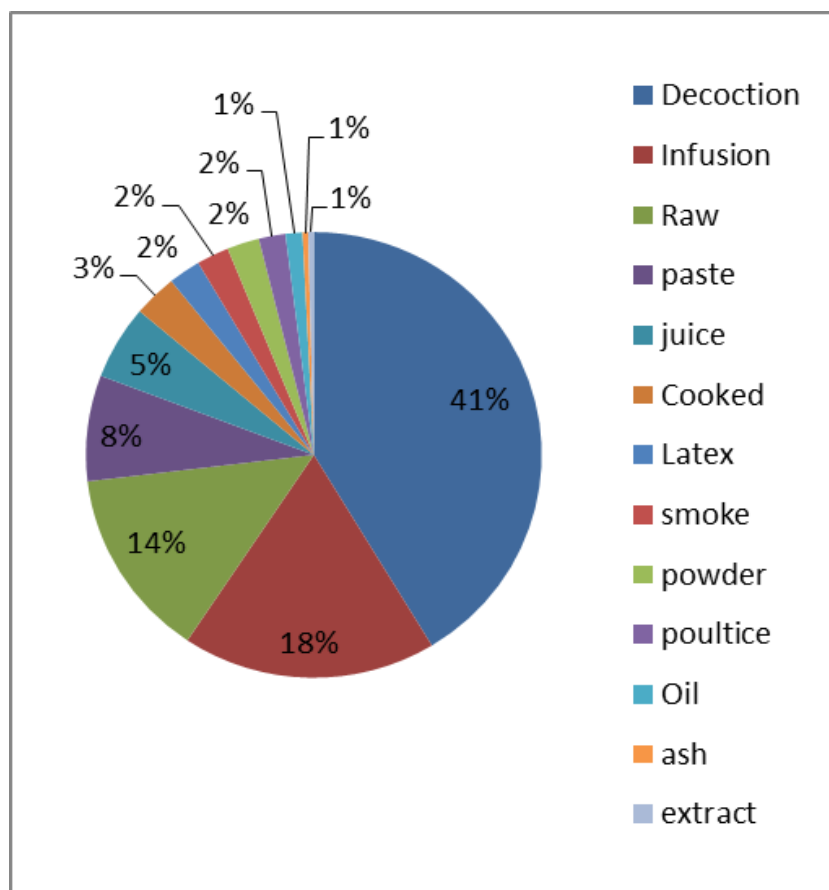


Figure 4. Percentage of mode of utilization

Discussion

Ethnobotanical knowledge plays an important role in exploring the human-plant relationship and medicinal uses of native flora. In this study possession of traditional knowledge about medicinal plants was found among the people with low level of education and among the age group of 46-<65. This is because inhabitants of the study area are mostly associated with rearing of animals and other depends on available land for farming, they have least concern about acquiring higher education. But due to intimate relation with nature they have enough knowledge about the use of these plants. On the other hand, the informants who are educated are unaware from the uses of plants because of least interaction with the nature.

Highest use report of plants belonging to Fabaceae and Lamiaceae is due to their dominance and wider occurrence as easily available plants are likely to be used frequently by local inhabitant (Agelet and Valles, 2001; Johns et al., 1990) Similar findings reported by Cornara et al., (2009); Giday et al., 2009; Saslis-Lagoudakis et al., 2011; Teklehaymanot, 2009). Moreover, the ascendancy of these families reveals the presence of a wide range of bioactive compounds in respective taxa belonging to these families. The diversity of bioactive compounds and secondary metabolites may be the reason for the multi-species use one or more health problems, as a single compound may not be the reason of efficacy (Verpoorte et al., 2005). The Poaceae had less aforementioned proceedings in ethno botanical investigations (Cakilcioglu and Turkoglu, 2010; Kadir et al., 2012; Rokaya et al., 2010) conducted at global level. In present study the reason of frequent use of family Poaceae is mainly the dependency of

locals for fuel (e.g., *Saccharum bengalense*, *S. revennae*, *S. spontaneum* etc.), thatching (*Arundo donax*, *Phragmites australis* etc.), forage (*Cymbopogon commutatus*, *Cynodon dactylon*, *Cenchrus echinatus*, *Chloris gayana*, *Coix lacryma-jobi*, *Dactyloctenium aegyptium*, *Desmostachya bipinnata*, *Dichanthium annulatum* etc.) and other ethnobotanical uses (medicinal) as compared to medicinal values, because lush herbaceous plants are abundant in study area. Such findings indicate great reliance of inhabitants on a diversity of plant species to treat ailments, and represent a good sign of the intense facts on plant based treatments (Nadembega et al., 2011). Among the reported plant species, some medicinal plants were of high indigenous priority thus are commonly cited by majority of the respondents. The highly cited medicinal plant species those having at least 32 citations or more (Table 1) were *Aloe vera*, *Calotropis procera*, *Mentha longifolia*, *Tamarix dioica*, *Ziziphus nummularia*, *Nerium oleander*, *Salvadora persica*, *Ziziphus mauritiana*, *Tamarix aphylla*, *Typha angustata*, *T. latifolia*, *Peganum harmala*, *Tribulus terrestris*, *Acacia modesta*, *Albizia procera*, *Eruca sativa*, *Ricinus communis*, *Withania coagulans*, *Withania somnifera*, *Morus alba*, *Conyza canadensis*, *Ocimum basilicum*, *Rumex dentatus* and *Urtica dioica*. These plants may reported frequently due to their abundance in the area and there is prevailing beliefs among the inhabitants to consider these plants medicinally effective, as majority of informants stated that maximum treatment were cured at domestic level because of unavailability of healthcare services and high cost of synthetic medications. The reason of frequent citation of these plants may be the presence of valuable and pharmacologically active bioactive compounds. Favorable climatic and topographic conditions of the study area might have positive contribution toward the rapid adaptation of herbaceous flora as compared to other life forms (Ayyanar and Ignacimuthu, 2011; Giday et al., 2003; Mesfin et al., 2012; Uniyal et al., 2006). According to most of the informants the fast restoration and higher potency of herbs is the main reason to have higher preferences for medicinal purposes and herbs are ephemeral in habit. Similar results were also discussed in previous documentations (Megersa et al., 2013; Upadhyay et al., 2010; Upadhyay et al., 2007). Herbs are rich in bioactive compounds (Srithi et al., 2009). The major use of flower is unique to this study when, compared with other ethnomedicinal studies (Rahman et al., 2016; Shah and Rahim, 2017) conducted in Pakistan. Local people believe that collecting a plant in flowering period is very important for the effectiveness of the formulation. This may be due to the richness of essential oils or the existence of bioactive compounds in flowers as compared to other parts. However, collection of premature flower and its excessive use may have negative impacts on plants sustainability. Furthermore, over-exploitation of seeds and roots for local uses can lead to a drastic decline in the populations of medicinal plants (Ghimire et al., 2008) and consequently an expatriation of medicinal species from the area. Therapeutic uses of leaves are defensible (Giday et al., 2003; Zheng and Xing, 2009) which is reported as the second highest part used in this study. Use of leaves in traditional medication is a common practice which is also reported in several other studies (Asase et al., 2010; Asase and Oppong-Mensah, 2009; Koudouvo et al., 2011; Nadembega et al., 2011; Nguta et al., 2010). The use of leaves may be of high preference due to its photosynthetic function and presence of secondary metabolites for defense from herbivores which could be medicinally important for curing various ailments in humans (Bhattarai et al., 2006; Ghorbani, 2005). In addition, leaf collection is ecologically sustainable and is easy to collect as compared to other plant parts (Giday et al., 2009).

Boiling the dried and stored plant parts for herbal preparation is considered more effective as compared to other methods. It is a general observation that heating process

speed up several biological reactions ensuring the extraction of countless vigorous compound (Al-Adhroey et al., 2010; Chen et al., 2008; Han et al., 2007; Zhang et al., 2005). Second rated mode of utilization reported in the area was infusion. Fresh and healthy plant parts are used for making infusions. Local people believe that infusion is one of the highly effective recipe which is easy to prepare and several effective compounds that plays a crucial role in the medication will not degraded during the process of preparation (Dike et al., 2012; Idowu et al., 2010). A handful amount (quantity that can be held or griped in a hand) of a patient is considered as an exact dose for medication from generation to generation. In the study area this is the most common way to measure a dose of drug required for different age groups from children to adults. Doses are taken twice or thrice a day depending upon the condition of the disease treated. Water was main and common solvent used in herbal remedies (Andrade-Cetto, 2009; Lee et al., 2008; Poonam and Singh, 2009; Prashanth et al., 2001; Ssegawa and Kasenene, 2007) since most of them were prepared as decoction or infusion. This practice is highly convenient because water is easily accessible, the easiest vehicle for herbal preparation and also expected not to disturb the chemical composition of the active constituents (Nunkoo and Mahomoodally, 2012). Some other ingredients sugar, salt, honey, olive oil, mustard oil and lemon are also added to improve the taste and to have additional effective that can help to reduce nausea, vomiting and constipation.

Quantitative analysis of ethnobotanical data

Use value (UV), Frequency of citation (FC) and Relative frequency citation (RFC)

Use value implies the relative significance of plant species on the basis of number of informants (FC) who mention the uses reported for respective plant species. The plant species with high UV (*Eq.1*) are suggested for further pharmacological and phytochemical screening to develop new drugs.

Relative frequency citation (RFC) (*Eq.2*) is a quantitative index that estimates the local reputation of every plant species used by the ethnic folks (Vitalini et al., 2013). It is calculated from Frequency of Citation (FC) divided by the total number of informants (N) who participated in the survey (Tardío and Pardo-de-Santayana, 2008) (*Table 1*).

The high RFC value suggests that these plants were known to majority of the informants. The high values of RFC help to identify species for which an appropriate conservation and sustainable utilization strategies should be formulated to ensure regular supply of raw materials for the future (Asase et al., 2005).

Comparison of different indices

Informant consensus factor (ICF) (*Eq.3*) values of reported medicinal plants were calculated for the categorized ailments (*Table 1*). Fifteen primary ailment categories were identified: *Table 3*. ICF values range from 0 to 0.7 (*Table 3*). Highest ICF value (0.7) was reported for oral and dental problems group, followed by respiratory problems (0.4), gastrointestinal problems, antidote and skin problems (0.3 each). The reason of high ICF could be the common happening of these illnesses in the community due to poor sanitation practice, low economic status and lack of adequate modern health care of in the Valley (Bieski et al., 2015). High ICF values undoubtedly disclose a noteworthy number of reports on the use of these taxa for a group of health problems (Baydoun et al., 2015). The slightest agreement among the informants was detected for plants used for group of sexual disorders, ear, nose and throat problems (ENT), eye ailments and other diseases which include pain, small pox, mumps, insect repellent, antitumor and anti-allergic, all these groups containing the zero ICF value. The least

value of ICF for ear, nose and throat problems (ENT) and eye diseases is in accordance with other studies (Bibi et al., 2015; Jamila and Mostafa, 2014). These low ICF values could be credited to the trend of folks in native or urban societies to use conventional medicines for curing predictable diseases, even in current times (Upadhyay et al., 2011).

Table 3. ICF Value of medicinal plants used for treatment of various diseases (ICF*=Informant Consensus Factor)

Disease category	No. of use reports	No. of taxa	ICF*
Respiratory problems	78	49	0.4
Urogenital diseases	9	7	0.25
Gastrointestinal problems	145	99	0.3
Musculoskeletal disorders	56	46	0.2
Sexual disorders	53	53	0
Skin problems	83	61	0.3
Glandular disorders	29	28	0.03
Antidote	22	16	0.3
Cardiovascular diseases	51	46	0.1
Neurological disorders	20	18	0.1
ENT problems	13	13	0
Eye ailments	3	3	0
Fever	68	55	0.2
Oral and Dental problems	19	7	0.7
Hair problems	6	5	0.2
Others	10	10	0

Comparative analysis of documented data with previous literature

To conclude whether the usage of plants by communities of Namal Valley were previously reported or not for medicinal value, a literature study on ethnobotanical use was done and comparative results are listed in *Table 1*. Twenty three research papers from different valleys were selected to compare the data and it was observed that various plants have novel use reports and some plant species like *Viola cinerea*, *Pulicaria glutinosa* and *Pseudogailonia hymnostephana* from the study area are reported for the first time and previously with no or rare use reports. In this study a total of 217 plant species were documented. Literature review of described medicinal plants have shown that the similarity of uses varies from 0% to 15.7%, while dissimilar uses range up to 32.5% (*Table 2*) (*Eq.4*). In our study high degree of similarity was found with studies directed in Bana Valley in Kotli, Pakistan by Amjad. (2015) and Soon Valley in Khushab, Pakistan by Shah and Rahim. (2017) with JI 23.9 and 14.9 respectively (*Table 2*). The cause of maximum similarity index may be the resemblance in plant diversity and their multipurpose uses against numerous health related problems in the study area. Noteworthy multiethnic discrepancy may be the cause of deviation in JI that are topmost symbolic of variation in habitation and populace (Leonti et al., 2009). The resemblance and inconsistency in ethnomedicinal studies appear to point out the significance of tribal wakefulness of medicinal plants in miscellaneous regions where chronological (Moerman, 1998) environmental (Ladio et al., 2007), phytochemical and organoleptic (Leonti et al., 2003) structures add in their assortment.

Limitations of the study, insights gained and approaches for improvements

This study was primarily aimed to document indigenous ethnobotanical knowledge of native communities of Namal Valley and evaluates their reliability within Pakistan and globally. However, few limitations still exists regarding sufficient interpretation of data. For example the native people have no acquaintance of common names/ vernacular names of some plant and similarly no report about their ethnomedicinal value and their use is confined to fuel, forage, thatching etc. Another obstruction of the study was that it did not investigate into the danger of invasive species and, documentation and dispersal of the introduced species.

Side effects of medicinal and other plants

In this study the documented ethnobotanical data generally elaborate the medicinal usage of the indigenous plant species, but it was observed that informants were much careful in using some of the plants such as *Achyranthes aspera*, *Calotropis procera*, *Cannabis sativa*, *Croton bonplandianum*, *Cuscuta reflexa*, *Datura metel*, *Dodonaea viscosa*, *Euphorbia helioscopia*, *E. heterophylla*, *E. hirta*, *E. peplus*, *E. prostrata*, *E. serpens*, *Heliotropium currasavicum*, *H. europaeum*, *Ipomoea carnea*, *Lantana camara*, *Lathyrus aphaca*, *Nerium oleander*, *Ricinus communis*, *Rhazya stricta*, *Solanum elaeagnifolium*, *S. xanthocarpum*, *S. nigrum*, *S. surattense*, *S. incanum*. The inhabitants are fully aware about the fact that these plants can cause symptom of toxicity including abortion, restlessness, depression, skin inflammation, vomiting, abdominal pain, nausea, impotency, sterility, dizziness and hallucination. People have a general knowledge about toxic signs and their interpretation of toxicity is based on the observation from generation to generation. Foremost taxonomic classification level for assessing the efficacy of plant to native societies is family (Thomas et al., 2009). Same is factual for the toxicity of plants (Huai et al., 2010). Fabaceae, Asteraceae, Euphorbiaceae and Apocynaceae have been described as the chief families comprising toxic plants in various studies (Levetin and McMahan, 2008; Huai et al., 2010; Ozturk et al., 2008). The reason of toxicity of these families is the presence of different toxins such as alkaloids, dicoumarin, glycosides, photosensitizing compounds, saponin, selenium (Fabaceae), acrid substances, alcohol, alkaloids, glycosides, nitrogenous compounds, photosensitizing compounds, saponins, selenium, volatile oils (Asteraceae), acrid substances, croton oil, photosensitizing compounds, biterpinoids, triterpenoids, steroids, alkaloids, cyanogenic glycosides and glucosinolates (Euphorbiaceae) and resin, glycosides (Apocynaceae) (Barla et al., 2006; Madureira et al., 2004; RIZK, 1987; Yamamura et al., 1989; Zhang and Guo, 2006). Further study of herbal toxicity in human is needed to certify safety and boost patient confidence about herbal remedies.

Conclusions and recommendations

This study exposed that traditional medication, mainly comprising the practice of medicinal plants playing a substantial role in curing the basic healthcare necessities of the inhabitants of Namal Valley, Pakistan. Usage of traditional medicine as a dominant part of their beliefs, inadequate access to recent health care conveniences and the cheerful prosperity of natural assets could be deliberated as the key influences for the prolongation of these traditional practices. The instant and thoughtful hazard to the native medicinal flora in the study area appears from the growing impact of overharvesting, overgrazing and deforestation due to human activities. There is dire necessity for thoughtful exertions to create awareness in the native people so that the

proper actions should be taken to protect the suitable surroundings/habitations mandatory to defend and conserve the medicinal plants in their natural ecosystems. Because of lack of written documents of conservation of plants and habitats, researches like this study is compulsory to protect primeval retentions, to encourage the flow of information to the younger generations, to preserve ethno-biodiversity and to deliver a beginning point for further pharmacological, biological and chemical investigations on medicinal objects.

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