

Full Length Research Paper

Traditional uses of medicinal plants of Nandiar Khuwarr catchment (District Battagram), Pakistan

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An ethno medicinal survey was carried out to collect information regarding the various traditional uses, especially the medicinal plant uses in Nandiar Khuwarr catchment. Floristically the area is placed in Western Himalayan Province. It is located on the western edge of Himalayas, dominated by Sino-Japanese type of vegetation. Aims of the study were to document the medicinal plant resources and their use patterns. A total of 156 taxa were reported as locally used for various medicinal purposes. Majority of the recipes are prepared in the form of decoction from freshly collected plant parts. Mostly a single species were used and mainly taken orally. All of these plants are collected from the wild, 12 of which are reported as scarce locally. They used medicinal plants for asthma, cough, tonic, abdominal pain, expectorant, anthelmintic, carminative, on boils, snakebites, jaundice, diarrhea and dysentery etc. Among 156 medicinal plants 22 were used for curing livestock. Field observation showed that vegetation of the area was generally threatened with the unwise of local communities. The trends like urbanization, deforestation, over grazing, habitat fragmentation, unscientific extraction of natural vegetation, introduction of the exotic taxa and habitat loss were the visible threats. Measures for the conservation of plant resources especially medicinal plants of Nandiar Khuwarr catchment are urgently needed.

Key words: Medicinal plant, Nandiar Khuwarr, Himalayas, conservation.

INTRODUCTION

Prehistoric people primarily depend on plants for their survival. In the beginning plant use was restricted to food, medicine and shelter but with the passage of time man explored the potential of plants for a number of other purposes. Hence, their dependency on plants increased both directly and indirectly. Wild plants have always been the matter of high concern and have always been used for their potential of human being (Ali et al., 2003). The knowledge of plants is based on trial and error. Consequently, the authentic knowledge of the uses of medicinal plants passed on from one generation to another, after refining and additions (Qureshi et al., 2010). With the passage of time wild plants were cleared from their original habitat to replace the desired cultivated crops on large scale. This practice has always been affected by

the availability of plants in their natural habitat and the way these resources are used by the local people are imperative. In developing countries medicinal plants provide a real alternative for primary health care system. According to an estimate between 35,000 and 70,000 plant species are used in folk medicine worldwide (Ali and Kaiser, 2009). Products from hundreds of species are being collected from remote forests and meadows and traded to international markets and consumed (Olsen, 2005). These harvests provide an important source of income to huge number of rural households. About 70 to 80% of the world population use traditional medicine for curing their illness and ailments (Fransworth and Soejarto, 1991). The percentage of people using traditional medicine decreased in developed countries (Titz, 2004) due to the availability of health facilities. In Himalayan mountains, certain areas are yet to be documented in the indigenous uses of medicinal plants (Ali and Kaiser, 2009). One of such area is Nandiar Khuwarr

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catchment western Himalaya. A detailed checklist of vascular flora of this valley has been recently prepared (Ahmad et al., 2010). Present study was there-fore carried out to document the indigenous knowledge of medicinal plants of Nandiar Khuwarr catchment and provide scientific basis for further research.

The study area

The Nandiar Khuwarr catchment is located in the Western Himalayan Province between 34° 33' and 34° 47' N and 72° 55' and 73° 14' E with a total area of 37521 ha. The Nandiar Khuwarr catchment is bounded by Allai valley in the north, by Siran valley in the east, by the Konsh and Agror valleys in the south and by the Black mountain and river Indus in the west. Nandiar Khuwarr catchment can be categories into agricultural land, wasteland, forest and alpine meadows. Total population of Nandiar Khuwarr catchment is 225782 (Anonymous, 1998; Ahmad et al., 2010).

The Nandiar Khuwarr catchment is mostly mountainous ranging in altitude from 525 m at Thakot to 3817 m above mean sea level at Malkisar. The area is generally rough and mountainous having variable slopes from gentle to precipitous. Conditions of altitude, aspect, disposition of mountain ranges and prevailing wind currents in the Nandiar Khuwarr catchment area results in climates varying from sub tropical at the base of the hills to "alpine" conditions prevailing in the higher reaches.

Swatis, Khankhel, Akhunkhel, Syeds and Gujars inhabit Nandiar khuwarr catchment with a small population of Kashmiries and Kohistanies. The entire population of the tract is Muslim with the exception of only a few Hindu (Sikh) families in Shamlai and Battagram. Majority of the people are dependent on agriculture as a first source of livelihood, followed by pasture animal husbandry. They grow rice, maize, wheat, red beans and vegetables. Beside agriculture, labor, remittances and livestock are also major sources of income. The people belonging to this area are generally poor; nearly 51% income comes from agriculture, 12% from livestock, 9% from forest, 9% from labor, 4% from services and 15% from remittances.

The catchments area of Nandiar Khuwarr, a tributary of River Indus, occupies sub valleys like Nandiar, Hill, Deshan, Tikri and Thakot. All the small streams coming from sub valleys join the main Nandiar Khuwarr at different locations, which runs from northeast of Hillian and flows across the Hill and Battagram arty to join River Indus at Thakot. The nullahs, which feed the main stream, are Nilban, Hill, Shahkhel, Doba, Kakarshung, Largram, Nilishang and Tikri Khwars (Anonymous, 1998; Muhammad, 2003; Ahmad et al., 2010)

Specific objectives of the study were:

(i) To explore the medicinal plants of Nandiar Khuwarr

catchment.

(ii) To collect information regarding to the plant uses, rate of consumption and rate of availability of medicinal plants.

(iii) To recommend ways for sustainable utilization of the local resources and to provide basis for further research.

MATERIALS AND METHODS

The study focused on Nandiar Khwar and its catchments area. Field trips to various parts of the selected area were undertaken from 1st May, 2008 to 30th May, 2010 to collect the information and specimens to be used for future reference. Fieldwork was carried out in order to explore medicinal plant diversity. Plant specimens were collected along with extensive fields notes including habit, habitat, lifeform, abundance, GPS value etc (Ali and Qaiser, 2009). For each plant, ethnobotanical information was collected from people of different ages belonging to different sub localities.

During the interviews, semi-structured questionnaire was developed as per modification from Lipp (1989) and Ali and Qaiser (2009). Field numbers were allotted to the specimens and field data. Scientific names, vernacular names, family and other relevant information were recorded properly. The plant material were pressed, poisoned, mounted on standard size herbarium sheets and preserved in Herbarium Hazara University (HHU). The specimens were identified through the flora of Pakistan (Nasir et al., 1970 - 2009. Fascicle series 1 - 217).

RESULTS

Total of 156 taxa are recorded for their ethno botanical uses, belonging to 130 genera and 86 families. Among them fungi was represented by single-family Helvelaceae with one species, Pteridophytes by 3 families and 5 species, Gymnosperms by 3 families and 5 species and Angiosperms by 79 families and 145 species.

According to field observations, 12 taxa viz., *Acer caesium*, *Betula utilis*, *Pistacea integerrima*, *Cornus macrophylla*, *Paeonia emodi*, *Cedrus deodara*, *Skimmia laureola*, *Taxus wallichiana*, *Aesculus indica*, *Dioscorea deltoidea*, *Rhododendron arboreum*, *Podophyllum emodi* and *Viola canescens* are extensively exploited by the local people for their various ethnobotanical uses. Due to over exploitation by the local people, a drastic decrease has been observed in the population of these taxa in the wild. These taxa deserve special attention on urgent basis, as their populations have alarmingly decreased in the wild.

Beside these medicinal plants certain other plants such as *Quercus glauca*, *Ulmus wallichiana*, *Vescum album* and *Opuntia dillenii* are also at the verge of extinction. Unsustainable means of collection and ignorance of the people regarding the rarity of these taxa are the main causes of depletion of their population in the wild. Conservation measures should be adapted immediately to protect these taxa from becoming extinct, and the medicinal flora of the study area are found in Table 1.

Table 1. Medicinal flora of the study area.

S/N	Botanical name	Local name	Family	Part used	Medicinal uses
1	<i>Abies pindrow</i> Royle.	Achal	Pinaceae	Dried shoots, Fresh leaves	Cough, asthma and other chest infection
2	<i>Acacia modesta</i> Wall.	Palosa	Mimosaceae	Gum	General tonic for backache and weakness
3	<i>Achillea millefolium</i> Linn.	Qarqar/ Dambrai	Asteraceae	Whole plant	Stimulant, tonic, diaphoretic and antipyretic
4	<i>Achyranthus aspera</i> Linn.	Geshay	Amaranthaceae	Fresh leaves Fruits and Roots	Expectorant and anthelmintic
5	<i>Acorus calamus</i> Linn.	Skhawaja	Araceae	Rhizome	Dysentery and diarrhea
6	<i>Adiantum capillus veneris</i> Linn.	Babozea	Adiantaceae	Whole plant	Hypertension
7	<i>Adiantum incisum</i> Forssk.	Babozea	Adiantaceae	Fronds	Skin diseases, cough and cold
8	<i>Adiantum venustum</i> D. Don.	Babozea	Adiantaceae	Whole plant	Expectorant, hypothermic, diuretic and in stomachache
9	<i>Aesculus indica</i> (Wall. ex. Camb.) Hook.f.	Banakor	Hippocastinaceae	Seeds	Anthelmintic and jaundice
10	<i>Ajuga bracteosa</i> Wall. ex Benth.	Yakhboti	Labiatae	Fresh leaves	Jaundice, hypertension and in sore throat
11	<i>Albezia lebbeck</i> J. L. Stewart	Srikh	Mimosaceae	Bark	Diarrhea and dysentery
12	<i>Allium filidens</i> Regel.	Oogakay	Alliaceae	Fresh leaves	gastrointestinal disorders and stomachache
13	<i>Amaranthus caudatus</i> Linn.	Chalera	Amaranthaceae	Shoots	Cough and asthma
14	<i>Amaranthus viridus</i> Linn.	Ganhar	Amaranthaceae	Leaves,Roots	Boils and scorpion sting
15	<i>Arisaema flavum</i> Forssk.	Marjarai	Araceae	Fruits	Cough and cold
16	<i>Artemisia</i> spp.	Tarkha, Jau,	Asteraceae	Leaves, Inflorescence	Stimulant, anti mycotic, urinary tract infections and anthelmintic
17	<i>Asparagus officinalis</i> Linn.	Tindoray	Asparagaceae	Shoots	Promoting lactation
18	<i>Berberis lycium</i> Royle.	Kwaray	Berberidaceae	Bark	General body tonic, astringent, and antiseptic
19	<i>Bergenia ciliata</i> Sternb.	Gut panra	Saxifragaceae	Rhizome	General body tonic, stomachache and duodenal ulcers
20	<i>Betula utilis</i> D. Don.	Broj	Betulaceae	Bark	In various recipes and for amulet
21	<i>Caesalpinia decapitala</i> (Roth) Alston.	Jara	Caesalpinaceae	Young shoots	Analgesic and antipyretic
22	<i>Calotropis procera</i> (Wild.) R. Br.	Spalmay	Asclepiadaceae	Fresh leaves, Latex	Poultice on dog bitten wounds and ringworm diseases
23	<i>Caltha alba</i>	Makan path	Ranunculaceae	Flowering shoots	Laxative

Table 1. Contd.

24	<i>Cannabis sativa</i> Linn.	Bhang	Canabinaceae	Flowering shoots	Sedative, anodyne and narcotic
25	<i>Cedrella serrata</i> Royle	Meem	Meliaceae	Whole plant, Leaf extract	Poisonous. For curing roundworms
26	<i>Cedrus deodara</i> Roxb. ex Lamb.	Ranzrah	Pinaceae	Wood extract	Anthelmintic
27	<i>Celtis australis</i> Linn.	Batkar	Ulmaceae	Fruits, Bark	Colic, amenorrhea and anti allergic
28	<i>Cephalanthera longifolia</i> (L) Fritsch		Orchidaceae	Rhizome	Promoting lactation
29	<i>Chenopodium album</i> Linn.	Bathu	Chenopodiaceae	Whole plant	Abdominal pains and diuretic
30	<i>Cichorium intybus</i> Linn.	Kasni	Asteraceae	Roots	Abdominal pain
31	<i>Cissampelos pareira</i> Linn.	Gorisum	Menispermaceae	Leaves	To livestock for diarrhea
32	<i>Clematis grata</i> Wall.	Chinjan-oly	Ranunculaceae	Shoots	Antimycotic, ring worm and baldness
33	<i>Clematis montana</i> Buch.	Chenjan-olay	Ranunculaceae	Flowers	Cough
34	<i>Convolvulus arvensis</i> Linn.	Ellay	Convolvulaceae	Roots	Purgative
35	<i>Corydalis stewartii</i> Fedde.	Mamera	Fumariaceae	Floral drops	Eye diseases
36	<i>Cotinus coggyria</i> Scop.	Chamy-arlakhta	Anacardiaceae	Leaves	To livestock against liver fluke
37	<i>Cotoneaster microphylla</i> Wall. ex Lindl.	Kharawa	Rosaceae	Fruit	Expectorant, astringent and stomachache
38	<i>Cotoneaster nummularia</i> Fish.	Mamana	Rosaceae	Fruit	Astringent
39	<i>Crataegus songarica</i> C. Koch.	Batsinga	Rosaceae	Fruits	Cardio tonic
40	<i>Cuscuta gigantea</i> Griff.	Akasbail	Cuscutaceae	Juice of plant	Anti poisonous agent
41	<i>Cynodon dactylon</i> Linn.	Kabal	Poaceae	fresh leaves	Applied on cuts and bleeding wounds, bleeding piles diuretic, antipyretic and diarrhea
42	<i>Dalbergia sisso</i> Roxb.	Shawa	Papilionaceae	Leaves	Stimulant, gonorrhoea, astringent, alterative, leprosy, boils and vomiting
43	<i>Daphne oloides</i> Schreb.	Kutilal	Thymalaceae	Seeds, Roots	Anthelmintic
44	<i>Daphne papyracea</i> Wallich .ex Steud.	Jangali Kutilal	Thymalaceae	Leaves	Kill the ecto parasites of livestock
45	<i>Datura innoxia</i> Miller.	Baturai	Solanaceae	Leaves, Seeds	Cutaneous affection of the head and employed in fever
46	<i>Datura stramonium</i> Linn.	Datura	Solanaceae	Leaves, Flower	Softening of the boils and earache
47	<i>Debregessia salcifolia</i> (D. Don.) Rendle.	Ajlai	Urticaceae	Leaves	Antiseptic, boils and other swellings
48	<i>Delphinium vestitum</i> Wall.ex Royle		Ranunculaceae	Flower	Hair tonic
49	<i>Descurainia sophia</i> (L.) Webb. and Berth.	Khoob kalan	Brassicaceae	Shoots, Seeds	Gas trouble, intestinal disorders and painkiller

Table 1. Contd.

50	<i>Desmodium elegans</i> D. C.	Jamkat	Papilionaceae	Root	Carminative, tonic, diuretic, chronic fever, cough, vomiting, asthma, and in snakebite
51	<i>Deutzia staminea</i> R. Br .ex Wall.	Boritus	Philadelphaceae	Whole plant	Remove the fleas from houses
52	<i>Dioscorea deltoidea</i> Wall.	Kanis zela	Dioscoreaceae	Tuber, Leaves	Jaundice, applied in hair to kill lice and to kill fishes
53	<i>Diospyros lotus</i> Linn.	Tor amlok	Ebenaceae	Fruits	Carminative, purgative, anti febrile, constipation and dysentery
54	<i>Dodonaea vescosa</i> (L.) Jacq.	Ghwara-sky	Sapindaceae	Whole plant	Astringent, anti rheumatic, aromatic, in swelling and burns
55	<i>Dryopteris jaxtapostia</i> Chirst.	Kuanjay	Dryopteridac-eae	Fronds	Enhance digestion
56	<i>Elaegnus umbellata</i> Thunb.	Ghanam-ranga	Elagnaceae	Flowers, Seeds	Stimulant, astringent and pulmonary infections
57	<i>Equisetum arvense</i> Linn.	Bandaky	Equisetaceae	whole plant	Jaundice
58	<i>Euphorbia indica</i> Lam.	Jangali Spalmai	Euphorbiaceae	Milky juice	Ringworm disease
59	<i>Euphorbia wallichii</i> Hook. f.	Hirvi	Euphorbiaceae	Whole plant	Poisonous, highly laxative causes sever diarrhea and dysentery. Used in skin diseases
60	<i>Ficus carica</i> Forsk.	Inzar	Moraceae	Fruit, Latex	Demulcent and for drawn prickle
61	<i>Ficus palmata</i> Forsk.	Inzar	Moraceae	Fruit	Laxative, demulcent, constipation and piles
62	<i>Ficus racemosa</i> Linn.	Oormal	Moraceae	Leaves, Root, Fruits	Astringent, dysentery, diabetics, carminative and astringent
63	<i>Foeniculum vulgare</i> Miller.	Saunf	Apiaceae	Fruits	Carminative, purgative, stomach disorders and in fever
64	<i>Fragaria nubicola</i> Lindl.	Budhi maiwa	Rosaceae	Fruit, Leaves	Carminative, stomach ulcers and antiseptic
65	<i>Fumaria indica</i> (Husskin) H. N.	Papra	Fumariaceae	Whole plant	Alterative, diuretic, anthelmintic, diabetics and in constipation
66	<i>Gallium aparine</i> Linn.	Cochna	Rubiaceae	Leaves	Jaundice
67	<i>Gentianodes pedicellata</i> D. Don.	Nilkant	Gentianaceae	Root	Urinary tract infections and stomachic
68	<i>Geranium wallichianum</i> D.Don.	Ratanjot	Geraniaceae	Root	General body tonic

Table 1. Contd.

69	<i>Grewia optiva</i> Drum. ex Burret.	Pastaw-onay	Tiliaceae	Bark, Leaves	Astringent and to increase milk production
70	<i>Gymnosporia royleana</i> Wall.ex Lawson.	Sorazgh-ay	Celastraceae	Fruits	Toothache
71	<i>Hedra nepalensis</i> K. Koch.	Albomor	Araliaceae	Leaves	In diabetes and for removal of leeches from the nose of livestock
72	<i>Heliotropium cabulicum</i> Bunge.	Geshay	Boraginaceae	Whole plant	Boils and swellings
73	<i>Hypericum perforatum</i> L.	Shen chai	Guttiferae	Leaves, Inflorescence	Cold, cough, carminative and stimulant
74	<i>Impatiens bicolor</i> Royle.	Bantil	Balsaminaceae	Fruits	Diuretic, tonic and cooling effect
75	<i>Indigofera hetarentha</i> Wall. ex Brand.	Ghoreja	Papilionaceae	Roots	Headache and chest pain
76	<i>Inula royleana</i> D.C.	Kut	Asteraceae	Roots	Hypertension
77	<i>Isodon rugosus</i> Linn.	Sperkay	Labiatae	Leaves	Toothache
78	<i>Jasminum humile</i> Linn.	Konkoni	Oleaceae	Root,Flowers	Ringworm disease, astringent and tonic
79	<i>Jasminum officinale</i> Linn.	Chamba	Oleaceae	Leaves, Flowers	Cough, fever, blood purifier, and to increase milk production
80	<i>Juglans regia</i> Linn.	Ghuz	Juglandaceae	Leaves, Fruit , Bark	Eczema, intestinal worms, rheumatism and detergent
81	<i>Juniperus communis</i> Brand.	Gogar	Cupressaceae	Dried leaves	Cures the effect evil eyes
82	<i>Justicia adhatoda</i> Linn.	Baiker	Acanthaceae	Roots,Leaves	Asthma, bronchitis, cough, rheumatism, antispasmodic and expectorant
83	<i>Lathyrus aphaca</i> Linn.	Kokorb-ang	Papilionaceae	Seeds Roots	Narcotic, wound healing and to livestock as general body tonic
84	<i>Launea procumbens</i> Roxb.	Shauda pai	Asteraceae	Leaves	Enhance lactation
85	<i>Mallotus philippensis</i> (Lam) Muell.	Kambela	Euphorbiaceae	Fruits	Anthelmentic, astringent and diuretic
86	<i>Malva neglecta</i> Wall.	Banerak	Malvaceae	roots	Purgative for young cattle
87	<i>Marrubium vulgare</i> Linn.	Kharboti	Labiatae	Young leaves	Cough
88	<i>Melia azedarach</i> Linn.	Bikyana	Meliaceae	Bark, Leaves, Fruits	Cathartic, emetic, hysteria, rheumatism, hypertension and in diabetes

Table 1. Contd.

89	<i>Mentha longifolia</i> (L.) Huds.	Villanay	Labiatae	Leaves	Carminative, diarrhea, dysentery and stomachache
90	<i>Mentha spicata</i> Linn.	Podina	Labiatae	Leaves	Carminative, diarrhea, dysentery and stomachache
	<i>Micromeria biflora</i> Buchi. Ham. ex D. Don.	Yakha booti	Labiatae	Whole plant	Abdominal pain
91	<i>Mirabalis jalpa</i> Linn.	Gule badam	Nyctaginaceae	Leaves	Poultice to resolve boils and healing wounds
92	<i>Morchella</i> spp. Linn.	Gochai	Helvelaceae	Whole plant	General body tonic
93	<i>Morus alba</i> Linn.	Spin toot	Moraceae	FruitsBark	Laxative, purgative and anthelmintic
94	<i>Morus nigra</i> Linn.	Tor toot	Moraceae	Fruits, Leaves, Root	laxative, cooling, aromatic, cleaning throat, anthelmintic and astringent
95	<i>Myrtus communis</i> Linn.	Manoo	Myrtaceae	Leaves	Abdominal pain and diarrhea
96	<i>Narcissus tazetta</i> Linn	Gul e Nargis	Amaryllidaceae	Root	Emetic and toothache
97	<i>Nerium indicum</i> Mill.	Ganderay	Apocynaceae	Leaves Root	Swilling and snakebites
98	<i>Olea ferrugenea</i> Ryole	Khona	Oleaceae	Leaves	Astringent, antiseptic, diuretic, soar throat and toothache
99	<i>Origanum vulgare</i> Linn.	Ishpain	Labiatae	Shoots	Toothache and flavoring agent
100	<i>Otostegia limbata</i> (Benth.) Boiss.	Pishkand	Labiatae	Whole plant	Jaundice
101	<i>Oxalis corniculata</i> Linn.	Zmakay tarookay	Oxalidaceae	Leaves	Anti ascorbic, cooling and diarrhea
102	<i>Paeonia emodi</i> Wall. ex Hook. f.	Mamekh	Paeoniaceae	Flowers	General body tonic and diarrhea
102	<i>Persicaria stagnina</i> Buch - Ham. ex Meisn	Pulpulak	Polygonaceae	Whole plant	Cooling, astringent, colic and for killing fishes
103	<i>Pinus roxburghii</i> Sargent.	Nakhtar	Pinaceae	Resin	Stimulant, in ulcer, skin diseases, snakebites and scorpion stings
104	<i>Pistacea integerrima</i> J. L. Stewart.	Shnai	Anacardaceae	Fruts and galls	Body tonic and expectorant
105	<i>Plantago lanceolata</i> Linn.	Chamchi patar	Plantaginaceae	Seeds, Leaves	Diarrhea, dysentery and antiseptic
106	<i>Plantago major</i> Aitch.	Jabai	Plantaginaceae	Fruits	Astringent, tonic, stimulant, antiseptic, stomach disorders, fever and dysentery
107	<i>Platanus orientalis</i> Linn.	Chinar	Plantanaceae	Bark, Leaves	Diarrhea, dysentery and ophthalmic diseases
108	<i>Podophyllum emodi</i> Wall. ex Royle.	Bankakri	Podophyllaceae	Rhizome	Hepatic stimulant, purgative, emetic, fever and body pain
109	<i>Poligonatum verticelatum</i> (Linn.) All.	Norealam	Liliaceae	Rhizome	Joint pain, aphrodisiac and administrated to livestock for removal of placenta
110	<i>Polygonum amplexicaule</i> D. Don.	Masloon	Polygonaceae	Rhizome	Diarrhea and soften mammary gland of livestock

Table 1. Contd.

111	<i>Populus alba</i> Linn.	Bensa / Aspai / Shafeda	Salicaceae	Fresh leaves	Mouth and Foot diseases of livestock
112	<i>Portulaca oleracea</i> Linn.	Warkhary	Portulacaceae	Leaves. Seeds	External inflammation, cooling, demulcent and stomachache
113	<i>Primula denticulata</i> Smith.	Asal Mamera	Primulaceae	Flowers	Ophthalmic and hair tonic
114	<i>Prunus padus</i> Hook.f.	Barith	Rosaceae	Fruits	Narcotic
115	<i>Pteris cretica</i> Linn.	Qinchi panra	Pteridaceae	Whole plant	To livestock during cough
116	<i>Punica granatum</i> Linn.	Narsaw-ay	Punicaceae	Fruits	Whooping cough
117	<i>Pyrus pashia</i> Linn.	Tangai	Rosaceae	Juice of fruits	Eyes infections in livestock
118	<i>Quercus dilatata</i> Lindle. ex Royle.	Tor banj	Fagaceae	Fruits	Gonorrhoea, astringent, diuretic, diarrhea, indigestion and asthma
119	<i>Quercus incana</i> Roxb.	Spin banj	Fagaceae	Fruits	Astringent, diuretic, diarrhea and asthma
120	<i>Rhododendron arboreum</i> Smith.	Gulamair	Ericaceae	Flower petals, Leaves	Tonic and headache
121	<i>Rhus javanica</i> Linn.	Tetryay	Anacardiaceae	Fruits	Carminative and colic
122	<i>Ricinus communis</i> Linn.	Arind	Euphorbiaceae	Leaves, Seed oil	Emetic, narcotic, purgative and applied to swellings
123	<i>Rosa moschata</i> J. Herm.	Qurach	Rosaceae	Flowers	Stomach disorder
124	<i>Rubus fruticosus</i> Hook .f.	Karwara	Rosaceae	Fruit Leaves	Diarrhea, carminative, cough and fever
125	<i>Rubus ulmifolius</i> Schott.	Goraj	Rosaceae	Fruits, Roots, Leaves	Carminative, tonic, aphrodisiac and skin diseases
126	<i>Rumex dentatus</i> Linn.	Shalkhay	Polygonaceae	Fresh leaves	Constipation in livestock
127	<i>Rumex hastatus</i> D. Don.	Tarukay	Polygonaceae	Whole plant	Carminative, purgative, astringent, diuretic, jaundice
128	<i>Rumex nepalensis</i> Spreng.	Shalkhay	Polygonaceae	Whole plant	Diuretic, astringent, purgative and demulcent
129	<i>Salix babilonica</i> Linn.	Asela ola	Salicaceae	Leaves	Diabetics
139	<i>Sarcococca saligna</i> (D. Don.) Muell.	Bansatra	Buxaceae	Bark of roots, Leaves	Antiseptic, blood purifier and muscular pain
140	<i>Silene conoidea</i> L.	Mashroa	Caryophyllaceae	Seeds, Young leaves	Backache and applied on pimples
141	<i>Silene vulgaris</i> (Moench) Garcke.	Mashroa	Caryophyllaceae	Shoots	Stomachic and emollient
142	<i>Silybum marianum</i> Gaertn.	Rejakai	Asteraceae	Leaves, Seeds	Throat, chest infections, expectorant and stimulant
143	<i>Skimmia laureola</i> DC	Ner	Rutaceae	Smoke of leaves	Clean nasal tract also used in cough and cold
144	<i>Solanum nigrum</i> L.	Kachma-chu	Solanaceae	Fruits	Jaundice
145	<i>Solanum surratense</i> Burm.f.	Maraghonay	Solanaceae	Whole plant	Expectorant, digestive, astringent, diuretic, asthma, cough, fever, chest pain and jaundice
146	<i>Solena amplexicaulis</i> (Lam.) Gandhi	Kakora	Cucurbitaceae	Rhizome	Promotiing milk production and in fever

Table 1. Contd.

147	<i>Stellaria media</i> (L.) Cyr.	Larolay	Caryophyllaceae	Whole plant	Rheumatism, joint diseases and constipation
148	<i>Swertia paniculata</i> Wall.	Momera	Gentianaceae	Ripe shoots	Eye diseases
149	<i>Taraxacum officinale</i> Weber.	Hind	Asteraceae	Roots	Diabetics, jaundice and kidney disorders
150	<i>Taxus wallichiana</i> Zuce.	Barmi	Taxaceae	Bark, Leaves, Fruits	Cancer, pneumonia, bronchitis, whooping cough, asthma and sedative
151	<i>Thymus linearis</i> Benth.	Jaman	Labiatae	Leaves, Seeds	Fever, cough, cold, toothache and abdominal pain
152	<i>Urtica dioica</i> Linn.	Jalbang	Urticaceae	Leaves	Fed to livestock to increase milk production
153	<i>Valeriana jatamansi</i> Jones.	Mushkb-ala	Valerianaceae		Whole plant is fed to livestock to promote milk production
154	<i>Verbascum thapsus</i> Linn.	Khardag	Scrophulariaceae	Leaves, Flowers	Cough, pulmonary diseases, bleeding of bowels and other skin diseases
155	<i>Verbena officinalis</i> Linn.	Shamkay	Verbenaceae	Whole plant	Febrifuge, nerve tonic, amenorrhea, rheumatism, joint diseases and antidote to snakebite
156	<i>Viburnum cotonifolium</i> D. Don.	Bring	Caprifoliaceae	Fruits	General body tonic
157	<i>Viola canescens</i> Wall. ex Roxb	Banafsha	Violaceae	Whole plant	Cough, cold, fever and jaundice
158	<i>Vitex negundo</i> Linn.	Marvan-day	Verbenaceae	Fresh roots, Leaves	Bandage to relive pain of chest and back
159	<i>Withania somnifera</i> (Linn.) Dunal.	Asghand	Solanaceae	Leaves, Roots, Seeds	Poultice on swellings and diuretic
160	<i>Xanthium stromarium</i> Linn.	Desi Arind	Asteraceae	Fruits, Leaves	Demulcent, cooling, small pox and malarial fever
161	<i>Zanthoxylum armatum</i> D. C.	Dambara	Rutaceae	Seeds, Bark, Fruits	Body tonic, aromatic, fever, cholera, dyspepsia, stomachache and toothache
162	<i>Zizyphus oxyphylla</i> Edgew.	Elanai	Rhamnaceae	Roots, Fruits	Jaundice and gas trouble
163	<i>Zizyphus vulgare</i> Lam.	Markha-nai	Rhamnaceae	Whole plant	Diabetics

DISCUSSION

It can be rightly assumed that the present day ethno-botanical pharmacology is as old as man himself (Ali and Qaiser, 2009). Different medicinal plants have been in use from the time immemorial (Partel et al., 2005). Rig Veda between 4500-1600 BC and Ayurveda between 2500-600 BC are considered among the first compiled records of medicinal plants in Indo-Pak (Ahmad, 2002). The prevalent system of traditional medicine traces its origin to Greek medicine system, which was adopted by the Arabs, and spread to the sub-

continent and Europe (Iqbal and Hamayun, 2004). Whereas, Susruta Samhita (600 BC), a Sanskrit text on surgery, mentioned the progress made during Buddhist period, where medicinal plants were cultivated by qualified specialists (Ahmad, 2002; Raju, 2003). Even in the present age of science and technology, in the developed countries people still rely on traditional system of healthcare not only because of its low price, but also due to very less side effects, as compared to the modern allopathic medicines (Khan, 2003). That is why they are being used extensively world over especially in the third world countries. The

people of the valley have been using plant resources for their various ailments. The local people know the beneficial plants and preparation of raw drugs through personal experience and ancestral prescription and long utility. People of the valley are dependants on plant resources. They collect the plant for medicinal uses, fuel wood, fodder, timber, and many other purposes (Ahmad et al., 2010).

During current study a total of 156 medicinal plants were studied including 22 ethno-veterinary important plants. Majority of the recipes are prepared in the form of decoction from freshly

collected plant parts. Mostly a single species were used and mainly taken orally. They used medicinal plants for asthma, cough, tonic, abdominal pain, expectorant, anthelmintic, carminative, on boils, snakebites, jaundice, diarrhea and dysentery etc. All of these plants are collected from the wild, 12 of which are reported as scarce locally e.g *A. caesium*, *Betula utilis*, *P. integerrima*, *C. macrophylla*, *P. emodi*, *C. deodara*, *S. laureola*, *T. wallichiana*, *A. indica*, *D. deltoidea*, *R. arboreum*, *P. emodi* and *V. canescens* are extensively exploited by the local people for their various ethno-botanical uses. Field observation showed that vegetation of the area was generally threatened with the unwise of local communities. The trends like urbanization, deforestation, over grazing, habitat fragmentation, unscientific extraction of natural vegetation, introduction of the exotic taxa and habitat loss were the visible threats.

It is recommended that the local community should be educated regarding the importance, pre and post harvest methods. In addition, they should also be trained regarding the cultivation of these highly valuable medicinal plants on commercial basis, and thereafter their trade and marketing. This will ultimately generate extra sources of income and will reduce pressure on the extraction of these valuable medicinal plants. In Nandiar khuwarr valley the use of plant resources is also a source of income, besides fulfilling their various utilitarian needs. Settlements of majority of the population are subject to the seasonal changes in the valley. In winter they come down to the valley bottoms due to the unavailability of fodder for their cattle, and at the onset of summer as the snow melts and new plants start sprouting, they move towards the higher altitudes. The local people are ignorant about the importance of these plants at global level. Sometimes they collect plants in excess quantity and in most cases the whole plant is uprooted. They do not know about the proper methods and time of plant collection, as a result most of their collection is useless. On the other hand they are ignorant about the drying, storing or preserving techniques, which ultimately lead to wastage of plant resource.

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