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ETHNOBOTANICAL STUDIES OF SOME PLANTS OF CHAGHARZAI VALLEY, DISTRICT BUNER, PAKISTAN

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Abstract

Ethnobotanical information was collected on 216 plant species from Chagharzai Valley, District Buner, Pakistan. These plants were classified for their traditional medicinal and economic uses. Of the 89 families, 77 families were Dicots; 7 Monocots and 3 Pteridophytes. Asteraceae had 21 species. which was followed by Papilionaceae (12 spp.); Lamiaceae (10 spp.); Poaceae and Rosaceae (each with 9 spp.); Ranunculaceae (7 spp.); Moraceae (6 spp.); Amaranthaceae, Brassicaceae, Solanaceae, Apiaceae, Euphorbiaceae and Polygonaceae (each with 5 species); Chenopodiaceae and Papaveraceae (each with 4 species); Asclepiadaceae, Betulaceae, Caryophyllaceae, Fagaceae, Malvaceae, Meliaceae, Mimosaceae, Oleaceae, Rhamnaceae and Salicaceae had 3 species each. The remaining families had less number of species. Gymnosperms and fungi were represented by one family each. Among overall plants, 138 were medicinal plant species, 72 multi-purpose species, 66 fodder and forage species, 51 fuel wood species, 36 vegetable /pot-herb species, fruit yielding and thatching/ roofing 25 species each, 21 timber species, 19 ornamental species, 15 poisonous plants, 14 fencing/ hedges plants, 12 agricultural tools making species, 9 honeybee species and one species used to repel evils. The study indicated that the investigated area is under heavy deforestation, biotic interference and overgrazing pressure. Resultantly, valuable economic and medicinal plants of the area are decreasing. Sustainable utilization, proper management and conservation of the flora of the area is highly recommended.

Introduction

Chagharzai Valley, District Buner, lies between latitude 34°-11 to 34°-34 and longitude 72°-13 to 72°- 45. It is bounded by Swat and Shangla districts in North, on West by Distrct headquarter Daggar and historical shrine of Pir baba, on South by Mardan & Swabi and on East by Indus River, Haripur and Mansehra. Valley occupies 63543 ha, on which 15169 ha and 48374 ha were occupied by agriculture and forests respectively. The total population of the area comprises 66475 human including 32466 males. Elevation varies from 366 meters in south to 2911 meters in North. On the basis of Vegetation and climate the area can be classified as tropical, sub humid temperate with alpine glimpses at certain places. The geographical setting of the area provides habitat rich diversity of plants especially medicinal and other economic species.

Studies on ethnobotany have been conducted in the neighboring countries (Gupta *et al.*, (1997); Singh *et al*., (1997); Vedavathy & Mrudula, (1997); Siwakoti & Siwakoti, (1998); Ghimireet *et al*., (1999); Khan, (2000); Mustafa *et al*., (2000) and Siddiqui *et al*., (2000). In Pakistan such studies have also been carried out on the ethnobotany of various parts of District Swat (Hussain *et al*., (1995); Hussain & Sher. 1998; Sher *et al*., (2003, 2004); Hussain *et al*., (2004, 2005), Ibrar *et al*., (2007). Ethnobotanical studies have also been carried out by Tariq *et al*., 1995; Shinwari & Khan, (1997, 1998), Badshah *et al*., (1996); Dastagir, (2001), Durrani *et al*., (2003) and Gilani *et al*., (2003) in various parts of the country, however no work on the ethnobotany of Chagharzai Valley District Buner has been presented. Therefore, the present study reports the traditional utilization of some plants of the area, which might be helpful for the future workers, ecologist, pharmacologists, taxanomists, wild life and water shed managers.

Materials and Methods

A survey was conducted during 2004-2005 to document the traditional uses of plants. Plant specimen were collected, dried and preserved properly. They were identified through available literature (Nasir & Ali, 1971-1995; Ali & Qaisar, 1995-2006). The plants were classified according to their economic value (medicinal, fodder, vegetables, thatching, food, fuel wood) through interviewing and filling questionnaires from drug dealers, shopkeepers, timber dealers, fuel wood seller, local hakims, and farmers but priority was given to local elderly people and Hakims who were the real users and had a lot of information about the plants and their traditional uses. Literature survey and general observations adds some more information. The voucher specimens were submitted to the Dr. Sultan Ahmad Herbarium, Botany Department, Government College University, Lahore, Pakistan.

Results and Discussion

The following ethnobotanical information was collected on 216 plant species in the investigated area (Table 1). The reported vegetation comprised 127 species of herbs, 42 trees, 39 shrubs, 7 climbers, one fungus & one parasite species. The people of the area depend on agriculture, fuel & timber wood selling, livestock and other natural resources of the area for earning their daily commodities.

1. Plants used as medicine: There were 138 plant species that are being used as medicine. Some of the plants are used individually, while others in mixture. Many plant species have single or multiple medicinal uses. Among such plants *Acacia modesta*, *Acorus calamus*, *Adiantum incisum*, *Ajuga bractiosa*, *Ammi visnaga*, *Berberis lycium*, *Calotropis procera*, *Coriandrum sativum*, *Cucimus prophetarum*, *Fumaria indica*, *Mentha longifolia*, *Mentha spicata*, *Morus alba*, *Morus indica*, *Oxalis corniculata*, *Paeonia emodi*, *Plantago lanceolata*, *Punica granatum*, *Valeriana jatamansii*, *Verbascum thapsus*, *Viola biflora*, *Viola serpens* and *Zizyphus oxyphylla* are commonly used against the various ailments. The plant species used against a particular disease have been shown (Table 1). Sixty one percent of the local plants are used as medicine. Present findings agree with those of Hussain *et al.*, (1995), Hussain & Sher (1998), Sher *et al*., (2003, 2004), Hussain *et al*., (2004, 2005), Siwakoti & Siwakoti, (1998) and Ibrar *et al*., (2007) with respect to medicinal uses.

Table 1. Ethnobotanical uses of some plants of Chagharzai Valley, District Buner, Pakistan.

S. No.	Plants and family	Local name	Occurrence	Habit	Part used	Ethnobotanical uses
	a. Fungi					
1.	**Family Helvellaceae**					
	1. Morchella esculenta (L.) Pers ex. Fr.	Goojai	W	F	Whole plant	Edible and medicinal
	b. Pteridophytes					
2.	**Family Adiantaceae**					
	2. *Adiantum incisum* Forsk.	Sumbal	W	H	Fronds	Fever, cough and diabetes.
	3. *Adiantum venustum* D.Done	Sumbal	W	H	Fronds	Expectorant, emetic and diuretic, ornamental
3.	**Family Equisetaceae**					
	4. *Equisetum arvense* L.	Bandakay	W	H	Shoot	Hair tonic & anti-lice
4.	**Family Pteridaceae**					
	5. *Pteridium equilinum* L.	Kunjay	W	H	Fronds	Vegetables
	c. Gymnosperms					
5.	**Family Pinaceae**					
	6. *Abies pindrow* Royle	Achar	W	T	Trunk, branches	Fuel wood, TSR, Timber
	7. *Pinus roxburghii* Sergent	Nakhtar	W	T	Wood, branches, cones, resins, leaves	Stimulant, stomachic and diuretic, fuel wood, TSR, timber
	8. *Pinus wallichiana* A.B.Jackson.	Pahoch	W	T	Wood, branches, cones, resins, leaves	Fuel wood, TSR, timber
	d. Monocotyledons					
6.	**Family Aceraceae**					
	9. *Acer cappadocicum* Gled.	Chinaranga	W	T	Wood	Fuel wood, ornamental
7.	**Family Alliaceae**					
	10. *Allium cepa* L.	Piyaz	C	H	Bulb	Stimulant, diuretic, aphrodisiac, vegetables
	11. *Allium sativum* L.	Ooga	C	H	Bulb, leaves	Heart diseases, asthma and whooping cough, vegetables
8.	**Family Amaryllidaceae**					
	12. *Narcissus tazzeta* L.	Gul-e-nargis	W	H	Flowers vegetables	Purgative, emetic, ornamental, honey bee
9.	**Family Araceae**					
	13. *Acorus calamus* Linn.	Skha waja	W	H	Whole plant	Colic & diarrhea.
	14. *Arisaema jacquimontii* Blume.	Marjary	W	H	Rhizome	Poisonous
10.	**Family Iridaceae**					
	15. *Iris ensata* Thunb.	Oogakai	W	H	Root	Alterative, blood purifier.
11.	**Family Liliaceae**					
	16. *Asparagus officinalis* L.	Tindoray	W	H	Shoot	Vegetables, ornamental
	17. *Asphodalus tenuifolius* Cavan	Oogakay	W	H	Leaves	Vegetables
12.	**Family Musaceae**					
	18. *Musa sapientum* L.	Keela	C	H	Fruit	Demulcent and diuretic, fruit
13.	**Family Poaceae**					
	19. *Avena sativa* L.	Jamdar	W	H	Shoot	Fodder
	20. *Bromus japonicus* Thumb ex Murr.	Jokai	W	H	Shoot	Fodder
	21. *Cymbopogon distans* (Nees ex Steud.) Watson	Sargaray	W	H	Whole plant	Fodder
	22. *Cynodon dactylon* L.	Kabal	W	H	Whole plant	Fodder, ornamental
	23. *Dichanthium annulatum* Stafl.	Naram wakha	W	H	Shoot	Fodder
	24. *Poa annua* L.	Wakha	W	H	Shoot	Fodder
	25. *Saccharum bengalense* Ritz.	Kahay	W	H	Stem, flowering scape	TSR
	26. *Saccharum spontaneum* L.	Shurghashay	W	H	Stem, flowering scape	TSR
	27. *Sorghum helepense* (L.) Bern.	Dadum	W	H	Shoot	Fodder
	e. Dicotyledons					
14	**Family Acanthaceae**					
	28. *Dicliptera roxburghiana* Nees	Marchak bootay	W	H	Shoot	Fodder
	29. *Justicia adhatoda* Linn.	Baikar	W	SH	Leaves, roots	Antispasmodic, expectorant, abortifacient, TSR, honey bee
15.	**Family Amaranthaceae**					
	30. *Achyranthus aspera* L.	Ghishkay	W	H	Whole plant	Laxative and stomachic.
	31. *Amaranthus caudatus* L.	Chalwairay	W	H	Whole plant	Vegetables
	32. *Amaranthus spinosa* L.	Chalwairay	W	H	Whole plant	Laxative, vegetables
	33. *Amaranthus viridis* Linn.	Gunhar	W	H	Shoot, root	Menstruation, vegetables
16.	**Family Anacardiaceae**					
	34. *Pistacea integrima* J.L.Stewart ex Brandis	Shnai	W	T	Wood, leaves, fruit	Tonic and antiseptic. Fodder, timber
17.	**Family Apiaceae**					
	35. *Ammi visnaga* (L.) Lam.	Spairkai	W	H	Dry fruit	Asthma
	36. *Coriandrum sativum* L.	Dhanyal	C	H	Leaves, fruit	Carminative, vegetables
	37. *Eryngium biebersteinianum* L.	Ali kanda	W	SH	Shoot	Stimulant and carminative, fodder
	38. *Foeoniculum vulgare* Miler.	Kaga	C	H	Leaves, seeds	Diuretic, digestive.
	39. *Lespedeza juncea* (L.F.) Persoon	Oormaray	W	H	Shoot, leaves	Skin diseases, fodder
18.	**Family Apocynaceae**					
	40. *Caralluma edulis* Edgew.	Pamunkay	W	H	Whole plant	Diabetes, Vegetables
	41. *Nerium indicum* Mill.	Gundairay	W	SH	Whole plant	TSR, ornamental, poisonous

Table 1. (Cont'd.).

S. No.	Plants and family	Local name	Occurrence	Habit	Part used	Ethnobotanical uses
19.	**Family Araliaceae**					
	42. *Hedera helix* L.	Prewatai	W	Cl	Leaves	Fodder
20.	**Family Asclepiadaceae**					
	43. *Calotropis procera* (wild) R.Br.	Spalmay	W	SH	Whole plant, latex	Dry leaves are smoked for asthma and cough, poisonous.
	44. *Periploca aphylla* Decne.	Da ghar gilo	W	Cl	Whole plant bark milky juice	Stomachic, purgative
	45. *Tylophora hersuta* L.	Gilo	W	Cl	Root, leaves	Jaundice
21.	**Family Asteraceae**					
	46. *Achillea millifolium* L.	Jarai	W	H	Whole plant	Astringent and tonic, fodder
	47. *Artimisia maritima* L.	Juakay	W	H	Shoot	Anthelmintic
	48. *Artimisia scoparia* Walds & Kit.	Tarkha	W	H	Leaves	Anthelmintic
	49. *Artimisia vulgaris* L	Tarkha	W	H	Leaves, shoot	Skin diseases, fodder, ornamental
	50. *Calendula arvensis* L.	Zair Gulae	W	H	Flowers, leaves	Diaphoretic and antiemetic.
	51. *Calendula officinalis* L.	Zair Gulae	C	H	Flowers, shoot	Ringworm and skin diseases.
	52. *Centaurea calcitrapa* L.	----	W	H	Whole plant	Tonic
	53. *Cichorium intybus* L.	Kasni	W	H	Whole plant	Blood purifier, emollient.
	54. *Gnaphalium luteo-album* L.	----	W	H	Leaves	Astringent
	55. *Inula royleana* Clarke	----	W	H	----	Poisonous
	56. *Lactuca serriola* L.	----	W	H	Whole plant	Cooling sedative
	57. *Launea procumbens* Roxb.	Shodapai	W	H	Shoot, leaves	Fodder
	58. *Onopordum acanthium* L.	Wrijakai	W	H	Shoot, seeds	Fodder
	59. *Sonchus arvensis* L.	Shodapai	W	H	Whole plant	Fodder
	60. *Sonchus asper* L.	Shodapai	W	H	Whole plant	Fodder
	61. *Sonchus auriculata* L.	Shodapai	W	H	Whole plant	Fodder
	62. *Tagetus minuta* L.	Hamisha	W	H	Flowers	Ornamental
	63. *Taraxacum officinale* Weber.	Zair gulai	W	H	Flowering, shoots	Constipation
	64. *Xanthium strumarium* L.	Ghishkay	W	SH	Leaves	Malaria
22.	**Family Balsaminaceae**					
	65. *Impatiens balsamina* L.	Gul-e-mehandi	W	H	Whole plant	Cathartic and diuretic
23.	**Family Berberidaceae**					
	66. *Berberis lycium Royle.*	Kwaray	W	SH	Leaves, fruit, bark	Tonic, fruit, fencing
24.	**Family Betulaceae**					
	67. *Alnus nitida* (Spach) E.	Gairay	W	T	Wood	Fuel wood, Agri. Tools
	68. *Betula jaequimontii* Spach.	Birch	W	T	Wood	Fuel wood, timber, fencing, Agri. tools
	69. *Betula utilis* D.Done.	Birch	W	T	Wood	Fuel wood, timber, fencing, Agri. tools
25.	**Family Boraginaceae**					
	70. *Ehretia obtusifolia* H.ex Dc.	Ghada bootay	W	SH	Leaves, wood	Fodder, Agri. tools
26.	**Family Brassicaceae**					
	71. *Brassica compestris* L.	Sharsham	C	H	Leaves, seeds inflorescence	Fodder, vegetables
	72. *Capsella bursa-pestoris* Medic.	Bambaisa	W	H	Seeds	Astringent
	73. *Descurainia sophia* (L.) Webb.	Skha bootay	W	H	Flowers, leaves, seeds	Antiscorbic
	74. *Eruca sativa* L.	Jamama	W	H	Leaves, seeds	Hair tonic and antidandruff, vegetables
	75. *Nasturtium officinale* R.Br.	Talmeera	W	H	Shoot	Purgative, emetic, vegetables
27.	**Family Buxaceae**					
	76. *Buxus wallichiana* Baill.	Shamshad	W	SH	Whole plant	Diaphoretic, fuel wood, TSR, poisonous
	77. *Sarcococa saligna* (Dcne) Duel	Alatar	W	H	Leaves, flowers	Blood purifier, honey bee
28.	**Family Cactaceae**					
	78. *Opuntia dilleni* Haw.	Zaqoom	W	SH	Phylloclade, Fruit	Demulcent and expectorant. Fruit, fencing
29.	**Family Caesalpinaceae**					
	79. *Bauhinia variegata* L.	Kulyar	W/C	T	Wood, bark Flower buds	Skin diseases and leprosy, Fuel wood, vegetables, TSR, timber, ornamental
	80. *Caesalpinia decapitata* (Roth) Alston.	Jara	W	SH	Leaves, branches root	Purgative, fodder, fuel wood
30.	**Family Canabanaceae**					
	81. *Cannabis sativa* L.	Bhang	W	SH	Leaves flowers	Sedative, anodyne & narcotic
31.	**Family Caprifoliaceae**					
	82. *Viburnum foeten* Dcne.	Chamyarai	W	T	Fruit branches	Fuel wood, fruit
32.	**Family Caryophyllaceae**					
	83. *Cerastium fontanum* Baumg.	----	W	H	Whole plant	Refrigerant.
	84. *Sielene conoidea* L.	Mangotay	W	H	Shoot, fruit seed	Fodder, vegetables
	85. *Stellaria media* (L.) Cry.	-----	W	H	Whole plant	Fodder
33.	**Family Celastraceae**					
	86. *Gymnosporia royleana* Wall ex Lawson	Soor Azghay	W	SH	Whole plant	Fodder, fuel wood, fencing
34.	**Family Chenopodiaceae**					
	87. *Chenopodium album* L.	Sarmai	W	H	Leaves	Laxative, vegetables
	88. *Chenopodium ambrosioides* L.	Kharawa	W	H	Fruits, leaves	Dyspepsia
	89. *Chenopodium botrys*L.	Skha kharawa	W	H	Shoot	Healing wounds, used for discharge of pus
	90. *Chenopodium murale* L.	Chalwairay	W	H	Shoot	Fodder, vegetables

Table 1. (Cont'd.).

S. No.	Plants and family	Local name	Occurrence	Habit	Part used	Ethnobotanical uses
35.	**Family Commelinaceae**					
	91. *Commelina albescens* Hassak	Pulpolakay	W	H	Whole plant	Demulcent
36.	**Family Convulvuaceae**					
	92. *Convovulus arvensis* L.	Prewati	W	Cl	Whole plant, root	Purgative, fodder
37.	**Family Cucurbitaceae**					
	93. *Cucimus prophetarum* L.	Kalkunday	W	H	Fruits	Intestinal worms, poisonous
	94. *Luffa cylindrical* (L.) Roem.	Toorai	C	Cl	Fruits	Vegetables
38.	**Family Cuscutaceae**					
	95. *Cuscuta reflexa* Roxb.	Maraz bootay	W	P	Whole plant	Skin diseases
39.	**Family Dioscoreaceae**					
	96. *Dioscoria deltoidea* Wall.	----	W	H	----	Poisonous
40.	**Family Ebenaceae**					
	97. *Diospyrus kaki* L.	Toor Amluk	W /C	T	Wood, fruit	Fodder, fuel wood, Fruit
	98. *Diospyrus lotus* L.	Ziar Amluk	C	T	Wood, fruit, leaves	Fuel wood, fruit
41.	**Family Elaegnaceae**					
	99. *Elaegnus umbellata* Thumb	Ghanamranga	W	SH	Wood, Fruit	Cardiac stimulant. Fuel wood, fruit
42.	**Family Ericaceae**					
	100. *Rhododenron arborium* Smith.	Gul-e-nameer	W	T	Wood, flower	Flower petals are tonic, fuel wood, ornamental
43.	**Family Euphorbiaceae**					
	101. *Andrachne cordifolia* (Dene) Muell.	----	W	SH	----	Poisonous
	102. *Euphorbia helioscopia* Mewski.	Piryano doolai	W	H	----	Poisonous
	103. *Euphorbia prostrata* L.	Warmagha	W	H	Whole plant	Ringworm
	104. *Mallotus philippensis* Muell.	Kambeela	W	SH	Wood, fruits	Purgative and anthelmintic, fuel wood
	105. *Riccinis communis* L.		W			Emetic, narcotic
44.	**Family Fagaceae**					
	106. *Quercus dilatata* Lindley	Spin Banj	W	T	Wood, branches	Fuel wood, TSR, timber, Agri. Tools
	107. *Quercus ilex* L.	Banj	W	T	Wood, branches	Fuel wood, TSR, timber, Agri. tools
	108. *Quercus incana* Roxb.	Toor Banj	W	T	Wood, branches, leaves	Fuel wood, TSR, timber, Agri. tools
45.	**Family Fumariaceae**					
	109. *Fumaria indica* (Hsskn) H.N.	Papra	W	H	Shoot	Antipyretic
46.	**Family Hemmameledaceae**					
	110. *Parratiopsis jacquemontiana* Dene.	Beeranj	W	T	Wood, leaves, branches	Fodder, Fuel wood, Agri. tools
47.	**Family Hippocastinaceae**					
	111. *Aesculus indica* (Wall ex Cambl)H.K.F.	Jawaz	W	T	Wood, leaves, fruits	Colic diseases in horses, Fodder, fuel wood, TSR, timber, Agri. tools
48.	**Family Hypericaceae (Guttiferaceae)**					
	112. *Hypericum oblongifolium* Choisy	----	W	SH	----	Poisonous
49.	**Family Juglandaceae**					
	113. *Juglans regia* L.	Ghuz	C	T	Nuts, bark, leaves, wood	Eczema, fruit, timber
50.	**Family Lamiaceae**					
	114. *Ajuga bractiosa* Wall. Benth.	Khwaga bootei	W	H	Whole plant	Jaundice
	115. *Ajuga parviflora* Benth.	Tarkha bootei	W	H	Whole plant	Astringent
	116. *Mentha longifolia* (L.) Huds	Velanai	W	H	Leaves, inflorescence	Stimulant, aromatic and carminative, vegetables
	117. *Mentha spicata* L.	Poodina	W	H	Leaves, inflorescence	Stimulant and carminative, vegetables
	118. *Ocimum basilicum* L.	Kashmalu	W	H	Flowers, seeds	Demulcent and diuretic.
	119. *Origanum vulgare* L.	Shamakay	W	H	Whole plant	Diuretic, fodder
	120. *Otostegia limbata* Bth.	Pishkanar	W	SH	Whole plant	Fuel wood, fencing
	121. *Plectranthus rogusus* Wall.ex. Bth.	Spaikay	W	SH	Branches, leaves	Antiseptic, fodder, honey bee sp.
	122. *Salvia lanata* Roxb.	Kianr	W	H	Flowering shoot	Vegetables
	123. *Salvia moorcrftiana* Wall.	Khar dug	W	H	Leaves	Leaves poultice is used for healing wounds
51.	**Family Lythraceae**					
	124. *Woodfordia fruticosa* (L.) Kurz	----	W	SH	Wood	Fuel wood
52.	**Family Malvaceae**					
	125. *Malva neglecta* Waller.	Panaruk	W	H	Whole plant, leaves	Antispasmodic, vegetables
	126. *Malva officinalis* (L.) Schimp. & Spenn.	Panaruk	W	H	Whole plant	Antispasmodic, vegetables
53.	**Family Meliacea**					
	127. *Cedrella serrata* Royle.	Meem	W	T	Bark, leaves	Diabetes, TSR
	128. *Melia azedarach* L.	Shandai	W/C	T	Wood, leaves, bark fruit	Anthelmintic, fodder, fuel wood, TSR, timber
54.	**Family Menispernaceae**					
	129. *Tinospora cordifolia* (DC.) Meirs	Gilo	W	Cl	Stem	Fever, ornamental
55.	**Family Mimosaceae**					
	130. *Acacia modesta* Wall.	Palosa	W	T	Leaves, gum, branches flowers, wood, ashes	Tonic, stimulant, fodder, fuel wood, honey bee
	131. *Acacia nilotica* (L.) Delile.	Kikar	W	T	Wood, leaves, gum	Tonic, fodder, fuel wood, timber, Agri. tools
	132. *Mimosa himalayana* Gamble	Kikaray	W	SH	Leaves, roots	Root is used in vomiting, fodder

Table 1. (Cont'd.).

S. No.	Plants and family	Local name	Occurrence	Habit	Part used	Ethnobotanical uses
56.	**Family Moraceae**					
	133. *Ficus carica* L.	Baghi Inzar	W/C	T	Wood, leaves, fruit latex	Laxative, fodder, fuel wood, fruit
	134. *Ficus palmata* Forssk.	Inzar	W/C	T	Wood, leaves, fruit latex	Laxative, fodder, fuel wood, fruit
	135. *Ficus recemosa* L.	Oormal	W/C	T	Wood, leaves, latex fruit	Stem latex is applied in piles, fuel wood, fruit
	136. *Ficus religiosa* Roxb.	Peepal	W	T	Wood, bark, fruit	Laxative, fuel wood
	137. *Morus alba* L.	Spin Toot	W/C	T	Wood, leaves, fruit branches	Laxative, fodder, fuel wood, fruit, TSR, timber
	138. *Morus indica* L.	Toor Toot	W/C	T	Wood, leaves, fruit branches	Expectorant, fodder, fuel wood, fruit, TSR, timber
57.	**Family Myrsinaceae**					
	139. *Myrsine africana* L.	Marorang	W	SH	Shoot	Fodder
58.	**Family Nyctaginaceae**					
	140. *Boerhaavia diffusa* L.	Ensut	W	H	Root	Used externally for ulcers.
	141. *Mirabilis jalapa* L.	Gul-e-Nazak	C	H	Leaves	Wound healer, ornamental
59.	**Family Oleaceae**					
	142. *Jasminum humile* L.	Rambail chambail	W/C	SH	Flowers, root	Ringworms, ornamental
	143. *Jasminum offcinale* L.	Rambail chambail	W/C	SH	Flowers, root	Ringworms, ornamental
	144. *Olea ferruginea* Royle.	Khoona	W/C	T	Wood, leaves, bark	Fever and debility. Fodder, fuel wood, Agri. Tools
60.	**Family Onagraceae**					
	145. *Epilobium hirsutum* L.	Ganda bootay	W	H	----	Poisonous
61.	**Family Oxalidaceae**					
	146. *Oxalis corniculata* L.	Tarookay	W	H	Leaves	Fever and dysentery, vegetables
62.	**Family Paeoniaceae**					
	147. *Paeonia emodi* Wall. Hkf.	Mamekh	W	H	Rhizome, roots	Dropsy, epilepsy and colic
63	**Family Papaveraceae**					
	148. *Argimone maxicana* L.	Wild poppy	W	H	Shoot, flowers	Fodder, ornamental
	149. *Corydalis stewartii* Fade	Mamera	W	SH	Floral shoot	Used for eye diseases
	150. *Papaver nudicaule* L.	Zangali kashkash	W	H	Flowers, capsule	Slight sedative
	151. *Papaver rhoeas* L.	Alak jinai	W	H	Flowers, capsule	Slight sedative
64.	**Family Papilionaceae**					
	152. *Desmodium tiliaflium* D.Done	Krachay	W	SH	Leaves, braches	Fodder, fuel wood
	153. *Indigofera heterantha* L.	Kainta	W	SH	Leaves, wood, branches	Fodder, fuel wood, TSR
	154. *Lathyrus aphaca* L.	Kurkamanay	W	H	Shoot	Fodder, vegetables
	155. *Lathyrus cicera* L.	Wara chilo	W	H	Shoot	Fodder, vegetables
	156. *Lathyrus pratensis* L.	Chilo	W	H	Shoot	Fodder, vegetables
	157. *Lathyrus sativus* L.	Ghata Chilo	W	H	Shoot	Fodder, vegetables
	158. *Medicago minima* (L.) Grub.	Shpaishtay	W	H	Shoot	Fodder, vegetables
	159. *Medicago polymorpha* L.	Shpaishtay	W	H	Shoot	Fodder, vegetables
	160. *Vicia bakeri* Ali	Chilo	W	H	Whole plant	Fodder, vegetables
	161. *Vicia sativa* L.	Chilo	W	H	Whole plant	Fodder, vegetables
	162. *Shuteria involucrata* (Wall.) Wight & Arnott	----	W	H	Shoot	Fodder
	163. *Trifolium repens* L.	Shautal	W/C	H	Shoot, seeds	Tonic, carminative, fodder, vegetables
65.	**Family Plantaginaceae**					
	164. *Plantago lanceclata* L.	Jabai	W	H	Leaves, seeds	Diarrhea and dysentery
	165. *Plantago major* L.	Jabai	W	H	Leaves, seeds	Diarrhea and dysentery
66.	**Family Plantinaceae**					
	166. *Platanus orientalis* L.	Chinar	W/C	T	Wood, bark	Dysentery, fuel wood, TSR, timber
67.	**Family Polygonaceae**					
	167. *Bistorta amplexicaulis* (D.Don) Green	Tarva panra	W	H	Shoot	To cure ulcers.
	168. *Polygonum barbatum* L.	Polpulak	W	H	Whole plant	Poisonous
	169. *Polygonum serrulatum* Lagasca	Polpulak	W	H	Leaves	Applied to snake bite
	170. *Rumex dentatus* L.	Shulkhay	W	H	Leaves	Astringent, vegetables
	171. *Rumex hastatus* L.	Tarookay	W	H	Leaves	Diuretic and stomachic
68.	**Family Portulacaceae**					
	172. *Portulaca olearaceae* L.	Warkharay	W/C	H	Shoot	Refrigerant and alterative, vegetables, ornamental
69.	**Family Primulaceae**					
	173. *Primula denticulate* Smith	Asli mamera	W	H	Rhizome, leaves	Applied for leucoderma
70.	**Family Punicaceae**					
	174. *Punica granatum* L.	Anar	W/C	T	Fruit bark, leaves	Antipyretic, fruit
71.	**Family Ranunculaceae**					
	175. *Aconitum violate* Jacque. Staff.	Zahar mora	W	H	Tubers	Used for gout and rheumatism.
	176. *Caltha alba* Jacq ex Comb.	Makhanpath	W	H	Whole plant	Antispasmodic, sedative, vegetables
	177. *Clematis oreintalis* L.	Spin guley	W	Cl	----	Poisnuous
	178. *Delphinium equigilifolium* Bioss.	Warigulai	W	H	Flowers	Ornamental
	179. *Ranunculus aquitalis* L.	Jaghagha	W	H	Whole plant	Purgative, poisnuous

Table 1. (Cont'd.).

S. No.	Plants and family	Local name	Occurrence	Habit	Part used	Ethnobotanical uses
72.	**Family Rhamnaceae**					
	180. *Zizyphus jujuba* Mill.	Baira	W/C	T	Wood, leaves, fruit bark	Blood purifier, fuel wood, fruit, honey bee sp.
	181. *Zizyphus nummularia* (Burm. f.) Wight	Karkunda	W	SH	Leaves, fruit	Laxative, fodder, fruit, Fencing, Honey bee sp.
	182. *Zizyphus oxyphylla* Edgew.	Elanai	W	SH	Wood, leaves, root fruit	Used in gas trouble, fodder, fuel wood, fruit, honey bee sp.
73.	**Family Rosaceae**					
	183. *Crataegus oxycantha* H.K.F.	Tampsa	W	T	Leaves, wood, fruit	Fodder, fuel wood, fruit, fencing
	184. *Fragaria indica* Andrew	Da zamakay toot	W	H	Fruit	Laxative, fruit
	185. *Potentilla nepalensis* Hook.	Da ghar shalkhay	W	H	Root	Fever, blood purifier
	186. *Potentella raptens* L.	----	W	H	Whole plant	Febrifuge and astringent.
	187. *Pyrus pashia* Ham ex. D. Done	Tangai	W/C	T	Wood, fruit	Laxative, fuel wood, Fruit
	188. *Rosa webbiana* Wall. Ex.Royle	Palwari	W	SH	Flowers, branches	Ornamental, fencing, honey bee sp.
	189. *Rubus ellipticus* Smith	Bagana	W	SH	Leaves	Fodder, fencing
	190. *Rubus fruticosus* Hkf none L.	Karwara	W	SH	Leaves, fruit	Carminative, fodder, fruit, fencing
	191. *Rubus ulmifolius* Schott.	Goraj	W	SH	Leaves, fruit	Carminative, fodder, fruit, fencing
74.	**Family Rubiaceae**					
	192. *Gallium aparine* L.	----	W	H	Whole plant	Fodder
75.	**Family Rutaceae**					
	193. *Skimmia laureola* (Dc.) Steph.	Nazar panra	W	SH	Leaves	Repel the evils.
	194. *Zanthoxylum aromatum* D.C.	Dambara	W	SH	Wood, fruit	Aromatic, fuel wood, fruit, fencing
76.	**Family Salicaceae**					
	195. *Populus caspica* Bornm.	Spairdar	W/C	T	Wood, branches, leaves	Fodder, fuel wood, TSR, timber
	196. *Salix babylonica* L.	Wala	W/C	T	Wood	Fuel wood, TSR, timber
	197. *Salix tetrasperma* Roxb.	Wala	W/C	T	Wood	Fuel wood, TSR, timber
77.	**Family Sapindaceae**					
	198. *Dodonea viscosa* (L.) Jacq.	Ghwarskay	W	SH	Wood, bark	Anthelmintic, fuel wood, TSR, ornamental, fencing
78.	**Family Saxifragaceae**					
	199. *Berginia ciliata* (Haw) Sternb.	Kamar panra	W	H	Leaves	Tonic and pain killer
79.	**Family Scrophulariaceae**					
	200. *Verbascum thapsus* L.	Khar ghaug	W	H	Leaves	Used in cough & pulmonary diseases
80.	**Family Simarubaceae**					
	201. *Ailanthus altissima* (Mill) Swingle	Asli Bhikyanra	W/C	T	Wood, leaves, bark, gum resins	Gum resin mixed with milk is valuable for dysentery. Fodder, fuel wood, TSR, timber
81.	**Family Solanaceae**					
	202. *Atropa accuminata* Royle ex Mier	Barghak	W	H	Leaves	Narcotic, sedative
	203. *Datura innoxia* Mill.	Batora	W	H	Leaves, seeds	Antipyretic and narcotic, Poisnuous
	204. *Solanum nigrum* L.	Kamachoo	W	H	Shoot, leaves	Dropsy and jaundice.
	205. *Solanum surratense* Burm.f	Maraghony	W	H	Whole plant	Expectorant, diuretic
	206. *Withania somnifera* (L.) Dunal.	Kutilal	W	SH	Leaves, fruits, roots	Aphrodisiac tonic diuretic narcotic
82.	**Family Thymeliaceae**					
	207. *Daphne oloides* Scurb.	Laighonay	W	SH	Wood, fruit	Poultice is used for rheumatism, fuel wood, fruit
83.	**Family Tiliaceae**					
	208. *Grewia optiva* Drum.ex.Burret.	Pastawoone	W	T	Leaves, bark, branches	Fodder
84.	**Family Ulmaceae**					
	209. *Celtis australis* L.	Tagha	W	T	Wood, leaves, fruits	Amenorrhea and allergy, fodder, fuel wood, fruit, Agri. tools
85.	**Family Urticaceae**					
	210. *Debrrgesia salicifolia* D.Done.	Ajalai	W	SH	Wood, Fruit	Fuel wood
	211. *Urtica dioca* L.	Jalbhang	W	H	Not used	Poisonous
86.	**Family Valerianaceae**					
	212. *Valeriana jatamansii* Jones.	Mushk-e-Bala	W	H	Rhizome	Carminative and aromatic.
87.	**Family Verbenaceae**					
	213. *Vitex negundo* L.	Marwandai	W	SH	Branches, leaves, flowers	Tonic, febrifuge, fuel wood, TSR
88.	**Family Violaceae**					
	214. *Viola biflora* L.	Banafsha	W	H	Flowers	Diaphoretic, antipyretic and febrifuge
	215. *Viola serpens* Wall.	Banafsha	W	H	Flowers	Diaphoretic, antipyretic and febrifuge
89.	**Family Zygophyllaceae**					
	216. *Tribulus terrestris* L.	Markundai	W	H	Fruits, roots	Urinary disorders

Key, TSR=Thatching, Sheltering & Roofing spps; W=Wild; C=Cultivated; H=Herb; SH=Shrub; T=Tree; F=Fungus; Cl=Climber; P=Parasite.

2. Plants used as fodder and forage: Livestock is a very important component of the village life. Some 66 (30%) plant species are used as fodder. The most commonly used plants are *Acacia modesta*, *Avena sativa*, *Brassica compestris*, *Bromus japonicus*, *Cymbopogon distans*, *Cynodon dactylon*, *Lathyrus aphaca*, *Medicago minima*, *Melia azedarach*, *Morus*

alba, Morus indica, Rubus ellipticus, Rubus ulmifolius, Sorghum helepense, Trifolium repens and *Zizyphus spp.* Free grazing is the common practice in the area. Before the commencement of winter, the grasses are harvested, dried and put into a stake. The harvesting is done collectively and then during the bare and cold months of winter, these are fed to the domestic animals. Hussain *et al*., (1995), Hussain & Mustafa (1995), Hussain & Sher (1998), Sher *et al*., (2003, 2004), Hussain *et al*., (2004, 2005), Durrani *et al*., 2003; Gilani *et al*., 2003 and Ibrar *et al*., (2007) also reported the same from other parts of Pakistan.

3. Fuel wood species: Nearly 22% of the total recorded plant species were used as fuel wood. Fuel consumption per home in the studied area is often considered more than the consumption on feeding and other requirements because of severe winters. Khan (2000) and Awan (2000) observed that the fuel wood is collected before the commencement of winter. The most common plant species used as fuel are *Acacia, Ailanthus altissima, Dodonea viscosa , Melia azedarach , Mallotus philippensis, Morus* spp., *Populus caspica, Olea ferruginea , Quercus spp* and even *Abies pindrow* and *Pinus roxburghii.* Most of the economically important plants are decreasing due to cutting. All these species, which have high fuel value, are severely damaged. These include *Olea, Acacia, Dodonea, Melia* and *Quercus* which are decreasing in the area.

4. Vegetable, potherb and spices: Thirty-six species are being used as vegetables and potherbs comprising about 16% of the total reported plants. The cultivated species are *Allium cepa, Allium sativum, Brassica compestris* and *Luffa cylindrica,* while the remaining 32 plant species are wild. They included *Amaranthus viridis, Asparagus officinalis, Chenopodium album, Lathyrus* spp., *Malva neglecta, Medicago polymorpha, Mentha longifolia, Portulaca olearaceae*. Women and young girls collect the wild vegetables from their nearby area and generally used for their own need only. Hussain *et al*., (1995), Hussain & Sher. (1998), Sher *et al*., (2003, 2004), Hussain *et al*., (2004, 2005), and Ibrar *et al*., (2007). Durrani *et al*., (2003); Gilani *et al*., (2003) also reported many wild vegetable plants which are in use of local people.

5. Plants yielding edible fruits: There are 25 plant species (11%), yielding edible fruits. Among them nine species; *Diospyrus kaki, Diospyrus lotus, Juglans regia, Morus alba, Punica granatum, Pyrus pashia,* and *Zizyphus jujuba* are cultivated. The remaining 16 species including *Berberis lycium, Celtis australis, Rubus ulmifolius, Zizyphus nummularia, Ficus carica, Ficus palmata, Fragaria indica* are wild. Some of them are economically important, but in terms of density and frequency, the wild fruit plants are decreasing continuously due to biotic pressure (Hussain *et al*., 1995; Hussain & Sher, 1998; Sher *et al*., 2003, 2004; Hussain *et al*., 2004, 2005; Durrani *et al*., 2003; Gilani *et al*., 2003; Ibrar *et al*., 2007). *Diospyrus, Juglans* and *Punica* serve as cash crops in the area.

6. Plants used in thatching, sheltering and roofing: The local people use leaves and branches of 25 (11%) plant species including *Abies pindrow, Aesculus indica, Ailanthus altissima, Dodonea viscosa, Indigofera heterantha, Justicia adhatoda , Morus alba, Morus indica, Quercus spp., Saccharum spontaneum* and *Saccharum bengalense* for thatching, sheltering and roofing. Our findings agree with Badshah *et al*., (1996), Hussain *et al*., (2004, 2005), Sher *et al*., (2003, 2004), Gilani *et al*., 2003 and Ibrar *et al*., (2007) who also observed some of the same plants for similar purposes.

7. Timber wood species: Twenty-one (9.3%) species including *Abies pindrow, Ailanthus altissima, Betula jaequimontii, B. utilis, Juglans regia , Melia azedarach, Morus spp., Pinus roxburghii, Pinus wallichiana, Pistacea integrima, Platanus orientalis* and *Salix spp* are used as timber wood. These forests easily fulfill the requirements of the local people, but the activities of the timber maphia has greatly damaged the vegetation of the area. Similar observation regarding deforestation have been made by Hussain *et al*., (1995), Hussain & Sher (1998), Sher *et al*., (2003, 2004), Hussain *et al*., (2004, 2005), Durrani *et al*., 2003; Gilani *et al.,* 2003 and Ibrar *et al.,* (2007). Deodar fetches the highest price in Pakistan and this has greatly reduced in the recent years. An effort is needed to restore the original vegetation for better future.

8. Ornamental plant species: Nineteen plant species (8.4%) were classified as ornamental plants. Among them *Cynodon dactylon, Jasminum officinale, Mirabilis jalapa, Narcissus tazzeta, Nerium indicum* and *Tinospora cordifolia* were cultivated while *Adiantum venustum, Artimisia vulgaris, Asparagus officinalis, Jasminum humile, Rhododenron arborium* and *Rosa webbiana* are wild. Ornamental plants are commercially not exploited but it can become a good source of income generation. *Adiantum, Narcissus, Asparagus, Rosa* and *Jasminum* have the potential for commercialization.

9. Poisonous plants: Fifteen plant species (6.6%) including *Andrachne cordifolia, Arisaema jacquimontii, Buxus wallichiana, Clematus oreintalis, Datura innoxia, Dioscoria deltoidea, Euphorbia helioscopia, Polygonum barbatum* and *Urtica dioca* are considered poisonous to man, livestock or fish. These poisonous plants can be exploited as source of medicines.

10. Plants used in fencing and hedging: Livestock grazing is an important practice in the area therefore the people protects their crop fields by planting thorny, bushy or spiny plants around their crop fields. There were fourteen plants used for the purpose of fencing and hedging in the area. It comprised 6.2% of the total plants reported. Some important plants used for this purpose were: *Berberis lycium, Crataegus oxycantha, Gymnosporia royleana, Opuntia dilleni, Otostegia limbata, Rosa webbiana, Rubus spp., Zanthoxylum aromatum* and *Zizyphus nummularia.*

11. Plants used in making agricultural appliances/tools: In many parts of the valley even today, agriculture is carried out in primitive traditional way by using traditional wooden/iron tools. The study recorded that 12 species (5.5%) were used for making agricultural tools including ploughs, sticks, sickle handles, axe handles, pullies, knife handles and other agricultural appliances. *Acacia nilotica, Aesculus indica, Alnus nitida, Betula jaequimontii, Olea ferruginea, Parratiopsis jaequimontiana* and *Quercus spp* are important in this respect.

12. Honeybee species: Honeybees visit nine species (4%). The area is famous for wild honeybee species. *Acacia modesta, Justicia adhatoda, Plectranthus rogosus, Sarcococa saligna* and *Zizyphus spp.,* are important plant species for honey bees. Honey obtained from *Plectranthus rogosus* and *Zizyphus spp.,* is considered to be the best quality, which is

extensively used in the preparation of traditional medicines and sold at higher rates.

13. Multi-purpose plant species: The inhabitants of the valley depend on plants for their needs. Some 72 plant species are multi-purpose species (Table 1). They include *Abies pindrow*, *Acacia* spp., *Aesculus indica*, *Ailanthus altissima*, *Bauhinia variegata*, *Berberis lycium*, *Betula* spp., *Celtis australis*, *Diospyrus* spp., *Dodonea viscosa*, *Ficus* spp., *Gymnosporia royleana*, *Melia azedarach* , *Morus* spp., *Olea ferruginea*, *Pinus* spp., *Platanus orientalis*, *Quercus* spp., *Rubus* spp., *Salix* spp., and *Zizyphus* spp.

The area is under heavy biotic pressure in the form of deforestation and overgrazing, which has been considerably reduced regeneration of woody plants. Human population explosion, uprooting of medicinal plants by the local people and other casual factors are responsible for habitat loss, soil erosion and proper functioning of ecosystems. There is dire need to conserve the biodiversity of the area in order to provide the resources and resource alternatives for our own survival in future. Some of the recorded plants such as *Morchella*, *Olea*, *Abies*, *Cedrus*, Blue pines, *Caralluma*, Pomegranate and Mamekh are very important as cash crops in the area. *Morchella* is sold @ Rs. 4500-5000/Kg while medicinal plant like Mamekh is highly priced in the market. *Abies*, *Cedrus* and Blue pines are famous timber wood in the area. The price of *Cedrus* (Deodar) is approximately Rs. 2000-2500 / sq.ft, followed by *Abies* and Blue pines. Similarly *Olea*, *Acacia* and *Zizyphus* wood is praised as fuel wood. They are sold outside the area @ Rs. 250-270/ maund. *Caralluma* is declining in the area as it is collected and sold as vegetable @ Rs. 200/Kg. The whole plant is uprooted. Similarly, habitat deterioration has also lead to the reduction in regeneration of many woody and shrubby plants. For proper restoration of vegetation for sustainable use ecological efforts are needed with the participation of local community.

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