



# Ethnobotanical Survey of the Flora of Tehsil Balakot, District Mansehra, Khyber Pakhtunkhwa, Pakistan

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**Abstract :** *The inhabitants of tehsil Balakot, district Mansehra, Khyber Pakhtunkhwa, Pakistan were using eighty-eight different taxa belonging to seventy-one genera and forty-six families. Amongst the parts used, the results showed that the whole plant of most of them viz. thirty-two, the leaves of twenty-seven, the stem of twelve, and the fruits of nine taxa were used for different purposes. The governing families of the study area were Rosaceae Family consisting of thirteen taxa, solanaceae having five taxa, Buxaceae, Verbenaceae, Lamiaceae, Acanthaceae having three taxa each, Papilionaceae, Berberidaceae, Buddlejaceae, Anacardiaceae, Thymelaceae, Sapindaceae, Araliaceae, Guttiferae, Oleaceae, Cupressaceae, Euphorbiaceae, Poaceae, Rhamnaceae, Rutaceae, Caprifoliaceae keeping two taxa, and the rest of all the families contained one taxa, each was recorded in the study area.*

**Keywords:** *Ethnobotanical, Medicinal, Balakot, Mansehra, Khyber Pakhtunkhwa, Pakistan.*

## INTRODUCTION

Balakot is located between 34°33'N 73°21'E latitude and 34°33'N 73°21'E longitude near Kaghan valley located in the Northern part of Pakistan. It is a historical place and famous tourism site of the region, and the gateway to Kaghan valley of Khyber Pakhtunkhwa, Pakistan. The famous river of Balakot is Kunhar, originating from Lulusar lake and merges with River Jehlum just outside Muzaffarabad in Azad Kashmir. Balakot has a humid subtropical climate with hot summers and cool winters. Rainfall in Balakot is much higher than in most of the other parts of Pakistan. The heaviest rainfall occurs in late winter in the months of February and March, and in the monsoon season in the months of July and August; however, all the time there is a pleasant rainfall (Anonymous, 1998). Tehsil Balakot comprises of eleven union councils viz. Garhi Habibullah, Garlat, Ghanool, Hangrai, Kaghan, Kund, Mahandari, Sathbani, Shohal Mazullah and Talhata. Till now, there has been no documentation of traditional knowledge of their flora. The most common taxa of gymnosperms which have been found there, have been *Picea smithiana*, *Cedrus deodara*, *Taxus baccata*, *Pinus wallichiana* and *Pinus roxburghii*. While the most common angiosperm taxa have been *Fragaria duchesnia*, *Ranunculus muricatus*, *Zanthoxylum aramatum* and *Datura alba*. The important wild and cultivated fruits have been *Ziziphus nummularia*, *Ziziphus oxyphylla*, *Phoenix dactylifera*, *Viburnum grandiflorum*, *Rubus ulmifolius*, *Berberis lyceum* and *Diospyros lotus*. The key crops grown have been *Allium cepa*, *Oryza sativa*, *Zea mays*, and *Triticum aestivum*, *Hordeum vulgare*, *Solanum tuberosum*, *Brassica*

*campestris*, *Avena sativa*, *Lycopersicon esculentum*, *solanum melongena*, *cucurbita pepo*, *Cucumis sativa* and *Pisum sativum*. New plants have been adding to the flora of Pakistan which have great medicinal importance (Rashid et al., 2017). The residents of the study area have been using different kinds of plants' hormones for increasing the yield of crops (Irfan et al., 2017; Irfan et al., 2018; Irfan, M. & Ali. I., 2018).

Ethnobotany deals with the traditional knowledge and relationship that exists between plants, animals and humans. The delivery of the traditional knowledge traced back to China about five thousand years ago. Approximately eighty percent of the total human population still depends upon traditional uses of plants (Khan and Khatoon, 2007). According to the report of World Health Organization, three-fourth of human world population has not been able to afford modern medicines. These folks still use traditional plants and poultices of the traditional weeds for treatment of different remedies. About 422000 flowering plants have been reported all around the world, and amongst them 50000 have been used for medicinal purposes. About 6000 flowering plant taxa have been documented in Pakistan, and so far amongst them, there have been 600 medicinal plants (Tareen et al., 2010).

## Materials and Method

First of all, the available literature was studied, and the plants were collected in the respective localities by people having field notebooks, questionnaires, pencils, plant pressers, blotting papers, polythene bags, newspapers, knives, towels, gloves, twig cutters and sticks. Frequent field visits were carried out during January to December 2017 in different seasons of the year. A questionnaire was used to collect all the information regarding plants' traditional uses. Each specimen was tagged, pressed, poisoned with mercuric chloride and absolute alcohol, then mounted on the standard herbarium sheets. All the data viz. scientific name, vernacular name, family, habit, habitat, locality, parts used, medicinal use, folk recipe uses were documented in the field note book, and then transferred to the herbarium slip which was posted on the right foot corner of herbarium sheet. Plant taxa were identified with the help of available literature viz. flora of Pakistan (Ali, S.I., 2004). Finally, the collected plant taxa were deposited in the herbarium of Government Post Graduate College, Mansehra, Khyber Pakhtunkhwa, Pakistan.

## Results and Discussion

A total of three hundred and forty-five persons were investigated regarding the distribution on the basis of age and gender of informants. Out of three hundred and forty-five informants, there were two hundred males, and one hundred forty-five females. The consequences revealed that the males were mostly aged informants about the traditional knowledge than the young generation in the target survey area. In the study area, a total of 88 taxa belonging to 71 genera and 46 families were recorded during the first exploration of tehsil Balakot, district Mansehra, Khyber Pakhtunkhwa, Pakistan. The dominant families of the study area were Rosaceae consisting of thirteen taxa, solanaceae having five taxa, Buxaceae, Verbenaceae, Lamiaceae, Acanthaceae having three taxa each, while the families of Papilionaceae, Berberidaceae, Buddlejaceae, Anacardiaceae, Thymelaceae, Sapindaceae, Araliaceae, Guttiferae, Oleaceae, Cupressaceae, Euphorbiaceae, Poaceae, Rhamnaceae, Rutaceae, Caprifoliaceae keep two taxa each, and the rest of the families contained one taxa each recorded in the study area. Amongst these plant taxa, seventy-one taxa were wild while eighteen taxa were cultivated in the study area. Most of the taxa were reported to be quite successful remedies for different disorders viz. diarrhea, vomiting, stomach problems, diabetes, headache, blood pressure, backache, bronchitis, kidney problems, edema, pulmonary diseases, blood clotting, wounds healing, influenza, jaundice and cancer. These taxa were mostly used by hakims, local wound healers and old women, as well. The plant taxa were mostly used as a source of fuel, fodder, vegetable, medicinal and ornamental purposes. The highest percentage of the used plant parts were the whole plant viz. thirty-six percent, the leaves which were used viz. thirty percent, the stems were used viz. thirteen percent, the fruits were used viz.

ten percent, and the roots were used viz. eight percent, while the remaining parts were used viz. three percent only. The study area had the maximum diversity of wild flora viz. eighty percent, and rarely cultivated viz. twenty percent. The wise taxa investigation showed that twenty six taxa were used as a source of fuel, eleven taxa were used as a fodder, eleven taxa were used as an ornamental purpose, eleven taxa were edible fruits, seven taxa were used against jaundice, five taxa were used against stomach problems, four taxa were used against fever, three taxa were used against vomiting, three taxa were used for ear and nose pain, three taxa were used against backache, three taxa were used against asthma, three taxa were used against earache, two taxa were used against influenza, two taxa were used against diarrhea, two taxa were used for cleaning teeth, two taxa were used for the relief of menstrual cycle, two taxa were used for Blood purification, two taxa were used against arthritis, two taxa were used against pulmonary disorders, two taxa were used against skin infections, two taxa were used for making stick walks for aged people, two taxa were used against headaches, one taxa was used as a vegetable, one taxa was used against dyspepsia, one taxa was used against diabetes, one taxa was used against typhoid, one taxa was used for rope making, one taxa had spiritual values, one taxa was used against constipation, one taxa was used against piles, one taxa was used against kidney stones, one taxa was used against ringworm and foot athletes, one taxa was used as an analgesic, one taxa was used against bronchitis, one taxa was attractive for honey making, one taxa was anticancer, one taxa was used for healing wounds, one taxa was used as antilice, one taxa was used for making baskets, one taxa was used for house fencing.

Our result was in close union with a variety of other researchers who has previously conducted their study in different parts of Pakistan viz in Chapursan valley, Gojal, Gilgit Baltistan, Pakistan (Wazir et al., 2004), Shower Valley, District Swat, Khyber Pakhtunkhwa, Pakistan (Hussain et al., 2006), Dir valley, Khyber Pakhtunkhwa, Pakistan (Hazrat et al., 2007), Dir Kohistan valley, Khyber Pakhtunkhwa, Pakistan (Jan et al., 2010), Kahuta, District Rawalpindi, Punjab, Pakistan (Qureshi and Khan, 2001), Wari, district Upper Dir, Khyber Pakhtunkhwa, Pakistan (Manan et al., 2007), tehsil Kabal, Swat District, Khyber Pakhtunkhwa, Pakistan (Ahmad I., 2011), Neelum valley, Azad Jammu & Kashmir, Pakistan (Mahmood et al., 2011), Hazar Nao Forest, Malakand District, Khyber Pakhtunkhwa, Pakistan (Murad et al., 2011), Chitral Valley, Khyber Pakhtunkhwa, Pakistan (Ali H. and Qaisar, 2009), Samar Bagh Valley, Lower Dir district, Khyber Pakhtunkhwa, Pakistan (Irfan et al., 2017), district Lower Dir, Khyber Pakhtunkhwa, Pakistan (Ahmad I., et al., 2016), district Mansehra, Khyber Pakhtunkhwa, Pakistan (Gul, et al., 2016), southern Himalayan regions of Khyber Pakhtunkhwa, Pakistan (Qureshi et al., 2009), Siran Valley, district Mansehra, Khyber Pakhtunkhwa, Pakistan (Shah & Khan, 2006), Malam Jabba, district Swat, Khyber Pakhtunkhwa, Pakistan (Sher and Al\_yemeni, 2011), Dir Kohistan valley, district Dir upper, Khyber Pakhtunkhwa, Pakistan (Hazrat et al., 2011), Charkotli Hills, Batkhela District, Malakand, Khyber Pakhtunkhwa, Pakistan (Barkatullah et al., 2009), Mastuj, District Chitral, Khyber Pakhtunkhwa, Pakistan (Hussain F. et al., 2007), Maidan Valley, Lower Dir District, Khyber Pakhtunkhwa, Pakistan (Irfan M. et al., 2018), Dilbori, District Mansehra, Khyber Pakhtunkhwa, Pakistan (Ahmed J. et al., 2017), Upper Tanawal, District Mansehra, Khyber Pakhtunkhwa, Pakistan (Farooq M. et al., 2017), District Tor Ghar, Khyber Pakhtunkhwa, Pakistan (Mehmood A. et al., 2017), tehsil Laalqilla District Lower Dir, Khyber Pakhtunkhwa, Pakistan (Irfan M. et al., 2018) and also Kaghan Valley, district Mansehra, Khyber Pakhtunkhwa, Pakistan (Jamal Z. et al., 2017). Table 1 shows the ethnobotanical uses of the plants of tehsil Balakot, district Mansehra, Khyber Pakhtunkhwa, Pakistan.

**Table 1:** Ethnobotanical uses of the plants of tehsil Balakot, district Mansehra, Khyber Pakhtunkhwa, Pakistan

Sr. No.	Botanical name	Local name	Family	Part/s used	Ethnobotanical uses
1	<i>Andrachne cardifolia</i> L.	Karukani	Phyllanthaceae	Leaves and stem	Leaves and stem used as a fuel.

2	<i>Astragalus psilocentros</i> Fish	Pei botil	Papilionaceae	Whole plant	Leaves used as a fodder & fuel. Decoction of leaves used against cough & influenza.
3	<i>Berberis lyceum</i> Royle	Sunmbal	Berberidaceae	Whole plant	Extract of young stem & leaves used in Jaundice, diarrhea and Dyspepsia. Bark of root used with water against diabetes, vomiting, wound healing and cancer. Fruits are edible & used for blood purification.
4	<i>Berberis sp</i>	Jangalli Sunmbal	Berberidaceae	Whole plant	Fruits are edible. Stems used as a fuel. Root & Bark used in blood clotting.
5	<i>Buxus wallichiana</i> Bill	Kutay lal	Buxaceae	Leaves and stem	Extract of leaves used against edema & Stem is used as a fuel.
6	<i>Buddleja asiatica</i> Lour	Chiti boti	Buddlejaceae	Leaves and stem	Stem and leaves are used as a fuel & in Blood clotting.
7	<i>Buddleja Crispa</i> Bth	Chiita kao	Buddlejaceae	Whole plant	Whole plant is used as a fuel and in making sticks.
8	<i>Bougainvillea glabra</i> Choisy	Bengi boti	Nyctaginaceae	Whole plant	Ornamental purpose
9	<i>Calotropis procera</i> Ail	Rubber bush	Apocynaceae	Whole plant	Whole plant used against Diarrhea, vomiting and skin problems.
10	<i>Caesalpinia decapitala</i> Alston	Jarra	Caesalpinaceae	Stem and leaves	Leaves having ornamental value, and stem used as a fuel.
11	<i>Cotinus coggyria</i> Scop	Sagrati jhari	Anacardiaceae	Leaves	Leaves used as a fodder, and decoction of leaves used in Bronchitis
12	<i>Carissa opaca</i> L.	Jugnu	Apocynaceae	Stem	Stem used in making furniture
13	<i>Caryopteris odorata</i> D. Don	Safedii	Verbenaceae	Whole plant	Whole plant used as a fuel and fodder
14	<i>Cassia occidentalis</i> L.	Path jarri	Caesalpinaceae	Roots	Roots used in stomach ulcer
15	<i>Cotoneaster bacillaris</i> Wall ex. Lindle	Loon	Rosaceae	Stem	Stem used in making sticks
16	<i>Cotoneaster microphylla</i> Wall ex. Lindle	Lani	Rosaceae	leaves	Blood clotting
17	<i>Cotoneaster nummularia</i> Fish	Karwa	Rosaceae	Whole plant	Whole plant used as a fuel
18	<i>Cycus revoluta</i>	Sago palm	Cycadaceae	Whole plant	Ornamental value
19	<i>Cestrum nocturnum</i> L.	Rat ki Rani	Solanaceae	Whole plant	Pleasant smell used as ornamental
20	<i>Campsis radicans</i> (L.) Seem	Cow vine	Bignoniaceae	Leaves	Leaves used for headaches and ear pains
21	<i>Colebrookea oppositifolia</i> Smith	Balli	Labiatae	Stem	Stem used in asthma
22	<i>Cotonus coggyria</i> Scope	Paan	Anacardiaceae	Whole plant	Whole plant used as a fuel and making baskets
23	<i>Datura alba</i> MILL	Tatura	Solanaceae	Seed	Grinded seeds used for asthma
24	<i>Duranta sp</i>		Verbenaceae	Whole plant	Ornamental value
25	<i>Daphne mucronata</i> Royle	Kutay lal	Thymelaceae	Whole plant	Extract of leaves used to kill lice on animals' body hairs
26	<i>Daphne oleoides</i> Royle	Kutty lal	Thymelaceae	Whole plant	Whole plant used in Jaundice & rheumatism
27	<i>Datura strumarium</i> MILL	Tatura	Solanaceae	Leaves and fruit	Leaves are Anthelmintic
28	<i>Datura innoxia</i> MILL	Tatura	Solanaceae	Leaves	Blood purification
29	<i>Debregesia salcifolia</i> (D. Don) Rendle	Chenjal	Urticaceae	Leaves	Leaves used in jaundice .
30	<i>Isodon rugosus</i> (Wall. ex benth) Codd.	Chitt bota	Lamiaceae	Leaves.	Leaves used in Jaundice.
31	<i>Dodonea viscosa</i> (L) jacq	Sanatha	Sapindaceae	Leaves	Leaves used in diabetes and whole plant used as a fuel

32	<i>Eranthemum pulchellum</i> Andrews		Acanthaceae		Skin diseases and healing of wounds
33	<i>Ficus hederacea</i> Roxb.	Dumur	Moraceae	Leaves	For blood clotting
34	<i>Ephedra gerardiana</i> Wall ex.	Samai boti	Ephedraceae	Roots	Stomach problem and cough
35	<i>Hedra helix</i> K. Koch	Parwara	Araliaceae	Leaves	Blood clotting
36	<i>Foeniculum vulgare</i> Mill	Sounf	Apiaceae	Seed	Seed used for jaundice
37	<i>Hedra neoalensis</i> K. Koch	Berlli	Araliaceae	Roots	Roots have anticancer potentials
38	<i>Hypericum oblongifolium</i> Choisy	Shinoo	Guttiferae	Flower	Good attractive for honey bees
39	<i>Grewia tenax</i> (Forsk) Fiori	Tambar	Tilliaceae	Fruit	Fruits used in stomach ulcer.
40	<i>Gymnospora royleana</i> Wall. ex. Brand	Selti	Celastraceae	Whole plant	Whole plant is used as a fodder and fuel
41	<i>Indigofera heterantha</i> Wall. ex Brandis	Kainthi	Papilionaceae	Whole plant	Stem used in making baskets, as a fodder, blood clotting and in jaundice
42	<i>Isodon rugosus</i> (Wall. ex Benth) Codd	Chitt bota	Lamiaceae	Leaves	Leaves used in Jaundice and in pulmonary disorders
43	<i>Justicia adhatoda</i> Linn.	Baikar	Acanthaceae	Leaves	Decoction of leaves used in bronchitis and cough
44	<i>Jasminum nudiflorum</i> Lindl	Safedi	Oleaceae	Whole plant	Having ornamental value
45	<i>Jasminum humile</i> L.	Kangarru	Oleaceae	Flower	Flowers' extract used for the removal of kidney stones
46	<i>Juniperus communis</i> L	Barari	Cupressaceae	Whole plant	Asthma, joints pain and the rest of the plant's body used as fuel
47	<i>Justica adhatoda</i> L.	Baikar	Acanthaceae	Leaves & roots	Leaves and roots used in diabetes and vomiting
48	<i>Maytenus royleanus</i> (Wall ex. Lawson) Cuf	Patakha	Celastraceae	Leaves	Leaves used as a fodder & fuel
49	<i>Lespedeza hirta</i> (L.) Hornem.	Budii khantii	Fabaceae	Leaves.	Leaves' extract applied on wounds for blood clotting
50	<i>Lantana camara</i> L.	Nagh phool	Verbenaceae	Leaves & stem	Leaves used as Analgesic and the stem used as a fuel
51	<i>Mallotus philippensis</i> (Lam.) Muess		Euphorbiaceae	Fruits & whole plant	Fruits used in fungal infections & whole plant used as a fuel
52	<i>Myrsine africana</i> L.	Gori boti	Myrsinaceae	Root	Root extract used for the removal of kidney stones
53	<i>Nerium oleander</i> L.		Apocynaceae	Flower & whole plant	Flowers used for piles, & whole plant used as a fuel
54	<i>Otostegia limbata</i> (Benth) Boiss	Koray	Lamiaceae	Whole plant	Whole plant used as a fodder & fuel.
55	<i>Periploca aphylla</i> Dcne.	Kutti kidum wali boti	Asclepiadaceae	Whole plant	Whole plant used in stomach problems & fever.
56	<i>Prinsipia utilis</i> Royle	Desi sunbal	Rosaceae	Fruits	Fruit used for stomach, intestinal and urinary problems.
57	<i>Reinwardtia trigyra</i> (Roxb.) Planch		Linaceae	Leaves	Leaves used for blood clotting
58	<i>Ricinus communis</i> L.	Kashtrail	Euphorbiaceae	Root & Bark	Roots & bark used in Arthritis, swelling & backache.
59	<i>Rosa indica</i>	Rata gulab	Rosaceae	Flowers & whole plant	Flowers extract used in eyes infections and also having ornamental value.
60	<i>Rosa alba</i>	Chitta gulab	Rosaceae	Whole plant	Having ornamental value
61	<i>Rosa moschata</i> J. Herm	Gulabi	Rosaceae	Whole plant	Having ornamental value

		rose			
62	<i>Rosa damascene</i> Miller.	Gulab	Rosaceae	Flower	Flowers used in constipation in cattle
63	<i>Rubus ellipticus</i> Smith	Pogana	Rosaceae	Whole plant	Having ornamental value
64	<i>Rubus fruticosus</i> Hook	Karwara	Rosaceae	Fruits & leaves	Fruits used for blood purification & leaves for blood clotting.
65	<i>Rubus niveus</i> Thanbnon Wall.	Pogana	Rosaceae.	Roots	Roots used in excessive menstrual cycle.
66	<i>Rubus Ulmifolius</i> Schoot.	Phalwari	Rosaceae	Fruit and leaves	Leaves used as a fodder, and fruits are edible.
67	<i>Senna tora</i> L	Ban khenthi	Caesalpiniaceae	Leaves	Leaves decoction used in jaundice
68	<i>Saccharum spontaneum</i> L	Jharoo	Poaceae	Whole plant	Whole plant used in making brooms
69	<i>Spirea sp</i>		Rosaceae	Whole plant	Whole plant used as a fuel
70	<i>Thuja orientalise</i> L.	Cheelai	Cupressaceae.	Leaves	Leaves used in excessive menstrual cycle.
71	<i>Segetia thea</i> (Osbeck) M.C.Jhonston	Kandula	Rhamnaceae	Leaves	Leaves used as a fodder
72	<i>Sarcococa saligna</i> (D. Don) Muell	NEKA SANATHA	Buxaceae	Leaves	Leaves used in jaundice.
73	<i>Skimmia laureola</i> Dc	Nehra	Rutaceae	Leaves	Leaves used as evil repellents having spiritual value
74	<i>Saccharum griffithi</i> L	Jharro	Poaceae	Whole plant	Whole plant used for soil bonding
75	<i>Typha sp</i>	Sag wali rassi	Typhaceae	Leaves	Leaves used to make ropes and baskets
76	<i>Vitex negundo</i> L.	Marvandi	Lamiaceae	Leaves and stem	Leaves used for watering in mouth, and stem used as fuel and tooth brush
77	<i>Vitis vinifera</i> L	Angoor	Vitaceae	Fruits and stem	Fruits are edible, and extract from stem used for jaundice
78	<i>Viburnum cotinifolium</i> D. Don.	Ghuch	Caprifoliaceae	Leaves & fruits	Leaves used as a Fodder, and fruits are edible
79	<i>Viburnum grandiflorum</i> D. Don.	Uklun	Caprifoliaceae	Whole plant	Fruits are edible, leaves used as a fodder & rest of the parts are used as a fuel
80	<i>Segetia thea</i> Var	Gutka	Rhamnaceae	Whole plant	Used as fuels, leaves for fodder
81	<i>Woodforbia fruticosa</i> (L.) S, Kurz	Thahawa	Lythraceae	Leaves	Leaves are used as a fodder
82	<i>Phoenix dactylifera</i> L	Khajor	Arecaceae	Fruits	Fruits are edible having proteins and minerals
83	<i>Withania somnifera</i> (L.) Dunal	Patakha	Solanaceae	Fruits	Young fruits extract drunken one cup with milk in the morning for typhoid
84	<i>Yucca aloifolia</i> L	Azge Botey	Agvaceae	Whole plant	Having ornamental value
85	<i>Ziziphus nummularia</i> Burn. F	Kanda	Rhamnaceae	Whole plant	Leady used spine in nose and ear. Fruits are edible. Stem used as a fuel.
86	<i>Ziziphus oxyphylla</i> Edgew	Elani	Rhamnaceae	Fruit leaves & stem	Fruits are edible. Leaves are used as a fodder. Stem used as a fuel.
87	<i>Zanthoxylum aramatum</i> Dc	Timbar	Rutaceae	Leaves & stem	Leaves used for making chatni and stem used for cleaning teeth
88	<i>Hypericum perforatum</i>	Ban chahy	Hypericaceae	Leaves	Decoction of leaves used in influenza

## Conclusion

Mostly, the plant taxa were collected, cleaned, dried, grinded, and then the decoction was used twice a day orally against diarrhea, vomiting, cough, asthma, urinary, intestinal, skin disorders. The consequences of using different plant taxa were different, because the inhabitants of tehsil Balakot, district Mansehra, Khyber Pakhtunkhwa, Pakistan were mostly unaware about the modern facilities, and mostly depend upon the traditional knowledge and the ancestors' instructions. Additionally, due to the expensive prices of the modern

medicines, and the poverty of the inhabitants, their native home-made remedies and medicines were commonly used.

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