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# ETHNOBOTANICAL STUDIES OF THE FLORA OF TEHSIL BIRMAL IN SOUTH WAZIRISTAN AGENCY, PAKISTAN

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## ABSTRACT

*Ethno-botanical investigations were carried out in the tehsil Birmal of South Waziristan Agency, Pakistan during 2010-11. These investigations resulted in an exploration of 72 plant species from the area. These species included 49 medicinal plants, 16 forage, 11 fuel wood, nine vegetables, six agriculture tools, six ornamentals, four nectariferous, three tonic, two each for fencing and spices and one each for timber, furniture, confectionary and desserts, narcotic, cosmetic and insect repellent. A total of 30 plant families were recorded from the area, the largest was Lamiaceae, represented by nine species, Asteraceae by eight, Brassicaceae, Cucurbitaceae and Malvaceae by five, Chenopodiaceae by four, Apiaceae, Moraceae, Liliaceae, Fagaceae and Asclepiadaceae by three, Alliaceae and Mimosaceae were represented by two species. The remaining 17 families including Amaranthaceae, Anacardiaceae, Apocynaceae, Berberidaceae, Caesalpinaceae, Cannabinaceae, Capparidaceae, Celastraceae, Convolvolaceae, Cupressaceae, Ephedraceae, Euphorbiaceae, Fumariaceae, Juglandaceae, Meliaceae, Oleaceae and Polygonaceae were all represented by only one species each.*

**Key words:** Ethnobotany, folk therapy, Pakistan, South Waziristan, tehsil Birmal.

## INTRODUCTION

Tehsil Birmal, occupies western part of South Waziristan Agency lying between 31°-49′ to 30°-48′ North latitude and 69°-15′ to 70°-28′ East longitude and bounded in the west by Paktya province of Afghanistan, in the east by Wana (the North Waziristan Agency headquarter), in north by North Waziristan Agency and in south by district Zhob of Baluchistan province. The tehsil headquarter Angoor Adda is situated closed to Durand line at an elevation of 2150 meters. Main villages of the tehsil include Dhana, Sholam, Raghzai, Azam Warsak, Sara Kanda and Baghar Baba besides the tehsil head quarter.

The soils of the area are generally clay-loam in texture, shallow, being 15.7cm in average thickness, while parent rocks are calcareous. In accordance with the Data Processing centre record of

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Pakistan Meteorological Department Karachi, the mean minimum annual temperature ranged from 1.6°C–19.5°C, mean maximum temperature ranged as 9.9°C–30.8°C, annual precipitation ranges from 19.6mm to 121.3mm, percentage of relative humidity in the atmosphere ranges from 33.4% to 92.3%. The above mentioned statistical figures are based on the average data recorded between 1961 and 1990.

Ethnic structure of the tehsil Birmal reflects that it is wholly inhabited by Wazir tribe. Western Ethnologists write that Wazir tribe is of Rajput origin, an Indian race with the admixture of Seythian of Tatars. Wazir race is described as a tribe of Ghurgust Pathans. Pushto is the predominant language representing 98.7% of the population. According to 1998 population census of the tribe, 58712 people live in the tehsil with a female gender of 27382. The annual growth rate was 2.2% the same year and the population density was 65 persons per square kilometer. The male and female literacy rate was 19.8 and 2.6%, respectively. About 82% of the livestock was comprised of sheep and goats, 2.72% donkeys and 1.16% cows respectively. The percentage of the horses and camels was 0.71% of the total number of livestock.

**Natural vegetation and naturalized crops**

The natural vegetation is diverse due to uneven physiographic features of the area. At lower elevations in plain areas, the sub-tropical vegetation is dominant and at higher elevations, the sub-tropical vegetation is replaced by dry temperate forests with a clear ecotonal zone. At lower altitudes the most common trees are *Monotheca buxifolia, Olea ferruginea, Fraxinus xanthoxyloides* and *Cedrella toona.* The common shrubs are *Nerium indicum, Withania coagulans, Saccharum munja, Periploca aphylla;* while the common herbaceous weedy vegetation included *Peganum harmala, Euphorbia prostrata, Solanum nigrum, Solanum surrattense, Amaranthus viridis* and *Conyza canadensis.*

The vegetation cover at higher altitudes is comprised of (*Quercus incana, Quercus dilatata* and *Quercus semicarpifolia*) whereas at the upper reaches of the tree line *Pinus gerardiana, Pinus wallichiana, Cedrus deodara* and *Abies pindrow* were common taxa. *Berberis lyceum, Senecio flammeus, Daphne oleoides* and *Gymnosporia royleana* represented the dominant shrubs, while herbs like *Salvia nubicola, Thymus serphyllum, Iris hookeriana* and *Marrubium vulgare* were dominant.

According to the literature search, a review has been documented on the Medicinal and Aromatic plants in the universities of West Indies in Jamaica (Mitchell and Ahmad, 2001), while a survey has also been conducted on the anti-asthmatic plants in South West

region of Nigeria, of which ethno-botanical information has been published (Sonibared and Gbileb, 2008). Similarly efficacy of the folk medicinal plants used as a remedy for tapeworms among Nanga tribes in the North East India has also been reported (Temjenmongla and Yadav, 2005). The ethno medicine from plants survey has also been pursued in the salt range Kallar Kahar of Punjab Pakistan (Ahmad and Hussain, 2008). They reported the data based on 29 species belonging to 18 different families. Ethobotanical information was collected from Ranyal Hills of District Shangla, Pakistan. These plants were classified for their traditional medicinal and economic uses (Ibrar, 2007). Similarly, folk therapy of dysentery, diarrhea and cholera in the Arunchal Pradesh has also been reported by Kar and Borthakur (2008).

## MATERIALS AND METHODS

Ethnobotanical study was conducted in Birmal from April 2010 to March 2011. To ensure the maximum collection of the desired species and fill the questionnaire, four visits were made in the study sites in spring, autumn, winter and summer season during the abovementioned duration. To obtain ethnobotanical profile of the native villages, general information was obtained from the local people of these areas and geographical maps were obtained from the concerned offices.

The specimens were collected in each visit from the protected vegetation sites and were tagged with significant data, localities of occurrence and their macro-morphological characteristics. The specimens were pressed using blotting papers. To ensure sufficient aeration and complete drying of the specimens, the blotting papers were gradually changed after each 2 days until all specimens were completely dried. The dried specimens were treated with 2% solution of mercuric chloride and ethyl alcohol to avoid any quality loss and to preserve them properly. Naphthalene and moth balls application were proved as an effective insect repellant in the Herbarium specimens deposited at the herbarium of Pakistan Council for Scientific and Industrial Research (PCSIR) Laboratories, Peshawar. For insecticidal effect, naphthalene and paradiochlorobenzene were mixed in the ratio of 2:1 and kept in muslin bags in each cabinet of the herbarium. Mounting of the specimens were made on the Herbarium sheets. Plants were taxonomically characterized and given binomial nomenclature according to the fascicles of Flora of Pakistan (Nasir and Ali 1970-2004) and Macro morphological characters after (Trease and Evans, 1989). The specimens were given voucher specimen numbers and catalogued according to (Hutchinson I-II, 1967-68).

Information regarding local uses of medicinal, fuel wood, timber, fodder plants and plans of miscellaneous uses were collected from the people of different age groups and documented in Table-1 in the results section. However, preference was given to the information of elderly people and traditional healers who had indigenous knowledge of the plants and their traditional uses.

**RESULTS AND DISCUSSION**

Medicinal importance of the plants used among ethnic races of high lands needs recognition. Because wild herbs in the forests are a natural source of numerous chemicals, which are used in the preparation of many drugs of natural origin and medicine based on fine chemicals. The compounds obtained from such plants are used to fight major diseases like cancer, leukemia, muscular and heart diseases. They also form the basic ingredients of birth control hormones, stimulants and tranquilizers.

Since the study area is situated in the high lands hence the communication links are scarce, thus medical facilities are not available. Therefore, approximately 80% of the population is dependent on traditional medicine for all or most of their medicinal needs. Due to the reason, the people of tehsil Birmal are still forced to practice traditional or alternative medicine for their medicaments. Besides medicinal flora around this ethnic race is still undisturbed and abundant therefore the inhabitants are the beneficiaries. Application of the plants in various forms shows that they have been adopted as part and partial of the nature.

The important medicinal plants can be envisaged from the use of a few instances. The dried fruits of *Withania coagulans* are used in dyspepsia and flatulent colic. Similarly the seeds of *Malva neglecta* are used to relieve cough and ulcers in the bladder. Decoction of the leaf from the same taxon is considered as a remedy for tapeworm and profuse menstruation. *Mentha sylvestris* is extensively used for diarrhea and dysentery and decoction of the whole plant is used as a cooling agent. *Marubium vulgare* is another important medicinal plant of the area. The herb is used as a bitter tonic, expectorant and diuretic. It is exceedingly valuable in coughs, cold and pulmonary affections. The juice from fresh fruit of *Citrullus colocynthis* is mixed with sugar and is given in dropsy and externally applied in discoloration (leucoderma) of skin. The oil from seeds is also used for snake bite. *Berberis lyceum* is one of the widely used plants in the area. Roots of the plant are highly esteemed as a febrifuge and are used in relieving pyrexia. Leaves of the taxa are used as a cure for jaundice. The fruits are edible and given in the troubles of kidney

**Table-1. Ethnobotanical uses of plants of tehsil Birmal, South Waziristan Agency, Pakistan.**

| S.No | Plant species | Family | Local names | Traditional uses |
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| 1. | *Amaranthus viridis* L. | Amaranthaceae | Ranzaka | Cooked as pot herb, fodder for cattles |
| 2. | *Pistacia integerrima* Stewart | Anacardiaceae | Shrewaniay | Galls used in native medicine, fruit oily and edible, wood used for carving furniture and ornamental carpentry |
| 3. | *Anethum graveloens* L. | Umbelliferae | Zanrkay | Fruit decoction stimultant carminative relieves flatulance in infants |
| 4. | *Coriandrum sativum* L. | Umbelliferae | Danya | Leaves flavour cooked vegetables, fruits and seeds used in species for curries, fruit carminative, stimulant, and aphrodisiac, refrigerant. Decoction from fruit used to relieve colic pains, flatulence and bleeding piles |
| 5. | *Daucus carota* L. var. sativa Dc. | Umbelliferae | Gajar | Carrots used in confectionary and desert sweets. Seeds stimulant, carminative and effective in treatment of kidney and uterine pain |
| 6. | *Calotropis procera (*Wild.) Dryand ex W. Ait. | Asclepiadaceae | Spalmay | Leaves extract used in small doses for curing intermittent fever. Leaves powder dusted on wounds, ulcers and chornic sores, poultice of slightly roasted leaves administered to reduce inflamed swellings and rheumatic joints. Fermented leaves relieves chest pain and cures tympanitis |

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| 7. | *Caralluma edulis* (Edgew.) Bthex Hk. F. | Asclepiadaceae | Pamanai | Cooked as vegetable, hypoglycemic in cases of diabetes mellitus |
| 8. | *Periploca aphylla* Dcne | Asclepiadaceae | Barrara | White milk is used for skin ulcer and wounds |
| 9. | *Nerium oleander* Mill | Apocynaceae | Ganderi | Leaves decoction employed externally for skin diseases and piles. Whole plant used as fuel. Necteriferous flowers are meant for bee keeping and ornamentation near houses |
| 10. | *Artemisia scoparia* Waldst and kit | Compositae | Tarkha | Infusion of plant purgative, smoke useful for burns. Relives earache |
| 11. | *Aster trinervius* Roxb | Compositae | - | Roots used for cough relief and pulmonary infections, also used in the treatment of malaria and hemorrhages |
| 12. | *Cichorium intybus* L. | Compositae | Bhangara | The whole plant is used for the cure of diarrhea and bilious attacks. A decoction from the seeds is used in obstructed menstruation and for checking bilious vomiting |
| 13. | *Conyza canadensis* (L.) Cronquist | Compositae | - | Used as a fresh fodder and has diuretic and stimulant properties |
| 14. | *Launea nudicaulis* Hook | Compositae | Shapoon Zeera | Leaves applied to the heads of children suffering from fever |
| 15. | *Senecio flaevus* (Decne) Sch. | Compositae | Gharangawa | Plant is used for thatching purposes and the wood is also used as fire wood |
| 16. | *Tagetes patula* L. | Compositae | Zear-gullai | Cultivated as ornamental plant for its sweet scent and gollen yellow capitula |

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| 17. | *Xanthium strumarium* L. | Compositae | Randah | Decoction is administered for efficacy of long standing cases of material fever. Prickly fruit is considered cooling and demulcent and given in small – pox. |
| 18. | *Berberis lyceum* Rolye | Berberidaceae | Karai | The root is highly esteemed as febrifuge and used in relieving Pyrexia. Leaves are used as cure for jaundice. Fruits are edible and given to Kidney patients when in trouble. A watery solution of the roots and root bark is used as purgative for children and a blood purifier. The plant is also used as hedge, fencing and fuel wood |
| 19. | *Brassica rapa* L. | Brassicaceae | Tepar | The thickly fleshy roots are cooked as vegetable the leafy tops are used as salad |
| 20. | *Descurainia sophia* (L.) Webb. & Berth | Brassicaceae | Khashir | Seeds mixture in syrup form are swallowed for the cure of fever |
| 21. | *Lepidium draba* L. | Brassicaceae | Bashka | The plant is used as vegetable and fresh fodder. Also used as stomachic and tonic |
| 22. | *Raphanus sativus* L. | Brassicaceae | Meelay | Young fleshy roots are eaten raw for the cure of jaundice, liver ailment, urinary complaints and piles. Leaves are used as salad and for its diuretic and laxative properties. |
| 23 | *Sisymbrium irio* L. | Brassicaceae | Kharkasai | Seeds are expectorant and restorative and are used externally as a stimulating poultice. Also a febrifuge. |

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| 24. | *Sophora mollis* (Royle) Baker | Caesalpinaceae | Ghuger | Leaves and seeds are anthelmintic and are considered to kill abdominal worms. Also used as fodder for cattle, ash is used in making snuff |
| 25. | *Cannabis sativa* L. | Cannabinaceae | Bhangay | Bhangy (Marijuana) is prepared by cutting young green leaves of female plant, exposing them to sun or crushed in fresh condition. It is taken in the form of drink alongwith water, milk or sweets. It is considered as a cooling agent. Also used as stimulant, tonic and to cure urinogenital diseases |
| 26. | *Cleome brachycarpa* Vahl. ex DC. | Capparidaceae | Zachawa | Leave are crushed in oil and the paste is rubbed on the arm and legs as an embrocation for fever. The leaves, which are strongly aromatic, are put in cloths in order to protect tem from insects. |
| 27. | *Gymnosporia royleana (*Wall) Lawson | Celastraceae | Sherowa | Plant is used as hedge, for fencing and also as fuel wood. Young shoots are browsed by goats and camels |
| 28. | *Spinacea oleracea* L. | Chenopodiaceae | Palak | Leaves are edible and are used in the preparation of vegetables and stews |
| 29. | *Chenopodium album* L. | Chenopodiacene | Makhlaq | Plant is used as pot herb, also used as fresh fodder |
| 30. | *Haloxylon griffithii* (Moq.) Bunge ex Boiss. | Chenopodiaceae | - | Plant is browsed by goats and camels |
| 31. | *Salsola kali* | Chenopodiaceae | Bachkay | Used as a fooder for camels |

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| 32. | *Convolvulus arvensis* L. | Convolvolaceae | Parwathiay | Roos are purgative, but rarely used. Whole plant is used for skin diseases, also used as fresh fodder |
| 33. | *Citrullus colocynthis* (L.) Kuntze | Cucurbitaceae | | Juice of fruit when fresh is mixed with sugar and given in dropsy. Also applied in discoloration of skin/ leukoderma. Oil from the seeds is used for snake bite. Fruits are highly purgative and administered to cattle for intestinal disorder. |
| 34. | *Citrullus vulgaris* schrad | Cucurbitaceae | Hindworanh | It is a popular summer fruit of the area. The sweet and juicy fruit is relished by all. The epicarp is used as a fodder for cattle. It is a commercial crop and also used for bee keeping. |
| 35. | *Cucurbita maxima* Duch | Cucurbitaceae | Kadee | The fruit are used as vegetable |
| 36. | *Cucumis sativus* L. | Cucurbitaceae | Badrang | The fruit is used as salad |
| 37. | *Legenaria siceraria* (Molina) standley | Cucurbitaceae | Weezhd Kadee | The young yellowish green fruit is used as vegetable |
| 38. | *Cupressus sempervirens* | Cupressaceae | Bashtha | The wood is used as fuel and for coal making locally. The fruit is used as a cooling medicine for cattle. |
| 39. | *Ephedra intermedia* schrenk | Ephedraceae | Mowa | Decoction of the stem is considered as a useful remedy for rheumatic pains and syphilis. Besides also used in nasal and bronchial congestion, colds, a sthma and hay fever |
| 40. | *Euphorbia helioscopia* L. | Euphorbiaceae | Sagergotiae | The plant is used as cathartic and applied to remove warts. Juice is sometimes used to cure |

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| | | | | eyelids, though improper. Seeds are employed in roasted peper in cholera, while the roots are occasionally used as anthelmintic. |
| 41. | *Quercus dilatata* Royle ex Lindle | Fagaceae | Ghora tsore | The leaves are used as fodder for goats and cattle, particularly in winter season. The hard wood is used for agricultural implements and also used as fuel. The corns are roasted and eaten. |
| 42. | *Quercus incana* Roxb. | Fagaceae | Sperkey tsere | The wood is chiefly used as fir wood and thatching purposes, ash of wood is used in making snuff. |
| 43. | *Quercus semicarpifolia* sm. | Fagaceae | Khalanza | Wood is used for making handles of many agriculture implements, also used as fuel. The leaves are browsed by camels and its roasted seeds are eaten |
| 44. | *Fumaria indica* (Hausskn) H.N. Pugsley | Fumariaceae | Paparie | The plant is diuretic diaphoretic and aperient. An extract is used for cooling purpose, used externally also the same purpose. |
| 45. | *Juglans regia* L. | Juglandaceae | Matak | Kernels are eaten raw to gain weight, also used brain tonic. Root bark and leaves are used for teath cleaning and lip colouring by the women. |
| 46. | *Marubium vulgare* L. | Labiatae | Qurashka | Used as a bitter tonic, expectorant and diuretic. It is also used for pulmonary infections and in cold. |

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| 47. | *Mentha virdis* L. | Labiatae | Podina | The herb is used as stimulant, carminative. Its decuction is used to relieve cough, flatulence and digestive disorders. The leaves are used as flavouring ingredient in curries and chutnies. Leaves are also used as anti-pyretic and for bronchitis. |
| 48. | *Mentha sylvestris* L. | Labiatae | Valanai | The leaves and decuction of the plant are used as carminative. Leaves are also employed as astringent and for rheumatic pains, nausea, sickness and vomiting. They are also used for diarrhea, dysentery and soaked in water, the infusion so obtained is taken as a cooling medicine. |
| 49. | *Nepeta cataria* L. | Labiatae | Chemjanbetai | The dried leaves and flowering tops are carminative, diaphoretic, refrigerant and stimulating. The tea prepared by boiling the leaves is sipped, which is useful in cold and fever, gives mild sedative effect and produce perspiration. |
| 50. | *Perowskia atriplicifolia* Benth | Labiatae | Sansube | The plant is used as a cooling medicine. The flowers are soaked in water gives highly cooling effect when applied to the body of patients suffering from fever. |
| 51. | *Salvia nubicola* | Labiatae | Darshell | The plant is used as poultice in gangrene. |

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| 52. | *Stachy parviflora* benth. | Labiatae | Sperghunai | The bruised stem and leaves are anthelmintic and are useful for intestinal worms |
| 53. | *Teucrium stocksianum* Boiss | Labiatae | Kastorai | The plant is boiled and left to stand all night, the water is decanted and taken as a remedy for colds. It is also used in cases of heart pain. |
| 54. | *Thymus serphyllum* L. | Labiatae | Mervezei | The herb is considered antispasmodic, carminative, tonic and is given in weak vision, complaints of the stomach and liver, suppression of urine and menstruation. Seeds are given as vermifuge. Plant is also grazed by cattle and goats. |
| 55. | *Allium cepa* L. | Alliaceae | Pioz | The juice is used for various intestinal and gastric disorders also has diuretic and expectorant properties. |
| 56. | *Allium griffithii* Boiss | Alliaceae | Spee Khokh | Leaves and bulbs are eaten raw with bread by the inhabitants of the area. Also used as fresh fodder |
| 57. | *Iris hookeriana* Foster | Liliaceae | Sheeziay | Bulbs and leaves are either eaten raw or cooked as vegetables. |
| 58. | *Tulipa lehmenriana* Merckl | Liliaceae | Shandai | Mostly occur widely in hills but also grown for ornamental purposes |
| 59. | *Tulipa stellata* HK. F. | Liliaceae | Shondi | Grown for its beautiful flowers as an ornamental plant |
| 60. | *Abelmoschus esculentus* medic. | Malvaceae | Bhenday | Green fruiting capsules are used in vegetables and soups. Pultices |

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| | | | | prepared from leaves are applied on skin to stop irritation and removes swellings and pain. The mucilage from fruits and seeds is useful in the irritation of genitor-urinary system. |
| 61. | *Malva neglecta* | Malvaceae | Gogai | The seeds are used to relieve cough and ulcers in the bladder. |
| 62. | *Malva parriflora* L. | Malvaceae | Tikalai | The seeds are used to relieve cough and ulcer in the bladder. The decoction of the leaf is a remedy for tape worm and profuse menstruation. |
| 63. | *Malva rotundifolia* L. | Malvaceae | Nagankai | The leaves are employed externally in the treatment of scurvy and reckoned useful in piles. Seeds are said to be effective in bronchitis, cough, inflammation of bladder, also applied externally in skin diseases. |
| 64. | *Withnia coagulans* | Malvaceae | Shapianga | The dried fruits are used in dyspepsia and flatulence |
| 65. | *Cedrella toona* Roxb. ex Rottle and willd. | Meliaceae | Bakanra | The plant is cultivated for ornamental purposes and also for its cool shads. Also yield timber and fuel wood. Wood is also used for making agricultural appliances |
| 66. | *Acacia eucophloea* (Roxb.) Willd | Mimosaceae | Kikkar | Wood is used as a source of fuel, leaves are browsed by camels, goats and cattle, so used as fresh fodder. The species is also important for bee keeping. |

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| 67. | *Acacia modesta* Wall. | Mimosaceae | Palosa | The gum is medicinally used as demulcent and emulsifying agent. The leaves are browsed by camels. Wood is hard and is used for making various agricultural tools. Also used as fire wood and a bee keeping species. |
| 68. | *Ficus carica* L. | Moraceae | Inzar | Fruits are eaten fresh or dried. Being laxative are used in constipation. Leaves are used as fresh fodder. Also used as fuel wood and in making various agricultural tools. |
| 69. | *Morus alba* L. | Moraceae | Teeth | Fruits are juicy and are eaten raw or dried. Fruits are laxative and relieves constipation. The leaves are used as fresh fodder or stored for used in winter. Wood is used for making poles to support barbed wires for hedges and tencing round the field. |
| 70 | *Morus nigra* L. | Moraceae | Thor Teeth | The fruit is edible, eaten raw or dried. The leaves are used as fodder. The wood is used as a source of fuel. |
| 71. | *Daphne oleoides* | Oleaceae | - | Leaves of the plant are used for diarrhea and dysentery for cattle and goats. |
| 72. | *Polygonum plebejum R.Br.* | polygonaceae | Seer gulae | Juice of *Polygonum plebejum* is used in ophthalmic disorders of domestic birds and shows amazing results |

Since the area is lacking adequate veterinary services, thus traditionally many plants are used as veterinary medicines. For instance juice of *Polygonum plebejum* is used in ophthalmic disorders of domestic birds and shows amazing results. Leaves of the *Daphne oleoides* are used for diarrhea and dysentery for cattle and goats. Similarly, the fruit of *Cupressus sempervirens* is used as a cooling medicine for cattle. Table-1 shows all the ethnobotanical uses of the given plants by the people of tehsil Birmal in South Waziristan Agency.

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