

ETHNOBOTANICAL STUDY OF IMPORTANT WILD PLANTS OF DISTRICT SWABI
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ABSTRACT

A detailed study was conducted during summer 2016, in order to collect information about the ethnobotanical uses of important plants of tehsil Swabi, District Swabi and documented it for future use. The present investigation comprises the indigenous uses of 104 plant species belonging to 54 families based upon their utility. Out of this rich ethnobotanical germplasm, the most important families were Asteraceae, Amaranthaceae, Apocynaceae, Asteraceae, Chenopodiaceae, Euphorbiaceae, Lamiaceae, Malvaceae, Moraceae, Mimosaceae, Papilionaceae, Poaceae, Rhamnaceae, Rosaceae, Salicaceae and Solonaceae. The most common plants in the area were *Albizia lebbek* L., *Cuscuta reflexa* Roxb, *Citrus medica* L., *Dodonia viscosa* L., *Ficus carica* L., *Nerium oleander* L., *Mentha longifolia* L., *Ocimum basilicum* L., *Portulaca* sp. Some plants were important for their wild fruits i.e. *Capparis decidua* Forsk., *Solanum nigrum* L., while *Medicago polymorpha* L. and *Chenopodium album* L. were wild vegetables. It is concluded from the current study that the research area is rich in wild flora and the local community has a diverse knowledge about the use of plants of the target area. The present findings will prove a key to identify those elements in a plant with a pharmacological value that is ultimately meant for the international markets.

Keywords: Ethnobotany, biodiversity, phytosociology, uses of plants, wild plants.

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INTRODUCTION

Swabi District of Khyber Pakhtunkhwa province is situated at 34° 7', 48" N and 72° 28', 11" E of Khyber Pakhtunkhwa, Pakistan, and lies between the Indus and Kabul Rivers. It is the fourth most populous district of the province of Khyber Pakhtunkhwa in Pakistan.

Climate

Climate of District Swabi is harsh. The summer season is extremely hot. A steep rise of temperature is observed from May to September. During May and June dust storms are frequent at night. The temperature reaches its maximum in the month of June, i.e. 41.50 °C. Due to intensive cultivation and artificial irrigation, the tract is humid and heat is oppressive.

Socio-economic status

Tobacco is a cash crop of Swabi, along with vegetables, wheat, sugar cane and maize. Its climate is well suited for citrus fruits in particular, but many other fruits like watermelon, peaches and apricots are also grown there. Soil of District Swabi is fertile and can support rich phytodiversity but extreme biotic disturbance have precluded the original plant cover. The plains and sub mountainous tracts of District Swabi have tropical dry deciduous and sub-tropical forests at higher altitude (Beg, 1978). However, it caused a rapid fall of temperature. Grazing and land vegetation are economical use of range land (Malik, 2006).

Ethnobotany

The term "Ethnobotany" was used by Harshberger in 1896 to point to plants used by the aboriginals. It is considered as a branch of ethno-biology. It deals with the study and evaluation of plant-human relations in all phases and the effect of plant environment on human society. The study of use of local flora of a particular region or culture by native people is termed as ethnobotany.

Pakistan is an enriched ecological zone, in which medicinal plants have been used as traditional medicine for human health care as well as animals (Ismail and Nisar, 2010). Nearly six thousand species of flowering plants have been reported in Pakistan and Kashmir (Jamal et al., 2012). While 2,000 species have been reported as medicinal plants but only a small portion is being processed on commercial bases (Cotton, 1996). Most of the allopathic drugs are extracted from medicinal plants (Kayani et al., 2014). About 80% population of Pakistan depends on plants as usual medicine but due to lack of exposure these species are limited to the native areas (Hussain et al., 2010). The native population use these plants for different purposes including treatment of a broad range of diseases, from headache to stomach ache, cuts and wounds since prehistoric times (Ali et al., 2018). This wealth of knowledge has been transferred from generation to generation and now not only the proper documentation of this knowledge is required but also the conservation strategies (ex-situ and in-situ measures) should be carried out to deal with the ongoing loss of medicinal plants (Shinwari et al., 2011). Though there are different systems eastern medicine which are prevailing even today for primary health care by exploring medicinal properties of plants, yet there are serious threats of loss to this precious wealth of indigenous knowledge. Ali et al., (2018) explored the ethnomedicinal and cultural importance of native and alien plants of Jhok reserve forest, used by the local people. Sher et al., (2014) conducted a study to examine plant diversity and its ecological characteristics in Gadoon Hills. Abbas et al., (2016) documented the ethnobotanical knowledge of Tormik Valley, Karakorum Range, Baltistan. Ahmad and Pieroni (2016) conducted several studies to point out the importance of wild food plants (WFPs) for assuring food sovereignty and food security. Keeping in view the importance of traditional knowledge of plants, the present study was aimed to document the flora of Tehsil Swabi being used ethnobotanically.

MATERIALS AND METHODS

Field study

This research was conducted during summer 2016 in Tehsil and District Swabi, Khyber Pakhtunkhwa Pakistan. Frequent visits were made to the research

area and different sites in villages where natural vegetation was present, were thoroughly studied.

Collection of plant material

Plants specimens were confirmed by elder persons, local Hakims and other professionals (Pansari). Three or four specimens of each plant were collected during the trips and preserved in sterilized polythene bags and later on shifted to blotting paper followed by newspapers for drying purpose. After every 24 h, the newspaper was replaced to new one. The dried plants were mounted on the herbarium sheets after complete shade drying on newspapers. Standard method was followed for collection, drying, mounting, preparation and preservation of plant specimens

Identification of plants and Collection of Ethnobotanical Data

Taxonomic study including the name of genus, species, family, local name and locality, were recorded. Plants identification was made with the help of available literature (Nasir and Ali 1971-95). A comprehensive ethnobotanical data was documented from different sites of the research area. To get first hand information about the indigenous uses of plants, a total of 50 local key informants were interviewed including aged males, females, shepherds and Hakeems. The local residents still rely on plant resources for a variety of needs such as food, fodder, house construction, fencing, agriculture tools making and health care etc. They were asked about the vernacular names, occurrence, parts used and mode of administration of plants. The informants were interviewed in their local language, Pashto. The data were analyzed and indigenous knowledge was documented.

Life form and Leaf size spectra

The life form classes were constructed according to Raunkiaer (1934) using the complete list of the plant communities collected from the study area (Tables 1-3). The leaf area was obtained using the formula of Cain and De Oliveira-Castro (1959) such as:

Leaf area = $\frac{2}{3} (L \times W)$, where : L - Full length of the leaf and W: width of the leaf at its widest portion. Whereas Leaf size classes were depicted by Malhado et al. (2009) earlier developed by Raunkiaer (1934) to determine leaf categories.

RESULTS AND DISCUSSION

Data was collect from the local people and Hakeem of the area to gather knowledge on the daily usage of important plants of Tehsil Swabi. The plant species included grasses, herbs, shrubs and tree species. Ethnobotanical information was collected on 104 plant species in the investigated area and summarized in tabulated form along with their ethno-medicinal uses, local names, family and the parts being used to cure different diseases (Table 1, 2 and 3). The reported vegetation comprised of 57 species of herbs including one parasitic species, 31 tree species including one tree of Gymnosperm and 16 shrubs.

1. Plants used as medicine

More than 93 % plant species were used as a local herbal remedy for the treatment of ailments. The inhabitants of the area used some of the plants as a whole or their parts individually, and in other cases plants were used in combination for the treatments of diseases. There are some plants which are used for one disease and others are used for curing many diseases, for example *Acacia modesta*, *Berberis lycium*, *Calotropis procera*, *Fumaria indica*, *Mentha longifolia*, *Morus* species, *Oxalis corniculata*, *Punica granatum*, *Verbascum thapsus*, and *Zizyphus* sp. are commonly used against the various ailments. The plant species used against diseases have been shown in Tables 1, 2 and 3. These plants have been reported by various workers i.e Khan et al. (2017), Abbasi et al. (2013) and Sher et al. (2014) with respect to medicinal uses.

2. Plants used as fodder and forage

Livestock is a very important component of the village life. Some (23 %) plant species are used as fodder. The most commonly used plants are *Acacia modesta*, *Zizyphus* spp,

Avena fatua, *Cynodon dactylon*, *Medicago polymorpha*, *Morus* sp. and *Zizyphus* spp. Free grazing is the common practice in the area. The grasses are harvested, before the commencement of winter, dried and put into a stack. The harvesting is done collectively and then during the bare and cold months of winter, these are fed to the domestic animals. Aqil et al. (2017); Abbasi et al. (2013) and Sher et al. (2014), also reported the same from other parts of Pakistan.

3. Fuelwood species

About 45% 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. Awan (2000) observed that the fuel wood is collected before the commencement of winter. The most common plant species used as fuel are *Acacia* sp., *Albizia* sp., *Dodonea viscosa*, *Withania* sp., *Azadirachta*, *Melia*, *Eucalyptus*, *Morus* spp., *Populus caspica* and even *Pinus roxburghii*. Most of the economically important plants are dwindling due to cutting. All these species, which have high fuel value are severely damaged. These include *Acacia*, *Dodonea*, *Melia* and *Morus* which are decreasing in the area.

4. Vegetable, potherb and spices

Twenty four species of plants are being used as food (vegetables and fruit) comprising about 22.9 % of the total reported plants. The cultivated species are *Allium cepa*, *Allium sativum* while the remaining plant species are wild. Those include *Amaranthus viridis*, *Asparagus officinalis*, *Chenopodium album*, *Malva sylvestris*, *Digera arvensis*, *Medicago polymorpha*, *Mentha longifolia* and *Portulaca olearacea*. Women and young girls collect the wild vegetables from their nearby area and generally use for their own need only. Ali et al. (2018), Aqil et al. (2017), Khan et al. (2017), also reported many wild vegetable plants which are in the use of local people.

5. Plants yielding edible fruits

There are 9 plant species (8.65%) yielding edible fruits. Among them three species; *Morus alba*, *Punica granatum*, *Magnifera indica* and *Syzygium jambos* are cultivated. The remaining species including *Berberis lycium*, *Zizyphus nummularia*, *Phoenix dactylifera*, *Ficus carica*, and *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 pressures.

6. Plants used in thatching, sheltering and roofing

The local people use leaves and branches of 3.84 % plant species including *Pinus roxburghii*, *Dodonea viscosa*, *Justicia adhatoda* and *Morus* sp. for thatching, sheltering and roofing. Our findings agree with Kayani et al. (2014), Jamal et al. (2012) and Sher et al. (2014), who also observed some of the same plants for similar purposes.

7. Timber wood species

8.65 % plant species including, *Melia azedarach*, *Morus* sp., *Dibergia sisso* and *Salix babylonica* are used as timber wood. These trees easily fulfill the requirements of the local people, but the activities of the timber mafia has greatly damaged the vegetation of the area. Similar observation regarding deforestation have been made by Abbasi et al. (2013) and Sher et al. (2014). These trees 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

Out of 104 plant species, 4.8% were classified as ornamental plants. Among them *Jasminum officinale*, *Nerium indicum* and *Rosa indica* were cultivated while *Artemisia scoparia* is wild. Ornamental plants are not exploited commercially but it can become a good source of income generation. All these plants can be grown on a commercial scale to generate income.

9. Poisonous plants

1.9% plant species including *Euphorbia helioscopia* and *Euphorbia hirta* are considered poisonous to man, livestock or fish. These poisonous plants can be exploited as source of medicine.

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 10.57% plants used for the purpose of fencing and hedging in the area. Some important plants used for this purpose were: *Berberis lycium*, *Justicia adhatoda*, *Aerva javanica*, *Nerium oleander*, *Calotropis procera*, *Capparis spinosa*, *Dodonaea viscosa*, *Withania coagulans*, *Withania somnifera* and *Zizyphus nummularia*.

11. Plants used in making agricultural appliances/tools

In many parts of the area even today, agriculture is carried out in primitive traditional way by using traditional wooden/iron tools. The study recorded that 10.5% species were used for making agricultural tools including ploughs, sticks, sickle handles, axe handles, pullies, knife handles and other agricultural appliances. *Acacia nilotica*, *Olea ferruginea*, *Dalbergia sisso* and *Morus* spp. are important in this respect.

12. Honey bee species

Among the studied plant it was found that 43% plant species are visited by honeybees. That is the reason that the area is famous for wild honeybee species. Among these plants *Acacia modesta*, *Justicia adhatoda* and *Zizyphus* spp., are some of the important plant species for honey bees. Honey obtained from *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. Sports goods making plants

Some of the plants are used for making sports goods i.e., *Morus alba*, *M. nigra*, *Dalbergia sisso* the people of the area depend on plants for their needs. Some grass species are used for broom making by the local people of the area. 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 a dire need to conserve the biodiversity of the area in order to provide the resources and resource alternatives for our own survival in future.

CONCLUSIONS

The current study concluded that the research area is rich in wild flora and the local community has a diverse knowledge about the use of plants of the target area. Due to the lack of knowledge and unscientific collection methods, particularly medicinal plants are getting depleted from the area. It is direly needed to encourage the indigenous people to cultivate the threatened natural flora. This study may provide valuable information on the sustainable use and conservation of natural plants resources of the area studied.

Table-1. Summary of ethnobotanically important herbs of Tehsil and District Swabi.

S.No.	Botanical name	Vernacular name	Family	Life form/ leaf size spectra	Part uses	Uses
1	<i>Abutilon indicum</i> (Link) Sweet.	Botey	Malvaceae	Th/Mes	L,Sd,R,F l	Me, Fd
2	<i>Achyranthus aspera</i> L.	Kurashky	Amaranthaceae	Th/Mes	L	Me, Fd, Hb
3	<i>Aerva javanica</i> (Burm.f.) Shult.	Sassa	Amaranthaceae	Th/Mic	Wp	Fd,Me,Hb,H g
4	<i>Allium cepa</i> L.	Piaz	Liliaceae	G/ Mic	Wp	Me, Fo
5	<i>Allium sativum</i> L.	Ooga	Liliaceae	G/Mic	Wp	Fo, Me
6	<i>Aloe vera</i> Mill.	Zargia	Liliaceae	Cr/Mes	L	Me, SP
7	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC	Soba	Amaranthaceae	Th/Mes	Wp	Me, Fd.
8	<i>Amaranthus viridis</i> L.	Ranzakay	Amaranthaceae	Th/Mes	L	Me, Fd, Hb
9	<i>Anagallis arvensis</i> L.	Jonk mari	Primulaceae	Th/Mic	L	Me, Hb
10	<i>Argemone mexicana</i> L.	Botey	Papaveraceae	Th/Mes	L, R,Sd	Me, Hb
11	<i>Artemisia scoparia</i> L.	Jukay	Asteraceae	Ch/Lp	L, Sd, S	Me,Fd
12	<i>Asphodelous tenuifolius</i> Cav.	Zangli piaz	Asphodelaceae	G/Mic	Sd	Me
13	<i>Boerhaavia diffusa</i> L. nom. cons. ¹	Botey	Nyctaginaceae	Th/Na	Wp	Me, Hb
14	<i>Boerhavia procumbens</i> Banks ex Roxb.	Bash khira	Nyctaginaceae	Th/Na	Wp	Me, Hb
15	<i>Calendula arvensis</i> L.	Zyrgoli	Asteraceae	Th/Na	Fl,L	Me, Hb
16	<i>Carthamus oxycantha</i> L.	Azghiki	Asteraceae	Th/Na	Sd	Me, Hb, Fe
17	<i>Cuscuta reflexa</i> L.	Chambar h	Casutaceae	P/ Na	S	Me
18	<i>Catharanthus roseus</i> (L.) G.Don	Sada Bahar	Apocynaceae	Np/Mic	L	Me, Hb, Fe
19	<i>Chenopodium album</i> L.	Bathoo	Chenopodiaceae	Th/Mic	L, R	Me, Hb, Fd,Fo
20	<i>Chenopodium murale</i> L.	Toor Soba	Chenopodiaceae	Th/Mic	L,R	Me, Hb, Fo
21	<i>Chrozophora plicata</i> Neck. ex A.Juss.	Neil botey	Euphorbiaceae	Th/Mic	WP	Me, Fo, Hb
22	<i>Citrullus colocynthis</i> L.	Indrayan	Cucurbitaceae	Th/Mic	R ,Ft	Me, Hb
23	<i>Cleome viscosa</i>	Kusturi	Capparaceae	Th/Mic	L, Sd,	Me, Hb

	L.				R	
24	<i>Convolvulus arvensis</i> L.	Pervatay	Convolvulaceae	Th/Mic	Wp	Me, Hb
25	<i>Conyza Canadensis</i> (L.) Cronquist	Sassa	Asteraceae	Th/Mic	L, Wp	Me, Fd, Fe
26	<i>Coronopus didymus</i> Zinn	Beta	Cruciferae	Th/ Lp	L, Ft	Me, Hb
27	<i>Cynodon dactylon</i> (L) Pers.	Barava	Poaceae	H/Lp	Wp	Fd, Me
28	<i>Cyperus rotundus</i> L.	Dela	Cyperaceae	G/Lp	L	Me, Fd
29	<i>Desmostachya bipinnata</i> (L.) Stapf.	Sargarha	Poaceae	Hc/Mic	Fl, S	Fd, Fe, Hb,
30	<i>Digera arvensis</i> L.	Surmi	Amaranthaceae	Th/Mic	L	Me, Fd
31	<i>Eclipta alba</i> L.	Botey	Asteraceae	Th/Mic	L, Sd, Wp	Me, Fe,
32	<i>Euphorbia helioscopia</i> L.	Chatri dodak	Euphorbiaceae	Th/Na	Sd	Me, Po
33	<i>Euphorbia hirta</i> L.	dhodak	Euphorbiaceae	Th/Na	Sd	Me, Po
34	<i>Fagonia cretica</i> L.	Spela Azghay	Zygophyllaceae	Th/Na	Wp	Me, Fd
35	<i>Frageria indica</i> Andrews	Zamaki tut	Rosaceae	Hc/Mic	Ft, Wp	Me, Fo, Fd
36	<i>Fumaria indica</i> (Hauskn.) Pugsley	Paprah	Fumariaceae	Th/L	Wp	Me, Fd
37	<i>Heliotropium europaeum</i> L.	Hathi-sunda	Boraginaceae.	Th/Mic	Wp	Fe, Me, Hb
38	<i>Launaea procumbens</i> Cass.	Dudglak	Asteraceae	Th/L	L	Fo, Hb
39	<i>Malva sylvestris</i> L.	Panirak	Malvaceae	Th/Mic	L, S	Me, Fo, Fd, Hb
40	<i>Medicago polymorpha</i> (L.)	Sinji	Papilionaceae	H/Na	Wp	Fd & Me. Hb
41	<i>Mentha arvensis</i> L.	Pudina	Lamiaceae	H/Mic	L	Fa, Me, Hb
42	<i>Mentha longifolia</i> L.	Pudina	Lamiaceae	H/Mic	L	Fa, Me, Hb
43	<i>Oxalis corniculata</i> L.	Zyre beta	Oxalidaceae	Th/Mic	Wp	Me, Fd
44	<i>Peganum hermala</i> L.	Sponda	Zygophyllaceae	Th/L	Wp	Me
45	<i>Polygonum plebejum</i> R.Br.	Kheer wal	Polygonaceae	Th/Mic	Wp	Me
46	<i>Portulaca</i>	Warkhorh	Portulacaceae	Th/L	Wp	Me, Fo, Fd

	oleraceae L.	y				
47	<i>Silene conoidea</i> L.	Nosheen	Caryophyllaceae	Th/Na	Ft	Me,Fd,Hb
48	<i>Solanum nigrum</i> L.	Mako	Solanaceae	Np/Mes	L	Fo,Me,Hb
49	<i>Solanum surratense</i> L.	Marghorey	Solanaceae	Th/Mic	Wp	Fe,Me,Hb
50	<i>Sonchus asper</i> (L.) Hill	Tareza	Asteraceae	Th/Mes	Wp	Me,Fd
51	<i>Taraxacum officinale</i> (L.) Weber ex F. H. Wigg	Botey	Asteraceae	Th/Mic	L,R	Me,Fd
52	<i>Trianthema portulacastrum</i> L.	Sathi	Aizoaceae	Th/Mic	L, R	Me,Hb,Fd
53	<i>Tribulus terrestris</i> L.	Markonday	Zygophyllaceae	Th/Na	Ft , Wp	Me,Fd
54	<i>Xanthium strumarium</i> L.	Kurashki	Asteraceae	Th/ Mes	Wp	Me,Fe
55	<i>Verbascum thapsus</i> L.	Khar Ghuag	Schropholariaceae	Th/Mac	Wp	Fe,Me
56	<i>Withania coagulans</i> (Stocks) Dunal	Shapyanga	Solanaceae	Th/Mic	Ft,L,Sd	Me,Fe
57	<i>Withania somnifera</i> (L.) Dunal	Asghand	Solanaceae	Th/Mic	Ft,L	Me,Fe

Key: Parts used: Wp-Whole plant, Ft-fruit, L-Leaves, R-Root, S-Stem, Sd-Seed, Fl- flower.

Uses: Me-Medicinal, Fo-Food, Fd-Fodder, Hb-Honey Bee Species, Fa-Flavoring agent, Fe-Fuel, SP-Sacred Plant.

Lifeforms: Th: Therophytes, Phanerophytes, Mp: Megaphanerophytes, Np: Nanophanerophytes, Hc: Hemicryptophytes, G: Geophytes, Ch: Chamaephytes, Cr: Cryptophytes, P: Parasite.

Leaf size spectra: Mic: Microphylls, Lp: Leptophylls, Mes: Mesophylls, Na: Nanophylls, Mac: Macrophylls, Meg: Megaphylls

Table-2. Ethnobotanical summary of important Trees of Tehsil and District Swabi.

S.No.	Botanical name	Vernacular name	Family	Lifeform/ leaf size spectra	Parts used	Uses
1	<i>Acacia nilotica</i>	Kikar	Mimosaceae	Mp/Lp	Wd,L,Gm	Me, Ag. T, Fr, Fe
2	<i>Acacia medesta</i>	Palosa	Mimosaceae	Mp/Lp	Wd,L,Gm	Me, Ag. T, Fr, Fe
3	<i>Albizia lebbbeck</i>	Sirin	Fabaceae	Mp/Lp	St-Bk,Wd	Me, Tw, Fe
4	<i>Azadirachta indica</i>	Bakanrh a	Meliaceae	Mp/Mic	Wp, L,Ft	Me, Fe, Hb
5	<i>Bauhinia purpurea</i>	Kachnar	Fabaceae	Mp/Mes	Fl-buds, L,Wd	Me, Hb, Fe, Tw
6	<i>Bombax malabaricum</i>	Sumbal	Malvaceae	Mp/Mac	Gm,Sd,R, Bk,Fl,Wd	Me, Fe, Ag. T, Sp.g, Hb
7	<i>Buxus sempervirens</i>	Shmshad	Buxaceae	Ph/Mes	Fl,L,Bk, R,Wd	Me, Tw, Fe
8	<i>Capparis deciduas</i>	Kherha	Capparaceae	Ph/Lp	Ft,S	Fo, Me, Fe
9	<i>Cassia fistula</i>	Amaltas	Fabaceae	Mp/Mac	Ft,L,bk, R,Wd	Me, O, Fe, Ag.T
10	<i>Callistemon viminalis</i>	Botal brush	Myrtaceae	Mp/Mic	L,Bk, Fl,Wd	Me, Fe, Ag.T
11	<i>Dalbergia sissoo</i>	Shawa	Fabaceae	Mp/Mic	L,R,Wd, Fl	Sp.g, Hb, Fr
12	<i>Eucllyptus citriodora</i>	Safeda	Myrtaceae	Mp/Mes	L,Wd, Bk	Me, Fe, Sp. g, Ag.T ,Tw
13	<i>Ficus benghaalensis</i>	Bargad	Moraceae	Mp/Mes	Wp	Me, Fr
14	<i>Ficus carica</i>	Anjeer	Moraceae	Mp/Mes	Ft,L,Ltx	Fo, Me
15	<i>Jacaranda mimosifolia</i>	Jacarand	Bignoniaceae	Ph/L	Wp	Me, Fe, Tw
16	<i>Mangifera indica</i>	Aam	Anacardiaceae	Ph/Mac	Fl,L,Bk,Ft	Me, Fo,Fe
17	<i>Melia azedarach</i>	Neem	Meliaceae	Mp/Mic	Wp,Gm	Me, Fe, Hb,
18	<i>Morus nigra</i>	Toot	Moraceae	Mp/Mes	L,Wd,Ft,	Me, Tw, Fe, Fo,Ag.T,Sp.g
19	<i>Phoenix dactylifera</i>	Khajoor	Arecaceae	Ph/Meg	Ft,Sd,L	Me, Fo, Fe, Tha, Hg
20	<i>Pinus roxbergii</i>	Cher	Pinaceae	Mp/Na	S,L,Sd, Wd	Fe, Tha,Fo
21	<i>Prosopis juliflora</i>	Kabli Keekar	Leguminosae	Mp/L	L,Bk,Pd, Gm, S,Fl	Me, Fe, Hb
22	<i>Populus caspica</i>	Spairdar	Salicaceae	Mp/Mes	L,S,Wd	Me, Fe, Ag.T
23	<i>Punica</i>	Anar	Punicaceae	Mp/Mes	Ft,Ft-bk	Me, Fo

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24	Ricinus communis	Arind	Ricinaceae	Mp/Meg	L,Sd,S	Me, Fe,Hg
25	Salix babylonica	Walay	Salicaceae	Mp/Mic	Wp,Wd	Fe, Tw
26	Syzygium jambos	Jaman	Myrtaceae	Mp/Mes	Bk,Ft,Wd	Me, Fo, Ag.T
27	Tamarix aphylla	Ghaaz	Tamaricaceae	Mp/L	Bk,L,Wd	Me, Fe, Ag .T
28	Terminalia chebula	Haradh	Combretaceae	Ph/Meso	Ft,Bk,Wd	Fo,Me,Fe
29	Terminalia arjuna	Ashoka	Combretaceae	Ph/Meso	L, Bk , Ft	Me, Fe, Tw
30	Ziziphus moritiana	Ber	Rhamnaceae	Mp/Mic	Ft, L, Wd	Me, Fo, Fe, AgT,
31	Zizyphus numularia	Karkan	Rhamnaceae	Mp/Mic	Ft, L,Wd	Me, Fo, Fe, AgT,Hg

Key: Parts used:Wd -Wood, St-Bk: Stem bark, , Ft-fruit, L-Leaves, R-Root, S-Stem, Sd-Seed, Gm: Gum, Ltx: Latex, Bk : Bark, Ft-bk: Fruit bark, Pd:Pod.

Uses:Me-Medicinal, Fo-Food, Fd-Fodder, Hb-Honey Bee Species, Fa-Flavoring agent, Fe-Fuel, Po-Poisonous, Br-Broom making, SP-Sacred Plant.Ag.t-Agricultural tools, Fr. Furniture.Sp.g. Sports Goods, O-ornamental.

Life forms: Th: Therophytes, Mp: Megaphanerophytes, Np: Nanophanerophytes Hc: Hemicryptophytes, G: Geophytes, Ch: Chamaephytes, P: Parasite,

Leaf size spectra: Mic: Microphylls, Lp: Leptophylls, Mes: Mesophylls, Na: Nanophylls , Mac: Macrophylls , Meg: Megaphylls.

Table-3. Ethnobotanical summary of important Shrubs of Tehsil and District Swabi.

1	Aerva sp	Harh Sassa	Amaranthaceae	Ph/Mic	L	Me, Fo, Hb, Hg
2	Berberis lycium	Toorkwaray	Berberidaceae	Ph/Mic	Fl, L, Bk, R	Me, Tw, Fe, Hb, Hg
3	Calotropis procera	Spelmaka	Asclepidaceae	Ph/Mes	Wp	Me, Fe, Hb, Hg
4	Capparis spinosa	Caper	Capparaceae	Ch/Mic	Fl, Bk, R, S	Fo, Me, Fe, Hg
5	Citrus limon	Nimbo	Rutaceae	Ph/Mic	Fl, Ft	Me, O, Hb
6	Citrus medica	Katha	Rutaceae	Ph/Mes	Ft	Me, O, Fo
7	Dodonaea viscosa	Zerha wany	Sapindaceae	Ph/Mic	L, Bk, R	Me, Fe, Hb, Tha, Hg
8	Jasminum grandiflorum	Chambeli	Oleaceae	Ph/Mic	Fl	Me, O, Hb
9	Justicia adhatoda L	Ganderi	Acanthaceae	Ph/Meso	Wp	Me, Fe, Hb, Tha, Hg
10	Nerium oleander	Sassa	Apocynaceae	Ph/Mes	L, R	Me, Fe, Hb, Hg
11	Nicotiana tobaccum	Tamaki	Solanaceae	Th/Mac	L	Me
12	Osimum bacilicum	Niaz Bo	Lamiaceae	Ph/Mes	Fl, L, Sd	Me, Fe, Hb
13	Rosa indica	Gulab	Rosaceae	Ph/Mic	Fl, Ft	Me, O, Hb
14	Salvadora oleoides	Miswak	Salvadoraceae	Ph/Mes	S, R	Me, Ag. T, Fe
15	Withania coagulans	Shapyangay	Solanaceae	Shapyangay	Ch/Mic	Ft, Wp
16	Withania somnifera	Asgandh	Solanaceae	Asgandh	Ch/Mic	Ft, Wp

Key:

Parts used: Wp-Whole plant, Ft-fruit, L-Leaves, R-Root, S-Stem, Sd-Seed, fl-flower, Bk-bark. Uses: Me-Medicinal, Fo-Food, Fd-Fodder, Hb-Honey Bee Species, Fa-Flavoring agent, Fe-Fuel, Po-Poisonous, Br-Broom making, SP-Sacred Plant. Ag.t-Agricultural tools, Fr-Furniture. Sp.g. Sports Goods, O-ornamental. Life forms: Th: Therophytes, Mp: Megaphanerophytes, Np: Nanophanerophytes, Hc: Hemicryptophytes, G: Geophytes, Ch: Chamaephytes, P: Parasite, Leaf size spectra: Mic: Microphylls, Lp: Leptophylls, Mes: Mesophylls, Na: Nanophylls, Mac: Macrophylls, Meg: Megaphylls.

Table-4. Different ethnobotanical uses of various plant species.

S. No	Ethnobotanical Uses	%	S.No.	Ethnobotanical Uses	%
1.	Plants as medicine	94	9.	Poisonous plants	1.9
2.	Fodder and forage	23	10.	Plants used in fencing and bedding	10.6
3.	Fuel wood species	45	11.	Agricultural tools	10.5
4.	Vegetable/ spices	20	12.	Honeybee species	4.3
5.	Fruit yielding species	8.65	13.	Furniture making	4.8
6.	Thatching	3.84	14.	Sport goods making species	3.8
7.	Timber wood	8.65	15.	Broom making Plants	1.0
8.	Ornamental plant species	4.8	16.	Sacred plants	1.0

Table-5. Most common plant parts used for the different ethno-botanical purposes at Tehsil Swabi.

S.No.	Plant Part	Use
1	Leaves	50 %
2	Stem	10.57%
3	Root	16.3%
4	Flower	13.46%
5	Fruit	23%
6	Flower buds	0.96%
7	Whole plant	31.7%
7	Bark	12.5 %
8	Stem Bark	0.96%
9	Latex	0.96%
10	Seed	14.4%
11	Fruit Bark	0.96%
12	Pod	0.96%
13	Gum	3.8%
14	Wood	16.3%

Fig 1. Classification of important plants of tehsil Swabi into different leaf size spectra classes

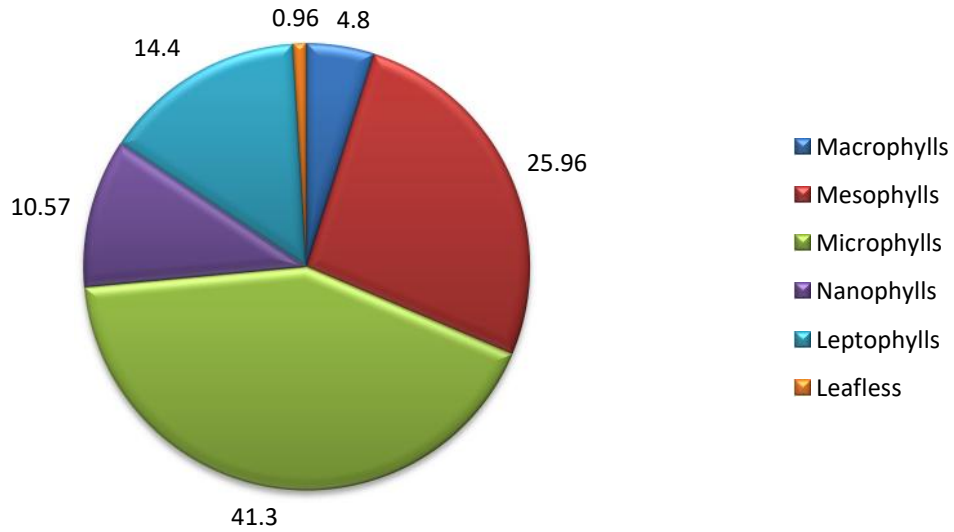
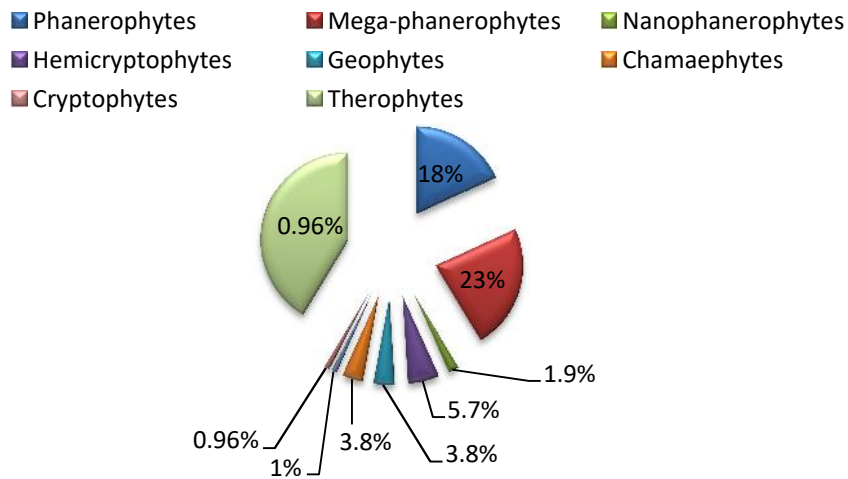


Fig 2. Classification of important plants of tehsil Swabi into different life forms



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