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Indigenous Utilization of Weed Flora of District Charsadda, Khyber Pakhtunkhwa

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Abstract: District Charsadda is a very important center of plant biodiversity in the central plain of Peshawar valley, Pakistan. The present study was carried out during 2015-2016 to investigate the ethno botanical profile of common weed flora present in district Charsadda, KP, Pakistan. The study revealed that there were 40 weed species belonging to 21 families. Among them, 25 weeds were annual herbs, 9 weeds were perennial herbs, three were annual grass, one was a climbing herb, one was a parasitic weed, and one was rhizomatic grass. The dominant families were Asteraceae, Fabaceae and Poaceae having 5 species (12.5 %) each followed by Ranunculaceae with 3 species (7.5 %). Plants were systematically arranged into botanical names, local names, families, habits, habitats, used parts, flowering periods, localities, and ethno botanical uses. The main aim of the study is the documentation and collection of ethno botanical information of the weed flora growing in the area.

Keywords: Indigenous Uses, Weed Species, Local Uses, Annual, Perennial, District Charsadda, Khyber Pakhtunkhwa

INTRODUCTION

Charsadda derives its name from its headquarters' town. At the time of Alexander's invasion, Charsadda was known as Pushkalavati (The Lotus city). Charsadda district lies in the central plain of Peshawar valley between 34-03' to 34-28' North Latitude and 71-28' to 71-33' East Longitudes with area of 996 square kilometres. It is bounded by Malakand district on the north, Mardan district on the east, Nowshera and Peshawar districts on the south, and Mohmand Agency on the west. The plain of Charsadda district is very fertile. The plants in Charsadda district are commonly mulberry (Tut), Sissu (Shwa), Tarmarisk (Ghaz), Paplar (supaidar) and Eucalyptus (Lachi). Trees are normally grown on the boundaries of the field and on water channels. Some of the common plants grown in the region are Zizipus species, Acacia modesta, Morus nigra/alba and Vitus vinifera. The climate of Charsadda district is extreme. The summer season persists from May to September. June is extremely hot and dry, July and September are monsoon months. July and August are hot and humid. The turns of season comes in October, and up to mid-November it is cold and pleasant. From December to mid-February, it is cold. The spring comes sometime around the middle of March which is the most pleasant period of the year, the mean of maximum and minimum temperatures (Anonymous, 1998). Precipitation and humidity were recorded at Charsadda as shown in Table 1. Major crops of the area are Tobacco, Sugarcane, Sugar beet,

wheat and maize while major vegetables are potato, tomato, cabbage, brinjals and spinach and major fruits are apricot, citrus, plum, strawberry and pears.

Table-1. Monthly Information

| MONTHLY MEAN MAX TEMP (°C) | | | | | | | | | | | | |
|--------------------------------------|------|------|-------|-------|------|------|-------|-------|------|------|------|------|
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2014 | 20.7 | 20.1 | 22.6 | 30.0 | 34.8 | 41.2 | 37.6 | 37.0 | 35.5 | 29.9 | 25.5 | 20.8 |
| 2015 | 19.5 | 21.3 | 23.8 | 30.4 | 35.4 | 38.5 | 35.9 | 34.8 | 34.3 | 30.2 | 23.5 | Nil |
| MONTHLY MEAN MIN TEMP. (°C) | | | | | | | | | | | | |
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2014 | 2.9 | 6.1 | 10.2 | 15.5 | 20.1 | 24.6 | 26.4 | 25.9 | 23.7 | 18.1 | 9.0 | 3.8 |
| 2015 | 4.3 | 9.0 | 11.5 | 17.5 | 21.7 | 24.7 | 26.9 | 25.7 | 21.1 | 16.7 | 10.2 | Nil |
| MONTHLY TOTAL RAIN (MM) [-1=TRACE] | | | | | | | | | | | | |
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2014 | 5.2 | 40.6 | 119.7 | 54.8 | 16.6 | 27.8 | 48.4 | 61.0 | 15.0 | 43.2 | 1.2 | 0.0 |
| 2015 | 33.7 | 70.1 | 120.3 | 114.1 | 39.2 | 0.0 | 119.0 | 158.4 | 53.3 | 52.0 | 29.6 | Nil |
| MONTHLY MEAN HUMIDITY (%) AT 0800 AM | | | | | | | | | | | | |
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2014 | 81 | 84 | 86 | 71 | 63 | 57 | 76 | 78 | 75 | 86 | 80 | 82 |
| 2015 | 84 | 83 | 85 | 81.1 | 64 | 63 | 82 | 85 | 79 | 87 | 86 | Nil |
| MONTHLY MEAN HUMIDITY (%) AT 0500 PM | | | | | | | | | | | | |
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2014 | 52 | 58 | 86 | 38 | 37 | 33 | 66 | 49 | 51 | 62 | 53 | 54 |
| 2015 | 54 | 54 | 62 | 50 | 42 | 42 | 62 | 67 | 56 | 55 | 60 | Nil |

Source: Pakistan Meteorological Department

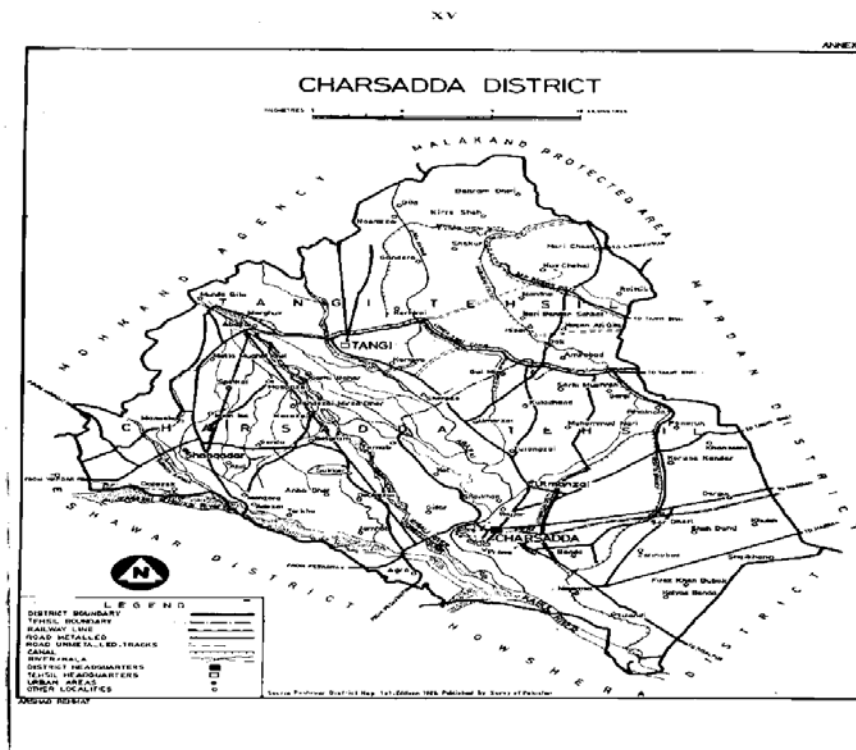


Figure 1: Map of the study area Charsadda

Ethnobotany is a biological and economic cultural relationship between people and plants of an area in which they exist. Indigenous knowledge of plants is as old as civilization, but the term ethno botany was used for the first time by an American botanist John. W. Harsh Berger in 1896, to study plants used by primitive and indigenous communities (Khan et al., 2015). Medicinally important plants are necessary for producing the various drugs and curing diseases. People use 26 species of the vascular plants of the Mianwali district for different purposes i.e. as a medicine, as furniture and agricultural implements and as food (Qureshi et al., 2007). The villagers have their own remedies for medicinal treatments by using various plants or plant products present in their vicinities (Bhushan & Kumar., 2013). (Ibrar et al., 2007) Estimated that there were 37 fuel species, 37 fodder species, 31 medicinal species, 18 edible species and 10 vegetable species which are used in our daily life. Valuable economic and ethno medicinal flora of the area is decreasing. Sustainable utilization and conservation of the flora of the area are strictly recommended (Sher et al., 2011). (Begum et al., 2017) reported 65 species belonging to 35 families, from the Valley coined to the ethno medical domain of the Tirat Valley, Swat District, Pakistan. The plant part used by the locals are: the whole plants (41.5%) followed by seeds, 4 leaves, 11 flowers, 9 roots, 4 barks, 7 gums, 4 stems, 1 fruit, 7 resins and 1 wood, stem and acorns. (Pandey & Pandey, 2016) Uses of ethnomedicinal plants should be confirmed by the experimental and phytochemical studies to increase the safety and effectiveness of these plants and witnesses to develop modern drug developments (Mengesha, 2016) Geological information was obtained from the office of Geological Survey of Pakistan, Peshawar. Population data were obtained from census report (1998), from Deptt: of Geography, University of Peshawar.

Materials and Methods:

The study was carried out in the flowering seasons during 2015-2016, and plant specimens were collected from different crop fields viz wheat, maize and sugar cane fields, and were kept in a presser, dried for a week, and identified with the help of available literature (Ali SI & Nasir, 1971-1991; Nasir& Ali, 1991-1993; Ali & Qaiser, 1995-2018). The ethnobotanical information from the local inhabitants was gathered (including Hakeems, framers, shopkeepers and elders of the area) through discussion methods and interviews.

Results and Discussion:

The current study is based on indigenous utilization of weed flora of district Charsadda, Pakistan. The study includes a total of 40 species belonging to 21 families. The leading families are Asteraceae, Fabaceae and Poaceae 5 species (12.5%) each, followed by Ranunculaceae with 3 species (7.5%), Amaranthaceae, Apiaceae, Brassicaceae, Plantaginaceae, Caryophyllaceae with 2 species (5.4%) each, while the remaining 14 families are monophilitic and comprised of single species (2.5%) each. Among them, 25 species are annual herbs, 9 species were perennial herbs, 3 are annual grass, 1 is an annual climbing herb, 1 is a parasitic weed, and one is a rhizomitic grass. Botanical names were followed by local names. Plants were systematically arranged based on botanical names, local names, habits, crop fields, habitats, parts used, ethnobotanical uses, flowering periods and their localities, and are shown in (Table 2). The percentages of economically important used parts of the plant species are; whole plant (24 species, 60%), leaves, stems and seeds (2 species, 5%), leaves (3 species, 7.5%), shoots (2 species, 5%), rhizome, roots and leaves (1 species, 2.5%), leaves and shoots (1 species, 2.5%), leaves and flowering buds (1 species, 2.5%), flowers (1 species, 2.5%), roots and shoots (1 species, 2.5%), leaves and roots (1 species, 2.5%), seeds and capsules (1 species, 2.5%), leaves and seeds (1 species, 2.5%), fruits, leaves and stems (1 species, 2.5%). These plants species were collected from different crop fields viz wheat, maize and sugar cane fields. Some economically weed species are growing on cultivated and waste fields, some were growing on waste, disturbed, dried, moist and shady places, and some are parasites on other plants. The plants are used for the treatments of various ailments such as toothache, cough, asthma, diarrhoea, stomach disorders

, vomiting, jaundice, diabetes, cholera, whooping coughs, sore throat, stomach pains, dysentery, constipation, low blood pressure, and inflammation, and they are used as blood purifier, laxative, stimulant, diuretic, narcotic, purgative, digestive, nerve tonic, antispasmodic, astringic, cardio tonic, stimulant, anti-cancer, anti-inflammatory, and anthelmintic, and for removing kidney stones, increasing milk production in cattle, and relieving headaches, and some are economically important and used for different purposes i.e. as vegetables, vegetable oils, fuel, coffee preparation, salads, edible and bitter tonics, insect attractants, utensils cleaners, and mostly are used as fodder. The local people of Charsadda, specially the poor ones, have been totally dependent on plant resources for their various ailments for a long time. The inhabitants know a lot about the preparation of the useful plants through long experience. Charsadda is very large, and therefore local inhabitants of the area are totally depending on natural resources as compared to urban people. The present work showed that local inhabitants of the area are mostly familiar and rich in indigenous knowledge of plant resources as well as ethno botanical and ethno medicinal uses for various treatment purposes. Several hakims (local healers) are famous not only locally, but also the people from other parts of the country visit them for treatment. Many of them do not charge anything for the services they provide, and guide the people and treat them without any payment. (Qureshi et al., 2007). Traditional uses of plants help ecologists, pharmacologists, taxonomists, watershed and wild life managers in their efforts to improve the wealth of area (Ibrar et al., 2007). Many scientists carried out various ethno botanical researches as some were discussed by (Jan et al., 2010). They elaborated the indigenous uses of 26 ethno botanically important weeds belonging to 16 families from common weeds of Dir, Kohistan Valley, Khyber Pakhtoonkhwa, Pakistan. (Razzaq et al., 2010) studied and documented the total of 50 taxa, belonging to 32 families which are used for various purposes to elaborate the potential ethno medicinal plants of Changa valley, district Shangla, Pakistan. (Farooq, et al., 2012) screened out 72 plant species from tehsil Birmal of South Waziristan Agency including 49 medicinal plants, 16 forage, 11 fuel woods, nine vegetables, six agriculture tools, six ornamentals, four nectariferous plants, three tonics, two for fencing and spicing, and one in timber, furniture, confectionary and desserts, narcotics, cosmetics and insect repellents. Local community was using 58 plant species belonging to 52 genera and 34 families for different purposes from Banda Daud Shah, District Karak, Pakistan (Murad et al., 2013). (Naz et al., 2014) studied and documented 80 plant species belonging to 64 genera and 36 families which were reported to be used by local inhabitants for the treatment of various ailments. (Hadi et al., 2014) explored and investigated the ethno botanical use of weeds. For this purpose, 15 local males and 10 local females were interviewed about the indigenous use of these weeds. About 200 local inhabitants were found to be utilizing 52 plants of 37 families for various ethno botanical purposes, such as timber, fodder and forage (Hassan HU et al., 2015). (Khan et al., 2015) Estimated and documented 45 medicinal plants which were collected in this study belonging to 27 different families. Out of 45 plants, 30 were herbs followed by 13 shrubs. (Ullah et al., 2016) observed the total of 40 weeds in wheat crops belonging to 21 families and 38 genera which were evaluated for their medicinal values and ecological importance from lower Dir. According to (Prabhu & Vijayakumar, 2016), 27 species of plants distributed in 27 genera belonging to 18 families were identified as commonly used ethno medicinal plants by ethnic people. (Wani et al., 2016) studied and estimated 27 threatened plants along with their ethno botanical uses from District Baramulla, Kashmir, Jammu and Kashmir, India. This work is the first ever report on indigenous utilization of the weed flora of district Charsadda, KP, Pakistan.

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Table 2: Checklist Of Ethnobotanical Profile Of Common Weed Flora Growing In District Charsadda, Kp, Pakistan

| S.No | Family/ Botanical Name | Local Name | Habit | Crop field | Habitat | Part used | Ethnobotanical Uses | Flowering periods | Locality |
|---------------|---|----------------|----------------|------------------------|-----------------------------|---------------------------|--|----------------------|-----------------------------|
| Amaranthaceae | | | | | | | | | |
| 1. | 1. <i>Achyranthus aspera</i> L. | Kotheri | Annual herb | Maize field | Cultivated and waste fields | Whole plant | Diuretic, toothache, cough, asthma, astringent, laxative and also used for removal of kidney stone. | June-August | Through out Charsadda |
| | 2. <i>Amaranthus viridus</i> L. | Gankhar | Perennial herb | Wheat and Garlic field | Cultivated and waste fields | Leaves, stem and seeds | Vegetable and commonly used as fodder | April-June | Through out Charsadda |
| Apiaceae | | | | | | | | | |
| 2. | 3. <i>Scandix pecten veneris</i> L. | Kali ziri | Annual herb | Wheat field | Cultivated fields | Whole plant | Grazed as fodder. | March-May | Shabqadar, Tangi, Umarzai |
| | 4. <i>Torilis leptophylla</i> (L.) reichenb.f. | Zangali gajer | Annual herb | Wheat field | Cultivated fields | Whole plant | Commonly used as fodder | Feb-April | Shabqadar, Tangi, Umarzai |
| Asteraceae | | | | | | | | | |
| 3. | 5. <i>Artimisia</i> sp. | Tarkha | Perennial herb | Wheat field | Cultivated fields | Whole plant | Diuretic, febrifuge, anodyne, and anti-inflammatory. | May-August | Shabqadar, Sherpao, Umarzai |
| | 6. <i>Cirsium arvense</i> (L.) Scop. | Azghake y | Perennial herb | Wheat field | Disturbed places | Leaves | Fodder and boiled water are used for diarrhoea | May-August | Through out Charsadda |
| | 7. <i>Parthenium hysterophorus</i> L. | Zangley tarkha | Annual herb | Wheat and Garlic field | Disturbed places | Whole plant | Fodder and fuel | April-October | Through out Charsadda |
| | 8. <i>Sonchus oleraceus</i> L. | Shodapay | Annual herb | Wheat field | Cultivated and waste fields | Whole plant | Fodder, febrifuge, sedative, diuretic It also increase milk production in cattle | April-June | Through out Charsadda |
| | 9. <i>Taraxacum officinale</i> Weber. | Zyar guli | Perennial herb | Wheat field | Waste places | Rhizome, roots and leaves | Fodder, constipation, laxative, diuretic, bitter tonic, vegetable. Rhizomes are used for coffee preparation. | April-June | Through out Charsadda |
| Boraginaceae | | | | | | | | | |
| 4. | 10. <i>Buglossoides arvensis</i> (L.) Johnston. | Not known | Annual herb | Wheat and Garlic field | Cultivated fields | Leaves | Leaves are used as diuretic | March-April | Sherpao, Umarzai, Tangi |
| Brassicaceae | | | | | | | | | |
| 5. | 11. <i>Brassica campestris</i> L. | Sharsham | Annual herb | Wheat field | Cultivated fields | Whole plant | Fodder, vegetable oil and salad | March-April | Through out Charsadda |

| | | | | | | | | | |
|-----|---------------------------------------|-----------------|----------------|-------------------------------|-------------------------|---------------------------|--|-------------|------------------------------------|
| | 12. <i>Coronopus didymus</i> (L.) Sm. | Sakha botay | Annual herb | Wheat and Garlic field | Waste places | Leaves and shoots | Fodder and blood pressure | May-August | Through out Charsadda |
| 6. | Cannabinaceae | | | | | | | | |
| | 13. <i>Cannabis sativa</i> L. | Bhang | Perennial herb | Wheat, Onion and Garlic field | Waste places | Leaves and flowering buds | Laxative, sedative, stimulant, diuretic, narcotics. | April-July | Through out Charsadda |
| 7. | Caryophyllaceae | | | | | | | | |
| | 14. <i>Cerastium glomeratum</i> L. | Patewah | Annual herb | Wheat field | Waste places | Whole plant | Juices are obtained and are used to relieve headaches. | April-July | Shabqadar, Umarzai, Tangi |
| | 15. <i>Silene conoidea</i> L. | Mangotai | Annual herb | Wheat field | Dried places | Whole plant | Laxative and purgative and commonly used as fodder | May-July | Sherpao, Umarzai, Tangi |
| 8. | Chenopodiaceae | | | | | | | | |
| | 16. <i>Chenopodium album</i> L. | Zangali gankhar | Annual herb | Wheat and rice field | Waste places | Whole plant | Abdominal pain, anthelmintic, laxative, vegetable and fodder | March-May | Through out Charsadda |
| 9. | Convululaceae | | | | | | | | |
| | 17. <i>Convululus arvensis</i> L. | Prewatai | Climbing herb | Wheat and Garlic field | Cultivated fields | Whole plant | cancer and stomach disorder | March-April | Through out Charsadda |
| 10. | Cuscutaceae | | | | | | | | |
| | 18. <i>Cuscuta reflexa</i> Roxb. | Banafsha | Parasitic weed | Wheat field | Parasite on other plant | Shoots | Diuretic, anthelmintic, jaundice, vomiting and diabetic. | April-June | Sherpao, Umarzai, Tangi |
| 11. | Euphorbiaceae | | | | | | | | |
| | 19. <i>Euphorbia heliscopia</i> L. | Mandaro | Annual herb | Wheat, Onion and Garlic field | Cultivated field | Root and shoot | Constipation, anthelmintic, cholera Latex are used for stoppage of mences in young female | April-July | Through out Charsadda |
| 12. | Fabaceae | | | | | | | | |
| | 20. <i>Lathyrus aphaca</i> L. | Materr | Annual herb | Wheat field | Waste places | Whole plant | Mostly used as fodder Seeds are edible | March-April | Shabqadar, Sherpao |
| | 21. <i>Medicago lupulina</i> L. | Peshtari sagh | Annual herb | Wheat field | Cultivated fields | Whole plant | Fodder, vegetable and for constipation | April-June | Through out Charsadda |
| | 22. <i>Medicago polymorpha</i> L. | Peshtari sagh | Annual herb | Wheat field | Cultivated fields | Whole plant | Fodder, vegetable and leaves are used for bitter taste | March-April | Through out Charsadda |
| | 23. <i>Trifolium repens</i> L. | Shautal | Perennial herb | Wheat and sugar cane field | Cultivated fields | Whole plant | Fodder and vegetable The flowers are used as honey bee attractants | May-June | Through out Charsadda |
| | 24. <i>Vicia sativa</i> L. | Mater palli | Annual herb | Wheat field | Cultivated fields | Whole plant | Fodder, seeds are used for bitter taste | June-August | Shabqadar, Umarzai, Tangi, Sherpao |
| 13. | Fumariaceae | | | | | | | | |

| | | | | | | | | | |
|-----|---|--------------|------------------|---|------------------------------------|------------------------|---|---------------|---------------------------|
| | 25. <i>Fumaria indica</i> (Hauskn.) H.N Pugsley | Papra | Annual herb | Wheat field | Cultivated fields | Shoots | Blood purifier, antipyretic, whooping cough, sore throat Commonly used as fodder | April-June | Through out Charsadda |
| 14. | Lamiaceae | | | | | | | | |
| | 26. <i>Lamium amplivicule</i> L. | Gulabi gulli | Annual herb | Wheat field | Cultivated fields | Whole plant | Laxative and stimulant | March-May | Shabqadar, Umarzai |
| 15. | Oxilidaceae | | | | | | | | |
| | 27. <i>Oxalis corniculata</i> L. | Qarghi mewa | Perennial herb | Wheat and Garlic field | Moist and shady places | Leaves and roots | Fodder, anthelmintic, stomach pain Leaves are used for bitter taste | April-June | Through out Charsadda |
| 16. | Papaveraceae | | | | | | | | |
| | 28. <i>Papaver dubium</i> L. | Qashqash | Annual herb | Wheat field | Cultivated fields | Seeds and capsule | Narcotics and purgative The capsule are used to make tea taken orally for cold and cough | Feb-April | Shabqadar, Tangi, Sherpao |
| 17. | Plantaginaceae | | | | | | | | |
| | 29. <i>Plantago lanceolata</i> L. | Asphaghol | Perennial herb | Wheat field | Cultivated fields and waste places | Whole plant | Digestive, constipation, vomiting and diarrhea | March-May | Shabqadar |
| | 30. <i>Plantago major</i> L. | Asphaghol | Perennial herb | Wheat field | Cultivated fields and waste places | Leaves and seeds | Constipation and dysentery | May-July | Shabqadar, Umarzai |
| 18. | Poaceae | | | | | | | | |
| | 31. <i>Avena sativa</i> L. | Jamdar | Annual herb | Wheat field | Cultivated fields | Leaves, stem and seeds | Commonly used as fodder. Antispasmodic, nerve tonic. Extract are used for soothe skin | March-June | Through out Charsadda |
| | 32. <i>Cynodon dactylon</i> (L.) Pers. | Kabal | Rhizomitic grass | Wheat, Onion, Maize, Rice and Sugar cane fields | Every where | Whole plant | For blood purifier, jaundice and dysentery | April-Sep | Through out Charsadda |
| | 33. <i>Phalaris minor</i> Retz. | Wakha | Annual grass | Wheat field | Cultivated and waste places | Whole plant | Commonly used as fodder | March-May | Through out Charsadda |
| | 34. <i>Poa annua</i> L. | Wakha | Annual grass | Wheat field | Cultivated and waste places | Whole plant | Fodder and used for cleaning of utensils | April-October | Through out Charsadda |
| | 35. <i>Rostraria cristata</i> (L.) Tzvelev. | Narri wakha | Annual grass | Wheat field | Cultivated and waste places | Whole plant | Grazed by animal as fodder | April-July | Through out Charsadda |
| 19. | Polygonaceae | | | | | | | | |
| | 36. <i>Rumex hestatus</i> D.Don | Shalkhay | Annual herb | Wheat and sugar cane field | Cultivated fields and waste places | Leaves | Astringic, diuretic and stomachic. Leaves are used as cattle fodder | April-June | Through out Charsadda |
| 20. | Ranunculaceae | | | | | | | | |

| | | | | | | | | | |
|-----|------------------------------------|-----------|-------------|----------------------------|--------------|-------------------------|--|------------|---------------------------|
| | 37. <i>Adonis aestivalis</i> L. | Mekhaki | Annual herb | Wheat field | Moist places | Flowers | Diuretic, cardio tonic, laxative and stimulant | March-June | Umarzai, Sherpao, Tangi |
| | 38. <i>Ranunculus arvensis</i> L. | Zyargulay | Annual herb | Wheat field | Moist places | Whole plant | Grazed by animals as fodder | May-July | Umarzai, Tangi, Shabqadar |
| | 39. <i>Ranunculus muricatus</i> L. | Zyargulay | Annual herb | Wheat field | Moist places | Whole plant | Toxic and laxative Mostly used as fodder | April-June | Umarzai, Sherpao, Tangi |
| | Solanaceae | | | | | | | | |
| 21. | 40. <i>Solanum nigrum</i> L. | kachmahoo | Annual herb | Maize and sugar cane field | Waste places | Fruits, leaves and stem | Inflammation, dysentery and for low blood pressure | April-June | Through out Charsadda |

Table 3: Summary of percentage of the Plant Parts Used for Traditional Medicine and Economic importance.

| S.No | Parts used | No of species | Percentage % |
|------|---------------------------|---------------|--------------|
| 1. | Whole plant | 24 | 60% |
| 2. | Leaves | 3 | 7.5% |
| 3. | Leaves, stem and seeds | 2 | 5% |
| 4. | Shoot | 2 | 5% |
| 5. | Flower | 1 | 2.5% |
| 6. | Rhizome, roots and leaves | 1 | 2.5% |
| 7. | Leaves and shoots | 1 | 2.5% |
| 8. | Leaves and flowering tops | 1 | 2.5% |
| 9. | Leaves and roots | 1 | 2.5% |
| 10. | Leaves and seeds | 1 | 2.5% |
| 11. | Leaves, fruits and stem | 1 | 2.5% |
| 12. | Roots and shoots | 1 | 2.5% |
| 13. | Seeds and capsule | 1 | 2.5% |
| | Total | 40 | 100% |

Table 4: Summary of percentage of different families

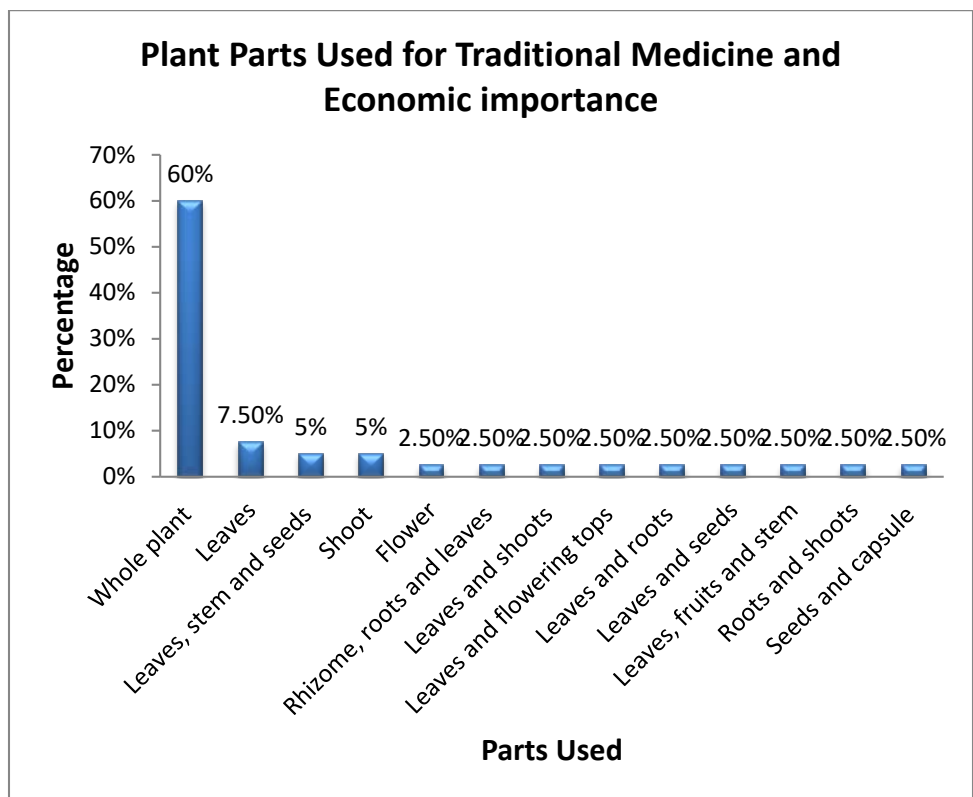
| S No. | Families | No of species | Percentage % |
|-------|-----------------|---------------|--------------|
| 1. | Asteraceae | 5 | 12.5% |
| 2. | Fabaceae | 5 | 12.5% |
| 3. | Poaceae | 5 | 12.5% |
| 4. | Ranunculaceae | 3 | 7.5% |
| 5. | Amaranthaceae | 2 | 5% |
| 6. | Apiaceae | 2 | 5% |
| 7. | Brassicaceae | 2 | 5% |
| 8. | Caryophyllaceae | 2 | 5% |
| 9. | Plantaginaceae | 2 | 5% |
| 10. | Boraginaceae | 1 | 2.5% |
| 11. | Cannabaceae | 1 | 2.5% |
| 12. | Chenopodiaceae | 1 | 2.5% |
| 13. | Convululaceae | 1 | 2.5% |
| 14. | Cuscutaceae | 1 | 2.5% |
| 15. | Euphorbiaceae | 1 | 2.5% |
| 16. | Fumariaceae | 1 | 2.5% |
| 17. | Lamiaceae | 1 | 2.5% |
| 18. | Oxilidaceae | 1 | 2.5% |
| 19. | Papaveraceae | 1 | 2.5% |

| | | | |
|-----|--------------|----|------|
| 20. | Polygonaceae | 1 | 2.5% |
| 21. | Solanaceae | 1 | 2.5% |
| | Total | 40 | 100% |

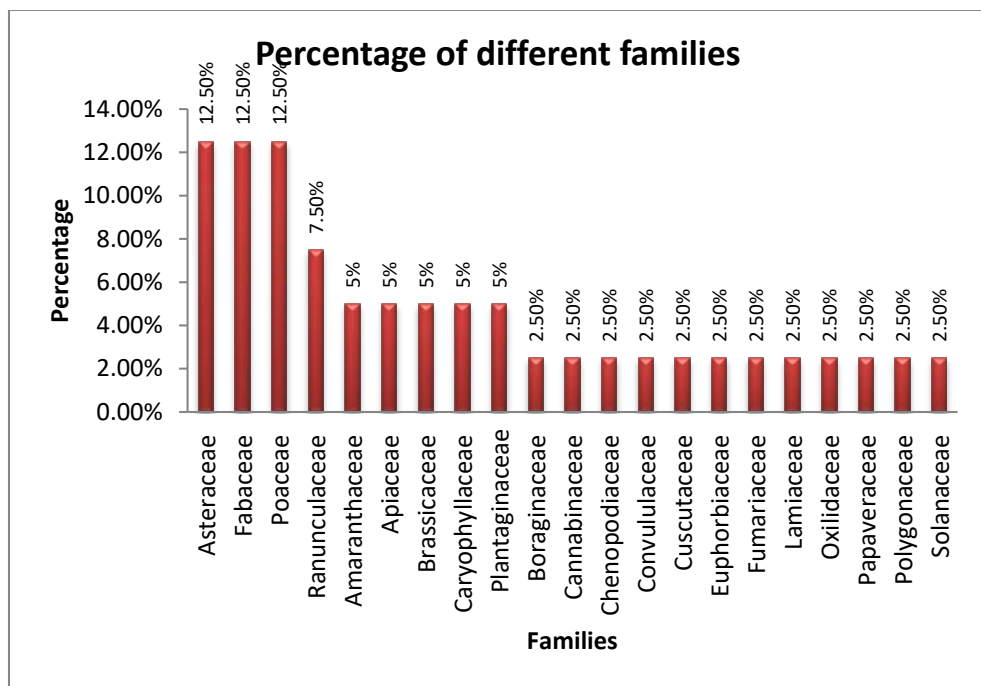
Table 5: Summary of percentage habit class

| S No. | Habit class | No of species | Percentage % |
|-------|------------------|---------------|--------------|
| 1. | Annual herb | 25 | 62.5% |
| 2. | Perennial herb | 9 | 22.5% |
| 3. | Annual grass | 3 | 7.5% |
| 4. | Parasitic weed | 1 | 2.5% |
| 5. | Rhizomitic grass | 1 | 2.5% |
| 6. | Climbing herb | 1 | 2.5% |
| | Total | 40 | 100% |

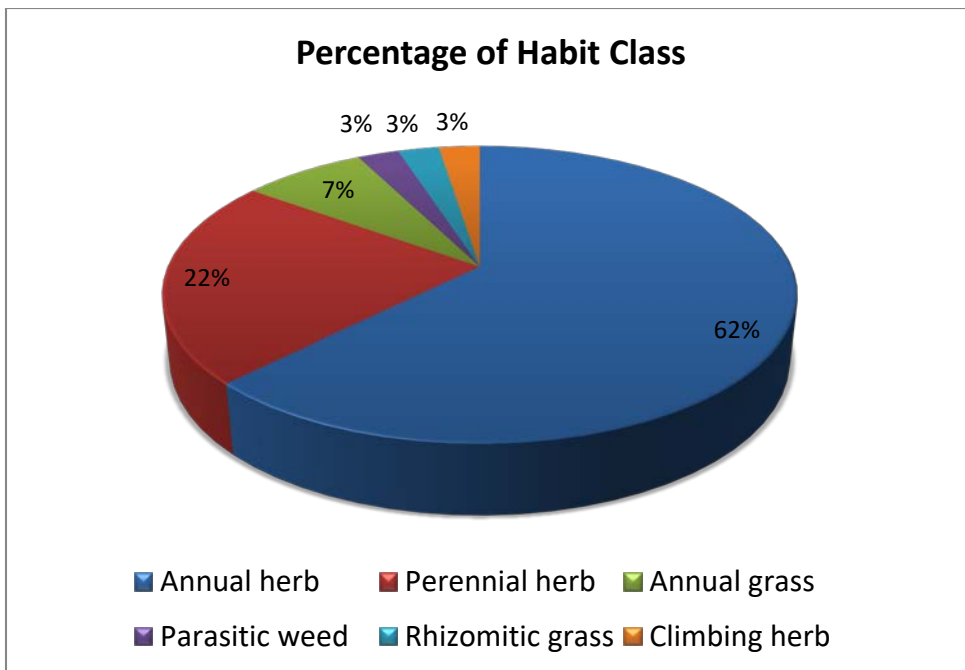
Graphs



A. Plant Parts Used for Traditional Medicine and Economic importance



B. Percentage of different families



C. Percentage of plant habit class