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ANGIOSPERMIC PLANT RESOURCES AND FOLK USES IN DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Ethnobotanical survey of angiosperms was undertaken in district Karak KP, Pakistan during March, 2010 through April, 2011.The aims and objectives of the study were to document the indigenous knowledge of plants particularly medicinal, fuel, timber, vegetables, ornamentals and fruit plants. A total of 88 genera and 103 species belonging to 43 families were collected from district Karak, KP, Pakistan. Out of 103 plant species, 76 species (74%) were herbs, 15 species (14%) were trees and 12 species (12%) were shrubs. Among these 103 plants, 70 (67.9%) plants are used as a fodder for cattle, 52 (50.4%) medicinal, 38(36.8%) fuel, 8 (7.7%) timber, 8 (7.7%) vegetables, 7 (6.8%) ornamental and 4 (3.8%) as edible fruits. Out of these, 6 (5.8%) used as a hedge plants and 10 (9.7%) used for miscellaneous purposes.

Key words: Ethnobotany, Flora, Medicinal plants, Karak, Pakistan.

INTRODUCTION

District Karak lies between 33˚-6′ to 33˚-7′ North latitudes and 71˚-2′ to 71˚-7′ East longitudes. It is bounded on North by district Kohat and Hangu, on South by district Lakki Marwat and on South-East by district Mianwali and on the West by district Bannu and Waziristan agency. Karak was upgraded to district on 1st July 1982. Before the up-gradation, it was a sub- division of district Kohat. It is divided into three sub-divisions; Karak, Banda Daud Shah and Takht-e-Nasrati. District Karak consists of a series of small mountains ranges located from East to West. Other important hills are called “Range of Khattak tribe” initiates from the boundary of district with South Waziristan and goes on East-West side up to the River Indus. District has extreme of climate. June is the hottest month with mean minimum 27ºC and maximum 40ºC temperature. The cold season is very extreme because of the wind comes from the west side called “Breeze of Hangu” and rarely blow down the valley of Mirazai. January is the coldest month with mean minimum 6ºC and maximum 18ºC temperature. Monsoon rainfall starts from May to September. The highest monsoon rainfall (110mm) occurs in month of August. From December to February winter rains occur.

‘John Harshberg’ for the first time in 1896 coined the term ethnobotany (Ahmad *et al.,* 2006). In 20th century, ethnobotany emerged as a distinct academic field of natural science. Now the term “ethnobotany” has been expanded and considered to be one of the major discipline of economic Botany, which emphasizes on the economic utilization of plant resources for the welfare of humanity (Wickens, 2001). Ethnobotany is the study of a regional plants and their practical uses through the traditional knowledge of a local culture and people. It is the scientific study of the traditional knowledge and customs of a people concerning plants and their medical, religious and other uses. Ethnobotany is the study of how the people of a particular culture and region makes the use of indigenous plants, while the ethnobotanist explores how the plant resources of the particular region are used for food, medicinal, timber, fuel, shelter and hunting purposes and in religious ceremonies. According to Balick (1996) ethnobotany deals with the relationship between plants and people of the particular area for their use as food, medicines, fuel, fodder, clothing, shelter and other house hold purposes. It is a plant science, which deals "the relationship between a given society and its environment and in particular the plant world". Allem (2000) and Khan *et al.* (2015) stated that ethnobotany is the study of biological, economic, and cultural inter-relationship between plants and the peoples of an area in which they lives. Ethnobotany plays a vital role in understanding the relationships between biodiversity, social and cultural dynamics (Hussain *et al.,* 2008; Mahmood *et al.,* 2011). The area is gifted with xeric and unique flora. The people of the area are mostly poor, educated and depends upon indigenous plant resources for their primary health care and domestic needs.Therefore the aim of the present study was to explore the ethnobotanical wealth of district Karak and its documentation.

MATERIALS AND METHODS

Plants collection, preservation and identification: Before the start of field work, research project was planned. Information regarding the study area and vegetation were collected. Several trips were made to different sites of the area during March, 2010 through

April, 2011. Ethnobotanically important plant species were collected from different sites of the research area. These collected plant species were then placed in the newspapers for the removal of moisture. Then they were pressed in plant presser. The newspapers were changed after every 24 or 48 hours. To prevent fungal attack, naphthalene powder was sprinkled over each plant. The newspapers were changed repeatedly until the plants were completely dried. The dried plants were then mounted on standard herbarium sheets. Plants identification was carried out based on morphological characters of leaves, flowers and fruits by following flora of Pakistan (Ali and Qaiser, 1995; Ali and Nasir, 1989-1991; Nasir and Ali, 1972). After the identification, the voucher specimens were submitted in the herbarium of Botany Department, Islamia College Peshawar for future references.

Data collection: Ethnobotanical information was collected through questionnaire. Structured and semi-structured questionnaire were prepared and distributed among the peoples in villages like Ahmad Abad, Banda Daud Shah, Chowkara, Haider khel, Lawaghar Cheni Khel, Narai Khra, Nari panos, Sabir Abad, Tatter khel, Warana and Zarkai of district Karak. From each village Hakims, educated and aged people and farmers were interviewed. During the trips personal observation were also made and recorded. The data collected through questionnaires and personal observations were thoroughly analyzed and documented.

RESULTS AND DISCUSSION

The present work was carried out in district Karak in order to record the ethnobotanical information about the plant resources. The research area was visited during March, 2010 through April, 2011. During this survey, plant diversity was thoroughly studied and ethnobotanical information were collected. A total of 103 species belonging to 43 families were recorded from the study area. The dominant families were Fabaceae (11 spp.), Asteraceae and Poaceae with (10 spp.) each. They were followed by Amaranthaceae with (7 spp.), Euphorbiaceae with (6 spp.), Boraginaceae with (5 spp.), Brassicaceae, Mimosaceae and Zygopyllaceae with (4 spp.) each, Solanaceae with (3 spp.). Apocyanaceae, Lamiaceae, Liliaceae, Polygonaceae, Palmaceae and Rhamnaceae with (2 spp.) each. While the rest of families were reperesented by single species each. The aim of the present study was to assess and document the ethno-botanical knowledge of angiospermic plant resources including herbs, shrubs and trees of district Karak.

It was found that 103 different plant species were used for medicinal, fuel wood, timber, ornamental, fodder, vegetables and some other purposes. All plant species were arranged in Family alphabetical order mentioning their botanical name, local name, habit, habitats, part used and ethno-botanical uses (Table. 1). Out of 103 reported plants, herbs (76 spp., 74%), trees (15 spp., 14%) and shrubs were (12 spp., 12%) (Figure 1). These ethno-botanical important plants occur in variety of habitats. Among these 103 plants, 56 (54.8%) grow on bare soil, 22 (21.3%) in gram fields, 15 (14.5%) in wheat field, 5 (4.8%) in graveyards, 2 (1.9%) on dry area, 1 (0.9%) as parasitic, 1 (0.9%) in hilly area and 1(0.9%) in sandy soil (Figure 2). Based on the information collected 70 (67.9%) plants are used as a fodder for cattle, 52 (50.4%) medicinal, 38(36.8%) fuel, 8 (7.7%) timber, 8 (7.7%) vegetables, 7 (6.8%) ornamental, 4 (3.8%) as edible fruits, 6 (5.8%) used as a hedge plants and 10 (9.7%) are used for miscellaneous purposes. (Figure 3). Similar ethnobotanical information was also collected by Barkatullah *et al*. (2011) while studying ethnobotany of Malakand Pass Hills, Pakistan, Ahmad *et al.* (2011) from Tehsil Kabal, district Swat, Sher *et al.* (2011) from Chagharzai Valley, district Buner, Pakistan, Shinwari *et al.* (2011) from Kohat pass Pakistan, Murad *et al.* (2012), from Hazar Nao forest, district Malakand, Pakistan, Badshah *et al*. (2012) from district Tank, Pakistan, and Khan and Musharaf (2014) from Sheikh Maltoon district Mardan, Pakistan.

Among them, the local inhabitants used medicinal plants for the treatments of various diseases. These were used to treat digestive disorders such as indigestion, diarrhoea, dysentery, constipation, stomachache and ulcer and skeleto-muscular disorders like muscle-ache, backache and rheumatism. These findings are similar to an ethno-medicinal study conducted by Akhtar *et al.* (2013) in Swat, Pakistan. Some plants were used to cure pulmonary diseases such as bronchitis, cough and asthma. While other were used as analgesic, anti-inflammatory, antipyretic, anti-diabetic, anti-hepatitis, tonic and expectorant. Few were used for the treatment of skin disorders, swelling, wound healings and curing of scorpion stings and snake bite. The local inhabitants of the area usually utilize every part of the plant. However, the use of a particular plant part depends on the user's needs and plant habits. The most frequently used plant parts were leaves 97 (94.1%), followed by stem 83 (80.5%), roots 40 (38.8%), seeds 10 (9.7%). Fruit 9 (8.7%), whole plant 8 (7.7%) and flower 3 (2.9%) (Figure 4). The present findings of the frequent use of leaves are similar to the findings of Murad *et al.* (2013), Akhtar *et al.* (2013), Hassan *et al.* (2015), Khan *et al.* (2015) and Sohel *et al.* (2016).

Table 1. Total reported Ethnobotanical plants from district Karak, KP, Pakistan with chorological characteristics.

S. No	Families	Plant Name	Local Name	Habit	Habitats	Part Used	Ethnobotanical Uses
1.	Acanthaceae	*Justacia adhatoda* L.	Boza	Shrub	BS	S,L	Asthma, bronchitis, cough, rheumatism, dysentery and fuel.
2.	Aizoaceae	*Trianthema portulacastrum* L	Lamay	Herb	BS	R,L,S	Analgesic, asthma, anemia, purgative, stomachache, piles, inflammation, bronchitis and fodder.
3.	Amaranthaceae	*Achyranthes bidentata* Blume Bijd.	Wormanday	Herb	BS	R,S	Fodder and fuel.
4.	Amaranthaceae	*A. aspera* L.	Harsoba	Herb	GF	WP	Fodder
5.	Amaranthaceae	*Amaranthes graecizans* L.	Ksohwar	Herb	BS	R,L	Fodder and fuel.
6.	Amaranthaceae	*A. viridis* L.	Ranzoka	Herb	GF	R,L,S	Vegetables, Emollient, pain killer, snake bite & scorpion sting.
7.	Amaranthaceae	*Bassia eriophora* Schard.	Lewansoba	Herb	BS	L,S	Vegetables and Fodder.
8.	Amaranthaceae	*Chenopodium album* L.	Spinsoba	Herb	GF	R,L,SD	Urinary diseases and rheumatism, vegetable and fodder.
9.	Amaranthaceae	*C. murale* L.	Torsoba	Herb	GF	L	Antispasmodic, Asthma, stimulant, vegetable and fodder.
10.	Apiaceae	*Foeniculum vulgare* Miller.	Kagao	Herb	BS	L,F	Carminative, stimulant and fodder.
11.	Apocyanaceae	*Nerium oleander* L.	Gandergul	Shrub	BS	R,L,S	Ornamental, snake bite & scorpion sting , swelling andskin diseases
12.	Apocyanaceae	*Rhazya stricta* Decen.	Ranzay	Shrub	BS	R,L,S	Blood purification, skin diseases and fuel.
13.	Asclepiadaceae	*Calotropis procera* Acit.	Spalmaka	Shrub	BS	R,L,S	Anthelmintic, skin diseases, ear pain, and snake bite.
14.	Asteraceae	*Calendula arvensis* L.	Zyarguley	Herb	GF	L,FL	Toothache, ornamental and fodder.
15.	Asteraceae	*Centaurea benedicta* L.	Marghatol	Herb	WF	R,L,S	Fodder.
16.	Asteraceae	*Carthamus oxycantha* M.B.	Ghazanka	Herb	WF	S,FL	Antipyretic, hair tonic, measles, laxative,and fever.
17.	Asteraceae	*Cirsium arvense* L.	Traper	Herb	BS	R,L,S	Tonic, diaphoretic, emetic and fodder.
18.	Asteraceae	*Conyza aegyptiaca* L.	Lalahozakh	Herb	WF	L,S	Stimulant, dysentery, diarrhea, fodder and fuel.
19.	Asteraceae	*Parthenium hyterophorus* L.	Lewanebhang	Herb	WF	L,S	Fodder and fuel.
20.	Asteraceae	*Silybum marianum* Gaerth.	Shodakai	Herb	WF	L,S,SD	Aperients, diaphoretic, demulcent, and fodder.
21.	Asteraceae	*Sonchus asper* L.	Toriza	Herb	GF	R,S,L	Asthma, inflammation, itching, heart problems, constipation, and fuel.
22.	Asteraceae	*Taraxicum officinale* Webber.	Zyer Gul	Herb	WF	R,S,L	Fodder.
23.	Asteraceae	*Xanthium strumarium* L.	Kata sora	Herb	GY	R,S,L	Urinary troubles and fuel.
24.	Boraginaceae	*Buglossoides arvense* L.	Lenai	Herb	BS	WP	Fodder and fuel.
25.	Boraginaceae	*Gastrocotyle hispida* Forssk.	Rarr	Herb	GF	R,S,L	Fodder and fuel.
26.	Boraginaceae	*Heliotropium biannulatum* Bung.	Wangai	Herb	GF	L	Fodder.
27.	Boraginaceae	*Myosotis alpestris* F.	Soba	Herb	BS	L,SD	Fodder and fuel.
28.	Boraginaceae	*Nonnea edgeworthii* DC.	Spinguley	Herb	WF	L,SD	Hair tonic, vegetable and fodder.
29.	Brassicaceae	*Chorispora tenella* Pall.	Soor Gul	Herb	WF	L,S,FL	Fodder and ornamental.
30.	Brassicaceae	*Coronopus didymus* L.	Kakorai	Herb	WF	WP	Fodder.
31.	Brassicaceae	*Farsetia hamiltonii* Royle.	Melangai	Herb	BS	R,S,L	Fodder and fuel.
32.	Brassicaceae	*Sisymbrium irrio* L.	Badalbhang	Herb	GF	L,SD	Antipyretic, stimulant diaphoretic and expectorant.
33.	Cactaceae	*Opuntia monocantha* Haw.	Ghzanka	Shrub	BS	L,S	Hedge plant.
34.	Capparidaceae	*Capparis aphylla* Roth	Kerra or tup	Tree	SS	R,S,L	Hedge plant, furniture purposes and fuel.
35.	Convolvulaceae	*Convolvulus arvensis* L.	Prewaty	Herb	GF	WP	Anti-dandruff, laxative, Anthelmintic and fodder.
36.	Cucurbitaceae	*Citrullus colocynthis* L.	Tarha Mara	Herb	BS	L,S	Fodder

37.	Cuscutaceae	*Cuscuta reflexa* Roxb.	Chambaal	Herb	PP	R,S,L	Diuretic , purgative, anthelmintic and carminative
38.	Cyperaceae	*Cyperus rotundus* L.	Dhela	Herb	GF	L,S	Back-ache, weakness, removing swellings and as fodder.
39.	Euphorbiaceae	*Chrozophora tinctoria* L	Skha botay	Herb	BS	R,S,L	Fodder and fuel.
40.	Euphorbiaceae	*Euphorbia helioscopia* L.	Sahaboty	Herb	BS	L	Anti-hepatitis, constipation purgative, and fodder.
41.	Euphorbiaceae	*E. inderiensis* Less.	Bota	Herb	GF	L,S	Fodder.
42.	Euphorbiaceae	*E. indica* Lam.	Pestai	Herb	BS	L,S	Fodder.
43.	Euphorbiaceae	*E. prostrata* Ait.	Prot-Peshtara	Herb	GF	L,S	Fodder.
44.	Euphorbiaceae	*Ricinus communis* L.	Arund	Shrub	BS	L,S,SD	Antipyretic, anti-hepatitis, anti-diabetic, antiperiodic, vermifuge, and fodder.
45.	Fabaceae	*Astragalus grahamianus* Royle.	Ghzanka	Herb	BS	L,S	Hedge plant and Fodder.
46.	Fabaceae	*A. psilocentros* Fisch.	Papar	Herb	BS	R,S,L	Fodder and fuel.
47.	Fabaceae	*A. tribuloides* Del.	Kso Speshtara	Herb	GF	L,S	Fodder.
48.	Fabaceae	*Dalbergia sissoo* Roxb.	Shawa	Tree	BS	L,S	Fodder, timber, ornamental and fuel.
49.	Fabaceae	*Indigofera linifolia* L.	Shanzakai	Herb	BS	L,S	Fodder.
50.	Fabaceae	*Medicago denticulata* Willd.	Speshtarey	Herb	GF	L	Carminative, vegetables and fodder.
51.	Fabaceae	*Melilotus indica* L.	Uzmai	Herb	WF	WP	Fodder
52.	Fabaceae	*Rhyncosia minima* L.	Tora prewatye	Herb	GF	L,S	Fodder
53.	Fabaceae	*Taverniera cuneifolia* Roth.	Kattey	Herb	BS	L,S	Making roofs and fodder.
54.	Fabaceae	*Trifolium alexendrianum* L.	Shotalla	Herb	WF	L,S	Fodder
55.	Fabaceae	*T. resupinatum* L.	Zierawona	Herb	BS	L,S	Fodder
56.	Fumariaceae	*Fumaria indica* Hausskn.	Lewanay Gajara	Herb	GF	R,S,L	Antipyretic, anti-hepatitis, anti-diabetic, antiperiodic, vermifuge and fodder.
57.	Geraniaceae	*Erodium malacoides* L.	Piazai	Herb	BS	L,S	Fodder
58.	Lamiaceae	*Ocimum bacillicum* L.	Bobray	Shrub	BS	WP	Anthelmintic, carminative, anti-dysentery and diarrhea, ornamental and perfume.
59.	Lamiaceae	*Salvia moorcroftiana* Wall.	Droshal	Herb	BS	L	Anodyne, swelling, constipation and fodder.
60.	Liliaceae	*Aloe vera* Auct.	Zargeya	Herb	BS	L,S	Anti-hepatitis, wound healing and detergent.
61.	Liliaceae	*Asphodelus tenuifolius* Cavan.	Pyazaky	Herb	GF	L,S,SD	Anti-inflammatory and fodder.
62.	Malvaceae	*Malva neglecta* Waller.	Torapeshtara	Herb	GF	R.L	Anthelmintic, anti-dysentery, vegetable and fodder.
63.	Meliaceae	*Melia azedarach* L.	Bakyanara	Tree	BS	R,S,L	Anthelmintic, Emetic, Vermifuge, fodder, fuel, ornamental and timber.
64.	Mimosaceae	*Acacia arabica* Lam.	Kikar	Tree	BS	R,S,L	Anti-dysentery, fodder, fuel, ornamental and timber.
65.	Mimosaceae	*A. modesta* Wall.	Palosa	Tree	BS	L	Animal carminative, fuel and timber.
66.	Mimosaceae	*Albizzia lebbek* L.	Sreikh	Tree	BS	L,S	Fodder, fuel, ornamental and timber.
67.	Mimosaceae	*Prosopis juliflora* Swartz.	Angrezi Kikar	Tree	BS	S	Rheumatism, fuel and timber.
68.	Myrtaceae	*Eucalyptis camaldulensis* Schlect	Loachi	Tree	BS	R,S,L	Antiperiodic, expectorant, antiseptic, carminative, fuel, ornamental and timber.
69.	Nyctaginaceae	*Boerhavia procum.bens* Banks.	Pendrawosh	Herb	WF	R,S,L	Anti-hepatitis, purgative and diuretic, scorpion bite and fodder.
70.	Oleaceae	*Olea ferruginea* Royle.	Zaitoon	Tree	BS	L,S	Antiseptic, diuretic, tonic, rheumatism and fuel.
71.	Orobanchaceae	*Orobanche stocksii* Bioss.	Koricharg	Herb	GF	L,S	Fodder.
72.	Palmaceae	*Nannorrhops ritchieana* H.Wendl.	Maizara	Shrub	BS	L	Making caps, ropes, cupboards, Hand fans, Baskets and fuel.

73.	Palmaceae	*Phoenix sylvestris* Roxb.	Kajoora	Tree	BS	L,F	Making ropes, Baskets, Hand fans and source of food.
74.	Plantaginaceae	*Plantago indica* Sibth.	Aspaghol	Herb	BS	SD	Anti-dysentery, Anti-diarrhea and Constipation.
75.	Poaceae	*Avena fatua* L.	Jomdar	Herb	WF	L,SD	Anti-dysentery and fodder.
76.	Poaceae	*Cenchrus ciliaris* L.	Mumloha	Herb	BS	R,S,L	Making ropes, fodder and fuel.
77.	Poaceae	*C. biflorus* HK.	Krushkey	Herb	BS	L,S	Hedge plant and fuel.
78.	Poaceae	*C. pennisetiformis* Hochst.	Shamloha	Herb	BS	L,S	Making ropes, fodder and fuel.
79.	Poaceae	*Cymbopogon jawarancusa* Jones.	Sargarra	Herb	BS	WP	Making ropes, fodder and fuel.
80.	Poaceae	*Cynodon dactylon* L.	kabal	Herb	BS	R,S,L	Anti-dysentery, blood purifier, and diuretic, ornamental, fodder and fuel.
81.	Poaceae	*Enneapogon schimperianus* Hochst.	Shamoha	Herb	BS	R,S,L	Making ropes, huts and fodder.
82.	Poaceae	*Eragrostis cilianensis* All.	Mumloha	Herb	GY	S	Making ropes, huts and fodder.
83.	Poaceae	*E. tenella* L.	Sargarra	Herb	GY	R,S,L	Mat in mosques, cleaning purposes, fodder and fuel.
84.	Poaceae	*Saccharum ravennae* L.	Kana	Shrub	BS	L,S	Hedge plant, making ropes, cupboards, trays, Baskets and fuel.
85.	Polygonaceae	*Calligonum polygonoides* L.	Balanza	Shrub	GY	R,S,L	Making snuff and fodder.
86.	Polygonaceae	*Rumex dentatus* L.	Mezyle	Herb	BS	L,S	Vegetable and fodder.
87.	Portulacaceae	*Portulaca oleraceae* L.	Warhora	Herb	GF	L,S	Vegetable (saag) and fodder.
88.	Primulaceae	*Anagallus arvensis* L.	Sheen starga	Herb	WF	L,S	Fodder
89.	Rhamnaceae	*Ziziphus jujuba* Lam.	Beira	Tree	DA	L,S,F	Anti-diabetics, constipation, edible fruit, hedge plant, fodder and fuel.
90.	Rhamnaceae	*Ziziphus nummularia* Burm.	Karkanra	Tree	DA	L,S,F	Hedge plant, constipation, edible fruit, fodder and fuel.
91.	Rubiaceae	*Galium aparine* L.	Babur	Herb	WF	R,S,L	Anti-diabetics, healing wound, Diuretic and fodder.
92.	Salvadoraceae	*Salvadora oleoides* Dene.	Plein	Shrub	BS	L,S	Anti-diuretic and making tooth brush locally “Miswak.”
93.	Sapindaceae	*Dodonaea viscosa* L.	Sanateboty	Shrub	HA	R,S,L	Astringent, rheumatism, stimulant, healing wound and fuel.
94.	Sapotaceae	*Monotheca buxifolia* Falc.	Gorgora	Tree	BS	L,S,F	Fruit edible, fodder and fuel.
95.	Solanaceae	*Datura alba* Nees.	Batoora	Herb	BS	L,F	Antipyretic,, anti-dandruff, antiperiodic, antispasmodic, hair tonic and fodder.
96.	Solanaceae	*Solanum surratense* Burm.	Speenazghay	Herb	BS	WP	Purgative, carminative and constipation, rheumatism, hedge plant and fuel.
97.	Solanaceae	*Withania somnifera* L.	Shapyanga	Tree	BS	L,S,F	Animals in gas troubles and fodder.
98.	Tamaricaceae	*Tamarix aphylla* L.	Ghaz	Tree	BS	L,S	Anti-inflammatory, toothache, curing of burn spots, timber and fuel.
99.	Violaceae	*Viola stocksii* Boiss.	Makarbotey	Herb	BS	L,S	Antipiles and gas troubles.
100.	Zygophyllaceae	*Fagonia arabica* L.	Sperlazghzai	Herb	GF	L,S	Blood purification and skin diseases.
101.	Zygophyllaceae	*Peganum harmala* L.	speelanae	Herb	GY	T,S,F	Burnt for evils expulsion, gas troubles and fodder.
102.	Zygophyllaceae	*Tribulus terrestris* L.	Markundai	Herb	BS	S,F	Diuretic, tonic and fuel.
103.	Zygophyllaceae	*Zygophyllum eurypterum* Boiss.	Zumai	Herb	BS	L	For cleaning clothes and fodder.

Key: BS= Bare soil, GF=Gram fields, WF=Wheat fields, GY=Graveyard, DA=Dry area, PP=Parasitic plant, HA= Hilly area, SS=Sandy soil, R=Root, S= Stem, L= Leaf, F= Fruit, FL= Flower, SD= Seed and WP= Whole plant.

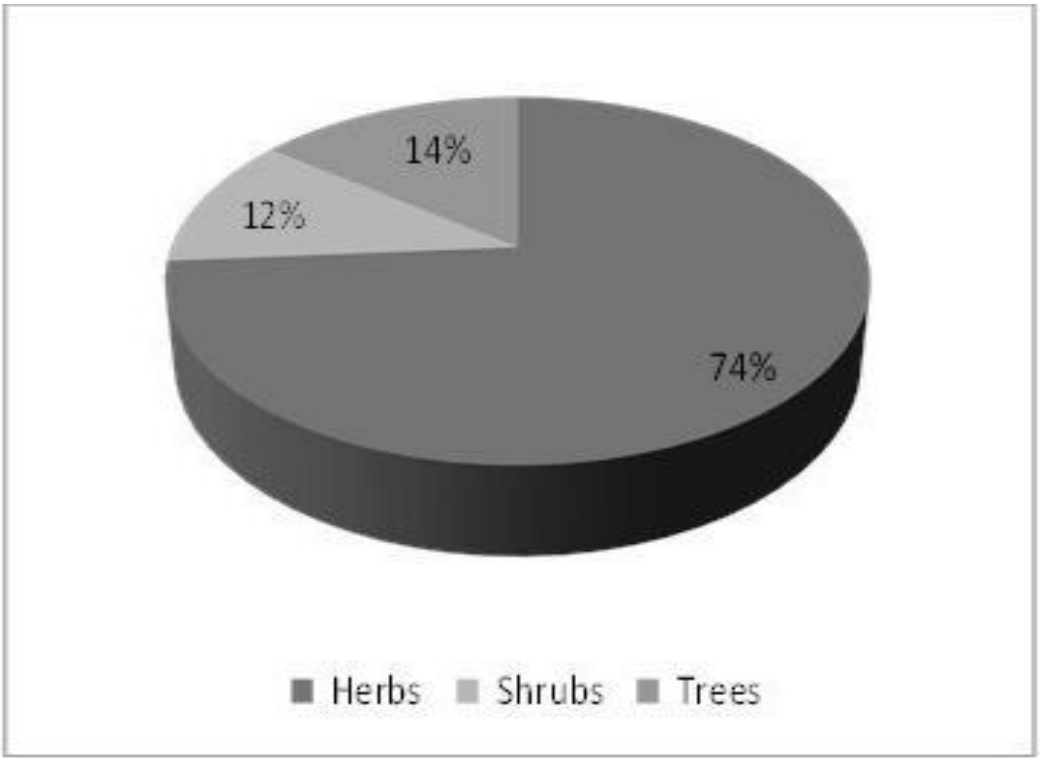

Fig. 1. Percentage of herbs, shrubs and trees used for different ethnobotanical purposes

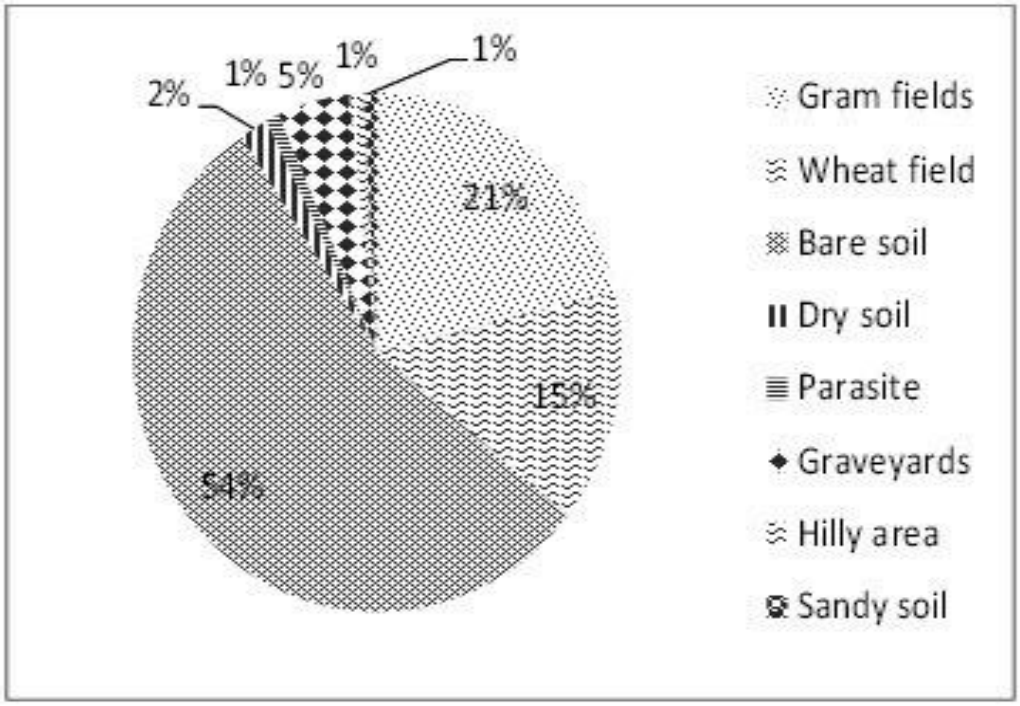

Fig. 2. Habitat types of ethnobotanical plants collected in District Karak, KP, Pakistan

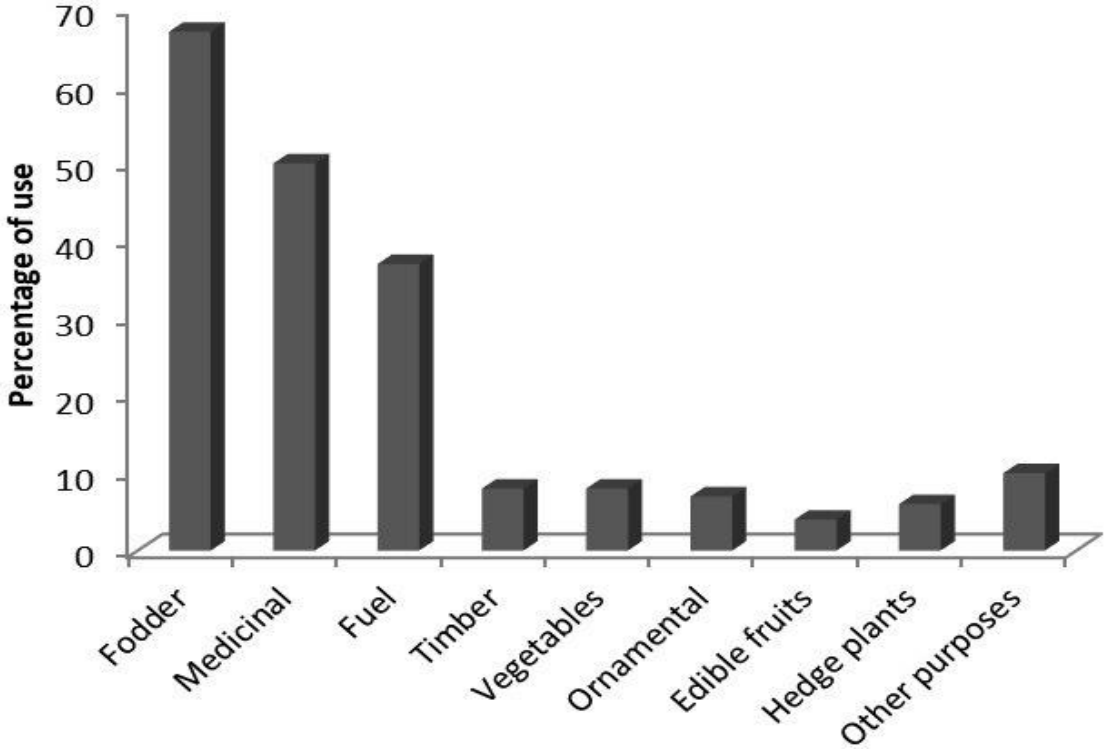

Fig.3. Ethnobotanical usage of plants collected in research area.

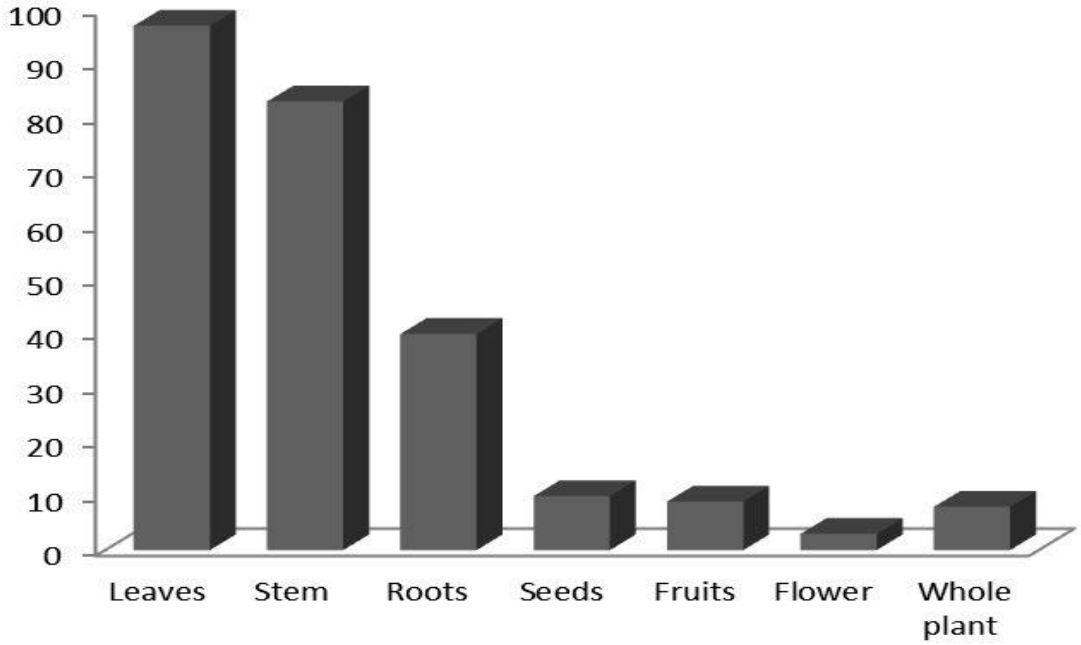

Fig.4. Part use of the studied plants

Conclusions: Karak is a semi-arid area of KP province in Pakistan with hot climate. Uses of ethno-medicinal plants are an old tradition in the study area. The aim of the present study was to document the indigenous knowledge of plants that can be helpful for further pharmacological investigation. Out of 103 species majority of the plant species are found on bare soil. Based on ethno-botanical usage 67.9 % of the collected plants are used as fodder, 50.4 % as medicinal and 36.8% as fuel, further habitat preferences of the species were recorded. With the development of allopathic drugs, like in other parts of the country plants folk use is on decline in the area. One of

the major reasons is lack of knowledge especially among the Youngers. This study will help in preserving knowledge of the traditional folk use of plants. For this purpose we have included local names of the plants so that most of the people can benefit from the findings including wide botanical readership.

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