

**DIVERSITY, DISTRIBUTION AND INDIGENOUS USES OF THE  
MEDICINAL PLANTS OF DISTRICT KARAK, KHYBER  
PAKHTUNKHWA, PAKISTAN**

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**ABSTRACT**

*The present research work deals with the indigenous knowledge of medicinal plant species utilized by the local inhabitants of district Karak Khyber Pakhtunkhwa, Pakistan. A total of 50 genera and 52 species belonging to 33 families have been recorded during March, 2010 through April, 2011. The local peoples of the area use medicinal plants to treat gastro-intestinal disorders such as dysentery, dyspepsia, diarrhoea, stomach-ache, ulcer and skeleto-muscular complaints like backache, rheumatism and muscular pain. Some species are used to treat respiratory disorders such as asthma, bronchitis and cough. While some other species are used as antipyretic, analgesic, anti-inflammatory, anti-diabetic, anti-hepatic, expectorant and as tonic. Few are used for skin diseases, wound healings, swelling, inflammation and curing of snake bite and scorpion stings. Aims of the present study were to document the medicinal plant resources and their patterns of usage.*

**Key words:** Diversity, indigenous uses, Karak-Pakistan, medicinal plants.

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**INTRODUCTION**

Medicinal plants produce valuable natural secondary metabolites which can be used for the treatment of various diseases. Medicinal plants, since ancient time have been used by human beings as remedies for various ailments throughout the world (Malik *et al.*, 2011) and these have good economic value and source of income (World Bank, 1997). People living in rural and hilly areas have been using indigenous plants as source of medicines. Indigenous knowledge of medicinal plants is transferring from generation to generation based

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on a practice and experience. Until now, 80% of the world's population for its primary healthcare needs depends on traditional medicines (Ullah *et al.*, 2010; Khan *et al.*, 2013). A total of 4,22,000 angiosperms plants (flowering plants) have been reported, out of these approximately 50,000 plants have been used for medicinal purposes to treat various diseases (Walter and Hamilton, 1993). Shinwari (2010) reported that worldwide more than 10,000 medicinal plants are currently under the severe threat of over grazing and deforestation. People living in rural and hilly areas prefer medicinal plants due to their easy accessibility, being free from side effect and cheap therapy as compared to costly allopathic drugs. In all over the world treatment through traditional medicine system is progressing, but particularly in the sub-continent this system is known by Ayurvedic or Unani (Malik, 2001). Unani system is generally followed among Muslim communities and Hindu communities follow the Ayurveda system. Some ancient data show that some of drugs used by the modern physicians and pharmacists were already in use by Babylonians, Romans, Chinese, Egyptian, Greeks and people of the sub-continent (Hazrat *et al.*, 2007; Khan *et al.*, 2011).

Pakistan due to its location in best ecological zone of the world has quite rich medicinal flora in major parts of the country due to its diverse climatic conditions (Abbasi *et al.*, 2010). Hamilton (2004) stated that approximately 6000 species of higher plants have been reported in Pakistan and from these 600 to 700 (10% to 12%) species are used for medicinal purposes. We now need to preserve this valuable traditional knowledge (Khan *et al.*, 2011). The aim of the present study was to transfer the indigenous knowledge of medicinal plants from district Karak, Khyber Pakhtunkhwa, Pakistan to wide readership in order to benefit from natural wealth of medicinal plants.

## **MATERIALS AND METHODS**

### **Study area**

Karak district lies between 33°-6' to 33°-7' East longitudes and 71°-2' to 71°-7' North latitudes. It is bounded on South by district Lakki Marwat, on south east by district Mianwali, on West by district Bannu and Waziristan agency and on North by district Kohat and Hangu. Karak was upgraded to a district in July 1982. Before its upgradation it comprised of Takht-e-Nasrati, Karak and Banda Daud Shah sub-divisions. Topography of district Karak consists of small mountains and common trend of the mountain series is from East to West. Climate of the district has extremes. The hottest month is June with mean minimum and maximum temperature of about 27°C and 40°C, respectively. The cold season is very extreme because of the wind which comes from west side called Breeze of Hangu. The coldest

month is January with mean minimum and maximum temperature of almost 6°C and 18°C, respectively. Monsoon rainfall occurs from May to October. The maximum rainfall (110 mm) is received in August during which the weather becomes hot and humid. Winter rains occur from December to February.

#### **Data collection**

Before starting of field work, research work was planned. General information about the medicinal plants were collected. Several trips were made during March, 2010 through April, 2011. Structured and semi-structured Questionnaires were prepared and distributed among the peoples in places like Ahmad Abad, Tatter Khel, Chowkara, Zarkai, Narai Khra, Haider Khel, Warana, Nari Panos, Banda Daud Shah, Sabir Abad and Lawaghar Cheni Khel of district Karak. From each village aged people, farmers and Hakims were interviewed during field work and personal observations were made and recorded. The data thus obtained through these questionnaires and personal observations were further analyzed.

#### **Plant collection, identification and preservation**

Different plant species from study area were collected. For the removal of moisture the collected specimens were placed in the newspapers and pressed in plant presser. After every 24 hours the newspapers were changed. Naphthalene in powder form was sprinkled over the plants to prevent fungal infections. The newspapers were changed repeatedly until the plants were fully dried. The dried plants were mounted on standard Herbarium sheets. The identification of plants was carried out on the basis of morphological characters of fruits, flowers, leaves, stem and hairs with the help of available literature and flora of Pakistan (Ali and Qaiser, 1995; Nasir *et al.*, 1972) or by matching with already identified plants in the herbarium of Department of Botany Islamia College Peshawar. After the identification, the voucher specimens were submitted in the herbarium (Department of Botany, Islamia College Peshawar) for future references.

### **RESULTS AND DISCUSSION**

The present study was carried out in district Karak in order to record the indigenous information about the medicinal plants. The area is gifted with medicinal plants and unique flora because of its dry climate. The people of the study area are educated and mostly poor depending upon plant resources for their domestic needs. A total of 50 genera and 52 species belonging to 33 families were collected from the area. From these 33 families, 2 were monocotyledonous (Cyperaceae and Poaceae) and the remaining 31 families were dicotyledonous. All the recorded plant species were arranged in Family alphabetical order

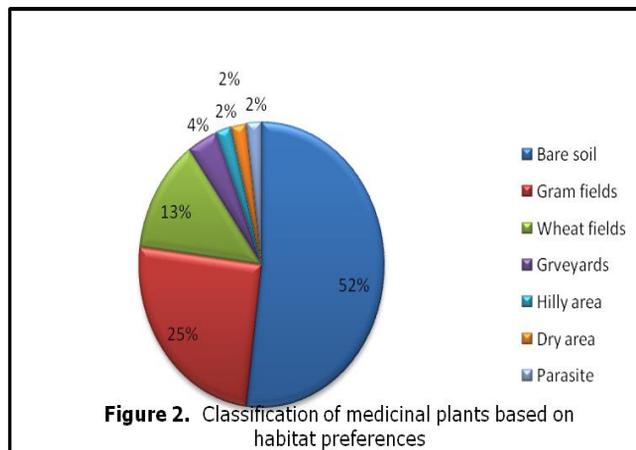
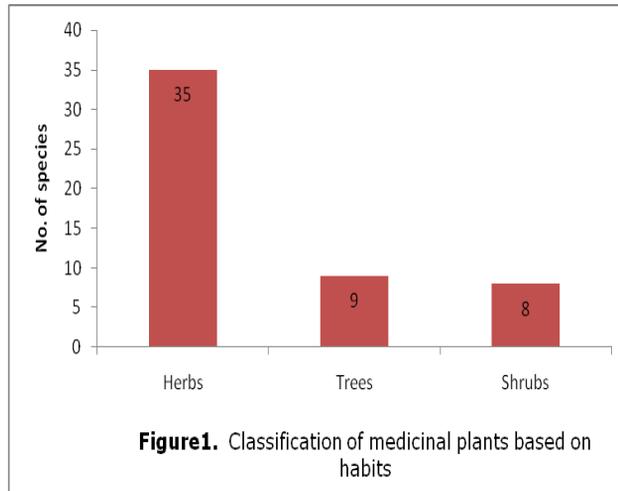
mentioning their botanical name, local name, habit, habitats, part used and medicinal uses (Table-1). Out of 52 plant species, 35 species (67.3%) were herbs, 9 species (17.3%) were trees and 8 species (15.4%) were shrubs (Fig.1). These medicinally important plants occur in different habitats. Among these 52 different plant species 27 (52%) grow on bare soil, 13 (25%) in gram fields, 7 (13.5%) in wheat field, 2 (3.8%) in graveyards, 1 (1.9%) in dry soil, 1 (1.9%) as parasitic and 1 (1.9%) in hilly area (Fig.2). Based on the information collected, the medicinal plants of the area are used for various human ailments to treat gastro-intestinal disorders such as dyspepsia (indigestion), dysentery, diarrhoea, vomiting, stomach-ache, ulcer and skeletal-muscular complaints like backache, rheumatism and muscular pain. Some species are used to cure respiratory disorders such as bronchitis, cough and asthma. While some other species are used as expectorant, antipyretic, pain-killer (analgesic, anti-inflammatory and antispasmodic), anti-diabetic, anti-hepatic, antiseptic, stimulant, diaphoretic, anodyne and tonic. Some of them are used for skin diseases, toothache, wound healings, swelling, scorpion stings and curing of snake bite (Fig. 3). The local inhabitants of the area usually utilize every part of the plant. However, why a particular plant part is used, it depends on the plant habit and on the need of the user. Most frequently leaves 44 (84.6%) were used, followed by stem 35 (67.3%), whole plant 21 (40.3%), roots 19 (36.5%), seeds 9 (17.3%), Fruits 6 (11.5%), and flowers 2 (3.8%) (Fig. 4). Our findings of the frequent use of leaves corroborate the results of Sohail *et al.* (2016), Hassan *et al.* (2015), Khan *et al.* (2015), Akhtar *et al.* (2013) and Murad *et al.* (2013). The use of specific plant parts used for curing various human diseases suggests that these parts have strongest medicinal properties but it needs further phytochemical analysis and phyto-pharmaceutical screening to cross-check the local information.

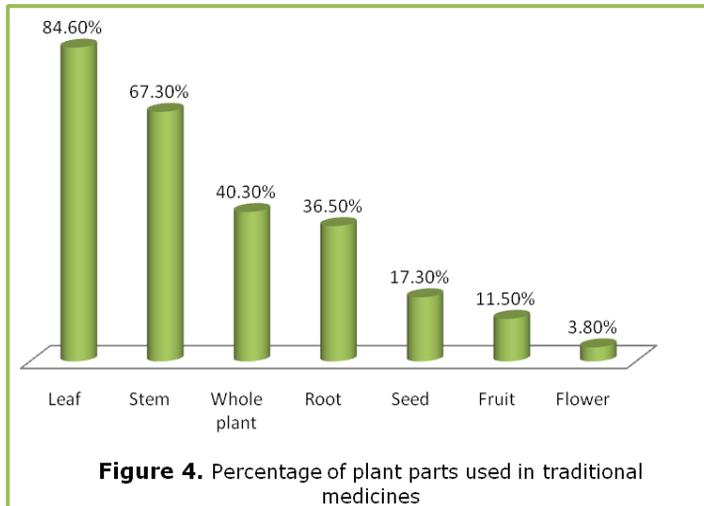
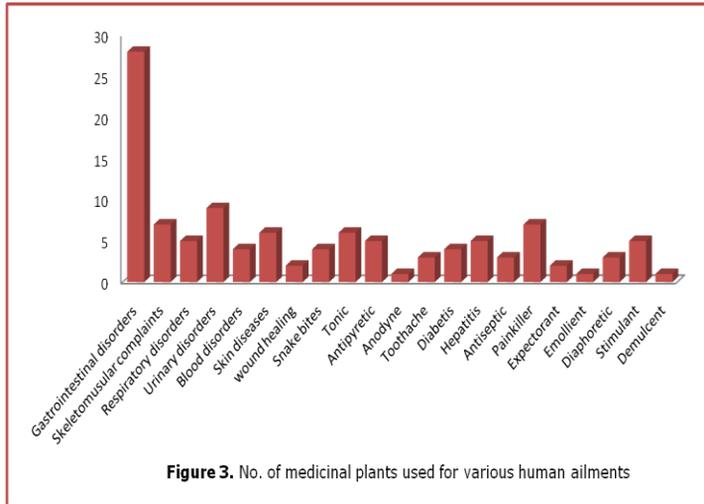
Main diseases in the study area are related to gastro-intestinal problems, respiratory infections, skin diseases and fever. The possible reason behind such diseases in the investigated area might be due to high air and water pollution, lack of proper sanitation, lack of proper drinking water, unhygienic conditions, poor quality food and fuel wood smoke inside houses. Gastro-intestinal disorders cholera, diarrhoea and dysentery and respiratory infections particularly cough, asthma and bronchitis are a major concerns in the study area. These findings are similar to an ethnobotanical study conducted by Murad *et al.* (2013) in Banda Daud Shah, District Karak, Pakistan.

## CONCLUSION

From the the present study it is concluded that the investigated area is rich in medicinal plants. The people of the area have good

knowledge of herbal drugs and they are dependent on these native plants for their health care needs. A total of 52 plant species belonging to 33 families were collected from the study area. The local peoples of the area widely used these plants for the treatments of various ailments.





**Table-1.** Total reported medicinal plants from district Karak, Pakistan with chorological and medicinal characteristics.

S. No	FAMILIES	PLANT SPECIES	LOCAL NAME	HABIT	HABITAT	PART USED	MEDICINAL USES
1	Acanthaceae	<i>Justicia adhatoda</i> L.	Baza	Shrub	Bare soil	Leaf and stem	Asthma, bronchitis, cough, rheumatism and dysentery.
2	Aizoaceae	<i>Trianthema portulacastrum</i> L.	Lamai	Herb	Bare soil	Leaf ,root and stem	Decoction is used as analgesic, purgative, stomach-ache piles, inflammation, asthma, anaemia and bronchitis
3	Amaranthaceae	<i>Amaranthus viridis</i> L.	Ranzaka	Herb	Gram field	Root, stem and leaf	Emollient, pain killer, snake bite & scorpion sting.
4	Amaranthaceae	<i>Chenopodium album</i> L.	Spin Soba	Herb	Gram field	Root, leaf and seeds	Decoction made used for urinary diseases and rheumatism.
5	Amaranthaceae	<i>Chenopodium murale</i> L.	Tor soba	Herb	Gram field	leaf	Asthma, stimulant and antispasmodic.
6	Apiaceae	<i>Foeniculum vulgare</i> Miller.	Kagah	Herb	Bare soil	Fruit and leaves	Carminative and stimulant.
7	Apocyanaceae	<i>Nerium oleander</i> L.	Ganderai	Shrub	Bare soil	Root, stem and leaf	Swelling, skin diseases , snake bite & scorpion sting.
8	Apocyanaceae	<i>Rhazya stricta</i> Decen.	Ranzai	Shrub	Bare soil	Root, stem and leaf	Decoction used as blood purification skin diseases.
9	Asclepiadaceae	<i>Calotropis procera</i> Acit.	Spilmaka	Shrub	Bare soil	Root, stem and leaf	Anthelmintic, ear pain, skin diseases and snake bite.
10	Asteraceae	<i>Calendula arvensis</i> L.	Zyer Guley	Herb	Gram field	Flower	Toothache.
11	Asteraceae	<i>Carthamus oxycantha</i> M.B.	Ghzanka	Herb	Wheat field	Stem, flower and seed	Antipyretic, laxative, hair tonic and fever.
12	Asteraceae	<i>Cirsium arvense</i> L.	Trapar	Herb	Bare soil	Stem, root and leaf	Decoction used as tonic and diaphoretic.
13	Asteraceae	<i>Conyza aegyptiaca</i> L.	Lalahozah	Herb	Wheat field	Stem and leaves	Stimulant, anti-dysentery and anti-diarrhoea.
14	Asteraceae	<i>Silybum marianum</i> Gaerth.	Shodakay	Herb	Wheat field	Stem, leaf and seeds	Aperient, demulcent and diaphoretic.
15	Asteraceae	<i>Sonchus asper</i> L.	Tariza	Herb	Gram field	Stem, root and leaf	Asthma, constipation, inflammation, itching, heart problems.
16	Asteraceae	<i>Xanthium strumarium</i> L.	Kata sora	Herb	Graveyards	Stem, root and leaf	Urinary troubles.
17	Boraginaceae	<i>Nonnea edgeworthii</i> DC.	Spin Gulley	Herb	Wheat field	Leaves and seeds	Hair tonic.
18	Brassicaceae	<i>Sisymbrium irio</i> L.	Badal	Herb	Gram field	Seed and	Antipyretic, diaphoretic,

			Bang			leaves	stimulant and expectorant.
19	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Prewatye	Herb	Gram field	Whole plant	Anti-dandruff, laxative and Anthelmintic.
20	Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Chambal	Herb	Parasite plant	Stem, root and leaves	Decoction is used as diuretic, purgative, anthelmintic and carminative.
21	Cyperaceae	<i>Cyperus rotundus</i> L.	Dela	Herb	Gram fields	Stem and leaves	Back-ache, weakness and removing swellings.
22	Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Bota	Herb	Bare soil	leaf	Anti-hepatitis, purgative and constipation.
23	Euphorbiaceae	<i>Raccinus communis</i> L.	Rund	Shrub	Bare soil	Seeds, stem and leaves	Antipyretic, antiperiodic, vermifuge, anti-hepatitis and anti-diabetic.
24	Fabaceae	<i>Medicago denticulata</i> Willd.	Speshtara	Herb	Gram fields	Leaf	Carminative.
25	Fumariaceae	<i>Fumaria indica</i> Hausskn.	Lewanai Gajara	Herb	Gram field	Stem, root and leaf	Antipyretic, antiperiodic, vermifuge, anti-hepatitis and anti-diabetic.
26	Lamiaceae	<i>Ocimum basilicum</i> L.	Bobrai	Shrub	Bare soil	Whole plant	Anthelmintic, carminative, anti-dysentery and anti-diarrhoea.
27	Lamiaceae	<i>Salvia moorcroftiana</i> Wall.	Dreshal	Herb	Bare soil	Leaf	Anodyne, constipation and curing swelling.
28	Liliaceae	<i>Aloe vera</i> Auct.	Zargeya	Herb	Bare soil	Stem and leaves	Anti-hepatitis, wound healing and antiseptic.
29	Liliaceae	<i>Asphodelus tunuifolius</i> Cavan.	Pezakai	Herb	Gram field	Seed, stem and leaf	Anti-inflammatory.
30	Malvaceae	<i>Malva neglecta</i> Waller.	Tor Peshtara	Herb	Gram fields	Root and leaves	Anthelmintic and anti-dysentery.
31	Meliaceae	<i>Melia azedarach</i> L.	Bakanra	Tree	Bare soil	Stem, root and leaf	Anthelmintic, vermifuge and emetic.
32	Mimosaceae	<i>Acacia arabica</i> Lam.	Kikar	Tree	Bare soil	Stem, root and leaf	Anti-dysentery.
33	Mimosaceae	<i>Acacia modesta</i> Wall.	Palosa	Tree	Bare soil	leaves	Animal carminative.
34	Mimosaceae	<i>Prosopis juliflora</i> Swartz.	Angrizi Kikar	Tree	Bare soil	Stem	Rheumatism.
35	Myrtaceae	<i>Eucalyptis camaldulensis</i> Schlect	Lachi	Tree	Bare soil	Stem, root and leaf	Antiperiodic, carminative, expectorant and antiseptic.
36	Nyctaginaceae	<i>Boerhavia procumbens</i> Banks.	Pendrawush	Herb	Wheat field	Stem, root and leaf	Anti-hepatitis, purgative and diuretic and scorpion bite.
37	Oleaceae	<i>Olea ferruginea</i> Royle.	Zaiton	Tree	Bare soil	Stem and leaves	Antiseptic, diuretic, tonic and rheumatism.
38	Plantaginaceae	<i>Plantago indica</i> Sibth.	Spighol	Herb	Bare soil	Dried seed	Anti-diarrhoea, anti-dysentery and Constipation.

39	Poaceae	<i>Avena fatua</i> L.	Jodar	Herb	Wheat field	Leaves and seed	Anti-dysentery.
40	Poaceae	<i>Cynodon dactylon</i> L.	Barawa	Herb	Bare soil	Stem, root and leaf	Anti-dysentery, blood purifier, and diuretic
41	Rhamnaceae	<i>Ziziphus jujuba</i> Lam.	Bera	Tree	Dry area	Fruit, stem and leaf	Anti-diabetics and constipation.
42	Rubiaceae	<i>Galium aparine</i> L.	Babar	Herb	Wheat field	Stem, root and leaf	Anti-diabetics, Diuretic and healing wound .
43	Salvadoraceae	<i>Salvadora oleioides</i> Dene.	Pleen	Shrub	Bare soil	Stem and leaves	Anti-diuretic and toothache
44	Sapindaceae	<i>Dodonaea viscosa</i> L.	Sanate bota	Shrub	Hilly area	Stem, root and leaf	Astringent, stimulant and rheumatism.
45	Solanaceae	<i>Datura alba</i> Nees.	Batora	Herb	Bare soil	Fruit and leaves	Antipyretic, antiperiodic, anti-dandruff, antispasmodic and hair tonic.
46	Solanaceae	<i>Solanum surratense</i> Burm.	Speen azghai	Herb	Bare soil	Whole plant	Purgative, carminative and constipation and rheumatism.
47	Solanaceae	<i>Withania somnifera</i> L.	Shapyang a	Tree	Bare soil	Fruit, Stem and leaf	Animals in gas troubles.
48	Tamaricaceae	<i>Tamarix aphylla</i> L.	Ghaz	Tree	Bare soil	Stem and leaves	Anti-inflammatory, curing of burn spots and toothache.
49	Violaceae	<i>Viola Stocksii</i> Boiss.	Makar Botey	Herb	Bare soil	Stem and leaves	Antipiles and gas troubles.
50	Zygophyllaceae	<i>Fagonia arabica</i> L.	Spelazghz ai	Herb	Gram field	Stem and leaves	Blood purification and skin diseases.
51	Zygophyllaceae	<i>Peganum harmala</i> L.	spelanai	Herb	Graveyard	Fruit, Stem and leaf	Burnt for evils expulsion and gas troubles.
52	Zygophyllaceae	<i>Tribulus terrestris</i> L.	Markundai	Herb	Bare soil	Fruit and Stem	Diuretic, tonic.

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